

RISK IDENTIFICATION AND ASSESSMENT FOR PPP INTEGRATED  
HEALTH CAMPUS PROJECTS IN TURKEY A CASE STUDY: KAYSERİ  
INTEGRATED HEALTH CAMPUS

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**RISK IDENTIFICATION AND ASSESSMENT FOR PPP INTEGRATED  
HEALTH CAMPUS PROJECTS IN TURKEY A CASE STUDY: KAYSERİ  
INTEGRATED HEALTH CAMPUS**

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**I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.**

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## ABSTRACT

### **RISK IDENTIFICATION AND ASSESSMENT FOR PPP INTEGRATED HEALTH CAMPUS PROJECTS IN TURKEY A CASE STUDY: KAYSERİ INTEGRATED HEALTH CAMPUS**

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Apparently, the most crucial role of a government is providing the health services to the public effectively. Hundreds of hospitals under this purpose are taken into service since the establishment of the Republic of Turkey. Different methods are tried to be used to provide health services through hospitals which are in charge under government. Those hospitals were directly bonded to the government up to now. In other words, they are built and operated by the government herself. This was a way to make the business more effortful and overpriced for the state. Employing the private sector at this point was vital, and it was also a common culture especially in England. Turkey had employed Public Private Partnership (PPP) model since 2000s and carried the business through domestic construction firms. PPP Model has not only some whip hands but also some difficulties to understand and implement it correctly.

This study will attempt to reveal the concepts, meanings, advantages & disadvantages about PPP and the risks which may be encountered as implementing the PPP in Turkey. Through a literature survey, risk factors and their possible impacts for some superstructure projects will be tried to conceive. And the study examines and put under the scope a major implementation of PPP in Turkey: Health Campuses.

Founded risk factors will be spotted and interpreted over a real implementation of PPP in Turkey: Kayseri Health Campus. Scenario Analysis will also be employed as a tool to assess the risk factors and the related cost overruns, which are showing up due to those risk factors.

Scrutinizing and revealing those factors makes this study meaningful and essential for upcoming projects. Because the current situation seems like; Turkey will be performing some PPP health campus projects hereupon and changing the way of conventional understanding of health service provision. From this aspect, the study is crucial to understand, particularly for the eager contractor firms.

Keywords: PPP, Health Campuses, PPP in Turkey, Risk Identification & Assessment, Scenario Analysis

## ÖZ

### **TÜRKİYE’DEKİ KAMU ÖZEL ORTAKLIĞI SAĞLIK KAMPÜSÜ PROJE RİSKLERİNİN BELİRLENMESİ VE DEĞERLENDİRİLMESİ ÖRNEK OLAY: KAYSERİ ENTEGRE SAĞLIK KAMPÜSÜ**

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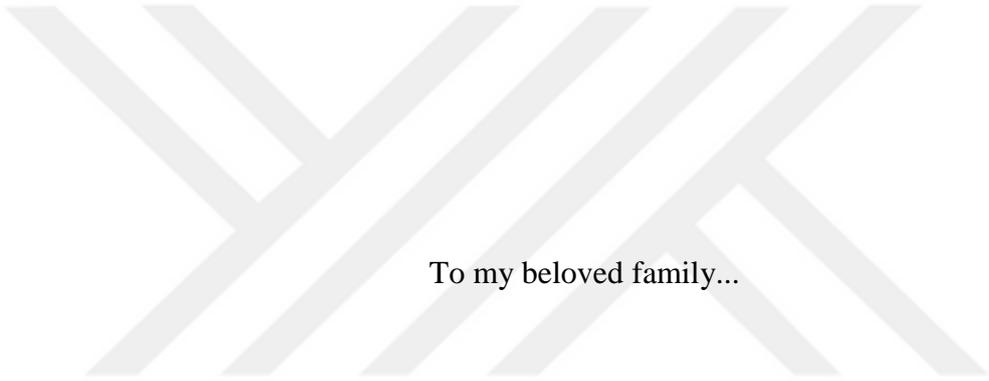
Malumu olduğu üzere devletin en önemli görevlerinden birisi sağlık hizmetlerini en etkin şekilde sağlamaktır. Türkiye Cumhuriyeti’nin kuruluşundan beri bu amaç doğrultusunda yüzlerce hastane görev almıştır. Devlete bağlı hastaneler kanadıyla sağlık hizmetlerinin sağlanması farklı yöntemler kullanılarak bu güne kadar gerçekleştirilmiştir. Hastaneler şimdiye kadar devlete bağlı şekilde hizmet vermekteydi. Bunun anlamı hastaneler devlet tarafından inşa ediliyor ve yönetiliyordu. Fakat anlaşılmıştır ki bu yöntem işleri hem daha efor gerektiren hem de pahalı bir hale getirmişti. Bu noktada özel sektörü oyuna sokmak hem hayati önem taşıyordu hem de bu yöntem zaten ilk olarak İngiltere’de olmak üzere uygulanmıştı. Türkiye böylece Kamu Özel Ortaklığı (KÖO) Modelini 2000’lerden itibaren sisteme entegre etmeye ve işleri yerel inşaat firmaları üzerinden yürütmeye başladı.

Kamu Özel Ortaklığı (KÖO) Modelinin güçlü ve elverişli yanları olmasına rağmen; anlaşılması ve uygulanmasına dair zorlukları bulunmaktaydı. Bu çalışma KÖO modeli ile alakalı konseptleri, kavramları, sistemin avantajları & dezavantajlarını ve KÖO modelinin Türkiye’de uygulanışında karşılaşılabilecek risk faktörlerini ortaya koymaya çalışacaktır. Bir literatür taramasının ardından bazı üstyapı projeleri

ile ilgili risk faktörleri ve bunların muhtemel etkileri ortaya koyulacaktır. Bu tez çalışması KÖO modelinin Türkiye’de ilk uygulama alanı olan Sağlık Kampüslerini yorumlayacak ve mercek altına alacaktır. Literatürde karşılaşılan risk faktörleri Türkiye’de KÖO modelinin gerçek bir uygulaması olan Kayseri Sağlık Kampüsü özelinde değerlendirilecek ve yorumlanacaktır. Risk faktörlerinin sebep olabileceği istenmeyen fiyat artışlarının değerlendirilmesi için Senaryo Analizi Yöntemi bir araç olarak kullanılacaktır.

Bu risk faktörlerinin irdelenmesi ve ortaya koyulması bu çalışmayı gelecek projeler için anlamlı ve önemli kılmaktadır. Çünkü son durum göstermektedir ki; Türkiye, Kamu Özel Ortaklığı Sağlık Kampüsleri Modelini şu andan itibaren ileride de uygulayacak ve geleneksel sağlık hizmeti verme anlayışını değiştirecek gibi gözükmektedir. Bu yönüyle bu tez çalışmasının anlaşılması, özellikle hevesli yüklenici firmalar açısından önem arz etmektedir.

Anahtar Kelimeler: KÖO, Sağlık Kampüsleri, Türkiye’de Kamu Özel Ortaklığı, Risk Belirleme & Değerlendirme, Senaryo Analizi



To my beloved family...

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## LIST OF ABBREVIATIONS

### ABBREVIATIONS

ACRP: Airport Cooperative Research Program

AIAP: All Included Annual Price

AHP: Analytical Hierarchy Process

BOO: Build-Own-Operate

BOOT: Build-Own-Operate-Transfer

BOT: Build-Operate-Transfer

BTO: Build-Transfer-Operate

CT: Corrective Time

CBRT: Central Bank of Turkey

DB: Design-Build

DBFO: Design-Build-Finance-Operate

DBO: Design-Build-Operate

PPP: Public-Private Partnership

EM: Emerging Market

EPC: Engineering, Procurement, and Construction

HSR: High Speed Rail Projects

HTP: Health Transformation Program

IHC: Integrated Health Campus

IMF: International Monetary Fund

IRR: Internal Rate of Return

GDP: Gross Domestic Product

LROT: Lease-Renovate-Operate-Transfer

LRT: Light Rail Transit

MOH: Ministry of Health

MR: Magnetic Resonance

NHS: National Health Service

NPV: Net Present Value

O&M: Operations and Maintenance

OECD: Organization of Economic Co-operation and Development

PFI: Private Finance Initiative

SPC: Special Purpose Company

SPV: Special Purpose Vehicle

TL: Turkish Lira

UAP: Urgent Action Plan

UF: Utilization Failure

URT: Utilization Response Time

USA: United States of America

VFM: Value for Money



## CHAPTER 1

### INTRODUCTION

#### 1.1. Background of the Study & Chronological Progress in Turkish Healthcare

Seljukian-Ottoman medical tradition enhances the sustainability of healthcare to the public and a cultural understanding of healthcare organization as well. Throughout the establishment of the Republic of Turkey, this organization had been improved, and while creating the health policies, a westward understanding has been adopted. As a brief, this is how the Turkish Ministry of Health (MoH) introduce themselves and what they embrace into their running.

If we look at the Turkish health systems and medical history, the first known Turkish hospital and medical school were “Gevher Nesibe ve Gıyassıye Şifaiyyesi” which was built by request of Gevher Sultan “the daughter of Kılıçarslan the 2<sup>nd</sup>” in the year of 1206 a.d at the time of Seljukians. However, the first known 4 hospitals of the Republic of Turkey were Ankara, Diyarbakır, Erzurum and Sivas Numune Hospitals that were built in the year 1924. And Haydarpaşa Numune Hospital followed them, and it was built in 1936. It was not meaning today’s popular saying Health Transformation Program (HTP) at that time, but it was a necessity.

Ministry of Health in Turkey was established in 3rd May 1920, and the Dr. Adnan Adivar was the first minister of ministry. Between 1920 and 1923 the policies of the ministry were not that shining, they were mostly dealing with the demolishments after the war and improvement studies about regulations.

Between 1923 and 1946, the Ministry is directed by Dr. Refik Saydam and at that time; small medical facilities, public services, 86 hospitals, 6437 patient beds, 554 doctors, 69 pharmacists, 4 nurses, 560 medical officers, and 136 midwives were employed and served. In the year of 1950s, the administration of health services was

slid from local management to central management systems. In the 1970s the socialization of healthcare services was promoted; from small to larger settlement areas; medical houses, community clinics, county hospitals, and city hospitals were established.

1982 Constitution Law had a dam which says that; “To ensure that everyone leads their lives in conditions of physical and mental health and to secure cooperation in terms of human and material resources through the economy and increased productivity, the state shall regulate central planning and functioning the health services. The state shall fulfill this task by utilizing and supervising the health and social assistance institutions, in both the public and private sectors” (Ministry of Health Webpage, 01.09.2015). This statement explains the duty of ministry, and it emphasizes that the government can supply the healthcare systems either with the hand of public hospitals or the private sector health services procurement way. As it’s obvious, the provision of healthcare services by the private sector was a common and old school fashion but not building and operating those with the hand of the private sector at that time.

The primary considerations which took part at Health Reform which was enforced by MoH in the 1990s can be listed as;

- 1- Employing a Comprehensive Healthcare Insurance,
- 2- Introduction of family services for first step healthcare,
- 3- Transforming hospitals from a traditional system to private enterprises,
- 4- Reconstruction of the MoH to make it a managing and developer body which scopes the preventive studies.

After the 3<sup>rd</sup> November 2002 general elections; the 58<sup>th</sup> government announced a set of objectives as the Urgent Action Plan (UAP) with a motto of “Health for Anybody.” Those objectives were as follows;

- 1- Rephase the management and tasks of the MoH,
- 2- Cover all people under a healthcare policy,

- 3- Unify all healthcare systems under a sole body,
- 4- Assign executive and economic liberty to healthcare facilities,
- 5- Present family health support,
- 6- Provide consideration on children healthcare,
- 7- Prolong preventative healthcare,
- 8- Boost private funds into health sector,
- 9- Depute the charge to other levels in public foundations,
- 10- Emphasize lack of healthcare personnel in prior growing areas, and
- 11- Initiate e-healthcare implementations.

In the light of pronouncement of the UAP, the Health Transformation Program (HTP) was improved and declared in 2013 by the MoH. The HTP covered desired following innovations;

- 1- MoH as the deviser and controller,
- 2- A cosmopolitan healthcare guarantee which meets anybody under a distinct roof,
- 3- A broad, available and favorable health system,
  - a) Strong primary healthcare,
  - b) Effectually working referral system,
  - c) Healthcare system with managerial and economic autonomy,
- 4- Highly adapted healthcare workforce weaponed with acknowledgement and abilities,
- 5- Education, preparation and painstaking formations,
- 6- Supremacy for quality of healthcare,
- 7- A well-prepared body in rational medical and supply supervision,

Between years 2003 and 2008, some necessary changes occurred in the healthcare system and it was a shining period for health provisions of Turkey. The program which was prepared and announced at the beginning of 2003, was emphasizing socialization of healthcare systems and was depending on previous experiences and the successful applications from all around the world.

Health Transformation Program actually involved some general and tone duties that a MoH should include under the supervision of itself in a country. But what is more important was standing under the Urgent Action Plan (UAP). UAP included some tips in terms of desired settlement of hospitals and the method that they should be constructed and operated. Especially article 3 was obviously indicating integrated health campuses and article 8 was signaling the PPP type of procurement.

## **1.2. History of PPP & Some PPP Models & PPP in Turkey**

Health services are amongst the most significant channel that a government stay focused and obviously it should be. Investments to make the health business right require high amounts of capital which cannot be easily afforded by the government itself. For this reason, employing the private sector to utilize the financial power they have, seems reasonable. The continuum was quite demanding in terms of good coordination to ensure having high quality and ergonomic healthcare systems. The mentioned continuum could be satisfied by employing well-designed contracts which are governing the legal relationships between the private sector and the state. These contracts are called Public-Private Partnerships (PPPs).

If we look at the history of PPPs; we should go to the middle of the 1800s. Paris was supplying the water needs from the River Seine by hauling thanks to some containers, vessels or even buckets. In the early 1700s; Napoleon Bonaparte was the first man who constructed the first sewer of 30kms from river to the city center with the hand of native Parisian workers. It is used for years, but in the year 1878, Baron Haussmann, the prefect of the Seine Department of France has implemented lots of innovations related urbanism such as boulevards, parks, and public works. Those were even known as Hausmann's Renovation of Paris. The renovations were including the 600km long sewer network to provide Paris with fresh drinking water. The design was made by the Parisian engineer Eugene Belgrand, and the construction is procured to the team Belgrand (Tunc, 2015). So it can be said that this was the first procurement

which was administrated by the Hausmann (who is literally a civil servant from the government) and the work was procured to the Belgrand who is a private initiative. As a result, we can say that the first PPP in the world happened in Paris in the year 1878. But after this point, the PPP approach was not used frequently. Actually the case Hausmann may be looked like a PPP, but they have not had even an idea about the PPP at that time and the structure of it. It was just mentally including the frame of PPP mindset.

Chronologically, United States of America (USA) was used PPP procurement to implement some urban transformation programs in the 1960s. And some education programs which were supported by public and private finance have followed the progress (Yescombe, 2007).

The financial crisis of 2007-2011 all around the world created an interest in PPPs mandatorily in improved and unimproved countries both. And as a footnote, this procurement method (PPP) was practiced in developed countries broadly, the developing countries still trying to incorporate the model into their business understanding and economic agenda (Sarica, 2016).

From this change of understanding; in the year 2010, 118 PPP contracts which have a total budget of \$18.3 billion were signed. England was the most enthusiast country by the number of 44 PPPs, Spain was the first country with a total PPP budget of \$4.5 billion. Moreover, England was important as the first declaration and most usage of PPP model. In the year 1997, the ruling Labor Party in England was focusing the notions;

- risk transfer and proper delegation of it,
- the fund invested,
- the revenue earned and,
- the maximum value earned

in their success targets against the criticisms about over costing PPP investments.

Out of those, the main reasons for the need to PPPs were sorting as by the ruling party at that time;

- Fund constraints of the public sector: Because of the fund constraints of the public sector and related latencies of needed investments, the private initiatives are employed.
- The desire of public sector to transfer the contractual and financial risks: Throughout the construction and operation periods, the risk that tends to be encountered, the planning of investments, feasibility studies and the provision of fund requirements are transferred to the private sector.
- The need to decrease the exteriority: The business is carried out with the hand of the private sector, and in this manner, the repayment of investment is not conducted by the capitation taxes and only conducted by the users of healthcare services.
- Improvement of healthcare productivity: With the profit based approach of the private sector, the whole business is carried out faster and is operated more abundantly. The knowledge which is derived from English National Assessment Office shows that; in the projects which are carried out by the public sector, where cost overruns reach 73% and time-outs 70%; in the projects which are accomplished by the private sector, the rates are 22% and 24% accordingly.
- Additional source creation to government: The borrowing need of public sector to invest money into some other services is removed by handling the business by the private sector.

### 1.2.1. Definition of PPP & PPP Models

So PPPs were becoming the tools that governments think about necessarily to improve infrastructures and some health-related services. For sure PPPs are some agreements which underlie some contractual and financial necessities inside in a complex variety, but there is still no consensus on the definition of PPP. But it's important that whatever the real definition of PPP is, it should govern some other definitions of partnerships which are used to implement the business.

But what we have about the definition of PPPs? Some definitions of PPPs can be listed as follows, and they are not that different from each other.

- Organization for Economic Co-operation and Development (OECD) defines PPP as; an agreement which is established between government and the private partner who expects the profit and shares the risk with public sector (OECD, 2008).
- International Monetary Fund (IMF) says that if the substructure and services which ought to be provided by the public sector is provided by a private company, it means a PPP (International Monetary Fund, 2006).
- EC (European Commission) defines PPP as; all implementations about funding, building, renovation, operating and maintenance which are served by a partnership between the public sector and private agencies to procure some necessary services (European Commission, 2004).

Thus, the PPP model is implemented by using different methods around the world. But the most common methods can be sorted as; BOT (Build-Operate-Transfer), DB (Design-Build), BOOT (Build-Own-Operate-Transfer), BOO (Build-Own-Operate), DBFO (Design-Build-Finance-Operate) and LROT (Lease-Renovate-Operate-Transfer) models (Özasari, 2015) and also OM (Operation-Maintenance), DBO (Design-Build-Operate) models (Ibbs, 2009).

BOT is a method which the project sponsor reliable for constructing, operating and financing the project and expects to generate revenue from the facility for a precise time period and transfers the facility to the employer back who is government generally (Tam, 1999).

DB method confers the responsibilities of designing the work and construction of it to the contractor. The method is widely used in the United States of America, and it's experienced that the most important thing for the method DB is the design-build team. It's said that the team here is vulnerable and considerable because any mistake that the team may do effects both the design and building stages of the project (El Wardani et al., 2006)

BOOT contract type can be defined as the government integrates a private sector firm into the process of building a specialized facility and owns it for a definite period of time, operate it and get the revenue back from it and then after the contractual period is over; transfers it back to the government. (Woodward, 1995)

DBFO is a procurement type of PPP which means the private sector initiative designs the facility, builds, finance the requirements and operates it. (Shaoul et al., 2006) The operation period is generally reached 25-30 years maximum. Because it's well known that the return period of the money invested is about 20 years. That's why the operation period of DBFO procurements last that long.

LROT was a term which means that a private party is employed by the public community to lease an existing facility, renovate the problematic and ineffective conditions, operates the facility with the changes they made to make them permanent and transfers it back. (Hall et al., 2003)

OM model means that the private sector is liable for all operation and maintenance works. Even the private sector doesn't need to finance the project for this type of procurement; it should concern to find the fund and determine how the money should be used throughout the project with public sector (Ibbs, 2009).

DBO is a model that the private sector should design, construction and operation of the project for a limited period to hand it over to the public sector (Ibbs 2009).

BOO is the model which implies that the private sector retains the ownership of the equity in perpetuity. The government uses the services generated for a limited time (Ibbs 2009).

The participation of public and private sectors and the involvement degree of participation between them is shown in Figure 1.1.

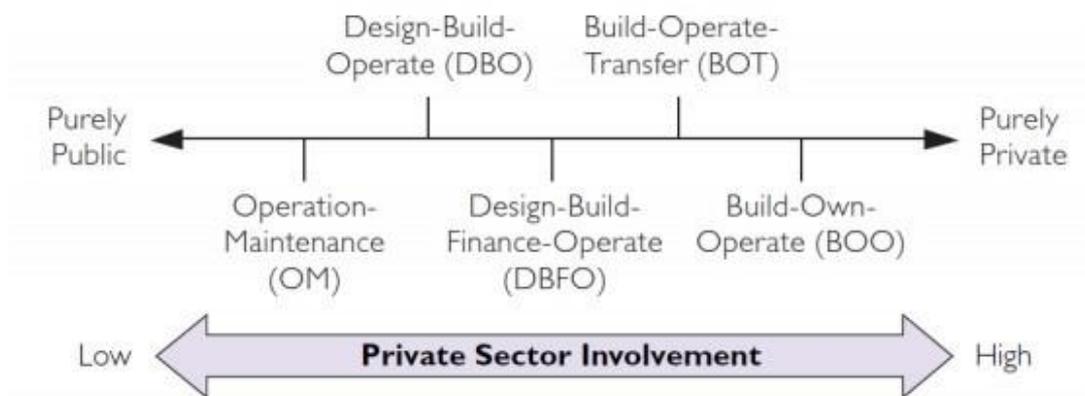


Figure 1.1 Continuum of Types of PPP

(Ürel 2015)

### **1.2.2. English PPP Model – Public Private Initiative (PFI)**

In the 1990s the United Kingdom (UK) government tried to center a series of reforms about the healthcare system. The secretary of state was emphasizing that a well-coordinated National Health Service (NHS) cannot be built in the 21<sup>st</sup> century with the hospitals which built in the 19<sup>th</sup> century. So the hospital renovation and rebuilding program was the main caution area and the first milestone for the UK's healthcare reforms. To nourish the investments, several kinds of PPP's were introduced, and Private Finance Initiative (PFI) system was first introduced in 1992 by a Conservative Government and employed over 90% of healthcare sector implementations in the UK since 1997. That was important for this study because, in other words, this attempt meant the first trial of PPP into healthcare in the world (Barlow and Köberle-Gaiser 2008).

Under the PFI some private sector initiatives gather for special purposes and create a consortium. The consortium is called "Special Purpose Vehicle" (SPV). SPV builds and finances the construction works and signs a long-term contract to provide some related services throughout the lifetime of the hospital. Contracts are tending to last 30 years in usual fashion. Throughout the operation part of the contract, SPV ensures some facility management works and also some "soft facilities management" (such as cleaning, catering, etc.) (Barlow and Köberle-Gaiser 2008)

Figure 1.2 shows that the structure that encircles the SPV in a typical English PFI contract. The second branch shows the initialization of public sector procurer and the work allocation of SPV. SPV can employ a company under itself for the construction works and another company to provide the facility management activities and to fulfill the service requirements under some construction contract and facilities management agreement. But it's desired that the sub-contractor companies are related to the equity providers. Equity providers make the investments to run the business to the Holding Company. Some of the equity investors only look after the return of the

investment they made, but some of them also chase being one of the sub-contractors of SPV and make another revenue from it (Demirag et al. 2012).

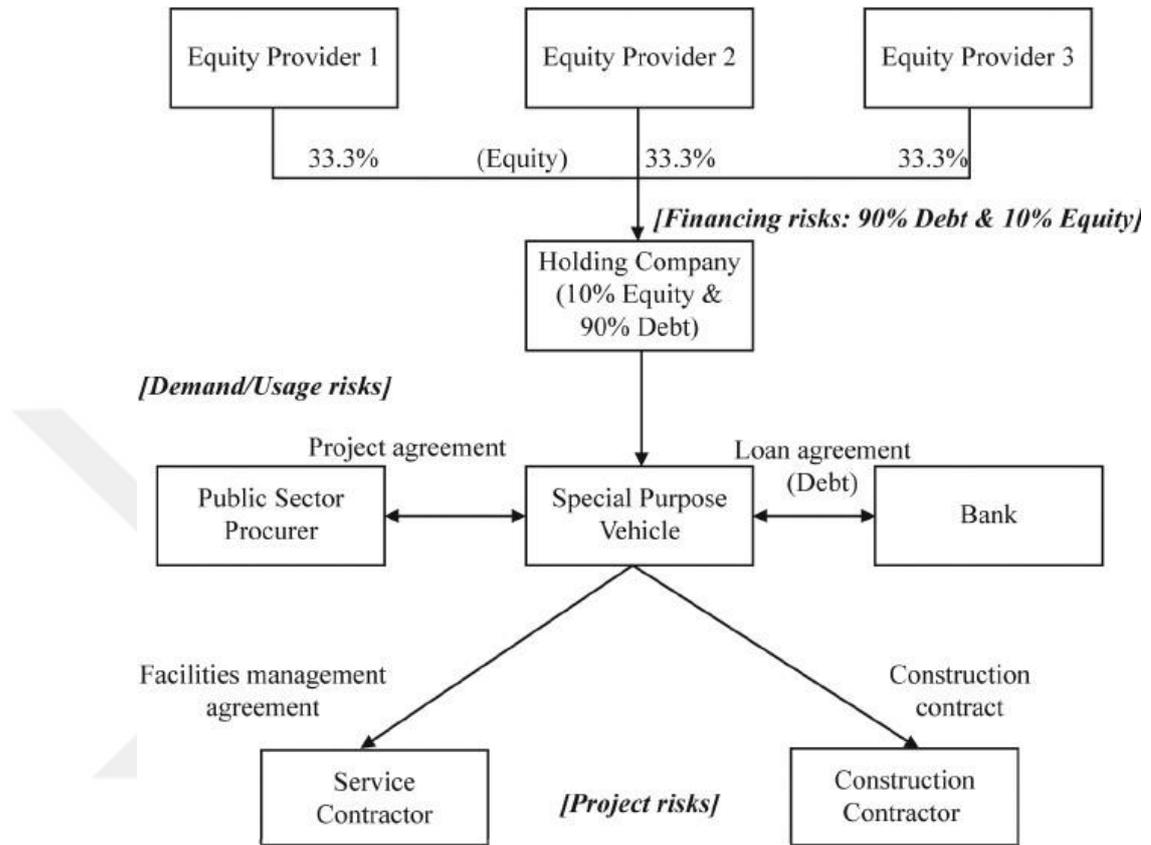


Figure 1.2 Structure of a typical English PFI Contract

(Barlow and Köberle-Gaiser 2008)

The case PPP in the UK rests most significantly on risk conveying from the public sector to private initiatives as other applications around the world. But that conveying process may not always happen as it's written in the contract (Edwards et al., 2004). Literature shows that insufficient specification definitions and erroneous allocation of parties' responsibilities are some of the problems encountered by the public sector in the UK. Furthermore, the report which was published by National Audit Office (NAO, 2011) stated that public sector should effectively have a part in complex projects with its antecedent desired skills to mitigate problems (Demirag et al. 2012).

Briefly, the government in the UK regarded PFI as a tool;

1. To explore the economic power of the private sector to finance the services
2. To maintain the facilities over the contract lifetime by using the abilities of the private sector,
3. Last and most importantly, to benefit from the private sectors experiences and skills to convey innovation to the healthcare business with an appropriate way.

### **1.2.3. Spanish PPP – The Alzira Model**

“Alzira Model” was another implementation of PPP for healthcare services in Spain. Experts in Spain are stating that the health costs are raising due to medical method changes, technological advances, change of public needs and aging population in contrast with the downtrend of the financial situation of governments. Eventually, with the tendency of employing private sector, the PPP pie of the whole Spanish healthcare sector has reached to a budget of \$55.5 billion by the year 2009 (Project Finance, 2010).

That dramatic increment in the sector made private firms focused to the PPP projects growingly. While the PPP policies were improving, the models to be used were getting more complicated. As mentioned, the English PFI system within a private sector initiative construct operates and provides some services such as service and maintenance for like thirty years was first used. However, this model was not specific to England; it's also prevalently used in Spain, Italy, South Africa, Australia, and Mexico. The entrepreneurs were dealing with not only the English PFI system but also models like franchising, BOO, BOOT, etc. (Acerete et al. 2011).

But firstly in Spain and contrary to ordinary, a system is used. The “Alzira Model” was the name of it. La Ribera hospital in the town Alzira in Valencia, Spain

was the first hospital which is operated by the Alzira Model. The Alzira Model was also a PPP model, but it had some specifications out of it. The private sector initiative was constructing the hospital building and operating the facility for years, but at the same time, it was providing clinical services too. This was first in the world and made the model divergent than the others. The system was reducing the responsibilities of the government and makes it almost just a commissioner in the system (Barros and Martinez-Giralt, 2009).

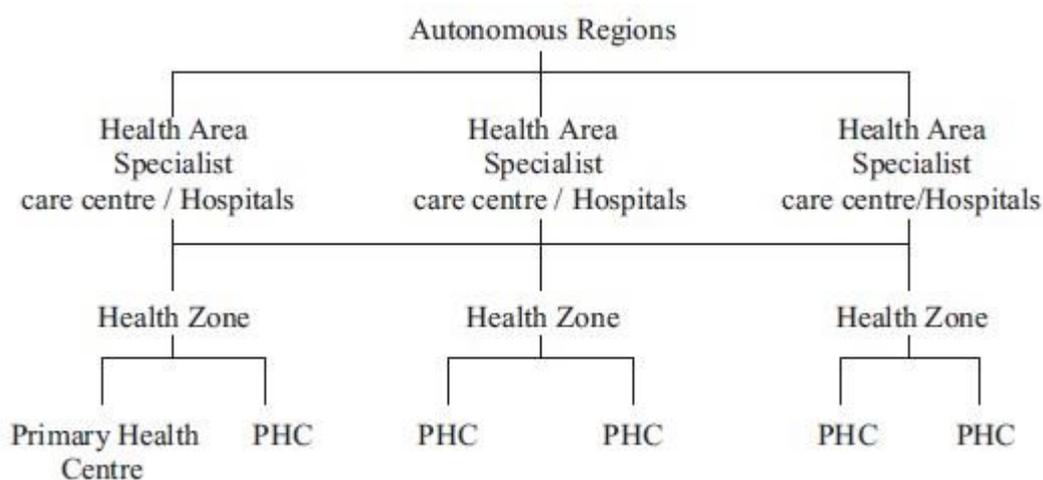


Figure 1.3 The Alzira Model

(Acerete et al. 2011)

Actually, the Alzira Model was another important managerial specification and deviation than others. In the year 2002, Spain has shifted the responsibilities of MoH from a central type of managerial understanding to a regional mindset. Those regions were some autonomous regions, and that was meant to ease the administration. Figure 1.3 shows that; according to the system, the whole of Spain is divided into 17 autonomous regions. The regions are divided into further health areas, and the areas are divided into health zones. All health zones were having Primary Health Centers (PHC) inside. People were supposed to go to the hospital which is closest to the place they live. If some deviations from this standard have occurred, the government was going to be able to understand that there might be some differences in healthcare quality amongst hospitals. It was actually not an arbitrary need, it was necessary.

Because the Alzira Model was providing some clinical services too, the quality of the healthcare service was supposed to be controlled somehow (Acerete et al. 2011).

#### **1.2.4. PPP in Turkey**

##### **1.2.4.1. Overall Picture of Turkey in Terms of Healthcare**

Public goods and services are provided by the public sector, private investors or coordination of both together. In Turkey, public services such as healthcare, safety, education, etc. were provided by the hand of government itself with its own sources for years. At the time that Mr. Turgut Özal became prime minister, and 1980 January 24 decisions were announced, liberalization and foreign expansion were driven and forced and owing to this the dominance of public sector into the investments were decreased (Acartürk, 2012).

January 24 decisions had some IMF type economic mindsets inside. It may be the first step of the idea “privatization” was literally flashed. Out of privatization issue, the January 24 decisions was including things like; the price stability should be governed, convertibility of TL (Turkish Lira), improvement of financial markets and things regarding the establishment of capital markets.

For the Turkish healthcare sector, the current situation was not that cheering. By the year 2010, the number of hospitals is 1439, and the number of beds is 199,950. From the year 2002, a number of hospital and beds grew 2.8% annually which is more than 2 times of population growth. But it’s still not enough, and there is a real need for investment in the sector. Figure 1.4 shows that; in the year 2009, the number of beds for every 10,000 people was 26.9, and in the year 2010 this number was 27.1. The same rate in Greece is 48, in Poland is 66 and in Germany is 83.

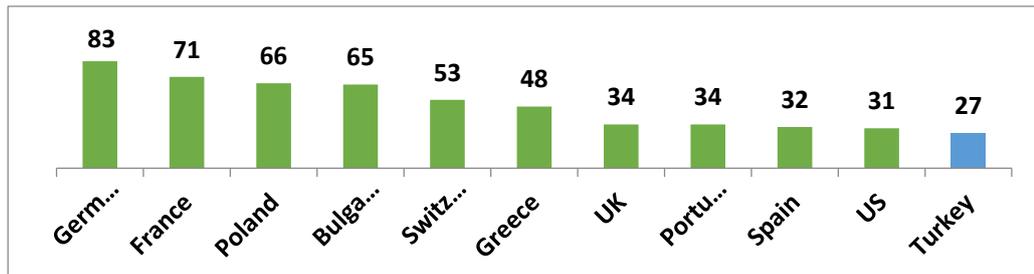


Figure 1.4 The number of beds for every 10,000 people in the year 2009  
 (<http://www.harmonigd.com.tr/tr/haber/turkiyede-saglik-sektorune-genel-bakis>)

The Turkish economy has demonstrated robust performance accompanied by steady growth over the last decade. Prudent fiscal and monetary policies coupled with structural reforms have lifted Turkey to become a 17th largest economy in the world (in 2013 GDP terms). Trade volumes and foreign investment have also risen substantially. Young and educated population, growing at higher rates than the rest of Europe, further contributes to continuing economic growth and development.

Despite strong real GDP growth of 4.3% in Q1 2014, clear signs of a broad-based slowdown in domestic demand have emerged in H1 2014 leading to a full-year growth forecast of 2.4%. Primary drivers of the relatively weak GDP growth are the gradual monetary policy normalization in the US weakening global demand for an emerging market (EM), the tightening of domestic credit conditions, and the stagnation in private consumption growth in Turkey. Nevertheless, GDP growth is expected to accelerate from higher than expected 2.4% in 2014 to 3.3% in 2015 and about 4% in 2016-20.

Consumer price inflation in Turkey is the highest among EM countries with inflation targeting central banks with a large margin. In 2014, inflation was expected to accelerate to 8.4% from 7.5% in 2013. The Central Bank of Turkey (CBRT) began cutting rate of interests, just after inflation reached its highest level in more than two years (9.7%). However, cutting interest rates will prevent a significant advance in the inflation view by stimulating demand and contributing to currency depreciation. Therefore, it is expected that inflation will only gradually fall in the next years remaining above the CBRT's relatively high target of 5%.

In April 2014, Fitch confirmed the Turkish government bond rating of BBB-, the lowest investment grade rating. Moreover, Fitch affirmed Turkey's outlook to be stable primarily reflecting the authorities' willingness about the economy's capacity for adjustment and the sovereign's underlying credit strengths.

Figure 1.5 shows that Moody's also placed the Turkish government bond rating of Baa3, the lowest investment grade rating. Moreover, the economic outlook was standing around a place between negative and stable.

Rating (Moody's / S&P / Fitch)	(Baa3, BB+, BBB-)
Outlook	Negative/Stable
Population	74.9 million
Unemployment rate (%)	9.8%
GDP per Capita (US\$)	10,943

Source: IHS Global Insight, EIU

Figure 1.5 Statistical data on Turkey's 2014 situation

(<http://www.tuik.gov.tr/UstMenu.do?metod=temelist>)

Ministry of Health started the Programme taking into account the Government's determination to develop the provision of essential facilities in the country. This decision has been taken against the backdrop of rising household incomes, a positive economic outlook, fast economic development and growth which has furthermore influenced the Government's decision. The new Programme of modernization of healthcare facilities across the regions has therefore aimed to reach these objectives in the short term.

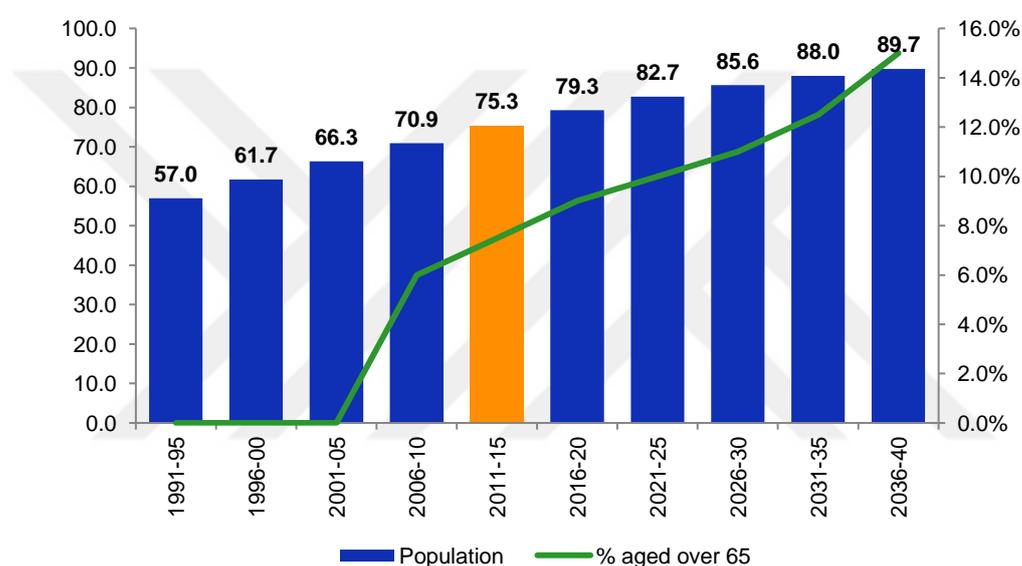


Figure 1.6 Age-Distribution of Turkey in years

<http://www.tuik.gov.tr/PreHaberBultenleri.do?id=27595>

Turkey has one of the youngest populations in Europe with an average age of 28.8 years. However, due to the decade of strong economic growth, which impacted on families' reproductive choices, the country shows signs of aging. Expected strong population growth follows the trend that many developed countries have experienced, stemming mostly from increasing life expectancy. Figure 1.6 shows that, before the 2000s, average life expectancy was under 65 years. But as a result of improving healthcare and medical implementations, in the year 2018, average life expectancy is

around 80 years. Trends and research are showing that, in the year the 2040s, the average life expectancy will be likely to 90 years. But this trend brings a natural result with itself. An aging population means that the dramatically increasing need to better healthcare provisions and medical reforms.

To summarize, the demand for healthcare services in Turkey is predicted to continue to expand going forward due to:

- Government determination to upgrade and modernize provision of essential services
- The population is growing fast
- Population is aging
- Income per capita is increasing
- Urbanization is rapid
- Healthcare tourism is a significant factor for the country

The healthcare PPP Programme constitutes an essential milestone in the major transformation of Turkey's healthcare sector that is aimed to facilitate access to healthcare services for a larger part of the population, leverage the most of available resources at the MoH' use and maximize efficiencies for the MoH to managing its overall budget. From the inspiration, the successful trials of similar programs which were tried in some of the countries, particularly in the United Kingdom, the Ministry of Health has determined that a well prepared PPP Programme would be the best way to effectively deliver a healthcare system in Turkey (Yilmaz 2013).

MoH currently decided to implement 30 integrated healthcare facilities which differ in sizes and bed numbers for 22 territories. Integrated health campuses will answer 29 regions in Turkey, which were settled related to the desire for healthcare facilities, patient potential and flow, availability and economic conditions. For each healthcare region, a territory was determined as the center of the healthcare region and sub-provinces to be linked to the center territory. Till now, 20 healthcare facility projects have started.

#### **1.2.4.2. Legal Framework of PPP**

Public-Private Partnerships (PPPs) are allowed by Article 47 of the Turkish Constitution law. The Law No. 6428 on the Construction of Facilities, Renovation of Existing Facilities and Purchasing of Service by the Ministry of Health pursuant to the Public-Private Partnership Model (the ‘Healthcare PPP Law’) was enacted by the Turkish Grand National Assembly on 21 February 2013 and published in the Official Gazette dated 9 March 2013 and numbered 28852, in an attempt to enhance the legal basis for healthcare PPP projects. The Healthcare PPP Law repealed the Supplementary Article 7 of the Law No. 3359 and established that the projects whose tender processes have been initiated on the basis of Supplementary Article 7 of the Law No. 3359 shall be completed pursuant to the terms and conditions of their existing tender specifications.

In fact, the Healthcare PPP Law is an “omnibus bill” and introduced amendments to several related legislation. One of these was the Law No. 4749 on Public Financing and Debt Management, which previously included a provision on debt assumption applicable to build-operate-transfer and healthcare PPP projects. The Healthcare PPP Law repealed the relevant provision of Article 4 in the Law No. 4749 and replaced it with Article 8/A entitled “debt assumption.” However, the MoH asserts that the aforementioned provisions of Article 8/A only apply to projects whose respective tender announcements have been made after 1 December 2012 which is the date of validity for such provisions. The Healthcare PPP Law got amended on 1 March 2014 following the enactment of the Law No. 6527 Concerning Amendments in Certain Laws.

The Law No. 6527 replaced former Article 4.9 of the Healthcare PPP Law and brought the possibility to (i) make changes in the language of the project agreement without changing the contract price; (ii) change the contract price; and (iii) modify the design of the facilities exceeding the initially envisaged total investment amount

provided that certain conditions are met, and consents from relevant public authorities are obtained.

Figure 1.7 shows the laws that touch PPP supportive applications. Those concerned may scrutinize the related laws, but those are not mentioned in the content of this study because of they are out of the scope.

Sayı No	Tarih	Adı	Açıklama
576	10 Haziran 1910	Menafi-i Umumiyye Mütteallik İmtiyazat Hakkında Kanun	Türkiye’de özel sektöre imtiyaz hakkı tanınmasını sağlayan mevzuatın temelini oluşturmuştur
3096	4 Aralık 1984	Türkiye Elektrik Kurumu Dışındaki Kuruluşların Elektrik Üretimi, İletimi, Dağıtım ve Ticareti ile Görevlendirilmesi Hakkında Kanun (YİD)	Elektrik sektöründeki özel sektörün dahil olduğu ilk kanundur
3465	28 Mayıs 1988	Karayolları Genel Müdürlüğü Dışındaki Kuruluşların Erişme Kontrollü Karayolu (Otoyol) Yapımı, Bakımı ve İşletilmesi ile Görevlendirilmesi Hakkında Kanun (YİD)	Karayolları Genel Müdürlüğü’nün inşaat, bakım ve işletmeler üzerindeki tekelciliğini ortadan kaldırmıştır
3996	8 Haziran 1994	Bazı Yatırım ve Hizmetlerin Yap-İşlet-Devret Modeli Çerçevesinde Yapıtılması Hakkında Kanun	
4046	24 Kasım 1994	Özelleştirme Uygulamaları Hakkında Kanun	
4283	19 Temmuz 1997	Yap-İşlet Modeli ile Elektrik Enerjisi Üretim Tesislerinin Kurulması ve İşletilmesi ile Enerji Satışının Düzenlenmesi Hakkında Kanun	
4749	28 Mart 2002	Kamu Finansmanı ve Borç Yönetiminin Düzenlenmesi Hakkında Kanun	
5216	10 Temmuz 2004	Büyükşehir Belediyesi Kanunu (İS, Yİ, YİD)	
5302	22 Şubat 2005	İl Özel İdaresi Kanunu (Yİ, YİD)	
5393	3 Temmuz 2005	Belediye Kanunu (İS, Yİ, YİD)	
5396	3 Temmuz 2005	Sağlık Sektöründe YKD Kanunu	YKD modelinin sağlık sektöründeki uygulaması başlamıştır

Figure 1.7 Related Turkish legislations about PPP

(Dizayn 2015)

### **1.2.4.3. PPP Construction and Organization**

PPP's are the vehicle of choice to plan and execute many types of development projects through Public and Private Participation. PPP's offer complete and efficient solutions, precise cost and completion expectancy and utilizes improved management skills of the private sector.

The aim of the program can be listed as;

- Renovation of the insufficient healthcare infrastructure
- Increasing the number of beds
- Consolidation of the small hospitals under one roof and save on operation expenses
- Increased service quality and efficiency
- To expand and improve medical education and training
- Establishing a modern and sufficient healthcare service

Planning in advance, bankable project documentation, selecting appropriate project scale, quality of design, assessing environmental and social impacts at an adequate level and public relations can also be listed as the vital things for a successful PPP. A well-defined organizational structure is essential to explain firstly to catch the goals which make PPP attractive. Figure 1.8 shows the PPP implementation structure and the relations of parties each other.

Briefly to explain the PPP healthcare structure, firstly, Ministry of Health or related employer from government tender the work and select one of the eager initiators for the work as it will be detailed following "Tender Process & Post-Tender Process" section. By the nature of healthcare implementation and contractual PPP, construction, design, operational and maintenance works are needed. Generally, Operations and Maintenance (O&M) work and Engineering, Procurement and Construction (EPC) works differ, and here at they are carried out by different firms. Those O&M and EPC firms gather and establish the Special Purpose Vehicle (SPV).

SPV is actually a newly established business firm, and it waits that there are no bank accounts, no liabilities, no debts, no business transactions and implementations before. It can be easily said that PPP is waited to be a baby firm with no past activities. It's highly desired by the lenders and administration both because the healthcare business, and integrated health campus idea is an expensive and obligatory to be served thing. The business shouldn't be affected with previous debts or a potential bankruptcy of the SPV.

Because of the healthcare PPP projects requires expensive investments, SPV needs to use credit from foreign lenders who are generally international banks that tend to loan the business and domestic banks as well. The equity sharing is generally highly depending on fundings. While the capital that sponsors provide is about 20-25% of total cost, the residual 75% can be funded by international banks or both domestic and international ones. So, SPV is the establishment which directly communicates MoH and Lenders but funded by sponsors and lenders.

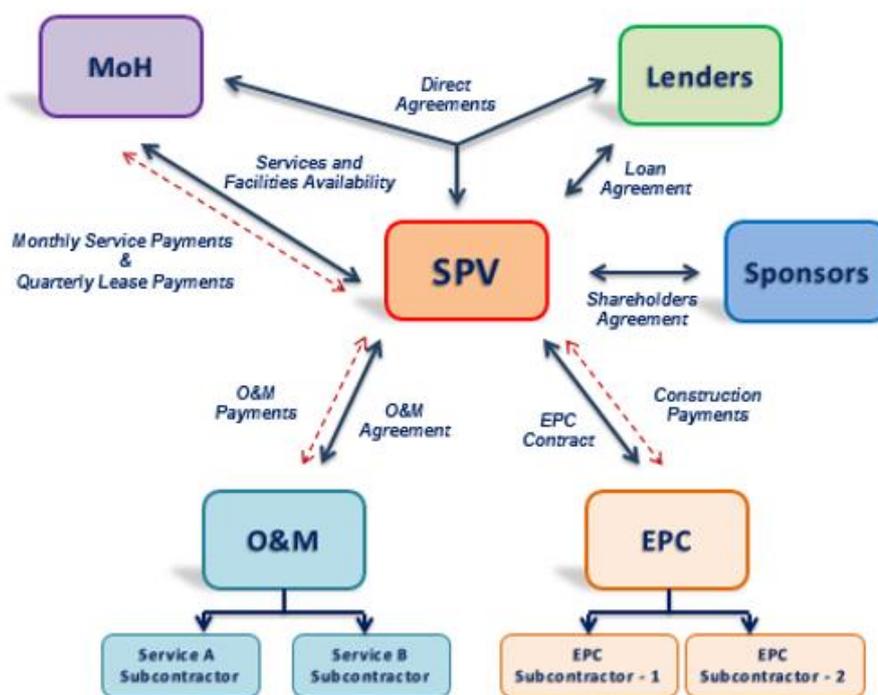


Figure 1.8 The organizational structure of PPP projects

Ministry of Health has a role of employer inside the wheel. It makes contracts with the initiator SPV firm. And as it was mentioned, SPV is the risk-taking firm that is supposed to meet the expectations. In a nutshell, to uncover those expectations, the responsibilities of parties in PPP model can be sorted as;

1. Special Purpose Vehicle (SPV) is liable from;

- Financing
- Design
- Build & Operate
- Medical equipment & furniture (initial investment)
- Maintenance and repair of building and equipment
- Medical and Non-Medical Support services (other than the Medical Treatment)
- Operation of commercial areas

2. Ministry of Health (MoH) is in charge of;

- Land acquisition
- The responsibility of all environmental and urban planning issues related to land
- Healthcare and treatment services (full responsibility for the treatment services)
- Renewal of medical equipment and furniture
- Availability payment and service payments

#### 1.2.4.4. Tender Process & Post-Tender Process

After a *pre-efficiency rating* which is conducted by the related ministry, the chosen initiatives that fulfill the expectations are invited to bid. It defines the tender to predetermined bidders or in other words restricted the tender procedure.

At the pre-efficiency rating stage, the appointments of domestic and foreign firms are taken before the final determined appointment date. Pre-efficiency rating commission assesses legal conditions, economic and financial efficiencies and technical/experimental efficiencies of the firms which appoint to bid the business. The desired qualifications can be generally listed as; *Strong financial structure, Occupational and technical qualification, Production capacity, Machinery, Personnel, and Senior staff.*

After prequalification, the bidders that are determined as adequate are informed by the administration and invited to take documents and to bid the business.

By the “*first bid*” of initiatives; they are waited to tender their technical and financial bids. The technical bid contains the projects, work programs, medical materials, etc. The bids with minimum cost and maximum benefit are regarded as the most economical bid in terms of project level and qualification of works. In other words, while the determination of the most economical bid; the cost that initiatives bid and at the same time nonprice factors have a crucial effect as well.

The bidders are waited to hold out a bid bond of 3% of total investment cost which is offered in the tender stage. After first bid assessment, the bidders who are taken into administration’s “short list” gain right to tender their “final bid.”

The final bids are taken, and the initiatives are invited to the “*dutch auction*” stage. The “dutch auction” starts with the minimum “All Included Annual Price” (AIAP) out of tenders. The initiatives which are in the short list lowers the price, and it goes on till only one bidder lasts.

The awarded bidder who offers the lowest price and the administration starts the “negotiations.” The contract is signed with the firm on the agreed final price. The awarded bidder gives a performance guarantee/performance bond of 3% worth of investment price and waits for the site delivery.

Figure 1.9 and Figure 1.10 explain the flow of tender and post-tender processes. At the tender stage, the most advantageous tenderer is selected. After the contract is signed, generally there is a period called “due diligence.” Throughout the due diligence period, the land is delivered to the private initiative, design developments are started, and the construction permit is taken by SPV from related ministry. Design lasts approximately 90days in the usual fashion, and the construction lasts 2-3 years. After construction is finished, the operation period which private initiative reaps the fruit of implementation is started. Operation periods generally last between 20-30 years.

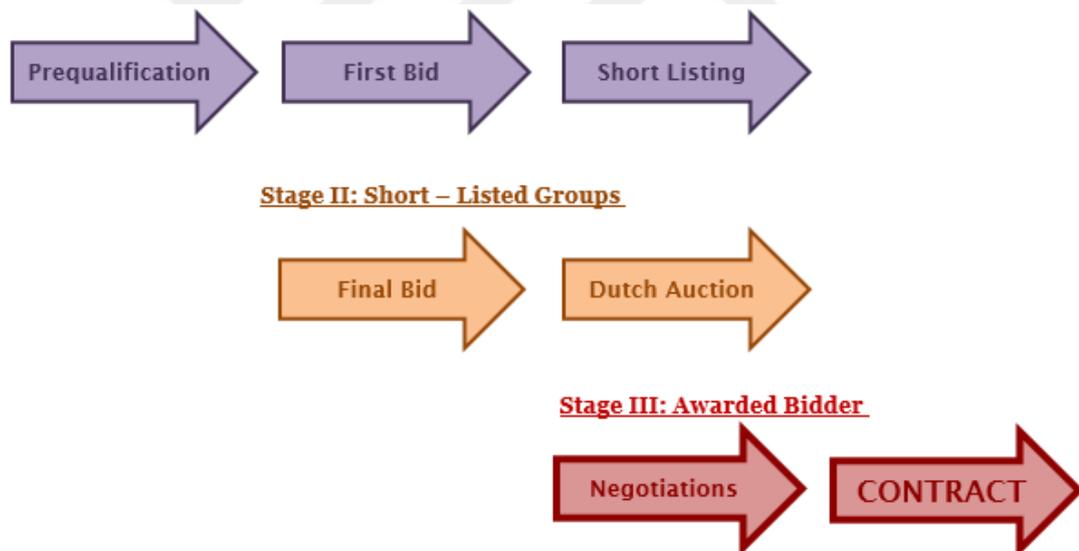


Figure 1.9 Tender Process

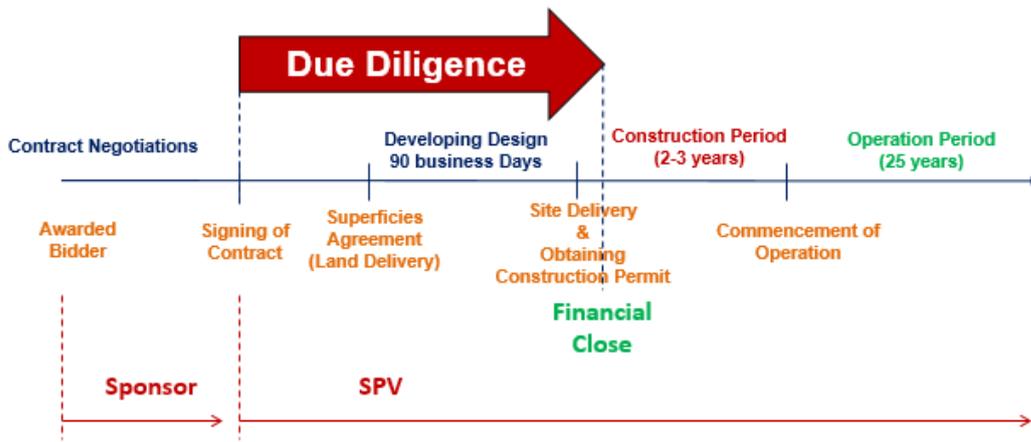


Figure 1.10 Post-Tender Process

#### 1.2.4.5. SPV’s Responsibilities, Expenditures and Revenues

This section presents an overview of the payment streams and associated mechanisms at the SPV level. The mechanisms between the SPV and its subcontractors for the service contracts are stipulated in the payment sections of the service provider contracts. The SPV is liable for providing the whole range of services within the completion date associated with each phase of the works. In order to provide these services, the SPV is to receive a quarterly Availability Payment and a monthly Service Payment, which is subject to various adjustments, showed in Figure 1.11 below.

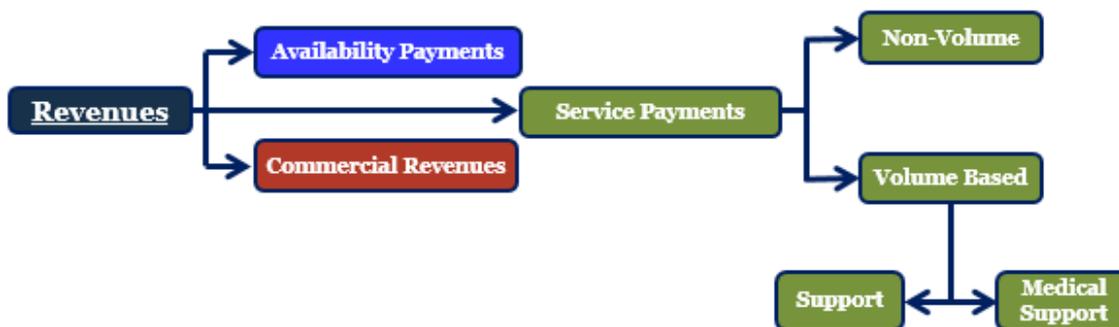


Figure 1.11 SPV’s Revenues and Expenses

On completion of each phase (if the project is to be completed in phases which is currently not planned), the SPV is to receive a proportional amount of the Availability / Service Payments, such amount to be calculated based on the percentage of the works relating to each phase in terms of the aggregate value of the works. As such, once each phase is completed, the SPV is to commence provision of the services relevant to each phase, and the administration shall apply the corresponding step-up in the payments.

Revenues of the SPV can be obviously sorted as;

- Availability Payment
- Service Payments
- Commercial Revenues

Availability payments are the payments that the government pays to the SPV partner as rental payments at each quarter of the year. Availability payments are calculated with regard to inflation in the country, the share of initial investment which corresponds to the quarter of one year, some correction factors, etc. It can be said that availability payments are the portions of the whole initial cost and which are the pay-backs that SPV desires to return to profitability.

Service payments are the payments which are paid for the mandatory services that SPV should provide and the optional services as well. Some contracts may obligate all services mandatory to be provided. Those are paid monthly to the SPV by the government. There are some protective awards at contracts about volume service payments, and administration guarantees some minimum payments to the SPV. For example, even one portion of the fixed menu is served for patients at that month, or in other words, even just one patient is standing at the hospital, administration pays the agreed amount of catering payment to the SPV.

Commercial revenues are the ones that SPV makes from the facilities inside the campus such as some kiosks, restaurants, pharmacies, etc. Some contracts add

those revenues into monthly service payments, but it's optional and dependent to the contractual agreements.

On the other hand, the biggest expense that private initiator should take account is obviously the investment cost. The investment cost in Turkey stands around 1800 to 2000 Turkish Liras/m<sup>2</sup>. But it can be changeable and highly dependent on the currencies & inflation etc. Out of investment cost, SPV, of course, should consider insurance costs and operational expenses. Operational expenses can be volume and non-volume ones. But they will be clarified at the next stages comprehensively.

#### 1.2.4.5.1. Availability Payments

The Availability Payment is paid by the Administration to the Consortium in quarterly installments in advance, with the payments effected on the first Work Day of each quarter. It is understood that payment commences on the achievement of each Phase Actual Completion Date and, accordingly, where such date does not fall on the first Work Day of a quarter, the sum payable is factored based on the remaining time in the current period.

$$AP_s = \left[ AP_0 \times \left( \frac{g}{365} \right) \times a\% \times \frac{\left( \frac{CPI_{(S-1)} - PPI_{(S-1)}}{2} \right)}{\left( \frac{CPI_0 + PPI_0}{2} \right)} \right] \times (1 - Deductions\%) \times CC$$

Figure 1.12 Availability Payment Equation

Where:

APs = Availability Payment in the applicable period

AP0 = Annual Availability Payment agreed in the agreement

CPI(S-1) = Consumer Price Index (CPI) for the last month of the year preceding the calculation date

CPI0 = Consumer Price Index (CPI) for the last month of the year when the proposal was made by the bidder

PPI(S-1) = Producer Price Index (PPI) for the last month of the year preceding the calculation date

PPI0 = Producer Price Index (PPI) for the last month of the year when the proposal was made by the bidder

Deductions% = Rate to be deducted on the grounds that the relevant branch or branches of the hospital facilities are not available due to the occurrence of a utilization failure in all or part of the hospital facilities

CC = Corrective Co-efficient

G = Number of days in the relevant period

a% = Percentage of the delivered phase within total value of the works

#### **1.2.4.5.2. Service Payments**

Service Payment is paid by the Administration to the Consortium in monthly installments, and is divided into two categories, depending on the method of pricing and payment for each Service:

- *Non-Volume Services* (SPNV) are those for which the service levels are not affected by the occupancy rate of the Hospital, nor the need, consumption and / or utilization.
- *Volume Services* are those for which service levels are dependent on the occupancy rate of the Hospital and the need, consumption and / or utilization.

Furthermore, the Volume Services are further divided into Volume Medical Support Services (SPVMS) and Volume Support Services (SPVS). The monthly Service Payment is the sum of the three payment streams, as set out in the equation below;

$$SPT = SPNV + SPVMS + SPVS$$

$$SP_{NV} = \sum_{i=1}^n g \times \left( \frac{12}{365} \right) \times c_i \times E \times (1 - Deductions \%)$$

$$SP_{VMS} = \sum_{i=1}^n [(k_i \times p_i) + (k_i \times (1 + y_i) \times z_i)] \times (1 - Deductions \%)$$

$$SP_{VS} = \sum_{i=1}^n [(f_i \times m) + (f_i \times (1 + y_i)) \times z_i] \times E \times (1 - Deductions \%)$$

Figure 1.13 Service Payment Equations

Where:

i = Refers to each of the Services

n = Number of Services provided under the Agreement

c = Monthly Service Payment amount for each Non-Volume Service

g = Number of days in the relevant period

E = Coefficient of the inflation index increase

p = Transaction points applicable under the Social Security Institution Health Practice Communique for each Volume Clinical Support Service

k = Unit Price per transaction point applicable under the Social Security Institution Health Practice Communique for each Volume Clinical Support Service

f = Unitary price for each Volume Support Service

m = Estimated monthly quantity of Availability / consumption for each Volume Support Service

y = Price change in % applicable to f or k for each Volume Support Service or Volume Clinical Support Service in the event that additional volume is needed

z = Additional quantity of Availability in respect of m or p in the event that an additional volume is required for each of the Volume Support Services or Volume Clinical Support Services in the Period.

<u>SERVICES</u>	<u>CATEGORY</u>
<b>P1 - MANDATORY SERVICES</b>	
ESTATE	non-volume
EXTRAORDINARY MAINTENANCE	non-volume
UTILITIES	non-volume
OTHER MEDICAL EQUIPMENT SUPPORT	non-volume
FURNITURE	non-volume
GROUNDS & GARDEN (LANDSCAPING)	non-volume
<b>P2 - OPTIONAL SUPPORT SERVICES</b>	
PEST CONTROL	non-volume
CARPARKING	non-volume
MATERIALS MANAGEMENT	non-volume
CLEANING	non-volume
HIMS (IT)	non-volume
SECURITY	non-volume
PATIENT GUIDING / PORTERING / RECEPTION / HELPDESK	non-volume
LINEN (LAUNDRY)	volume - support
CATERING	volume - support
WASTE MANAGEMENT	volume - support
LABORATORIES	volume - medical support
IMAGING	volume - medical support
STERILIZATION AND DISINFECTION	volume - medical support
REHABILITATION	volume - medical support

Figure 1.14 Healthcare Services Categorization

Figure 1.14 shows that contracts that regulate the application of PPP over healthcare services generally divide the services that are waited from SPV to provide into 2 main categories and name them as P1 and P2 services. All P1 services are non-volume services which means that they are all mandatory for SPV to provide. P1 services are not related to the occupancy rate of the hospital. Whether the patient number is high or low in numbers, the SPV has to provide them all. In other words, P1 services are not affected by the number of patients. However, P2 services include some non-volume and volume services inside. Some services inside P2s are not affected from the patient number such as cleaning, security or reception, but there are some services such as laundry, catering or imaging too which are related to the patient number and that's why they are classified as volume services. And as it's mentioned, volume services can be guaranteed by the administration.

### **1.2.4.5.3. Learning Curve Period**

During the Transition phase, the Consortium and its subcontractors are potentially exposed to an increased risk of deductions as changes are implemented, and infrastructure / services are subject to ‘bathtub curve’ failures. The name bath tube is literally derived from the shape of a curve which is generally used in reliability engineering. It is a hazard function and consists of three stages inside. The first stage is known as decreasing failure zone, and it refers to early inexperience failures. The second stage is named constant failure zone and which refers to random failures that can happen all the time somehow because of the human factor. And the last stage is called an increasing failure zone, and it refers to wear-out failures.

The Learning Curve Period, during which the contractor is granted relief from deductions (and revisions) to the payments for the Services. The Learning Curve Period commences at each Phase Actual Completion Date, with a six-month duration during which no deductions to either the Availability Payment or Service Payment shall be applied.

The learning curve period is considered to provide an appropriate degree of protection for routine failures in the early stages of the project and is a widely used method of reducing exposure to risk during periods when systems and procedures are effectively being developed and commissioned in a live environment. The fact that the Learning Curve Period provides total relief from all deductions for such a significant period is considered beneficial and provides the consortium with a degree of protection that exceeds that available on similar PPP projects, in which unavailability events, in particular, may be exempt from any relief mechanism.

In addition, it is noted that there are Learning Curve Periods associated with each Phase Actual Completion Date. This provides adequate mitigation in the event that, for different phases of the project, there may be associated step changes in the level and complexity of services provided.

#### **1.2.4.5.4. Unavailability Deductions**

Unavailability Deductions are applied to the occurrence of Utilization Failures in the preceding Payment Period. Contracts with availability based payments should define explicitly what is meant by 'available' or 'unavailable,' that specify conditions that must be met if the Service is to be treated as available. The definition should be objective, measurable and reasonable such that it should be clear to all parties whether or not the criteria are being satisfied. In addition, the Deductions mechanism should be calibrated such that the level of deductions is reasonable in line with the size of the health campus and international best practice.

Contracts generally divide the healthcare operations into some areas according to their significance and define Utilization Failures (UF). Under contract conditions, a deduction amount is determined to the availability payment on the occurrence of a utilization failure whereby the area is either out of operation or operation is affected and the area continues to be used. However, this UF deduction is only applied if there is, in addition, a subsequent failure to correct the failure within the required Corrective Time (CT). Following the occurrence of a utilization defect, the contractor has a defined Utilization Response Time (URT) in which to respond to the defect and take the following actions;

- Secure the zone, define the problem and take care of the site if compulsory
- Nominate a proper experienced person to understand the situation which is accepted to give instructions in regard to any desired motion
- Make all needed actions to make parts secured
- Give the administration deputy the means to access problem and to take necessary measures and give the administration's representative information about the timescales required for the related functional parts and services and about any work that could affect the related functional parts and services which must be fulfilled within the other limitations.



Figure 1.15 Availability & Service Deductions



### 1.2.4.5.5. Risk Allocation between Parties

The allocation of risks is in line with the standard for PPP Projects and will follow the general principle that risks are allocated to the party best able to manage them. A summary of the allocation of several of the key risks is shown in Figure 1.16 below. The ticks indicate the leading party or parties that each risk is allocated to. Lenders should note that the table is only indicative and still subject to detailed due diligence to be carried out by the Lender advisors on the contractual arrangements.

Risk	Grantor	SPC	EPC	O&M
Land Title, Superficies Right	✓			
Site Conditions	✓		✓	
Construction Consents			✓	
Clinical Services Consents	✓			✓
Clinical Support Services Consents				✓
Commercial Activities Consents		✓		
Operating Licence	✓			
Design			✓	
Construction Cost			✓	
Construction Programme			✓	
Defects in Construction			✓	
Additional Works	✓			
Maintenance Cost				✓
Staffing (clinical staff)	✓			
Staffing (non-clinical staff)				✓
General Changes in Law		✓		
Discriminatory Changes in Law	✓			
Health & Safety Compliance		✓	✓	✓
Inflation	✓			
Currency	✓		✓	
Non-availability of Revenues				✓
Commercial revenues		✓		

Figure 1.16 PPP Healthcare Risk Allocation (Initial Expert Opinions)

In the table, Grantor refers to the sponsors who support SPC (Special Purpose Company) or with the familiar name SPV. EPC and O&M companies work under SPC, and one is responsible from engineering (design, construction, etc.) and procurement works (EPC), and the other one is responsible from operating and

maintenance works (O&M). This risk factors and allocation of them is derived from the expert opinions. As risk factors, general infrastructure project risks were taken and experts are just asked to allocate them between parties (Grantors, SPC, EPC, and O&M) which are the main parts of PPP organization. As it's mentioned those factors are too generic to specialize the PPP and the risks emerged out of it. More related, specialized and significant risk factors will be tried to reveal from literature review, semi-structured interviews with seniors of SPV company at the following stages.



### **1.3. Why is PPP so Advantageous and Problematic at the same time?**

As it's understood so far, PPPs are the key initiators for governments to enhance some abilities to provide the services that public needs. Provision of services requires financial capabilities, experienced occupational caliber and mandatory risk-taking in terms of construction, finance, operation, etc. Because of the provision of services, which should be naturally considered as healthcare services in the context of this study, is a fundamental task of government, the advantages, and disadvantages of PPP implementation should be conceived from the side of government for sure.

Many researchers studied the pros and cons of PPPs. As the concept of PPP and its frame is crystal clear, they met on common ground.

After a brief literature review it's shown that in terms of advantages; thanks to PPP procurement system, the government doesn't need to rely upon its own financial sources to support the facilities (Cumming, 2007). Through the participation of the private sector into business, the government can be able to use its financial, mental and experimental sources upon provision of some other services. This allocation of sources positively affects the quality of facilities and public services (Edkins and Smyth, 2006). Another disadvantage of usage of the model can be said that it enhances the ability to allocate risks at different stages of the project between the public sector and private partner (Shen et al., 2006). Private sector applies its commercial learnings to public projects and finds the way to reduce risks which are derived from cost overruns and project delays (Li and Akintoye, 2005).

Even the PPP procurement seems like a glamorous method that enables the government to provide services that they need to deliver to the public without a financial requirement, the saying "no pay no play" comes true for the reality of PPPs (Kumaraswamy and Zhang, 2001). According to the studies that Kumaraswamy and Zhang held, the main address that derives the problems for PPP implementation is shown as the public sector. The rulers of PPP projects tell that most of the obstacles for PPP implementation are political ones (Algarni et al., 2007).

So after all, it is meaningful to give a unifying table to show the advantages and disadvantages of PPPs from the side of researchers and PPP ruler professionals. Table 1.1 shows the lumped pros and cons of PPP implementation which is crucial not only to show the public sector perspective of PPP implementation but also enable eager private sector firms to understand the PPP reality.

*Table 1.1 Advantages and Disadvantages of PPP Implementation*

*(Nurul Sakina Mokhtar Azizi and Heumann 2015)*

Positive factors include:

- Transfers risk to the private partner.
- Caps the final service costs.
- Reduces public sector administration costs.
- Reduces public money tied up in capital investment.
- Solves the problem of public sector budget restraint (Akintoye *et al.*, 2001).
- Non-recourse or limited recourse public funding.
- Reduces the total project cost.
- Improves buildability.
- Accelerates project development.
- Saves time in delivering the project.
- Improves maintainability.
- Benefits local economic development (HM Treasury, 2000).
- Transfers technology to local enterprises.
- Facilitates creative and innovative approaches (Birnie, 1999; Government of Nova Scotia, 2000).
- Enhances government integrated solution capacity (Sohail, 2000).

Negative factors include:

- Few schemes reach the contract stage.
- Threatened by lack of experience and appropriate skills (Morledge and Owen, 1998; Ezulike *et al.*, 1997).
- Leads to higher direct charges to users.
- Imposes excessive restriction on participation.
- High participation costs are incurred (Ezulike *et al.*, 1997; Saunders, 1998; Birnie, 1999).
- High risk relying on private sector.
- Confusion can arise over government objectives and evaluation criteria.
- May lead to high project costs (Ezulike *et al.*, 1997; Birnie, 1999; Public Services Privatization Research Unit, 2000).

#### **1.4. Objectives and Significance of the Study**

Objectives of this study can be said;

1. Identification of PPP healthcare related risk factors by making a thorough PPP related literature survey and conducting open-ended expert interviews who were into healthcare implementations in Turkey.
2. In the light of those findings, another objective of this study can be said; interpretation of founded risk factors upon a real processor hospital project in Turkey.
3. And the last objective of this study is proposing a scenario-based risk assessment process to be used for potential investors under three scenarios which are most-likely, worst and best case scenarios.

This study has crucial importance not just because of it explains the PPP terminology, its financial and organizational structure, the related legislation about that and even the revenue and its calculation that the holding company expects. This study also has a guidance meaning for those eager to run the PPP healthcare business in Turkey.

The study firstly defines the term PPP and its history. The PPP usage in some different countries was observed and explained. After some general information, specific to Turkey, the organization and structure of PPP, its tender processes, the expectations of government from a private sector initiator for PPP, financial structure, related legal framework etc. was scrutinized in detail.

The part after introduction includes a vital meaning as revealing the risk factors about PPPs, which were encountered or tend to happen. The study will unify the risk factors which were derived from the literature survey and expert opinions that are going to be obtained via some open-ended interviews. And at the final stage, the risk factors are going to be tried to be weighted and their contribution to the total risk premium will be tried to be recognized. The most sensitive risk factor and the variation in Net Present Values (NPV) for PPPs will be tried to be found out.

This study has a substantial meaning for those eager to run PPP business for government. Because it's obvious that, recently, the prevailing trend is to apply PPP for governments' mandatory service provisions in Turkey which means an opportunity for private sector firms to enhance their reputation and make profit out of the business.



## CHAPTER 2

### LITERATURE REVIEW ON RISKS IN PPP PROJECTS

#### 2.1. Risk Factors for PPP Projects

The term “risk” can be defined with some other ways, but it can be generalized as the probability of occurrence of a risky situation that sparks unwanted consequences (Dikmen et al. 2008). Crichton (1999) defines risk as the likelihood of a deprivation that is dependent on three factors; hazard, vulnerability, and exposure. And a well-known example is given at this point to understand those terms. If we think about an earthquake which is a hazard itself, exposure can be thought as the building on an earthquake area, and the vulnerability of it is obviously depends on the building’s design and construction quality. So it’s apparent that a building with poor design and constructional quality, in other words, a vulnerable building under the impact of a hazard ends up in disasters.

One of the other significant terms about risk approach can be given as complexity of it. Complexities are actually stemmed from the interactions between the participant elements of a situation, business or project, etc. One other term is the impact of the risk factor. The impact can be literally defined as the consequence that a risk factor which causes if it’s existed. All of the projects requires a risk management approach not to see the impact of it and to mitigate from all. So, risk management is a necessity and means an iterative process to firstly identify the related risk factors about a project, to make a qualitative or quantitative assessment of the second and to create some risk mitigation strategies after all (Dikmen and Birgonul 2011).

While conducting a risk management process, there is an important “how to assess risk factors?” question arises. Most of the risk assessment studies go through a risk checklist and take risk factors as individuals and grades them — the problem here

not to establish a causal approach to risk factors. Risk sources, their consequences, briefly causal relations are neglected. So it can be said that “risk paths” should be kept in mind instead of taking risks as individual risk factors (Dikmen et al. 2014).

Briefly, it can be said that the aim of a proper risk management approach, contrary to popular myth, is not the only provision of mitigation of risks, but also building forward-looking expectations on a reliable basis, consideration of risks at the project assessment stage and determination of proper contract conditions about risk factors (Dikmen 1996). This point that Dikmen emphasize is also dramatically important for PPP implementation in Turkey because we will frequently be stressing the contract stage of PPPs and the need to impose the risks into them.

PPP procurement implementation on health sector is vulnerable in several ways too. They can be vulnerable in terms of design, construction stages, procurement of medical stuff, skillful management at senior level or loyal labor capacity, etc. But as it's understood obviously, those factors are not that different from other infrastructural engineering works. The main thing that this study will be interested in the contractual risks about PPP and the vulnerability which is derived from PPP application. So it can be easily said that this study will be dealing with the risk factors and vulnerability of PPP healthcare business in Turkey in the sense of an entrepreneur contractor who finances and operates the business. Thus, this study will be trying to find out what risk factors a PPP entrepreneur in Turkey might encounter. In other words, revealing the vulnerability of PPP implementation in Turkey and its consequences will be the primary motivation of this study. PPPs are vulnerable, and we know it from the true-life stories. The study will be trying to distinguish the PPP specific vulnerability definitions and risk factors from well-known standard construction projects. Because PPP implementation has the risk factors that standard projects include of course, but also it has its idiosyncratic risks inside.

So at this point, it's important that to understand the term vulnerability. The term vulnerability is actually about the characteristics of a project, building, situation,

etc. But it can be just said that the vulnerability of a project enhances the potential of damage taking for a project, but it's not dependent of the probability of occurrence of a risky situation (Sarewitz et al., 2003).

If we look at the literature, the term vulnerability is defined in many other ways. Table 2.1 shows some of the definitions of vulnerability from different perspectives.

Table 2.1 Vulnerability Definitions (Dikmen et al. 2008)

Author(s)	Definitions
Agarwal and Blockley (2007)	"Vulnerability is a particular form of hazard- a hazard which is internal to the system."
Allen (2003)	Vulnerability refers to "the set of socio-economic factors that determine people's ability to cope with stress or change."
Blaikie et al. (1994)	Vulnerability is "the combination of characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from hazard impacts that threaten their life, well-being and livelihood."
Buchanan (1991)	"Vulnerability refers to the scale and complexity of the problems facing the project manager, the degree of uncertainty and risk involved, and to the anticipated degree of contention and resistance which the change is likely to generate."
Buckle et al. (2001)	"Vulnerability is a measure of the exposure of a person to a hazard and indicates the type and severity of the damage that is
Council for International Organizations of Medical Sciences cited in Levine (2004)	"Vulnerable persons are those who are relatively or (absolutely) incapable of protecting their own interests because they may have insufficient power, intelligence, education, resources, strength, or other needed attributes".
Nicholls et al. (1999)	"The likelihood of occurrence and impacts of weather and climate related events."
Oksuz (2003)	Vulnerability assessment is for the prediction and identification of the seismic performance and safety level of the building, which might be exposed to severe damage during an expected earthquake.
Winslow (1998) cited in Levine (2004)	Vulnerable populations are the "social groups who experience limited resources and consequent high relative risk of morbidity and premature mortality."
Zhang (2007)	"A system's vulnerability represents the extent or the capacity of this system to respond to or cope with a risk event."

As evident, the scope of this study is health campuses and PPP implementation. However, not to miss some related risk factors, it's meaningful that the general risk approach for some other sectors should be scrutinized. So many researchers have studied the risk factors for mega projects. Integrated health campuses are simply the

mega infrastructural projects too. So for starters, before scanning the literature just specific to PPP healthcare projects, as a first step, the general approach to find out risk factors for some other mega projects in different scopes will be revealed.

### 2.1.1. Risk Factors for Different Infrastructure PPP Project Scopes

Airport Cooperative Research Program (ACRP) had some research to assist airports to manage risks associated with capital and project maintenance to ensure the schedule and budget are met. The study which is driven by the ACRP meant to create a consistent risk management language and a tool for airports, and it should be applicable to all airports regardless of size, location, etc.

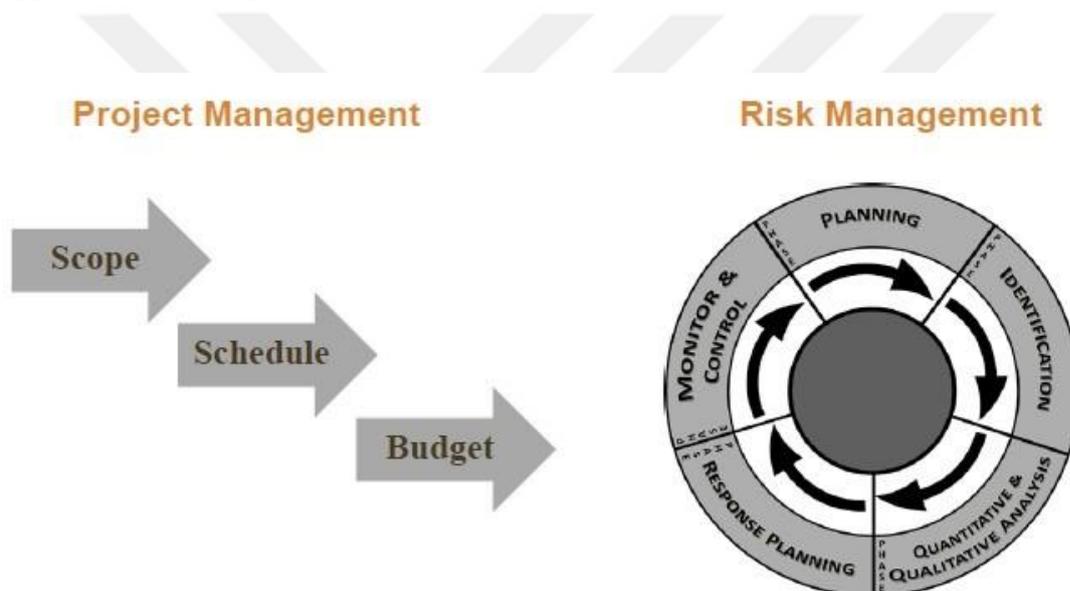


Figure 2.1 Risk Management & Project Management (Pirce 2014)

The report expresses the terms “project” and “risk” and the relation between those for starters. According to ACRP no matter how big, small, simple or complex the project is there are always some uncertainties which may affect the estimated cost, schedule or scope of the project if they are not realized. And the report also states that poor predictions about the performance of project tied to some risk sources such as cost estimation risks, change on the funding profile, bottlenecks about the schedule

milestones and some technical risks include technology needed to succeed the project mature. Those risk sources actually highly bound to uncertainty of equipment, materials and design completeness in terms of cost; acknowledgement of airport projects, design, quality, complexity, site conditions and scope definition in terms of technical risks; staff availability and weather conditions in terms of schedule; suppliers and vendors, procurement process and contractors in terms of commercial risks; funding timing and funding boundaries in terms of the risks related to funding.

Out of those; some risk factors are given as customer side, political, public relations, market conditions, permitting, property acquisition and regulatory changes in terms of external risk factors which can affect the destiny of the project (ACRP Report 116).

Akçay et al. (2017) emphasize the demand for energy as a consequence of fast-growing industrialization and population growth. At this point, renewable energy sources are considered as the key to meet the demand. Turkey as the public agency has not enough fund to make the energy business right on its own, but the Public-Private Partnership (PPP) is still a catalyzer solution. They state that Turkey uses the PPP solution since the early 1980s to solve an energy crisis. The overall budget of total 575 hydroelectric plants reaches almost \$6.5 billion. As the number of expenses are such high, Birgonul et al. tried to develop a method to predict the profitability and feasibility of hydropower investments considering related risk factors. The power plants may be differentiating from the healthcare campus investments, but they are hardly similar to each other in many ways such as complexity, budget level, technique and economic impact on the country which they are built.

The study actually draws a risk identification frame and gives; change in law, delay in project approvals, change in government, unavailability in material during construction, unavailability of labor hours, unavailability of finance, insolvency of subcontractors, change in tax regulations, import restrictions, inflation rate volatility, fluctuation in foreign exchange rates, adverse change in financial markets, fluctuation

in energy demand, public opposition to the project, force majeure, unaffordable weather conditions as *external risk factors* and problems with design, delay in construction, vagueness of geotechnical conditions, poor quality of construction (rework), change in scope (quantity changes), technical problems during construction and operation, lack of organization / coordination, third-party delays (vendors, subcontractors etc.) and accidents as *technical risk factors* (Akçay et al. 2017).

By the way, while trying to reveal risk factors which are provided for some different scopes, it's inevitable to touch the term "critical success factors" for this study because each of the mentioned success factors easily means the absence of the related risks. So the risks can be derived from the context of success factors. The absence of a risk factor naturally enables the way that goes to success.

Baghdadi and Kishk (2015) state that as the highway projects are considered very complicated because of their nature, they are highly tending to counter certain risks. They tried to investigate Saudi Airport initiatives and found out that the projects are delivered with a significant cost and schedule overruns. Thanks to the interviews which is carried out with 13 experts, contractors and project managers; they have listed out a series of new risks and classified them as; internal, external and force majeure.

The researchers first scrutinized the related literature and found out the risk factors from related project types. After the detection stage, they have conducted some semi-structured interviews with 13 experts from different specialties such as contractors, researchers, consultants, etc. Some questions like;

1. What are the projects that you have been involved with?
2. What was your role?
3. What are the major risks in the projects that you have been involved in?
4. What is the impact/s of the mentioned risk/s in the project you have been involved with?

Questions such as in 1, 2, 3 and 4 are directed and thanks to some voice-recordings and data analyzing techniques the keywords are tried to be sorted out. Out of the open-ended dialogues, the interviewees are also directed to range the risk factors on hand which is carried out after literature review. After the mentioned two stages, a series of risk factors are achieved (Baghdadi and Kishk 2015).

Those factors are listed in Table 2.2 categorically below;

Table 2.2 Risk Factor Categorization Example for Highway Projects (Baghdadi and Kishk 2015)

**A. Internal Risks**

Client Specific Risks:

- Payment Delays
- Tight schedule set by client
- Inappropriate intervention by client
- Design changes by client
- Inadequate scope
- Site access delays
- Contract breaching by client
- Client financial failure
- Lack of experience of client
- Obtaining/issuing required approval
- Issue of sustainability
- Inadequacy of requirements
- Poor coordination
- Changing demands

Designer Specific Risks:

- Design errors
- Incomplete design
- Design constructability
- Poor quality of design
- Project type know-how skills

Contractor Specific Risks:

- Poor quality of construction
- Lack of experience of construction
- Contractor financial failure
- Low or poor contractor work productivity
- Errors during construction
- Accident and safety issues
- Quality and control assurance
- Contractor breaching by contractor
- Project type know-how skills
- Inadequate risk management plan

**B. External Risks**

Political Risks:

- Bureaucratic Problems
- Threat of war
- Labor issues
- Corruption
- Changes to laws

Social Risks:

- Crime rate
- Cultural differences

Financial Risks:

- Inflation
- Currency fluctuation

Natural:

- Poor site conditions
- Pollution

**C. Force Majeure Risks**

Natural Phenomena:

- Earthquakes
- Fires

Floods

Weather Issues:

- Severe weather conditions

They realized that amongst the whole series of the factors, there were 5 risks mentioned by all of the 11 interviewees. The 5 factors are scrutinized profoundly, and they were; *inadequate scope* (which is shown as the most severe risk from 100% of the interviewees), *payment delays* (which was mentioned by 60% of interviewees and said to be caused difficulties with client cash flow), *design changes* (mentioned 60% of client interviewees), *bureaucratic problems* (which are extremely hinder the project if it happens) and *changing demands* (Baghdadi and Kishk 2015).

The whole mentioned risk factors were about the generic infrastructure projects. As healthcare services are provided through hospitals, hospital projects can be considered as infrastructure projects. Therefore, hospitals projects have some similar risk factors with routine infrastructure projects. But one of the major thing about PPP, it is a new implementation in Turkey, and the contracts are highly complex than the others. So it can be easily said that possibly this study will be revealing some different risk factors too. A literature review about PPP and the related risks and expert opinions will be utilized hereafter, and they will be combined in the consideration of their associated impacts.

When the PPP or with the other name PFI is firstly used in 1992 in England, it was considered as a way to deliver project related risks, to decrease economic pressure on government, to make investments up, to cut public expenditures and to get benefit from the experiences of the private sector. That's why the PPP is thought as the key factor and essential for public infrastructure projects. But it's vital to understand and name the risks and allocation of it between parties while implementing PPP (Bing et al. 2005).

Bing and Akintoye are two of important researchers for this study because amongst the limited researches about "PPP healthcare implementation" they have dealt into this subject. They have stated that the list of risk factors and the knowledge about what should be well-known by the public client and the private contractor before

the tender process. Even it's crucial that the risk matrixes should be available in the tender documents before bidding process. So it makes things crystal clear before the works are started and avoids conflicts that are possible to occur during the business.

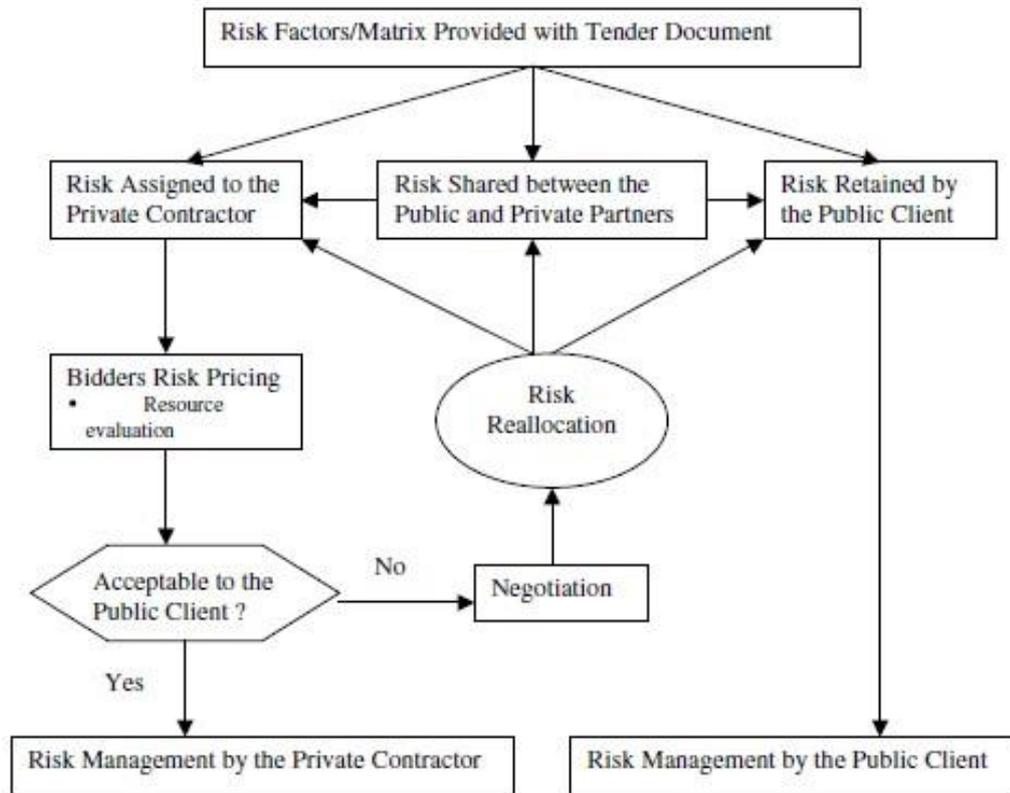


Figure 2.2 Risk Allocation Process in PFI Contract Procurement (Bing et al. 2005)

Figure 2.2 shows the risk allocation process after the risk matrix is included inside the tender documents. According to the figure, a risk list and the impacts of those are studied, identified and provided by the public sector sponsors. Sponsors are the organizations that are experienced about the contracts or project implementation and makes benefit out of the service they give. After the risk checklist is attached into the tender documents, both public sector and private contractor knows the risks that they may encounter. So according to the risks, private initiator regulates the price to bid. In other words contractor prices the risks. If the public client accepts the bid they

go for it; if a disagreement occurs and some negotiations are needed, it can be said that; a risk allocation should be repeated again.

Bing et al. (2005) approach PPP related risks as macro level risks, meso level risks, and micro level risks. They define macro risks as the risks that affect PPP project exogenously, in other words, their effects are external. Meso level risks are endogenous, and the risks and their impacts are about the project, and they occur within the project system boundaries. And finally, the micro level risks are the risks formed from stakeholder relationships and contractual managerial disagreements.

Table 2.3 PPP Related Risks from Literature Review 1 (Bing et al. 2005)

Categorised catalogue of PPP/PFI project risk factors		
Risk meta-level	Risk factor category group	Risk factor
Macro level risks	Political and government policy	<ul style="list-style-type: none"> <li>• Unstable government</li> <li>• Expropriation or nationalisation of assets</li> <li>• Poor public decision-making process</li> <li>• Strong political opposition/hostility</li> </ul>
	Macroeconomic	<ul style="list-style-type: none"> <li>• Poor financial market</li> <li>• Inflation rate volatility</li> <li>• Interest rate volatility</li> <li>• Influential economic events</li> </ul>
	Legal	<ul style="list-style-type: none"> <li>• Legislation change</li> <li>• Change in tax regulation</li> <li>• Industrial regulatory change</li> </ul>
	Social	<ul style="list-style-type: none"> <li>• Lack of tradition of private provision of public services</li> <li>• Level of public opposition to project</li> </ul>
	Natural	<ul style="list-style-type: none"> <li>• Force majeure</li> <li>• Geotechnical conditions</li> <li>• Weather</li> <li>• Environment</li> </ul>
	Meso level risks	Project selection
	Project finance	<ul style="list-style-type: none"> <li>• Availability of finance</li> <li>• Financial attraction of project to investors</li> <li>• High finance costs</li> </ul>
	Residual risk	<ul style="list-style-type: none"> <li>• Residual risks</li> </ul>
	Design	<ul style="list-style-type: none"> <li>• Delay in project approvals and permits</li> <li>• Design deficiency</li> </ul>
	Construction	<ul style="list-style-type: none"> <li>• Unproven engineering techniques</li> <li>• Construction cost overrun</li> <li>• Construction time delay</li> <li>• Material/labour availability</li> <li>• Late design changes</li> <li>• Poor quality workmanship</li> <li>• Excessive contract variation</li> </ul>
	Operation	<ul style="list-style-type: none"> <li>• Insolvency/default of sub-contractors or suppliers</li> <li>• Operation cost overrun</li> <li>• Operational revenues below expectation</li> <li>• Low operating productivity</li> <li>• Maintenance costs higher than expected</li> <li>• Maintenance more frequent than expected</li> </ul>
Micro level risks	Relationship	<ul style="list-style-type: none"> <li>• Organisation and co-ordination risk</li> <li>• Inadequate experience in PPP/PFI</li> <li>• Inadequate distribution of responsibilities and risks</li> <li>• Inadequate distribution of authority in partnership</li> <li>• Differences in working method and know-how between partners</li> </ul>
	Third party	<ul style="list-style-type: none"> <li>• Lack of commitment from either partner</li> <li>• Third Party Tort Liability</li> <li>• Staff Crises</li> </ul>

Table 2.3 shows the risk factors under macro, meso and micro levels. At the end of their study, Bing et al. state that they make public and private sector respondents to grade the risk factors. The results were showing that the most severe risks degressively were *poor political decision making, inflation, late design changes, staff crisis, interest rate volatility, project approvals and permits, lack of experiences in PFI arrangement and operational revenue blow expectation.*

Up to date information about Nigeria shows that with a population of 150 million and the population growth rate with approximately 2.5%; the government needed to provide essential infrastructure to fulfill the requirements. At this point employing private sector while conducting the services was not just a necessity but also an obligation. Because those scenarios made a massive pressure on the shoulders of government in terms of financial abilities. In Nigeria, as a PPP procurement method BOT and JVs are widely used to make the system work (Ibrahim et al. 2006).

Researchers in Nigeria checked literature and listed the PPP related risk 61 risk factors which are shown in Table 5 and directed those risk factors to 150 professional including researchers, contractors, clients, etc. who are into PPP projects. Most of them were 15 years' experience in the construction sector and from middle or top management levels. They asked interviewees briefly their position and to grade risk factors from their perspective within the limits of six-point Likert scale which is a grading system that contains grading numbers 0 to 5, and they respectively mean "no importance" to "very important. After all, 42 questionnaires were taken back out of 150 ones, and 36 of them were usable (Ibrahim et al. 2006).

The results were showing that "*unstable government*" factor was holding the 1<sup>st</sup> place with a mean grade of 4.17. "*Inadequate experience in PPP*", "*availability of finance*", "*land acquisition/site availability*", "*poor financial market*", "*availability of appropriate labor*", "*residual value (after concession period)*", "*operation cost overrun*", "*staff crises*" and "*force majeure*" were the following risk factors degressively (Ibrahim et al. 2006).

Table 2.4 PPP Related Risks from Literature Review 2 (Ibrahim et al. 2006)

Exogenous Risk Factors	Endogenous Risk Factors
<u>Political and government policy</u>	<u>Project selection</u>
Unstable government	Land acquisition/site availability
Possible expropriation/nationalisation of assets	Level of demand for the project
Poor public decision making process	Prolonged negotiation period prior to initiation
Strong political opposition/hostility	Competition risk
Inconsistencies in government policies	<u>Project Finance</u>
<u>Macroeconomic factors</u>	Availability of finance
Poor financial market	High finance costs
Inflation rate volatility	Lack of creditworthiness
Interest rate volatility	High bidding costs
Unstable value of local currency	Inability to service debt
Influential economic event (boom/recession)	Lack of government guarantees
<u>Legal and Legislative factors</u>	Bankruptcy of concessionaire
Legislation change/inconsistencies	Financial attraction of project to investors
Change in tax regulation	<u>Residual risk</u>
Corruption and lack of respect for law	Residual value (after concession period)
Import/Export restrictions	<u>Design factors</u>
Rate of returns restrictions	Delay in project approvals and permits
Industrial regulatory change	Design deficiency
<u>Social factors</u>	Unproven engineering techniques
Lack of tradition of private provision of public services	<u>Construction risks</u>
Public opposition to projects	Construction cost overrun
Non-involvement of host-community	Construction time delay
Cultural differences between main stakeholders	Availability of appropriate labour/material
<u>Natural factors</u>	Late design changes
Force majeure	Poor quality of workmanship
Geotechnical conditions	Excessive contract variation
Weather	Insolvency/default of subcontractors and suppliers
Environment	<u>Operation risks</u>
	Risk regarding pricing of product/service
	Operational revenue below projection
	Operation cost overrun
	Low operating productivity
	Maintenance more frequent than expected
	Maintenance cost higher than expected
	<u>Relationship risks</u>
	Inadequate experience in PPP
	Inadequate distribution of responsibilities and risks
	Lack of commitment from public/private partner
	Inadequate distribution of authority between partners
	Organisation and coordination risk
	Different working methods/know-how between partners
	<u>Third party risks</u>

Zou et al. (2008) were studied a life-cycle risk management system for PPP projects. They have stated that two or more partners are desired for PPPs and each partner should bring some value in terms of its capabilities to the partnership. Risks and responsibilities should be shared and well-known in terms of contracts. They have

also stated that while PPPs are enabling some difficulties, they also bring some limitations at the same time.

As well-known and mentioned before they also listed benefits of PPPs as; risk sharing especially from public to private, reducing the cost to implementation of projects, greater Value for Money (VFM), shorter construction times, bringing bigger and more experienced contractors to the projects, enabling innovative solutions and chance to build green buildings etc. But to identify the risk factors, they are inspired by three real case studies. They investigated Sydney Cross City Tunnel, Sydney Airport Railway Link and China Fu-De Highway. They have realized that three of the case studies were connecting each other with the same risk factors which were happening throughout the projects (Zou et al. 2008).

Researchers listed real-life risk factors while implementing PPP projects as;

- *Low credibility of government policies*
- *Poor transparency in contracts*
- *The difference in interests and expectations*
- *Inappropriate feasibility study*
- *Lack of government commitment*
- *Poor risk sharing and management*
- *Inadequate legal framework*
- *Poorly defined public sector policies*
- *Poor transparency*

The authors have taken risk factors as a tool to carry the contractor to failure or success both. In other words, they have stated there is a trade-off between risk factors and consequences. For instance, if the mentioned risk factors became reversed; *credit enhancements, stable policy regime, good public acceptance, transparency of the process*, etc. can be listed as opposites of risk factors and they lead the project to success naturally. But the darkness of the whole story is the most significant risk of itself.



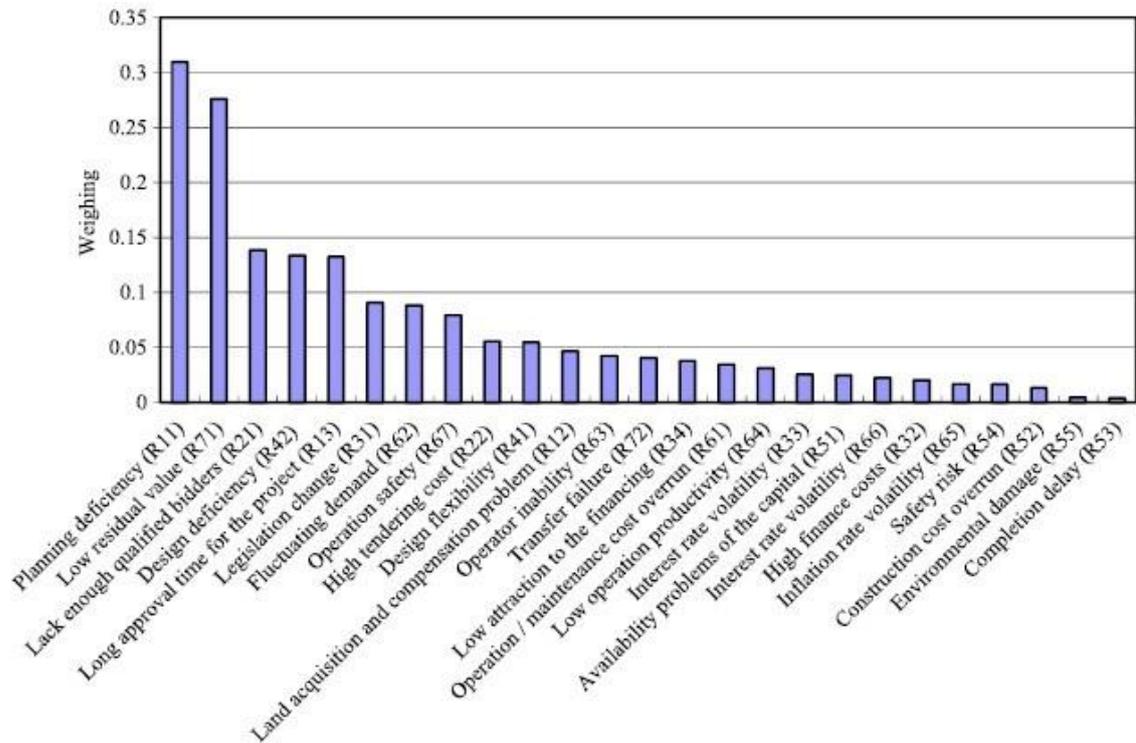


Figure 2.3 Weighed Risk Factors for PPP Expressway Case Project (Li and Zou 2011)

Chan et al. (2013) have stated that China will be the densest population in the world with approximately 827 million in 2025. To mitigate the problems which may be encountered, transportation investments and particularly mass rapid transit project are popular in China. To properly regulate the funding abilities of government, PPP is a crucial tool to be used. China has adopted some trademark PPP projects such as “Birds Nest” Olympic stadium or Beijing Metro Line 4. The researchers have stated that the most important key factor for PPP success is a reliable, well-organized risk assessment methodology and a risk allocation mechanism between parties (Albert P. C. Chan and John F. Y. 2013).

Delmon (2000) has stated that the consequences of an unsuccessful PPP trial cause hazards. Risks which are derived from PPPs can be financial, operational, constructional or political. So it can be easily said that in spite of the numbers of advantages of PPPs, risks, and uncertainties that are stem from contractual obstacles

or so may lead to stand government back from a point and drive the private initiator firm to bankruptcy.

The risk is generally included in the construction projects and causes cost overrun or schedule delays. PPPs are no different. So Chan et al. have conducted an extensive literature survey and reached 34 risk factors which are related to PPPs. To assess those founded risk factors in accordance with importance, researchers have distributed 580 questionnaires out, and 105 useful responses were taken back. Questionnaires were 6 point Likert scales. And after those risk factors which are shown in Table 2.6 degressively. The first 20 of those will be shown.

*Table 2.6 Overall Risk Ranking for PPP Projects in China (Albert P.C. Chan and John F.Y. 2013)*

Risk factor	Risk probability	Risk impact
	Mean	Mean
1. Government corruption	3.63	3.61
2. Government intervention	3.91	3.88
3. Nationalization/expropriation	2.34	3.46
4. Public credit	3.11	3.63
5. Third-party delay/violation	3.16	3.17
6. Political/public opposition	2.48	3.06
7. Imperfect law and supervision system	3.54	3.51
8. Legislation change	2.79	3.35
9. Interest rate fluctuation	3.39	3.34
10. Foreign exchange fluctuation	3.24	3.27
11. Inflation	3.33	3.36
12. Poor public decision-making process	3.59	3.63
13. Land acquisition	2.86	3.39
14. Delay in project approvals and permits	3.30	3.31
15. Conflicting or imperfect contract	3.23	3.43
16. Financing risk	3.50	3.70
17. Project/operation changes	3.40	3.26
18. Completion risk	3.24	3.47
19. Material/labor nonavailability	2.74	3.09
20. Unproven engineering techniques	2.56	3.03

Iyer and Sagheer (2010) have studied the Indian PPP BOT highway projects, and 17 critical risk factors are derived. Although the assessment and prioritization of

those risks is something hard to manage they tried to find relationships between risk factors and also to find the most dominant risk factors by using Interpretative Structural Modelling (ISM). After modeling financial closure risk, Schedule risk and cost overrun risk has found as the most vulnerable factors for Indian BOT highway projects (Iyer and Sagheer, 2010).

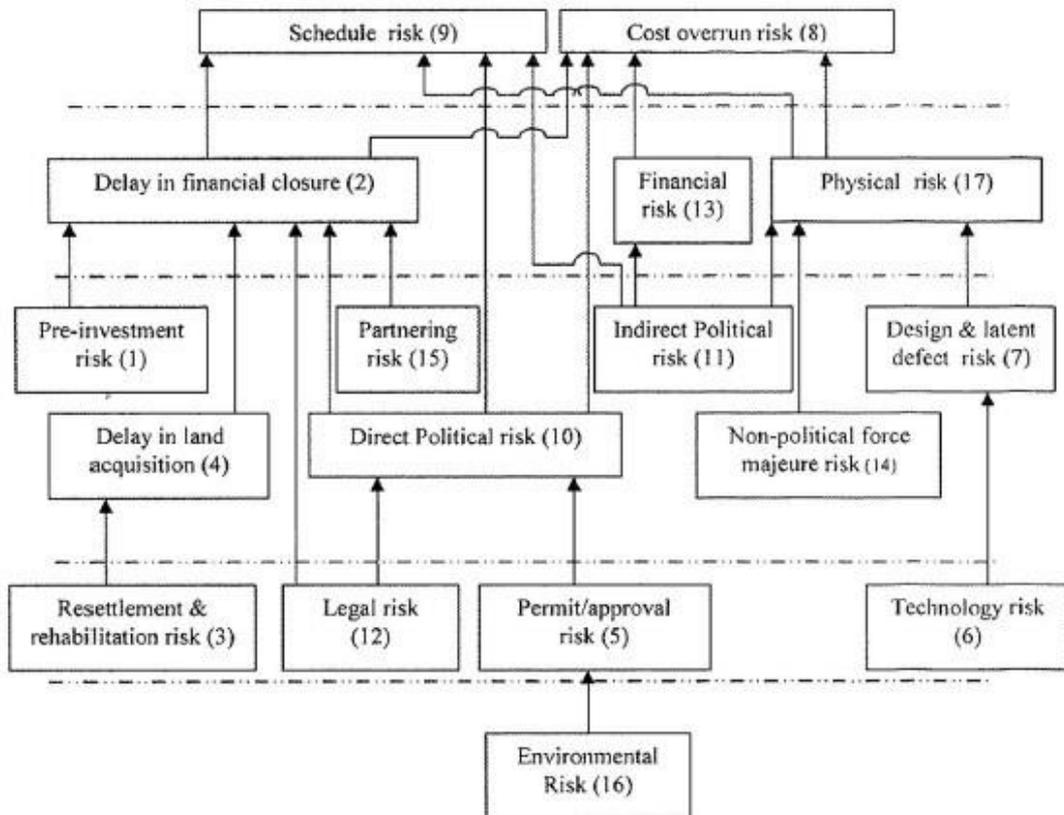


Figure 2.4 Risk Interrelations for Indian PPP Projects (Iyer and Sagheer 2010)

Figure 2.4 is showing the risk interrelations for Indian PPP projects. As it seems, “delay in financial closure” risk is triggered by 5 other risk factors which are “pre-investment risk,” “partnering risk,” “delay in land acquisition,” “direct political risk” and “legal risk” factors. That’s why the most vulnerable risk factor for PPPs in India is “delay in financial closure.” The sequent risk factors are “Schedule risk” and “cost overrun” risk as mentioned.

Ameyaw (2013) has studied water supply projects in Ghana. He has conducted a literature review and checked 22 related studies with water supply PPP projects and made real-life case studies of 6. The projects were designated from different zones of the country. After the researches, 40 related risk factors were found. The researchers are stating that the research is including a comprehensive risk assessment frame for water supply PPP projects in Ghana and the developing countries as well (Ameyaw, 2013).

Table 2.7 Overall Risk Factors for PPP Projects in Ghana (Ameyaw 2013)

Risk factors	Risk consequences/impact
<i>Political and regulatory risks</i>	
Political interference	Undermined service delivery as tariffs were held down
Termination of contract by government	The local government authority took over service provision
Government's commitment risk	Public sector unwillingness to finance expansion/rehabilitation programs
Change in government	Undermined effective regulation of service providers
Regional political instability	Limited private sector investment in the urban water sector
Corruption (government and private sector)	Sustained public resistance to the PPP process
No baselines for performance measurement	Affects the water sector integrity
Weak regulatory and monitoring regime	Hampered effective assessment of private sector performance
<i>Operational risks</i>	
High operational costs (energy)	Limited profitability
Equipment defect and lack of maintenance	Raised O & M costs
Obsolete technology	Undermined service levels/failure to serve the growing populations
Reliability of service/water quality	Weakened consumer willingness to pay
Poor performance	Resulted in public dissatisfaction and financial operating imbalances
Acceptability risk (aesthetics)	Resulted in reduced revenues
Inability of private partner to honour financial obligations (operator default)	Generated strained relationship between local governments and private operators
Poor asset condition	Posed operational challenges and increased operational costs
Water theft	Commercial losses to private operators
<i>Market/revenue risks</i>	
Alternative cheaper water sources	Created low demand for piped water
Low water consumption (fall in demand)	Sufficient demand becomes critical for project profitability
Delayed and non-payment	Constraints financial sustainability of water supply services
Uncertain tariff reviews	Undermined private sector confidence
Profitability of schemes	Disincentive to both local governments and domestic private sector

Hwang et al. (2013) were studied critical success factors of PPP implementations in Singapore and have reached 42 risk factors from the literature review. Hand the factors out to the biggest construction firms of the company to be graded, and after expert opinion based assessments, 23 of them were found more significant. Researchers have recognized that out of 42 risk factors, 7 of them should be allocated to the public sector. 19 of them were related to the private sector. 11 of those were hard to be allocated for individual parties, so they were thought as about private and public parties both. The residual 5 risk factors were neither about one of the parties and nor the shared by both parties. They were project specific and still worth to reconsider in terms of the nature of the project. Table 2.8 shows the risk factors that were found by the researchers from Singapore. As usual, the six-point Likert scale was used for the risk factors to be graded (Hwang et al. 2013).

Table 2.8 Overall Risk Factors for PPP Projects in Singapore (Hwang et al. 2013)

Risk factors	Level	Rank	Mean
Lack of support from government	Macro	1	4.46
Availability of finance	Meso	2	4.25
Construction time delay	Meso	3	4.21
Inadequate experience in PPP	Micro	4	4.17
Unstable government	Macro	5	4.15
Lack of legal/regulatory framework	Macro	6	4.13
Site safety and security	Meso	7	4.08
Construction cost overrun	Meso	8	4.08
Organizational and communication risk	Micro	9	4.06
Strong political interference	Macro	10	4.04
Inflation	Macro	11	3.98
Interest rate	Macro	12	3.85
Corruption and bribery	Macro	13	3.79
Inadequate distribution of responsibilities	Micro	14	3.77
Delay in approval and permits	Meso	15	3.65
Inconsistent legal/regulatory framework	Macro	16	3.60
Inadequate distribution of authority	Micro	17	3.56
Lack of commitment of between parties	Micro	18	3.54
Poor financial market	Macro	19	3.42
Differences in working method	Micro	20	3.40
Excessive contract variation	Meso	21	3.38
Financial attraction of project to investors	Meso	22	3.38
Level of demand for project	Meso	23	3.33

Public sector works in Hong Kong are literally divided into two in general. They are housing projects and the others. Increasing demand in infrastructure projects especially forces the government to find some other funds than the self-sources of state. The risk sharing was a vital thing to think about too. So at this point, PPP was employed and used from the late 1990s in Hong Kong. The general knowledge was showing that most of the project risks were arising from initial stages of projects. Design and construction stages were two important milestones from this reason. Most of the risks came to exist from those stages. If proactive precautions are not applied, the recovery of the consequences would be more effortful. Shen et al. have studied Hong Kong Disneyland PPP project, and they stated that several risk factors are encountered in the project and they were recognized and allocated effectively between the parties. The allocation and responsibilities were as shown in Table 2.9 below, and the related risk factors were as follows under the table (Shen et al. 2006).

*Table 2.9 Hong Kong Disneyland Risk Allocation Between Parties (Shen et al. 2006)*

Risk factors	Public sectors	Private sectors
R-1	Responsible (land acquisition)	Responsible (existing buildings)
R-2		Responsible
R-3	Shared	Shared
R-4		Responsible
R-5	Shared	Shared
R-6		Responsible
R-7	Shared	Shared
R-8	Responsible	
R-9	Shared	Shared
R-10		Responsible
R-11		Responsible
R-12	Responsible	
R-13	Shared	Shared

R1-Site acquisition risk, R2-Unexpected underground conditions, R3-Pollution to the land and surroundings, R4-Risk of land declamation, R5-Development risk (risks about development stage of the project for exp. waste of resources case), R6-Design and construction risks, R7-Changes of market condition, R8-Inexperienced private partner, R9-Financial risks, R10-Operation Risks (while maintaining facilities

etc.), R11-Industrial action (about organizational management risks; about directing the staff), R12-Legal and policy risks, R13-Force majeure (Shen et al. 2006).

Chou et al. (2012) have worked on Taiwan PPP general infrastructure projects and PPP high-speed rail projects (HSRs) and tried to compare the risk factors of those. Total of 37 risk factors is derived from expert interviews. The results were showing that the factors for traditional infrastructure projects were almost similar to the HSR projects. The authors have stated that the most important key factor to reach a good value for money requirement (VFM), a well-organized risk allocation between parties is important. After the expert opinion is driven risk allocation, the founded results were having risk factors such as inflation, interest rates, cost overruns, time delays, lack of government support and commitment, financial problems, etc. and the top three risks that are considered to be owned by the public sector were;

- Land acquisition
- Change in law
- Government reliability

and the weights of them were identical for both traditional PPP projects and HSR projects. The top three risks that are thought for a private partner were;

- Delay in supply
- Operation cost overrun
- Technology risk

and the weights of these ones were identical too for both project types (Chou et al. 2012).

The results may be identical with the results of some other researchers but this one has crucial importance of showing that the similarity in terms of risks between traditional construction works and a particular type of construction, which is high-speed rail projects for this research. This may lead to the understanding that clearly, the PPP healthcare implementations are not a way different from the other

implementations of traditional construction. They also include the constructional and managerial risks, but the government imposed, and contractual complexities will be some other divergent issues that this research will be trying to reveal collaboratively.

CityLink PPP road infrastructure project was settled and tendered in Melbourne, Australia, with an approximate cost of \$2 billion. It was a BOOT, and when the project delivered to the private sector to be constructed and operated, it was looking beneficial with a B/F ratio of 2, NPV of \$1.3 billion and a real rate of return expectancy of 17.5%. But because of the following risk factors that were experienced in the project, it turned out bad (Hodge, 2004). The experienced risk factors were as follows;

- **Site Risk:** Government had to pay \$10 million because of the land acquisition and site delivery problems to the private initiator. If the claims would be issued to the court, the results could turn costlier for the state.
- **Design and Construction Risks:** The opening of the southern section of the CityLink was delayed for almost one year because of the design and construction faults. The tunnel was leaking because of the cracks on it, the joint between a floor and an arch was faulty and which is resulted in a 40mm settlement of a bearing wall.
- **Operating Risks:** The project was losing \$100,000 for a day because of the leakings and the delay because of it.
- **Sponsor and Financial Risks:** The project's revenues were under expectations and was not covering the interest costs due to the issue mentioned the lenders worried about the debt payments and financial insurance.
- **Market Risk:** The western link had the traffic load around 75,000 vehicles per day, which is under the forecasts, because of the usage of alternative ways.

Quiggin (2005) from the University of Queensland Australia has stated that the PPPs have been seen as a way to deliver risk factors to the private entrepreneurs from the public sector. However, because of the poor or inappropriate contractual arrangements between the parties, some unexpected risks, which may lead to cost overruns, may be occurred. Therefore, as it is understood, Quiggin had studied upon only the contractual risks that PPPs involve and showed the “put and call options” as a potential key answer to overcome contractual failures via proper risk allocation. Put and call options system allows both parties to terminate the contract whenever they have wanted in exchange for designated prices (call and put prices). The system leads to force parties to prepare more transparent contracts before the works are started because of the termination options. It's easy to understand that the termination of the implementation is worse for both parties, so the system turns out better contractual arrangements (Quiggin, 2005).

Smith and Gannon (2008) have studied the “political risks” within the scope of light rail PPP projects in the United Kingdom. The researchers stated that the most cited risk factor, which is related to PPP implementations, is political risks. Between the years 1987 and 2006, UK has financed a total worth of £55 billion PPP projects and £22 billion of them was transport projects. However, the whole implementation was not that successful as it's encountered in the projects such as Metronet or Light Rail Transit (LRT) harmfully. From all of the case studies, 23 risk factors were identified and to assess the association of risk factors, Analytical Hierarchy Process (AHP) was utilized. Throughout the AHP utilization, most of the participants graded the political risk in their top three risk factors and the eight of them approached the same risk as the most critical risk factor. The case studies were also showing that; the cost overruns, time delays, project admission failures, wasted project development and risk factors like those are most vulnerable to lack of political support, and they are stem from political risks as well (Smith and Gannon, 2008).

Budayan (2018) from the Yildiz Technical University of Turkey has studied the risk factors about PPP projects by using triangulation method from Turkey perspective. As he declared in his research, he had a thorough literature survey, conducted some semi-structured interviews, and an empirical questionnaire survey was performed. He has also stated that the international resources were used to find out the risk factors mostly because even there are some risk identification studies in Turkey were conducted so far, they are a way lower in numbers. At the end of his study, Budayan has reached 89 valid risk factors, and the 7 of those were as stated below degressively;

- Project technical feasibility
- Efficient procurement process
- A sound government control
- Project applicability
- Adequate legislative framework and political conditions
- A proper risk allocation between parties
- Reliable consortium with strong abilities in terms of finance and technic
- Stable macroeconomic environment (Budayan 2018).

Doloi and Jin has studied PPP healthcare projects and tried to reveal the risk factors about it from the perspective of Australia and sorted the characteristics of PPP healthcare implementation as;

1. The project's cost and staff of PPPs generally start lower degrees from the initial phases and gets higher while approaching the end of the projects.
2. In spite of that, the risk and uncertainties are higher in the first stages, and they get lower during the project proceeding.
3. The risk that stakeholders may affect the characteristics of the project is higher at the beginning, and that risk gets lower as the project is being implemented.

4. Final and the most severe risk is explained by them as; the number and cost of changes and faults get increases as the project is progressing. At the end of their research Doloi and Jin draw the frame of the lifecycle of PPP projects and emphasized that at the end of the lifecycle mostly contract changes are shown. And this causes delays and unexpected coastal effects.

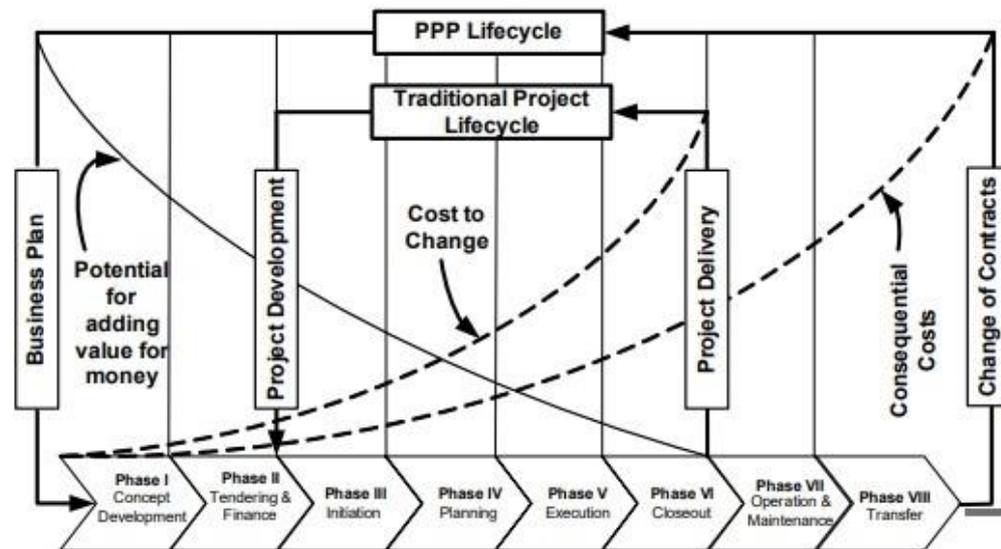


Figure 2.5 The lifecycle of PPP Projects (Doloi and Jin 2009)

Abdou and Zarani have studied the United Arab Emirates (UAE) PPP healthcare implementation, and the risk factors may be derived from the application. They have conducted some lessons learned case studies from Mubadala Healthzone, Abu Dhabi. With the conjunction of a comprehensive literature survey and expert opinions from the implementers of projects, the following risk factor table is provided by the authors as healthcare PPP implementation related risk factors (Abdou 2015).

Table 2.10 PPP Healthcare Implementation Risk Factors in Abu Dhabi (Abdou 2015)

Risk Factor
Design changes by client
Slow process of government approvals
Lack of design experts
Lack of guidance from client
Market conditions
Inadequate specifications
Incomplete/poor project scope
Poor project management systems
Lack of communication/coordination within Gov. organizations
Inappropriate project organization structure
Project design complexity
Errors and omissions
Defective/ inadequate designs
Lack of communication/coordination within design team
Resources shortage
Culture differences
Unforeseen soil conditions
Exchange rate fluctuations
Inflation & interest rate
Changes in project consultancy costs
Changes in policies and laws
Taxation on material
Political instability
Act of God

Siemiatycki and Farooqi (2012) have published an article in the Journal of the American Planning Association about Value for Money (VFM) and Risk in PPPs. VFM can be defined as the provision of some aids which can be said mandatory services of the public sector within the reasonable lowest limits of finance. VFM is an essential key factor because it forces PPP implementation to be innovative, well-thought of lifecycle costs and properly allocated risk transfer between parties. In other words, if a better VFM mindset can be imposed into PPP implementation, the risk factors turn out inevitable to be minimized. But “it is not that easy for sure,” the authors said (Siemiatycki and Farooqi 2012).

The VFM concept is a supportive tool to assess the merits of PPP implementation comparatively to the other types of procurement methods. To conduct this assessment, method firstly introduced in the UK. According to the concept, benefits and costs of the PPP project is calculated and to accomplish the comparison; the same process is applied to another traditional procurement type. VFM is actually depended on three specifications; the base costs of construction and operations of a project which is procured by either PPP or traditional ways of procurements, the risk retained and transaction costs (Siemiatycki and Farooqi 2012).

As shown in Figure 2.6, to add value into a project, or in other words, application of VFM mindset into the projects may lead to increase the base costs and transaction costs of the project to assure the risk allocations from the initial phases of the project. But at the end of it, as expected, the retained risks on the contractor firm is decreased.

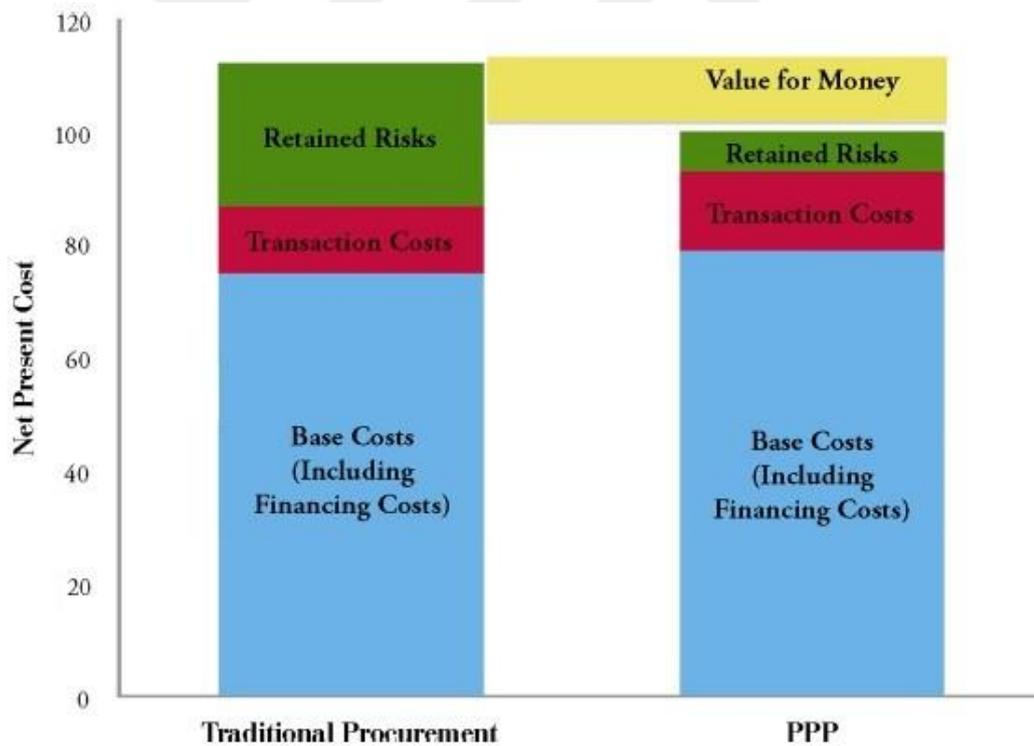


Figure 2.6 VFM Effect on Projects (Siemiatycki and Farooqi 2012)

Visconti has studied risk sharing between parties in Italian healthcare PPPs. VFM is also thought as a key approach in the research to make reasonable and proper procurement selection. The risk allocation is the most significant thing in PPP implementations, and it directs the VFM considerations.

The main issues / variables and the risk factors which effect VFM of the healthcare projects are given as;

- Location of the project: Features and specifications of the new hospital should fulfill the requirements of the area; otherwise the interest gets low.
- Site conditions: Unexpected ground conditions may lead to higher constructional costs and time delays.
- Approvals / Political oppositions: Local political opposition and the delay in approvals may lead to project delivery delays.
- Delay in start-up: Unexpected delays to site delivery would drive higher initial costs.
- The useful life of the hospital: Because of the force majeure, health legislation and treatment changes, etc. the expected over 60 years of the life of hospitals may be lower, and it may turn out concrete blocks with no advantage.
- Construction: the risk of unforeseen events throughout the construction stage means cost overruns and time delays.
- Maintenance / Reconstructing: If the quality of final productions is not met the expectations, repayments driven from reconstructions can happen. (Visconti, 2016)

## 2.2. 28 Risk Factors Were Derived from Literature Review

After a thorough literature survey, amongst a total number of 130 risk factors, 28 ones out of those were derived. While the elimination stage, the similar factors that were stated by different authors, the irrelevant or too generic factors were ignored. Different infrastructure project types were considered during literature review such as airports, railways, roads, highways, tunnels, healthcare campuses, etc. The reality that they are not a way different from each other was recognized. We can say that, at least for the literature review stage, the projects may be different from each other in terms of the way what they serve for, but they are all infrastructure projects, and they have almost similar risk factors. At this point, expert opinions will be possibly helpful to identify whether there are any other risk factors only specific to healthcare PPPs or general PPP implantation risk factors are valid for healthcare implementation too. The derived list of risk factors from the literature survey is shown below without consideration of their importance, impact or severity.

- |  |  |
|--|--|
| 1. Delayed drawings or instructions          | 14. Conflicting or imperfect contract    |
| 2. Change in tax regulations                 | 15. Schedule risk                        |
| 3. Fluctuation in foreign exchange rates     | 16. Construction cost overrun            |
| 4. Public opposition to the project          | 17. Governments lack commitment          |
| 5. Change in scope (quantity/design changes) | 18. Acceptability risks (aesthetics)     |
| 6. Payment delays                            | 19. Inadequate experience in PPP         |
| 7. Operational revenue blow expectation      | 20. Unstable government / Political Risk |
| 8. Availability of finance                   | 21. Lack of legal framework              |
| 9. Force majeure                             | 22. Delay in approvals and permits       |
| 10. Poor transparency in contracts           | 23. Excessive contract variation         |
| 11. Poorly defined public sector policies    | 24. Operation cost overrun               |
| 12. Interest rate volatility                 | 25. Incomplete project scope             |
| 13. Inflation                                | 26. Political oppositions                |
|  | 27. Delay in start-up                    |
|  | 28. The useful life of the hospital      |



## CHAPTER 3

### RESEARCH METHODOLOGY

As the research methodology; firstly, PPP term was defined, the history, origin, advantages and disadvantages, the international usage of the procurement method and the types of PPPs were introduced. After those, the organizational scheme and the structure of PPPs were introduced, and the legal framework & related legislative laws, tender process of PPPs, payment mechanisms between parties and significance of the study was stated. To emphasize the significance of the study, there were restricted numbers of PPP implementation risk identification and assessment studies in literature, less in Turkey in terms of numbers and no “PPP healthcare” risk assessment in Turkey. So it’s meaningful to conduct a study for this reason to understand the risk frame of healthcare PPP implementation in Turkey.

To identify risk factors a thorough literature survey was conducted. After the literature review a total number of 130 risk factors were identified and the identical ones, too irrelevant ones, the ones that have similar meaning and too generic risk factors were eliminated and with the open-ended interviews which were conducted with experts from contractors who have implemented PPP healthcare campuses in Turkey, the collaborated list of risk factors were reached.

The risk factors were adjusted upon the first tendered PPP healthcare project: Kayseri Integrated Health Campus and the results and the consistency of those were interpreted.

At the final stage, the risk factors and the effects of them were adjusted and after that, they have been expressed in a cash flow. Related Net Present Values were calculated under three scenarios which were most likely case, best-case and worst-case. Risk adjusted interest rates were considered during the NPV calculations and

consequent NPVs for three scenarios was stated. As an another feasibility approach, the Internal Rate of Returns (IRR) under different scenarios was employed as well. The detailed illustration of research method is given below.

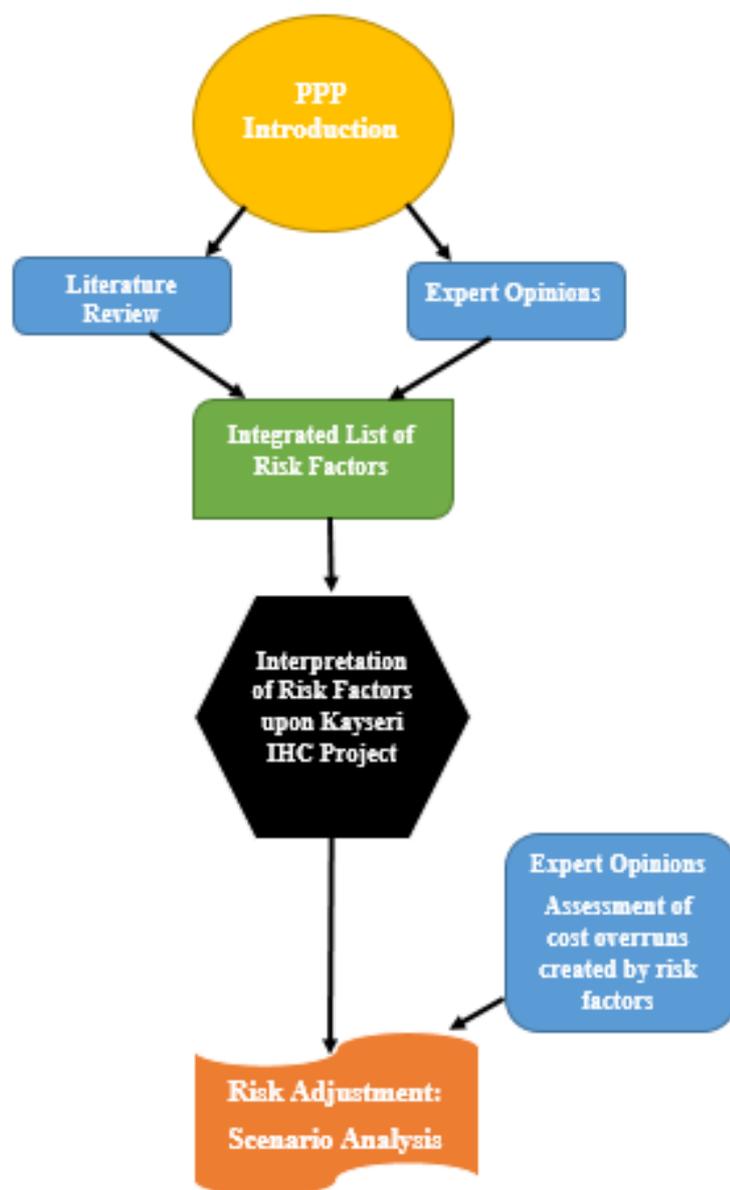


Figure 3.1 Research Methodology Schematic View

## CHAPTER 4

### INTERVIEW FINDINGS

#### 4.1. Interviewees

For understanding the related PPP healthcare implementations and the experienced risks about it, one of the flagship construction company of Turkey and the related personnel with PPP implementations were interviewed. To keep companies' name confidential, it is called as Company X. Company X has constructed over 20,000 housing projects at different locations in Turkey and international areas. Nuclear plants, airports, industrial facilities, substructure projects, residences and as following to the trend all around the world, PPP healthcare projects in Turkey. Manisa, Urfa, Konya, and Kayseri Integrated Health Campus projects are the ones that company drives domestically. This study will be putting under scope Kayseri IHC project. Kayseri IHC has a divergence and importance out of all other PPP healthcare projects in Turkey with the way this one is the first bidded PPP health campus project in Turkey. That's why it experienced all reality about PPP and risks which were first encountered at that time.

To identify risk factors that Kayseri IHC experienced, the executive management of the company and related managers were interviewed to assess the validity of risk factors that were derived from the literature review. And also if there is something missing in terms of risks, they were tried to come in light. The interviewees from Company X were as follows, and their educations and experience levels were stated too.

1. Chairman of the executive board
2. Vice chairman of the executive board
3. CEO (Chief Executive Officer)

4. Construction coordinator
5. Financial department manager

Number 1 and 2 are both civil engineers with an experience of almost 20 years in the sector. Number 3 is a civil engineer too and has experience of 25 years in different construction firms that have implemented projects in international areas. Number 6 has experience in government and has worked as an eminent officer in the treasury. Number 5 is the highest experienced civil engineer in the firm; he has worked at different projects including PPPs.

## **4.2. Interview Findings**

The interviews with experts have shown crucial information and contributed to the study dramatically. That was an expected result obviously because the firms are the ones who are in the business and they literally lived all the risk factors and knew what PPPs include in terms of opportunities and dangers.

At the bidding stage, MoH of Turkey just shares the quantities and preliminary projects. The technical specifications are also given to the initiator firms. After those poor handlings, firms prepare the proposal envelopes.

Envelopes include three smaller envelopes inside. The first one includes the proposal for constant investment price which contains construction, furniture, and general costs, etc. And the second one is all included annual price proposal. The last proposal is for the optional service prices, but this one is no effect on winning or losing the bid. The one who proposes the most favorable bid takes the business, and the process starts at this point.

PPP needs in Turkey was an obligation, because the public procurement law in Turkey was only including construction works, service works and procurement separately. There was no all included construction, service, operation, and procurement regulation. So Turkey decided to introduce the law related PPPs.

The experts have stated that PPPs are being used as financial instruments in Turkey. Public sector transfers the financial burden to the private sector. Governments always have two options while serving the public needs; whatever the project is, either public sector implements the services on its own sources and financial abilities or by using some procurement techniques such as BOTs, DBFOs, BOOs, etc., they employ private sector to make business real and prefer to finance the projects within a specified period. By the way, PPP hospital business is an excellent example of Build Lease Transfer (BLT) model. On the other hand, the most important advantage of PPPs for the public sector, the debt that occurred from implementations are not shown in balance-sheet of the public sector; it's transferred to the private firms.

From the perspective of Turkey; the leading and most important advantages of PPPs can be said;

1. Financial requirements are transferred to the private sector from the shoulders of the public entity.
2. Under normal conditions, if the public sector decides to make implementations on its own, the projects would last for maybe eight years, by employing PPPs, the implementations are being completed within three-four years. The main reason why this difference happens so, because the private sector looks for the ways to complete the works and initialize operation period to start taking availability payments as immediate as possible. For instance, the Turkish government has announced a health program with 60,000 beds. If public sector would decide to make it on its own, it may take 25 years, but instead of this, the government decided to employ private firms to make healthcare services faster, the progress would take 3-4 years, and pay for it for 25 years. Therefore, public reach necessary health services a way faster.
3. When the public sector undertakes the business, the final costs turn out higher degrees than privatization of works. It's undoubtedly

understandable because private sector uses credits, pays interests which are derived from that and tries to finish business as cheap as possible.

4. The private sector does business at higher qualities. While the quality at public hospitals in Turkey is at unacceptable levels, the condition in PPP hospitals is a way different than the public ones. The reason for this can be said, unfortunately, the public sector holds initial investment costs lower, and correspondingly the running costs are higher. Because of the private sector undertakes the maintenance of facility too, the initial quality grows higher normally.
5. By employing PPPs, know-how comes to the country. For example, the airport business was a different implementation for Turkey before the 1990s, but Turkish firms can run airport business at international areas right now.
6. Out of those, the government can use PPPs to affect public and gain the confidence of it.

VFM should be something considerable in PPP implementations. Because of the client in PPP healthcare implementations is public sector, value for Money thing or in other words, whether the benefit earned is worth to the Money spent or not is something that governments think about comprehensively.

In terms of VFM;

1. The government outsources the services in hospitals such as catering, cleaning, etc. in the current method. But having ten another separate hospitals and outsourcing the services is more expensive than collecting all those hospitals under one roof and taking services from one firm. This is the first considerable value.
2. At the current execution, there is limited quality control in public sector hospitals. But PPPs in Turkey and contractual terms in Appendix 14

describes quality conditions comprehensively and related punitive acts. The quality will inevitably increase in PPP health campuses.

3. The saying “no illness, but patient” is a knowing reality in the healthcare sector. The experiences show that the success in public hospitals is better than private ones. This is directly related to the number of patients that doctors encounter. The experience of medical staff gets greater as they face several patient types. PPP hospitals have massive amount of capacities and possibly will be able to result in better healthcare abilities in years.
4. The service standards in PPP hospitals are clearly better than public hospitals. “The hotel services” in PPPs is a way greater; the room capacities are constricted with two patients most.
5. The science of economy shows that; each \$1 infrastructure investment provokes GDP to jump for \$0.20. So if a country invests a \$10 billion in infrastructure projects, \$2 billion GDP jump can be reached. While making those calculations; for example, if the investment is the highway, the decrease in fuel consumptions, the lack of accidents that happen and the healthcare costs stem from that, and things like that are considered.

Experts have expressed the need why PPPs in healthcare should be used and why it was almost obligatory, what advantages they bring with themselves and the VFM perspective of PPP in their way above. And most importantly for this study, the risk factors from their side are given and sorted as following passages. They are emphasizing that PPPs bring so many risks together beyond any doubt and a comprehensive study is vital for minimizing and mitigating the related risks.

### **1. Inadequate knowledge at tender stage**

So for starters, one of the essential things that experts had stated was the tender stage of the process. Tenders should be transparent and competitive. Neither the specifications should be too hard to accomplish, nor they should go with mediocre

expectations. Relatedly, neither tender forces no firms to be eager for business nor all of incapable firms should run the business and ending failures.

As the first thing, the firms have no projects or drawings before the tendering but just preliminary ones. This may result in unexpected cost overruns for the firm. The firms can only know total quantities and bid the tender in light of that information from elder experiences and knowledge. But, as the business progresses, the quantities and bed numbers may change, or the exchanges between quantities of different hospital stages may affect prices because some of the departments require more expensive needs for settlement than the other ones. When the firms have not enough knowledge about specifications, the resulting implementations may be under applicable level for MoH and firm may not be able to claim related price increases. This is the first “in work” risk in the PPP hospital business in Turkey. “In Turkey” statement is important here because all of the PPP implementations in western countries, competitive dialogue model is valid. All of the information is known before tendering, projects, drawings, and related specifications are shared with the firms, even financial needs are arranged, funds are adjusted with the knowledge of interest rates for funds before tender, and within a crystal-clear frame, the tender is signed and closed. But in Turkey within all those stated obscurities, firms have no knowledge about interest rates that they are going to face or the increments in quantities and their related consequences such as cost overruns. So there is no need to take cost overrun risk as an individual risk factor.

## **2. Public support risk to the project**

Lobbying with the public is a crucial thing to be considered by the public. If there is a lack of public support to the projects, the public may decide not to use the facilities intentionally. This risk results in the decrease in the expected revenues of commercial areas of hospitals. Moreover, if public support is known by politicians, they can act more supportive, facilitator and comfortable too. For PPP hospitals, the PR studies of business didn't conduct properly. PPPs got to the point to be canceled.

Laws changed three times, chamber of medical doctors sued constitutional courts to cancel PPP healthcare programs. They were thinking that the mandatory services that government should provide was going to transfer to the public sector. There was information pollution about PPPs in Turkey. If the public were adequately informed, the chamber wouldn't find the courage to conduct this kind of actions.

Another motive that doctors were chasing was the hospital circulating capital issue. They were supporting that the income that hospitals get will decrease because of the high availability and service payments that MoH pays to the private sector. The government provides the land for the private sector, and firms construct the health campuses and make some availability payments in return of the operations that firms make for around 25 years. The public sector employs doctors and medical personnel to operate the hospital. If the performance of the public sector is adequate, PPP health campuses can make higher circulating capitals too, and we can see the applied examples of it. Moreover, availability payments are not paid by the MoH; they are regulated from the budget of the treasury. So the circulating capital issue is entirely irrelevant from the PPP implementations.

Another thing that public suppresses against PPP healthcare is guarantee issues. In Turkey, most citizens think that government gives astronomic guarantees to the private sector. For PPP healthcare, the government provides some guarantees for volume services, which were mentioned previous stages, but the public sector has experience from hospital implementations for years about the volume services. For instance, if the public sector gives a guarantee of 10 tonnes of laundry, they already know that a health campus with this much potential will need at least 15 tons of laundry service. Or how much will catering services be, how much Magnetic Resonance (MR) imaging will be done, and statistics like that are available in the database of MoH. So the public sector stands safe side all the time. Guarantees are essential not for the private sector; actually, it's a relaxing hand for lenders more. While funding the business, lenders know the cash flow and the minimum payments that private firm takes via guarantee mechanisms. Guarantee issue is not a risky or a

money-spinner issue for the private sector in healthcare PPPs after all; it may be risky in transportation PPP implementations such as bridges, etc. Because public sector needs to estimate the passenger passages from the bridge for such PPP implementation types. If the public doesn't prefer to use the bridge, or in other words, if public sector gives a guarantee of 100 million passenger passage to the private sector and 50 million passenger level is reached, the Treasury pays the extra 50 million price to the firms. But as mentioned, it's not valid for healthcare implementations.

### **3. Political risks / Reliability of public sector**

Experts have stated that one of the most critical risks in healthcare PPPs is political risks. Political risk includes several sub-risk pieces inside. As known, PPP is a financing model, and at this point, banks are involved hardly in the business. Bankability of project is a need for private firms.

If there is a consideration to make a business in Saudi Arabia, lenders cannot know what changes Arab monarch will make throughout the project. Will he make your payments on time? Will he cancel the project? Those obscurities create tremendous risks for the destiny of the project. Or if there is not a strong government, tax regulations can be changed arbitrarily. A taxation regulation in something that the private firm need to accomplish business can make things upside-down. Or nowadays in 2018 Turkey, the government announced a regulation consideration about compulsive usage of Turkish Liras instead of foreign currencies. And they added the existing projects would be affected from that change. The private sector has obviously not enough financial capability to run that big business on its own capital. High levels of loans had been used. The mentioned regulation hasn't become sedentary, but if it would be, it would obviously effect PPP healthcare project implementers hazardously.

So the experts have combined several risk factors under political risks / reliability of public sector originated risk roof, but it's obvious that the taxation regulation risks, change in law risks, country risk, etc. are all included inside this risk factor.

#### 4. Currency risk

In Turkey, availability and service payments are made in Turkish Liras. The consumptions of the private sector in healthcare PPP business is mostly in foreign currencies. For instance, the private firm is responsible for the initial provision of medical equipment for hospital and as just a single example is blood taking sets required. They are all imported stuff, and they are compulsory to be paid in foreign currencies. So, in other words, if a devaluation happens in the country as a result of inflation, by the way, which is not something rare for Turkey, the 100 million liras for today will not be the same money for 5 years later.

$$D = \frac{DKR_{(D-1)}}{DKR_0} \quad E = \frac{\frac{T\dot{U}FE_{(D-1)} + \dot{U}FE_{(D-1)}}{2}}{\frac{T\dot{U}FE_0 + \dot{U}FE_0}{2}}$$

$$\text{if } D-E \leq 0,25 \text{ then } DK = \frac{(D-E)}{2} + 1$$

$$\text{if } D-E > 0,25 \text{ then } DK = 0,875 + (D-E)$$

In PPP contracts, public sector regulates this condition and states that, if foreign currency value increments or with technical name of it the dutch disease is higher than inflation in the country; and the difference between those is below 25%, the risk is shared fifty-fifty. If the difference is above 25%, public sector undertakes all exceeded risk. So as an overall picture, currency risk is shared between parties at 87.5% and 12.5%. But it's evident that there is a currency risk for the private sector in PPP business.

One another related risk is actually a combination of both political / public sector risks and currency risk. Governments should be responsible for announcing real numbers about their economy, but sometimes as it can be seen in Turkey example,

inflation rates can be reported lower than it is to take public support. It will inevitably affect whole formulations that preserve the rights of the private sector.

### **5. Payment delays**

Experts have stated that delays in availability of service payments can lead irrecoverable consequences for firms. All of the firms in the PPP business are using loans from domestic or international lenders if firms cannot take the payments on time, credit payments delays. According to the agreement made between the private sector and lenders, generally, 6 months of allowance in payment delays is valid. If firms cannot afford the charges by using its' own capital, lenders can use their step-in right.

### **6. Step-In right risk**

Step-in right is a term which indicates that if the fund repayments resulted in delays within agreed time limits, according to the source of the problem, in other words, the main reason why the payments are delayed, either lenders sue the government for payment delays in international courts and tries to take their money back or deactivates the private firm and replaces their own firms to make the business.

### **7. Excessive operation expectation**

If the feasibility of the project is not straight ahead and the private firm cannot earn the expected revenue at the operation stage, it may obviously lead to tremendous problems in terms of cash-flow and fund repayments. Even some of the service payments during operation stage is guaranteed by the public sector; for example, if the commercial areas and the revenues expected from facilities stand under forecasts, the private firm may have affording issues. Or the consideration is volume services, if the guarantee given by the public sector is 50 tones for laundry per month, but the firm make some considerations for 150 tones in their calculations, it may lead similar undesired consequences.

## **8. Availability of finance**

Availability of finance is one of the most important risk factors that a private sector initiator may encounter. For example, the considered and willing Channel Istanbul project needs a financial requirement of \$10 billion. This amount is not easy to be funded. At this point lenders and their considerations are highly considered to understand risk factors and their sources. The known things that lenders highly consider while funding a business can be sorted as;

**Contract:** Whether the risks are allocated to the parties properly in terms of the contract, or is the contract applicable?

**Client:** Have client implemented similar projects before or know the PPP type of procurement comprehensively? For example, from the perspective of Turkey; General Directorate of State Airports Operations (DHMI) proved herself and a better option to be funded for lenders, but MoH was implementing hospital services via their own sources so far. This was a consideration for lenders to think.

**Contractor:** Has contractor completed similar projects before or whether they are able to finance the business if payment delays would occur?

**Country:** This factor is mentioned before but once again, is the government reliable, are payment delays possible to happen, do some regulation changes happen mostly, inflation in the country, etc.

## **9. Force Majeure risk**

Force Majeure means any kind of unexpected events, hazards such as floods, earthquakes, civil wars, military coup attempts etc. In terms of healthcare PPP implementations or any kind of PPPs, force majeure is important from the perspective of lenders in the business. Lenders want to know how risks which are derived from force majeure will be allocated and whether the terms are clear in contracts.

## **10. Schedule risk**

Schedule risk that occurs in healthcare PPPs can lead to several consequences. But some of the most severe ones can be said as; if a schedule delay happens repayment of funds can become difficult. And again if the benefits of lenders would startle, their step-in right may become the main topic of conversation. Deviation from the expected schedule is a undesired situation. If the private firm falls behind the schedule, the public sector may want to make some payment delays. If the firm makes implementations too fast, then extra financial requirements may exist. But between lenders and the private firm, designated cash flow and credit payment program is arranged. Going too fast may be resulted in experiencing a turnaround and firm may need to finance the business on its own capital.

## **11. Inadequate experience in PPP**

The experts have stated that this is one of the most important risk factors about PPP implementations. If both parties have not enough knowledge and experience in PPP procurement method, contracts cannot be adequately prepared, risks cannot be shared as it should be so as a result of those, the creditability of project cannot be possible. As a mentioned example, making business with general directorate of state airports authority or ministry of transport in Turkey is preferable for both private sector and lenders because they have implemented PPPs and had experience in it but if the matter is MoH and healthcare PPP implementation in Turkey, they are brand new in business so the firms can face the comments like “it may be not included in the contractual terms, but you should make it happen for the public welfare”.

## **12. Excessive contract variation risk**

This one is also an important risk factor according to experts because healthcare PPP contracts in Turkey has 20% limit in initial investments. Exceeding that limit cannot be financed by the MoH. But this doesn't spirit off the contract variation risks. If variations happen, the firm should find the capital either from lenders by making supplemental agreements or by using their own capital.

### **13. Political oppositions**

In Turkey and the countries that political will can be changed frequently and the conflict between parties may lead political oppositions. These oppositions can affect both the daily life of public but also more relevantly to the scope of this study; it can also affect the business works. If the ruler party changes today and asserts that they are against PPPs and all implementations will be canceled; the private sector will be obliged to sit at the table with lenders on its own. If payments that the public sector is responsible for providing to the companies are delayed, credit repayments will be impossible to be paid with the own capital of firms.

### **14. Market Test right risk**

To conduct competitive strength, for each of the services, the public sector has a right of market testing for every 5 years. After the market testing, if there is a lower bid for the services, SPV firm has a “right to match” option. If SPV cannot provide the services for the bidding price, the new firm provides the related services and SPV issues the bill to the public sector by adding its’ head office costs on it.

### **15. Arbitration risk**

If there is a conflict between both parties, first an expert is employed to reconcile the issue. The decision that expertly made can be objected either one or both parties. At this point, the claims can be transferred to international arbitration. Arbitration is not actually a risk factor for parties but a risk factor for the reputation of the country. It can be thought as a muddling in implementing PPPs in Turkey, and it is not the desired situation.

### **4.3. Integrated List of Literature and Interview Findings**

After a thorough literature survey and conducting interviews with experts who are experienced in the business for years; for literature review, a total number of 130 risk factors were obtained. Similar ones, identicals, irrelevant, too general risk factors, etc. were eliminated and a total number of 28 risk factors remained.

All of the selected experts were the ones who are in PPP healthcare business, either engineer, financemen from lower positions or chairmen who are facing all of the bottlenecks of PPP implementation in Turkey. Some of the factors such as “step-in right” of lenders risk or “market test right” of the public sector were too technicality but if they happen the results would be knockout. Some of the factors were identified that we have found in the literature review. So they were canceled. Experts also stated that some of the risk factors, which were found from literature, are almost identical or some of them are not valid right now such as lack of legal framework. The first PPP law maybe was not flawless, but the third law that we are using right now can be said sufficient. Or they have mentioned about inflation in currency risk, and also they shared the currency and inflation risk allocation equations. Or literature review was including a risk factor named “public opposition to the project” and the experts have stated a risk factor named “public support risk”. Or again the literature review was including a risk factor as “useful life of hospital” and the factor was touching the problem of whether people surrender to use the health campus for some reason or is it possible for the health campus to be useless in years or not. Experts have stated that for Turkey it is not that possible, some cities such as in Detroit, industrialization may be interrupted, and people may decide to leave the cities. However, Turkey is suffering from a lack of hospitals, and that risk factor is not valid for Turkey. Therefore, they were canceled too. The most repeated and emphasized risk factor that they have done was “Inadequate experience in PPP”. But “political risk”, “step in the right” and “public support” was some of the risk factors they attached importance too.

So after all, within the light of reasons mentioned above, some risk factors canceled, some were combined, and some of them were not taken because of the number of risk factors will be too much or irrelevant for a Scenario Analysis. So the most repeated and mentioned risk factors from the literature review were taken into consideration.

Therefore, the final united list of risk factors about PPP healthcare implementations in Turkey is given below without consideration of importance. The importance or in other words effect of those will be assessed after a Scenario Analysis at the final stage of this study.

The united list of risk factors, which are derived from a literature survey and expert interviews;

1. Political risks / Reliability of public sector
2. Public opposition to the project
3. Payment delays
4. Availability of finance
5. Currency risk
6. Step-in right risk
7. Inadequate knowledge at tender stage
8. Force Majeure risk
9. Market test right risk
10. Political oppositions
11. Change in scope (quantity/design changes)
12. Inadequate experience in PPP
13. Delay in approvals and permits
14. Governments lack commitment
15. Schedule risk



## CHAPTER 5

### CASE STUDY ON KAYSERİ INTEGRATED HEALTH CAMPUS PROJECT

#### 5.1. Brief Information about Kayseri and Health Services in City

Kayseri Province is located at the middle of Turkey covered by the Nevşehir, Yozgat, Sivas, Maraş, Adana and Niğde Provinces. The City has an approximate population of 1.4 million peoples (<https://en.wikipedia.org/wiki/Kayseri>)

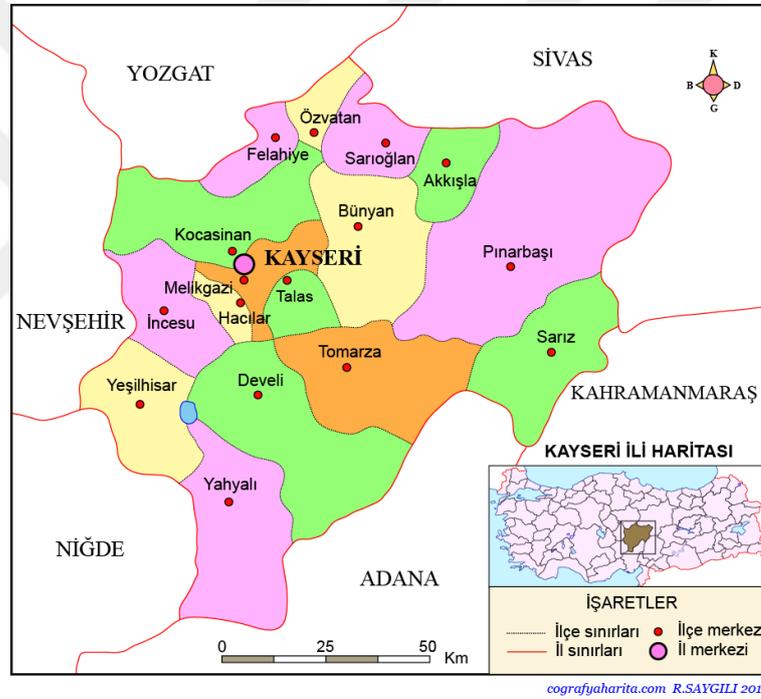


Figure 5.1 Kayseri Province ([http://cografyaharita.com/haritalarim/41\\_kayseri\\_ili\\_haritasi.png](http://cografyaharita.com/haritalarim/41_kayseri_ili_haritasi.png))

The city has 38 hospitals, which is including 5 dental hospitals, 22 private hospitals, and 11 public hospitals. Kayseri Integrated Health Campus will be the 39<sup>th</sup> hospital of the province (<https://www.hastane.com.tr/kayseri-hastaneleri-sayfa-1.html>).

A brand new statistics have shown that between the months January and October 2017, Kayseri at the top line of a total number of inspections with 3.3 million people. Therefore, it looks like the city is suffering from a lack of hospitals inside.

The mount Erciyes is a famous place to visit and the city renowned for its' favorite foods such as mantı, yağlama, sucuk, and pastirma.

### 5.1.1. Kayseri Integrated Health Campus

Kayseri Integrated Health Campus (IHC) is the case study of this research, and the associated risk factors will be utilized upon Kayseri IHC project. Kayseri IHC is designated as a case study because the project has a crucial difference than other IHC projects. Kayseri IHC is the first bidden healthcare PPP implementation in Turkey. The tender process was started at February 2011 and contract was signed at August 2011. As investment period a total duration of 3 years and for operation period 25 years was agreed between MoH and SPV.

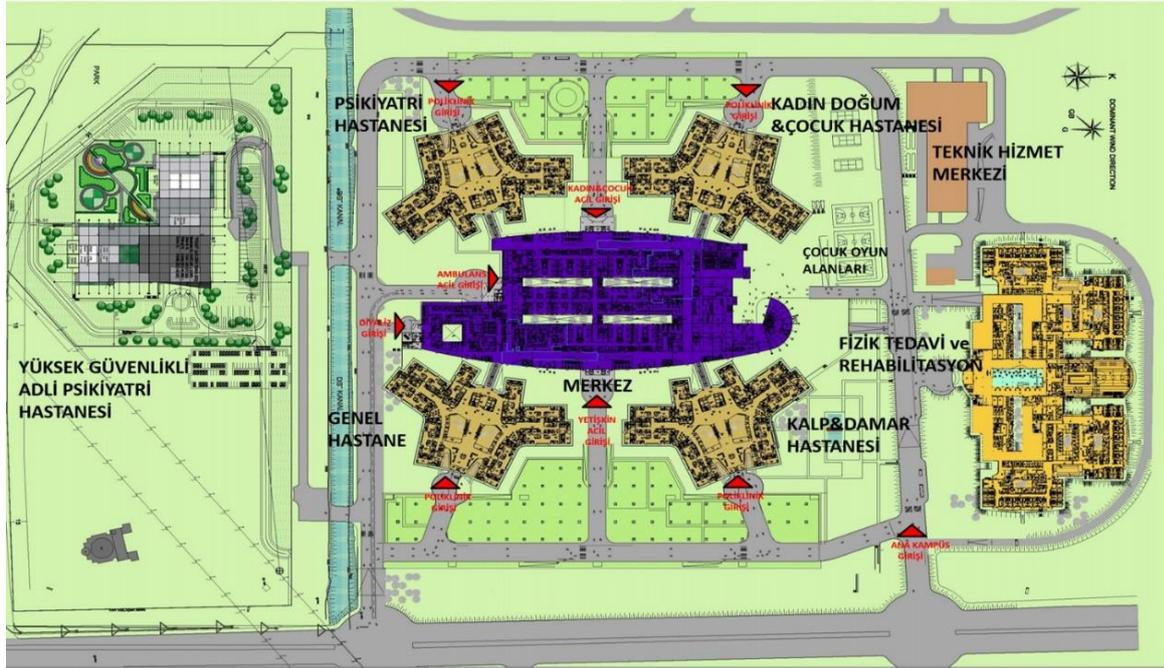


Figure 5.2 Kayseri IHC Project Plan

The total area for construction was considered as 385,000 m<sup>2</sup> at the tender stage, but it has ended for 465,000 m<sup>2</sup>. Landscaping area in the project was 245,000 m<sup>2</sup>. The project has 220 outdoor and 3030 indoor garages. The parts of the hospital can be listed as 200 beds for physical medicine and rehabilitation center, 480 beds for the general hospital, 261 beds for gynecology and child hospital, 412 beds for cardiology clinics and 120 beds for psychiatry. So the total number of beds included is 1607. Out of those, there were 413 outpatient clinics (polyclinic), a technical service facility, 43 operating rooms, 248 intensive cares and also the high-security psychiatry service was included after the tender stage.

For the construction stage, 2 concrete plants were established in the site, and a total of 11 tower cranes was employed. The site has a labor capacity of 2500 people. Over 30 sub-contractors were employed throughout the construction process. Site investigations and ground studies have shown that the ground was highly needed bored piles for soil improvement. Over 13,000 bored piles, over 780,000 m<sup>3</sup> of earthworks, over 250,000 m<sup>3</sup> of concrete and over 26,000 tons of constructional steel were used during construction. The advisor firms were outsourced for occupational safety and quality control issues.



*Figure 5.3 Kayseri IHC Render Sketch*

The total investment cost of the project was €450million. €311 million of it financed by lenders, and the residual €103 million is provided by the own capital of the contractor. The availability payment of the project was designated as 80 million Turkish Liras for each quarter payments. Construction permit of Kayseri IHC was taken at September 2015.

## **5.2. Interpretation of Risk Factors upon Kayseri Health Campus Project**

Due to the Kayseri IHC is the first tendered healthcare PPP project in Turkey, the project has faced most of the risk factors mentioned at previous stages. In this part, Kayseri IHC project will be analyzed and interpreted in the light of risk factors stated one by one. Not all of the factors are obligatory to be faced in the project, but the relevant ones will be included in this part.

### **1. Political risks / Reliability of public sector**

For Kayseri IHC Project, quantity changes, revisions and as a result of those total of 16.5% constant investment cost increment was approved at 11.06.2015 by MoH and notified the contractor. However, the availability payment revision process was a problem. Including expert operations, for following 2.5 years several written and verbal contracts have met. At the time of different ministers, the revised availability payment was agreed, but throughout the project, the minister of health was changed three times. All newcomer ministers have tried to find new methods and calculations. According to the contract, for the situation of a conflict about availability payments, arbitration could be the analytical way to go but this was also rejected, and this issue was procrastinated by MoH, and whole related clauses of the contract was violated.

## **2. Public opposition to the project**

For general, even there was no public opposition particularly for Kayseri IHC project, there was a common understanding for PPP hospitals that they were a way to escape of government from its' mandatory health services to be provided for the public and transferring those to the private sector. It was understood as privatization of healthcare services which ought to be provided by the public sector. This was not real, but it caused PPPs to be started after long legal cases in Turkey. Chamber of medical doctors has sued several cases for PPPs to be canceled. But the reality was far away from a privatization issue, MoH was going to employ all doctors and medical staff for integrated health campuses and just construction, and operational services were going to be provided by the private sector. By the way, outsourcing those services (catering, security, imaging, cleaning, etc.) are already being applied as the way mentioned for processor public hospitals. Briefly, nothing happened specifically to Kayseri IHC but delay in application of PPPs in Turkey, that was something significant.

## **3. Payment delays**

As it's written in PPP contracts openly, the availability payments are refunded in every three months which are called quarter payments and the service payments are paid in every month. But at Kayseri IHC the availability payment which should be paid in the month May is paid in sequent October.

The payment delays are important in terms of the circulation of capital for business. Contractors sign high amount of credits to succeed the structural works. The repayments of those are attached by strict regulations. The payments can be deferred via extra agreements with lenders for 6 months at most. After that point, lenders have the step-in right to be used. To not fall into

a situation like that, firms generally try to solve financing issues by using their own capital. But payment delay is the serious risk factors for sure.

#### **4. Availability of finance**

Because of the prolongation in the process of availability payment disagreements, the creditability of the project and its continuity experienced some difficulties. At the beginning of the project, as obvious lenders have expected the risks in the contract were allocated properly and payments will be made on time. The main consideration of lenders was that the contractor firm or in other words SPV would take the availability and service payments right on time from the public client. They were aware that, if there found something unimagined in this process, the repayment of the funds would be hazardous. And undesirably public client raised some difficulties about the number of payments after quantity increments.

The agreement between SPV and lenders included some credit increments too after increments in quantities and as a result of that the investment cost. But promises were given was stating that the availability payments were going to revised by the public client and the extra credits were going to utilizable after that. When the conflicts about revising the availability payments have arisen, lenders refused to provide extra credit for business. The project had to proceed by the own capital of SPV.

#### **5. Step-In right risk**

After availability payment revising conflicts arose, lenders have worried about the cash flow of financing expectations of SPV. They were about to stop credit runs. Six months of allowance was arranged between lenders and SPV. The issue was going to end in arbitration when the six months was over. Lenders reported some step-in considerations in writing. The things were getting complex, and the project was facing the risk of being a frustration.

At the meeting on the date of 4<sup>th</sup> May 2018 in Kayseri, President Recep Tayyip Erdoğan has untied the availability payment issue surprisingly. The contractors stated the price that MoH and expert were suggested and the disagreements about that. Mr. Erdoğan has shown off the final number, and the conflicts were over.

#### **6. Inadequate knowledge at tender stage**

Kayseri IHC project was tendered, and at that time the only thing that SPV got was preliminary projects of work and technical specification documents. The contractors cannot see the possible changes, all details and most importantly because of the absence of projects; lenders were not feeling intimate with funding the business. SPV jumped in the business with no knowledge about funding limits, interest rates of funds, etc.

#### **7. Force Majeure risk**

The coup attempt on the date 15<sup>th</sup> July 2016 was failed, and the possible risks haven't become sedentary. But if it would be, as the history showed that, military forces could take control on ruling the country and "how the regulations would change" would be a question mark.

#### **8. Market test right risk**

"Market test right" risk factor is a factor that can occur at the operation stages of the project. Kayseri IHC was engaged to the service in May 2018. So after 5 years of operation, whether MoH will offer a market test or not will be understood, but this is still its' risky condition.

#### **9. Political oppositions**

From the beginning of the tender stage of Kayseri IHC, Turkey had 3 times of general elections. PPPs were the result of a Health Transformation Program which was announced by the ruler party in Turkey and was supported by them. If the government had reshuffled during those years, the approach of the new ruling

party was going to be obscurity. If they get a foothold against PPPs, the destiny of the project would be darkness.

#### **10. Change in scope (quantity/design changes)**

After the tender stage, the bid and signed 385,000 m<sup>2</sup> of the total project area has rearranged for 465,000 m<sup>2</sup>s. This change is approved on the date of 1<sup>st</sup> April 2015 and notified to the SPV on 8<sup>th</sup> of April 2015. In other words, the project has started with a program of 800 beds, and it turned to 1250 beds during the progress. It was apparent to rearrange the availability payments in the light of those increments, but due to the diffidence of bureaucrats for upgrading the payments, the mentioned conflicts and claim needs have arisen.

#### **11. Inadequate experience in PPP**

Both SPV and MoH had no experience before healthcare PPPs before Kayseri IHC project in Turkey. For the aviation sector and transportation, PPPs were applied. But healthcare was a brand new implementation. Lack of experience came to light in several ways for Kayseri IHC. Firstly, the contractor firm quoted a price for services in the light of statistical data of MoH. But the reliability of the data was obscurity. The second risk, the operation period of any healthcare PPPs was not known. Firms had assumed the revenues of commercial areas for instance. Another indicator of lack of experience was the change in contracts 5 times in 3 years. The first contract was signed in 2011, and with the participation and guidance of lenders technical advisors, the contract has taken its final form in the year 2014. The works couldn't start for 3 years. At the final state of contract, risks were adequately allocated and lenders admitted the contract and business as bankable.

#### **12. Delay in approvals and permits**

After construction has finished, provisional acceptances were not obtained for months. Even punch lists were announced and notified after 3 months than the

works were done. As the delivery of work was not taken by MoH, the availability payments were not started to come to hand. Payments were important for easing the repayments of funds. But that period was eluded by using the own capital of contractor firm.

### **13. Schedule risk**

Before handling the funds from lenders, a credit cash flow is arranged. According to the cash flow agreement, some months bring more payments than the others. To adjust the flows, SPV assumes the monetary needs month by month due to the expected running speeds upon construction. At the middle of the Kayseri IHC project, the arranged credit limits were not at its' highest point, but the pace of works got higher than the other months. So the financial need of the project and the balance of payments had changed. Because of SPV couldn't get the funds corresponding to the works they have done, the finance of the project was provided by the own capital of the firm again.



## CHAPTER 6

### SCENARIO-BASED RISK ASSESSMENT METHOD

Since 1970s, academics and business practitioners have implemented scenario analysis while trying to understand and estimate the possible uncertainties which can affect the destiny of projects. As the determination of clear forecasts is hard to receive all the time, experts generally finds creating different scenarios for future meaningful (Postma and Liebl, 2005).

Scenario analysis can be implemented by using different instruments for another types of projects for sure. Conducting a scenario analysis for Kayseri IHC project has been done with a financial manner. To satisfy the needs of mentioned financial scenario analysis; the real total investment cost of Kayseri IHC, real capital distributions as debt and equity, real debt payment period assumed, and the negotiated availability payment in the year of 2010 was used. In addition, the parity in the year 2010 between Euro and Turkish Liras was taken for calculations. Service payments, commercial area profit expectations, and operation expenses were taken fictitiously due they are confidential data and prohibited for using by the contractor firm. Therefore, they were taken respectively, 15%, 5% of availability payments and 90% of service payments for operational expenses throughout the lifecycle of Kayseri IHC.

The interest rate for debt was taken as 7%, inflation in Euro was 2%. Investor Risk Premium cell is something essential to conduct scenario analysis, and it was taken as 5%. Experts have stated that all of the possible risk factors that can occur during the project lifecycle and construction stage is always expressed into a percentage in projects. That risk integration is defined as Investor Risk Premium percentage. 5% for risk integration can be reached by stock market studies or the statistical data available from processor hospital projects.

Today, as the Turkish Government, the country can receive any funds with an interest rate of 7%. For Kayseri IHC or in other words, for the projects which include any Turkish Ministry as a client, this interest rates can be taken for fundings from either domestic or international lenders. That rate was taken in the light of this information and with consideration for the riskiness of Turkish Economy. This rate is also called a fund with a risk-free interest rate. But for example, the German Government can hand some funds with an interest rate of 2% for the projects they want to run because of the economic stability of the country.

Figure 4.4 shows the pioneer assumptions for Kayseri IHC project and the scenario analysis, which is desired for the project to analyze the impacts of risk factors under most likely, best and worst-case scenarios. And the corresponding Net Present Values (NPV) and changes amongst them will be presented.

Assumptions	
Interest Rate for Debt	7%
Total Investment Cost	€ 420.000.000
Total Debt Amount	€ 315.000.000
Equity	€ 105.000.000
Debt Payment Period	15
Availability Payment (in 2010)	80.000.000,00 ₺
FX Rate as of 31st December 2010 (€/TL)	2,059
Availability Payment in Euros	€ 38.853.813
Service Payment Ratio over Availability Payment	15%
Commercial Payment Ratio over Availability Payment	5%
Operation Expenses Ratio overt service payments	90%
EUR Inflation	2%
Investor Risk Premium	5%
Cost of Equity	12%

*Figure 6.1 Pioneer Assumptions for Scenario Analysis*

NPV means the summation of current values of money which may be obtained in different future times. And Internal Rate of Return (IRR) means an interest rate that makes NPV of a specific project equal to zero. IRR is generally used to estimate the

profitability or feasibility of a project in terms of interest rates. The equation to calculate NPV is as following;

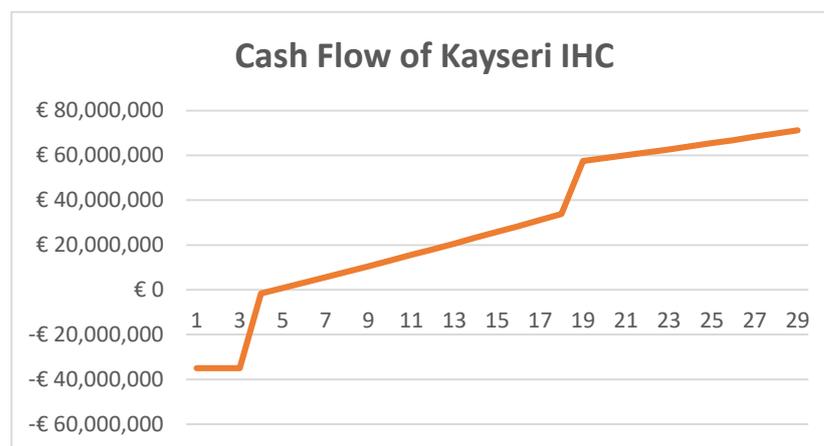
$$NPV = \frac{\text{Future Value}}{(1 + i)^t}$$

where  $i$  states interest rate and  $t$  for time duration for cash flow.

By using stated data above, a cash flow diagram was established. Years affecting the project life was expressed from -3 to 25. Three years for the construction period and the 25 years for an operation period of the project.

For establishing a sample model, expenses sheet of the SPV was produced by using Loan Debt Payments, Interests of debt and Operation Expenses of the hospital throughout the lifecycle of Kayseri IHC. Revenues were considered as Availability Payments, Service Payments and the expected revenues from the operation of Commercial Areas. The total investment at the beginning of the project was € 420,000,000, and it was paid equally in 3 years as € 140,000,000. The € 105,000,000 of it was used as lending, and in terms of risk allocation between banks, € 35,000,000 of it was used from own capital of SPV.

The related cash-flow diagram of SPV for Kayseri IHC was as in the illustration below;



As the cash flow diagram represents, the business was in a bottleneck at the beginning of a project, and it was showing a loss about € 1,700,000. That was reasonable because the highest amount of loan and interest in it was faced at the beginning of the payment session. Afterward, the trend was changed, and the project turned to the beneficial side. Figure 4.5 shows the sample cash flow of Kayseri IHC including each transaction for each years in detail.

Year	-3	-2	-1	0	1
Investment	€ 140,000,000	€ 140,000,000	€ 140,000,000		
Lending	€ 105,000,000	€ 105,000,000	€ 105,000,000		
Equity	€ 35,000,000	€ 35,000,000	€ 35,000,000		
<b>Balance Sheet Main Items</b>					
Debt Amount Remaining				€ 294,000,000	€ 273,000,000
<b>Expenses</b>					
Debt Payment				€ 21,000,000	€ 21,000,000
Interest Payment				€ 22,050,000	€ 20,580,000
Operation Expenses				€ 5,245,265	€ 5,245,265
<b>Revenues</b>					
Availability Payments				€ 38,853,813	€ 39,630,889
Service Payments				€ 5,828,072	€ 5,944,633
Commercial Incomes				€ 1,942,691	€ 1,981,544
<b>Net Profit</b>	<b>-€ 35,000,000</b>	<b>-€ 35,000,000</b>	<b>-€ 35,000,000</b>	<b>-€ 1,670,690</b>	<b>€ 731,802</b>

2	3	4	5	6	7	8	9
€ 252.000.000	€ 231.000.000	€ 210.000.000	€ 189.000.000	€ 168.000.000	€ 147.000.000	€ 126.000.000	€ 105.000.000
€ 45.355.265	€ 43.885.265	€ 42.415.265	€ 40.945.265	€ 39.475.265	€ 38.005.265	€ 36.535.265	€ 35.065.265
€ 21.000.000	€ 21.000.000	€ 21.000.000	€ 21.000.000	€ 21.000.000	€ 21.000.000	€ 21.000.000	€ 21.000.000
€ 19.110.000	€ 17.640.000	€ 16.170.000	€ 14.700.000	€ 13.230.000	€ 11.760.000	€ 10.290.000	€ 8.820.000
€ 5.245.265	€ 5.245.265	€ 5.245.265	€ 5.245.265	€ 5.245.265	€ 5.245.265	€ 5.245.265	€ 5.245.265
€ 48.508.208	€ 49.478.372	€ 50.467.939	€ 51.477.298	€ 52.506.844	€ 53.556.981	€ 54.628.121	€ 55.720.683
€ 40.423.507	€ 41.231.977	€ 42.056.616	€ 42.897.749	€ 43.755.704	€ 44.630.818	€ 45.523.434	€ 46.433.903
€ 6.063.526	€ 6.184.797	€ 6.308.492	€ 6.434.662	€ 6.563.356	€ 6.694.623	€ 6.828.515	€ 6.965.085
€ 2.021.175	€ 2.061.599	€ 2.102.831	€ 2.144.887	€ 2.187.785	€ 2.231.541	€ 2.276.172	€ 2.321.695
€ 3.152.943	€ 5.593.107	€ 8.052.675	€ 10.532.034	€ 13.031.580	€ 15.551.716	€ 18.092.856	€ 20.655.418



The weighing of risk factors and contribution of risk factors to the total Risk Premium was distributed in the light of expert opinions. The risk weights were multiplied with the most likely risk factor contribution 5%, and the contributions of each risk factor to the total Risk Premium was decided. After reaching most likely risk factor contributions, experts have graded worst-case and best-case scenarios and corresponding risk factor contributions. Summarizing those percentages gave the worst case and best case Risk Premiums. In other words, with a financial language, for best, worst and most likely cases; the cost of equity was determined. The mentioned contribution of each risk factor to the total risk premium values of worst, best and most likely cases is shown in Figure 4.6 below.

Risk Factors	Weight (Impacts of Risk Factors)	Investor Risk Premium (Most Likely Case)	Best Case	Worst Case
1. Political risks / Reliability of public sector	10%	0,50%	0,20%	0,80%
2. Public opposition to the project	5%	0,25%	0,10%	0,40%
3. Payment delays	5%	0,25%	0,10%	0,50%
4. Availability of finance	5%	0,25%	0,10%	0,40%
5. Currency risk	15%	0,75%	0,50%	1,00%
6. Step-In right risk	5%	0,25%	0,10%	0,50%
7. Inadequate knowledge at tender stage	15%	0,75%	0,30%	1,00%
8. Force Majeure Risk	5%	0,25%	0,10%	0,40%
9. Market test right risk	5%	0,25%	0,05%	0,70%
10. Change in scope (quantity/design changes)	10%	0,50%	0,20%	0,80%
11. Inadequate experience in PPPs	10%	0,50%	0,30%	0,90%
12. Delay in approvals and permits	5%	0,25%	0,10%	0,40%
13. Schedule risk	5%	0,25%	0,10%	0,40%
	<b>100%</b>	<b>5,00%</b>	<b>2,25%</b>	<b>8,20%</b>

Figure 6.3 Risk Factor Contributions to Total Risk Premiums

For this study, in the light of expert opinions, Risk Premium for the worst case have founded as 8.20% and for best case 2.25%. By adding Risk premiums to Interest Rates, the equity costs have reached. For worst, best and most likely cases, equity costs were expressed respectively; 15.20%, 9.25%, and 12%.

The initial equity or in other words the own capital that contractor firm, was € 105,000,000 for the Kayseri IHC. For the best case, worst case and most likely

case scenarios, Net Present Values (NPV) were calculated. The result was showing that, for the assumption of the firm or in other words for the most likely scenario, the return of the money invested was going to be € 140,000,000. For the best-case scenario if the risk contributions would be too low, the return of the money invested was going to be € 205,000,000 and for the worst case if risk factors would severely affect the destiny of the project, the return of the money invested was going to be a loss and the value of the money invested would be € 93,000,000. Or as another feasibility assessment method, if the IRR of the project for different scenarios was going to be considered, by the way the IRR calculated for Kayseri IHC was 13.2%, Most Likely and Best Case Scenarios has equity costs respectively 12% and 9.25% which are lower than IRR and which means the project is feasible. But for Worst Case Scenario, equity cost of the project is shown as 15.2% which is higher than IRR and which means that the project is not profitable for that circumstances. Figure 4.7 is showing the related data.

	Investor Risk Premium	Best Case	Worst Case
Equity	€ 105,000,000	€ 105,000,000	€ 105,000,000
Interest Rate for Debt	7.00%	7.00%	7.00%
Risk Premiums for Most Likely, Best Case and Worst Case Scenarios	5.00%	2.25%	8.20%
Cost of Equity (Investor Risk Premium Included)	12.00%	9.25%	15.20%
<b>NPV of Equity Investment with Equity Cost (with Risk Premium Considerations for each Scenario)</b>	<b>€ 140,507,859</b>	<b>€ 205,247,923</b>	<b>€ 93,981,233</b>
<b>IRR</b>	<b>13.2%</b>	<b>13.2%</b>	<b>13.2%</b>

Figure 6.4 Findings after Scenario Analysis



## CHAPTER 7

### CONTRIBUTION, LIMITATIONS AND CONCLUSION

Throughout the study; definition of PPPs, types of Public-Private Procurements, history of PPP in Turkey and in the world, specifically to healthcare implementations; its' organizational structure, parties which affect each other, payment mechanisms, legal framework and some terminology such as deductions, learning periods etc. were introduced in detail. Some of the acknowledgement stated in this study were studied by different researchers amongst whole PPP literature before but some risks were brand new such as “step-in right”, “market test right” and that was what makes this study distinctive on one level. An another thing was study has employed the first tendered PPP healthcare project in Turkey. PPP healthcare related risks were studied in other countries in a few studies but it was the first trial of them in Turkey. Those can be said the contributions of this study to the PPP healthcare related literature.

The main objective of this study was revealing PPP healthcare related risk factors via a thorough literature survey which is about risk identification of PPPs from different working scopes and healthcare PPP sector as well and via open-ended expert interviews who are already conducting implementations of PPP healthcare business in Turkey. The list was unified, irrelevant and generic risk factors were canceled and a final list was obtained.

The obtained risk factors were interpreted upon Kayseri IHC Project. As a case study, Kayseri IHC was selected because it was the first tendered and signed PPP health campus in Turkey. That's why the project has faced most of the risk factors mentioned. While conducting the interpretation stage of risk factors upon the Kayseri IHC project, the risk factors “currency fluctuations” and “excessive contract

variation” risks could not be employed. Because there was no specific variation in contracts for Kayseri IHC and currency fluctuation risk were being shared in the contract terms of the project and at the same time during the construction period of Kayseri IHC, no significant currency fluctuation has occurred. Even so, experts have stated those risks as related risk factors of PPP healthcare implementations because they are not always shown up as it’s came up in Kayseri case for all PPP projects. The consequences generally depend on the contract signed and the situation of country at that time. As it’s mentioned as a case study Kayseri IHC was employed only because I haven’t reach any other companies that are into PPP healthcare implementations in Turkey. Additionally, the hospitals’ operation period related risk factors couldn’t been interpreted during the case study because PPP healthcare implementations have been started in 2010s and they are newly came into service. That’s why the undesirable consequences cannot be faced for now. Those mentioned statements can be said the limitations of this study.

At the final stage, a scenario analysis has been applied. As variables, the weight of risk factors, related investor risk premiums for most likely, best-case and worst-case scenarios under those risk factors and their expert opinion based distributions were handled. The results were different from each other. Nevertheless, to sum up, experts have graded the risk factors “currency risk” and “inadequate knowledge at tender stage” as the most severe risk factors while the assessment they have conducted.

To sum up, the trend of PPP healthcare implementation is a brand new approach in Turkey since 2010s. However, the study is showing that the risks muchly stemmed from the first time implementation of PPPs in the health sector. The study may help to decide whether it is meaningful to run a PPP healthcare business in Turkey and lighten the way of eager construction firms by showing the two faces of the coin.

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