Breaking Down Factors of Public-Private Partnership in Urban Rail

Experience from Latin American Cases

by

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Preface

On December 2007, during my social community service for Christmas, I had to go to one of the Cones of Lima in order to bestow some activities to children. We gathered together on the location of the shantytown of Pachacutec at the foothill of the district of Ventanilla in Lima, Peru. I remembered to discuss with one of the priests of the community about the problems of the town while we were preparing hot chocolate and Panetón1 for the small Christmas lunch in Pachacutec. I asked him how is the life of the citizens and what is the biggest problem in Ventanilla. Surprisingly he answered to me: “It is similar to make paneton, you have to work long hours in order to produce only the basic dough. Here, people work long hours in the city center in order to have something to eat for the next day. The precarious environment where they live can hinder the evolution of the city. However, if we at least we can solve one problem such as the transportation, we can make a great difference”. In light of this, he told me that people use to travel almost 2 hours to reach their work places.

At first, it was hardly for me to believe on this situation. I ask myself how the capital of one of the emerging countries in Latin America can have such a deteriorating transport system for their residents. Thus, I made a try to test this claim one day in 2008 before traveling to the Netherlands. We went from the city center to the middle of the hill in Ventanilla. The result was more than I expected. It took almost two hours to reach our destination. First, we took a small bus, combi, for 30 minutes. We reach the backbone of the city center. There, we took a big bus in order to reach the district of Ventanilla. The bus was overcrowded and the trip lasted 1 hour and 20 minutes. We arrived at the foothill of the district. Finally, we took a motorbike to reach the middle of the hill for about 15 minutes. All in all, it was true that a Pachacutec citizen can spend on average four hours per day only traveling. If the government would finish the massive transport system conceived in 1985, the things could work better now. This experience has shaped how I want to invest my next months: analyzing the critical factors in the urban rail transportation in emerging regions such as Peru.

This project therefore focuses on the analysis of the critical factors in the urban rail transportation system in Latin America. Beginning with the theories of how the government and the private party can work together towards a solution for the urban rail system. From that, a theoretical framework of the most important factors in our environment are described. These framework would be used as input for an evaluative comparison of several cases. The empirical cases examined in this research cover the different cities of Latin America: Rio de Janeiro, Sao Paulo, Buenos Aires and Lima. They are the main indicators to know what recommendations can be useful to achieve success in urban rail transport projects. In this research project, I applied concepts related with transportation systems and policy analysis. This new but fascinating topic proved to me that we can make suggestions based on previous experience as well as to acquire knowledge about new policies.

Finally, the present document is the result of this six months research project based on urban rail projects in Latin America, breaking-down the most important factors in the transportation sector as well as to make recommendations for the future of Lima. Similarly, it is also aimed to obtain the Master of Engineering and Policy Analysis at the Faculty of Technology, Policy and Management of Delft University of Technology and at the Faculty of Management of the Harbin Institute of Technology.

1Traditional Christmas’ bread
Acknowledgments

During these months, I have not only learned about the concepts of new policies in different infrastructure areas but also I have the opportunity to work with professionals who guide and support me during this small adventure to write a thesis. My gratitude goes to all of them.

From the long list, I want to first acknowledge my gratitude to the persons with whom I had a particular contact during the execution of my research project. I warmly thank my supervisors for the provided assistance. To graduation professor Ernst Ten Heuvelhof, for his useful comments and advice for improving my research project during our meetings. To my first supervisor, professor Joop Koppenjan for his untiring support and advice, for his systematic way of thinking, for his meaningful arguments during our meetings and for his patience to overcome cultural differences. To my second supervisor Jan Anne Annema, for sharing his knowledge about transport field in this research. To my Harbin supervisor, professor Martin de Jong, for introducing me this topic when I was in China and for his sharp line of practical suggestions during meetings. To my mentor Mig de Jong, for his clarity of mind when dealing with my research project, for his analytical attitude and advice when I had some doubts and for his dedication to my big and small questions. Without their help, I could not be able to complete my thesis work.

Moreover, I would like to express my gratitude to Bert Enserink and Hoek Toke for helping me during the EPA Master courses. To my EPA classmates who worked on their thesis project at the faculty, especially to Breno, Leonardo, German, Bart and Aline for the nice lunches, for supporting each other in every milestone and for their advice in my project. To people from the Peruvian government and various organizations including AATE and ProInversion for helping me in collecting empirical data. To Nuffic HSP Talent Scholarship for the financial support to study at the Netherlands.

Furthermore, I am particularly thankful to those persons that filled all other aspects of my life. To my sister Denisse and brother Jonathan for their intensively support in the most difficult moments, for their examples of self-improvement, for their suggestions in good times and not so good ones and specially for being the motor of my life. To my brother in law, Francisco, for the final revision of the thesis. To my Peruvian friends, for their unconditional support despite of the distance. To my family, for their love and concern in all the moments. Moreover, my eternal gratitude goes to God for giving the support in every aspects of my life and his infinite force in everyday.

Finally, I dedicate this thesis to my parents, Rosa and Oscar, for being the best role model, the best professionals, the best professors, for their unconditional and everlasting love, for encouraging me never to surrender, for their indefatigable support and for being my light in the dark times. My everlasting gratitude go to them. Gracias por ser mi mejor inspiracion y el mejor modelo a seguir.

August 2010,

Giuseppe Manrique
Summary

In recent years, Latin America has experienced a rapid urbanization process, which leads to the increase of transportation demands in their main cities. In light of this, governments are working to enlarge infrastructure in the transport sector. However, some limitations such as the availability of public funds for enormous investment in these projects make it impossible for the government to promote new projects. These constraints have led some countries to develop agreements with private partners in order to promote new delivery methods such as Public-Private Partnerships (PPP) in the transport sector. This new approach has been used in different regions including Latin America. Peru, with its urban rail project - Lima Urban Rail - is using one of the schemes of PPP, but with peculiar characteristics that have not permitted to finish the project since 1986. Other countries, such as Argentina and Brazil, have already had a history of PPP in the same sector, but with discouraging results. PPP also carries many new challenges for transportation projects. Thus, achieving success in this area and specifically knowing what influences the success of PPP projects, is not a straightforward task. In other words, this research aims to know the path to achieve success in PPP projects in Latin America through the study of the most influential factors.

Therefore, considering this motivation, this research first studies the theory of Public-Private Partnership (PPP). In this context, the analysis of the benefits and detriments of PPP are examined in detail in order to understand the issues that first hinder the success in these projects. Moreover, the definition of success in our environment is defined in relation to the different phases of the project (Contract Success, Implementation Success and Post-Implementation Success). This is particularly important because it allows us to create a new theoretical framework of the most important factors that influence the success of a PPP project. In other words, a set of factors related to the context and to the project itself are extracted by theory providing the creation of a framework of important factors in PPP. They served as input for evaluation through the different cases of studies.

Thus, in order to evaluate this framework, we examined four PPP cases in the urban rail or subway sector in Latin America. These cases correspond to subways/urban train of the cities of Rio de Janeiro, Sao Paulo, Buenos Aires and Lima. This analysis was focused on the study of the relevant factors which can produce or disturb successful projects in Latin America. Moreover, the review of the main characteristics produced important reflections on our work. First, the Latin American plan lacks a long-term vision for the durability of their projects. Most of the Latin projects failed to provide an acceptable quality of service after some years of implementation. Transport failures embrace problems in the frequency of the trains, bad maintenance of stations and poor security personnel. Some of the sources of these issues are encountered on the lack of funding guarantees to support the durability of the project and the poor monitoring system of some PPP units. Secondly, three factors were found as critical in all the phases of a PPP project: Institutional & Legal Environment, Political & Socio-Economic Environment and Risk Allocation. The Institutional & Legal Environment of Latin countries is characterized by the lack of transparency law, independent judicial system but with some progress in unifying PPP laws. The Socio-Economic Environment is distinguished by the volatility which can reach long periods of economic growth but also long periods of unexpected economic crisis. The Risk allocation is still a challenge that can affect the total duration of a project. Thirdly, a new set of framework which fits in the Latin environment was contrasted, making real recommendations for the Peruvian government and general suggestions for Latin governments. These findings gave new light upon the success of PPP projects in Latin America.
Among the most important recommendations in order to achieve success, we can advise the Peruvian government to create a new guarantee fund in order to deal with possible economic crisis. The Peruvian economy can be very changeable and thus the government should be prepared to face any probable economic risks. Moreover, the congress should also work on establish a new transparency law in PPP projects. The information of all the phases of the project should be opened to public in relation to the different phases of PPP. Public participation is important on the acceptance of high-investment projects, thus it should be included in the process of the projects. Furthermore, an independent monitoring system for the long-term of the project is a “must”. The research showed that the long-term duration of a PPP project in Latin America can not be easily achieve due to the lack of monitoring methods through the life of the project. Additionally, we also suggest to the Latin governments to see PPP as a new model for the market. Some of the projects are done independently without looking at previous experience and thus the same mistakes are made. Projects can be an example of new ones, creating a new market for other cities. Finally, government should also give some incentives or penalties in order to deter private parties from strategic behavior, providing stimulus to accomplish their goals. These are feasible recommendations in the specific Lima case and general Latin projects, however it will also depend predominatly on the commitment of the parties to overcome the detriments of PPP projects.

Taken the definition of “success”, emphasizing on the context-related factors and risk allocation and using our created framework, recommendations based on the most important factors influencing the different parts of the projects are put forward, aiming at building up an efficient transport environment for Latin America and in the case of Lima.
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<td>Number of concessions in Peru by 2008</td>
<td>172</td>
</tr>
</tbody>
</table>
Part I

Introduction
Chapter 1

Introduction

The rapid growth of inhabitants and economic development in the world has resulted in an important need for transportation from different destinations; and Brazil, Argentina and Peru are no exceptions. The fast variations in Latin American layout of economic zones and more intense agglomeration and radicalization effects of some cities, induce the urban temporary population to increase greatly and inhabitants to travel more frequently. Furthermore, since the early 1980s, other countries in late 1990s, with some radical economic reforms brought forward, the discussion for new types of changes on infrastructure has given a new focus to the public sector. This situation has led governments to embrace a scheme where the private sector financed urgently needed infrastructure investments, thereby freeing up public resources for projects in other priority areas.

Moreover, developing urban rail systems is thought to be an effective solution for the lagging development of Latin American transportation infrastructures; beginning with the most populated cities such as Sao Paulo and Rio de Janeiro in Brazil, Buenos Aires in Argentina and Lima in Peru, which nowadays shelter more than 7 million of people in their metropolitan area. These large transport infrastructure projects such as urban rail or subway systems require huge amounts of capital, thus people believe that only funding from the private sector can fill the immense gap between the limited presence of public resources and rapidly growing sustainable urban infrastructure need.

As a consequence governments have started to develop different kind of public-private partnership (PPP) in their metropolitan urban rails or subways. Nevertheless, urban rail PPPs also face specific problems that may obstruct the implementation in the main cities. Three of these cities (Buenos Aires, Rio de Janeiro and Sao Paulo) have already gained some expertise with their projects, but one of them (Lima) is still stagnating.

The present project has two aims to cover. The first goal is to create a new framework of the most influential factors in PPPs projects in Latin America. In light of this, further works might be based on this framework and research can be easily developed. The second goal is to provide recommendations on PPPs for the specific project Lima Urban Rail in order to achieve successful projects for next construction lines and general recommendations for other Latin American projects.

Therefore we will analyze the effective route to reach the objectives of this research by developing a systematical research on PPP critical factors in Latin America. The entire research layout is presented in this chapter. First, the problem which we will be facing is framed and the context will be described in Section 1.1. Then, the research rationale of the thesis is further explained in Section 1.2. Finally, the section 1.3 provides a readers' guide for the thesis structure.

1.1 Problem Description

As many cities in Latin America, Lima has been suffering from a disproportionated demographic growth during the last years with an annual increase of 3.7% (See Table 1.1). In addition to this,
1.1 Problem Description

the presence of deficient transport infrastructure has permitted the continuous dissatisfaction of the citizens in the capital of Peru. For instance, the inhabitants of the poorest district in Lima, named “pueblos jóvenes”, had to travel in low-quality buses - “combis” or in old collective taxis, “carcochas” - word which also is used to denominate anything in bad conditions or disrepair (Rodriguez, 1994).

<table>
<thead>
<tr>
<th></th>
<th>Lima Population(mil.)</th>
<th>Lima Annual Growth (%)</th>
<th>Peru Population(mil.)</th>
<th>Peru Annual Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>640</td>
<td></td>
<td>6,208</td>
<td></td>
</tr>
<tr>
<td>1961</td>
<td>1,843</td>
<td>5.1</td>
<td>9,907</td>
<td>1.9</td>
</tr>
<tr>
<td>1972</td>
<td>3,303</td>
<td>5.5</td>
<td>13,538</td>
<td>2.8</td>
</tr>
<tr>
<td>1981</td>
<td>4,608</td>
<td>3.7</td>
<td>17,005</td>
<td>2.6</td>
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<tr>
<td>1993</td>
<td>6,345</td>
<td>2.7</td>
<td>22,639</td>
<td>2.0</td>
</tr>
<tr>
<td>2007</td>
<td>8,482</td>
<td>2.1</td>
<td>28,220</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Table 1.1: Lima and Peru Population Growth (Source: INEI 2009; Census 1940-2007).

As a consequence the national government launched the project “Lima Urban Rail”. This project was conceived in February 1986 as a way to correct the imbalances within the public transport system and gradually address urban transport difficulties faced by travelers in Metropolitan Lima. The implementation was stopped after some months, with only one part of the section built (9.8km), due to the economic crisis that shook the country. After several years of giving priorities to other sectors, the government wanted to restructure the transport sector and therefore taking up again the project “Lima Urban Train”. In 2007, Peru has already surpassed the financial depression and enjoys an average annual economic growth of 6.9% (Bank 2009), which recaptured the trust of some foreign investors and thus the project was again put on the table with sense of urgency. This new intention was also criticized by many parties who believed that the risks of the project were too high for the government (Glave 2009). However, the plan was approved by the Peruvian Presidency of the Council of Ministers (PCMCM) and Lima Metropolitan Municipality that establish to improve the current infrastructure of the project. Nowadays, the first line is under a new scheme of PPP, named BOT (Build-Operate-Transfer) with a cooperative company consortium, comprising the national company Graña y Montero SA and the Brazilian company Norberto Odebrecht SA, to carry out the civil works at a cost of US$410 millions (AATE 2010). Also, the national government through its urban rail direction named Autonomous Authority of the Electric Train (AATE- Autoridad Autonoma del Tren Electrico) had also a master plan to construct six other lines for Lima.

The great advantages of urban rail network compared with other public transit modes; such as stability, rapidity in delivering and minimal effects on environment (Liu et al. 2008), makes the Peruvian government aware of promoting infrastructures needed to counter the increasing traffic congestion problems existing in Lima. However, both construction and operational costs are too high for the government to fund entirely. Moreover, the public interest nature of urban rail infrastructures makes them different from the pure private goods and thus impossible to realize privatization completely in this field. Therefore PPP (Public-Private–Partnerships) schemes, a new cooperative arrangement between the government and private parties, have been worldwide applied in the infrastructure field.

PPP is seen as a tool of shaping new policies around the world. Not only have they became a cost-efficient engine for the implementation of public policy, but also brought significant benefits in terms of development (Osborne 2000). Leading by United Kingdom in 1992, through its mechanism of Private Finance Initiative (PFI), it introduced new agreements to solve sensitive cases such as health, prison and education (UNISON 2005). The attraction of the projects, mostly off the public balance sheet, keeps a straight balance in the cost-effective management of the public sector. In recent years, PFI, specifically the model DFMO- design, construct, manage and finance- has already become one of primary methods to collect funding for public sectors in the U.K.

As a consequence, the transport infrastructure from both developed and transition economies, was also influenced by this pattern. According to the Asian Development Bank (Bank 2008), PPPs are attractive because they can achieve through collaboration of the public and private sector what
each, acting alone, cannot. Also, by contributing to enhance efficiency in delivering services, the productivity can be improved from the private sector making commercially-based decisions when designing, operating, maintaining, staffing, costing, and delivering investments and services. As a result, profits from operation and returns on investment are higher than under state ownership.

These signals have attracted the attention of the Peruvian government who assumed that applying PPP in urban railway construction field might result in enhancing operational efficiency and lowering social service price due to the compressing cost behavior taken by private sectors to pursue the maximum profits. However, PPPs also introduce some challenges because its application is not easy and straightforward. There are massive issues and risks that do not permit to adopt this service deliver approach quite favorably such as opportunistic behavior, bad risk allocation and market failure (Koppenjan and Enserink, 2009). Therefore is not easy to conciliate the attractive investment opportunities brought by private parties and safeguarding the public interest at the same time. Moreover, PPPs have not been widely used in Latin America, only some countries such as a Argentina, Brazil and Chile are in the initial stage, which does not mean that they are successful. Also if we sum up the social problems, institutional deficiencies and political risks from developing countries into PPPs, especially in Latin America, we can not assure that the Lima Urban Rail project would have a positive outcome. Furthermore, this project is on edge of the actual political and social environment in Peru due to the prime priority to reorder the transport system. On one hand, the continuous advance of other city neighbors (Rio de Janeiro, Sao Paulo, Buenos Aires) encourages to build up a rapid solution for a huge demand but on the other hand, the main risks and past experience of this ambitious plan are taking away the breath of the local authorities.

Therefore, the goal of the research is located at two levels:

At the theoretical level, the author wants to contribute to the Latin American knowledge pool of PPP by studying several case studies, and thus providing a solid theoretical foundation for its application in practice. This include to have a clear knowledge of the main factors of success or failure in PPP in infrastructure in Latin America.

At the practical level, the author wants to propose recommendations with respect to the success for the next construction of the lines of Lima Urban Train and in PPP projects in Latin America through analyzing the main factors of Public-Private Partnership. This includes steering the best practices to confront the main challenges of Peruvian transportation project (including the informal considerations) and learning from others Latin American works that fit in the actual domestic political, economic, cultural and social context in Lima. These will help to facilitate the urban rail progress.

1.2 Research Rationale

Once the objectives are drawn, the next step is to set the proper framework to guide the thesis structure. For that reason, the next section presents the research questions and research design developed along with the conceptual framework and research methods adopted. The aim of this section is to provide the reader with some answer by investigating whether and how different the factors in PPP projects in Latin American countries; can influence the outcome of success.

1.2.1 Research Questions

As explained above, the advantages and the disadvantages of PPP in infrastructure project entails a challenging framework in the project, thus the main question of this is:

_How to achieve successful public-private partnerships for the next lines of the projects in Latin American, including the next lines of Lima Urban Rail, considering the most important factors in the urban railway sector?_

And there are also several research sub-questions:
1.2 Research Rationale

1. What is the general theoretical content of PPPs in urban rail infrastructure, including a theoretical evaluation framework of the factors for success and failure in PPP urban rail projects?

This question will identify the various definitions of PPP and clarify the various schemes of PPP. Moreover, it will develop the framework of critical factors in PPP in order to assess and explain their success/failure in the urban rail sector. As a result, an evaluation framework will be described as an input for the empirical research.

2. What is the influence of the social, economic, legal, and institutional context in the transport infrastructure in Latin America?

The significance of the question is based on the uniqueness of the context of Latin America, which differs from other cities in Europe or Asia. The context can determine the key understanding of the success or failure of an infrastructure project. As an example, some characteristics that lie inside the context are:

- Some projects have passed through periods of fiscal crisis and through periods of stability and economic accrual.
- Incipient legal framework enacted to rule the granting of concessions in infrastructure projects
- Lack of the definition of responsibilities for public transport in urban areas in general. This is translated into weak public management and inefficient enforcement of the inconsistent institutional framework.
- Obsolete public transport units, with an average age of 19 years for omnibuses
- Lack of political willingness to coordinate on urban transport matters between the relevant authorities of the national government and supervisory companies

3. What lessons can be drawn from experience of PPPs urban rail infrastructure in Latin American cities (Rio de Janeiro, Sao Paulo, and Buenos Aires) based on the evaluation framework?

This question will depict PPP real-life projects in study cases based on the context of other Latin American cities and will give a deep knowledge of the lessons of PPP in other cities besides Lima, through the evaluation of the framework previously found.

4. What lessons can be drawn from experience of PPPs in Line 1 in Lima Urban Rail based on the evaluation framework?

As in the previous questions, the author wants to assess the evaluation framework in the PPP project in Lima and identify the most important factors for success and failure that fit in the actual context of PPP in Lima.

5. Which generic factors can be encountered in PPP projects in Latin America?

This question will analyze the most important factors based on the study of the cases. In this sense, we will notice which factor has a major impact in the outcome of success and provide recommendations to overcome PPP issues.

6. What recommendations can be proposed to adapt a successful PPP for urban rail projects that can be used as the guide in implementation for the future lines in the Lima’s Urban Train and in Latin America in general?

At the final stage, the systematic ex ante analysis and the empirical research based on the information derived from previous questions will be used to draw the final recommendations for a successful PPP in the specific projects of the Lima urban rail and in general Latin projects. That means, it will summarize the suitable circumstances for their implementation according to differences in the states of different metropolis, after taking complex Latin American actual conditions into account.
1.2 Research Rationale

1.2.2 Methodology

According with the plan of the project and the research questions, the methodology will include:

- Desk research: It will be used to search publications of governmental and non-governmental institutions, documents, annual reports and databases. This methodology will give some details in the context of the infrastructure in Peru (See 1.2.4).

- Literature Research: An extensive literature review from the available sources of internet and library was studied in order to learn the current research state on theoretical content about PPP, different schemes and general critical factors in infrastructure. Exploration on the potential problems existing in implementation process of PPPs would be analyzed. Furthermore, an essential element of the cases is to understand under what circumstances and to what extent practices or programs effective in one country or city can have in common with other country or city. Also, the case of studies can determine key elements that prove the successful/failure PPPs in infrastructure in other Latin American countries. The choice of the cases is mainly based on the variety of institutional contexts of PPP in these cities and the availability of information from the cases of studies.

- Interviews: People who were involved in the Lima’s Urban rail project were interviewed, which covered some officials in Municipal of Lima, Ministry of Transportation, Autonomous Authority of the Electric Train (AAEE), Peruvian Agency of Private Investment (Pro Inversion) and related experts. The interviews will explore how the actual process of implementation of Line 1 went, what are the main problems faced by the local governments in implementation, and what the feasible methods to deal with these problems.

1.2.3 Research boundary

The research scope is limited on Latin American projects which have been investigated. The projects include the lines of the Peruvian construction project that have been applied (Line 1 Lima Urban Rail), line 1 and 2 of Metro Rio, line 4 of Sao Paulo Metro and on the subway network of Buenos Aires subte. More concretely, the geographic boundary is identified in Lima, Rio de Janeiro, Sao Paulo and Buenos Aires. Furthermore, the Latin American experience including the study cases of Brazil and Argentina are given as input to drawn lessons. Even though, there are more cases in Latin America such as in Mexico, Chile and Colombia, we believe that these cases are totally representative of our environment. Moreover, the information available for the investigation of PPP projects were also an important factor to choose only four cases.

1.2.4 Data collection

There are three channels to collect data information, the first is the Peruvian National Database (for instance through the National Institute of Statistics and Information, and Ministry of Transport and Communication). The second is the field research in order to obtain high-quality outcomes. Thus we decided to organize face-to-face interviews on Lima local governmental officials to guarantee the precision of the research. Finally, for the study cases, we analyzed the data based on previous Latin American works including scientific papers and books.

1.2.5 Possible Outcomes

The following study is aimed to provide the possible outcomes:

- A set of factors for a successful PPP in infrastructure in Latin America. There are a number of authors inspired in creating the framework for critical factors in PPP but they mainly focus on countries such as UK (Li et al. 2005), East Asia (Qiao et al.) or in Australia (Jeffries et al. 2002) but there is little research on these factors in other countries such as Latin America.

Giuseppe Manrique  August 2010
1.3 Readers’ Guide

- A set of recommendations for the national Peruvian government with respect to PPP in the project Lima Urban Rail and general recommendations for Latin America. These recommendations can be used as a guide for the implementation of the next lines of the Lima Urban Rail.

1.2.6 Research Framework

The research scheme with its corresponding research methodology and possible outcomes are presented in Figure 1.1 below. The research is divided into 3 parts. The first part includes the general knowledge of PPP, and the selection of appropriate criteria for a successful PPP. These involve the understanding of the institutional preconditions and risks in PPP projects and therefore examine the main factors that can hinder or prevent the success of PPP. Moreover, it also involves investigating the context of the Latin American transport system, which includes the different transport modes. This will give a general understanding of the current situation in transport infrastructure. The outcome of this part will be a set of questions used in the interviews and the criteria for compare the cases of studies. The second part will include the empirical research through the interview framework to analyze the Lima Urban Rail and the Latin American cases. The lessons learned derived from the criteria used in the cases is an input for the next part. Thus, the third part involves the direction of the results of the cases and the depict of the critical factors in Latin America. These will serve as an input to draw recommendations and conclusions for Lima Urban Rail project and Latin projects in general.

Figure 1.1: Project Scheme

1.3 Readers’ Guide

The present chapter introduces the motivation and background for this research. Chapter 2 presents the theoretical background along with the conceptual framework and the adopted research methods. It depicts in further detail the different theories of the factors influencing PPP projects. In addition,
it reviews the theoretical basis of the a tentative framework for evaluation in general PPP projects. Moreover, the definition of Success is explained and a list of influencing factors in PPP projects are analyzed through a literature study.

Chapter 3 describes the context of Latin America. This context is important because of its influence in the transport projects. In this case, the description of the context comprised the Economic, Legal, Social and Political variables in four cities in Latin America. Chapter 4 presents the empirical results from the comparative study realized through desk research on Rio de Janeiro, Sao Paulo and Buenos Aires. This includes a description of each of the cases and their respective developmental paths, the main challenges ahead for each of them and a number of lessons learned. Chapter 5 presents the description of the first phase of Lima Metro, and provides some lessons learned in relation to the factors.

Chapter 6 investigates the influence that different elements in the starting positions (e.g. external factors) have on the developmental paths. Therefore the evaluation of the theoretical framework will be contrasted with the cases of studies. As a consequence, a process of evaluation can be carried out in order to indentify the critical factors in PPP projects based on the factors influencing criteria for success. This framework was enhanced by the new findings. Three criteria were confirmed: contract success, procurement success and implementation success. Based on these criteria, some performance indicators were recognized in order to measure these criteria. Thus, the analysis of the factors that influences these criteria is depicted in this chapter. Finally, Chapter 7 elaborates on the implications of the research findings for procurement policy. It gives recommendations for PPP projects in Lima based on the most important factors that influenced the cases in Latin America. It explores in detail recommendations based on the most important factors influencing the criteria of success in PPP projects. To finalize, it provides conclusions and recommendations for future research.
Part II

Theoretical Framework
Chapter 2

Public-Private Partnership

2.1 Introduction

Last decade was marked by the establishment of new forms of private involvement for the provision of services in infrastructure, specifically in transportation. Its origin came from the numerous challenges that countries have to face in addressing poor service delivery and infrastructure backlogs through traditional procurement process. This procurement has long been involved in building roads, hospitals, schools and public buildings, and in providing management and maintenance services (Grimsey and Lewis, 2007). However this type “agreement in one contract” has produced successful outcomes but also various inadequate results. For instance, Flyvbjerg et al. (2003) studied 258 large transport infrastructure projects covering 20 countries in which the majority of them were implemented applying traditional approaches. As a result the actual costs of the rail projects were 45 per cent higher than estimated. Thus, many pitfalls can be encountered on the traditional procurement. Some of them we can specify:

1. **Insufficient Funding**: High cost overruns shared by public sector and contractor until the end of design development (Grimsey and Lewis, 2007). Thus, limited financing channels and difficulties in collecting adequate investments create huge payback pressures on governmental public finance under the traditional schemes.

2. **Unbundling**: Hart (2003) refers as a “conventional provision”, the way the government can contract a private sector to build and operate an asset separately. He argues that the choice depends on the relative importance of different types of error. Framed the issues in terms of transactions costs, with the choice between bundled or unbundled structures whether it is easier to write contracts on service provision than on the quality of the building. According to his research unbundling of construction and operations offers no more incentive to make larger upfront outlays in the construction phase in order to achieve lower life-cycle maintenance costs. The absence of bundling, declines productivity efficiency.

As a consequence, some governments have been adopted a new modality to work in their transportation projects due to the non-sustainability of traditional provision pattern of transport infrastructures. A most recent tendency of these agreements is Public-Private Partnerships (PPP) projects. PPPs have attracted much attention in recent years as possible means to handle large and costly projects, such as the construction of new infrastructure (Alexandersson and Hulten, 2009). Not only have they became a cost-efficient engine for the implementation of public policy, but also have brought significant benefits in terms of development (Osborne, 2000).

Nevertheless, there is no clear view of why PPPs emerged and gained popularity. According to Valila (2005), PPPs are seen as a vehicle for the government to shift investment spending off its balance sheets. Thereby creating room to spend on other priority projects but still getting the infrastructure
supplied. Other view [Guasch 2004] shows that PPPs offer real benefits in terms of productive efficiency at the project level. The overall goal of PPP projects is to find solutions to problems in which the advantages of the private sector are combined with the advantages of the public sector. Thereby, PPP project might generate a combination of allocating efficiency and productive efficiency that is superior to an entirely public or entirely private project.

In the case of Europe, the transportation sector has been particularly influenced by this new tendency in which the deregulation of transportation markets allowed the increased role of private sector ownership and involvement. Leading by United Kingdom in 1992, through its mechanism of Private Finance Initiative (PFI), which introduced new agreements to solve sensitive cases such as health, prison and education [UNISON 2005]. In recent years, PFI, specifically the model DFMO- design, construct, manage and finance- has already become one of primary methods to collect funding for public sectors in the U.K. Other countries such as the Netherlands, reactivated this process through the Knowledge Center, which was set up in 1999. This Center established the framework for discussion on PPP, which created draft policies relating to PPPs in close co-operation with the sector ministries. It also supported concrete PPP projects and offered advice on some of their projects, such as the HSL (the high speed train line between Amsterdam and Belgian border), the A59 road project and the Delfland waste water project. In France, three major road projects associated with PPPs were launched in 2000, named Millau Viaduct and the roads A19 and A28; and in Finland the Helsinki-Lahtti motorway was the first PPP project.

Not only developed countries have used PPPs as a tool to improve infrastructure, but also new transitions economies has adopted these policies. In China, the first stage of development in PPPs was done between the mid 80s and mid 90s when the Shenzhen Shajiao power project was implemented under the cooperation with a Hong Kong company. In South Africa, the use of toll roads to upgrade and maintain the national road systems in 1997 and the building of the first two private prisons in 2000 were also part of the first PPP projects.

In the context of Latin America, PPPs have been used as a result of the disastrous role of the privatization. Thus, the development of Public Private Partnerships (PPP) in Latin America has been adopted gradually during the last ten years. In Brazil, the project of PPP in the State of Minas Gerais for the MG 050 highway sector was the pioneering of the transport sector. In Argentina, the case of a water concession in the province of Salta provides an example of a successful PPP that survived despite its location in a poor province hit by a severe economic crisis. In Peru, the 960 km network of toll roads located in the northern of Peruvian Amazonian region was issued as one of the most promising PPPs project in the entire region.

As described above, some countries have perceived the long-term and sustainable approach to improve social infrastructure, enhancing the value of public and making better use of the taxpayer’s money [Akintoye et al. 2003]. Thus, the transport infrastructure from both developed and transition economies, was also influenced by this pattern. According to the Asian Development Bank [2009], PPPs are attractive because they can achieve through collaboration of the public and private sector what each, acting alone, cannot. Also, by contributing to enhance efficiency in delivering services, the productivity can be improved from the private sector making commercially-based decisions when designing, operating, maintaining, staffing, costing, and delivering investments and services. As a result, profits from operation and returns on investment are higher than under state ownership.

However, the application of PPP is not an easy and simple task. There are many issues and risks that hamper the correct adoption of the service delivery. PPP projects are typically complicated projects. One major reason for this is the fact that the projects generally have to deal with long-term investments that are divided into two phases – the construction phase and the operational/ maintenance phase – being very different in character and implying different demands [Alexandersson and Hulten 2009].

Therefore, the topic of PPP is a challenge subject. Thus, the research in this chapter look into the theoretical knowledge in order to understand the concepts related to PPP. Firstly, the definition in Section 2.2 and the classification of PPPs in Section 2.3 will be provided. Secondly comparison of the different schemes of PPPs will be drawn in Section 2.4. Thirdly, we will define success in PPP projects in Section 2.5 and identify factors related to the criteria for success (Section 2.6). Fourthly, a tentative
framework of factors for PPP projects will be described in Section 2.7. Finally, risk associated with PPPs (Section 2.8) will be studied for the success of PPPs projects in section 2.2. Definitions of Public-Private Partnership

The different definitions of PPPs between different nations and organizations are overwhelming and makes difficult to restrict the concept of PPP in a unique manner. According to UK government approach HM Treasury (HMT, 2000), PPPs are arrangements typified by joint work between the public and private sectors for a long term for mutual benefits, which covers different types of partnerships. Other view such as the Canadian Council for the Public-Private Partnership (CCPPP, 2010) defines PPP as a co-operative venture between the public and the private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards. Both U.K and Canada have a long experience using PPPs and it represents an alternative to innovate new infrastructure.

However, for developing countries, PPPs are adopted gradually because government needs capital to evolve as a derivative of privatization. According to Koven and Strother (2005), PPPs in developing countries are seen as a tool to offer the promise of generating profits for private companies, increasing government revenue, and improving people standard of living. In this context, several factors help account to increase interest and popularity on PPPs. The promise of efficiency savings on strained public resources has certainly struck a positive chord in countries operating under tight budgets (Spackman, 2002). Nevertheless, it is true that both developed and developing countries, PPP is an institutional arrangement which can bring efficient forms of enhancing well-being and promoting growth.

Therefore, PPPs projects are usually defined in two levels. In a wide sense, we agree with the view of the Australian Government (ADG, 2007) that claims PPP as a cooperative venture between the public and private sectors in order to ensure the financing, construction, renovation or management of infrastructure, or a provision of a service. Thus, PPPs include a wide array of models that make increasing use of the expertise or capital of the private sector. In a more narrow sense, the term of PPP in infrastructure is seen as financial models that enable the public sector to make use of private finance capital in long term for mutual benefits where most assets are held by the private sector (Hodge and Greve, 2007). The condition that private sectors should take in charge of financing duty is entitled as an important identification criterion of their own environment (Wettenhall, 2003).

In spite of the non-unique definition of PPP, Peru takes the broad definition: “PPP in transport projects is an agreement between the State and the Private enterprise (which can be composed of companies-consortium) in which the government grants the implementation and operation of certain public infrastructure works or the provision of public services for a specified period” (ProInversion, 2010a). Thus, different models and characteristics can be apply to this wide extend, but there are some distinguished features that apply to PPP projects in infrastructure. In the next lines we will describe the most important characteristics of PPP, benefits and different schemes.

2.2.1 Characteristics of PPP

Public-Private Partnerships (PPPs) have attracted much attention in recent years as possible means to handle large and costly projects. However, their different points of view to embrace the consensus of a tight definition is a challenge task. Despite some differences in the definition of PPP, some fundamental features are presented in the projects of PPP in transportation:

- **PPP involves two or more actors**

  There should be at least one body from the private sector and another from the public sector co-operating with each other towards a common goal. However sometimes each partner in PPP works under a strategic behavior being able to bargain on its own behalf, rather than
referring to authorities (Akintoye et al., 2003). Moreover, each of the parties should be able to negotiate and contract on its behalf (Grimsey and Lewis, 2007). Each of the parties have a role in the agreement. For instance, the public sector in PPP transportation projects has the role of developing and enforcing public policies and establishing regulations for efficient provision of public services while the private sector should provide the design for construction or help to alleviate fiscal pressure. Even though, this example seems quite simple, the reality is that a complex network of actors integrates large projects of infrastructure, such as the concessionaire, consortium, insurance companies, central government, regulatory agencies, among others; which makes a multifaceted and difficult process of decision making.

*Participants in PPP bring something to the partnership:*

Actors in the partnership should share their own experiences or resources for the enhancement of the project. The value of bring real capabilities to the project is given by drawing the best available skills, knowledge and resources from both parties to embody the project. For instance, in infrastructure projects, the private sector brings new technology and innovative knowledge, while the public sector brings public values and helps to the transference of authority (Akintoye et al., 2003).

*PPPs establish an enduring relationship among the actors:*

PPP agreement provides the basic architecture of the contract, which sets out the rules of the game providing the partners with some certainty (Grimsey and Lewis, 2007). Thus, there must be shared values, a common understanding of priorities and policy objectives, and a good measure of trust. PPPs are continuous relationships between the parties with negotiations or renegotiations during the entire process. For instance most of the transport projects in Latin America (concessions) take 30 years of mutual considerations.

*PPP involves cooperation and sharing responsibilities:*

Partnerships also means “work or act together” (Osborne, 2000), thus PPPs suggest ideas of share responsibilities and mutual benefits. In PPPs, responsibilities are located according to the roles that the actors play in the partnership. The implication is that there is a cooperative investment of resources and therefore joint risk-taking, sharing of authority, and benefits for all partners (Lewis, 2001). This mutual responsibilities contrast with relationships between public and private sector in which the public body retains control over policy decisions after getting advice of private entities (Grimsey and Lewis, 2007).

Furthermore, PPP presents numerous advantages for both, public sector and private sector. The alternative to a PPP solution is typically an investment related to public services, the implications for the public partner have been getting much more attention in the literature (Alexandersson and Hulten, 2009). In the next section, we will describe the benefits for both partners and some issues related with PPPs project in infrastructure.

### 2.2.2 Potential benefits on PPP projects

Grimsey and Lewis (2007) agree that PPP constitute more than an outcome-driven contracting system in which the high degree of cooperation costs and risk allocation is present. Thus, many governments might undertake PPP projects in infrastructure projects because of the potential benefits in the area of transportation. Some of these potential benefits applied to the transport sector are:

*More Value for the Money*

Many governments desire to adopt PPP in order to improve Value for Money (VfM). This includes having a better service quality with the same amount of money than a traditional delivery approach to realize maximum value of public goods or service paid by taxpayers. The chances of overspend in terms of time and budget decrease, because private parties are better at project management. It is supposed that private party can work more efficiently than the
2.2 Definitions of Public-Private Partnership

According to Koppenjan (2008), PPP procurement offers potential benefits to reduce costs because they are bound to a faster delivery to the project. PPP projects typically enclose different type of activities such as design, construction, and future service provision which are often bundled in a special purpose vehicle for a project. Thus, better overall solutions are possible to accomplish in which the life cycle costs of the whole project can therefore be reduced (Alexandersson and Hulten 2009). For example, packaging private financing and building can reduce risks of construction delays and project cost overruns.

Moreover, there is a long history of publicly procured contracts being delayed and turning out to be more expensive than budgeted. Transferring these risks to the private sector under a PPP structure and having it bear the cost of design and construction over-runs is one way in which a PPP can potentially add value for money in a public project (Grimsey and Lewis 2005).

Furthermore, the possibility of achieving extra value for money by implementing a PPP can be estimated with analysis to be conducted prior the PPP implementation. One measurement that some governments use to determine whether a PPP approach should be applied instead of public delivery is the Public Sector Comparator (PSC). Despite the fact that PSC method has been heavily criticized, it is still functional to evaluate the better value for money of PPPs. In order to be a valid comparative model of traditional procurement, the PSC calculation must use the same assumptions as the PPP in respect of the following elements (Grimsey and Lewis 2005):

- **Timing**: The PSC assumes the same commencement date and project term as the PPP.
- **Funding**: The PSC assumes the capital funds are available for the up-front investment required to deliver the same output specification as the PPP.
- **Procurement costs**: Only the costs associated with implementing the reference project should be included in the PSC.
- **Output specification and performance standards**: The reference project and PSC must be developed to achieve the same standards as under the PPP.

Moreover, PSCs are generally categorized into four core elements: Raw PSC, transferable risk, retained risk and competitive neutrality (which are seen in the Figure 2.1).

These elements are explained as:

- **Raw Cost**: The raw PSC should provide a base costing including capital and operating costs (direct and indirect costs), and fair estimate of all of the costs of delivering and level of performance
- **Transferable Risk**: Cost of transferable risk to the private sector

Figure 2.1: PSC and Value for Money (Source: Grimsey and Lewis 2005)
2.2 Definitions of Public-Private Partnership

- **Retained Risk**: They are risks that are not transferred under the PPP contract.

- **Competitive neutrality adjustment**: It removes any net competitive advantages that accrue to a government business by virtue of its public ownership.

Given the criteria and the parts of PSC, some authorities that are active in the PPP market have been adopting the concept of a PSC in some form to provide the core test as to whether a PPP achieves a better value for money (Grimsey and Lewis, 2005). This potential benefit is one of the motivations for applying PPPs.

- **Lightening Public Fiscal Pressure**

Another potential benefit of PPP is alleviating financial burdens. It is common that the private sector is responsible for the design, construction and future service production of infrastructure projects. Therefore the government has more chances to administrate project costs, through the period of time.

Under schemes of PPP, public and private sectors can invest together, so private capital can share partial or entire financing burdens, which could save public investment, relieve public financial pressures and achieve infrastructures without growing budget deficits (Xu, 2008).

Also, PPP project can create a high degree of assurance to the public sector that the project goals are reached and line up with the price and subsidies agreed upon at the time of signing the contract. This reduces the possibility for large unexpected cost increases, which facilitates the long-term planning of the public sector (Alexandersson and Hulten, 2009).

- **Encouraging innovation**

Involving private parties, especially for international players, expertise and new knowledge are added value in transportation sector because governments in developing countries are not prepared to create an innovative solution for their new projects. They are in the initial step of the maturity process. Thereby, the process of innovation in PPP can be achieved due to the transfer of responsibilities for some activities to the private sector. This “new” responsibility can enhance the project for developing new techniques in which the government will not intervene heavily. Furthermore, in the procurement process of PPP, bidders can compete on the basis of their ability to develop unique and creative approaches to the delivery of the required project (Birnie, 1999). As a consequence, it can bring benefits also for the users which could enjoy new innovative infrastructure, such as in the case of Irapuato-La Piedad project in Mexico (Box 2.1).

### Box 2.1: Case Irapuato-La Piedad Road - Mexico (Source: www.ifc.org)

The Irapuato-La Piedad project consists of the expansion, upgrading, operation and maintenance of a 74.3 km long road beginning in the junction of the Querétaro-Irapuato highway with the Irapuato-La Piedad road, and ending at km. 77 of the junction with the future bypass of La Piedad de Cabadas in the State of Guanajuato, in the Central part of Mexico. The Project is being developed through a 20-year Concession and a 20-year Services Contract between the Mexican Ministry of Communications and Transportation (SCT) and Concesionaria Irapuato La Piedad, S.A. de C.V. (the Company) on September 12, 2005.

Even though, this project passed through several hurdles (such as social and political instability), it also brings innovative advantages. Some technical advantages were applied in the construction phase which used new road materials to increase the durability, as well as constructing cycle roads and new pedestrian roads.

- **Improving of the service quality**

Public-Private Partnership in developing countries is seen as a mean to mobilise private investments and introduce efficiency in service provision. The proper mix of public and private resources can improve service delivery, bring technical and management expertise, improve performance, and monitor to ensure accountability in delivery of services (IndiaGovernment, 2010).

Moreover, according to the European Commission, the quality of service using a PPP scheme in infrastructure project is usually better than conventional public procurement model. This
statement suggests that PPP projects provide benefit of reducing costs and delivering high quality services. The study of Flyvbjerg et al. (2003) examined 258 projects which used some conventional approaches (non PPP-related projects) to public procurement, found that the cost were underestimated in the majority of the cases.

For the developing world, the private infrastructure is considered crucial for improving access of services in connectivity and affordability to poor urban consumers (See Box 2.2). Increased service provision is one of the main factors proponents for Public-Private Partnerships (Alexandersson and Hulten, 2009).

Box 2.2: Case Water Service Provision in Buenos Aires (Source: Alcazar et al. 2000)
The signing of a concession contract for the Buenos Aires water and sanitation system in December 1992 attracted worldwide attention. Buenos Aires, private participation led to an increase in the population served from 70 percent prior to the partnership to 85 percent; an increase of 1.6 million people, including 800,000 living in poor neighborhoods.

The performance of the water system improved dramatically. The average annual investment of Aguas Argentinas in the first six years of the concession was 2.4 times that of the national utility National Sanitary Work (OSN) in the last decade of its operation, its operating efficiency improved markedly, and product and service quality were much higher. There were also important social and external benefits from the increase in coverage. Some 1.46 million people who now have access to piped water and 583 thousand with access to sewerage will no longer be consuming contaminated well water or polluted groundwater.

- **Improving decision making**

PPP arrangements are complicated and therefore the allocation of costs, benefits and risks should be correctly defined beforehand. As a consequence, the possibilities of additional costs and detriments might decrease (Koppenjan, 2008). For instance, during the preparation study phase, the private parties can be involved and be consulted with the governments upon alternative technical plans for construction. Private participation might improve the decision-making as they usually bring pressures on governments that project scope should be explicitly identified and described in advance. In the specific case of Peru, Proinversion, the entity in charge of the tendering process, asks to all the possible candidates to work together towards a good delimitation of the scope of the project.

### 2.2.3 Potential detriments of PPPs

PPP projects in infrastructure give a wide range of opportunities to both private and public sector in order to improve service delivery. However, there are many disadvantages and risks that if they are not correctly identified, problems and possible failures can appear in the project. In light of this, many authors (Alexandersson and Hulten, 2009; van Herper, 2002) identified some potential detriments of PPPs projects in infrastructure. Among them, we recognize complicated contracts and hold-ups, lack of flexibilities in long-term contracts and higher capital costs:

- **Complicated contracts and hold-ups**

PPP agreements tend to be complicated due to the all the effects and the risks associated within large and long-term infrastructure projects. It may therefore take a long time to negotiate all the contract terms which increases the costs and prolongs the project time in the introductory phase (Valila, 2005). PPPs often present risks such as hold-ups that might become an issue. Some PPPs contract that are delayed can be generated by the opportunist behavior of one the parties (usually the private sector). This actor seeks to gain a contractual advantage by not making a complete disclosure of his knowledge about a project, for instance insisting on renegotiate a project for a specific benefit. This information may only gradually become apparent to the other actors involved in a long-term project as they acquire information about the project’s functioning and effects (Alexandersson and Hulten, 2009).
2.2 Definitions of Public-Private Partnership

- **Reduced flexibility with long-term contracts and lock-ins**
  Many PPP projects assumed long-term commitment from all parties, which may create lock-ins and reduced flexibility. Lock-ins might create cases such as “hostage-taking”. In this case one partner usually has made a sunk investment in a second partner, in which this investment suggests the continuity of the relationship. Notwithstanding, the second partner might use this sunk cost as a hostage to hold up the first partner, ensuring renegotiations in his favor [Williamson, 1983]. Moreover, there are some projects in which the private actor can demand renegotiation – or can dissociate itself from the project by accepting any sunk costs (See Box 2.3), letting the public partner alone in a potentially disadvantageous position (Alexandersson and Hulten, 2009).

**Box 2.3: Case of Water project in Tucuman -Argentina** *(Source: Medalye and Panikkar, 2008)*

In 1995, Aguas del Aconquija, a subsidiary of Vivendi won a 30-year concession to run the water supply system for 1.1 million people in Tucumán. The private partner doubled water tariffs within a few months time in order to meet the aggressive investment requirements specified in the concession. Due to political opposition and change in water quality, 80 percent of residents stopped paying their bills. In October 1998 the government terminated the concession. Vivendi agreed, but quickly filed a US$100 million suit against the government, and joined several other companies who had filed complaints against the local government of Argentina.

- **Higher Capital Costs**
  The research of [van Herper, 2002] shows that Public-Private Partnership will result in higher capital cost because of private borrowing. The additional cost of private finance is in general approximately 1% to 2%. Moreover, the transactional cost in PPP projects seems to be higher for both governments and private parties. In some cases if the cost exceeds the original estimations, the end-users eventually have to pay these costs (See Box 2.4)

**Box 2.4: Case Road Samana, Dominican Republic** *(Source: Guash et al., 2002)*

It was the only country’s toll road construction concession by 2002. The contractor stipulated that 6050 vehicles will use it in the first year of concession and the traffic will increase by 5 percent a year thereafter. If traffic does not reach those levels, the government will have to pay the winning bidder the shortfall in toll revenue. In this case, the government was also responsible for covering any deficit created by external factors and therefore the concession contract allowed the operators to raise the toll fare as they saw fit. At the end of that year, the Dominican taxpayers were adversely affected by the new fares of the toll.

These advantages and disadvantages permit the development of a path in some countries. Some of them have exploited to the full the benefits from PPP. For instance, such as UK, Australia and Ireland has take their own path by improving sophistication in developing infrastructure in PPP and rising PPP activities. In the next lines we will describe this tendency.

2.2.4 Development of PPPs

The consultancy company [Deloitte, 2007], states that the rapid growth of PPPs infrastructure in different countries around the world (a sample of 30 countries that have been working during the last 10 years in PPP infrastructure projects) depends on the vastly different stages of understanding and sophistication in using innovative partnership models. Each country takes its own path in developing infrastructure PPPs, some of them growing and gaining experience as the complexity of partnerships or the involvement in partnerships increase. Thus, many factors play a role in developing sophistication of the capital market and political environment, which we will call later contextual-related factors and the factors that forces the driving formation of partnerships which enable their creation. Nevertheless, three distinct stages of PPP maturity can be observed across the world.

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These three stages represent a tendency for some countries to reach a level of mature in which both the degree of sophistication and activity are high. Moreover, what is true is that not all the countries can follow the same path. In the case of Latin America, only Mexico and Brazil are appointed as the two only countries studied in the curve with a high degree of activity but low degree of sophistication. This implies that these countries in this region are still in the first stage of maturity for PPP projects which will have the opportunity to learn from the trailblazers who have moved to more advanced stages in order to have more experience in the new PPP projects (See figure 2.2).

![Figure 2.2: Mature Curve of PPP projects (Source: Deloitte 2007)](image)

While international networks are being created to draw on the experiences and knowledge of experts in each area of PPP, the level of PPP maturity differs significantly from region to region based on the complexity of projects and the amount of involvement. This complexity of the projects also depends on the type of projects that is carrying on. Some of the projects use only service contract while others use concessions or DFBM contracts. Therefore the degree of sophistication has widely varied. In the next section we will describe the different classifications of PPP.
2.3 Classification on PPP Models

In a PPP project, the different phases in the transport sector can be identified according to the project life cycle. In a more general view, it includes the planning and exploration phase in which the partnership is conceived. The planning phase will pay attention to the structured cooperation, definition of the project scope and refer to risk-sharing by public and private partners. Moreover, it also includes the design phase in which the project plan is modeled and the informational and functional requirements are unified in design specifications. The construction phase contains the construction of facility, but it can extend into part of design phase, and finally the operation and maintenance of the transport system. The figure 2.3 below describes this process (Koppenjan, 2008):

![Figure 2.3: Formation process of PPP (Source: Koppenjan, 2008)](image)

The different phases of a PPP project also include different combination of roles and responsibilities between the public and private partner, as well as, finance methods. PPPs usually originate from the initiatives of a service provider, purchaser or regulator. Depending on the degree of government control and private scale, private involvement might include provision of service but also outright ownership of facilities (Akintoye et al., 2003). Therefore, the next lines will describe an attempt to summarize the most important models. The classification given is in accordance with the sorting standards of Word Bank which include the most used models of PPP in infrastructure in Latin America. These embrace: Service contract (Sec 2.3.1), Leasing (Sec 2.3.2), Joint Ventures (Sec 2.3.3), Build-Operate-Transfer (Sec 2.3.4), Design-Build-Finance-Maintain (Sec 2.3.5) and divestiture (Sec 2.3.6).

2.3.1 Service and Management Contract

According to Gidman et al. (1995), service and managements contracts represent the simplest form of partnership. In this form of contract the maintenance of a project is included in a common short-term agreement. The service/management contract is an agreement between government and private sector in which the latter takes responsibilities of operation and/or maintenance of the infrastructure. It is customary to use this type of contract for existing projects or those freshly completed. It thus allows the government to benefit from the particular technical expertise of the private operator (or the maintainer if the contract is management contract), managerial techniques and potential cost savings. And the private actors are paid on a fixed fee basis or an incentive basis if it receives premiums for meeting better service levels and targets (Mu, 2008). Figure 2.4 shows the scheme of this type of contract. Moreover, some form of this agreement is used if the private sector will provide services directly to users of the infrastructure facility. The main purpose of such licensing is to ensure the supply of the relevant service at the desired level of quantity and quality.
Moreover, in management contracts, private sector can bring skills into service design and delivery, operational control, labour management and equipment procurement. However, the public sector retains the ownership of facility and equipment (IndiaGovernment [2010]). The simplest management contract is when government pays fixed expense for management work taken by private sectors. In addition, it is possible to add more complexity identifying certain achievement objectives and basic reward in advance. If the operational efficiency is enhanced, then some incentive rewards will be given to private sectors (Ross [2003]). Furthermore, in Latin America, this contract is most often used to upgrade some roads, ports or other infrastructure projects for a short period of time while government maintains financial responsibility (through public funds or international banks) and the ownership of the asset (Gidman et al. [1995]). In light of this, Brazil has signed some service contracts in order to provide better maintenance in one of its biggest projects (See Box 2.5).

**Box 2.5 : Case Service Contract in Brazil (Source: www.skanska.com)**

Skanska has received a maintenance and service contract for oil, alcohol and chemical derivatives storage tanks in Brazil. The contract is valued US 44 million. The customer is Transpetro (Petrobras Transportes), a subsidiary of Petrobras, the state-owned Brazilian oil company that is one of Skanska’s repeat customers in the energy sector in Latin America.

The two-year contract includes both inspection and implementation of necessary service and maintenance measures for a large number of storage tanks at seven different oil and gas terminals in Sao Paulo and Minas Gerais. Minas Gerais continues to produce more than half of Brazil’s mineral wealth. Apart from construction services for the international energy industry, operation and maintenance of oil and gas facilities are Skanska Latin America’s core business.

### 2.3.2 Leasing/Affermage

The arrangements in an affermage and a lease are very similar. The difference between them is technical. In the lease agreement, the operator retains revenue and makes a fee payment to the contracting authority while an affermage, the operator and the contracting authority share the revenue. In this research, due to the similarity of characteristics between both type of agreements, we will be referred as similar terms.

A leasing arrangement involves a situation where the private sector uses public facilities, and pays a rental fee to provide a service (Akintoye et al. [2003]). It can be combined with concessions contracts (BOT) such as the Build-Lease-Operate-Transfer (BLOT), in which a private entity receives a franchise to finance, design, build and operate a leased facility (and to charge user fees) for the leasing period, against payment of a rent. It includes a scheme in which government invests and regulates, an asset...
2.3 Classification on PPP Models

company that does the planning and the lessee who performs the tasks of the affermage (See figure 2.5)

Figure 2.5: Sample scheme of Leasing/ Affermage agreements (Source Skilling and Boot, 2009)

Leasing usually represents a medium-term agreement (from 5 to 10 years) by which the private partner assumes the financial risk during the period that manages the operation. Although the public sector is responsible for capital investment, the contractor must pay the capital labor and other costs during the period of the contract. Payment is usually based on rate established on the contract awarded by tender public, ie a percentage of the rate charged by the service (water rates), and the rest is paid to public sector for leasing. This mechanism can be used to promote competition in the market where there is a natural monopoly. In Latin America, its use is still incipient but few cases achieved overall good performance (See Box 2.6)

Box 2.6: Case Leasing in Cartagena-Colombia (Source: PPIAF- World Bank)
The affermage/leasing in Cartagena (1995-2005) was one of the first PPP in the water sector to be awarded in Latin America. The company in Cartagena, Colombia, operates under a lease contract with the municipal government. They provide a good illustration of the overall operational efficiency gains that a successful private operator can achieve. Both private operators were able to reduce their working ratio through measures to reduce costs through higher productivity, even as the tariff was reduced in constant terms. Several factors influencing the working ratio are under the private operator's control. But the tariff level is controlled by the public utility owner or the government, and it can account for considerable variations. Tariffs moved toward full cost recovery, though this did not systematically translate into increases.

2.3.3 Joint venture

Join venture takes place when the private and public sectors jointly finance, own and operate a facility (Grimsey and Lewis, 2007). The joint ventures provide a vehicle for “true” Public-Private Partnership, in which governments, business and others can pool their resources generating a shared return (Akintoye et al., 2003). The public and private sector partners can either form a new company or assume a joint ownership through a SPV (Special-Purpose-Vehicle), a combined public-private-law body whose shares entirely belong to the government and can be financed with both public and private funds, will be established in order to realize the public projects (Koppenjan, 2008). Moreover, in a joint venture of a duration of 15 to 30 years, the asset ownership is on hands of the public sector while the operation and management are driven by the SPV (See Figure 2.6)
2.3 Classification on PPP Models

The cooperation between public and private parties starts with the confirmation of the feasibility study. By right of SPV, the cooperation will run through the total progress and both sides are responsible during the entire life-cycle of the project. In the early phase, both parties will participate in confirmation, technical design and feasibility study phases, evaluate and confirm the possibility of financing, and design rational risk-share framework after negotiations (Xu, 2008).

2.3.4 Build-Operate-Transfer (BOT)

These contracts occur when the private sector takes primary responsibility for building and operating the project. The public sector owns and finances through national or local government equity or debt. Control and formal ownership of the project is then transferred back to the public sector (Grimsey and Lewis, 2007). In Latin America BOT projects, private sector usually works together with local partners, make equity investments (typically 10-30 percent of the total project cost). Then the private project company will build the project, operating long enough to pay back the project debt and equity investment, and then transfer it to the host government (See figure 2.7). At the end of concession period, the facility will be turned over to the government without any reimbursement. Appendix A shows the actual concession programs of BOT in Peru.
of BOT in Latin America is described in Box 2.7. Also, according to Akintoye et al. (2003), the use of BOT can be also applied to small contractors and small projects.

Box 2.7: Example of BOT Road Concession in Chile (Source: http://www.cinver.cl/)

In the early 1990s, the government of Chile sought for private capital to support needed investments in a deteriorated and antiquated infrastructure system. To this end, it designed a concessions program to encompass the construction, operation, and transfer of transportation infrastructure, including roads, ports, and airports. Although initially stimulated by budgetary constraints, the program doubled as a mechanism to increase economic efficiencies by passing responsibility for the construction and maintenance of infrastructure to the private sector.

Under the BOT concessions system, over 1,500 km. of the Panamerican Highway - the backbone of Chile’s road system - have been upgraded, bringing them up to high international standards. These contracts represented a total investment of more than US$3.7 billion. The results of this program which was finished on time and within budget, the Panamerican Highway is now a four-lane highway from La Serena in the north (Coquimbo Region) to Puerto Montt (Los Lagos Region) in the south. New high-speed highways also connect Santiago to nearby cities, including the main ports and beach resorts.

2.3.5 Design-Build-Finance-Maintenance (DBFM)

Under this model, the private sector designs, builds, finances, operates and maintains a new facility under a long-term lease. At the end of the lease term, the facility is transferred to the public sector. In addition to be used for new projects, PPPs can also be used for existing services and facilities. The difference with other models is that private financing is involved. Therefore it is necessary that the private party worked together from the project conception and the design phase due to the high financial risks that are involved. The figure 2.8 shows the scheme of DBFM in a railway project. This method has been widely used in UK and nowadays is one of the preference forms of agreements in transportation in Brazil.

2.3.6 Partial Divestiture / Privatization

Privatization involves full or partial sale of a stated-owned asset either by auction, public stock offering, private negotiation, or outright grant to the private organization that assumes operating responsibilities. It can be divided into two different types: complete divestiture and partial divestiture (Akintoye et al., 2003). In Latin America, the partial divestiture was the most used form of agreement in
the 90s in some countries such as Peru and Argentina (See Box 2.8). Complete divestiture means that the government sells a certain public project to private sectors who answer for it completely, actually resembling the complete privatization. However, as to the partial divestiture, the government still owns partial property of the public assets, but other responsibilities and related risks on financing, construction and operation all belong to private sectors (Li et al., 2005). It is common to use the partial privatization for transport projects. The lack of government disengagement in the full privatization and the regulation imposed to the private partner; are two distinctive factors that differ from PPPs. Therefore, in this research we will only include the partial privatization as part of Public-Private Partnership.

Box 2.8: Example of Disvestiture Case Entel Peru (Source Torero et al., 2001)

In 1994, the Peruvian government privatized the companies Compañía Peruana de Teléfonos S.A (CPT) and the Empresa Nacional de Telecomunicaciones (ENTEL). CPT provided local telephony service in Metropolitan Lima, while ENTEL provided the service to the rest of the country and the national and international long-distance services. The government had organized the sector in this way through the 1970 Telecommunications Act, which considered the sector strategic and therefore kept domestic and foreign private business from participating in it. The privatization process brought one main disadvantage and one important advantage. First, it established a tariff re-balancing period, in order to gradually reduce the existing tariff distortions. The tariff re-balancing considerably increased monthly service charges, while reducing the cost of local calls and national and international long-distance calls which affected directly consumers through prices and access to telephone. However, at the same time the Peruvian Telecommunication sector has expanded its network in approximately 167% since 1993. Even more, the telephone density per 100 habitants rise up to 7.8 from a level of 2.9 in the earlier nineties. In terms of coverage, quality and technology, there has been a drastic improvement.

2.4 Comparison of Models

Nowadays, PPP models come in different types and forms, however in the previous subsection, the author summarized six of the most important models that are most used in Latin America. These models combine the roles of the public and private sector in different degrees. Figure 2.9 reveals the involvement degree of both parties.

Figure 2.9: PPP Models (Adapted from CCPPP 2010 and Akintoye et al. 2003)

But not all models are perfect. Each of the options has its own advantages and disadvantages with
2.4 Comparison of Models

respect to their application fields. In the next lines, we will present the main advantages and limitations of each model.

- **Service/Management Contract**

  With a service contract, the public sector can be benefited from the technological and managerial issues and thus saving costs. This mean to gain access to technologies or specialized skills beyond current organizational capabilities (Xu, 2008). Moreover, this kind of project is often used to improve an existing project (not a greenfield project).

  However, service/management contracts are unsuitable if the main objective is aimed to attract capital investment. These contracts might enhance efficiency and release some revenue for other purposes. However, the contractor is not under an obligation to provide financing. Therefore the effectiveness of the contractor may, in fact, be implicated if other sources of financing (from the public sector) do not materialize (WorldBank, 2008).

- **Leasing**

  The main advantage of the government is that commercial risks are shared with the private sector while for the private partner the major advantage is the incentive to achieve operational efficiency. Private party makes profits only if it manages to reduce operating costs while meeting the designated service level. Nevertheless, the disadvantage that the public party bears is when the risks related to network expansion (construction), capital improvements and financing are high.

- **Joint Venture**

  The joint venture makes possible that some risks and project management responsibilities can be transferred to private contractors, leaving the government with fewer obligations on their side. However, transaction costs are high under Joint-Ventures scheme because of the actors involved in the project. Moreover, there is an increase in the complexity of the management of the project and sometimes the monitoring turns difficult if the responsibilities are not correctly delegated.

- **Build-Operate-Transfer**

  BOT project integrates the process of design, construction and maintenance, which combines responsibilities under a single private actor. It can foster greater efficiency gains and removes important maintenance issues from the public budget. This integrated scheme obliges the private operator to take into account the cost of operating the asset during the design and operation phase and therefore stimulates a better planning and management of the service itself. Here again, the public party bears the financial risk; however, unlike what occurs in other types of PPP, the public party relinquishes its control on important phases of the life-cycle of the asset (Renda and Schrefer, 2005). Furthermore, another disadvantage is that this scheme can include conflicts between design and construction and lack of maintenance during the contract period.

- **Design-Build-Finance-Maintain**

  The DBFM agreement was adopted by some governments because the risk of finance is transferred to the private party. The public budget can be used for some other priorities whereas the infrastructure project is on construction. Moreover, these contracts stimulate the private companies to think about maintenance costs while they are still designing the project which can bring in a good planning costs. However, due to the high risk of finance, some parties can not manage the process to find strong financial packages. Many medium and smaller contractors cannot qualify for the best financial packages while often very large or global ones find the best financial rates (Mu, 2008).

- **Divestiture**

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The main advantages of the privatization includes incentive for private parties to safeguard their interests, achieve higher microeconomic efficiency and foster economic growth, as well as to reduce public sector borrowing requirements through the elimination of unnecessary subsidies (Sheshinski and Lopez-Calva, 2003). However, it can also induce the monopoly behaviors in which the private partners can take advantage in tariffs or other prices.

2.5 Defining success in PPP

PPPs can provide a mechanism for exploiting the comparative advantages of public and private sectors in mutually supportive ways, but at the same time several issues and risks are angles that deserve careful consideration while using PPP projects in infrastructure. These constraints can lead some governments to renegotiate some of their projects and even more, some PPP projects have to be cancelled in the current arena. In Latin America by the early 2000s, a growing disenchantment with private sector involvement in general and concessions in particular has forced governments to slow down or stop the program and reform process (Guash et al., 2002). Those concerns have grown over the years and have threatened the future of the reform program in some developing countries. Serious doubts have arisen about its efficacy, and efficiency over the process of contract, the poor service delivery and incidents of opportunistic renegotiation have come to the fore (Guasch, 2004). Reasons why some PPP projects had to be cancelled embrace: 1) when the private sector physically abandoned the project, or 2) when the private sector ceased to provide services to public users or 3) when the private sector stopped the construction of the project for around 20 percent or more of the project’s expected life (project’s duration) following the revocation of a license (WorldBank, 2008).

The definition of success in PPP is highly important. However, this explanation means different things to different people, and so the point of view of the different stakeholders for the definition of success may differ. Generally speaking, according to Pinto and Jr (1990), the success of the project will be identified by three aspects of project performance as benchmarks for measuring the success or failure of a project: the implementation process, the perceived value of the project, and client satisfaction with the result. Recent research (Baccarini, 1999) has suggested new perspectives using a hierarchy of project objectives which include goal, purpose, outputs and inputs, and has suggested distinguishing between project success and product success. He contended that the project management team is responsible for producing the project output, but the determination of project purpose is beyond their responsibilities. Needless to say, according to this framework, project success is detached from expected business results. Other research such as Shenhar et al. (2001), says that defining and assessing project success is a strategic management concept in a multidimensions, which should help align project efforts with the short and long term goals of the organization. Nevertheless, in a more narrow vision of success, the WorldBank (2003) in the Guidelines for Success in PPP, the success implementation depends on recognition of partner’s objectives, in which PPPs require careful consideration of control and management systems through project agreements. Partnerships require the will of all parties involved to work together. They also rely on clear and carefully crafted agreements defining the rights and obligations of the parties involved and establish a framework for responding to new situations as they arise. Finally, Allport (2008) and KPMG (2010) defined success in transport sector derived from 22 cases of study as three aspects, which include the financial success, policy success and durability success.

As a consequence, based on the previous literature and on the potential benefits that PPP can bring to infrastructure projects, firstly the author will define success of PPP in transport sector from the viewpoint of the public authorities. The role of the government in PPP plays a valuable job in the project, for instance in providing guarantees for some macro level risk or in making decision for improving the service for the citizens. Moreover, this study is aimed to give recommendations to the public sector therefore the need to know the meaning of success in PPP projects. Furthermore, we do not consider whether the project was the best that could have been identified, but solely whether it is considered successful against its objectives, assessed from both objective evidence and perceptions (Allport, 2008). Thus, the perceived project success in transport sector will be seen as a multidimensional concept, because it will not depend on only factor. There are many dimensions.

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that make sense for transport projects which will lead to a more accurate assessment. [KPMG, 2010] defined three types of success: financial success, named like this in order to evaluate the economic viability at the preparation phase of the project. The second criterion relates to the procurement success which analyzes the success through the implementation phase. The third criterion refers to the durability success which evaluates the project through the post-implementation phase. Thus in order to match these three aspects with the different phases of the project, we will rename these terms and define success according to Contract Success, Implementation Success and Post-Implementation Success. In our research, success will embrace these dimensions:

![Figure 2.10: Criteria for Success in Public Private Partnership]

### 2.5.1 Contract Success:

Before implementing a project, the planning should be able to demonstrate that the possible cost implemented in the procurement process should be lower than that implemented by the same service provided by conventional public delivery approach. This is a proper allowance for the quality of services, which is known as value-for-money ([Grimsey and Lewis, 2005]). This criterion include the proper economic appraisal techniques, which involve the proper allocation of risk where the expected value for money is maximized in the preparation phase. Furthermore the correct planning is enhanced by the accurate allocation of risks, because the financial outcome might be reduced. If risks that cannot be best managed by the private partner, value for money will decline.

Moreover, the contract success of PPP projects in transportation is also closely related to the attraction of private investment to some projects. The funds of government are limited to new infrastructure, thus they should make efforts to attract private money in order to establish their investments ([Koppenjan, 2008]). Therefore the importance to give incentives for the private partners to get involved in the project is high.

### 2.5.2 Implementation Success:

The satisfaction of stated objectives on time and demand of the project within a fair conditions, should be met to complete contracts successfully. Success in this dimension may indicate a well-managed and efficient project in the transport sector in the different phases of the project (design, build, operate, etc) which might lead to improve service delivery.

This improvement of service delivery is a characteristic of a procurement success which can be evaluated immediately after the procurement process. The level of service quality to be offered to the public should increase. In the procurement both parties may also carry special expertise and technology that will result in improving service quality. The use of competition in operations may create even more incentives to improve quality and also encourage innovation ([Alexandersson and Hulten, 2009]).

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In addition, the problems that affect PPP procurement arose when the malfunction of some decisions or bad actions were taken in the design phase. The ambiguity in the design of the project can generate high tariff for the users or can produce the emergence of future conflicts.

### 2.5.3 Post-Implementation Success:

This additionally identifies the durability of the overall approach. It concerns the ability of the project or business to maintain its service delivery over the medium and long-term - such that policy success is maintained (Allport 2008). It also relates to the suitability of the project development process as a model to be followed on future occasions. Some projects were carried by good planning and well-defined scope and therefore provide a reliable environment to apply for future project (this happened to the enterprise Odebrecht in Peru). Moreover, the post-implementation success in infrastructure project also implies the new development of a new industry. For instance, UK (HMT 2000), not only works to support the delivery of major infrastructure projects and programmes but also to exploit this market for future projects.

In this context, the political and social context play also a role for the future. If the political environment is favorable, the more investors are willing to participate in future projects and thus assure the presence of more private investment in infrastructure projects (See Box 2.9).

**Box 2.9: Case Odebrecht Peru (Source: www.odebrecht.com.pe)**

Odebrecht has completed the US$ 630 millions financing the IIRSA Sur toll road in Peru. This deal follows closely on the heels of an early financing for the IIRSA Norte concession closed in 2006. The good results of first project IIRSA Norte, makes Odebrecht to have a good position in the Peruvian Market. Moreover, the process in the IIRSA Norte included a good transfer technology at the last stage of the project. In this new project, Odebrecht will fund the construction, rehabilitation, maintenance and operation of the 700 km second and third sections of a 2500 km toll road network in Southern Peru.

These three definitions of success represent the criteria (See figure 2.10) for adopt a definition of success. This will help us to define whether a project can be success. However, the origin of these criteria is based on the factors that influence them to makes successful PPP projects. Therefore, the aim of the project is to analyze these factors and their relation with these outcomes for defining success. In the next section we will define the factors that influence these criteria in PPP projects.

### 2.6 Factors for PPP

In order to deepen the factors that influence success in PPP, we should look at the wide range of research conducted in the last years. Some previous research identified, through questionnaire surveys, interviews, and case studies, the factors that contribute to the successful delivery of PPP projects. For instance Li et al. (2005) identified 19 factors for PPP projects in the United Kingdom construction industry which were specified in different levels: 1) appropriate risk allocation; 2) transparency in the procurement process; 3) good governance; 4) political support; 5) sound economic policy; and 6) well-organized public agency. Qiao et al. (2001) characterizes 6 critical factors for winning PPP contract, including 1) entrepreneurship, 2) picking the right project, 3) a strong stakeholder teams, 4) an imaginative technical solution, 5) a competitive financial proposal, 6) inclusion of special features in the bid. Zhang (2005) identified and analyzed 47 critical factors and classified them into five categories, 1) favorable investment environment 2) economic viability, 3) reliable concessionaire consortium with strong technical strength, 4) sound financial package, and 5) appropriate risk allocation via reliable contractual arrangement. Jefferies et al. (2002) give 15 factors in the Australian environment which include 1) environmental impact, 2) approval process efficiency, 3) technological innovation, 4) developed legal and 5) economic framework, 6) political stability and support, 7) selecting the right project,
8) strategic alliances, 9) trust, 10) community support, 11) feasibility study, 12) transfer technology, 13) financial capability, 14) complimentary skills, and 15) consortium structure. Tam (1999) presents the successful conditions for projects in Asia after empirical studies from various projects in Hong Kong and Thailand. These factors are 1) viable projects, 2) flexible toll fee adjustment, 3) qualified consortium, 4) technical competent, 5) equitable and experienced government authority.

The different points of view about important factors for PPP are widely, and some authors try to create the framework to assess PPP projects in general while others pay attentions to specific factors for PPP in certain geographical areas such as China, UK, Australia, Hong Kong, Thailand. However, they will serve as input for establishing the framework of critical factors of PPP projects. These factors are varied from countries to countries; it is reasonable because the factors for PPP project success in this country cannot be appropriately applied for others due to its potential differences. However, there are a number of critically generic factors agreed among various researchers and some of them can be applied to developing countries in the transport sector.

Furthermore, different authors use distinctive methodologies to make explicit the key areas that are necessary for the success. In our study, these factors and their sub-factors noted above have been distilled in two big groups. The first two factors are related with the context. By context, we mean the project environment that surrounds the transport projects. These factors are related with the good governance and are identified as the economic, political, social and legal environment. These Context-Related Factors are not inherent of the transport projects, thus they can also be of great importance in other infrastructure projects.

The other groups of factors are called the Intrinsic Factors, which are factors related within the project itself in Public-Private Partnership in transportation. Even though, some factors might be applied to other sectors, these factors are dependent to the different phases of PPP project. They are essential for the good implementation of the project and are closely related with the characteristics of the project.

In light of this, the high value for the procurement process influences the successful of the agreement or the contract. For instance if there is no good transfer or if there is a bad control in the construction process; the agreement will not be completed on time. The same occurs if there is an incorrect transport and strategic planning; the agreement will not be finish on the respective term. In the case of the external factors, shocks in the macro-economic sector or any political instability will not permit the correct agreement for both parties. Thus, context-related factors and intrinsic factors affect the agreement completion.

Moreover, in order to achieve value for money objectives in public project and service delivery development, the public and private sector partners need to reach a mutually acceptable risk allocation scheme before the contract is awarded (Bing et al., 2005). For instance, if the risk is allocated to the partner that best manage them, the higher the quality of services, they will obtain. Furthermore, Ma (2008) emphasizes that the strategic behavior emerges from information asymmetry between private and public players, and thus this lack of communication can bring a decrease in the value for money for transport project because of the refusal to behave in line with the interests of the public client.

The durability success or the future ongoing is also influenced by both kinds of factors. The long-term demand for the project should be assured in order to enhance economical progress for the project. If a PPP project works under a significant economic value, it can be used later as a model for other projects. Government stability and public acceptance is also a key for the future ongoing. The future of the PPP project in transport should be work closely with the public policies and the public affordability to this new service.

As we explained above, the intrinsic and the context-related factors are linked with the criteria for success. Therefore, we can state that this factors are part of the framework for the Critical Success Factors for Public Private Partnership projects. According to the theory, we will use our criteria in order to know which factors can be best influence them in the transport sector. These factors are explained in the next few lines:
2.6 Factors for PPP

2.6.1 Institutional/Legal Framework

The establishment of a transparent regulatory framework is necessary for the private sector participation in a PPP (Jefferies et al., 2002). From a public sector perspective, such regulatory framework (tendering and administration framework included) is crucial because PPPs generally need a direct organizational and control relationship between public and private to ensure the partnership operates effectively and efficiently in optimizing the resources available to them in line with the broader policy objective. The legal framework establishes the limits within government units. For example, the early PPP acts were enabled with specific conditions including for example: regulating project ownership, authorizing the use of specific PPP mode e.g., BOT and BTO, authorizing the use of tolls (Aziz et al., 2007). Moreover, good transport projects need the right institutional, professional and political backing to make them work. This requires strong political control, clear regulations, ability to procure strong advice, the authority to take decisions, effective stakeholder engagement, leadership and institutional effectiveness during implementation and operation (Allport, 2008). In the context of developing countries, this factor is special because most of the projects failed due to the lack of the institutional framework and regulatory institutions (Guasch, 2004). Some sub-factors can better explain the definition of this sector:

- **Favorable legal framework**: It is important to place the regulation based on legal framework. The legal framework refers to the laws and legislation regarding PPP projects. Moreover, the highest impediment to private financing for transport infrastructure in developing countries is a clear legal system to enhance financial viability for PPP projects. Moreover, the government needs to have master plans for sector-based and territory-based infrastructure development and determine fields for PPP priority. A favorable legal environment is related with a robust system of PPP laws which can provide the necessary guarantees for the proper relation between the private and public sector.

- **Strong Institutional Framework**: In many cases, the regulatory institutions should be placed closely with all the phases of the PPP agreement. In Latin America, according to study of Guash et al. (2002), 72% of these cases in the projects, contracts were renegotiated as actual regulatory behavior diverged from the conceptual framework in the agreement. Moreover, a strong institutional framework is related to the capacity of the agencies (especially the regulatory agencies) to provide with the necessary instruments to reduce different kind of risks as well as to have competent agencies and adequate concession design in order to avoid political interference.

2.6.2 Political and Socio-Economic Environment

A stable environment is a necessary factor in transport because any economic shock can created an unexpected situation for the government, which will not let it to comply with its contractual duties. These shocks may increase the difficulty in implementing the project and accelerating the failure of the project, because they may cause contraction of real income and thus reduction in demands for infrastructure services. Therefore the resulted demand reduction destroys the initial estimate on service demand (Mu, 2008). Moreover, changes of political requirements and changes on regulatory framework and complementary investment for constructor will seriously threaten the implementation of transport projects (See Box 2.10).

**Box 2.10: Minas Gerais Brazil** (Source: Guash et al., 2002)

The city mayor of Minas Gerais canceled a contract that gave operating control of electricity distribution companies to new minority foreign owners who had purchased 33 percent of the distribution companies share. Similarities, other city mayors in other Brazilian municipalities have contested the concession terms of water. Such interference did not increase possibility for the creation of regulatory framework of agencies.

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2.6 Factors for PPP

The political stability of a country permits the gradual increase of the involvement of private investment and thus governments from the transition economies are looking for a good environment in which the private participation can feel comfortable in their duties. In this sector we identify the following sub-factors:

- **Stable Political System**: In PPP projects, the stable political environment is highly important to smooth operation on transportation projects. An unstable political system cannot provide the necessary for the investors to put “all their chips” in the game and even discourage them to expend effort for future benefits.

- **Affordability**: A weak social support from the users of the transportation projects, can bring pressures from the government to stop already signed contracts. The social acceptance is valuable to continue the well-being of a project. Moreover, the public affordability and willingness to pay from the users’ point of view should be taken into account when the financial resources are scarred.

- **Favorable economic conditions**: Due to the financial crisis which has turned into an economic crisis, the demand for vital road freight transport services in some Latin American countries have slowed down dramatically. Therefore the favorable economic conditions should be worked closely with the public policies and good governance of the country.

2.6.3 Risk Management

PPP transactions benefit from strong representation of all parties involved. Identification and allocation of risks are an important issue in contractual arrangement, which dictates both the type and content of the contract. Moreover, various risks can be effectively managed by allocating them to parties best able to control them through appropriate contractual arrangements, including a concession agreement between the government and the concessionaire, and shareholder agreement, design and build contract, loan agreement, insurance agreement, supply agreement, operation agreement (Zhang, 2005). Risk management was explained in more detail in section 2.8.2 and as a consequence this sub-factors are identified:

- **Appropriate risk allocation**: Risk allocation can be described as appropriate when both of the parties can best manage the allocated risks by bringing high benefits. First, both parties should be aware of the risks and provide attention to them. The necessity of allocate correctly the risk in transport projects would help governments to achieve cost efficiency (See Box 2.11).

- **Type of agreements in the contract**: Another key factor in implementing projects on PPP basis is to adopt transparent procurement methods. The appropriate contractual arrangements and the collaboration between the public and private sector to provide significant public infrastructure premised on the allocation of risk.

- **Guarantees from the government**: In some transport projects is necessary that the government participation work in the form of project guarantees in order to reduce the risk of the private investor. This method has been required in Latin America as a demand from the private sector, to secure their profits.

**Box 2.11: Costanera Norte, Chile** *(Source: Brandao and Saraiva, 2007)*

The presence of the government as mitigatory entity of risk may be a necessary condition since the control of many of the variables that affect important aspects of the project are under its responsibility, such as interest rates, regulation and others, because market risk is such that the project is not feasible from the perspective of the private investor. An example was the bid of the Costanera Norte toll road in Chile in 1998, a urban highway of 30 km connecting the city of Santiago to the airport, in which the government initially refused to offer guarantees deemed necessary by the private investors. Consequently, no bids were forwarded. Only after government supports were included was the road was successfully bid.
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2.6.4 Project planning

Project development requires planning and forecasts as well as to establish clear strategies for the development of a particular city or region. Such planning needs to confront considerable uncertainty, if sound decisions are to be made. Project development also needs to consider the role of the private sector. The benefits of private sector involvement may include reality checking the implementability and bankability of projects (in effect plugging major weaknesses of public sector planning), and facilitating early implementation of projects justified as beneficial and financial in the long term but unfeasible without up-front financing [Allport 2008]. In transport projects, the project feasibility should be carefully revised in order to satisfy the relevant requirements. In this section this sub-factors are comprised in:

- **Strong strategic planning and analysis**: According to [WorldBank 2003], most PPP failures can be attributed to inadequate or non-existent feasibility studies, including unrealistic demand forecasts and undefined public contribution of funds. The strategic planning should involve both parties and their experiences are a fundamental factor in the strategic decisions. Moreover, strategic planning makes possible the creation of public debates, policy analysis of the alternatives, the conflicts of interest and opinions that, otherwise, would tend to be ignored and would appear during later implementation of the project, causing delays or even halt the project.

- **Good infrastructure and transport planning**: Transport planning is also important to build a correct framework and do not overrun costs later in the project. Transportation plan should be based on the latest available estimates on the demand of population, land use and development, travel, employment, congestion, etc.

- **Transparent and Competitive Tendering Process**: In the Pre-Qualification phase, in order to choose a contractor, there should be a non-restricted competitive tendering process. Transparency is an important requirement to have good governance in the public sector management. This can facilitate information flowing to the public and thus diminish the probability of corruption that can enfeeble the good results of the partnership.

2.6.5 Economic viability

Economic viability is closely related to the financial success and is critical to any kind of project. PPP projects are characterized by high capital outlay, long lead time, and long operation period with a broad range of risks and uncertainties. The uncertainties bring risk into capital investment evaluation decisions and, consequently, new methods have been developed. Public affordability is also a key test for economic viability. The scope of long-term service charges must be within public budget constraints [Zhang 2005].

- **Decision to do the project**: It is very important that parties evaluate the project from different angles in order to provide positive outcomes. The societal level and the public resistance before the implementation of the project can bring serious consequences later on if the project is realized.

- **Financial capability**: This is critical to the success of the project regarding investors and the resources available. The need exists also for the public party to be able to account for contingencies and the adoption of financial policies and guarantees to provide private parties enough confidence to maintain a good environment.

- **Sufficient profitability of the project on return investments**: Private parties are driven by the highest profits for their investments. Thus, companies also exploit quantitative methods to know their expected return in public-private partnerships. However, not all PPP transport projects are profitable, thus government should be prepare to give some incentives to private partners in order to realize the project.
2.6 Factors for PPP

- **Long-term demand for the service offered by the project:** It is common that before a project is conceived, the demand for use the service must have secured; otherwise the project can not be profitable. Therefore, the government should provide some mechanism to secure the long-term demand such as guarantee fees or marketing options to incentive the citizens to use the new transportation project.

2.6.6 Trust

Trust is a disposition and attitude concerning the willingness to rely on the actions or behaviors of another party, under the circumstance of contractual and social obligations with the potential to collaboration (Mu, 2008). Trust in PPPs can be weaken by both public sector and private sector. In the public sector, this behavior may be induced by government officials, including power abuse, public resources misuse purposively, corruption, and collusion between government officials. In the private sector, strategic behavior includes estimating project costs on a biased basis, lower the level of service quality stealthily, looking for supplementary investments to the government, pseudo announcing bankruptcy and withdrawing from the investment. However, this is not the only sub-factors included in this sector, among other we can describe:

- **Project management style:** A good direction of the project should reinforce the trust and collaboration of both parties by providing effective communication in order to achieve joint objectives. The different project styles might also affect trust. For instance, governments can adopt a communicative style in which problems can be efficiently discussed and thus strengthen the trust of both parties. Project success can be better assured if participants work together as a team with established common objectives and defined procedures for collaborative problem solving.

- **Strong commitment:** The commitment refers the continuous involvement from both parties in the different phases of the project. The commitment can not be called strong when the government leaves important decisions to the private party facilitating unilateral decisions, or when one of the parties abstain to collaborate in any of the important process of the project (when is capable to do). The lack of commitment can carry the breaking of relation between both parties and thus the project can be in danger.

- **Strategic behavior:** It may lead to failure of PPP contracts and break the trust between both parties. According to Guash et al. (2002), the public perceived that the private sector in transport infrastructure in Latin America take some advantage of their experience and knowledge for their own convenience. Strategic behaviors manifest variously, both in the ex ante contracting period and in the ex post contracting process, in forms of collisions among candidate bidders and shrinking efforts during implementation of the work, known as problems of adverse selection and moral hazard (Mu, 2008). In Latin America, this behavior can reveal issues associate with corruptions. The perception of corruption is still high in some countries such as Venezuela, Ecuador and Guatemala which are seen as the most corrupted countries (See Figure 2.11).
2.6 Factors for PPP

Uncompetitive procurement gives a strong position to the negotiation private party and can lead to long delays as well as the increase of costs (Cuttaree, 2008). Moreover, most governments have a broad policy stance on procurement and financing for transport mega projects – increasingly in favor of Public Private Partnerships (Allport, 2008). The procurement process should include a competitive tendering process, which will avoid collusive bidders and their collusive actions. Furthermore, construction monitoring may be effective in timely supervising project quality and provide technical supports for the private sector, as well as the good technology transfer for the last phase. These factors have a major impact on stakeholders in terms of their involvement:

- **Strong parties capacities**: The experience of both parties will help to increase the value of the procurement process in the project. In general terms, the experience, high profile and a good reputation are factors that can enhance the service delivery by introducing new innovative designs and reducing costs in construction or operation. These capacities are also shown with the maturity level of the projects such as in the case of UK. However, in developing countries the experience in PPP projects are in the initial stage but can be compensated with external experienced consultants.

- **Quality control in Construction and Operation**: Quality control portrays a increase tendency to ensure the transport projects in the phase of the construction. Many defects or failures can be derived in very large costs. Moreover, accidents during construction process can similarly result in personal injuries and large costs. Therefore, a monitoring system works to diminish these unnecessary costs by including procedures in the project construction.

- **Good Technology Transfer**: The complete transfer of the service is the last sub-factor to increase the value of procurement. This mean that the private operate should deliver the asset in the correct conditions stipulated. The improvement of the service should be depicted in this phase and is critical for the future participation of the provider on other projects.

### Figure 2.11: Latin American countries by control of corruption (Source: WorldBank, 2008)
2.7 Framework of Critical Factors

The following table 2.1 summarizes the factors and the sub factors in the context of transport system in Public-Private Partnership. This table gives seven different critical factors from the literature. Some of these factors are theoretically based, and others are empirically proved. Furthermore, as can be seen from the table, whereas some are general in scope such as the context-related factors, other such as the intrinsic factors address specific points of interest. Our purpose here is not to arise with all possible critical factors that might affect project outcome, which is impossible because of the diversity of projects, but to show the importance and characteristics of these factors in supporting policies in the transport sector in developing countries. Moreover, the identification of the groups to which the critical factors belong would bring a value added to the project to evaluate which factors affect more PPP projects. From the point of view of the government, this would bring a clear understanding of which aspects of projects might be critical for their successful completion. As will be demonstrated in the following section, our intention is to evaluate this framework and demonstrate what will be their effect which leads to project success or failure.

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<thead>
<tr>
<th>Type of Factors</th>
<th>Factors</th>
<th>Sub-Factor</th>
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<tr>
<td>Context-Related Factors</td>
<td>Institutional Legal Framework</td>
<td>Favorable Legal framework</td>
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<td></td>
<td></td>
<td>Strong Institutional Framework</td>
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<td></td>
<td>Political &amp; Socio-Economic Environment</td>
<td>Stable Political System</td>
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<td></td>
<td>Risk management</td>
<td>Appropriate risk allocation and sharing</td>
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<td>Guarantees from the government</td>
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<td>Economic viability</td>
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<td>Trust</td>
<td>Project management style</td>
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<td>Value of Competitive Procurement</td>
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<td>Strategic Behavior</td>
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<td>Good technology transfer</td>
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Table 2.1: Framework of Critical Factors

2.8 Risks in Public-Private Partnership

One of the most important factors in the framework describe above is Risk Management. According to the Royal Society [1991], risk is the probability that a particular adverse event occurs during a...
2.8 Risks in Public-Private Partnership

stated period of time. In the case of infrastructure, the good identification of risk is thus at the most important parts of PPPs. Any exploration of risks in infrastructure projects, therefore, needs not only to consider task, commitments and objectives of partnerships but also the decision-making processes associated with organizational structures (Akintoye et al., 2003). Much of the risk of a PPP project comes from the complexity of the arrangement itself in terms of documentation, financing, taxation, technical details, sub-agreements etc involved in a major infrastructure venture, while the nature of the risk alters over the duration of the project. For example, the construction phase of the project will give rise to different risks than those during the operating phase (Grimsey and Lewis, 2002).

The planned transfer of risks from the public sector to private parties is a major part of the forecast benefits from the private funding of public infrastructure. The study of Ball et al. (2003) notes that ‘risk transfer accounted for 60% of the total cost saving for the PFI projects’ in the UK, and that for six of the 17 cases (35%), achieving value for money was entirely dependent on risk transfer. In concept, risks are allocated in a contract to the party best able to control them. In practice, the risks allocated to the private sector are paid for by the government which, of course, pays for the facility over the longer term. Alternatively, if risks are allocated to the government, this can result in a cheaper up-front project price. Risks being managed by the public sector in the knowledge are essentially "self insuring" bearing those risk outcomes that might eventually occur (Hodge and Greve, 2007).

Moreover, there is a misconception in the motivation of PPP in transport projects if governments only want to transfer as much as risks as possible to the private sector. It can bring disastrous consequences if the private parties can not handle the control of a risk which will increase risks even more. Therefore, there should be a tight relationship between provision efficiencies of the transport system and the total control risk costs. The figure 2.12 shows not only if the relation is positive or negative, but also if the risks are distributed optimally, to follow the statement the Highest Efficiency at the lowest Cost (Peng and Lai, 2004).

Figure 2.12: Relation between Provision and Efficiencies and Total-Risk Control Costs

A reasonable risk-allocation mechanism is an important requirement to apply PPP in transport projects successfully. In PPP contracts risk allocation is seen as a way to establish financial equilibrium between partners. Therefore inadequate risk assignment can raise the costs of capital as well as tariff levels in the investment. If inefficiencies and raised costs emerge as a consequence of inaccurate risk allocation, often they need the renegotiation of the concessions, making a new risk allocation between the private and public parties (Medda, 2007).

As a consequence, the first step to allocate the risk correctly is to identify the main characteristics of them. In the next section 2.8.1 we will present a study of the main risk and their proper identification.

2.8.1 Risk Identification

Risks are going to exist in every project and thus risks should be able to reduce to an acceptable level. For instance, different contract framework makes the arrangement suitable for procurement, but the complexity of the arrangement might lead to an increased risk exposure for all the parties.
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involved. Therefore the importance of identify the risks can help to mitigate and allocate efficiently the increased risks.

According to HM Treasury (HMT, 2000), the first step for a good risk management is identify the different types of risks. Although it is applied to the UK, the risk identification can bring certain advantages in developing countries where the increase of Partnership is in a gradual promotion, such as:

- Risk identification instruments facilitate the flow of local and international private capital, support the creation and commercial and sustainable funding mechanism for infrastructure development, and promote the provision thereof (Matsukawa and Habeck, 2007).

- Identifying and allocating risks in line with opportunities creates an incentive for the controlling party to use its influence to prevent or mitigate the risk and to use its capacity to do so in the overall interests of the project (Jin and Doloi, 2007).

There are many methods for identification, but the study of Li et al. (2005) proposed a meta classification approach on the basis of three levels of risk factors for PPP/PFI projects. The three levels comprise: macro level risks; meso level risks and micro level risks. This method (also applied by other authors Hodge and Greve, 2007; Grimsey and Lewis, 2002) has been used in transport infrastructure and is combined with the risk in Latin America.

According to Li et al. (2005), the macro level comprises risks sourced exogenously, i.e., external to the project itself. This level focuses on the risks at a national or industry level status, and upon natural risks. The risks at this level are often associated with political conditions, economic conditions, market condition, etc. In this level is included the political and market risks.

The meso level of PPP/PFI risk includes risks sourced endogenously, i.e., risk events and their consequences occurring within the system boundaries of the project. It is represented in the implementation problem of the project, involving issues such as project demand/usage, location, design and construction and technology. In this level is included the project-related risks.

The micro level of PPP/PFI risks represents the risks found in the stakeholder relationships formed in the procurement process, due to the inherent differences between the public and private sectors in contract management. The main reason for proposing this risk category rests on the fact that typically the public sector has social responsibility, while the private sector is profit driven. In this level is included the party-related risk.

![Figure 2.13: Different type of risk levels. Adapted from Li et al. (2005)](image)

In the context of Latin America the identification of risks is one of the core stones in transport infrastructure. The study of Guash et al. (2002) shows about 75% of the transport contracts in Latin
America were renegotiated \cite{Flyvbjerg et al. 2003} shows that risks in developed economies should be a concern at all stages of the process.

Many authors \cite{Ke et al. 2009, Arndt 1998, Lam et al. 2007, Li et al. 2005, Ng and Loosemore 2007, Wang et al. 2000, Grimsey and Lewis 2002} have already describe different risks in infrastructure projects. Therefore in the next section we will describe the various types of risks in the transport sectors according to theory in order to elaborate a framework for the correct identification of risks

### 2.8.1.1 Market risk

Market risk concerns changes in broad economic conditions that affect a whole market. For instance, they may relate to changes in asset values as a result of systematic environmental factors. Other examples of market risk includes changes in consumer spending, level of industrial output, exchange rates, interest rates, energy prices, etc \cite{Akintoye et al. 2003}. Furthermore, market risks may be caused by general economic downturn and phenomenon of inflation. For instance, the risk of a reduction in economic activity will influence the demand for the contracted service, which will make the project revenue below projections. In addition, the inflation risk will lead to the value of payments received during the project period devalued and thus reduce the real returns of the private actor \cite{Flyvbjerg et al. 2003}. The following table 2.2 will define the different types of market risk in a theoretical view and also an example is explained in Box 2.12

<table>
<thead>
<tr>
<th>Market Risk</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflation Risk</td>
<td>Unanticipated Local Inflation Rate due to local economic and banking system</td>
<td>\cite{Lam et al. 2007, Li et al. 2005, Ng and Loosemore 2007}</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>Unanticipated Interest Rate due to local economic and banking system</td>
<td>\cite{Li et al. 2005, Ng and Loosemore 2007, Arndt 1998}</td>
</tr>
<tr>
<td>Tariff change</td>
<td>Improper tariff design</td>
<td>\cite{Ng and Loosemore 2007, Arndt 1998, Wang et al. 2000, Li et al. 2005}</td>
</tr>
<tr>
<td>Financial Risk</td>
<td>Poor financial market or unavailability of financial instruments</td>
<td>\cite{Wang et al. 2000, Grimsey and Lewis 2002}</td>
</tr>
</tbody>
</table>

Table 2.2: Market-Related Risk

**Box 2.12: Case Azurix Argentina** (Source: Newspaper La Nacion - 4th July, 2001)

In June 1999, the enterprise Azurix bid $438 million to win a 30-year water concession covering two of the three regions of the Buenos Aires Province. Finally, after a couple of years of arduous negotiations, the concession contract between Azurix SA in the province of Buenos Aires ended. The provincial government informed the company about its decision to stop granting the potable water and sewer over seventy districts in the province of Buenos Aires from the year 2002. The particular reasons that led to this situation are varied, including the strong financial sunk cost that will not be recovered by the economical crisis and inflation that shocked Argentina in 2001.

### 2.8.1.2 Political Risk

According to \cite{Kettis 2004}, political risk is difficult to clarify due to the fact that it is a phenomenon present in the interface between an organization and a political environment and involves the concepts of risk and uncertainty, political sources and political environments. Political risk can define as the risk arising from adverse interference of central government on an organization’s business operations (i.e. forced divestment, confiscation of assets or expropriation) or as a result of political decisions such as in the Case of Port of Matarani (See Box 2.13) or societal events impacting on an investment already made in that country that results in reduced returns, major losses or managerial control.
In 1999, Peru began with a process of concession of their regional ports. This country began with the small port Matarani. The contract stipulated a concession of 30 years and four companies pre-qualified for this project. However, in the last stage of the process (one month before the offer’s opening), the government decided to shorten the term of the concession to 15 years. As a consequence, three companies decided to leave from the tendering process. The main reason from the companies was not the reduction of the term, but it showed a sign of the modification unilaterally of the contract which increased insecurity and lack of commitment from the government.

In the transportation sector in Latin America, this is one of the most common risks in projects. Terminating the contract unilaterally, placing toll price ceilings and increasing taxes on revenues would severely reduce the returns to operators to recoup the costs, repay the debts and earn profits. Incomplete legal systems and unstable institutional environments would cause changes in the rules and norms that applied to the project before and thus cause loses of the project to cater to new rules and norms. Due to the long duration of most contractual agreements and due to the risks. The different type of political risks are depicted in the next table and an example of their consequences in Bolivia is shown in Box 2.14

<table>
<thead>
<tr>
<th>Political Risk</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationalization</td>
<td>Government takes over the facility run by private firm unilaterally</td>
<td>Li et al., 2005, Ng and Loosemore, 2007, Wang et al., 2000</td>
</tr>
<tr>
<td>Termination of concession by government</td>
<td>Government interferies in terminating the contract without compensation</td>
<td>Ng and Loosemore, 2007, Wang et al., 2000</td>
</tr>
<tr>
<td>Political/Public opposition</td>
<td>Prejudice from public due to different values, culture, social system etc.</td>
<td>Li et al., 2005</td>
</tr>
<tr>
<td>Change in law</td>
<td>Government’s inconsistent application of new laws</td>
<td>Lam et al., 2007, Li et al., 2005, Ng and Loosemore, 2007, Arndt, 1998, Grimsey and Lewis, 2005</td>
</tr>
</tbody>
</table>

Table 2.3: Political Risks

Bolivia remains a difficult place to do business. Economic activity is often disrupted by social unrest resulting from centuries of economic, political, and social inequality, and indigenous, labor, and anti-globalization organizations have recently targeted private investment - particularly foreign investment - as the cause of many of the country’s ills. Political violence can escalate quickly.

In September 1999, a 40-year concession was awarded to Aguas del Tunari (AdT), to provide water services in Cochabamba, Bolivia. The concession included operation of the existing water supply system and construction of the Misicuni Multipurpose Project (MMP), a project involving the use of the water resources of the River Misicuni for electricity generation, irrigation and water supply to the city. Yet within five months, the population rioted against water tariff increases and the contract was canceled. Roadblocks were even more serious in September and October 2000, when rural indigenous groups, coca growers, and a variety of labor and social movements united in opposition to various government policies. Concessions by the Bolivian government ended unilaterally and subsequent protests appeared.

### 2.8.1.3 Project-Related Risk

This type of risk is involved in the different phases of the project such as the construction, operation and maintenance. For instance the construction-related risk in transportation includes the risk of...
construction cost-overrun, construction delay, late design and material/labor availability (Bing et al., 2005). This risk emerges during the construction phase may be caused by technical difficulties and/or poor management on the one hand, and on the other hand it may be derived from land acquisition, obtaining necessary permissions and licenses. The construction facilities play a significant role in the delivery of public services of subways or highways. Both serve as a basis for people to move between two or more locations (Akintoye et al., 2003). Thus the construction facilities should have good quality but exist numerous uncertainties that are not considered in the initial stage which permit the increase of risks in this sector. In some developing countries, the construction risks come from delays in completion and cost overruns (Guash et al., 2002). In the next lines we will define the main project-related risk in the construction of the project (See Table 2.4) and an example of that will be shown in Box 2.15.

<table>
<thead>
<tr>
<th>Project Risk-Construction</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improper design</td>
<td>Improper arrangement of the design of the project</td>
<td>Ng and Loosemore, 2007; Wang et al., 2000; Arndt, 1998</td>
</tr>
<tr>
<td>Delay in completion</td>
<td>Longer construction time than predicted</td>
<td>Ng and Loosemore, 2007; Wang et al., 2000; Arndt, 1998</td>
</tr>
<tr>
<td>Site conditions</td>
<td>Not suitable conditions for construction</td>
<td>Li et al., 2005; Lam et al., 2007</td>
</tr>
<tr>
<td>Construction changes</td>
<td>Unanticipated changes and errors in construction resulting from a poor design</td>
<td>Ng and Loosemore, 2007; Lam et al., 2007</td>
</tr>
<tr>
<td>Construction cost overrun</td>
<td>Inefficient work practices lead to cost overrun</td>
<td>Li et al., 2005; Ng and Loosemore et al., 2000; Arndt, 1998</td>
</tr>
<tr>
<td>Poor quality of construction</td>
<td>Quality defects in construction</td>
<td>Lam et al., 2007; Li et al., 2005; Ng and Loosemore, 2007</td>
</tr>
</tbody>
</table>

Table 2.4: Project-Related Risk in Construction

**Box 2.15: Case Highways in Uruguay** *(Source: APP in highways in Uruguay, Pereyra 2008 & Risk Analysis and Mitigation Mayer Brown)*

In the last 15 years of the last century, Uruguay joined the private sector in the construction, operation and maintenance of roads, particularly through the concession. The economic result of the concessions is not easy to evaluate even to the extent that they are still running, however some difficulties were identified. Some of these difficulties stem from the incentives that are generated in the very design of operation and construction of the roads.

Construction “wraps” may not be feasible because of the lack of relationship of the parties involved, or the prohibitive cost of including turnkey exposure (and associated credit support) in contract pricing. Highly structured solutions – involving financial, legal and technical components – may be required to provide adequate assurance of timely project completion.

Moreover, the operation and maintenance are also part of the project-related risks. These costs may exceed those estimated in the project planning phase. If design has been well identified, construction has been adequately performed and start-up testing has been carried out satisfactorily, expected operation costs would be held in control (Perrot and Chatelus, 2000). In some developing countries context, the operation risk are caused by certain management problems appeared due to operator’s negligence or mistakes, incorrect manipulations on equipments, system outage and ineffective management. In the next lines we will describe the main project-related risk in the operation of the project (See Table 2.5).
2.8 Risks in Public-Private Partnership

<table>
<thead>
<tr>
<th>Project Risk- Operation</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in operation</td>
<td>Longer operation time than predicted</td>
<td>Ng and Loosemore, 2007; Arndt, 1998; Li et al., 2005</td>
</tr>
<tr>
<td>High operational costs</td>
<td>High operation cost resulting from improper measurement</td>
<td>Wang et al., 2000; Arndt, 1998</td>
</tr>
<tr>
<td>Poor quality of operation</td>
<td>Quality defects in operation</td>
<td>Arndt, 1998; Ng and Loosemore, 2007; Wang et al., 2000</td>
</tr>
</tbody>
</table>

Table 2.5: Project-Related Risk in Operation

2.8.1.4 Party-Related Risk

These risks are related with the relationship or connection between all of the public and private partners involved in transport projects. This kind of risk can be explained by the relationship between the organization and coordination in transport project, differences in working method and knowledge between partners and lack of commitment from either partner (Bing et al., 2005). The discrepancies between the different parties may cause different implications for the behavior and for the process as a whole, and also create complicated issues in the negotiation process of the project. Moreover, the lack of commitment of one of the parties (in the developing countries mostly the public sector) in developing countries have a high impact in the delivery of the project (Harris, 2003). The following table 2.6 will show the two types of party risks and the Box 2.16 will give an example of it.

<table>
<thead>
<tr>
<th>Party Risk</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of commitment of government</td>
<td>Poor support from government in project decisions.</td>
<td>Li et al., 2005</td>
</tr>
<tr>
<td>Lack of commitment of private party</td>
<td>Poor support from the private party in project decisions</td>
<td>Li et al., 2005</td>
</tr>
</tbody>
</table>

Table 2.6: Party-Related Risk

Box 2.16: Case Highway in Madre de Dios Peru (Source: Newspaper El Comercio 25th Nov 2009)

The president Alan Garcia, criticized the private sector to not be fully committed in the concession in the highway of Madre de Dios, while the private part says the other problems such as finance and demand can hamper their ambitious. The real situation was that both parties were relatively inexperienced. Governments may have unrealistic expectations, or mismanage the difficult process of awarding concessions. Delays in securing government commitments may prevent projects from achieving financial closure. Following unsuccessful financing, political pressures may lead governments to revoke concessions. Moreover, risk management of PPI projects has both technical and political dimensions: even well-structured PPI projects may fail without government or private commitment.

Once risks are identified, it is important to allocate risks correctly to the parties that best can manage it. However, risk allocation in privately financed public infrastructure projects, is a challenging job due to the nature of incomplete contracting (Jin and Doloj, 2007). In the next section we will describe the theoretical foundation of risk allocation.

2.8.2 Risk allocation

Given the complexity, size and time set of different agreements, there are a huge range of potential risks which can affect the result of an infrastructure project (Ng and Loosemore, 2007). Therefore, allocate the risk to the partner who can best manage has been a fundamental driver to success in transport projects. Risk allocation refers to a primary measure of assignment between the projects’
2.9 Concluding remarks

direct participants (only public and private sector). According to Kerf (1998), a variety of risks are inherent to infrastructure projects. Risk should be borne by the party that is best able to assess, control and manage them, or by the party with the best access to the instrument, the greater ability to diversify the risk, or the lowest cost of the risk that bearing.

Moreover, due to the assigned risk is within the actor’s bearable ability, thus this sector is motivated to strive to manage this risk. Nevertheless, it is not an easy task to specify the responsibilities of each of the risks to the parties, but shifting the risk to party not be able to manage that risk, creates even more risk to the project. If both parties bear a certain risk outcome, that is called “shared risk allocation mechanism” (Bing et al., 2005). However, there is no unique formula to dictates who is going to take the risk, thus we will try to identify the allocation strategies for each of the of the different risk. Appendix B summarize the most common allocation parties in the main four risk in developing countries projects (Arndt, 1998; Li et al., 2005; Ng and Loosemore, 2007). This will serve as a preliminary view of the infrastructure project in mitigating and allocating risk.

2.9 Concluding remarks

The formal analysis of the theoretical review of factors in PPP projects have been proved useful for depicting a tentative framework for evaluation in the Latin American cases. We defined the type of success that we will use in this research. Findings on this topic brought us to limit success in three main concepts: Contract Success, which has a relation with pre-phase of the project, Implementation Success which is closer connect with the implementation of the project and the Post-Implementation Success which is related to the post-implementation of the project. In light of this, the criteria of success were analyzed with the factors that influence them. In this case, we found two main groups in this framework. The first one represents the factors related with the environment of the project named context-factors and the second is related within the project itself called intrinsic-factors. Both of them have been studied by many scholars around the world which convert the seven factors in a robust support for the examination of the cases of study (See Figure 2.7).

<table>
<thead>
<tr>
<th>Context-Related Factors</th>
<th>Intrinsic Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional &amp; Legal</td>
<td>Project Planning</td>
</tr>
<tr>
<td>Political &amp; Socio-Economic</td>
<td>Economic Viability</td>
</tr>
<tr>
<td></td>
<td>Risk Management</td>
</tr>
<tr>
<td></td>
<td>Trust &amp; Behavior</td>
</tr>
<tr>
<td></td>
<td>Value for Procurement</td>
</tr>
</tbody>
</table>

Table 2.7: Evaluated Factor for PPP projects

Criteria and factors were studied in order to produce an evaluatory framework that will be contrasted with real cases. Following, the analysis of the factors shows that some factors need deep exploration due to the priority of them in infrastructure projects. In this sense, we found that risk management is a very important factor in this kind of projects. Risks have been proved to affect the performance of the system and needs some strategies to mitigate them. Therefore, through the literature analysis we gave some methods for the correct management of this risks. This includes risk identification, risk allocation and risk mitigation.

In general, the findings of this exercise advocate for a serious and systematic discussion of the factors (including risk management) in order to know which of them have a great impact on the criteria of success in PPP projects in Latin America. These critical factors are going to be evaluated with cases of studies. Therefore the next figure 2.14 shows the evaluative framework for our study. Next chapter will first explain the context that surrounds these cases. This analysis will help us to provide an overview of the cases in a new environment of study.
2.9 Concluding remarks

Figure 2.14: Evaluatory Framework for PPP projects in Latin America
Chapter 3

Latin American Context

3.1 Introduction

The significant growth to be expected in the large urban areas around the world is an important subject in the actual transport system. During the 90s many countries in Latin America implemented broad private programs for infrastructure services, including transport systems, with the aim of raising fiscal revenues and improving sector performance. These programs were done under the recommendations of the World Development Report 1994 - *Infrastructure for Development* (Fay and Morrison 2007), which describes four main messages:

- *The Latin American and Caribbean region needs to spend more on infrastructure*: On average, countries in the region spend less than 2 percent of GDP on infrastructure, while 3–6 percent is needed to catch up or keep pace with others that once trailed them, such as China and the Republic of Korea.

- *The region also needs to spend better*. Resources should be better allocated between investment and maintenance. New investments must focus on increasing productivity and competitiveness. Though that need not be at the expense of social goals, since universal coverage of water, sanitation, and electricity could be achieved within 10 years for less than 0.25 percent of GDP a year.

- *Governments remain at the heart of infrastructure service delivery*. Private participation does not reduce the need for public involvement. Governments still have to regulate and oversee infrastructure provision and pay for a large share of investments. They are also still responsible for setting distribution objectives and ensuring that resources are available and policies in place to provide access for the poor.

- *The private sector is needed*, but bringing it back requires learning from the past. Infrastructure projects with private participation have collapsed to less than a quarter of their peak value in the region and showed no sign of recovering, given investors’ disaffection with emerging markets. Bringing back the private sector will require improving the balance of risks and expected returns for projects.

Despite the increase of infrastructure projects in Latin America, not all them have become beacons of effective transportation within their cities. According to the recent study of KPMG (2010), there are some factors related with the context that played a remarkable role in the development of infrastructure. A positive aspect of the factors is located in the economic sector. If there is an economic stability within the government, the process of private participation can be accelerated. However, on the other hand, the context of Latin America has been marked by its instability during the 90s.
in which the main characteristics were the political changes. Thence, the economic development was hinder and its effect on the accumulation of physical and human capital was heavily hit.

In order to face these challenges, the vast majority of the Latin American countries has embarked on ambitious reform programs aimed at opening up their economies, reducing inflation, privatizing enterprises and deregulating the infrastructure sector. These policies were carried out because some factors threatened the path for success of the infrastructure projects. As a consequence, the context influenced both how to work in the project, and the type of issues that would have to be dealt with during the process. Therefore, framing the context in which is situated our main case, is very important for the research. In light of this, the environment gives us more details of the actual situation of the project and the factors that affect it. The uniqueness context of Latin America can be described through these four axis (see Figure 3.1) named Economic context, Institutional context, Legislative Context and Social context.

![Figure 3.1: Context of the Urban Transport in Lima](image)

As visualized above, the study proposed will follow in great measure the description of this figure, beginning with the social aspect in Section 3.2 and economic aspect in Section 3.3. Then an explanation of the current economic economic condition will be depicted in Section 3.4 and the Institutional and Legislative environment will be explained in Section 3.5. Finally some concluding remarks will be analyzed in Section 3.6

### 3.2 Social Environment

Infrastructure services are the backbone of development because they support essential service delivery require to meet economic, financial and social conditions. A good social development helps to improve governance and fight corruption by enhancing the capacity of citizens to demand good institutional context. Nevertheless, in Latin America, the social context had been also source of many issues with high repercussions in the actual environment. These aspects have already proved fatal consequences in infrastructure sectors, such as transportation. For instance, corruption is one of the common forms for the decline of some projects. In the next lines we will describe, the most important facts in the actual social environment in Latin America which includes poverty, crime, informality and corruption.

#### 3.2.1 Poverty

According to the World Bank (2000), poverty is defined as the deprivation of essential assets and opportunities to which every human is entitled. Poverty reduction is one of the main goals for developing
3.2 Social Environment

countries. The resources needed to fuel sustainable growth far exceed the resource mobilization capacity of governments and international institutions. Private capital flows are already far more significant and more efficient to manage investment than governments in developing countries. Thus, the active involvement in infrastructure is essential for successful poverty reduction. The contribution of the private sector to diminish poverty is enhanced through enterprise development, expansion of services and other public services [WorldBankInstitute (2010)]. It is important to notice that infrastructure projects are aimed to reduce poverty and improve quality of service for the low-income population. Transport projects are intended to connect low-income zones to the city center. Thus the acceptance of the project from the low-income people are important. Moreover, the affordability reflected in the tariffs are also a key factor that contribute the approval of the project.

High rates of population in poverty in the metropolitan area can be explained in several ways. One factor is the large amount of population migrated from rural areas of the country to metropolitan area. During the last four decades, the massive population growth has been established by poor families who have migrated from the countryside. They have built their homes in the dusty wastelands of the periphery or on the slopes of the hills, and their settlements normally do not have basic infrastructure like electricity, drinking water and drainage. The same phenomenon is seen in different countries under different names. In Peru, “Barriadas” or “Conos” are the districts that shelter the high rates of poor population in Lima, nearly 50% of the inhabitants are poor. In Brazil these areas are known as “Favelas” and in Argentina they are known as “Villa Miseria”.

In the Peruvian framework, the percentage of population in poverty in the country increased from 42.7 percent in 1997 to 48.4 percent in 2000, but decrease gradually in the last years to reach 36% in 2008. In the metropolitan area of Lima and Callao, the percentage of the population in poverty was lower than the national average, reaching a 20% in 2008. According to these figures, it is estimated the population in poverty in the metropolitan area in 2008 was nearly 1.6 million inhabitants (See Table 3.1). The agglomeration of poor people are located in: San Juan de Lurigancho (“North Cono”), San Martin (“North Cono”), Comas (“North Cono”), Ate-Vitarte (“East Cono”), Villa Maria del Triunfo (“South Cono”), and Villa El salvador (“South Cono”).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Peru</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population (millions)</td>
<td>24.681</td>
<td>25.939</td>
<td>26.509</td>
<td>27.840</td>
</tr>
<tr>
<td>Population in Poverty (%)</td>
<td>42.7%</td>
<td>48.4%</td>
<td>44.5%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Metropolitan Lima</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population (millions)</td>
<td>7.087</td>
<td>7.501</td>
<td>7.880</td>
<td>8.115</td>
</tr>
<tr>
<td>Population in Poverty (%)</td>
<td>25.4%</td>
<td>38.9%</td>
<td>30.5%</td>
<td>20.7%</td>
</tr>
</tbody>
</table>

Table 3.1: National Statistics of Poverty. Source INEI, 2009

In the Brazilian environment, poverty is one of the main social issues mainly due to the inequalities of income of the different states. In 1980s, poverty got worse as a consequence of the lack of efforts from the former administration to stop the inflation. The following table 3.2 shows the poverty in the metropolitan areas of Rio de Janeiro and Sao Paulo. The average income of families living below the poverty line in Rio remained constant between 1990 and 2000. The pattern was very similar in Sao Paulo.

<table>
<thead>
<tr>
<th></th>
<th>% Poverty 1981</th>
<th>% Poverty 1990</th>
<th>% Poverty 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rio de Janeiro</td>
<td>27.2%</td>
<td>32.5%</td>
<td>32.4%</td>
</tr>
<tr>
<td>Sao Paulo</td>
<td>22%</td>
<td>21%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Table 3.2: Poverty Line in Metropolitan areas of Sao Paulo and Rio de Janeiro (Source: Brazilian Institute of Statistics- http://www.ibge.gov.br)
Moreover, these inequalities brought as a consequence the creation of the slum cities named “favelas”. These favelas are marginal places built near the steep hills as an effect of the dramatic increase in the population. Nowadays, there are over 1000 favela communities existing within the city of Rio de Janeiro and Sao Paulo which can reach the third parts of the total population. Moreover, it is estimated that nearly 1 million of inhabitants live in the favelas of only Rio de Janeiro. Most of them live without proper sanitation and electricity; however they do not pay taxes neither rent for some public services. The growing of the favelas is keeping a fast rate (7.5% a year) and it is well know that they are controlled by drug gangs (Gilbert, 1996). Furthermore, crime is also part of the daily routine.

In the case of Argentina, the factor that affected the larger size of the population in poverty is the high level of unemployment. The result of the instable economic structure worsen this situation. For instance, the agriculture and traditional craft industry was changed by industries of large scale manufacturing, and services. The suburbs of the metropolitan area have experienced an invasion of the population in poverty, which causes the deterioration of urban environment and increase informality. The large number of informal activities caused a gradual abandonment of the formal business activities. Informal activities accelerated the degradation of the urban environment in Buenos Aires.

### 3.2.2 Informality

The trade liberalization and economic recovery measures adopted in the decade of 90s brought about a shift towards privatization and de-regulation of the transport sector. Nowadays, in developing cities such as Lima, Sao Paulo and Rio de Janeiro, the informal transport sector comprises mostly small vehicles and low-performance services that are operated by self-employed entrepreneurs that lack official registration and work long, hard hours in a highly competitive market.

For instance this informality let Lima to double the number of motorized vehicles in the city during the 90s, which brought good and bad consequences (See Box 3.1). Since then, thousands of mini-vans called “combis” have flooded Lima’s streets, driven by inexperienced chauffeurs. The result has been an increasing in urban chaos and congestion. According to Inei (2008), there are many vehicles per 1000 inhabitants, predominatly old vehicles. This, in combination with inexperienced drivers and no technical check-ups, is translated in frequent accidents in the last years.

**Box 3.1: Advantages of Informal Lima Urban Transport (Source: Cervero, 2000)**

- **Fast Mobility:** Combis often ply routes and enter neighborhoods that are inaccessible by buses (because of the geography of the hills) and grant fast connection between the poor neighborhoods and the jobs centers. This transportation network has a very broad coverage; people have to walk no more than 500 meter to get a combi.
- **Source of employment:** it can provide employment for unskilled , young people who has just arrived from the countryside
- **Low Cost:** The price of public transportation is very low (33 cents of a US dollar) and has increased very little since 1991.

**Issues and concerns about Informal Lima Urban Transport**

- **Traffic congestion:** The nonrestrictive market leads to excessive supply of service providers. In the case of Lima, the traffic slows first because of the quantity of combis, and secondly because drivers cut each other off while stopping in the middle of the lanes to load customers.
- **Accidents:** Informal operators are characterized because driving aggressively and recklessly. Peru has the highest rate of accidents in south America,with 15 thousands deaths caused by transit accidents in the last five years.
3.2 Social Environment

- Pollution: The bus companies operate under the old mini-vans, which were brought as second hand vehicles in the 90s, which are gross-emitter of air pollution. Some features of that vehicles are diesel propulsion, absence of catalytic converters, frequent acceleration and deceleration in congested traffic, among others.

3.2.3 Populism

The term “populism” is used in different in many contexts with different meanings. According to Checchi [1996], populism in Latin America is the result of government incompetence or leader short-sightedness mixed with individual factors. The variety of national elements are part of this term. Thus, we can not compare the populism of Carlos Menem from Argentina with the populism of Hugo Chavez of Venezuela, but some important facts are commonly attached:

- Special attraction to the marginal sectors of the population: The basic ingredient of populist movements emerges from nonpolitical spheres of national societies. Alberto Fujimori, Luiz Inacio Lula and Christina Fernandez used this kind of strategies in order to gain more votes in their elections.
- Speech without elitism: The power elite’s resistance to change is a favorite theme of the populist leader’s rhetoric.
- Image of non-traditional politician.
- Charisma: It is easy for a charismatic leader to persuade people to believe in his ideas.

The proposed strategy to cope with poor and marginal sectors is inclusive in its nature which brings access to great masses of people. However, this populism also has produced high levels of corruption behavior. The populist opportunism is evident in Latin America because it reveals a short-term formula that the government can take possession making quick decisions only to satisfy short term demands. This scourge of populism is clearly a result of failed governments, which make use of abusing old-style policies.

3.2.4 Crime and Terrorism

Ordinary crime and police corruption is increasing in Latin America in line with rising levels of poverty. Even though the levels of crime are not so high in general, its rates alarm the population. The authorities are unable to cope with the rising wave of violent crime, especially in Conos, Favelas or Villas Miseria.

Besides this issue, these zones also brought another feature in the violence in Latin America, named “vandal gangs”. These young gangs correspond to the group of adolescents over 12 years and under 18 who share common identity but act violently to the society. Their vandal actions are involved in all areas of street-crime activities such as burglary, drug traffic, rape or extortion and also in closed spaces such as buses or train stations.

In Brazil, crime is another social features of the actual problems of Rio de Janeiro and Sao Paulo. The rate of crime in both cities is strongly linked with the favelas. According to the last census in Brazil [IBGE 2000], there are 612 favelas in Sao Paulo and 513 favelas in Rio de Janeiro which shelter more than 2 million of people. The crimes in favelas appear to increase and the different forms of crimes seems to be related to the organized crime, such as robberies and thefts and also includes homicides [Zaluar 2001].

However, the crime are not only carrying out in the shanty towns, the street crime are a problem of the residents of the cities. Street crime is a problem for local residents in the urban areas of...
Buenos Aires, Sao Paulo and Rio de Janeiro. The incidence of crime against foreign is greater in areas surrounding beaches, hotels, bars and even in metro stations. The incidents of theft on city metro are frequent. According to the last report of the Police of Sao Paulo, there is a particularly high incidence of robberies and pickpocketing in the stations Estacao de Luz of the Line 1 and the station Paulista of Line 2 of the Sao Paulo Metro. In addition to this, groups of guns from the favelas used to wait their victims in the doors of the metro in the peak hours in order to pick pocket their belongings. A similar figure faces Rio de Janeiro, in which the crowdedness of the people in the peak hours of the metro are the main attractiveness for thieves. In Buenos Aires, pick pocketing is the common type of robbery at the subways stations and inside the subway itself.

Moreover, in the Peruvian society, one important issue is terrorism. A wave of terrorist violence during the 1980s brought a major shift in criminal behavior throughout Peru. Lima suffered when the rural based Shining Path guerrillas and became an important recruitment center and also the principal target by which national and international attention could be attracted. However, since Abimael Guzmán’s (leader of the guerrilla) capture in 1993, guerrilla activity has declined remarkably. The strong relation with drug traffic and crime are seen as potential risk in any infrastructure project.

3.2.5 Corruption

Corruption is presented in Latin America, as one of the most difficult problems to overcome during the last decade. Countries have experienced this issue in different ways. In Peru, the high levels of corruptions provoked the decline of a government in 2001 stopping many infrastructure projects and converting the country in a total chaos. In Brazil, although its ratings to control of corruption are improving, this topic is still an ongoing concern. It is more visible now than in the past because of the decreased transparency and willingness to prosecute. Moreover, the aggressive media and some institutions investigate new scandals around the political spheres. Some of the most scandalous cases of corruption were done by Fernando Collor who resigned to avoid impeachment for corruption and the “mensalão”, a vote-buying scandal that nearly destroyed President Luiz Inácio Lula da Silva’s government in 2005.

Argentina has developed a well-expanded institutional framework in order to combat the corruption. However, the institutions cover some major problems in their implementations and enforcement shortcomings which do not permit the correct effectiveness in their regulation acts. Corruption is creating a imminent issue in the actual Argentinian environment. It spans throughout its political history, especially when referring to the past six presidents that have occupied office since the economic meltdown in 2001. For instance, during 90s, some government officials received illicitly commissions in order to benefit their own companies. Moreover, during Menem administration, some state-owned companies were sold off or put in public service concessions to foreign investors. Many of these privatizations were involved in some irregularities which were investigated by the media. The probable acts of corruptions had their source on the lack of effective controls of the institutes and the excessive discretion of the process in privatizations and concessions. Therefore, the effectiveness of these agencies in combat the corruption should depend on the institutional operative capacity and structure.

The effects of corruption have been devastating in some cases. However, the institutional framework to deal with this aspect can mitigate some risks related with the social factors.

3.3 Economic Context

During the 90s, most countries of Latin America made important changes to the economic model they had followed since the 1970s. An inherited model sometimes categorized in simplified terms as “system directed by the state” or in other words an autocratic government. The incentive to make such reform not only was a consequence of the political environment but also worked as necessary tool to placate the economic crisis that almost all the countries passed through. Among elements prompting fundamental rethinking were the crisis conditions experienced in many Latin American countries, we
can include external debt crisis, hyperinflation, and macroeconomic stagnation or decline. Naturally, it had repercussions in the acceleration of change the management of the infrastructure projects.

These conditions are operating as a key danger for Latin America in which the “regressivity” of the financial crises is still latent in some countries. The crises are socio-economically regressive due to the massive diversity of fiscal resources to be spent. The economic situation of these countries presents some difficulties and challenges which are reflected on their external developments. Additionally, the financial problems for the state in emerging regions and the significant reduction of Latin American public external debt give governments more leeway to play a stabilizing role for private markets. The international economic and financial system does not work perfectly, and its not proper functioning is partly responsible for the instability. In the next lines, we will present the economic conditions of Peru, Brazil and Argentina during the period of their concession projects and the current conditions.

3.3.1 Latin American Economic Path

The economy of Latin America has been characterized by its volatile to variations in the last three centuries. To be more explicit, the economy has passed through challenging events during the 80’s and 90’s which brought impact in their sectors of transportation, trading and energy. This period was characterized by economic crisis which permit a wide-ranging process of liberalization and privatization. According to [Thorp](1987), Latin America is a region full of paradoxes that has suffered dramatic fluctuations in its macroeconomic policies and has been characterized by its great exposure to changes in economic structure, showing little stability in its economic cycles.

In order to face this problem; Brazil, Argentina and Peru introduced a new program of privatizing public enterprises, and removed restrictions on some products in order to increase competition and boost productivity. Moreover, these reforms also addressed the concepts of decentralization, partnership and promotion of private investment. Even though, the economy crisis was perceived as harmful tool with societal effects, more than this, the economic instability served as a new window of opportunity to create a new path in restructuring new policies for the future. The next lines will describe the major changes of the Latin economy during the last years.

3.3.2 Increase of Private Participation

Private investment can foster competitiveness and increase sustainable development and as a consequence it can improve the welfare of the people. According to the [OECD](2006), private investment is a powerful catalyst for innovation, economic growth and poverty reduction. Therefore it has a critical role to play in improving the environment for the national activities the changing demands, and thus in helping to pave the way for robust growth.

For private investors, investments in transport infrastructure have characteristics which make them different from other capital goods in several ways [Nijkamp and Rienstra](1995):

- On one hand, the operational costs are relatively low in many cases, especially on longer distance infrastructure. There are some labor, overhead and maintenance costs. Compared to the construction costs of infrastructure and to the exploitation costs of other investments, these costs are relative low. On the other hand, during the construction a large amount of capital is required. Often also high loans have to be attracted, which makes interest costs relatively high.
- The construction period is very long compared to other investments. It can take up to two years where there are no revenues, but there are already interest and other costs.
- Once started, the investment is almost irreversible. If the construction is stopped this will imply destroying capital, because it is not possible to use the investment alternatively.
The private participation process, specifically in the transport sector, was impulse by the economic conditions that the countries suffered during the decade of the 80s and 90s. In the case of Peru, prior to the statist military coup of 1968, the country has exhibited a strong tendency toward “non-interference” economic policy, and the swing toward orthodoxy in the 1980 was consistent in Peru’s historical tendency to revert to liberal economic policy regime when direct state intervention failed, through the following of the International Monetary Fund (IMF) Stabilization program (Pastor and Wise 1992). Therefore in 1980, with the government of Fernando Belaunde-Terry, the first real attempt to increase private participation was made but with fatalic consequences. However, the vestiges from these neoliberal experiments surface in the Belaunde administration made some important steps in reducing state enterprise and stimulating private investment. For the government the opening to the international market was a priority. As a proof, some government actions were planned by the Premier Manuel Ulloa (1980), such as eliminating government intervention in pricing, marketing and the financial system; reducing tariffs and trade barriers, and maintaining crawling-peg currency devaluation in order to maximize Peru’s competitiveness in foreign markets. These actions are summarized in three policies in the following table 3.3, which include the plan of action and what really happened:

<table>
<thead>
<tr>
<th>Policies</th>
<th>Plan of action</th>
<th>Real situation</th>
</tr>
</thead>
</table>
| Privatization and Private Investment | . The regime sought to shed stated-owned enterprises and encourage private investment  
. Announce to privatize 8 enterprises | . Private resources were inadequate to the task  
. Recession of 1982-1983  
. Foreign inversion in short supply  
. No attempts to privatize, only a few (supermarket chain, machine tool factory) |
| Trade liberalization         | . Promote of non-traditional exports                                           | . Lower tariff brought a flood of foreign products in the domestic market      |
| State Investment Program   | . Reroute state investment into economic infrastructure to support private enterprise  
. From 1981 to 1985, a plan of investment of 80 projects | . Many projects still lack of funding  
. Unpaid contractors and suppliers stopped worked |

Table 3.3: Main Economic Policies in Peru 1980 (Pastor and Wise 1992)

In summary, the attraction of much higher level of local private direct investment, met with disappointing results. Private capital fell from 18% in 1980 to 12% and then to 8.5% at the late 1980’s. This was a clear sign for creating a new set of policies that reformed the Peruvian economy. These packages of reforms, called “Fujishok”- keyed by the President Alberto Fujimori- had a high impact in infrastructure by privatizing most of the Peruvian assets.

In the case of Brazil, the private participation increased with the new reforms of Fernando Cardoso. Although the Collor’s administration faced imminent hyperinflation and reduce public resources, the new administration of Fernando Cardoso initiated a new stabilization plan. The Brazilian domestic market together with a series of reforms helped to ameliorate the crisis of the 80s. Brazil’s commercial integration has occurred in the context of a new globalized world order, based on the model of the so-called “new regionalism” that is characterized by the integration of countries through bilateral including Mercosur and multilateral agreements such as free trade zones, customs unions and common markets (Averbug 2000).

In the case of Argentina, the transfer of public enterprises to the private sector was the first step of economic policy liberalization of the administration of Menem. This acceleration process included different sectors such as energy, transport, telecommunications and industry. In the context of the
transport sector, Ferrocarriles Argentinos, the rail largest operator, was losing an approximately US$ 1.4 billion a year due to the bad condition of the network and the ineffective availability of the wagons (Carbajo and Estache, 1996).

The three cases above mention, clearly show the urge to increase private participation through different policies which includes the privatization process, commercial liberation and decentralization.

3.3.3 Privatization

One of the methods to increase private participation is by way of privatization. Privatization alludes to the transfer of enterprise ownership in whole or in part, which includes control and responsible functions, from the state to private hands. In other words, privatization is the act of reducing the role of government or increasing the role of the private institutions of society in satisfying people’s needs; it means relying more on the private sector and less on government (Savas and Savas, 2000).

Moreover, the privatization is driven by the poor performance of state ownership, and also guided by private sector’s technical progress, cost saving incentives, market oriented thinking and efficient management mechanism (von Hirschhausen et al., 2004). Privatization brings private capital investment in transport infrastructure and thus rebalances the roles public and private sectors play in public service delivery. It also can lead to obtain higher profitability and productivity growth but it should include a regulation framework within the government and the private sectors. Argentina, Brazil and Peru provided with tools that were devoted to the privatization of transport projects in order to manage the debt and make viable alternatives for the macroeconomic policy. The administration has devoted all its energy to restore ties with the foreign financial community, and devised an economic stabilization program that would the unfavorable trends of the last period (Wise, 1994).

In terms of macroeconomic adjustment, the Peruvian privatization process was launched with the Decreto 041 in 1991, which regulated the management activity of the state. The initial objective was to privatize as many as many public companies as quickly as possible. At first, the government included the privatization process of the main sectors that could bring the high revenue for the state. Therefore the first divisions that were privatized correspond to the telecommunication, electricity and mining sector (See Figure 3.2) and then the transport, fishing and tourism sector would be done in a second phase. Moreover, the state created the Special Committee for Privatization (CEPRI), which will be the responsible for the projects.

![Privatization Revenues By Sector (Millions)](image)

Figure 3.2: Private Revenue in Peru by Sector. Source: COPRI, 1999
In economical terms, the first part of privatization brought an income of US$ 3370 million and a sale of 65 enterprises, which reduced the higher inflation and increase the private investment in 5.4% of the national GDP. However, despite the increase in government revenues and future investment commitments, there were some problems that arose with this policies, such as the lack of transparency in the process and the poor public approval. In the transport sector, Peru privatized highways, roadways and trains that connect different departments. The urban train project was not privatized during this period.

In Brazil, between 1994 and 1997 Cardoso’s government took advantage of a favorable international situation to stabilize first the currency by introducing the real. The previous currencies, cruzado and cruzeiro, failed to survive the hyperinflation and therefore Brazil began to persist in neoliberal reforms which included the privatization of the most important state enterprises. However, some problems appeared even with this first wave of reforms in which the economic growth was slower. Although there were serious problems related with inflation in Brazil, the privatization process already began in 1991 with the Federal Program of Destatization (NPD). Between 1990 and 1994, the Federal Government privatized 33 companies, 18 of which were controlled companies and 15 minority shareholder participation of Petroquisa and Petrofertil. The Government obtained receipts of US$ 8.6 billion that, along with the US$ 3.3 billion in debt transferred to the private sector, brought the total to US$ 11.9 billion (BNDES, 2000). This first phase was seen as not successful because the reform problems comprises the political instability of 1992 and the lack of management of the public administration to use the resources for an improvement of some cities. This brought a large social gaps and increase of poverty in some regions of the North and South of the country.

In 1995, with the presidency of the Fernando Henrique Cardoso, a new phase of privatization was initiated, in which public services began to be transferred to the private sector administration. Moreover, the concessions were also initiated especially in the areas of urban transportation and highways. The aim of these new projects was to improve the rail operations and increase investment and maintenance. In this context, the new era of partnerships were established, reforming the urban transport sector in the different states of Brazil. As a consequence the projects studied here (Rio de Janeiro Metro Line 1 and 2, and Sao Paulo Metro Line 4) were conceived in this phase

In Argentina, the privatization process was lead by the administration of Menem. The need to change the management of some important assets was the first strategy from the Government of Argentina. In that time one of the most deficient infrastructure system was the railway system. The monopoly of a state-owned enterprise brought a high increase in the subsidies which the government was not able to pay. This inspired the privatization of the railway system by breaking state network monopoly into new concessions parties. The intercity railway connection was not the only privatized company. The underground of the city of Buenos Aires or “subte” changed the public management into a more private participation through the scheme of concession in 1994.

These reforms worked quite well in the years in which the economy was stabilized (1991-1999). However this reform also brought disastrous consequences after 1999. First, the money of the neighbor country, Brazil was devalued, and the new currency “real” entered with force in the market and therefore the investors could buy more easily dollars in Brazil in which the competence of consumer goods got cheaper than in Argentina. Moreover, the extensive debt that the Menem administration allowed the high devaluation of Peso by strengthening the unemployment and the poverty rates. As a consequence Argentina lost the confidence of investors quickly and the country was again floated in a crisis ([Chudnovsky and Lopez, 2008]). New measures were brought again by banning the Convertibility Law and therefore the economy gradually again reach the same economic levels as the beginning of the 90s. At the same time, a new concept arose to deal with the problems of privatization. This concept was named **Partnership**

### 3.3.4 Partnership

Partnerships appeared as a new phenomenon to work with the new projects in order to deal with errors made by privatization. According to the World Bank Institute (2010), there is a wide spectrum
3.4 Current Economic Conditions

of reasons as to why governments are seeking partnerships. The first reason is located on achieving Value for Money (VfM) and delivering better quality of services for the same amount spent by the public sector. The second is to provide increased infrastructure provision and services within imposed budgetary constraints. This will help to utilize private sources of finance via off balance sheet structures, and to accelerate delivery of projects which might otherwise have to be delayed.

For public parties, the involvement of private parties is desirable because they operate more efficiently than public organizations. Moreover, they possess the market experience and innovative creativity which public parties often lack. A distinctive feature of a joint product is that through the combination of functionalists of partners, a project is realized which could not have been achieved by single partner acting individually [Ham and Koppenjan (2001)].

The transport infrastructure in Latin America driven by the uptrend of this reform is undergoing the process of decentralization and more participation of the private sector, which includes Public-Private Partnership projects. For instance, the first private participation in the Peruvian transport sector was the BOT program (Build-Operate-Transfer) of the highway Arequipa-Matarani awarded to the private enterprise CONCAR S.A which finished on December 2007, and benefited more than five districts in the second most populous city in Peru. In Brazil, the biggest BOT program in transport sector is now implementing in the Line 4 of Sao Paulo Metro.

Public-Private Partnership is the actual tendency to implement infrastructure projects. The indicators show that PPP projects have also changed the actual economic conditions of Latin countries. Thus, the actual economic conditions of the Brazil, Argentina and Peru will be depicted in the next lines.

3.4 Current Economic Conditions

Despite the economic crisis suffered in the 80s and the 90s, Peru and Brazil have been carrying out economic policies that lead to a gradual improvement during the last 10 years. Moreover, they have shown relative high economic growth in relation with other Latin American countries. On the other hand, Argentina are making efforts to recover the economy sunk in the beginning of 2000s. Nevertheless, the three countries’ economy improved significantly in the last decade.

In Peru, the average annual growth maintained 6.3 percent between 1991 and 1995 (Inei, 2008). Since 2000, the country has experienced steady growth with an average annual growth of 4 percent between 2000 and 2005, and a later increase of 8.8 percentage between 2006 to 2008 (See figure 3.3).

![Figure 3.3: Annual Variation of GDP in Peru. (Source: Central Bank of Peru, 2009)](image)

As we can see, during the last five years, the Peruvian economy has been experiencing a sustained expansion of economic activity, reaching GDP growth rates of 7.6% in 2006 and 9.0% in 2007, ac-
3.4 Current Economic Conditions

accompanied by a similar trend of domestic demand. In particular, private consumption and private investment have shown a faster pace of growth, reflecting consumer and business optimism in a context of increased disposable income due to higher terms of trade and employment growth, specifically in the last wave “Macroeconomic stability” after the crisis of the 90s (Figure 3.4).

Peru has also experienced significant capital inflows, especially in foreign direct investment (FDI), contributing to economic growth and development of infrastructure. This behavior has been strongly related to structural reforms and better macroeconomic management, which accounted for stable inflows of long term capital, even during periods of financial crises. The private investments in 2008 reached more than US$ 27,296 million and gave the country the investment grade “BBB-”, which create a good perspective for the future investments (See Figure 3.5).

In Brazil, the economy is considered one of the biggest emergent markets in the world. Brazil has improved its macroeconomic policies during the last 10 years and has recovered rapidly from the different economic crisis mainly due to the internal market and the demand for commodity exports. Moreover, the responsible economic management and increasing monetary policy independence have good consequences in targeting inflation under control. In this context, the Central Bank predicts a GDP growth of 5% in 2010 (See Figure 3.6).
Furthermore, the actual presidential administration of Ignacio Lula da Silva has been working towards a solid global demand through improving the commodity prices, elevated liquidity to lower external indebtedness and strengthen the currency. The Lula’s policies for promoting investment environment has been fortified through a participatory method with the involvement of the citizens and minorities (Lula’s political party is left-winged). In addition, the Brazilian government is now encouraging public-private partnerships instead of privatizations in order to attract private capital (EDC 2010). The private investment for infrastructure accounts for 2.1% during 2001-2007. However, this tendency does not benefit equally to all the regions. There are differences between the states which has developed quicker than others. These inequalities bring also social problems between the high gaps of the socio-economic status of the citizens. Thus, Rio de Janeiro and Sao Paulo are the two main regions of the Southwest of Brazil that have been favored with the private investment and therefore they are the main cities that more contribute with the GDP in the country, but also they are the main cities with high rate of social inequality in Brazil.

In Argentina, the economy has passed through different phases which permitted to lost part of the leadership between Latin America. Although some political and economic crisis; the Argentinean domestic market is high compared with other countries such as Peru. It is still one of the strongest in South America and among their main macroeconomic features distinguish PBI, inflation and foreign direct investment. The actual GDP of Argentina grows in about 2.6% with respect to the previous year. Although as we can see in the figure 3.8, there is a small decline in the first months of 2009 due to the American Financial crisis, the numbers still are positive which convert in Argentina in one of the biggest economies in the world.
The Private investment during the last ten years oscillated between 16% and 18% of the total GDP, as a consequence of the stabilization program for stopping the inflation in the administration of Menem. These numbers has also been maintained during the last decade and has been beneficial to the Argentinean economy.

A body of world-wide literature agrees that, every positive change in macroeconomic policies should include a strong institutional framework which would provide the right environment for a stable economy. The OECD (2010) and the World Bank, define "Institutional Framework" as the formal provision that assign primary responsibility and the authority to an organization or group of agencies for the collection, processing, and regulation of arrangements or procedures to facilitate data sharing and coordination between the parties involved in a infrastructure project. In this particular case, the private party enters as a player in the traditional provision in order to provide techniques and experiences. The process of collaboration between the private sector and the public sector permits the formation of Public-Private Partnerships. Requirement of special provisions which include skill and experiences, are not usually found in the public sector. Therefore, to increase private sector participation in the economy and the style of carrying it out, is vital to require private sector skills. The experience in Latin America shows us that the privatizations and concessions projects, forms of partnerships, worked in different ways according to the institutional foundations.

Giuseppe Manrique August 2010
During the 90’s, the private sector became the main player for the development of infrastructure and the provision of public services areas that were traditionally conceived as public sector responsibilities. Thus, in order to gain a proper understanding of how governance worked in Latin America, it was necessary to become familiar with the institutional framework. An effective institutional framework is a key sign of the necessary commitment which provide confidence required for a project. The institutional context are composed by the agents and the laws that a country have been enacted. Thus, in the first case, the entities play an important role in shaping project behaviors in Latin America. In the next lines we will describe the agents in Public-Private Partnership projects in the cities of Lima in Peru, Rio de Janeiro and Sao Paulo in Brazil and in Buenos Aires in Argentina.

3.5.1 Institutions in a Infrastructure Project

The institutions which regulate and supervise the projects are fundamental for the success of an environment that seek to develop alliances within the new transport system. Moreover, the World Bank (2003), explained governance through the measure regulation quality, which estimated the perception on the ability of the government to formulate and implement sound policies and regulations, as well as to monitor the process of a PPP project. Therefore the agents that work in the process of projects of PPP and the institutional preconditions for concession projects can hinder or increase the limitations for Latin America in their both subway projects.

The establishments of appropriate and effective institutions are a prerequisite to create an environment that fosters private investment in public infrastructure. Institutions help to create and shape interests, influence the goals of actors, and constrain the options open to individuals to achieve those goals (Bloom et al. 2001). The work of Putnam et al. (1993) on institutions has a particularly strong resonance among development specialists, showing how institutional configuration creates ‘path dependency’, with different paths having different implications for growth. Hereby the description of the most important institutions in Brazil, Argentina and Peru

### 3.5.1.1 Institutions in Peru - ProInversion

In the Peruvian context, ProInversion (Agency for Promotion of Private Investment) is the institution responsible for encouraging both local and foreign private investment. This agency has evolved during the last years, because of the change from privatization to public-private partnership agreements in the transport sector (See Box 3.2). This agency created in 2003 seeks the promotion of private investments while providing assistance to regional and local authorities engaged in attracting investments. It also looks forward to improve quality of utilities and expand their coverage through modalities encouraging participation of investments non-dependent from the Peruvian State.

#### Box 3.2: Historical Analysis of Pro Inversion - Source: Pro-Inversion website www.proinversion.gob.pe

- In 1991, with the Legal Decree Nº674, the Commission for the Promotion of Private Investment (COPRI) was created to be in charge of the conduction and design of the Process of Private Investment Promotion in the sphere of the Institutions that comprehend the state-own enterprises, including projects of infrastructure and public services.

- In 2002, with the Supreme Decree Nº027-2002-PCM, the Commission for the Promotion of Private Investment (COPRI), the National Commission of Foreign Investments and Technology (CONITE) and the economic division of the Peruvian Promote Commission (PROMPERU) merged to form the Executive Direction of the Private Investment Fund (FOPRI).

- In 2003, with the Supreme Decree Nº095-2003-EF, the FOPRI changed to be the Private Investment Promotion Agency–PROINVERSION.
3.5 Institutional Context

- In 2006, with the Supreme Resolution 089-2006-EF, the PROINVERSION Steering Council consists of the following Ministers of State: Chairman of the Cabinet (Head of the Council), Minister of Economy and Finance, Minister of Transport and Communications, Minister of Energy and Mines; Minister of Housing, Construction and Sanitation, Minister of Production, Minister of Foreign Trade and Tourism and Minister of Agriculture.

3.5.1.2 Institutions in Peru - Regulatory Agents

With the wave of infrastructure liberalization that has spread throughout the world, many countries are working on the creation of new regulatory institutions to monitor the behavior and performance of their newly infrastructure projects. Therefore, governments are increasingly willing to abandon their regulatory competencies and to delegate them to specialized institutions that could assist the public sector. In the transportation sector, there are many regulatory institutions depending on the new infrastructure. In Peru, Ositran (Supervisor Agency of the Investment in Transport Infrastructure of Public Use) is the main responsible for the regulation of transport infrastructure for public use. It regulates the conditions of access in sectors where lenders operate, monitor the implementation of concession contracts to ensure efficiency in the operation of transport infrastructure for public use.

3.5.1.3 Institutions in Brazil - Federal Level

One of the significant steps for PPP implementation is the development of actors in order to encourage an attractive frame for the PPP projects. The Brazilian institutional agents work into two levels: the federal level and the state level. The federal level worked for the whole country while the state aimed to work at the local level. In Brazil, the federal actors were established after 2004, with the law of PPP and then each of the states has established their own actors to work within their own PPP projects. The project of Rio de Janeiro Metro was conceived in 1997 and therefore it was supervised only at the State level. However, the Sao Paulo’s Metro was directed by both level of authorities.

Even though the recent implementation at the federal level, it is common to find in the concessions process the following scheme 3.10 that refers to two important actors in the organization of a general PPP project in Brazil. Therefore first, we will introduce these actors at the federal level.
Management Council for Public-Private Partnerships (CGP) - Ministry of Planning
This institution was created as a branch of the Ministry of Planning to support the process of PPP in the selection of the project, the creation of bidding documents and contracts, as well as the opening of the bidding procedure for the projects at federal levels. In the case of transportation, both Metro Rio and Sao Paulo Metro works with the same entity but at state level. Both projects are included as a concessions that behoove to the states and will be depicted in the next chapter. The institution was created at the federal level because some important projects had to pass the approval of the federal government.

Federal Public-Private Partnerships Guarantee Fund (FGP) The Federal Guarantee Fund is a private legal entity that works as a Trust Fund of public assets at a federal level. It works as guarantee only for government payments and it aims essentially to protect private partners against contracting authority default risk and mitigate the “political risk” to the private partner. Bank of Brazil (Federal government owned bank) is the trustee entity for this fund which works through cash, public bonds, real estate and stocks.

The original system (before the Federal Government Fund was created) involved the finance of the state-owned banks in order to allocated the necessary funds for financing infrastructure projects only identified by Government. However, the crisis affected the original grants and the direct lending to the infrastructure projects. This situation did not permit that the banks facilitate the long-term deposits and other flexible financial mechanisms in order to achieve profit between money in and out. The national state-owned banks during the end of the 90s could not become a key player in financing infrastructure. However, during the actual times, the bank served as a consultant in order to assess the investment in feasible projects. The guarantee fund also works as institution to counteract the financial risk obtained by economic crisis. Together with the high growth rate of Brazilian economy and rapid development of the securities markets, the financial system of this country has seen a boom in investment funds.

3.5.1.4 Institutions in Rio de Janeiro - State Level
Before the consolidation of the federal agents in Brazil, the concessions and privatizations projects were held by the state level. The process of decentralization in Brazil brought an impact of PPP projects in the different states. Some of the obligations depicted in law are empowered to a lower level (of the states) especially in the transport sector. This includes the development of the projects in subways and urban rail, in different regions, such as in Rio de Janeiro. They enclose their own actors
3.5 Institutional Context

...to work in the Project of Metro Rio Line 1 and 2 which was signed by a concession contract in 1997. The figure 3.11 shows three state agents and one federal actor that worked towards the renovation of contract agreement of Metro Rio Line 1 and 2. In the next points we will define their roles and responsibilities in this project.

![Diagram of institutional context](image)

**Figure 3.11: State Agents in the PPP contract in Rio Metro Line 1 and 2**

- **Metropolitan Agency of Urban Transport - AMTU Rio de Janeiro**: The AMTU is the representative of the States and the municipalities in the Metropolitan Area of Rio de Janeiro which works in the planning, management and operation of public transport in the region. Its structure is composed of members of the state government, municipalities comprising the metropolitan area bodies and companies linked to state and federal transport operators and concessionaires of public transport services, representatives of various sectors of industry and academic institutions and specialized techniques in transport.

  AMTU main objective is to seek efficiency of public transport in the metropolitan region prioritizing the physical integration and operation. This agency is responsible for the creation of preliminary projects such as the creation of the Line 3 for the Metro Rio.

- **Management Council for PPP - CGP Rio de Janeiro**: The Management Council for Public-Private Partnership of Rio de Janeiro (CGP Rio de Janeiro) was created by the State Law 5068 and it works fundamentally towards the creation of bidding documents and the bidding process in a PPP project. Moreover, it was appointed as the major concession approval for PPP projects and its additional extensions.

  This institution did not work in the tendering process of the concession of Metro Rio in 1997, because it was created recently. However, its duties were related to the renegotiation of this project in 2007 when the consortium renegotiate the agreement for 20 years more.

  In addition to this, in the renegotiation process, this institution authorized the use of financial resources for any guarantee obligations incurred by government in PPP contract of the Metro Rio.

- **Regulatory Agency of Transport Public Services (AGETRANSP)**: The State Privatization Program provided the necessary framework to enable the creation of a regulatory body for the privatization and concession projects in infrastructure. Firstly, in 1997, the ASEP RJ (Regulatory Agency for Public Services) was created for the public projects in Rio de Janeiro, in which the State Government gave it full administrative autonomy to exercise regulatory actions, monitor, control and supervise concessions in the area of transportation, water and energy. Over the years, the ASEP RJ was dissolved but the State government create in 2005 the regulatory body only for transport named AGETRANSP (Regulatory Agency for Transportation). The AGETRANSP was created in the form...
of special government indirect administration, which include the same ASEP RJ’s duties established in laws, decrees, contracts or agreements.

According to official documents, the work of AGETRANSP should play an important role in order to deal with the problems of the Line 1 and 2 in Metro Rio. They should have been working towards ensuring the quality of service of the subway by supervising careful the transport services. However, these duties have not been working correctly in the actual situation. This entity has been criticized by many actors and by the media. Some of them (such as politicians or Ministerial members) stated that this institution lack of speed in their actions. The Public Ministry of Rio de Janeiro assures that AgeTransp is not putting attention to the problems of delay of the trains and irregular maintenance (See Box 3.3) and only take actions when the issues appeared in the channels of mass communication.

Due to some inefficient actions in this institution, the public acceptance of this transport has declined during the last year.

**Box 3.3: AgeTrans and Problems in Metro Rio (Source: Newspaper Ultimo segundo Brazil 23/02/10)**

The regulatory agency of Rio de Janeiro (Agetransp) ruled on Tuesday that Metro Rio should resolve in a period of 15 days, the operational problems that are causing the direct connection Pavuna-Botafogo (Line 1A). Since December, passengers have consistently complained of problems in the subway. According to users, the trains are overcrowded, the intervals between the trains are irregular and there are maintenance problems in some cars.

Therefore, the agency already declared that if the provider is unable to correct the flaws, the company will have to return to operation in the old ways, or transfer lines 1 and 2 to the State. Moreover, the Public Ministry of Rio presented a civil action requesting that the old subway operation should be restored including the return to previous conditions such as restoring the range of four minutes for trains intervals.

Agetransp said it will decide on few days whether to open or not a regulatory procedure to investigate the new subway problems. If this happens, this will be the fourth opened inquest by the agency since December, when the Rio subway began operating Line 1-A. The cases are still under the note and are under severe investigation and will be assessed in regulatory sessions.

The company Metro Rio stated that the project was validated by the state government and technical experts from the subway in Sao Paulo and Paris. The company also stressed that the direct connection Pavuna-Botafogo is working within the rules of safety without offering risk to passengers. "Both Line 1 and Line 2 operate with appropriate signs, which allows traffic control compositions and the safe transportation of passengers. The signs covered with black bags appointed by the action of MP corresponds to the equipment being installed by the licensee to make fully automated Line 2 and modernize the network, enhancing security systems."

Monitoring has to be effective in timely supervising project quality providing technical supports for the private partner. In Rio de Janeiro, the subways has been regulated by AgeTransp, but his commitment has been perceived as a failure from the social point of view. The monitoring group should be able to address any problem and communicate rapidly to the society.

### 3.5.1.5 Institutions in Sao Paulo - State Level

Sao Paulo Metro Line 4 is a Public-Private partnership (PPP) project of 20 years signed for its construction in 2006 by a BOT contract. Among the state agents which contribute to this project and coordinate other PPP projects, we can find the Company of Partnership of Sao Paulo and the Public-Private Unit of Sao Paulo. These will be described in the next lines (See figure 3.12)
3.5 Institutional Context

Company of Partnership of Sao Paulo- Companhia Paulista de Parcerias (CPP) This institution is aimed to provide guarantees in order to collaborate in the planning of PPP Program in Sao Paulo and support the activities of the Management Council of the State of Sao Paulo. Moreover, it is responsible for deciding on the technical studies of the preliminary proposal for any PPP project in the State of Sao Paulo and monitoring any study related with the technical studies and later showed openly to the public the results of these studies.

Public-Private Partnership Units - Sao Paulo (UPPP) Similar to the counterpart in Rio de Janeiro CGP, the Public-Private Partnership Unit works together with the development of the bidding procedures that are providing from the studies of the preliminary proposal of PPP projects. Moreover, it supports the technical activities in the preliminary phase in which proposals have already been submitted to the PPP Oversight Board. Sometime, it might also subsidize the decisions of the PPP Oversight Board concerning the approval of the preliminary proposals. It also enhances new methodologies for PPPs and assist the PPP Oversight Board in the elaboration of the final report of PPP in the State of Sao Paulo (SEP, 2010).

3.5.1.6 Institutions in Argentina - Secretary of Transport

The Argentinean institutional entities worked in a federal level as a difference with Brazil. The institutions that worked in the concession process came from the highest levels of the governmental spheres. This mean that government did not create a special institution for that and instead worked through a branch of the Ministry of Planning and Transport in Buenos Aires.

Moreover, in order to work correctly the economic reform, is necessary to have a good institutional context that support the policy decisions in the government of Menem. Thus, the institutional context means an important step in the economic consolidation in Argentina. Therefore the institutions and the regulations played an important role in the process of concession in the Metro of Argentina.

The Ministry of Federal Planning, Public Inversion and Services (through the Secretary of Transport of Buenos Aires) is one of the main actor of the involvement of the private investment in Argentina. This institution aimed to implement new policies in the transportation sector sector by coordinating studies to improve the quality of service of the Metropolitan Transport in Buenos Aires. It also participates in the planning of new projects which include the extensions of the lines of Metro and monitor the quality of service in the railway sector. The central government of Buenos Aires and the Secretary of Transport initiated the plan to promote the concessions of the Metro in Buenos Aires.

Moreover, as Brazil and Peru, the planning of a project should consider the approval of the Ministry of Economy and Finance and specifically the National Direction of Investment. They will work according to the annual plan of private initiatives. This entity will provide technical prioritization criteria with major budgetary agencies in order to find the best way to finance the project.
3.5.1.7 Institutions in Argentina - Regulatory Agencies

The rail transport in Argentina during 1991-1996 can be distinguished by an institutional instability and the overlapping of functions between the regulatory agencies [Papazian (2000)]. For instance, during these years, the government created 5 entities: The National Commission of Railway whose mission was to solve the problems between the state and the concessionaire in the contract agreement, the National Commission of Transport which regulate the service control of all the transport modes (including the metro), the Restructuring Program of Railways which control de concession process in the finance sector, the National Commission of Railway Transport which regulate the suburban transport in the metropolitan area of Buenos Aires and the National Court of Transport which worked to solve problems in the contract between the state or the users and the private party. The different variety of the regulatory agents in many cases can cause duplication of efforts and functions as well as lack of coordination between all of them, especially in the determination of conflicts in the contract. Thus, the concession of the Metro was heavily criticized by the private parties because the regulations also include a series of different procedures which can differ from institution to institution. As a consequence, the government of Argentina in 1996, made an attempt to centralize the regulation agents in only one institution: National Commission of Transport Regulation. As it is described in the study of [Papazian (2000)], this entity basically aims to control only the transport utility service after the implementation of the service.

3.5.2 Laws and Regulations on Transport Projects

The legislation and regulatory laws are important part of the institutional framework of a country, because they provide the necessary instruments to achieve some policy objectives. Moreover, the institutional laws provide the capacities needed to implement activities and programs related to forest policy implementation. The laws are enacted by the legislative authorities of a country over time which provide the legal instruments necessary to put into effect many of the objectives of a policy. These laws can affect the different phases because they set the necessary guarantees to create a good environment inside the projects.

Furthermore, the regulatory tasks should comprise the different stages of the project since the bidding process such as the evaluation of the competing bids; the review of the pricing rules (the impact of inflation on prices must be calculated in accordance with indexation formulas, for example); and the implementation process in which the firms behavior are monitored to ensure compliance with pricing, quality, and other obligations. Furthermore, some “rigid” rules have costs and, in some cases, some flexibility will be desirable. Therefore, the establishments of appropriate and effective institutional frameworks are prerequisite to create an context that fosters private investment in public infrastructure. Even for the countries where such an institutional environment already existed, it is important to ensure that laws are sufficiently flexible and responsive to keep pace with the developments in various infrastructure sectors. In the case of Latin America, the institutional circumstance is still incipient and has been working towards attend bottleneck facilities and the incompleteness of the contract.

This section presents the institutional law and regulation for the projects in Peru, Brazil and Argentina in order to see what are institutional gaps and limitations in Latin America in this aspect.

3.5.2.1 Regulations and Laws in Peru

The institutional framework works jointly with the legal context. In the case of Peru, it has made progresses in establishing laws and regulations for private participation in infrastructure. The legislative framework relevant to the innovative procurement models involves a series of laws, regulations, notes, circulars and implementation rules issued by the governments through supreme decrees.

According to Proinversion in its website (www.proinversion.gob.pe), the cornerstone of the legal framework lays down the rules necessary for the development of foreign investment in the country (Legislative
Decree No. 662, approved in August 1991). This decree includes the guarantees and promotion of private investment, establish the tributary regimen of private investment among others (See Box 3.4)

The general legal framework for foreign investment treatment is complemented by the Framework Law for Private Investment Growth, adopted by Legislative Decree No. 757 and Regulation of Systems of Private Investment Guarantee approved by Supreme Decree 16292-EF. The legal framework for investment treatment is based on the principle of "national treatment". The foreign investments are allowed without restrictions in most economic activities and do not require prior approval by their foreign status.

Every company has the right to organize and develop its activities in accordance with their own framework. It has abolished any statutory provision which establishes patterns of production or productivity rates and prohibiting or obliging any new technological processes.

**Box 3.4: Part of the Decree 662 in Promotion of Foreign Investment**

The State promotes and guarantees foreign investments made or to be made in the country in all sectors of economic activity and in any business or contractual forms allowed by national legislation. For these purposes, it shall be regarded as a foreign investments, the overseas investments made in income-generating economic activities under any of the following ways:

- Property contributions from foreign individuals or legal entities, through the National Financial System, the capital of a new or existing in any of the company forms identified in the General Law of Societies, in freely convertible currency or in physical or tangible such as industrial plants, new and reconditioned machines, new and reconditioned equipment, spare parts, components and parts, raw materials and intermediate products
- Investments in local currency from resources that are entitled to be proceeded from abroad
- The convertible bonds with foreign private equity;
- Investments located in the territory of the Republic;
- Intangible technological contributions, such as trademarks, industrial designs, technical assistance and expertise patented or unpatented which may take the form of physical goods, technical documents and instructions; among others

**Regulation on Approval Process** The approval process for transport projects in Peru can be defined as time-consuming because it depends on several factors (different institutions evaluate the project). Private participation in Peruvian public infrastructures is still at its initial stage. The approval process concentrates on the preparation phase. First the sector in which is conceived the project, is the responsible for the pre-selection of the investment project. In the case of transport, this sector is the Ministry of Transport with their own decentralized office. For instance if the project belongs to the city of Lima, the responsible for the identification of the project is the Lima Department of Transport. Once is selected the project, a pre-feasibility study will be conceived under the methodologies and procedures of the National Private Investment System (SNIP) according with the rules of the Ministry of Finance.

Then, the Office of Investment and Programming (OPI) evaluates the pre-feasible study (Term: 30 working days). The aspects that are evaluated embrace specification of objectives and results (quantifiable), risk assignment (public and/or private sector), private sector interest and implementation capacity of a Public-Private Partnership.

This report is sent to the Ministry of Finance (MEF), which through its direction Multiyear Programming General Direction (DGPM) evaluates the project execution that include a preliminary
comparison between the Model of the Public Sector and an alternative from the Private Sector (Term: 30 working days).

Then, the Steering Council authorizes the launch of the design of the investment project with the MEF report as background information and starts the feasibility study. The Investment and Programming Office (OPI) evaluates for the second time the aspects of socially profitable, sustainability and economic according to the parameters of the National System of Public Investment.

The last step in the approval of the project is done by the MEF which evaluates the cost-benefit analysis. If the conclusion is that the private sector can deliver the service or good with lesser costs or equal cost and better quality, the DGPM prepares a report which includes the modality of execution of the project, involving costs of implementation and operation, limits in the firm commitments and quantifiable contingencies, limits for granting and contracting of guarantees; and the forecast of budgetary availability. The following figure 3.13 summarizes the approval process.

Figure 3.13: Process of Project Approval in Transport projects

The regulatory institution that works in all the steps of the project approval is Ositran, however it is also well known that the Ministry of Transport and the Ministry of Finances are the main actors that supervise the correctly approval of their projects.

Regulation on Bidder approval As described before, the organization in charge of private investment within the scope of infrastructure and utilities is Proinversion. This is the entity which works since the project approval. It also establishes, based on technical, financial, economical and other studies, the infrastructure projects to be granted in concession. Its power comprises the determination whether the form of procedure to be followed will be that of Public Bidding or Invitation to Tender for Integral Projects.

Proinversion received the project approved by the MEF and realizes the processes of promotion of the private investment in agreement with the Unique Arranged Text (TUO) which includes the elaboration of the promotion plan. Then, the Executive Council evaluates the plan and is ratified by a Supreme Resolution and sends it to Proinversion. They elaborate, approve and disclose the tender terms and call for a bidding of the process. After that, Proinversion elaborates and approves the final version of the contract. The contract is sent to each of the bidders and the General Control National Bureau (CGR) which prepare a draft report. The tender terms are also regulated by Ositran, who act according to the legislative framework.

For each project, Proinversion appoints a special committee that is in charge of awarding the corresponding concession. Such special committee calls the Bid through a publication in the official gazette “El Peruano” and in other two newspapers of national circulation, during two consecutive days. In the cases of international bids, the call may also be done through a publication in the newspapers of the countries in which there may be interested investors.
Bidders may post inquires or request clarification on the bid conditions. Answers from the special committee will constitute part of the bid conditions and shall be available to all bidders at least fifteen days before the submission of offers. Bids usually include a “prequalification stage”, a phase in which bidders must demonstrate that they count with the minimum financial and technical requirements established by the terms and conditions of the bid. Only prequalified bidders will be able to present a valid offer. On this respect, it is important to highlight that it is also usual to allow bidders to present technical and financial information from their affiliated companies.

Proinversion in joint with Ositran, receive and evaluate the proposal of the bidders, and more specifically verify if the technical, economical and financial conditions have been met, according to the criteria established in the tender terms and the conditions of the Ministry of Economy and Finance.

Afterwards, Proinversion elaborates the Public-Private Partnership report, with the support of the sector. The argument is that the offer selected will generate more benefit for the society and will assure the sustainability of the service. Moreover the risks assumed by the Peruvian Government should be quantified. The evaluation criteria shall be described in the bidding conditions and should include, among other elements of evaluation, the following:

- Tariffs levels
- The concession term.
- The financial offer.
- The technical conditions.
- The guaranteed revenues granted by the State.
- The risks assumed by the bidder with respect to the cost of the project and the exploitation risks.
- The tariff adjustment formulas and its review system if applicable.
- The additional services offered.
- The environmental and ecological considerations.

Regulation on operation approval  After one private enterprise is granted with the contract, the contractor will get additional approvals to start construction of the infrastructure. Some other institutions are involved in granting the operational approvals, such as the Committee of the Roads and Railroads, General direction of Environment, banks which are the authorities responsible for safety, planning, land use and environment.

Regulation on financing  Peru and most countries in the world have had severe problems in securing resources to ensure the maintenance of infrastructure. For instance, highway concession systems, properly managed, have been successful in finding resources necessary for construction, rehabilitation, operation and maintenance of roads around the world. Moreover, if such concessions are designed in ways that create adequate incentives to the concessionaires, they face ideal conditions for good management of the business, which imply an efficient maintenance and improvement in the quality of the tracks. If this objective is achieved, ensure a substantial saving of resources to society, savings can translate into higher investment and growth.

Infrastructure projects such as highways and urban rail, have high requirement of investment costs to make profits over the long run. The source of finances, apart from the state, comes from loans of banks or foreign institutions such as the World Bank and the Andean Development Corporation (CAF- Coorporacion Andina de Fomento). In the railway sector, the institution that ask for the support of the projects is the Ministry of Finance and Pro Inversion.
Transparency law  The transparency law is a prerequisite for PPP projects because require the selection of the private concessionaire through competitive tendering procedures. When the tendering procedures and evaluation criteria are either not clearly established or are based on subjective judgments, corruption may emerge and potential bidders will be unprotected against arbitrary treatment and may be faced with transaction cost increase due to the extra money spent on bribery. Furthermore, even if the right bidder is selected, during the operation process corruption may occur because some government officials who accept the bribery from the operator may turn a blind eye on the level of service quality. As a result, moral hazard would be nourished.

Therefore, the transparency law may ensure that the institutional environment is guaranteed by clear and readily accessible rules and by efficient procedures for their applications. The purpose of establishing transparency law is thus to guard against corrupt actions or arbitrary decisions by government authorities and to help build up a confident institutional environment for public procurement and private investment.

In the context of Peru, there is the law 27806 on transparency law which intends to promote transparency of the acts of the State and the acts of the enterprises. It does not apply only to PPP projects but to all kind of problems. It tries to regulate fundamental right of access to information enshrined in paragraph 5 of Article 2 of the Peruvian Constitution, but it has not been working correctly during the last years. The Peruvian corruption has seriously diminished the level of public funds available for health, education, and other social and development services during the 90s. It has created a very unstable environment, prevailing law of the strongest to exploit as many opportunities as they can. Therefore, a political degeneration is the adoption of laws, programs and policies, without legitimacy, in order to seize public resources.

3.5.2.2 Regulations and Laws in Brazil

Brazil has been making many efforts to work towards a legislative and institutional framework favorable for the projects in Public-Private Partnership of the transport sector. The scarcity of budgetary resources to high cost projects and the international experience in creating new forms of partnership with the private sector enable PPP in Brazil to represent new form of private participation. Therefore, the proper regulations and the institutional framework is working towards giving more security in the legal process which permit the better planning of the project for both parties.

Brazil is a federal country, thus the most important rules come from the Federal Government. In the case of PPP, the Law 11.079 was enacted in 2004, and brought to Brazil a new legal framework for the partnership system. This law was a major improvement of the two previous law: General Law of Agreements - 8.666/93 and General Law of Concessions- 8.987/95, which did not specified the proper arrangement and even did not encourage any Public-Private Partnerships projects.

Federal Public Private Partnerships Law  In this context, the Federal Government with the Law 11.079 intend to strenghthen the ties with the private parties and maximizing the potential of the PPP for the development of new financing mechanisms.

Among the essential elements of the Federal Law includes:

1. PPP as a concession contract: Public-private partnerships in Brazil are defined as concessions contracts which can be derived in two types:

   (a) Sponsored concession: In this contract the Public Administration supplies with the direct payment and also includes the tariff charged to the users. It covers the provision of public services or public construction works.

   (b) Administrative concession: In this type of contract there is a direct or indirect payment of the Public Administration, provides all the compensation to the private partner for rendering such public service. There is no possibility for user charges.
2. **Tendering Process**: The selection for the PPP contracts should be made through competitive public bids always under the pre-qualification system and preceded by a public audience. In choosing among bids submitted, the decision will be based on the criteria of technical proposal, the lower tariff to be charged the end user and the lower compensation to be paid by the public sector.

3. **Trust Fund**: The Brazilian regulation covers the guarantees to be given by the Public Administration in favor of the private partner. Some of them includes the creation or use of special funds established by law or by obtaining security bonds from insurance companies not controlled by the State or international guarantees.

4. **Contract**: This article enforces the former laws of concessions by including contracts of PPP as long term agreements between 5 to 35 years with a possibility of renegotiation, clear sharing risk among the parties. Moreover, it includes large contract for over US$ 9 million (BRL 20 million) and the possibility of complementing user charges with government payments. The government payments are due as service is delivered and based on performance indicators. The most common contracts include BOT (Build-Operate -Transfer), DFOM (Design-Finance-Operate-Maintain)

State Rio de Janeiro Public Private Partnership Law  
The State Law of Public-Private Partnership - 5068- for Rio de Janeiro was established in 2007. It proceeds from the general rules of the Federal Law 11.079 but includes some features particular to this State. In this law, “PPP contract is considered as a long-term agreement between the government and private initiative, aiming to develop economic activities or social benefit for the collective interest of the State of Rio de Janeiro”. This law was considered important because two factors: the scarcity of public resources to support new investments in infrastructure and the need for improvements in the qualities of public services coupled which were not assumed under the traditional system of concessions.

The most important aspects of this law include the following guidelines:

1. **Transparency of Procedures**: This law aims to ensure the transparency of procedures and decisions, as well as the distribution of risks according to the ability of partners to manage them. Moreover, this law encloses the legal framework to ensure fair competition during the tendering process of selecting the contractor.

2. **Assign duties the Management Council for Public-Private Partnership (CGP) and the Unity of Public-Private Partnership (UPPP) in Rio de Janeiro.** Among its responsibilities, it includes the approval of projects for Public-Private Partnerships, and extensions to allow the opening of the bidding procedure. Establish models of bidding documents and contracts for public-private partnership as well as the minimum technical requirements for approval; authorize the hiring through the bidding process, to review the level of risk inherent in projects of public-private partnerships to be employed and the presentation of solutions in order to mitigate the identified risks.

3. **Legal treatment of the types of concessions.** The law gives special treatment for each type of concession. The administrative concession applies to projects between 5 and 30 years with a minimum of R$ 20 million (US$ 11.4 million) and risks shared in a form of BOT or DBFM; while the client concessions (concessões patrocinadas) applies to outsourcing of the services. Both of them, demand a contract in which several characteristics such as the concession period, form and conditions of service provision, formulas, etc; should be described explicitly.

4. **Assign a Fund of Guarantee:** The law provides special procedure of security in contracts of Public-Private-Partnerships. These guarantees are intended to encourage the private sector in provide a good proposal without any financial issue. Moreover, this law works towards ensuring a project from the public sector by granting funding. This grant is secured by special funds provided by law or by contracting with insurance companies that are not controlled by the government or provided by international organizations or financial institutions that are not controlled by the government.
5. Consumer Protection: Not only the relationship between the government and the private sector is important. The final consumer also plays an important role, therefore this law contemplate the application of the Consumer Code (Law No. 8078 of 11.09.90) through its Article 22.

**Tariff Regulation - Rio de Janeiro**  Tariff regulation on infrastructure projects such as Metro Rio is included in the State Law on 2869/79. The State of Rio de Janeiro, regulates through the price cap tariff. This tariff structure contains the limits that can be charged by concessionaires and is indicated in the concession agreement. Moreover, the private entity may charge different rate tariff depending on the technical characteristics and cost for the services, but it should pass through rigorous revision and be informed constantly to the users.

This law also includes any possible readjustment of the tariffs. It is allowed to change the tariff limit but it should first be in accordance with the contract criteria and approved by the Regulatory agency. Furthermore, every five years the State of Rio de Janeiro will review the tariff based on the cost services and return of capital. The method for reviewing the tariff will take into account the need to stimulate the increase of operational efficiency through the composition of costs, considered its effective development.

**Regulation on Project Approval - Rio de Janeiro**  In the State of Rio de Janeiro, the approval process for the subway project is very rigorous in the preparation phase of the public infrastructure. To get the approval of the project, the AMTU begin with the preparation of the feasibility study (or also named “technical study”) which should be in accordance with the State Transport System Plan and the State Public-Private Partnerships Plan. The technical study covers a series of documents such as the technical, economic and financial viability. Moreover, it considers a demand analysis, basic design engineering, specification of service indicators performance, risk matrix, financial evaluation, impact environment and the draft bidding documents of concession.

Once the technical study is prepared, the State of Rio de Janeiro can send the project to public consultation. Most of the projects in Rio were approved by the society because the origin of the project was conceived by public pressure. After this process, the members of CGT should revise the document.

In the case of the Metro Rio, the project included a second study carried out by a local consortium. This study helped to produce the preliminary background memorandum, the cash flow analysis, the environmental and safety assessment, the inventory of existing infrastructure and equipment, and the procurement documents. Finally, the project was approved by the members of the State, and was included in a Decree.
State Sao Paulo Public Private Partnership Law  As it is stated before, the Brazilian institutional framework of PPP established the projects of PPPs at the federal and state levels. Therefore the Brazilian PPP program will empower the federal government to issue completion guarantees, as well as to permit private sector players to pledge their revenue streams to lenders and permit arbitration to resolve disputes.

The states of São Paulo, similar to Rio de Janeiro, has already had laws needed to implement PPPs at state level and enacted some regulations. However, the São Paulo PPP program, meanwhile, deviates from the federal model in one important way. Instead of using a fiduciary fund, it creates the Companhia Paulista de Parcerias (CPP) to provide guarantees to private-sector participants. Public-sector assets will be contributed to the CPP, which in turn will issue securities and performance guarantees. The main project of PPP is the Subway of Sao Paulo Line 4 [Urda and Girolami 2004].

In this context, in 2004, the Law 11.688 enacted the Program of Public-Private Partnerships (PPP) in the State of São Paulo. It was established according to the Federal Law of PPP (as well as in Rio de Janeiro) in order to create a favorable environment for the implementation of Public-Private Partnerships in the State. The Line 4 of the Sao Paulo Metro was implemented according to some of this rules. Among some of the main characteristics of this law is included:

1. **Encouraging the private participation:** the private sector in the promotion of new infrastructure building Public-Private Partnership for the projects in Sao Paulo

2. **Fill gaps in current legislation:** Complementing the existing federal regulations on contracts

3. **Bidding procedures:** The law includes the framework of the process of bidding through an invitation letter followed by open auction. The bids in the open auction shall always be submitted in the reverse order of classification of the written proposals and the invitation to tender shall not limit the number of bids. The assessment of technical proposals, for purposes of qualification or bid appraisal, shall be conducted by a motivated act, based on requirements, parameters and indicators that are related to the scope of the contract, clearly and objectively defined in the invitation to tender.

4. **Transparency:** The selection for the PPP contracts should be made through competitive public bids under the requirements of the system. The criteria of the lower tariff to be charge to the final user and the lower compensation are the criteria for choosing among bids submitted. Moreover, it also includes a combination of these criteria with technical expertise. Thus, in order
to promote the transparency in the bidding process, the public administration should create an environment where the bidding models work under a efficient and fair competition system by giving greater legal security to PPP contracts, which includes specific rules for credit protection for the private parties.

**Regulation on Project Approval and Party Approval - Sao Paulo**  
The State Law 11.688/64 of Sao Paulo sets up the framework for the submission of preliminary proposals for the projects in transport infrastructure in PPP. The projects can be either initiated by the Public Sector or the Private Sector in which both can submit their proposals. These proposal will be aproved by the PPP Unit, CPP and the secretaries of the State. Moreover, if the proposal are not approved by the PPP Unit or CPP, it will not generate any cost for the State. Furthermore if the projects proposals have some points that needs to be clarified, they will be submitted to the first appreciation of the PPP Oversight Board.

In case of approval of the proposal, the PPP Oversight Board will authorize the corresponding studies and will begin with the elaboration of the financial, legal and operational studies. It will deliberate on the form of act of contract of studies and act of receiving of contributions techniques of the private initiative. After the technical studies, the Units of PPP and CPP will deliver a disclosed study in order to cover all the final aspects of the project approval. If it is approved later by the PPP Board, the draft of the project is sent to public consultation and then the bidding process can begin.

![Diagram of Project Approval in Sao Paulo](http://www.planejamento.sp.gov.br)

**3.5.2.3 Regulations and Laws in Argentina**

The Argentinean process of privatization began with the declaration of the Law 2637.93 (Emergency Law) which authorized the government to contract the private sector through its main transport system. This law has a special chapter of the privatization and participation of the private investment in which they encourage privatization and concessions agreements.

In the context of the privatization, the law establishes different modalities of privatization such as the sale of assets. The decree 677.2001 established the directions of transparency for public works in the public project. This law is evolution of the decree 102.99 which established the functions of anti corruption and transparency rules through the Agency of Anti-Corruption created in December 10, 1999.

Among its main functions, the institution proposed a fiscal action plan and the criteria for identifying policies in order to establish a transparent process in the bidding of a public asset. Moreover, it recommended the state institutions of any monitory and control plan in the implementation process of a infrastructure project and analyze any situation of administrative corruption and its causes.
3.6 Concluding Remarks

Regulation on Project Approval  In Argentina, project approval depends on the sector responsible of the project. However, in the case of the Argentina Metro, the decision began with national plan of privatization which was needed to improve the quality services of the rail infrastructure. Therefore, the approval process was not as tricky as in Peru or Brazil, in which the Ministry of Transport and the Ministry of Planning decided to concession the operation and the management of the Buenos Aires suburban railway. Moreover, Ferrocarriles Argentinos could not generate funds to maintain and improve the network adequately and thus contributed to the deterioration of track and equipment.

As a consequence, the Ministry of Planning took the decision with the approval of the Ministry of Transport and the Ministry of Finance to concession the network of 899 km of the services of suburban metro of Buenos Aires.

Regulation on Bidding Process  The concession process of the Buenos Aires Metro was made through a competitive bidding process. It was awarded through the function of the lowest subsidy requested by the concessionaire to operate the line and undertake the specified investment and rehabilitation program (Estache et al., 1999). Moreover, the bid required to deliver a schedule which included the gradual declining operating subsidies to be paid by the state. The best subsidy (the lower one) will be quantified as the ten year present value of the annual subsidy required to begin with the operation and the net of a cannon (net annual flow of the fee) to be paid for the use of track and stations (Gomez-Ibanez, 1993).

In other words, the winner of the project will be based on the bid that had the lowest net present value of the cost of the investment plan, subsidy paid by government and excluding the concession fee paid by the concessionaire. This method of awarding the concessions was more transparent, and have known as model for other concessions such as the Flunitrens in Brazil.

Regulation on Finance  Argentina created the program in Metro concession which included subsidies paid by the government. The Buenos Aires government had been working well during the period of 1994-1999 until the crisis hit the economy of Argentina. Therefore the government could not pay subsidies on time and thus decided to freeze the fare from 2002 (Phang, 2007). This generated a decrease in the quality of services, and therefore the rapid social problems arose. Moreover, the government had to renegotiate again the contracts with some of their concessionaires. However, the non-completion of the contracts made the government to rescinded the concession of one of the lines (San Martin Line) which also lowered the passenger demand.

3.6 Concluding Remarks

We have developed a description of the most important factors in the context that surround the transport cases. Some of the main facts are depicted in the next lines:

- Social problems such as poverty and informality have a high impact on infrastructure investment. Contribution to deal with social issues are perceived as improve the transport system. Therefore the policies in each country was mainly focused in addressing the transportation system in low-income zones. However, some aspects are still a concern in the head of the authorities. The relation between low-income zones and crime is high. The inclusion of a new transportation system without proper security can increase the risk of crime in these areas.

- Macroeconomic stability has attracted the foreign investment, including the transport sector, which has been considered an essential element for the support and development of economic activities. The three countries have been pushed to begin their reform process due to economic crisis that suffered in the 90s. The change in the economic policies have helped to increase more private participation and changed the administration from the public sector to the private party. This alteration was a method that took many years. The systematical replacement of a
“system directed by the state” to “privatization” and later to “partnership” have created a path to develop a new form of implementing infrastructure projects. Even though, the path brought social problems, it was also necessary to find the correct way to improve service delivery. Therefore, the economic context for the infrastructure project through time was favorable in order to provide some incentives to attract possible investors in the concession process. Some problems will be resolved and will generate sufficient revenues to cover operating costs.

- Argentina, Brazil and Peru countries have gained some experience and maturity with the years according to their laws. The Argentinean institutional preconditions are an example of a good institutional environment only in the transport sector during the beginning of the project. It includes almost all the regulations and laws ordain by the government. However, their laws did not stipulate the risk of an economic crisis and what to do in this case.

- In the case of Brazil, the transparency law is still a problem. This is very vulnerable to corruption and other probable abuses. The consequences of these corruptive behaviors would put obstacles in the way of selecting the right contractor in tendering process. The Transparency law, being emphasized by many public sectors around the world, however, has been legislated by few countries. Transparency is important in open acts because it can create a transparent, clear and open procedures that will allow the entrance of a wide variety of actors.

<table>
<thead>
<tr>
<th>Sao Paulo</th>
<th>Rio de Janeiro</th>
<th>Buenos Aires</th>
<th>Lima</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Intellectual property Right Law (9279)</td>
<td>- Intellectual property Right Law (9279)</td>
<td>- Intellectual Property Right</td>
<td>- Intellectual Property Right</td>
</tr>
<tr>
<td>- Transparency law</td>
<td>- Transparency law</td>
<td>- Transparency law</td>
<td>- Transparency law that does not work</td>
</tr>
<tr>
<td>- Regulation on Tariff</td>
<td>- Rules for Tariff (2865/97)</td>
<td>- Regulation on Tariff</td>
<td>- Regulation on Bidder approval and tariff</td>
</tr>
<tr>
<td>- Regulation on Finance</td>
<td>- Regulation on project approval</td>
<td>- Regulation on Finance</td>
<td>- Regulation on approval process</td>
</tr>
<tr>
<td>- Regulation on party approval</td>
<td>- Regulation on party approval</td>
<td>- Regulation on project approval</td>
<td>- Regulation on approval process</td>
</tr>
</tbody>
</table>

Figure 3.16: Different laws in Latin American cases

- Peruvian regulations seem to be cleared according to the international standards. However, corruption practices still are present in the projects. One possible cause is the lack of proper executions of laws and regulation from the judicial system. The contribution of an independent judicial system can work properly in the fulfillment of laws.

- Sao Paulo has already a law that include all the important issues in concession process unified in one. This is important because the procedures for the concessions and the possible topics related with them would be found easily in only one regulation. This mean that the property law, regulations on approval, regulation and tariff would be answer specifically for concession projects and not for a broader meaning.
Part III

Findings: Cases of Study
Chapter 4

Factors in Latin America

4.1 Introduction

According to the theoretical framework studied in Chapter 2, the success of PPP projects are strongly related with the context-related and intrinsic factors in PPP projects. Studies show some factors could create beneficial association with the private party but also they can create more bottlenecks in the subway infrastructures development faced by some governments. On one hand, a competitive tendering process provides a more efficient service delivery by opening the market access. On the other hand, the economic and political context might affect the project by decreasing the quality of service (Argentina) or by giving rapid negotiations without correct planning (Brazil). Positive and negative impacts in the success or failure of a project can be associated with different factors such as the transparent bidding process, an unstable political environment and the poor economic performance.

Therefore, these factors are not the only reason why projects can prosper or fail. Some other factors such as poor planning, lack of commitment to the project or incorrect allocation of risks might impact in the results of the subway or suburban PPP projects. This chapter explores the influence of these factors and their current application in PPP projects in Latin America. In order to know if a project is success, we identified in Chapter 2 three different success criteria. Contract success, Implementation success and Post-Implementation success are strongly related with factors. Thus, this chapter is also aimed to provide with information for the later examination whether these factors can obstruct or strengthen the PPP arrangements. Moreover, the actual local circumstances can help to detect the problems in its application through deliberate specific case studies.

The selected cases are the Metro of Rio de Janeiro; Metro of Sao Paulo and the Metro of Buenos Aires. These cases are a role model for the big metropolises in Latin America. The Metro of Rio de Janeiro was one of the first subways to be concessioned to a private partner in Brazil. The Metro of Sao Paulo was the first BOT project in the city of Sao Paulo which exemplifies the favorable business environment offered by the local government to private parties. The Metro of Buenos Aires was the first concession made to a private party after an economic crisis. Thus, these three cases show the different frameworks of PPP arrangements in the Latin American context. They illustrate the different financing realizations, the complex allocation agreement, the distinctive distribution on duties of investment, and the complex relations in construction and operation between public and private sectors. Therefore, the variety of these cases can bring several lessons for other new agreements in the Latin America and their success or failure of PPP schemes will largely depend on whether these factors and relations can progress smoothly or not.

Furthermore, to guarantee precision and adequacy of the research and produce high-quality outcomes, we looked in official documents and real data available in the website to analyze in deep information about the chosen PPP projects during the last decade in Brazil and Argentina. This information will help to understand more the critical factors and investigate the success of a PPP project in urban
4.2 Metro Rio- Brazil

During the early 90s, the lack of integration between the Metro Rio and Flumitrens (other suburban rail) and the poor demand of passengers in the first stations of the Metro resulted on people preferring to use bus instead of subway. They could easily reach different parts of the center of Rio. By 1995, a total of 9 million trips was carried everyday in Rio de Janeiro in the public transportation. In this case, 77% of these trips were done by bus while 3% were done by the subway (IBGE, 2000). The increase of the public vehicles lowered the air quality of Rio de Janeiro and the overcrowding metropolis battled to improve the transport system. As a consequence the environmental impact began growing and although vehicular air pollution has been somewhat mitigated by the use of green technology; the problem remains severe. Furthermore, the accidents in the Rio roads were still a danger to pedestrians who demanded a better transport system.

The local government of Rio de Janeiro owned one state company (CTC) in the transport sector and almost all bus services were provided by private parties. The following table 4.1, shows the basic data of the state-owned companies in Rio de Janeiro, in which the high annual subsidies received by the subway and the suburban rail left operating deficits that the state alone could not cover since 1995.

<table>
<thead>
<tr>
<th>Name of Company</th>
<th>Mode</th>
<th>Num. Employees</th>
<th>Annual num. passengers (million)</th>
<th>Annual Revenue (million US$)</th>
<th>Annual Operating Subsidy (million US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro</td>
<td>Subway</td>
<td>3272</td>
<td>97.2</td>
<td>31</td>
<td>109</td>
</tr>
<tr>
<td>Flumitrens</td>
<td>Suburban Rail</td>
<td>7871</td>
<td>93</td>
<td>34</td>
<td>180</td>
</tr>
<tr>
<td>Conerj</td>
<td>Boats</td>
<td>1097</td>
<td>24</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>CTC</td>
<td>Bus</td>
<td>2496</td>
<td>26.6</td>
<td>13</td>
<td>37</td>
</tr>
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<td>Total</td>
<td></td>
<td>14736</td>
<td>240.8</td>
<td>89</td>
<td>354</td>
</tr>
</tbody>
</table>

Table 4.1: Data of the State-own companies Rio in 1995 (Source Rebelo, 1999b)
As we can see the high costs of operation of the Metro made it impossible for the local government to continue with the administration of the subway. In absolute terms, the cost of operating the subway and suburban train are more expensive than the bus. However, the number of passenger were more than three times (3.6 times) higher compared with buses. This mean that in relative terms, Metro was more efficient in transporting more passengers and number of employees than bus. In other words, the concession program for Metro was a profitable business in 1995.

Other aspects that influenced the acceleration of the concession program was the economic factor. The economic crisis of the early 90s, the influence of the Asian crisis and the budgetary deficit, which embraced an inflation rate of 50% per month in 1992; helped to develop a series of reforms aiming to stabilize the economy. The first of these policies was the implementation of the Real Plan which permitted an initial boost in the economy. The increasing confidence in the Brazilian economy allowed new enterprises to invest billions of dollars in the different infrastructure projects throughout Brazil. Therefore, the urban problems and the new reforms pushed the beginning of the concession of its most important services in 1995, including the subway network in Rio de Janeiro named Metro Rio.

The Metro Rio (Figure 4.1) is the subway network that covers the city of Rio de Janeiro. It was opened in 1979 with only 4.3 kilometers which connected only five points of the city. The Metro Rio began its enlargement until completing 41 km at the year of the concession. In 1997, in order to address the Brazilian economic crisis and the lack of integration between Metro and other transport modes (no integration of 23-kilometer long Metro and the 264-kilometer rail network); the local government of Rio de Rio de Janeiro started the process of concession of their two lines (Orange Line 1 and Green Line 2). The main objectives of the new partnership include the following points [Rebelo, 1999b]:

1. **Ensuring Safety:** Rio faces high rates of poverty and street crime. The aim of the reform was to guarantee the level of service under safety conditions, specifically in rush hours where many many people concur to the facilities of the metro.

2. **Recovering Cost through Tariffs:** The tariff should be set together with a policy of subsidies in order to cover the cost of equipment and capital. The new companies in charge should reduce the cost and create a new funding mechanism to obliterate unnecessary expenses.

3. **Reducing environmental impact:** The pollution and urban congestion can be reduced through a correct planning of new line transport systems. The allocation of responsibilities together with the State Environmental Agency (FEEMA) in order to provide new cleaner and quiet transport.

4. **Reducing congestion:** Citizens are accustomed to use more buses and taxi transport which create congestion at peak hours. According to Rebelo (1999b) the inhabitant of Rio de Janeiro spends 10-15 days a years only on traveling because of traffic jams. Congestion and overcrowding of the public transport system also contribute to environmental stress.

The new reform of 1997 included the prior objectives of the government in the concession of the two Lines of the Metro of Rio (See Figure 4.2), which wanted to reduce the level of subsidies to the transport enterprises, improve the level of service provided and finance the maintenance of the metro. Therefore the option to attract more investors in the bidding process, would be very beneficial for the accomplishment of goals. Moreover, the main incentive to build this project was to halt the economic crisis of the beginning of 90s by increasing the private investment in the city. In the long term, it would work as a model for the operation of future lines in Metro Rio. In the next lines, the project of Metro Rio and their influential factors in this PPP project, will be described.
4.2 Project Background

In the early 90s, the heritage of the reforms of the government of the former president Fernando Collor carried a very critical situation in financial terms. Brazil needed a change in their policies in order to face the chaos at the different levels of their industries, which included the infrastructure sector. Therefore, the political administration in 1993 created the State Reform and Privatization Program in order to provide a solution for the railway sector that was hit by the crisis.

The privatization plan of Brazil included the concession of Metro Rio. This project was conceived within a context of changes of administration and restructure of institutions. This plan was appointed as a new tool to increase the private participation which allowed more coherent development of the sector by increasing the quality of services. The concession program aimed to improve the actual subways service system, permitting the elimination of subsidies of US$ 109 million at the start of the reform period.

This concession will include initially, the control of the administration and the operation of Rio Metro, while the expansion of the network of the metro and the acquisition of new trains would be responsible of the State Government. Two studies of the situation were carried by the government in order to shape the new design of the concession contract and the bidding. The studies recommended the state to introduced new mechanism to fund the subsidies in order to contribute to the future expansion of the Metro and the Flumitrens [Rebelo 1999a]. To increase the attractiveness for the private sector, the local government began the downsizing of the costs. As a consequence, the reduction of the overstaff was done by May 1996, in which 800 positions were cut. Even though, a high quantity of labor workers were discharged from their jobs, the government provided some mechanism to protect the former employees by giving some funds in accordance with the quantity of years they had worked. The overstaff has declined successfully and no protests were carried out.

The local government demanded that the concession of Metro Rio should have begun their operation no later than 1997. The management of the project was studied beforehand by the World Bank. They concluded that the government should pay a subsidy to the private partner. The Argentinean project of the Buenos Aires Metro served as model for the concession of Rio Metro. In this contract, the government would gradually reduce the subsidies and then after it declined to zero, the concessionaire would pay the government an annual fee. The model also included the call for bids to perform the implementation plan. This plan would be defined by the government but implemented by the private party. The formula for choosing the winner bidder project would be the lowest net present value for the cost of the investment plan, plus the lowest subsidies paid by the government, and deducting the concession fee paid by the private party [Rebelo 1999a]. The term of concession embraced a 20-year of agreement of 41 kms in which an extension of the metro line must be realized in the following years.
The implementation of the project is programmed to include the operation of two metro lines:

- **Line 1 - Orange Line**: Began its operation in the north of the city center which included the beaches in Copacabana. Then, it run through the main railway station to Estácio and Tijuca, where transfer is provided to Line 2. The first section of the line opened in 1979 between Glória and Praça Onze (5 km). After some years, it was then extended to Botafogo in the south and Saens Peña in the west.

- **Line 2 - Green Line**: This line started operating as a light rail - Pemetro line in 1983, near to a suburban railway alignment, leaving from Estácio station on Line 1. Then after some years, it was extended towards the north-western districts of Rio and in 1998 it reached the district of Pavuna. After that the light rail changed to a metro operation. The technical characteristics include some elevated parts of the train and new electric details.

The **Carioca** Government has given high priority to the project, since it is a core component in the economic and social development of Rio de Janeiro and surrounding districts. Nowadays, some studies are carried out to expand the system and be ready for 2016.

### 4.2.1.1 Technical scope

The concession program of the Metro Rio included a package of administration and operation of the network of 41 kms in Rio de Janeiro (Two lines: Orange and Green Lines) of the metro. However, the expansion of the network and the acquisition of new rolling stock would be obligation of the local government, not of the concessionaire (first contract). The project was conceptualized following the recommendation of the Master Plan of Rio (PDTU) which includes the carrying capacity of the rail-based system at peak hour, improvement of quality of service at the transfer terminals, reduction of delays in trains and a good maintenance of the rolling stocks.

### 4.2.1.2 Contractual agreement

Some important actors played a role in the concession agreement of Metro Rio. The Figure 4.3 shows the most important different stakeholders that were present in the agreement:

1. **Government of Rio de Janeiro**: The conception of a concession project in Brazil was done by the federal government. The National Privatization Plan was the first step for the government to face the crisis. However, the design of the concession was carried out by the local government of Rio de Janeiro which was appointed as the institution to approve the conditions of the agreement for the concession.

2. **Metro Rio**: After the project was approved, the new management and responsibility for the operation was transferred to the private party. The bidding process included 20 years of operation and subsidies paid by the state.

3. **Brazil National Development Bank**: The financing structure for this project contained a guarantee fund for nearly US$ 620 million, which was provided by Brazilian national bank

4. **ASEP RJ**: A regulatory institution aimed to ensure efficiency, quality and safety of services provided. Moreover, they supervise the operating process and structure incentive schemes to ensure adequate service quality and maintenance.

---

1. Term to refer to Rio de Janeiro

Giuseppe Manrique

August 2010
4.2 Metro Rio- Brazil

4.2.2 Analysis of the Metro Rio

This section will describe in more detail the most important factors inside the project Metro Rio. Factors such as socio-economic context, institutional factors, economic viability, project planning, value of procurement, trust & strategic behavior and risk management through the various phases of the project from the bidding to the operation, will be depicted. In light of this, we are going to work with the scheme of context-related and intrinsic factors developed in chapter 2. It will be used as tool to shape the success or failure of this case. In the case of the Metro Rio, we are going to analyze the concession agreement signed in 1998 and the operation of the Metro during ten years. The renegotiation contract will not be part of the study due to the availability of information encountered for this new contract.

4.2.2.1 Institutional Framework

Rio de Janeiro increased its process of private participation through the Privatization Program enacted at the end of 1997. It enabled the creation of institutions and regulatory bodies for privatization and concession projects in infrastructure. The ASEP RJ (Regulatory Agency for Public Services) was created for the public projects in Rio de Janeiro in order to supervise and regulate the concession agreements. Some problems arose in the post-implementation process due to the slow response of its actions. However, during the concession process of Metro Rio, the institutional framework was still incipient. There were some laws related with the concession program but there was no distinction between concession, privatization or service agreements.

Therefore, along with the maturity process of Brazil in 2004, the federal government created the Brazilian federal law on Public-Private partnership (Law 11.079) in order to provide with one set of laws connected especially with PPP projects. This is a big step in unified the legislative aspect. Incorporation of several regulation, such as the establishment of tariffs, regulation in party and project approval, were described in PPP law. However, transparency law was not correctly explained in this group.

Moreover, the guarantee fund was also created in order to provide economic viability in the long term.

4.2.2.2 Socio-Economic Environment

The negatives effects of trade liberalization and some other financial problems shocked Brazil in the decade of 90s. The Real Plan had to be stopped and the Asian Crisis (China and Japan are their
main export and import partners) in 1997, worsen the economic environment. Furthermore, during 1997-1999 the new currency real began a process of devaluation. In 1998 the real lost a total of 45% of its value, which increase more the socioeconomically gap of the different states in Brazil. However in 1999, a previous agreement with the IMF went into effect, in which they obtain the support of credit line of about US$ 18.2 billion, and other credit lines, which conform an international support package of US$ 41.5 billion. (Nations, 2010).

The progressive deterioration of systems due to the lack of investment from state brought a lack of productivity in the transport sector and the lack of a strategies for a proper improvement. Thus, the incorporation of new parties (private) was essential to face the current issues. The federal state and the local government of Rio de Janeiro, prepared studies for the concessions of their most important enterprises and estimated that the private participation in Rio's transport sector would ensure the project management and the investment in extending the system. In 1995, the government of Rio also faced scarcity of funds and Metro Rio was appointed as loss-making enterprise, which received subsidies that accounted in average as 8% of the total revenue of the city of Rio de Janeiro. Thus, the government of Rio has more than one reason to begin the process of concession of the Metro.

4.2.2.3 Economic Viability

The decision of doing the project was conceived due to the financial crisis that shock Brazil during the early 90s. This determination to find the partner was essential for the state of Rio. As a consequence, the local government provided with a plan in order to attract more parties in the concession.

The initial planning for the concession of Metro Rio assumed a compromise for the government to be in charge of the investment plan costs. This would attract more private parties to the bidding process. For that reason, the local government guaranteed the investment plan with a loan from the Brazil’s National Development Bank (BNDES) of US$ 620 million. Metro Rio has been already secured these funds ten years ago and could not be used before because of the debt that exist between the state of Rio de Janeiro and the Federal government.

The studies carried by the local government assessed that the project could bring community benefits such as the increase of quality of services of Metro and the reduction of traffic congestion in the roads. Moreover, the economic evaluation showed that the project can be economically viable if the government commit to encourage more participation. However, the return of the investment would not be immediately because the private should make some investment in the rolling stock and infrastructure. It would take some years to find profitability in the Metro, including advertisement in some station. Furthermore, the willingness and capacity of users to pay tariffs would remain stable because the tariffs are adjusted only by inflation every year (BNamerica, 2002).

This study also showed that the private partner should propose the implementation of the lowest subsidy schedule in the long-term demand of the subway. For the private investor, the incentive of the government to provide the funding for the implementation, could help to focus on the planning of the next lines rather that obtaining external funding. Furthermore, after implementing such investment plan, the private party would make their own investment to decrease cost by for example using better technology (Rebelo 1999b).

4.2.2.4 Project Planning

As already mentioned, Metro Rio followed the model of Buenos Aires. A study sponsored was initiated by the World Bank in order to identify the basic criteria that should be included in the bidding process. Some of the performance indicators in Metro Rio that would improve the service are shown in Box 4.1. The planning of the demand of the system and the recommendations for the correct operation of the network were carried carefully together with private consultants and the Secretary of Planning and Finance. This actor was of great importance in the bidding process because it gave an environment of transparency that is not common in this type of project (lack of a transparency law).
was not related to any operating agency, lowering the risk of transportation lobbies. It is a common Brazilian practice to have lobby activities in very costly business.

Moreover, the study also analyzed the demand of the system, prepared financial projects and examined the institutional framework. According to the financial projections, the system would required an operation subsidy for two years. The government of Sao Paulo was very strict with this measure and refused to grant this subsidies. The main reason was that all the investment would be financed by the state and thus the private party would not have any commitment with the funding. Moreover, some legal issues appeared with a law that does not permit subsidies to private party. Due to the incipient law in concessions in Rio by 1997, the legislative framework had to be changed because it did not consider that the state would pay any subsidy to the concessionaire or permit a “negative concession”. Furthermore, the state would finance the extensions and the rolling stocks and the private party would be responsible for only operate and maintenance of the metro. After some negotiations, the public sector agreed to introduce financing mechanisms to fund urban transport operating subsidies only for the future expansions.

**Box 4.1: Criteria established to improve the level of service in Metro (Source: WorldBank, 2009)**

- Average interval between trains at peak hour
- Punctuality and reliability for rail operations
- Availability of rolling stock
- Total number of paying passengers carried per day (linked trips)
- Operating subsidy
- Staff costs

Furthermore, the integration with the other transport modes such as the Flumitrens and SuperVias was also studied. The future extension of Line 1 to Ipanema was finished in 2006 but was not opened until February 2007 due to financial conditions. The second study headed by the State of Rio de Janeiro and private consultants, helped the contract arrangement with a more detailed analysis about the environmental and safety assessment, inventory analysis and procurement documents (Rebelo, 1999a). Furthermore, these consultants were in charge of the concession process. This process will be described in the next section.

### 4.2.2.5 Value of Procurement

Applying BOT-Build-Operate-Transfer as a form of concession in the Metro Rio was driven by the financing bottleneck of the Federal government in the mid 90s. The standard BOT means the host government or its authorized administrations provide the concessionary agreement as the base of the project financing to domestic or international private sponsors. The private company undertook the management and operation of the work. When the concessionary period expires, the ownership of the project must be delivered back to the host government entirely.

This section will explain the various phases of project Metro Rio. We will look at the propositions of bidding, operation and maintenance process from the first ten years (1996-2008) and see the results of the implementation of the project.

**Project Bidding** In this bidding process, the concession was given in two phases. The first phase includes the pre-qualification of the experience of the private parties with similar projects. Moreover, the technical proposals were evaluated by a grup of expert who assessed the performance targets of
frequency, reliability, safety and comfort. The private consultants were responsible for the evaluation of the experience, as well as organizing bidding in accordance with the approved selection criteria and requirements in the tender invitation dossier. Moreover, the proposals were also delivered to a special commission of the Rio de Janeiro Stock exchange which also verified the candidates requirements. This commission and the consultants verified the candidates and approved the proposal of 4 consortium in the pre-qualification phase.

The second phase was based in the comparison of the cost of the four proposals which was opened in a public session on December 19, 1997. The following table 4.2 shows the four final consortium and their bid in the concession of Metro Rio. As we can observe, the number of consortium that passed the pre-qualification phase was quite high and thus increase the confidence of the Metro situation. Moreover, the award criterion that imposed the State of Rio was the best offer above the minimum price (US$ 26.56 millions) including the material in stocks. This price was sharply criticized by some politicians and was clearly showed in bidding proposal of the four consortium which exceed by more than 3 times the minimal price. The Rio Stock Exchange was also present in this second round of qualification and helped with the evaluation of the bids. This brought a sense of transparency because the Rio Stock institution is a very respectful agent in Brazil.

<table>
<thead>
<tr>
<th>Companies</th>
<th>Bid ( million R$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oopertrans (Brazil)</td>
<td>291.6</td>
</tr>
<tr>
<td>Cometrans (Spain)</td>
<td></td>
</tr>
<tr>
<td>Andrade Gutierrez (Brazil)</td>
<td>205.5</td>
</tr>
<tr>
<td>Guanabara Diesel (Brazil)</td>
<td></td>
</tr>
<tr>
<td>CGE A Transport (France)</td>
<td></td>
</tr>
<tr>
<td>RATP (France)</td>
<td></td>
</tr>
<tr>
<td>Cascais Participacoes (Brazil)</td>
<td>133.7</td>
</tr>
<tr>
<td>Bozano Simonsen (Brazil)</td>
<td></td>
</tr>
<tr>
<td>Metrovias Argentinas (Argentina)</td>
<td></td>
</tr>
<tr>
<td>Emepa (Argentina)</td>
<td>111.1</td>
</tr>
<tr>
<td>MPE (Brazil)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2: Consortia Bidding in Metro Rio (Source: Rebelo, 1999a)

The consortium winner was the local Company Oppertrans in joint with the Spanish Company Cometrans. All the other competitors also involved a local partner in the bidding process, which drew a tendency in the last bidding process in Brazil. Furthermore, the Metro concession process was completed without any delay in the two phases of the qualification process.

**Operation and Maintenance**  The consortium Oppertrans assumed the operational control and maintenance of the Metro Rio on April 5, 1998. During the first two years of operation, Metro Rio was involved in reducing the staff costs and in beginning with the maintenance of the rail lines system and facilities. The private party invested in maintenance work such as the rehabilitation of rolling stock, signaling and telecommunications. An example of this is seen in the Box 4.2.

**Box 4.2: Example of Maintenance Work of the Metro Rio (Source: Powerwave, 2005)**

"The monitoring and supervision service of the Metro Rio was appointed by installing the advanced Operation and Maintenance System (OMS) at Telefonica Celular’s supervision center. This system consist of repeaters which are remotely-accessed via a CDMA modem installed in each unit; alarms that are interconnected with Telefonica Cellular’s supervision and control software. The OMS software also allows all possible parameter changes such as gain, output power, software upgrade, etc, as well as monitoring system behavior and CDMA channels in real time, using the Measurement Receiver (MRX) feature of Powerwave repeaters".
According to the contract agreement, the implementation of the extension of Line 1 with the finance of the state-owned company Rio Trilhos (representative of the State), should cover the stations of Cardeal Arcovenda in Copacabana, Irajá, Colégio, Coelho Neto, Engenheiro Rubens Paiva, Acari/Fazenda Botafogo and Pavuna. The Metro Rio accomplished the reduction of costs and the number of passengers served daily by the metro increased from the current 300 thousand clients/day to 500 million clients/day by 2004.

In late 2004, the Metro Rio entered into its process of reconstruction and extension. The constructor responsible for both reconstruction and extension was headed by the private consortium through local partners. After project completion, results of project quality inspection showed significant financial problems and the actual project costs exceeded the estimated costs in one of the stations. During 2004-2007 only the station of Siqueira Campos and Cantagalo station were finished but the inauguration of the later had to be postponed because of financial burdens. In spite of these problems, the results seems to have a positive outcome (See table 4.3) and thus in 2007 Metro Rio renewed the concession for another 20 years, then valid until 2038, with the same consortium but which a number of improvements announced in early 2008, including the finance and extension of Line 1A.

<table>
<thead>
<tr>
<th>Category</th>
<th>1997 Before concession</th>
<th>2007 - 10 years after concession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Num. Employees</td>
<td>5000</td>
<td>1740</td>
</tr>
<tr>
<td>Route Km</td>
<td>25.3</td>
<td>36.9</td>
</tr>
<tr>
<td>Num. Train Station</td>
<td>24</td>
<td>33</td>
</tr>
<tr>
<td>Passenger Volume (per day)</td>
<td>308 000</td>
<td>550 000</td>
</tr>
<tr>
<td>Weekly hours of operation</td>
<td>102</td>
<td>130</td>
</tr>
<tr>
<td>Annual Deficit (Gov subsidies)</td>
<td>US$ 100 mill</td>
<td>US$ 0</td>
</tr>
</tbody>
</table>

Table 4.3: Comparison of Metro Rio 1997 and 2007

Even though the improvement of the figures in the Metro Rio (specially in the subsidies), the service quality during the last years (since 2007) have been criticized by the consumers. First, the increment of the passengers in the Metro Rio was about 80% and the demand for new transport facilities was a priority. The great demand of the passenger, problems related with the facilities (leakages, old infrastructure) and the bad frequency of the arrival of trains permitted the process of deterioration of Metro Rio.

In some station of the Line 1, it still used the same rolling stocks of the year 1980 when it was inaugurated. This includes the poor maintenance of the facilities in Metro Rio. As a example, some of trains do not have air condition or they stopped working for months which generate a suffocating mean of transport in the summer. Furthermore, the overcrowding precluded the good management of cleaning the rails, wagons, platform and stations. As an example some fungi born in the piping of air conditioning which brought bad smell and would have been the source of many diseases (See Figure 4.4).

Moreover, problems related with the frequency of the trains arose. The interval of the trains was about 6 minutes in 2000, which was an acceptable level. However, over the time, the interval of the trains began to extend to 8 minutes in some of the stations such as Cinelandia and Carioca in the center of Rio de Janeiro. As a consequence, the stop of the stations were overcrowded and many security problems appeared.

Citizens were really upset with the poor performance during the last years of operation of the consortium. They promised to offer a good service quality and efficient means of transport but they could not achieve to maintain the same long-term strategy. Moreover, the safety performance was also left behind and the safety procedures could not followed correctly. Therefore, after many months later, the Regulation Authority - Agetransp, gave a ultimatum to the private party in order to establish the
4.2 Metro Rio - Brazil

quality of service of Metro Rio. Otherwise, the concessionaire will pay an amount of US$ 56,524 per day as a fee to violate the contract agreement. The concessionaire already accepted to improve the quality of service but until now the results are still the same.

Figure 4.4: Problems generating by the increasing demand (Source: Gonzales, 2007)

4.2.2.6 Trust

Strategic behaviors from the contractor were lessen from the robust bidding process. The Stock exchange of Rio institution is a highly respected institution that provided a transparent evaluation of the bids. Even though, the World Bank procurement guides (WorldBank, 2009) did not contemplate the use of the certified broker associated with the Rio Stock exchange, this institution provided the sufficient guarantees for a transparent process because it also included a certified agencies. Moreover, the state also prevented the formation of cartels, which was not possible because the state provided some time to other bidders to join.

Additionally, the state provided some attentions to monitoring costs on this project as it is the first concession of the railway in Brazil. This project was also deeply concerned by the officials from the Ministry of Communication in terms of its contractor selection and construction. Furthermore, problems of corruption during tendering were not found. Powerful officers did not try to corrupt in such a project with substantive attentions and monitoring efforts. Therefore the commitment between both parties during the first years of the operation of the Metro Rio could achieve good levels of service quality.

In the operating process, renegotiations in the Metro Rio took place in 2007. In this context, renegotiations could be addressed according to the institutional circumstance and the formulation of complete terms in order to foresee future contingencies. However, after the period of renegotiation of the contract, Metro Rio has suffered gradually from profit loss. The decline of the quality of service, involving problems on train intervals, technical problems on air conditioner and the slow action of the monitory systems brought the decrease in the level of acceptance of Metro Rio.

Metro Company justified their actions of failures and breakdowns in the system, by claiming technical limitations and that their priority for finishing the extension of Line 1A. As a consequence, after some months of public complaints, the regulatory authority brought the case to the court because of non-completion of the contract. The concessionaire has to pay a fee for the poor service, improve the air system in the trains and bought new 19 rolling stocks for the connections of Line 1 and 2 in order to improve their connectivity.

Giuseppe Manrique

August 2010
4.2 Metro Rio- Brazil

4.2.2.7 Risk Management

This project was the first type of concession agreement in Rio and previously only contract management were carried out. As a consequence the State of Rio de Janeiro used some guidelines that were already identified by the Management Council for PPP and the local government of Rio de Janeiro in order to deal with some priority risk for the government. It should be noted that in the specific case of Metro Rio, a study of the risk was conceived in order to serve as a model for other concessions of transport modes such as the Flumitrens. In this study carried out by the State of Rio, the most important risks that State of Rio bore were the Political Risks, Market-Related Risk and the Maintenance Risk.

Political Risks  The incapacity of not having a good institutional arrangement, imprecise law and wrong actions from agencies conducted laws may generate political risks which jeopardize the project. Specifically, primary political risks include currency inconvertibility and transfer restriction, expropriation, breach of contract, delay in approval, change in law, corruption are often occurred PPP projects. However in the concession of the Metro Rio, the political administration of Rio was one of the topics that the public and the private party did take into account. Firstly, the state and municipality administration were controlled by different parties which brought political opposition during the first phases of the project. One of the parties opposed to the concession of the service claiming that the Metro should be a responsible of the state and not of the private parties. The concession was used as a political instrument to argue that the winner of the concession would not be able to cover all the cost and that the business plan of each bidder would not prove the full operation of the system. This claims were defeated by the National Management Council of PPP and there were no strikes or any protests against the concession.

Moreover, the public sector allocated the political risk on their side. After the negotiations with the private parties, the government mitigated this risk with some guarantees funds if there was a unilaterally change in the law from the new government of Rio de Janeiro. The variations in legal system or changed macro-adjustment policies must have been approved and implemented by the state government; thereby the legal risk certainly should be retained by the public sector. Finally, the public sector also assumed the majority of the financial risk which was also very important in this concession process.

Financial Risks  The inflation risk in the state of Rio de Janeiro, was also an important point in the agenda of both parties. Even though, the inflation rate was not high after the Brazilian financial crisis, it could cause several problems if it was not mitigated correctly. It was consider that the impact of inflation factors from the perspective of project finance could increase if another financial crisis would happen. Therefore, the government of Sao Paulo assured the project with already the funds from the World Bank and obtained the trust of the private partner. The change in the real prices can lead in the alteration of the tariffs and thus take with the reduction of the revenues. In the case of the Metro Rio, the tariffs can only be updated for inflation according with formulas stipulated in the agreement contract which included the alteration of the inflation indexes.

The economic risk incurred by foreign exchange was also borne by the state of Rio de Janeiro because private sectors can not influence it at all. The economic risk incurred by market demand also was retained by the public side because the anticipated incomes of subways depend on the tariffs which was highly regulated by the state of Rio.

Bad Maintenance Risk

The risk related with maintenance problems were allocated with the private party. As a consequence the problems related with the bad service quality including the low frequency of trains and the facilities issues, were responsible of the consortium Opportrans. In this context, the regulatory agency that
supervise the good quality service of the Metro was also responsible to not act quickly to give regulations on time to face this issues. The role of the regulatory agencies is very important to mitigate the risk of bad maintenance from the private because they can keep control of the performance indicators and supervise the works of the operator. As a consequence, the output quality could not be properly monitored and thus the incentives of the operator to lower costs by reducing quality, increased. Thus the citizens paid the high price of the bad maintenance.

Other risks were allocated according with the following table:

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Description</th>
<th>Mitigation</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate Risk</td>
<td>Risk that changes in the rate interest during the term of project may affect the structure price of the service</td>
<td>Protection mechanisms to ensure rate changes such as a mix of fixed rate and floating rate instruments. Tariff adjustment formulas that implicitly share risk through the way they adjust the tariff over time.</td>
<td>Shared</td>
</tr>
<tr>
<td>Foreign Exchange Risk</td>
<td>Risk of currency mismatch between the revenue in local currency and the national expenditure investments financed with foreign currency.</td>
<td>Establish clauses in the contract about the monetary readjustment of the tariff through index that captures the variation of national currency</td>
<td>Shared</td>
</tr>
<tr>
<td>Tax Risk</td>
<td>Risk of change in the structure tax</td>
<td>Allow the recovery of imbalance of economic and financial in the contract due to the tributary impact</td>
<td>Public</td>
</tr>
</tbody>
</table>

Table 4.4: Market-Related Risks

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Description</th>
<th>Mitigation</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration of Project</td>
<td>The configuration of project will not allow the perfect achievement of performance service.</td>
<td>Establish of criteria for performance-related variables to the concessionaire</td>
<td>Private</td>
</tr>
<tr>
<td>Construction Risk</td>
<td>Risk of adverse occurrence during the construction period.</td>
<td>Get local partners who have extensive construction experience.</td>
<td>Private</td>
</tr>
<tr>
<td>Risk Industrial Relationship</td>
<td>Industrial relations can affect the schedule project design</td>
<td>Ask the private partner to submit the agreements that were signed with suppliers</td>
<td>Shared</td>
</tr>
<tr>
<td>Risk of operator failure</td>
<td>Risk of the operator does not obtain sufficient resources to continue operating</td>
<td>In the first phases, ask the private partner for their financial statements and create monitory incentives</td>
<td>Private</td>
</tr>
<tr>
<td>Risk of not good maintenance</td>
<td>Risk that the design or quality of construction will be insufficient</td>
<td>The private sector should be able to manage long-term contracts with subcontractors or in establishing PPP contract criteria performance.</td>
<td>Private</td>
</tr>
<tr>
<td>Risk of obsolete technical innovation</td>
<td>Risk that service provided would be ineffective due to obsolete technology.</td>
<td>Establish in the contract some criteria evaluation for the operational performance.</td>
<td>Private</td>
</tr>
</tbody>
</table>

Table 4.5: Project-Related Risks
4.2 Metro Rio- Brazil

4.2.3 Evaluation of the project Metro Rio

In this section, we will describe the most important findings in the concession of the operation and maintenance of Metro Rio:

<table>
<thead>
<tr>
<th>Project Characteristics</th>
<th>Topics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Size</td>
<td>41 km of Line 1 and 2 of Metro Rio and inclusion of possible extension - Concession agreement</td>
<td></td>
</tr>
<tr>
<td>Construction by</td>
<td>Public Sector</td>
<td></td>
</tr>
<tr>
<td>Operation by</td>
<td>Private Sector</td>
<td></td>
</tr>
<tr>
<td>Contract Duration</td>
<td>20 years</td>
<td></td>
</tr>
<tr>
<td>Payments by government</td>
<td>No payments</td>
<td></td>
</tr>
<tr>
<td>Award Criteria</td>
<td>Net present value of Best Offer above minimum price and rolling stock (US$ 25 million)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Institutional Framework</th>
<th>Privatization Program incentivized PPP projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>No transparency law</td>
<td></td>
</tr>
<tr>
<td>Socio-Economic Environment</td>
<td>Economic crisis encourages Privatization Program</td>
</tr>
<tr>
<td></td>
<td>Big social problems in Rio including crime, drug traffic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Viability</th>
<th>Secured a loan of the Brazil’s National Development Bank (BNDES) - US$ 620 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Planning</td>
<td>Project boosted by the financial crisis Involvement of the Secretary of Finance and Planning , as a trusty entity</td>
</tr>
<tr>
<td>Value of Procurement</td>
<td>Bidding process included the Rio Stock Exchange which bring a sense of transparency Short term of operation results were positive. It includes the increase in the ridership</td>
</tr>
<tr>
<td>Trust</td>
<td>Strong commitment only in the first years of operation, but then some issues arose Decline of quality of service due to lack of monitoring schemes</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Political risk mitigate by the guarantee funds The slow action of the regulatory agency increased the bad maintenance risk</td>
</tr>
</tbody>
</table>

Table 4.6: Summary of key points in Metro Rio

- **Economic crisis is the driving tool to begin the plan of concession**

A weakening of financial conditions in the Brazilian economy, marked by strong deflation of assets, contributed to reduced dynamism in the Brazilian capital market and therefore permitted the creation of the State Reform and Privatization Program in Brazil. The economic policy decision aimed at increase the private participation and accelerate the expansion of the economy to restrain inflationary pressures. Moreover, the poor demand in the subway system at the beginning of the 90s allowed the quick change of administration of the Metro Rio.

- **Economic viability was secured by guarantee funds**

The studies related to the Metro Rio concluded the considerable economic benefits for the subway system with the development of a business plan for the project. These benefits were bonded by the Brazilian National Bank through a secured guarantee. The financial capacity of the national entity provided sustainably and credibly support for the project. Moreover, the availability of public capital to expand service provision in the subway system permitted the support of the project by improving the economic factors and reducing the political risk.

- **Doing the right project**
Privatization of the transport sector in Rio de Janeiro Metropolitan Region represented a valiant effort by a state administration to increase private sector participation and reduce costs in a sector that had been heavily subsidized. It allowed the State to get out of a business in which it had no comparative advantage, to depoliticize the process of appointing directors, and to obviate the need to pay subsidies to expand the sector. Thus, with the help of the Brazilians authorities and the studies of the World Bank, the project was chosen at the best moment for alleviate the troubled subway services

- **Clear bidding process**
  Many foreign investors bid on the concession without no international road show. The good planning of the project permit the inclusion of many partners. Moreover, the consortium winning the concession was led by a foreign company and a local investment bank. This shows that there were no preset strategy to favor local companies. Moreover, the use of the Rio Stock Exchange to present and evaluate bids was another factor that represented trust and transparency.

- **Acceptable short term results in operation**
  First, the reduction in the subsidies were successful. The operating deficits in Rio de Janeiro were as high as 8% of State revenue and were decreased in the first years of implementation. Moreover, these high deficits made difficult for the political opposition to resist the concession plan. Second, there were no strikes or destruction of inventory, immediately after the sign of the concession. It is very common in Brazil that when a state-owned company was taken over by the private sector, many protest were held. The concession process was undertaken in one shot, and initial legal injunctions against the concession were easily defeated. Thirdly, during the first five years of the operation, the demand for the subway increased substantially

- **No long term plan for operation**
  Privatizing urban transit in Rio de Janeiro should raise the level of service and benefit the low-income residents. Brazilian’s subway infrastructure must be operated for the long-term public interest. However, tempted by short-term cash and short-term mind, the local government relinquished public control over the management and planning of transportation networks and failed to receive fair value for these assets. The lack of involvement of the actual concessionaire and the low monitory schemes from the government allowed the decline of the quality service of the subway and thus increasing problems. The state already took some initiatives to stop this situation but was seen as late response for the issues generated by the concessionaire.
4.3 Sao Paulo Metro

The vast region of Sao Paulo is the economic center of South America and covers 8000 square km of the Brazilian territory. A total total population of 18 million inhabitants in the region and 11 million inhabitants in the Paulista city, generates nearly 22% of the National GDP. This city has been growing disproportionally as the effect of the urbanization since the last 50 years. Thus, the choice to connect two distant districts Santana and Jabaquara with the city center, was conceived in 1968. This decision was the beginning of the construction of Line 1 of the subway system called Metro Sao Paulo.

Nowadays, nearly 39 million people-trip take some trips in Sao Paulo in which 13 million are walking trips, 14 million by auto and the rest by public transport. Citizens in Sao Paulo use the bus (23%), metro rail (4.5%) and only metro (2.5%). Metro Sao Paulo is divided five-colored lines which cover an extension of 62 kms, the largest network in South America.

1. Line 1 Blue - The first line of Sao Paulo metro began its construction in 1968, and started its operation in 1974, from Jabaquara to Vila Mariana. In 1975 the line was complete, from Jabaquara to Santana, and with this the northern and southern part were connected. In 1998, it was extended to Tucuruvi.

2. Line 2 Green - It was inaugurated on January 1991, with an extension of 2.9 km of extension and 4 stations. It was ready for service in the most important axis of the expanded center of Sao Paulo, with a high concentration of financial institutions, state secretariats, radio and television broadcasting stations, theaters, and museums [MetroSaoPaulo 2010a]. In 2007, the extension of Line 2 was inaugurated which cover 11 stations and 10.7 km long.

3. Line 3 Red - The construction of Line 3-Red was directed by the urban planning measures that were carried out in Line 1. It covers 22 km in length with 18 stations. Today it connects the Palmeiras-Barra Funda and Corinthians-Itaquera stations, transporting 310 million passengers per year.

4. Line 5 Lilac - It covers the most unprivileged areas in the Sao Paulo Metropolitan Region, in which the districts of Capão Redondo, Capela do Socorro, Campo Límpo, and its surroundings are included in the network of Line 5. It insures a 8.4 km of extension and 6 stations.

Figure 4.5: Metro Sao Paulo
5. Line 4 Yellow - It will have a highly strategic and structuring function within the high capacity urban transportation network which will be of fundamental importance to the current collective transportation system with a length of 12.8 kms and 11 stations.

As in the case of Rio de Janeiro, the Sao Paulo Metro suffers from the lack of full integration between other transport modes. Thus, buses and cars increase the congestion and discourage more rail trips. According to the study of [Rebelo 2009], the poorest citizens of Sao Paulo were the main users of public transport.

Moreover, some problems during the first years of the operation of the metro were:

- There was a deficit of capacity at peak hours resulting in overcrowded conditions,
- The journeys can take 2.5 hours per day from the metropolitan periphery to the urban centers, with often more than two modal transfers;
- Fares were to high for the poor people.

However, by the end of 2004, the State and the Municipality of Sao Paulo started to coordinate their transport policies through a new plan of integration of the buses and the rail transport modes. Moreover, the introduction of single tariff with a lower cost can be used in different transport modes. Thus, the demand in transport mode increased and the need for new stations and the accessibility of the network to the West part of Sao Paulo and the city center, raised the decision to construct a New Line, named Line Yellow.

**Line 4 Yellow**

The Line 4 began as a project of the State of Sao Paulo in order to connect the west side of the city (See Figure 4.6) with the center through an integrated network. The first draft plan was conceived with the other lines but it was not until 90s when the first basic project was prepared without the southeast section. This project will be used as a link between the Line 5 Lilac and the urban rail network. Moreover, it should connect other 3 Metros lines as a form of grid configuration. Among the main objectives of the Metro Line 4 of Sao Paulo, [Ribeiro 2004] detach:

1. Improve quality and long-term sustainability of urban transport in the city of Sao Paulo by interconnecting the transport mode with Line 4 Yellow
2. Improve accessibility of low-income population to transport facilities
3. Seek private sector participation
As a consequence, after some years of studies, the decision to use a Public-Private Partnership began in 2003. The Line 4 Sao Paulo Metro is the first Private Public Partnership project in Brazil financed by international markets. The major incentive was to build the first PPP agreement under a BOT contract. The financial structure itself is built around an innovative two-phase loan framework. The contract was signed on November 2006 through a BOT scheme, which will last for 30 years. After this time period, the system will be transferred to the Sao Paulo municipality. Moreover, in the long term, it will connect two sides of the city which was forgotten by the former authorities.

The Line 4 would have an extending area of 12.8 km, which will connect large economic concentration centers, such as the Historical Downtown Area, the New Downtown Area (Ave. Paulista) and the Pinheiros-Faria Lima region. Furthermore, it would incentive the internal articulation of the city’s Historical Downtown Area and its relationship to the the New Downtown Area and would also interconnect both areas to Pinheiros/Faria Lima and Buntantã in the west and the Brás, Pari/Oriente in the east, important districts in Sao Paulo.

4.3.1 Project Background

The Line 4 will be a principal commuter route that runs southwest to northeast through metropolitan Sao Paulo. This line connect Luz Metro station in the central area of Sao Paulo to the municipality of Tobao da Serra in the south east. Thus, the PPP of this Line should consider the improvement of accessibility, availability, acceptability and affordability of public transport services particularly for the low-income segments of the population. This project is being built in two phases. The completion of both phases are expected to reduce the number of vehicle-kms by road-based modes mainly buses which will shorten their itineraries by feeding the stations:

- Phase 1, From Luz to Vila Sonia, covers the construction of 12.8 km of line, 6 stations, the structure of 3 intermediate stations, systems items and 1 depot at Vila Sonia station
- Phase 2 will conclude the finishing of the intermediate stations, the construction of 2 new stations and complementary systems items.

The State of Sao Paulo took the decision to use PPP in Line 4, because the local government also wanted to target other investment projects for the city. Thus the division of risks with the private partner will help to alleviate the financial burdens and help the government to make better use of...
their resources. Moreover, the agreement with the World Bank required the inclusion of some form of private participation in the project.

This period of the PPP project was designated as a concession model (BOT) of 30 years, which include the investment in rolling stock, signaling systems, a centralized supervision center and the operation system for passenger in Line 4. The implementation of both phases for the public and for the private partners has a total investment of 1.2 billion dollars. Once finished, the project will increase the high quality public transport up to one million users. It represents an important travel time saving, reduction of gasoline and parking costs to the users and a significant improve in the life quality due to the accessibility expansion.

4.3.1.1 Phase 1 - Metro Sao Paulo

The first phase of the Metro covers the implementation of 12.8 km of railway, tunnels, the stations Butantã Pines, Faria Lima, Paulista, República and Luz; the structure of the intermediate stations Fradique Coutinho, Oscar Freire and Higienópolis; and the depot in the station Vila Sonia. This implementation will be done by the State of Sao Paulo while the private partner will invest in rolling stock and the control systems (wireless voice and data). Some operational characteristics include:

- Round Trip duration: 28 minutes
- Reach 705 000 passengers per day
- Invest in a fleet of 14 trains
- Integrate Line 4 with other metro lines

In this phase, the state will only execute the works of construction for the structure of the intermediate stations which will be finished in the next phase of the project. This development will not affect the quality of service. Moreover, this phase includes turn-key contracts between the state and construction private companies for civil works and installation of the equipment.

4.3.1.2 Phase 2 - Metro Sao Paulo

The goal of the Phase 2 of the Metro Line 4 is to build the intermediate stations which were not completed in the previous phase and then enter into operation with the Vila Sônia yard. These stations could not be included in Phase 1 of the project due to the debt limits imposed on the State of Sao Paulo by the Republic of Brazil at the time the Phase 1 was launched. Then after the approval of Phase 1, the decision of building the intermediate stations was chosen as soon as the state would be able to secure the necessary guarantees from the country to obtain a loan for the construction of the remaining stations.

Moreover, the private party will be in charge of the operation and implementation of the intermediate stations São Paulo-Morumbi, Fradique Coutinho, Oscar Freire and Higienópolis-Mackenzie. Furthermore, the rolling stock will be invested by the private concessionaire. The infrastructure and the equipment represent 97% of the project costs. This phase also contemplated the signalization and maintenance of the metro. Some operational characteristics are shown below:

- Round Trip duration : 47.67 minutes
- Reach 970 000 passengers per day
- Invest in a fleet of 15 train
4.3 Sao Paulo Metro

4.3.1.3 Contractual agreements

The different actors involved in the two phases of implementation of Sao Paulo Metro are shown in the figure 4.7. They are different from the Rio de Janeiro and Buenos Aires cases because the building and construction of the stations are present in Sao Paulo (it does not only include the operation & management) and therefore new actors got involved in this project:

1. **Government of Sao Paulo**: The local government was the initiator of the project by extending the network of the Metro. Sao Paulo government was the responsible for the starting up of the project by providing the necessary requirements. Moreover, the local government would be involved activities such as financing and the construction of some stations.

2. **International Banks**: The Japanese Bank for International Cooperation and the Inter-American Development Bank also worked as a financers in order to accomplished the project. These international banks cover political risks for the commercial loans financed by the consortium that include: (i) failure by the Government to fulfill its payment obligations under its guarantee, (ii) inconvertibility of Eeal into US dollars, (iii) political force majeure events adversely affecting the Project including changes in law; and (iv) expropriation (WorldBank, 2009).

3. **Concessionaire**: It is the consortium that will operate and maintain the line 4. Among their duties correspond the construction of the intermediate stations and the supply of rolling stock. The BOT contract stipulates that the government grants the private party the exclusive right to construct and operate the railway line.

4. **Subcontractor**: The local government would be the responsible for the construction of Line 4. It will need to contract an experienced partner to help with the construction of the infrastructure. This partner would be chosen by a bidding process.

5. **Regulatory agency**: They are the responsible for monitoring infrastructure suppliers and implementing public policy.

![Figure 4.7: Stakeholders involved in the PPP agreement Sao Paulo](image)

4.3.2 Analysis of Metro Sao Paulo

This section will illustrate the description of the different factors inside the project of Line 4 of the Metro Sao Paulo
4.3 Sao Paulo Metro

4.3.2.1 Institutional Framework

As similar to Rio de Janeiro, Sao Paulo elaborated a framework that unify Public-Private Partnership laws. This law 11.688 provides a legislative structure which comprises regulation on tariff, intellectual property rights and regulation on party and project approval. In this case also the transparency law is not completely explicit in this area. Transparency law, being emphasized by many public sectors around the world, however, has been legislated by few countries. Transparency is important in open acts because it can create a transparent, clear and open procedures that will allow the entrance of a wide variety of actors.

Regarding the agents in the institutional framework, we found that the planning of the project was done by Company of Partnership of Sao Paulo and the bidding procedure was executed by the PPP Unit of Sao Paulo. The Guarantee Fund also enabled the government secured the project in a long-term demand.

4.3.2.2 Socio-Economic Environment

The economic environment was appropriate at the time of the project implementation. Brazil was already a new emergent market in the world, attracting high number of private investor in their main cities. Thus, the government of Sao Paulo exploited these advantages and promoted the BOT program for the Metro Sao Paulo. Moreover, the proper guarantees were established and the viability of the project was set up.

In the social aspect, Sao Paulo as many other cities have severe problems with crime and poverty in city’s peripheries. Favelas are the main source of these problems. Transport sector is always threatened by these situations.

4.3.2.3 Economic Viability

Line 4 of the Metro of Sao Paulo is a strategic line which will enclose the network through its connectivity with other lines. The decision to begin with the project relied on the investment and the funding that both the state and the private partner could bring to the table. In the case of PPP, the government assumed a huge part of the investment as seen in the next table [4.7]

<table>
<thead>
<tr>
<th>Parties</th>
<th>Phase 1 (US$ million)</th>
<th>Phase 2 (US$ million)</th>
<th>Total (US$ million)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sao Paulo State</td>
<td>734</td>
<td>188</td>
<td>922</td>
<td>73</td>
</tr>
<tr>
<td>Concessionaire</td>
<td>184</td>
<td>156</td>
<td>340</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>918</td>
<td>344</td>
<td>1262</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.7: Investment Participation in Project Line 4 - Metro Sao Paulo (Source: MetroSaoPaulo 2010a)

The investment cost were financed by several entities such as the Inter-American Development Bank (IDB) and Japanese Bank for International Cooperation (JBIC). For instance, the IDB signed a long-term Loan financing for the Sao Paulo Metro Line 4, pursuant to the award of a 30-year Public-Private-Partnership concession with the State of Sao Paulo for US$69.2 million for the Phase 1 and US$240 million for Phase 2 (See more details in Box 4.3).

Box 4.3: Structure of Loan IDB (Source: CCR 2006)

“In response to this two-phase obligation in the PPP, the IDB structured a limited recourse, two-tranche A Loan from its own capital providing up to 25% of the total investment cost for each phase. To accompany

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Thus, the financial viability of the project should cover the investment cost in the long term. The division of the fare revenue and the compensation of free fare service, between the private partner and the state was agreed according the following characteristics (GRSP 2008):

- Exclusive passenger of Line 4: 100% of the fare for the private partner;
- Integrated passenger with other transport modes: 50% of the fare due to Concessionaire of the Line 4
- Free fare service: integral compensation by the State Government

Furthermore, the public fare was defined by the State of Sao Paulo and paid by the user. This fare was established in 2005. In addition, transport fare to be paid to the private partner was defined in the concession bidding. It will be initially the same as the public fare, based on the January 2005 and included the adjustment which can be done annually according to a formula. The fare collection would be implemented through a centralize mechanism as condition of making effective the guarantees to the private partner.

The investment costs were spread over a longer period of time than originally planned due to the initial project delays. Due to the delays in the conclusion of the works, the first year benefits also started later. However, over some private studies, the financial model promises a internal rate of return of concessionaire of 14.4 % per year and internal rate of return of the shareholder of 18.7% per year (GRSP 2008).

4.3.2.4 Project Planning

As mentioned before, the whole project was designed to be implemented in two phases. The phase 1 includes the construction of six stations (Butantã, Pinheiros, Faria Lima, Paulista, República and Luz), the structure of intermediate stations and a courtyard in Vila Sonia; and the Phase 2 includes the completion of the intermediate stations: Fradique Coutinho, Oscar Freire and Higienópolis-Mackenzie and construction of other other station: Morumbi. The supply of rolling stock and technical equipment, signaling and control management is part also part of concession program and will be derived to the private partner, in this case the consortium QuatroVia (winner in the tendering process).

This project was developed in the decade 90s with the projects of Line 1 and Line 2. However, these projects ensured the financial resources with private banks, while Line 4 due to the high investment could not obtain the sufficient funding for the project. Moreover, the financial crisis did not stimulate the trust of the investors for the project. At the end of the 90s, the local state of Sao Paulo hired the service of a private financial advisory services in order to help with the model concession. In 2000, the agreement of the state debt with the Federal Government and the loans from the banks made possible the bidding process of Line 4.

The preparation of the project also included different roles and responsibilities of the private and public party. The most important responsibilities of the concession authority, Metro Sao Paulo Company, includes (GRSP 2004):

- Carry out periodic inspections to verify the conditions of the facilities, the equipment, safety and operations.

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- Conduct audits
- Inspect compliance to standards, operation and maintenance, regulations and execution procedures.
- Inspect measures of quality of services, also receive and follow up on user complaints
- Establish tariff structure and policies, fix and review passenger public transportation fares

Among the responsibilities of the concessionaire, we can distinguish:

- Dispose of equipment, accessories, human resources and materials to allow for the perfect execution of the services
- Carry out management programs and services and provide training to staff to enhance services and user comfort
- Inform the Concession Commission on all and any occurrence that might not be in conformity to the operation
- Devise and implement service plans for emergencies involving users, and for such, have human resources and materials available
- Devise, implement and maintain a user service plan and inform the Concessions Commission on its development

The Sao Paulo Metro company is an organization that has been working in the operation and implementation of the various lines of the Metro since 1968. At the beginning of the project for the Line 4, this experienced organization created a special department that was in charge of supervising the works of this new Line 4. In this department, staffed with 32 engineers and technicians worked during the design and construction. Moreover, the unit of Project Management (PMU) was responsible to report about the different phases of the project. This unit issued a project management report to the different banks and borrowers every three months. The State Secretary of Metropolitan Transport (STMSP) also support the works of the PMU, which will then reports the Secretary and to the Governor on strategic aspects of the project.

4.3.2.5 Value for Procurement

Bidding Process

The planning of the tendering process of the Sao Paulo Metro was initiated by the State of Sao Paulo which took the decision to begin with the process of concession of the Line 4. Naturally, the Sao Paulo Metro company was in charge of the bidding process and tendering in approval with the Management Council for PPP in the State of Sao Paulo.

The Sao Paulo officials were encouraged by the results of the studies done by the World Bank and moved the Line 4 Metro project as a partly privately financed subway under BOT. Moreover, Unibank was appointed as a financial consultant. This institution gave a support in the transparent process because it is non-governmental bank.

The tendering process begin in late 2005 with an international competition which increased the participation of more foreign companies. As a consequence, given some differences between the traditional procurement and the PPP approach, the government relied on services of consultancy firms that have foreign experience with applying BOT. There were two qualification phases in the Metro Sao Paulo. The first phase included the bidding for 3 lots under civil works supply and installation. The turnkey contract for the provision of civil works and electrification for the 12.8 km of metro line was financed

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by the Inter-American Development Bank, Japanese Bank for International Cooperation (JBIC), and State. This first phase of the project was co-financed by the Japanese Bank for International Cooperation (JBIC) in the same amount as the Bank’s financing (US$209m), by the State of Sao Paulo (US$332m) and by the private sector (US$183m). Some results of the first of the bidding process are shown in the box 4.4:

<table>
<thead>
<tr>
<th>Box 4.4: Results of bidding for the construction process in the first phase (Source: GRSP, 2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Lowest bids Lot 1: 868; 976; 1061 millions of reals (SR)</td>
</tr>
<tr>
<td>● Lowest bids Lot 2: 729; 815; 871 millions of reals (SR)</td>
</tr>
<tr>
<td>● Lowest bids Lot 3: 220; 225; 238 millions of reals (SR)</td>
</tr>
</tbody>
</table>

Even though, all the formal papers seemed to be according with the norms, the first qualification phase had to be suspended for several months because some irregularities occurred in the tendering process. The attempt of one of the companies to change the composition of the consortium was known four days before the opening of the envelopes. The Court of Accounts of the State delayed the process in order to clarify this irregularity. After several months, the process was again restored. However, it brought rumors of not having a transparent process. Despite the issues presented in the first phase, the government made efforts to show the public audience that these problems were correctly solved and thus did not permit the departure from the other international bidders. As a consequence the first phase could be carried out in 2006.

The second phase was done through a bidding process of the concession for rolling stock, signalization and operation & maintenance. It was awarded according to multiple selection criteria such as the proposed technical solutions, financing standings, and proposed regulation on profits. At the end of the second phase, the BOT contract was granted to an established company, named “ViaQuatro Concessionaire” composed by five private enterprises, shown in the table 4.8:

<table>
<thead>
<tr>
<th>Company</th>
<th>Composition (%)</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companhia de Concessões Rodoviárias – CCR</td>
<td>58%</td>
<td>Brazil</td>
</tr>
<tr>
<td>Montgomery Participações S/A.</td>
<td>30%</td>
<td>Brazil</td>
</tr>
<tr>
<td>RATP Development S/A.</td>
<td>1%</td>
<td>France</td>
</tr>
<tr>
<td>Benito Roggio Transporte S/A.</td>
<td>1%</td>
<td>Argentina</td>
</tr>
<tr>
<td>Mitsui &amp; Co. Ltd.</td>
<td>10%</td>
<td>Japan</td>
</tr>
</tbody>
</table>

Table 4.8: Winner consortium for Line 4 Metro Sao Paulo

The concession contract between the Metropolitano of Sao Paulo (Sao Paulo Metro) and ViaQuatro concessionaire included basically the investments on rolling stocks, operation and maintenance activities such as security services, communications, operations control, customer user and operating income alternatives. The concession contract as well as the negotiation process defined responsibility and risk allocation and profit regulation between the government and the concessionaire.

Construction Phase  The construction of the Line 4 Yellow project began in 2004, after the funding and the concession agreement took effect. This project was divided into two phases, in which the first one include a 12.8-km construction line from the Luz Station to Vila Sonia. The Metro was designed as to minimize displacement, thus using underground tunneling for alignment of Line 4. This tunneling first connects the Line 1 at Luz Station, Line 3 at Republica Station, Line 2 at Consolação Station and the Line 9 of the urban train (CPTM Company). According to the report of the construction [Ribeiro 2004], the construction methods utilized for the stations of Line 4-Yellow were two: cut-and-cover and NATM (New Austrian Tunneling Method). The construction process followed the same pattern as the Line 2 - Green Line. The architectural concept of the stations was done through the
use of one or two vertical start shafts. This shafts permitted the excavation of the whole station body through a connecting tunnel. If they are located on the platforms, the excavation of the station body is performed from the shaft itself (MetroSaoPaulo 2010b).

This type of method for construction also brought the appropriate space needed to build the stations. As a consequence some vacant lots, parking lots and gasoline stations were expropriated in order to permit the excavations for the stations. The result was a minimum disruption of residents because during the early 1990s, already some social workers from Metro visited the occupants of properties and discussed their options. The majority of the residents preferred a compensation. Some property values were assessed by independent real-estate experts and compensation was executed at market replacement value. However, there were some problems with the traffic and as a result the local government initiated a campaign to aminoraite these problems.

**Accident at Pinheiros Station** Moreover, the design of the architecture followed the pattern of the Line 2 in which the use of one or two vertical start shafts for the station worked as a basis for the construction method. The location of the shafts allowed the excavation of the whole station body through a connecting tunnel. After finishing the excavation process, the start shafts will be used as connecting spaces from the platforms to the surface level (MetroSaoPaulo 2010b). Even though the construction method is often used in countries with similar conditions, in 2007, a construction accident appeared. A partial tunnel collapse and landslide occurred at the shaft for the Pinheiros Station of Line 4. Seven people - five passengers in a van and two pedestrians on nearby streets - died in the accident. Moreover several houses and other structures were affected. This accident brought a severe delay in the project and the revision of the contract agreement. According to Institute for Technology Research (IPT 2008), the incident was the most serious accident in the history of the São Paulo Metro and due to the number of fatalities was reported internationally. After the accident, an independent commission was appointed to investigate the causes of the accident and to identify lessons to be learned, through recommendations for future works.

After the accident, a commission (headed by the Institute for Technology Research IPT) was appointed to investigate the causes of the accident. The IPT Commission collected and analyzed all documentation that could potentially be related to the accident, from the bidding process to final design and construction reports. The result of the findings included a series of shortcomings in engineering processes highlighted the problems in design and construction procedures (See Box 4.5) and the deficiencies in the emergency plan without a proper evacuation plan for workers.

<table>
<thead>
<tr>
<th>Box 4.5: Problems identified by the commission after the accident (Source: IPT 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problems in the Non-Validated Design</strong></td>
</tr>
<tr>
<td>• Over-simplified geomechanical model, which disregarded geological structures (discontinuities) that could play an important role in tunnel behavior and stability.</td>
</tr>
<tr>
<td>• Based on the over-simplified geomechanical model, a structural concept for the tunnel was proposed using an open support system (heading arch and footings), which could be inappropriate for this type of rockmass.</td>
</tr>
<tr>
<td>• The type of modeling and assumptions made for the calculations were far from the reality. Even so, they suggested the structural concept was not appropriate for the tunnel, indicating failure zones under the arch footings (bench side walls); in addition, one of the most relevant design weaknesses was the lack of definition of threshold values (warning and emergency) for monitoring, required for evaluation of tunnel behavior.</td>
</tr>
<tr>
<td>• Deficient GG mapping and monitoring data</td>
</tr>
<tr>
<td><strong>Problems in Non-Validated Construction</strong></td>
</tr>
<tr>
<td>• Change of excavation direction</td>
</tr>
<tr>
<td>• Increase in the bench height</td>
</tr>
<tr>
<td>• Deficient of plan of contingency</td>
</tr>
</tbody>
</table>
This accident brought a delay in the construction and again a definition of the project’s technical indicators. The review of the project quality in order to achieve was careful monitoring according to the new design documents. This accident also increased construction a better risk management in construction.

**Operation**  ViaQuatro is the responsible for the operation and maintenance of Sao Paulo Metro Line 4 system. The operation system was opened recently in May, 2010 and therefore the results of this commercial operation can not be shown in this research. Nevertheless we can describe the most important facts that will work in the operation phase

- This company supplies the rolling stock composed of 14 train fleet. In 2008, the company established a partnership to supply the metro cars with the consortium Siemens / Rotem. The contract signed with the two companies also includes the supply of the signaling system and the complete automation of the line.

- The service provided along the subway network is open to the public daily from 4:40 a.m. to 24.00 hours, as integration with other metro lines or other urban public transport systems, through stations and terminals. The designed capacity of Line 4 is 60,000 passengers / hour / direction, calculated using six standing passengers per m2 and with 20% of this total for seats. The initial plan comprised the beginning of the operation in 2009. However due to the delays in the work and the accident, the operation had to be postpone to start on May 2010. Although project development and construction phases seemed to foretell not a success, the concessionaire has been making a lot of effort in order to provide a good operation for the Metro Line 4.

- The criteria for the operation includes: Acquisition and ticket validation service, adequate supply service, traffic and safety service, station service, public security service, customer call centers and the elaboration of daily operations reports.

**4.3.2.6 Trust**

Transparency is significantly important in ensuring selecting the relatively optimal private partner and deterring corruption in the tendering process, but still it sometimes difficult to combat some kind of strategic behaviors in the contractual period. As already mention, in the pre-qualification process, one of the companies decided to change the composition of their consortium. The Consortium Andrade Gutierrez / Queiroz Galvão / Cobra which participated in the first phase of the tendering wanted to be dissolved due to some internal problems. The tendering commission refused to admit the dissolution of the entities because it could affect the tendering procedure by reducing the qualifying conditions individually or collectively, the possible inclusion of firms that were not pre qualified and the reduction in competition. The possible incorporation of new companies in the tendering process could provide a destabilization in the project and the rejection of the other entities.

In the construction period, the accident also showed that the concessionaire used some type of strategic behavior. The contractor has had already experience in doing this kind of work and thus accurately and exactly know to what extent and what elements of the construction could be built and be equipped with lower level materials and fewer amount of materials. This technical information was only known by the contractor itself, and due to the lack of monitoring systems from the state, the project quality could not be ensured on time. Therefore the quality specifications were not reached thus generating a fatal accident.

**4.3.2.7 Risk Management**

In this project, the main foreseen risks have to do essentially with the project related risks and the macro risks. In the case of the project risk, we should include the completion of the work, integration, construction delays and accidents due to the complex civil works. In the case of the macro risks, the demand and the exchange rate were the main priority of both parties. In the next lines we will present the main risks associated with this project:

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**Construction Risk**  In the case of Metro Line some problems in the construction delays were related with the soil conditions which might have been missed in the very detailed geological studies, or the slower performance of the method of construction. These risks are related with project cost and time overruns leading to delays in completing the project. The investigation and judicial inquiries of the January 2007 construction accident may also cause additional delays.

Moreover the construction risk were higher when the design was not correctly validated by observation and monitoring, as prescribed by the construction method NATM. This also included the poor detail of the geomechanical mapping and the lack of a good monitoring system for tunneling during bench excavation. The quality control performed during construction by the contracting consortium (self-certification) was far from that expected for this type of urban underground works project; in which there was no clear policy number, location and procedure of tests or corresponding remedial actions in case of negative results. In addition, there was no evidence of contingency actions until the day before the collapse, when a meeting was set up to discuss the problem. The combination of a fragile design with severe deficiencies, poorly followed-up during construction and not validated by monitoring data (back-analysis, correction, improvement) constitutes the causal line to the structural collapse of the Pinheiros Station, in terms of design [IPT, 2008]. Furthermore, the contractual agreement did not specify the technical detail and performance specification, as well as the correct analysis and interpretation of a monitoring system. To mitigate this type of risk, there would be penalties and monitoring systems related to the construction.

**Demand Risk**  The demand risk of this project was also important. The main risk is that the projected demand expected, would not happen. Therefore the need to share the risk of demand between the public party and the private partner was examined in a more detail by the policy makers involved in the project. Furthermore, the finance model is very sensible to the demand in which the lack of share of some risks, can affect the demand and that are not controlled by the private partner. In this context, some studies were carried out in order to assess the projected demand. They found out that the quality of services was one of the main factors to improve the demand. Therefore, the incentives from the government and the private sector to encourage to use the other metro lines will be very important to mitigate the risk.

**Other risks**  Due to the accident in Pinheiros, the government had to update the risk table and put more effort in contemplate the adjustments in the original design with elements required by law. These risks are depicted in the following table:
### Risk Category | Description | Mitigation | Allocation
---|---|---|---
Construction accidents | Risk that another accident happen in the construction of the subway | Enforcement of strict construction safety measures measures not only in the worksites but also in the areas above the shafts, particularly during the use of the shield machine or the application of the NATM. | Private
Construction costs | Failure to obtain sector financing or higher construction costs due to unexpected soil conditions | The State has agreed to finance the gap and the private party secured guarantee | Shared
Tax Risk | Risk of change in the structure tax | Allow the recovery of imbalance of economic and financial in the contract due to the tributary impact | Public
Not support from government | Risk that the government can not support continuously the project | If the support from the government (such like subsidies) can not be guaranteed continuously during the contract, then the support should be not written as a contractual clause, but as a bonus for better project performance or quality achievement. | Public
Construction cost overrun | Risk to have more costs than expected in the construction phase | The general constructor may experts sub-contract with several small constructors and in this way it may transfer the cost overrun risk to sub-contractors | Shared

Table 4.9: Other risks related to Sao Paulo Metro (Rebele, 2009)

### 4.3.3 Evaluation of the Project Sao Paulo Metro

The Sao Paulo Metro has served as a model role for other infrastructure services. Nevertheless it has been criticized because of the bad planning and the capacities of the concessionaire to manage the project. In the present section, we will describe the most important facts in this case:
### Table 4.10: Summary of key points in Metro Sao Paulo

<table>
<thead>
<tr>
<th>Topics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Package Size</td>
<td>12.8 km of Line 4 of Sao Paulo Subway - BOT agreement in two phases</td>
</tr>
<tr>
<td>Construction by</td>
<td>Private Sector</td>
</tr>
<tr>
<td>Operation by</td>
<td>Private Sector</td>
</tr>
<tr>
<td>Contract Duration</td>
<td>30 years</td>
</tr>
<tr>
<td>Payments by government</td>
<td>73% of the project would be invest by Sao Paulo State</td>
</tr>
<tr>
<td>Award Criteria</td>
<td>Lowest tariff to be charged from the user, verification of the proposal and the experience of the candidates</td>
</tr>
<tr>
<td><strong>Context-Related Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Institutional Framework</td>
<td>Unified law of PPP but without lack of Transparency Law Guarantee Fund</td>
</tr>
<tr>
<td>Socio-Economic Environment</td>
<td>Good economic environment at the beginning of the project</td>
</tr>
<tr>
<td></td>
<td>Social problems arose. Crime and corruption</td>
</tr>
<tr>
<td><strong>Intrinsic Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Economic Viability</td>
<td>Investment secured by international banks and by the Guarantee Fund</td>
</tr>
<tr>
<td>Project Planning</td>
<td>Project initiated by the State Plan</td>
</tr>
<tr>
<td></td>
<td>Proper studies of planning analyzed by the World Bank</td>
</tr>
<tr>
<td>Value of Procurement</td>
<td>Attempt to change one of the consortium four days before the opening of envelopes</td>
</tr>
<tr>
<td></td>
<td>Lack of proper design was the cause of a construction accident</td>
</tr>
<tr>
<td></td>
<td>Delay in construction and operation, increased the cost of the project</td>
</tr>
<tr>
<td>Trust</td>
<td>No strong commitment in the tendering process which permit the delay in the approval of the concessionaire</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Demand Risk is very close related to the quality of service of Metro Sao Paulo</td>
</tr>
<tr>
<td></td>
<td>Lack of monitoring schemes influenced the accident at Pinheros station</td>
</tr>
</tbody>
</table>

- **Funds Secured**
  The decision to do the project was initiated from a general planning of the State of Sao Paulo which include the interconnection between the west and the east part of the city. The growing demand for the connection of these neighborhoods pushed the implementation of Line 4. However, in order to enhance the value of a potential development such as the subway project, it was necessary to guarantee the execution of it. The Paulista State already secured some funds from foreign banks for the project but they were not enough to implement the plan in the early 90s. Thus, the government put efforts to look for new loans and guarantees needed for the project and after almost a decade the project could be realized. The importance to guarantee the project located in the management activities of any organization involve planning, organizing, and controlling. If the government made the project attractive, many banks might support it. In the case of Sao Paulo, the local law contained the **Guarantee Fund**, which facilitated the implementation of the PPP projects by acting as a trusty entity.

- **Divided the project in two phases**
  Lines 1, 2 and 5 of Sao Paulo were implemented in one phase and only the public sector was responsible. In the case of Line 4, the PPP agreement was the first contract made in Sao Paulo State. This agreement stipulated the division of the project in two different phases which is not
very common. The first phase aimed to construct a 12.8 km of railway system and some stations while the second part allowed the construction of intermediate stations, the implementation of the rolling stock and security systems. In this context, the private party should be involved in both phases and provide commitment to the project by giving some ideas about the infrastructure planning and transport planning to provide a sound basis for future decisions.

- **Bad Design and lack of monitory system**
  The design is a key part of implementation of a subway system. The incorrect design of the construction can lead to unexpected results. In the case of Metro Sao Paulo, the imprecise design and the high complexity of the work, led to a terrible accident. Accidents are not common when building tunnels, but if they are not planned correctly, some accidents might occur. The Pinheros accident had its problematic source in the low construction materials, the incorrect design of the explosions which generate vibrations and the lack of monitoring system to support the completion of the station. Even though it is difficult for the public sector to monitor service quality and maintenance work during implementation process, strong and continuously enforced incentive schemes can be designed in order to oblige the contractor to do their job correctly without harming the environment.

- **Environment for Tendering Process**
  A competitive bidding and a professional contractual arrangement are of great importance in the success of the contract phase. Competitive tendering helps the public party choose a good consortium with financial, technical strengths and experiences, which create favorable technical solutions for a project. This good environment also left outside the collusion and strategic behavior. However, in the case of Sao Paulo, the tendering was misted by the change of the composition of one consortium which violated the rules of transparency of the bidding process. If the government were not able to attacked this problem, the possible inclusion of firms that were not pre qualified could been occurred.
4.4 Buenos Aires Subway

The city of Buenos Aires, capital of Argentina, is the second-largest city in South America, with a population of 13 million inhabitants. This largest city is the economic center of Argentina and has become one of the massive populated zones in the region. Similar to other South American countries, the city presents urban and income distribution problems. The southern area of Buenos Aires presents a marked income difference in relation to the north. The slum development in the south, called “Villa Miseria” are one of the problems in the city of Buenos Aires. However, this is not the only issue that the government has been facing during the last years. The economic crisis also was a serious problem during the 90s and 2000s. As a consequence, in 1994 the government of Argentina decided to give in concession to the private party the operation and management of its suburban railways.

In the early 90s, the Buenos Aires Region produced nearly 18 million motorized trips per day (Rebelo, 2007), in which 50% of these trips were made by public transport. The transport is composed of a suburban railway network of 840 km of line, a subway network of 42 km and a bus system with a fleet of 15,000 buses. The following table 4.11 shows that the percentage of passenger that use public transportation, in which the Metro system only accounted for 6%. The lack of incentives to use public subway transport and the poor quality of service provided by the government, accelerate the process to change the management of the railway operators.

<table>
<thead>
<tr>
<th>Transport System</th>
<th>Passengers (millions /day)</th>
<th>Percentage of Total trips (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro - Subway</td>
<td>1.0</td>
<td>6</td>
</tr>
<tr>
<td>Suburban Railway</td>
<td>1.5</td>
<td>7</td>
</tr>
<tr>
<td>Buses</td>
<td>7.5</td>
<td>42</td>
</tr>
<tr>
<td>Taxis</td>
<td>2.0</td>
<td>12</td>
</tr>
<tr>
<td>Private Cars</td>
<td>5.0</td>
<td>28</td>
</tr>
<tr>
<td>Other informal transport</td>
<td>1.0</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4.11: Public Transport in Buenos Aires (Source Rebelo, 2007)

For instance, Ferrocarriles Argentinos, the largest operator in 1990, was losing about US$ 1.4 billion a year. The main reason was that the citizens preferred to use the bus instead of the subway, due to the low price of the tickets, quality of service and level of security. Moreover, the assets were in a poor conditions with 54% of the network in bad or fair situation and only half of the rolling stock available for service. As a result, the strategy of the Menem administration was to reform the transport sector. This also stopped the financial crisis and increase the level of service of the operator.

The government of Argentina in 1994 decided to concession the railway network to a private partner. This rail network include seven lines of suburban rail and six lines of the subway. Both networks were separated in 7 concessions which will be operated by 4 concessionaires (See Table 4.12). The next lines will describe the project of the Subway of Buenos Aires...
### 4.4 Buenos Aires Subway

<table>
<thead>
<tr>
<th>Concessionaire</th>
<th>Line or Network</th>
<th>Start Date</th>
<th>Term (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrovias</td>
<td>Suburban Line Urquiza and the entire Network Subway</td>
<td>January 1994</td>
<td>20</td>
</tr>
<tr>
<td>Ferrovias</td>
<td>Suburban Line Belgrano Norte</td>
<td>April 1994</td>
<td>10</td>
</tr>
<tr>
<td>Metropolitano</td>
<td>Suburban Line San Martin</td>
<td>April 1994</td>
<td>10</td>
</tr>
<tr>
<td>Metropolitano</td>
<td>Suburban Line Belgrano Sur</td>
<td>May 1994</td>
<td>10</td>
</tr>
<tr>
<td>Metropolitano</td>
<td>Suburban Line Roca</td>
<td>January 1995</td>
<td>10</td>
</tr>
<tr>
<td>Trenes de Buenos Aires</td>
<td>Suburban Line Mitre and Suburban Line Sarmiento</td>
<td>May 1995</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 4.12: Concession of the Rail Network in Buenos Aires (Source Rebelo, 2007)

### 4.4.1 Project Background

The economic crisis that embraced the country at the beginning of the administration of Menem, provided the tools for the implementation of the concession program. In this context, the concession was a catalysis to improve the bad conditions of the Subte and other railway network. The Argentinian government mandated a series of reforms to change the administration of the railway network that includes the subways and suburban trains. Therefore the concession of the subway was carried out in 1994.

The subway of Buenos Aires, also known as the “Subte” was the first metro in South America (Figure 4.8). The first line (Line A) was inaugurated in 1913 and then the construction of the other lines was done during the first decades of the century. The second subway line (Line B) was opened in 1930 and the construction was entrusted to the group Lacroze Railway. In 1933 a third company started the construction of a new line (Line C) that would nearly double the length of Line B and it was opened one year after the construction. Line D and Line E were opened in 1937 and 1944 respectively. Then, it took almost more than 60 years after another line (Line H) was opened.

These six lines correspond to the pack of concession of the operation and maintenance which were embraced in a tendering process for the private investors. This agreement did not include the extension of the network which would be responsible of the local government. The strategy that the government adopted was the “single-operator” which means that the competition would not appear from several operators using the same track (very used in Europe) but from several potential private companies tendering for the service during the concession (Carbajo and Estache, 1996).
This kind of project were new at the time that was conceived and was applauded from many experts. The main incentives in the short term was to improve the economic situation by changing the administration and operation of Buenos Aires subte. Other incentives in the long term include the reduction to zero the subsidies paid by the government. The immediately outcomes allowed the Subte to be a model for other concession programs in Latin America. However, some risks also affected the project operation during the last decade. The next lines will show the process of concession and their results in the last years in Buenos Aires.

### 4.4.2 Analysis of Buenos Aires Subway

Almost 30,000 kilometers of rail track belonged to the state-owned company Ferrocarriles Argentinos (before the concession), was the largest railroad in Latin America and the sixth largest in the world. This enterprise was the only railroad company in the country. In 1994, the Buenos Aires Subway decides to give in concession the subway network services in a sole concession with the Urquiza suburban line. This mean that Ferrocarriles Argentinos would no longer be in charge of the administration of the subway. The most important facts of the concession process will be depicted in the next sub-sections.

#### 4.4.2.1 Institutional Framework

The Argentinean privatization of enterprises were guided by the Emergency Law 2637.93, which encourage the government to collaborate with the private sector in the transport system. During the agreement period, there was not a unified law that dictate all the aspects for the concession projects. In other words, the regulations on tariffs were described in one law that managed all transport projects (without differentiate between privatization or service agreement).

Moreover, there were five regulatory agencies during the concession period without proper roles and responsibilities. This carried out many problems between the private party and the government. In addition, Argentina has already developed a legislative framework; however, some problems with corruption occurred. The probable source of the problem was the non-independence of the judicial system. The lack of autonomous governance of the most important state apparatus brought the decline of a transparent process.
4.4.2 Socio-Economic Environment

The economic aspect of Buenos Aires subte at concession time, was characterized by the economic crisis that hit Argentina. Thus, it was necessary to reorder the plans and began the quick process of privatization. Beginning with the most important enterprises, Buenos Aires subte was concession in order to deal with the crisis. The result of the concession brought good results stabilizing the economy.

Moreover, some social problems appeared. Protest from former employees arose due to the shortage of labor costs. However, the government could control these protests by providing some important benefits to employees.

Furthermore, there were no guarantee funds that could secure the long-term demand of the project. In other words, the lack of economic policies to counteract unforeseen circumstances and risk, brought the decline of quality of service in the subte.

4.4.2.3 Economic Viability

The economic viability of the project is very important in the early phases of the project cycle. In the case of Buenos Aires, the analysis whether the investment operation would be successful represented a role from a group of consultants that held a previous research of the contract agreement. The analysis of the investment operations were the major proposals because it was known that from the beginning of the project that the government would give subsidies in order to call the attention to the possible investors. Therefore the lowest subsidy was needed in order to ensure the long term profits. This operating subsidy also served as a form to adjust the initial demand uncertainty giving more time to the private party to improve the subway system. The idea behind the project was to force the concessionaire to be cost-efficient and thus save money to apply in the investments which he had to do to set the concession in motion (Carbajo and Estache, 1996; Rebelo, 2007).

The tariffs were also set according with the concession agreements with the possibility to adjust according the concessionaire targets and the inflation rate. In this case some adjustment appeared to recognize a tariff bonus during the first phase of the operation in which the service was improved. The adjustment of tariff in 2001 aimed to increase the investment (15%) , however after 2002 the local government decided not to increase the tariff in order to confront the crisis and encourage the citizens to use the subway. The tariff was about $0.50 for shorter trips (maximum of 12 kms) and remained unchanged until 2007. This also increase the levels of subsidies and thus the implication to ask for a loan to the World Bank to finance this gap. Even thought, this policy did not affect the citizens directly, it brought higher cost to the local government. The Buenos Aires administration disbursed US$ 15 million monthly in 2003 to face the unchange tariff and remain increasing each year. In 2005, the subsidy was US$ 21 million monthly and in 2007 it reached to US$ 44 million.

4.4.2.4 Project Planning

In the context of economic crisis in Argentina in the 80’s, the privatization and concession of the metropolitan rail system provided a rapid solution for the poor administration and maintenance of a system that brought an annual deficit of nearly $335 million. The deterioration in the quality of service and the poor demand of the public passenger carried a new plan of planning and investment in the transportation sector.

The serious deterioration in the security of transportation, coupled with the deficit which caused the decline of the rail operation “Ferrocarriles Argentinos” led the national authorities to make the project of “Railway Restructuring” under the decree 666.89 in order to change the management and operation of the seven railway groups in Buenos Aires. The ministry of Works and Public Services recognized that the planning of the project should be carried according to the fiscals norms which include the reduction in labor costs and better passenger service. Naturally, this also brought some protests and disputes between the different groups that used to worked in the subway and the new administration of the system (Felder, 2000).
The planning of the process of concession took a different perspective with respect to other privatization railways outside Buenos Aires. The World Bank, the Municipality of Buenos Aires and the previous railway state-owned enterprise Ferrocarriles Argentinos created a commission in order to provide the criteria for the correct process of transfer of the operation. The tariffs would be regulated and the concessionaires would have to execute an investment plan which include the lowest subsidy paid by the government. In this context, the compromise of the government to be an active player in the concession would also encourage the private party to bid in this process.

4.4.2.5 Value of Procurement

Tendering Process

Once the legal framework of privatization and concession took place in Argentina, the process to identify the new operator for the subway of Buenos Aires began in 1992. The concession will include the operation and the maintenance of all the lines of the subway and the Line Urquiza of the suburban rail. This concession was set for twenty years and was awarded according the lowest subsidy required for the operation of the line and the responsibility for the rehabilitation program. The method for the concession of the subway required the submission of a schedule of declining operating subsidies which was paid by the government and of fees to paid by the private party to the states for the concession right (Rebelo, 2007). The idea of the agreement is that the a certain date, the tariff should decline by zero.

The concession contract called the attention of several possible investors. Thus the most important requirements that they should have were the experience in other projects, the inclusion of at least one domestic company in the tendering and the economic proposal. Therefore, each applicant submitted three envelopes in which they described the background of the consortium or company, the business plan and the role of foreign company in the organization and the financial offer linked to contributions of works.

The concessions attracted a lot of possible investors. The first phase selected 4 consortium from the 5 possible candidates: Benito Roggio and Company, FerroMetro Argentino, MetroBaires, Pardo/Rabelo/others and Traimet. Traimet was disqualified because did not reach the full criteria of the tendering process. There were some controversies between some probable advantages for some enterprises related to the government. Thus the internal problems inside some consortium did not bring proper transparency in this phase. Moreover, the control entities were also questioned because of the lack of proper supervision that brought as a consequence the delay of this phase. In the second phase the operation of Buenos Aires subway was awarded to the enterprise Benito Roggio and other which conformed the consortium Metro Vias with a bidding of US$ 394.8 in investment by 2012.

Operation Phase

Argentina was the forerunner in the inclusion of PPP in Latin America. The Buenos Aires urban rail offered a 20 year concession in which the private party compromised in operate the subway and in execute the government investment plans. The concession took place in 1994 and some authors (Phang, 2009; Rebelo, 2007) claimed that the impacts produced favorable results during the first phase of the operation (1994-2001). The success of the first phase held up in a recovery in the ridership and in the quality service indicators. The ridership recovery increased in more than 100% between 1993 and 1999. The good levels of punctuality and the low cancellation of the trains brought an increase in the demand of the subway. For instance, the passenger demand was of 212 million in 1993, while in 1999, the demand increased in 480 million (Rebelo, 2007). Furthermore, before the period of the concession the private party received an obsolete fleet without good levels of maintenance. Thus, the concessionaire had to renewed the subway and the suburban train supply and invested in maintenance for the new 80 cars that were bought before 2001. In addition, the positive impacts in the operation of the train also include the

Giuseppe Manrique

August 2010
the benefits in saving time and money if we compare with other transport modes. The time saving in
the subway user was about 10 minutes (per user) until 2001 and the fare maintained almost the same
during this period. The operation costs also were also low due to the low cost of the operating system
if it is compared with other modes.

However, the economic crisis that hit Argentina during 2001, allowed the gradual decrease in quality
of service of the subway during the second phase (2001-2004). The local government could not pay
the operating subsidies on time and therefore the low comprise for the investment obligations was also
reduced. This is a case were the government could not foresee the situation and therefore some services
were reduced such as the security personnel. Moreover, there was a decrease of 15% in the demand
and as a consequence some costs began to increase. As the government delayed in the payment of
subsidies, the private party reduced the supply of the subway. This implied the reduction of the
frequency of the trains and some of the cars in the trains were diminished. In this period there was
not increase in the implementation of new lines or new stations.

After the Argentinian economy began to stabilized in 2004 with the Kirchner administration and
the inclusion of private Banks to finance some government operations brought some light to the
improvement of the subte. Among some improvements, the local government extended Line B of the
subway by inaugurating two stations, the increase of new cars for Line D and the redesign of the
Stations Carlos Pellegrini, Diagonal Norte and 9 de Julio.

4.4.2.6 Trust

In the case of Buenos Aires, it was clear that the commitment from both parties were broken in
the different phases of the concession of the Subte. First, during the tendering process the internal
problems of the consortium and the demand of the poor control management from regulatory entity,
brought as a consequence the delay of the tendering process. Some public actors (Ministry of Finance)
made the private parties responsible for the extension of the process and threatened to leave from the
tendering process. However, on the other hand, the same entity accepted to renegotiate the agreements
and dismissed the opinion of the control entities. These conflicts had to be solved by a series of changes
in the fiscal entities. This mean that the last word was always from the highest public institution in
this case the Ministry of Finance. The consequence of this behavior also brought the disdain of the
formality of the process of transfer. Therefore during the first phase of the concession of the subway,
there were several entities which had the regulation of the railway presenting redouble of efforts and
costs (Felder, 2000).

After the crisis, the local government could not pay on time its obligations and thus the private party
responded lowering the level of quality of service. It is very clear that the private party could foresee
this situation due to the volatile economic situation of Argentina and thus commit with the state to
prevent any contractual upwards which in the long term could disincentive the citizens to not to use
the subway. However, the private party keeps vigil only in one side with an integration of short term
and leaving out the mutual benefits (Rebolo, 1999a).

4.4.2.7 Risk Management

Similar to the other cases, the Argentina Government used a model to define the proper allocation of
the risks in the operation of the Subway. However, the allocation of the risks was also a topic that
the possible concessionaires and the state were discussing at the beginning of the project. The private
parties wanted to reduce their risks and thus the government enforced to introduce guarantees and
subsidies in order to deal with externalities. Among the most important risk that were present in the
Buenos Aires Subway, we can describe:

Financial Risks The clear understanding of the financial risks would facilitate the endeavors of
public-private partner in the process of financial arrangement. The Argentinian administration should
recognize that concession projects can be as risky investments for foreign investors who are capable to involve in large-capital-consuming infrastructure projects, which the national investors cannot be afford. The support of the government through subsidies was vital to enhance the confidence of these investors in order to finance for long-list projects calling for investment. This incentive is also present in many of the good international practices in order to satisfy the interests of private partner. Thus, the private partner had to create also an attractive financial package for this project as a form to reduce the subsidies paid by the government, giving assistance of innovative technical solutions and improving the service.

In the case of Buenos Aires, this risk was allocated to the public sector. Thus the policy of maintaining the tariffs unchanged reduced the incentives to expand the system and increased the amount of subsidies. The government had to look for a guarantee which would be triggered when the State defaults on its obligations. This process took time because the guarantee was hard to obtain when the Argentina government look for private banks to aminoraite the situation. The risk was maintained in the state side, but fortunately in 2004 the World Bank gave again a loan to face the contract with the private party.

**Public Opposition Risk** The aim of the concession was also to eliminate the fiscal drain from the railway deficit by reducing some labor costs. In 1995, the local government and the concessionaire made the first strong initial staff reductions, which brought a series of protest. This affected the passenger from Line A, B and C. The labor union claimed that the dismissal was arbitrary and there was no protection from the state. This measure obeyed the government to take a step back and find a better solution with the labor union. There were 2032 employees among the subway and the Urquiza line together because they were under the same concession and the reduction would reach nearly 40%. However, the negotiations with the labor union, brought a only gradual decrease of the staff in 20% during 1997 and 1999 ([Clarin](#)), 1997).

In 2001 with the financial crisis, the private party rationalized their maintenance services, through the closing down of some subway facilities and decreasing drastically the staff. This carried the compensation of labor demands and the pressure from some labor unions. This risk was also absorbed by the state which increase even more the operating costs.

**Party-Related Risks** The lack of a regulatory agency in the first phase of the concession led to the delays in dealing with the concessionaires. During 1990, the planning of the concession began without the establishment of the control criteria from the regulatory agency. Because there was no entity to supervise, the different duties were given to different entities who participated in the concession process. Only after the problem of the tendering process, in 1992 the regulation of the rail sector in Argentina was headed by a public department, the National Commission for Transport Regulation (CNRT), dependent on the Ministry of Economy and with jurisdiction over both rail and road freight and passenger transport. This group was in charge of solve some problems between the concessionaire, the states and the user. This entity did not have any control about the performance of the services. One year later, 1993, the local government create a commission who was in charge of monitoring the overall performance of the transport sector, including the safety and quality standards. In the case of Buenos Aires, the lack of a strong regulatory mechanism in the tendering process brought some problems such as delay of almost two years in the concession. It also carried a quick renegotiation of the contracts after 2001 ([Rebele](#)), 2007).

### 4.4.3 Evaluation of the Project Buenos Aires Subway

The next section will describe the most important points and facts of the Subte of Buenos Aires, through an evaluation of the bidding process, operation and implementation:
### 4.4 Buenos Aires Subway

<table>
<thead>
<tr>
<th>Topics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Package Size</td>
<td>44 km with seven lines - Concession agreement</td>
</tr>
<tr>
<td>Construction by</td>
<td>Public Sector</td>
</tr>
<tr>
<td>Operation by</td>
<td>Private Sector</td>
</tr>
<tr>
<td>Contract Duration</td>
<td>20 years</td>
</tr>
<tr>
<td>Payments by government</td>
<td>The government paid subsidies until it declines to zero</td>
</tr>
<tr>
<td>Award Criteria</td>
<td>Low subsidies paid by the government</td>
</tr>
<tr>
<td><strong>Institutional Framework</strong></td>
<td>No unified laws for PPP. Non-independent judicial system</td>
</tr>
<tr>
<td></td>
<td>Five regulatory agents with unclear roles</td>
</tr>
<tr>
<td><strong>Socio-Economic Environment</strong></td>
<td>No guarantee funds</td>
</tr>
<tr>
<td></td>
<td>Project impelled by economic crisis</td>
</tr>
<tr>
<td><strong>Economic Viability</strong></td>
<td>The private party would only take care for the maintenance and operation leaving the planning and extension of the lines to the State's duties</td>
</tr>
<tr>
<td></td>
<td>Since 2002 there are no increase of the tariffs, thus the need of more subsidies</td>
</tr>
<tr>
<td><strong>Project Planning</strong></td>
<td>Project initiated by the central government “Railway Restructuring Plan”</td>
</tr>
<tr>
<td></td>
<td>Economic crisis of the early 90s, also pushed the concession</td>
</tr>
<tr>
<td><strong>Intrinsic Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Value of Procurement</td>
<td>Several bidders in the tendering process</td>
</tr>
<tr>
<td></td>
<td>In the short term of operation (five first years), the subte had a recovery in the ridership and in the quality service indicators.</td>
</tr>
<tr>
<td></td>
<td>In the long-term, the economic risk could not make the government to pay the subsidies. As a consequence there was a decline in the service</td>
</tr>
<tr>
<td>Trust</td>
<td>Many regulatory agencies had no clear roles and responsibilities</td>
</tr>
<tr>
<td></td>
<td>Not strong commitment from the state when the economic crisis appeared</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Lack of a guarantee funds which could mitigate the financial risks</td>
</tr>
<tr>
<td></td>
<td>Public opposition brought a series of protest as a result of reduce in labor costs</td>
</tr>
</tbody>
</table>

Table 4.13: Summary of key points in Buenos Aires Subway

- **Non-profit project for the state but clear government goals**
  
The aim of the government was to reduce the high subsidies and revitalize the economy by allowing the private parties to get involved in the operation of the subway system. The company Ferrocarriles Argentinos was making losses and the need to change the administration and operation was a reality in the mid-90s. Thus, the local government began with the plan of concession of the railway network. However, the studies in the preparation process showed that suburban rail operations might need fiscal support to operate the services. The government accepted to subsidize the subway system but they agreed that in a certain time it would be reduced to zero. In this case the profitability of the project was realised with the subsidies that the government provided.
- **Noticeable tendering process**
  
The tendering process called the attention of several domestic and foreign private companies. This response demonstrates that the private sector agrees that there is an opportunity to be exploited, although the risks of the traffic projections and financial projections are only now
emerging. It is also important to know that the Buenos Aires Subway was the first kind of PPP in subway infrastructure in Argentina and in South America. Moreover, the commitment that showed the Argentinian government to support the project was also a key factor in the tendering process.

- **Good short-term results**

After five years of implementation, during 1995-1999, some results appeared to overcome the critical situation of the subway system in Buenos Aires. First, the labor cost was reduced significantly. The employment was reduced from 92,000 workers to about 17,000 in 1998. Secondly, the subsidies decreased from about US$400 million/year in 1995 to US$100 million/year in 1999. The main aim of the government was achieved. Thirdly, the ridership recovery increased in more than 100% between 1993 and 1999. The good levels of punctuality and the low cancellation of the trains brought an increase in the demand of the subway. For instance, the passenger demand was of 212 million in 1993, while in 1999, the demand increased in 480 million. All these factors enable to obtained positive outcomes during the first five years and be a model for other concession projects.

- **Unexpected economic risks**

The economic crisis that affected Argentina during the early 2000 had terrible consequences for the subway system. In 2001, the government could not pay the subsidies that were stipulated in the contract and thus the private party had to reduce the quality of service. This brought a decrease in the ridership and a decline in the maintenance. Some example of these include the low frequency of the trains, bad maintenance of the stations (some of them are still very dark) and less security (security workers were dismissed from their jobs). In this case, the lack of controls to approach this situation and the lack of guarantee to face the crisis made that the subte change their positive outcomes. Moreover, the improper management and planning for a long-term plan (without a proper funds) enable to decrease the acceptance of the service in the subte.

### 4.5 Concluding Remarks

In this chapter we have described three different cases in the Latin American Environment. These are: the case of Rio de Janeiro, the case of Sao Paulo, and the case of Buenos Aires. The first case belongs to Metro Rio, an agreement for concession the operation and maintenance of the project. The concession was able to increase the ridership in a very short term but it could not maintain the same level after some years. The lack of a good planning for the future and the poor monitoring methods permitted the decrease in service quality and a constant problems between the state and the private party arose. However, the good guarantees and the strong commitment from the local government could help to overcome some of the issues related with the project.

The second case corresponds to the case of Sao Paulo which is still in the phase of operation. This BOT project was aimed to extend a new line (Line 4) of the subway network in the Sao Paulo. The tendering process did not cause many problems, but the construction of one of the tunnel provoked an accident where some citizens died. This brought a delay in the process and increase in costs and time in the implementation.

The third case analyzes the subway of Buenos Aires city. This concession of operation and maintenance works well in the first years of operation. The ridership increased in more than double and most important the subsidies paid by the government were reduced dramatically. However, similar to Metro Rio, the government could not maintain the same quality services in the next years. The cause of this problem was an economic crisis that could not be able to stop and permit the decay in the quality of service.
Chapter 5

Factors in Peru

5.1 Introduction

Public transport is a key matter for people of all socioeconomic levels in the capital city of Lima. It constitutes a permanent worry for the citizens who have been claiming for a better quality of service since 1980s. The different governments had only made some attempts to solve the transport problem but the policies have not been successful. The management of the public sector has not provided the expected result, thus the need to change the administration from the public sector to the private sector might be the light for a 30-year problem. As a consequence, the tendency to opt for a Public-Private Partnership model has been increasing in Peruvian infrastructure projects.

However, in the second part of the decade of the 80s the limited-recourse debt financing for infrastructure projects in PPP has been extremely difficult in Peru due to incipient regulatory framework and the limited experience of government agencies in dealing with complex contractual arrangement. The result has been long delays in the process. Moreover, political risks and lack of willingness from the public sector aggravate the situation. After years of waiting for an efficient mass transport system, a new administration revived the project of Lima Metro. This project has been stopped for more than a decade without obtaining any economic benefit.

Nowadays, with the rebirth of the project, this chapter is aimed to revise the most important facts of the project Lima Metro. The importance of the selection of the case is located at the unique environment that represents it in Latin America as well as the high importance for the Peruvian society. In this thesis, the selection of cases is based on the availability of data, empirical materials and the accessibility to the interviewees -See Appendixes C and D. Therefore, the research of the Peruvian case is based on the collected detailed information and governmental issued project documents provided by interviewees. The following chapter looks at the most important events that did not permit the continuity of the project by giving a description of the main issues in transport (Section 5.2). The, the project Lima Metro will be described in the first phase (Section 5.3). Then the description of the new phase and the most important factors in the actual process of implementation, will be depicted in the Section 5.4. Finally a list of lessons learned are shown in this chapter (Section 5.5).

5.2 Lima Metro- Peru

The city of Lima presents serious problems with regard to the general circulation of transport in their main districts. For instance to go from the district Villa el Salvador, the southern district of Lima -See Map Appendix E- to the city center, people usually take 1.5 hours by public transport (if there are no traffic jams). This situation affects more to the lower-income people because they live in the peripheral areas of the city. The structural problems in the organization of the transport services include not
5.3 First Phase: Lima Metro Project Background (1985-1995)

only high travel duration, but also poor transport infrastructure, chaotic traffic, pollution and high rates of accidents. Furthermore, the proliferation of medium size vehicles called “combis” represents nearly 50% of the public transport fleet. These vehicles are characterized by their high speed and the bad quality service. Moreover, there are approximately 190,000 taxis in Lima (compared to 60,000 in Buenos Aires and 100,000 in Santiago), which brings even more pollution and congestion on the roads.

Definitely, the public transport sector is still one of the main problems of Lima. The incentive to use individual transport (cars and motorcycles) on the roads is growing tendency. More congestion and the growing of informal transport are also part of this trend. The next figure 5.1 shows the transport problem in Lima.

Lima is evolving without a correct planning and a good leadership to improve the management of the transport system for city. The plutocracy that still exists in the governmental area and the centralism of the urban city is part of a mega-problem which includes high governmental levels of the state. Moreover, the overcrowded Lima of almost 9 million inhabitants permits the increase of the informal sector bringing even more troubles to the transport sector. The mobility that reaches the 43 districts of Lima is facilitated by 844 public transport routes competing to gain passengers and generating chaos and pollution. The number of car accidents in metropolitan Lima reached 46,726 (between 2000-2002) with 13,135 victims including injured and killed people (MDTU, 2002).

Thus, it is important to study the history of the transport system in order to provide some recommendations that would help in the construction of the next lines of Lima Metro. The following section will give an overview of the urban rail transport system.

5.3 First Phase: Lima Metro Project Background (1985-1995)

The local government had made some attempts to ameliorate the problematic transport situation in Lima. Therefore, some studies have been carried out. The first study occurred in 1973, headed by Council of Transport of Lima and Callao and the consortium “Metro Lima”, formed by the enterprises Electro-Watt Ingenieros Consultores S.A. (Germany), Deutsche Eisenbahn Consulting (Germany), Lahmeyer Internacional (Germany) y P y V Ingenieros S.A.(Peru). They carried out the project “Urban Transports for Metropolitan Area of Lima and Callao” by the creation of a master plan. This
was done to alleviate the chaos of the city and proposed the construction of a urban rail network composed of 4 lines (See figure 5.2) that would go through the districts of:

- Line 1 (North-South): Comas - Rimac - City Center - San Juan - Villa El Salvador
- Line 2 (West-Center): San Borja - City Center - San Miguel
- Line 3 (East-Center): Rimac - Wilson - Salaverry - San Isidro
- Line 4 (East): La Victoria - Carmen de la Legua

However, the project did not succeed because of the political risk that Peru suffered during the decade of 70s. The military coup headed by the former president Juan Velasco, simply rejected the project due its high investment cost for the government. However, further negotiations took place in 1974 between the government and Metro Lima in order to take up again the project. In that year, economic policies were unsuccessful and the government ran deeper into debt and was forced to devalue the currency. As a consequence, the political risks of possible expropriation and the financial risks of a growing inflation, left out the project for a Metro in Lima.

![Figure 5.2: Proposed Metro Lines of the company Metro Lima](image)

After the military administration, in 1986 with the first administration of Alan Garcia, the decision to construct an urban rail system was taken during one of public meetings. Garcia announced the possibility to build a new metro and by this, he could obtain the public support especially from the lower-income people. Citizens were tired of spending long hours for traveling from their homes to the works. The majority of them, lived in the “sleepy districts” (called like this because people only go there to sleep) which are situated in the “cones” of the city. They were the most affected with the transport system.

The first step from the government of Peru was to establish the guidelines of a new transport system by creating the “Authority of the Special Project of the Electric UrbanTrain (AATE)” by the decree 001-86. This entity had the responsibility for planning and executing the necessary studies for the implementation of the urban train. Moreover, the institution was in charge of coordination and control of the construction of the metro which contained the creation of possible agreements with national and international institutions. AATE was comprised by one representative of the President, one representative of the Ministry of Transport and the Ministry of the Presidency, one delegate from the Municipality of Lima and one delegate from the Municipality of Callao.
After the creation of this entity, the government secured an investment of US$ 83 million for the first phase of the construction of the metro. At the same time the AATE was looking for possible candidates for agreement on electro-mechanics works. The idea of the project was that the private partner would be in charge of the electric works and its financing. Moreover, the institutional environment was still incipient in 1986 and the lack of transparency of the process led to corruption acts.

5.3.1 Technical Scope

One of the aims of the project was to improve the quality of transport services through the introduction of new technologies providing efficient alternatives to solve the traffic congestion problems in Lima. The construction of a line that covers the northern point with the southern point, would benefit almost 6 million of people in Lima at that moment. The scope of the project in 1989 was to build a railway of 41 kms by 1995. The project was stopped after 9.8 kms due to financial problems.

![Figure 5.3: Different Phases in Lima Metro](YACHIYO and JICA, 2005)

In the first phase of the project, the construction embraced the railway structure that would support the technical infrastructure for the Metro in Lima (See Table 5.1). Moreover, the site preparation for the installation of the project was restricted to the district of Villa El Salvador where the maintenance was also located. Then the other areas were prepared accordingly to the master plan and their implementation was done gradually up to Atocongo station. Furthermore some lands were expropriated in order to complete the metro system. Fortunately, these lands belong to the Lima’s municipalities, so it did not bring problems to people.

<table>
<thead>
<tr>
<th>Item</th>
<th>Main Line Between stations</th>
<th>Main Line at Stations</th>
<th>Yard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outline Radius</td>
<td>250 m</td>
<td>400 m</td>
<td>70 m</td>
</tr>
<tr>
<td>Maximal Slope</td>
<td>35%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Structure of the Gauge</td>
<td>1,435 mm</td>
<td>1,435 mm</td>
<td>1,435 mm</td>
</tr>
<tr>
<td>Rail</td>
<td>50 Kg/m</td>
<td>50 Kg/m</td>
<td>36 Kg / m</td>
</tr>
<tr>
<td>Technical subjection</td>
<td>Pandrol</td>
<td>Pandrol</td>
<td>Tirafones</td>
</tr>
<tr>
<td>Ballast</td>
<td>25 cm</td>
<td>25 cm</td>
<td>20 cm</td>
</tr>
</tbody>
</table>

Table 5.1: Technical Details of the Infrastructure of Metro Lima in 1989 (Source YACHIYO and JICA, 2005)
5.3 First Phase: Lima Metro Project Background (1985-1995)

5.3.2 Stakeholders Involved

In 1985, the AATE was the key responsible for the implementation of the Lima Metro. The key agreements between AATE and their subcontractors were significant in the development of the project (See Figure 5.4). Among the most important actors we have the subcontractors, regulatory agencies and banks. In the next lines, we will describe the main key players in Lima Metro.

Figure 5.4: Key Stakeholders in the first phase of implementation of Lima Metro

**Authority of the Special Project of the Electric UrbanTrain (AATE)** The AATE was created under the jurisdiction of Ministry of the Presidency in 1986 and their main goal was to establish the organization of the railways system by initiating the implementation of the Metro Lima. This entity was in charge of the planning, coordination, supervision, control and execution of the new system that would help a number of citizens to reach their jobs in the city center. In this case, the AATE was responsible for almost all the phases in the project. In other words, the state-owned company agreed to take almost all the risks that could occur during the life of the project. Moreover, the dependence of this entity was very volatile. During the first five years (1985-1989), the entity belonged to the Ministry of the Presidency. Then, in 1991, the administration was transferred to the Ministry of Transport, in 1997 to the Ministry of Construction and in 2003 to the Municipality of Lima. Nowadays, the entity is managed again by the Ministry of Transportation and Communication.

**International Financial Sources** The first Metro line was financed with domestic and foreign capitals. The main capital sources comprised public finance from the central government of Peru, regional governmental funds and foreign capitals. In the case of the local financial sources, the government was supported by the funds of the Central Reserve Bank of Peru. This entity incorporated US$ 83 million for the project which was aimed to implement the construction of the yard, rolling stock and part of the railway system. The main aim of the international loan was to support the electro-mechanical works. The amount of foreign capitals reached US$ 110 million as a loan from the government of Italy. This loan was criticized by its low interest rate which could lead to a possible favoritism for an Italian enterprise. The bad management of the loan was one of the sources whereby Metro Lima was never concluded. Moreover, the lack of a guarantee funds and the inadequate contingent planning to guide recourse for the project implementation worsen the situation. The banks were dealing with inability payoff borrowers within a fixed term resulting in restructured and extended loans.

**TraLima** The company Tralima along with InterMetro consortium preceded from Italy and were the responsible for building and constructing the first stage of the project works of Lima Metro. TraLima was in charge of the coordination of the operational activities of the project and was the nexus between the subcontractors of Italy and the designers from Lima.
The company attended important meetings between the government and the Italian counterpart. They aimed to finish the construction in a period of two years. However, due to some indications of corruption between the president of the firm, Luciano Scipione and some Peruvian authorities; the work of the project had to be postponed in 1989. Some representatives of TraLima had also some judicial problems in Italy. Investigations were later carried out in order to know if the Italian company had committed any corruption acts. After some years, these acts were confirmed by the judicial system.

5.3.3 Analysis of the Project

This section will describe the different factors inside the project Lima Metro in the first phase.

5.3.3.1 Project planning

The project planning was intended to promote economic growth by developing the infrastructure for improving the situation of the railway system. The project was analyzed by the Commission of Planning of ATTE. The process of scheming all the duties took only three months. This was a very short time for one of the most important projects in Lima. Moreover, the master plan of the development of the railway system which proposed four lines, decided to give the priority to the line that interconnect the southern districts, city center and the northern areas. In this plan, the government assessed the evaluation for the investment costs and the operative plan.

In the planning process, a number of shortfalls were identified. Firstly, the subcontractors and the Italian consortium TraLima were not involve in this early phase, thus its expertise and business knowledge can not be exploited. As a result, the risks can not be shared with other partners. Secondly, the project was driven by a political strategy from the government. Even though there was a demand for a better transportation system, there was also a political interest to begin this project. The inauguration of the works coincidentally occurred a month before the municipality elections. The Lima’s candidate of the presidential party accompanied the President Alan Garcia in the design of the project. As a consequence, he often appeared in the media as one of the initiators of Lima Metro. He gained a lot of votes by staying closely to the project and the public media. Thirdly, there was not any independent supervisory institution to revise the planning of the AATE. Fourthly, during the project preparation, many project characteristics, such as the financial implications and construction details, were not known in detail.

5.3.3.2 Economic Viability

The planning analysis carried out cover also the entire program investment. This investment project compromised some components that were not necessary for the system operation and was left for a new phase. Moreover, the investment plan included the operation cost differential and time saving for passengers. The result provided an approximately net present value of US$100 million, using a discount rate of 12%. These figures represent a conservative valuation since the analysis did not include benefits arising from fewer accidents, reduction in environmental pollution, improvement of urban habitat, and others. No sensitivity analysis was conducted on the rate of return or in the investment costs. Moreover, the investment planning did not contemplate the consequences of the financial crisis that was appointed at the end of the 80s. Having a state-owned enterprise to be in charge of almost all the different phases of the project, was also the risky action to confront different unexpected actions such as the economic burdens.

Moreover, not only the economic viability was an important issue. The planning also included a program socially viable. This depended basically on the acceptance generated by users. The idea of first served the citizens of the north and south cones of Lima where the low-income resident live, brought a high level of social acceptance in a country where the socioeconomic classes are totally segregated. The support from the inhabitants of the peripheries at the beginning was the key to boost the project but it also was the main critic when the project was not concluded.
5.3 First Phase: Lima Metro Project Background (1985-1995)

5.3.3.3 Trust

Strategic behaviors from the contractor and the government were found out in this project during implementation phases. First, during the process of choosing a subcontractor, the government of Peru had some preferences in respect with other possible candidates. This issue was clearly studied in one of the cases in 1995, when the president Alan Garcia was accused from illicit enrichment (Calderon, 1995). The report showed the interest that the government of Italy had with the Peruvian business:

“There was a clear intention from the president of Peru to induce intentionally his officials to commit pressure and gave strict orders (unrelated to its function) in which he set the participation of Italian company in the project of AATE”

The report also showed that some official authorities, including the president, had connections and dealings with the former President of the Council of Ministers of Italy, Bettino Craxi in order to benefit Italian companies to be responsible for implementing the Lima Metro. Moreover, the President of the Consortium Tralima, Luciano Glarini Scipione, who signed up the contracts with the AATE, was accused in the Italian courts and had recognized the commission payment of the Lima Metro. He confessed to delivered payments to the Peruvian authorities of US$ 200,000 in cash and US$ 840,000 through bank accounts in PLG Grand Cayman. Nevertheless, this case could not be investigated more due to the “limited evidences” that the judicial court presented at the end of the 90s. Therefore the case was filed in the administration of the new president Alberto Fujimori.

As it is explained, the possible collusion behavior was accomplished between the state and the possible concessionaire. The corruption act was done “under the table”. As a consequence, the government received poorer quality goods and services. For instance, the trains that were brought by the subcontractor were second-hand wagons. The project planning required new trains. The concessionaire did not have an incentive to provide quality services. Moreover, the private party involved in the project also had less incentive to be efficient and innovative, and this ultimately raised the cost of doing business in the entire economy. In that time, the regulations and the transparency laws where very insufficient because it was the first type of infrastructure project that involved the private sector. The lack of a transparent process and the absence of an independent monitoring system permit the collusion strategies from some foreign companies.

5.3.3.4 Value of Procurement

In the next lines, we will present some of the facts from the contract process and implementation:

- The tendering process was a close act and the government invited few bidders. The winner was the Italian-Peruvian Consortium, TraLima. The tendering process was seen as ineffective due to the fact that none of the companies qualified with the minimal requirements, but for the pressure of the government, TraLima was appointed for the works of the electric train. The relation between some government officials and TraLima officials (the President of TraLima, Luciano Scipione was indicted later by the Italian court) were pointed as a corruption act in 1995. Mr Scipione recognized the payment of some invalid commissions to Peruvian officials in 1985 in order to benefit from the project

- In 1986, the AATE Board approved the commencement of civil works for the urban train. The Head of the National Planning Institute gave priority to begin with the two kilometers of civil works in the district Villa El Salvador. However, this approval did not require the end of the technical and economic feasibility study of the project. Moreover, the required documentation for the determination of the characteristics of the system regarding the rolling stock and its financial justification was not included prior the approval. The cost-benefit analysis and the technical justification for execution of the different sections were not provided by the AATE.
The monitoring agency in charge of this project was the Italian company ITALFER. The Peruvian government used this company as “screen” for the possible acts of corruption. In that time, the members of the political party of the president, APRA, were appointed in the most important functions which include the judiciary system and the congress. The lack of an independent judiciary could not improve the public sector management and consequently a favorable environment for projects. In addition, not having an independent judiciary brought ineffective executions of laws and regulations which are meaningless for a transparency of a project.

Even though there were clear signals of corruption, the local government evaluated the Plan for transportation of Lima and Callao in 1989 and began with the design of the first line. These works included:

- The construction of 9.8 kms of urban rail system which include seven stations: Villa el Salvador, El Sol, Pumachahua, Villa Maria, Miguel Iglesias, San Juan and Atocongo (route South to Center).

<table>
<thead>
<tr>
<th>Name of the Station</th>
<th>Distance (Km)</th>
<th>Structure of the Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Station Villa el Salvador</td>
<td>0.362</td>
<td>Ground Level</td>
</tr>
<tr>
<td>2. Station el Sol</td>
<td>1.775</td>
<td>Elevated</td>
</tr>
<tr>
<td>3. Station Pumacahua</td>
<td>3.585</td>
<td>Elevated</td>
</tr>
<tr>
<td>4. Station Villa Maria</td>
<td>5.060</td>
<td>Elevated</td>
</tr>
<tr>
<td>5. Station Miguel Iglesias</td>
<td>6.060</td>
<td>Elevated</td>
</tr>
<tr>
<td>6. Station San Juan</td>
<td>7.350</td>
<td>Elevated</td>
</tr>
<tr>
<td>7. Station Atocongo</td>
<td>8.960</td>
<td>Elevated</td>
</tr>
</tbody>
</table>

Table 5.2: Structure of the Train Network (Source YACHIYO and JICA, 2005)

- The construction of the courtyard in Villa el Salvador (area 144,00 square meters). This has a capacity for 220 cars considering meeting demand forecast for the future.
- Security system which compromised security cameras, signal systems and central control system

It was supposed that the design and the construction period would last three years (1990-1992), however only the design of the civil works and electromechanical equipment were carried out during this time. The total budget for the design (US$ 9 million) was distributed in:

- US$ 2.5 million for the design of civil works in line
- US$ 4.5 million for the design of electromechanical equipment of line
- US$ 1.3 million for the design of civil works of depot
- US$ 0.7 million for the design of electromechanical equipment of depot

**Court Yard Villa el Salvador Characteristics:** The court yard of Villa El Salvador known as “El Patio” is a complex installation which shelters different facilities in the project Lima Metro. It has an area of approximately 14.5 hectares divided in two levels and their main characteristics include (YACHIYO and JICA, 2005):

- The beginning of the route South to North
- Actions of maintenance and repair works
- Location for the new technological equipment
5.3 First Phase: Lima Metro Project Background (1985-1995)

- Capacity of 220 wagons (164 wagons for 2020)

Moreover, the supplies of the urban train which include the parts of the electromechanical equipment, telecommunication parts and equipment of depot; were brought from Italy during 1989-1995. The Italian company Ansaldo Trasporti gave this equipment for the project.

The construction period of the urban train began in 1989; however the implementation of the urban train could not finish in 1992 according to the studies of the AATE. The design of the project was done during previous months and the execution followed the defined terms of the design. However, the construction could not finish the original design which considered the urban rail system until the station Hospital 2 de Mayo in the city center. The economic situation of the country and the social crisis in the early 90s did not permit the completeness of the project and the suspect of acts of corruptions of some officials raise the possibility to not to finish the project. As a consequence the urban train only reached 9.8 kms of Line 1 until the district of San Juan de Miraflores in the Atocongo Station in 1995. The poor construction process without correct monitoring system and the financial crisis made this project as one of the most unsuccessful infrastructure projects in Peru.

5.3.3.5 Risk Management

The project was carried out with as state-owned company that assumed almost all the risks of the infrastructure project. The contract agreement with some constructors involved only the sharing risk in construction and delay in the implementation of the project but the government would assume all the other external risks that might happen. By the end of 80s the Peruvian economy was already involved in many financial problems and the economy was declined due to the bad economic reforms that were approved in the early period of the Garcia’s administration. The main risks associated with this case were the economic risks. In the case of Lima Metro, the lack of guarantees to face a crisis brought as a consequence the increase of the economic risk that lead to the interruption of the project.

**Economic Risks**  The economic risks have been surrounding the government during the first phase of the Metro Lima. The short efforts from the government to create a viably financial package by offering any guarantees were the key stone to increase the economic risk in 1987. Moreover, during the decade of the 80s, some macroeconomic policies in Peru were introduced in order to capture the attention of foreign investors. The government was spending some resources in other projects and the regulatory agencies did not support the correct financial control in order to improve the economy. Thus, the considerable external debt was enhanced and the inflationary process in Peru seemed to earn space in the financial framework. This was imminent response for the bad economic policies taken by the government.

The former financial and economic crisis affected all the infrastructure projects in Peru in numerous ways. First, it had a major negative impact on the availability of finance for transport infrastructure investment. The government could not ensure the financing from foreign banks such as the loan from the World Bank and the Italian loan. The Peruvian stock indexes fell by over 70% in few months. The depreciation of the currency was an action that destabilized the country and allowed the increasing of social problems. Secondly, the high volatility of financial market indicators did not ensure the continuation of the private partners in some other projects. In the case of Lima Metro, the subcontractors were scared with the low commitment of the government to support the project and thus their actions reflected the lack of confidence that they had with the project. Thirdly, the fall in commodity import revenue (which is the most important resource in Peru) brought the related to increase in prices and thus the lack of resources to guarantee a huge investment projects. Therefore the Metro Lima was identified as a “high risk asset”.

The challenge facing by the Peruvian economy, at that time with fewer resources, was aggravated by the lack of policies that could protect against any critical expenditures, including on human development and critical infrastructure. The incentives to confront the economic volatility and slowdowns simply disappeared. As a consequence, the government had to stop the implementation of the Lima Metro and decided to recuperate the economy and the resources to finance other economic activities.
5.4 Second Phase Lima Metro (1995-2004)

After the crisis, a new government was elected in Peru. Alberto Fujimori (Former President 1990-2001) tried to stabilize the economy and conciliate the private sector with the public sector through a series of reforms known as “Fujishock”. The policies were led by the Privatization process that was done to the most important enterprises in Peru, but it also encouraged other social problems such as corruption. Thus, his administration made some efforts to continue the project and executed technical plans. Among the important facts during the Fujimori administration:

- During 1992-1995, some parts of the supplies for the electromagnetic train arrived from Italy. There was a delay in the materials due to the lack of funds from the Peruvian government. However, in 1995 they arrived and permitted the first non-commercial operation of the train. Nevertheless, the government could not finish the implementation of the trains due to the priority of other projects (such as gas and oil projects). The project stopped, and the government decided to re-plan the project while finding financing for that.

- In 1996, there was an in-depth evaluation of alternative for the second section of the train in order to select the most viable routes in the two sections of the Metro Lima. The study was kept by the AATE.

- In 1996, the initial operational plan was changed due to variation in the demand of the citizens. A group of researchers led by authorities of the National University of Engineering analyzed the new requirements and explained that a metro was not the most suitable solution for the growing Peruvian capital. They concluded that a transportation system composed of a bus system and metro line was the most attractive idea for the society. They recommended implementing a bus rapid system in Lima first.

- In 1998, the government of Peru, through the Ministry of Construction and Transportation, analyzed the initial Metro Line 1 and selected a new alignment for the network. They decided that the Line 1 should change the route to the road Paseo de la República. The idea was to cover the demand of people near this main expressway who wanted to go to the north or the south of the city.

- In 1998, a Japanese bank (Japan Eximbank) presented a feasibility project for the extension of Line 1. The project was a complementary study of a Metro Network and analyzed the extension of Line 1 between the Atocongo Bridge and Benavides Station. However, it was filed in the AATE as a possible solution of the Metro Line.

As it was explained before, many studies were carried out in the project Lima Metro, but none of them were taken into account and others were filed. This happened because the government did not have the willingness to resurge the project until a new administration was in the authority. The administration of Alejandro Toledo brought back some confidence to continue the project. Here we will present some important facts in Toledo’s presidency with respect to the project Lima Metro:

- In 2002, the company Rail Consult analyzed the Metro Rail Network and its integration with the bus system. It proposed an integration of the existing line of the railways system with nine feeder bus routes which included two rapid bus lines.

- In 2003, The Municipality of Lima designed a network mass route comprising the main corridors in Lima. This was the scheme for the bus massive network and also the beginning of the bus rapid project planning. In this project, the main routes of the bus would cover one part of the former Lima Metro route. Including the expressway Paseo de la República (backbone of the city) along other districts. As a consequence, the route of the Lima Metro has to change again according with the new route of the bus system.

Giuseppe Manrique
August 2010
In 2004, the government of Peru asked the Government of Japan to carry a study with respect to the transit problem that was generating in Lima. Therefore, they accomplished a Master Plan for transport in the main capital of Peru. This study helped the government to decide again the implementation of two systems: the bus-rapid transport system and the Lima Metro. Here we will give a brief description of this project.

5.4.1 Master Plan for Transport in Lima

The study conducted by the Japanese company JICA (Agency of International Cooperation of Japan) covered a Master Plan for Lima, which recommended a short-term plan for the Peruvian capital (2005-2010) and feasible studies for the transportation system in a long term (2010-2025). The projection of the demand was analyzed for the year 2004, in which most of people mobilized from the southern districts such as Villa el Salvador to the Northern part of the city in San Juan de Lurigancho. This trend will be maintained until the year 2025, which highest demand will be from Villa el Salvador to the city. In rush hour it can reach 110,000 passenger in 2025 (See Figure 5.5).

Moreover, the plan included a full technical analysis of the rehabilitation/service plan for the Metro Lines, economic market analysis, financial analysis, environmental studies and other supporting regulatory analysis. The result of that project was design of new transport system based on the main core districts (See Figure 5.4). This project comprised new strategies for a better organization of the bus system, improving the main routes of the actual bus system, improving the traffic management and the creation of new lines for the Metro Lima.
The aim of this project was to recommend the government of Peru about the possibilities of the new transport system. Therefore, the benefits for the Peruvian would be:

1. Improving the quality of public transport in Lima.
2. Reducing congestion throughout the transportation system.
3. Introducing a new transport technology that enables the optimization of system resources
4. Improving efficiency of the new routes and frequency of public transport
5. Reducing traffic accidents and environmental pollution
6. Generating benefits of urban planning, greater densification and concentration of services
7. Increasing the attractiveness of investment in Metropolitan Lima

The implementation of this master plan would mitigate the negative impact of the transport issues. For instance the traffic congestion would be reduced in 17%, the speed of the average trips would be 4.2 kms quicker than before, the time to travel would be reduced in 17 minutes in average and the pollution would be reduced in a 57% percent in the year 2025. The low cost of operation of the public transport system incorporated more vehicles on the roads. In the long term it will save for the city’s economy. Other social benefits would be acquired such as the reduction of the pollutant emissions and traffic accidents. The result of the total project comprised a net present value of US$ 563 million with a IRR of 31.3% and a relation of Benefit-Cost of 11.3.

It can be inferred that the project was viable thus the local authorities decided to re-establish its implementation as soon as possible.
5.4 Second Phase Lima Metro (1995-2004)

5.4.2 Taking up again the project Lima Metro

The project was again planned based on the studies that were carried out by the government of Japan and other previous studies. In that context, they established that it was necessary to divide the project into three phases:

- Phase 1: Railway system and construction of the infrastructure from the stations Villa el Salvador - Atongo
- Phase 2: Railway system and construction of the infrastructure from stations Atocongo - Grau. It also includes the Operation and Maintenance of the entire system
- Phase 3: Railway system and construction of the infrastructure from stations Grau - San Juan de Lurigancho

The implementation of the first phase was already done by the government of Alan Garcia, in which the works could not be concluded. The section 5.3 describes the most important facts of this phase. Throughout the years, the administration of the local and regional government changed. As a consequence, the actual government was looking to implement again the project which could not be finished on time. The first action was to begin with the inspection of the current situation of the Metro Lima and do some maintenance works of some equipments and facilities. The aim of this work was to have a deep knowledge of the railway system because some of their facilities remained intact since the 80s. A group of specialized technician revised the facilities and reported a general description of the first part of the project. This is depicted in the Box 5.1:

**Box 5.1: Summary of the facilities of Lima Metro - first phase** *(Source ProInversion 2010b)*

- 5.5 km of viaduct (100% secure and exclusive, with electronic sensors-mails and no grade intersections)
- 32 cars (with capacity for 250 passengers each)
- Maximum speed: 80 km/h
- 1 Yard of almost 15 hectares
- Central Traffic Control
- 9.8 kms of Railway system

Thus, after the planning of the project, the beginning of the second phase should be carried out immediately. The government in 2006 delegated the responsibility to the AATE and Pro Inversion, agency of private promotion, in order to look for a Public-Private Partnership for the implementation of the second Phase. The AATE would be responsible to formulate the technical requirements and Pro Inversion would be the initiator of the tendering process. Pro Inversion was in charge of the bidding of the 2nd phase of the project which includes the construction of the railway system and stations from Atocongo to Grau; and the operation and maintenance of the entire system. The project assumed a total investment of US$ 380.4 which includes external and domestic funds. The next table 5.3 describe the total investment:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Investment (US$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Work</td>
<td>208.3</td>
</tr>
<tr>
<td>Equipment</td>
<td>53.4</td>
</tr>
<tr>
<td>Rolling Stock</td>
<td>100.9</td>
</tr>
<tr>
<td>Pre-operative expenses</td>
<td>13</td>
</tr>
<tr>
<td>Interest during construction</td>
<td>4.4</td>
</tr>
<tr>
<td>Other Work</td>
<td>0.3</td>
</tr>
<tr>
<td>Total Work</td>
<td>380.4</td>
</tr>
</tbody>
</table>

Table 5.3: Total Investment of Lima Metro in 2007

In this project the sharing of risks would be critical for the concessionaire and the AATE, a dependency of the Municipality of Lima. This contract with the concessionaire includes articles with strong requirements for the subcontractors and operators. The BOT (Build-Operate-Transfer) would have the following scheme (See Fig 5.7):

The tendering process was planned in 2008, with the promotion of Pro Inversion. Even though, there were six consortiums that seemed to be interested in the project, the strong requirements from Pro Inversion finished with no expected proposals. Pro Inversion executed a new study about the demand of Metro Lima and concluded that a Build-Operate-Transfer (BOT) partnership was the most suitable solution for the project. Thus Pro Inversion proposed two phases for the tendering process. The first phase included the experience of the company and the second comprised some technical reports and conditions regulated by the Ministry of Transportation. Six enterprises were pre-qualified for the agency of supervision of the tendering process. However, none of the enterprises presented a complete economic and technical report for the second phase. They were disqualified from the tendering process. Some of the companies adduced that the requirements were too high to find a partner with the necessary conditions for win the tendering. This problem discouraged the desire from the government to opt again for a partnership. Thus, the government had to modify the plan according with the experience already gained.

The aim of this phase was again to ensure the private participation through a concession program and therefore, the concession agreement should be divided in 2 parts. The first part incorporated the electro-mechanical operations and the extension of the Line 1 until the station Grau. The second part comprises the concession of the operation and maintenance of the Line 1 until station Grau (See Figure 5.8). These two parts should be carried according to the Peruvian legislation in order to avoid any type of strategic behavior and risks that presupposed the termination of the contract from one of the parts.

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The first part of the implementation began at the end of 2008 with the second presidential term of Alan Garcia. The economy of Peru was raising and the private participation was increasing during this first phase. Thus, the investment climate for the Lima Metro was favorable. Months later, the government designated who would be the responsible for the planning of the bidding phase. In this case, the Supervisory Agency of Agreements in Peru - Ositran (a agency from the Ministry of Transportation) was the responsible for received the questions about the civil works in Metro Lima.

There were some attempts to begin the project as possible in 2008 but the new contract had to include some changes in order to attract more competitors. The government already had failure experience with previous tendering processes and did not want to lose more resources in a poor tendering process. Therefore, the government began a fierce campaign to include more private parties in the bidding of civil works for Lima Metro. After some months of analysis, the government presented a proposal with the approval of the Treasure inspection office.

According to [AATE] (2009), there were 20 companies (international and national companies) interested in entering in the tendering process that will permit the execution of the civil works of the project. These tasks include the electro-mechanical works between the station Atocongo and the station Grau in the city center. This works should be carried within a period of 18 months with the finance of the institution Coorporacion Andina de Fomento. From the 20 companies, only few of them presented the complete technical and economic analysis necessary for the project. Among the most important characteristics of the civil works that the bidding companies presented are:

- 22 km of viaduct: 100% secure and exclusive with electronic sensors
- 80 cars with capacity for 250 passengers each
- 80 km/h : Maximum speed
- Travel time: 27 minutes, between stations Villa El Salvador and Grau
- Time between trains: 6 minutes
- Low percentage of pollution (hydroelectric power)
- New stations
- Maintenance of backyard workshop

The bidding process was seen as a transparent according to the media; however some problems arose with the candidacy of the winner consortium. The three consortium that passed the qualification phase were Tren Electrico, Consorcio Metropolitan and Tren Lima. The winner consortium “Tren Electrico Lima” was formed by the Peruvian Company Grana y Montero and the Brazilian company Norberto
5.4 Second Phase Lima Metro (1995-2004)

Odebrecht. They imposed to the consortium “Consortio Metropolitano”, formed by the Peruvian company Gallegos-Casabonne-Arango- Quesada Ingenieros Civiles and the Brazilian company Andrade Gutierrez, and the consortium “Tren Lima” formed by the Peruvian company Cosapi and the italian company Astaldi. The winner consortium has a long reputation in Peru and already was awarded the exploration of some other projects such as hydroelectric plants, irrigation projects, highways, railways and ports. Some of the competitors declared that there was a kind of favoritism from the government to the Brazilian enterprise. This enterprise also was part of the implementation of the Sao Paulo Metro. There were some signs that the bidding process would have been canceled. However, the president of the commission of supervision of the bidding process showed the entire requirements and the support documentation of the transparency of the process in which the consortium won with a score of 100/100. The media facilitated this documentation and any kind of observation from other consortiums was diminished. As a consequence the winner consortium Odebrecht and Grana y Montero began their operation with a proposal of US$ 420 million (90% of the established referential value) in the beginning of 2010 for a 21 kms for civil and electro-mechanical works. Some issues had been shown during these four months of construction which should had taken into account:

- The works are following the planning process, however it seems that the concessionaire and the municipalities are not coordinating the technical plans. The works are worsening the traffic congestion due to the lack of a plan to manage the new routes in which the cars have to transit. The lack of a correct transport planning for the other transport modes aggravates the public commitment of the project.
- One of the stations in the district of San Borja will not operate in the project as it was initially planned. There was a strong opposition from the wealthy district of San Borja to not permit a station in their district. They adduced that people from the “cones”, such as Villa el Salvador would bring social problems to their districts as well as more informality. The negotiation between the concessionaire and the residents was taken in the beginning of this year and the decision that they took was to build the station and then the negotiations for the operation will take place again in order to convince the residents to approve the intermediate station.

The execution of the works is still under progress and the consortium aimed to work day and night to accomplish the terms of agreements.

While these works were done, the agency of the private promotion, Pro Inversion, was delegated to carry out the bidding process of the operation and the maintenance of the system. The aim of this concession is to include the private participation by providing a good quality of services. Thus, the concession agreement will include the following points:

- 30 years of term concession
- Acquire a new rolling stock which guarantee the operation of the system during the concession period
- Enlargement of the yard in Villa el Salvador
- Maintenance of the System
- Operation of the Phase 1 and Phase 2 of Lima Metro

The attractiveness of the project is the remuneration in which the concessionaire will not assume the demand risk. This is a key factor in determining the success of the project. According to [Menzies and Mandri-Perrot (2010)], allocating the demand risk to the private partner had generated unsatisfactory outcomes during the last years. The Kuala Lumpur and the Bangkok failed in sharing demand risks with private partners or had to restructure their projects. For instance the Kuala Lumpur project experienced temporary discounts which permitted the increase of ridership but without a proper control. The planning of the demand risk is still a puzzle in the organization of the city but the Peruvian government opted to allocate the risk on their own side. In this case the public sector is

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taking this risk in order to incentive the private participation by increasing their commitment to the project.

Therefore the Peruvian government recommended to provide the corresponding remuneration as a basis of:

- Incomes for every Km covered
- Income for additional kms
- Income for commercial activities and other financial resources for additional materials

The government also divided the functions between the private and the public sector. Therefore, the state proposed the obligations from both the concessionaire and the government (Ministry of Transport). The most important function of the state will be to define the standards of quality of services which will be based on the service hours, average speed of the train, minimal and maximum frequencies in rush hours. The following table 5.4 will give us an idea of the most important facts in the second phase of the Metro:

<table>
<thead>
<tr>
<th>Concessionaire</th>
<th>Ministry of Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Acquisition of the 10 New Rolling Stock with 3 wagons each one</td>
<td>• Define the quality of service</td>
</tr>
<tr>
<td>• Building of the extension of the Yard in Villa el Salvador</td>
<td>• Define kms guarantees</td>
</tr>
<tr>
<td>• Guarantee the availability of the service and assure the quality of service</td>
<td>• Define tariffs</td>
</tr>
<tr>
<td>• Accomplish the maintenance of the system</td>
<td>• Supervise the quality of service</td>
</tr>
<tr>
<td>• Collection of tariffs</td>
<td>• Guarantee the viability of the service</td>
</tr>
<tr>
<td>• Development of commercial activities</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.4: Different functions of the actors in the Concession of O&M in Metro Lima

**Tendering Process Second Phase**

The project Lima Metro wants to achieve the true nature of PPP in order to not fail again in the financial problem of the 80s. Therefore the need for a competitive tendering has been arranging by Pro Inversion. In 2008, the promotion agency looked for the approval of the Ministry of Transport and Economy to begin with a new process to support the bidding of the maintenance and operation of Lima Metro. Before any tendering process, the Lima Metro has again been determined, a series of feasibility studies which were organized by the AATE and Pro Inversion committed to know the most important facts in the demands trends, quality services and connections with other transport modes. For instance, in 2011, it is forecasting that in rush hour, Lima Metro could carry 39,000 passengers with direction north to south, which contains big demand of boarding and alight of the train in the corners of the city of Lima (See Figure 5.9)
5.4 Second Phase Lima Metro (1995-2004)

Other requirements include the economic resources and the experience from the possible concessionaire. The financial sources of the company includes a patrimony of at least US$ 40 millions and minimum billing of US$ 80 million during the last three years, while the requirements of the experience includes:

1. Operator of Metro, Light Rail, Train or Urban Rail Train with more than 20 millions of passengers annually during the last three years OR

2. Manufacturer of the rolling stock with 250 wagons built in the last 3 years OR

3. Operator of rapid bus system with an operation of 50 millions of passenger/year in the last 3 years OR

4. Operator of Metro, Light Rail, Train or Urban Rail Train with more than 10 millions of passenger/year during the last 3 years AND Operator of rapid bus system with an operation of 15 millions of passenger/year in the last 3 years

The tendering process of this second phase is planned according to the rules already learned from previous experiences. However, there are still some things that the government is not taking into account. These things are listed in the following lines:

1. **Lack of integration**: The government decided to divide the concession process in two phases. These two phases should be comprised of a tight relation in order to achieve success for the entire project. In the case of the concession of the O&M, it seems that there is no clear connection between Pro Inversion and the companies in charge of the civil works, Odebrecht and Grana and Montero. Pro Inversion did not ask any technical requirements from Odebrecht for the tendering process and preferred to work with their own technical team. Until now, it has not presented any problems but it might unchain later issues when the civil works are finished and unexpected issues arise in the operation of the trains.

2. **Cost overruns**: There are large cost overruns of the project since the beginning of the second phase. The government has gained some experience with other projects but their optimism on the new project permitted new cost estimations such as monitoring costs in order to ensure the project. These efforts in monitoring and providing incentives for the contractor will definitely incurs in the transaction costs. Nevertheless, if there were no signs of monitoring and offering incentives in the Metro Lima project, no guarantees could be made in terms of collusion or strategic behavior. Moreover, in this volatile situation, the sensitive analysis of the costs might be analyzed and carried carefully in order to deal with these issues.
3. Promotion and public approval: In Peru, the public acceptance of a project is of high importance. People are tired of the poor transport system in Lima which is the main pitfall in the local administration. Thus, the actual government believes that the project would encourage more people to use a good transport system. Although, other transportation projects have failed to do this activity. For instance, the bus rapid system in Lima, Metropolitano, has been the point of many criticisms due to the lack of commitment of the authorities to finish the work on time and the poor communication with the end users. Even though the system is not yet in operation, citizens of Lima are not totally happy with the feedback that they receive from the project. As a consequence, a good strategy is to involve the users of the transport system in order to show the benefits that the new project would give. But still, the government has not planned any marketing strategy for Lima Metro which should be of great importance if the public party is allocating the risk of demand on their side.

5.5 Evaluation of the Project

In this chapter, we have studied an important case in the Peruvian society. Although it did not cover the whole empirical research results in chapter 2 due to part of the project being still in progress, they can illustrate some points in the identification of the critical factors in the Peruvian context. The project was divided in three phases in which the last one represents the actual project. Thus we will identify the most important lessons from the first and second phase:

<table>
<thead>
<tr>
<th>Topics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Size</td>
<td>9.8 km - First phase</td>
</tr>
<tr>
<td>Construction by</td>
<td>Public Sector and Subcontractors</td>
</tr>
<tr>
<td>Operation by</td>
<td>Public Sector</td>
</tr>
<tr>
<td>Payments by government</td>
<td>The government paid construction costs</td>
</tr>
<tr>
<td>Institutional Framework</td>
<td>No unified laws for PPP. Non-independent judicial system</td>
</tr>
<tr>
<td>Socio-Economic Environment</td>
<td>No guarantee funds                           Social factor played a important role - Social Support</td>
</tr>
<tr>
<td>Economic Viability</td>
<td>No proper economic analysis in the planning phase. It did not contemplate economic risks</td>
</tr>
<tr>
<td>Project Planning</td>
<td>Consortium were not involved in the first phase of the project.</td>
</tr>
<tr>
<td></td>
<td>Planning of the project last three months</td>
</tr>
<tr>
<td>Value of Procurement</td>
<td>Few bidders in the tendering process. The project had to be abandoned due to the lack of fundings</td>
</tr>
<tr>
<td>Trust</td>
<td>Corruption problems in the selection of the contractor</td>
</tr>
<tr>
<td></td>
<td>Not strong commitment from the state when the economic crisis appeared</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Lack of a guarantee funds which could mitigate the financial risks</td>
</tr>
</tbody>
</table>

Table 5.5: Summary of key points in Lima Metro

- Transparency is significantly important in ensuring selecting the optimal contractor and deterring corruption in the project. The transparency of the project can be seen as trust and strategic behavior factor. The information obtained through such strategic communications among bidders or between bidders and the government, makes bidders move onto an advanced position over the government during tendering process. As a consequence, the collusion and strategic behavior can occur. In the case of Lima Metro during the first phase of the project, the state failed to guarantee a good process by granting the support only to Italian companies and by negotiating
all relevant contracts without taking into account the allocation of the risks, monitoring schemes and public participation. Moreover, the lack of a transparency policy with still incipient laws and the lack of an independent monitoring system ruined the project in the 80s.

- The correct planning to counteract again any financial crisis was absent in the first part of the project. The Peruvian government did not presuppose a financial crisis that was latent in the economy for years. Therefore the consequences of the external factors are always an issue in developing countries. One way to face this problem is by using a guarantee fund. Trust funds would possible to provide support to privately financed infrastructure projects. The mobilization of financing as a contingency of any external problem that could occur in the contractual period would help to manage and mitigate some risks. However, this was not well-managed in the first phase of the project. Not only, the funds are a viable strategy for the government to reduce risks but also are signs of commitment to the project.

- Some projects neglected the public participation regarding it as not important for this project. In case of the Lima Metro, the future users have taken some distance and are not actively engaged in the decisions that affect where communities live and work. The government made little efforts in involving the public participation in the decision making process during the planning of the project. In the early works, the government successful negotiated with the people near the district Villa El Salvador, their lands but that was the only attempt to include the end users. The social support factor through a public participation program which can coordinate with the end users and the representative of the districts are essential for infrastructure projects.

- The Social problems are still an imminent issue in Peru. Not only the corruption and the poverty are the main barriers in the community but also the country’s large social difference. Even though there is an enviable growing economy of the last years, Lima is the center of one of the greatest inequalities in Latin America. The social differences between the rich and the poor; between the “criollos” (descendants of European immigrants mixed with indigenous) and the indigenous are still an issue in Peru. This had a consequence in all kinds of aspects in big projects in Lima. For instance, the station of San Isidro where the “criollos” and the middle-class residents live could be operated if the social problems would not be so apparent. There is an apparent resentment between the people that live in the “cones”, which are composed mainly by indigenous people, migrated from the Andes and the people that live near the city which is mainly composed by “criollos”.

### 5.6 Concluding Remarks

In this chapter, the case analyzed was the Lima Metro. This project could not be finished due to the lack of funding of the project. The context-related factor had an enormous effect in the urban rail project. First, the economic crisis provided with the lack of funding to develop the implementation of the project. Second, the political crisis that arose at the end of the 80s, instigated the cessation of the project. Thirdly, the poor acceptance of the urban rail system and the decline of the demand, did not stimulate the politicians to continue with the project.

These issues can help to describe which factors are important in the Latin America environment. Thus, the description of the cases can provide the input necessary to define success in the PPP projects in Latin America.
Part IV

Analysis, Recommendations and Conclusions
Chapter 6

Analysis of the Cases of Studies

In Chapter 4 and 5, we have described the cases of PPP in Latin America, specifically to subway or suburban railway projects. Four cases were analyzed including the Metro Rio and Sao Paulo Metro from Brazil, Buenos Aires Metro from Argentina and Lima Metro from Peru. Some of the cases included positive and negative outcomes in the different phases of the project. The cases were not seen as a complete success because they had different obstacles during the path towards the implementation process. However, they represent important projects in the actual massive transport system in the main metropolises in Latin America.

Therefore, we will analyze the performance of each of the cases according to the framework depicted in Chapter 2. Some performance indicators related to the three phases of success will be assessed by the empirical analysis. After that, we will discuss the most influential factors associated with the different criteria of success. These critical factors will enrich our evaluative framework by providing important results on the Latin Context. Therefore, section 6.1 will provide with an evaluation of the cases. Then, section 6.2 will analyze the relation between the factors and the success criteria. Finally, in Section 6.3 a set of the most important factors will be described.
6.1 Evaluative Comparison

As argued before, the context-related factors and intrinsic factors appear to be important factors in PPP projects. Therefore in order to evaluate this argument, the contrast with the cases by an evaluative comparison will be necessary. The detail of the cases of study in PPP projects including the “Metro Rio” in Rio de Janeiro, “Sao Paulo Metro” in Sao Paulo, “Buenos Aires Subte” in Buenos Aires and “Lima Metro” in Lima, described in the previous chapter, are going to be depicted through the different criteria of success. The chosen cases were implemented in different PPP environments and even some projects are still being carried out now.

According to the theoretical framework discussed in Chapter 2, we defined a scheme for evaluation for PPP projects which will be enhanced with our findings. The design consists of success through three different criteria. These three criteria are derived from the work of KPMG (2010). They presented a framework that represents the standards for measuring the positive or negative performance actions of projects. The first criterion refers to the contract success, which focuses on evaluating the preparation phase of the project. The second criterion relates to the procurement success which analyzes the project through the implementation phase. The third criterion refers to the durability success which evaluates the project through the post-implementation phase.

As it is described, the three criteria are closely related to the success in the different phases of the project. Contract Success, Implementation Success and Post-Implementation Success will define the major success criteria of project as seen in Figure 6.1. They will assist us to define if a project can be called successful or not.

The definition of the success criteria is still vague if it is only generally described. For instance, when the term Implementation Success is described, many definitions can embrace this criteria. We can refer to the procurement with respect to the completion of works on time or completion of work within scope. Thus, the criteria can create misunderstanding if they are not specified correctly. On that basis, it will be necessary to clearly describe the criteria through quantitative and quality measures within the different phases of the project. These measures are known as “performance indicators” which will give us an idea of how good/ bad a project is. The indicators will provide us with a description of the attributes of the system. They will measure the quantitative and qualitative aspects of the research and enhance our actual framework. Figure 6.2 shows the relation between the criteria for success and the performance indicators.
These indicators are framed in a context that fit in the Latin American environment. Therefore in the present research, we will explain the criteria based on some performance indicators. These indicators were extracted according to the availability of the data obtained through the empirical research. They include measures of the different phases of the project. Table 6.1 describes these performance indicators.

<table>
<thead>
<tr>
<th>Performance Indicators</th>
<th>Criteria for Success</th>
<th>Project Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1: Quality of the contract</td>
<td>Contract Success</td>
<td>Ex-ante</td>
</tr>
<tr>
<td>K2: Economic guarantees before the project</td>
<td>Success</td>
<td>Implementation</td>
</tr>
<tr>
<td>K3: Quality standard construction methods</td>
<td>Implementation</td>
<td>Project</td>
</tr>
<tr>
<td>K4: Contract completion within budget</td>
<td>Success</td>
<td>Implementation</td>
</tr>
<tr>
<td>K5: Contract completion on time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K6: Scope of the project in accordance with planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K7: User satisfaction (Service Quality)</td>
<td>Post-Implementation</td>
<td>Ex-post</td>
</tr>
<tr>
<td>K8: Ridership recovery in Short-Term and Long-Term</td>
<td>Success</td>
<td>Implementation</td>
</tr>
<tr>
<td>K9: Failures in Operation &amp; Maintenance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.1: Performance Indicators and Criteria for Success

The performance indicators are devoted to develop an evaluating comparison between the cases. Moreover in order to give recommendations we have to know also what are the factors that influence these criteria. The importance of them is located on discovering which of these factors are really critical for PPP projects in Latin America. Thus next figure 6.3 shows the relation of these elements in our study.
Subsections 6.1.1, 6.1.3 and 6.1.4 are dedicated to clarify the success or failure of PPP projects in Latin America based on this framework.

### 6.1.1 Contract Success

Contract success of the projects is an important part of the ex-ante evaluation of the project. This criterion is focusing on the pre-implementation phase of PPP projects. Among the performance indicators that are needed to achieve the contract success: we describe the *ex-ante evaluation of the proposals*. In other words, this performance indicator measures the characteristics of studies done before the implementation process. Risk analysis and cost-benefit analysis are important parts of the proposals. Moreover, economic guarantees are also measures to evaluate before the contract.

Table 6.2 shows the results of each of the cases in relation to the contract success. The outcomes of the evaluation show us that Metro Rio and Buenos Aires used both developed risk analysis and cost benefit analysis only to the short-term assurance of the project. However, the proposal for the concession Buenos Aires Metro provided with more innovative solutions than Metro Rio. It caused positive results on the short term. In the case of Sao Paulo, the ex-ante evaluation was carefully revised by an independent consultancy company which mentioned that the four proposal were robustly technical elaborated. In Lima, only one company presented a proposal which fulfilled the minimal requirements.

In the case of the second performance indicator, the project was evaluated through economic guarantees to deal with the project. In the case of Brazil, both projects of Rio de Janeiro and Sao Paulo secured a loan from international banks, while Peru and Buenos Aires financed their projects mostly through national banks.
### 6.1 Evaluative Comparison

#### Cases/ Performance Criteria

<table>
<thead>
<tr>
<th></th>
<th>Ex-ante evaluation (Risk analysis, Cost Benefit analysis, technical proposal)</th>
<th>Economic guarantees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>Risk analysis and Cost-Benefits were developed for a short-term orientation</td>
<td>Secured a loan from Brazilian National Development Bank (BNDES)</td>
</tr>
<tr>
<td>Sao Paulo Metro</td>
<td>Overall good ex-ante evaluation. The consortium provided with robust maintenance proposals</td>
<td>Finance from the Inter-American Bank and the JBIC. Project also guarantee by the Fund of Guarantee</td>
</tr>
<tr>
<td>Buenos Aires Subte</td>
<td>Risk analysis and Cost-Benefits analysis. Inclusion of a innovative proposal to lower the subsidies</td>
<td>Most of the finance was provided by the state (incl. subsidies), but secured short-term loan from international banks</td>
</tr>
<tr>
<td>Lima Metro</td>
<td>Cost benefits and risk analysis passed minimal requirements.</td>
<td>State finance</td>
</tr>
</tbody>
</table>

Table 6.2: Cases and Performance Indicators - Contract Success

We can infer from table 6.3 that Sao Paulo Metro, Metro Rio and Buenos Aires Subte marked best in ex-ante evaluation (“+”) They elaborated proper risk and cost/benefit analysis in the pre-phase of the project. Some of them gave innovative methods which served as a model for other concessions. Moreover, they also provided with secure guarantees from international banks, lowering by then any kind of political risk during the implementation process. The case of Lima was quite opposite to these cases. Goals were accomplished partially. In the ex-ante evaluation, they only execute the minimal requirements. Besides, the economic guarantees were only financed by the state which did not permit sharing any risks. That is why is rated with “0”

Therefore, we can state that Metro Rio, Buenos Aires Subte and Sao Paulo Metro achieved contract success. The pre-evaluation before the implementation of the project were robust providing sufficient guarantees to maintain the project in the short term.

<table>
<thead>
<tr>
<th>Cases/ Performance Criteria</th>
<th>Ex-ante evaluation (Risk analysis, Cost Benefit analysis, technical proposal)</th>
<th>Economic guarantees</th>
<th>Contract Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Sao Paulo Metro</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Buenos Aires Subte</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Lima Metro</td>
<td>0</td>
<td>0</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 6.3: Evaluation of Cases - Contract Success

Legend: “+” = Fulfill more than expected / “0” = Fulfill minimal requirements / “-” = did not fulfill the requirements

### 6.1.2 Influencing Factors - Contract Success

In order to know what makes project success, we should revise the factors that influence the criteria for success. The contract success will depend in several factors which includes the ones related with the context and the intrinsic factors. In Latin America, the different cases presented the following pattern:
6.1 Evaluative Comparison

6.1.2.1 Institutional and Legal Framework

Both the institutions and the regulations are essential for the infrastructure projects. In the case of Brazil, at the federal level there is a central organism that designates, approves and delegates PPP projects. The Management Council for Public-Private Partnership represents a new development in the institutional framework in promoting competitiveness. Even though this institution was only available for the implementation of Sao Paulo Metro (in the case of Metro Rio, the local government was in charge of this responsibility), it provides with rules and regulations for the feasibility studies of the project. Therefore, the possible candidates analyzed the project solutions. In the case of Argentina, the local government in charge of the preparation phase suggested companies to provide innovative solutions for the project. The incentive was the legal framework that at that time was acceptable. In the case of Lima, the incipient framework even worsen the situation.

6.1.2.2 Socio-Economic and Political Environment

The economic factors have been a vital factor in the implementation of a PPP project. Firstly, all the Latin projects have begun their planning as an incentive to face an economic crisis. The privatization projects of Brazil, Argentina and Peru started with the weakening conditions in their economies. The strong financial problems encouraged the rapid creation of some established programs in order to counteract the poor participation of the private conditions in the cities. Secondly, the economic crisis did not permit the creation of new mechanism to create a structure of payments. In the case of Peru, the local financial crisis of 1989 created problems about the continuing of the economic policies from the preparation phase and thus even aggravate the support of the private investment in the projects. The participation of private sector had to be canceled because the state could not finish paying the proper financial arrangement to the private party.

6.1.2.3 Economic Viability

In the Latin American cases, the majority of decisions to do the projects came from a single root. The privatization or concession programs were the engine that accelerate the “go” of the projects. Metro Rio project was conceived after the financial crisis and the political instability of 1993 in which the government had to enact a series of actions under the name of State Reform and Privatization Program, in order to face the crisis. The local government of Buenos Aires decided to give as a concession many of their enterprises. Most of them were passing through a financial crisis, such as Ferrocarriles Argentinos that was losing nearly US$ 1.4 billion a year. Therefore there was necessary to provide more incentives through innovative mechanisms in the preparation phase of the project. Moreover, the Brazilian new institutional framework also comprises a Federal Guarantee Fund which is a mechanism to mitigate risks by assuring resources in a long-term for the partnership system. In the case of Sao Paulo, the project used this guarantee fund in order to mitigate risks. In Metro Rio, the guarantee came from the international banks. Buenos Aires Metro also secured its risk through international loans to provide a feasible project for the infrastructure sector. In the case of Lima, it presented economic guarantee from the state which could not supply a good long-term viability of the project. The Peruvian government was not completely well-managed to work in a large project.

6.1.2.4 Risk Management

Risk management factor is one of the most important aspects for success in the implementation of PPP. Certainly, the allocation of risk is an important lesson that previous projects have left. As already pointed, the risks should be located on the best party that can best manage them. In Latin America, the negotiation with both parties represented long disputes. In this aspect, Brazil had already some experience with the allocation of the risks. In Sao Paulo Metro, Buenos Aires subte and Metro Rio; the public party had already a clear knowledge of who could manage the respective
risks. The experience from the previous line implementations permits the management commission to work on clear risk allocation. For instance the political factor was assumed by the government and the financial risk was assumed by the government and the private party. It also served for the good description of the risk analysis in the preparation phase of the projects.

6.1.2.5 Project Planning

Infrastructure projects such as Metro or Subway comprise complex techniques that require a high level of project planning. The correct planning requires the proper analysis of the project taking into account several topics such as cost, time or resources. Moreover, project planning permits the identification of possible risks and failures that last during the implementation process. A comprehensive analysis of the project might help to bring transparency in the first phase of the process. In the case of Metro Rio, the project planning has been commanded by the Secretary of Planning and Finance and in Sao Paulo by the Management Council for PPP. Although these entities are administrative units from the government, they are very well-known in Brazil for its independence in the process. These institutions could ensure the process in order to leave out lobby activities that could bring any kind of problem in the preparation phase.

6.1.2.6 Number of Private Parties

Furthermore, almost all the cases (except Lima Metro), provided with an interesting environment for investment, increasing the private participation in the project. In average, 4 consortium were approved to participate in the projects which made it, more competitive as well as the inclusion of new innovatory ideas.

6.1.2.7 Inclusion of Experts in Planning

Another important step to provide a strong planning process is the inclusion of a panel of independent experts with experience in previous projects. The knowledge that they can bring to the project is important in the decision making process of the big infrastructure projects. Moreover, the opinion of experts is another source of ideas and innovation that could leads to bring some lights to the project. In the concession of Metro Rio, a group of experts from project Buenos Aires subte were hired in order to give important technical details and support in the preparation plan of the subway.
6.1 Evaluative Comparison

6.1.3 Implementation Success

The success in the implementation process will be based on performance during the construction or the first years of the operation of the project. Similar to the contract success, measures are used in order to describe the implementation success. Therefore we have identified four performance indicators to understand the procurement process of the project (See Table 6.4). The first corresponds to the quality standard methods that were used during the construction process or the maintenance of any of the lines of the system. In the case of Metro Rio, there were high costs in providing a proper maintenance. In this case, the cost were devoted in following the standards to do some works in the maintenance of rolling stocks and lines. In the case of Sao Paulo Metro, in the construction process, the lack of correct construction standards in building one of the stations provoked an accident. Along with that, the incorrect design of the company to include low-cost materials, poor security methods to deal with this situation and weak coordination between the partners; increased more the construction risks in the project. In Buenos Aires subway, standards methods were specified in the planning of the project. Works of extension of lines were built according to international standards. In Lima project, the construction followed the same trend than Buenos Aires subway. There were no problems in the construction methods of stations.

Regarding the contract completion, Metro Rio and Buenos Aires subway, succeed in provide a good O&M contract during the first years of implementation. Some cost increased but no more than 20%. Moreover, the proposed time to maintain some stations and buy new rolling stock was carried out according to the planning. In the case of Metro Sao Paulo and Lima Metro, they could not finish their contract on time. In the Paulista state, the accident brought many delays in the project and in the Peruvian case, simply the project could not be completed because of the lack of funds for the project.

The characteristics of the project were also an important part of the procurement process and specifically the scope of it. In the case of Metro Rio and Buenos Aires Subway, the projects also succeeded in the short-term. However, some changes in the contract were necessary in the operation of the project (some includes the extension of the line). In Sao Paulo, the project was divided in two parts, including the construction and operation with different partners. It was done mainly to spread the risks with different agents providing a solid implementation. Nevertheless, the accident made the managers reallocate some risks of the project. In the case of Lima, the project did not reach the proposed planned scope, building only 9.8 km out of 42 kms.
6.1 Evaluative Comparison

Table 6.4: Cases and Performance Indicators- Implementation Success

<table>
<thead>
<tr>
<th>Cases/Performance Criteria</th>
<th>Quality Standard Construction</th>
<th>Contract Completion Costs</th>
<th>Contract Completion Time</th>
<th>Scope of the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>The planning of the project provided with the quality standards. They were followed during the first years of maintenance of rolling stock</td>
<td>The O&amp;M contract began in 1997 but had to be renegotiated. The costs of the company did not increase more than 20% according to the planning (1997-2007)</td>
<td>The beginning of the operation time for the metro did not present delay time. But the opening of new stations (Cantagalo) in 2006 delayed more than 5 months</td>
<td>The project includes the agreement of O&amp;M for 20 years. However, renegotiation appeared in 2007 to change the scope of the project (extension of one line)</td>
</tr>
<tr>
<td>Sao Paulo Metro</td>
<td>Incorrect design of the quality standards for the construction method</td>
<td>The contract had to be extended due to the accident. Costs increased in almost 30%</td>
<td>By now, due to the accident, the opening time is delayed more than 6 months respected with planning</td>
<td>The project was divided in two phases. One include the implementation of some stations and the second phase consider the build and O&amp;M. Construction process followed the project scope</td>
</tr>
<tr>
<td>Buenos Aires Subte</td>
<td>The contract provided with sufficient maintenance quality standard points</td>
<td>The O&amp;M provided short-term positive results according to budget until the economic crisis of 2001. Cost did not increase more than 15%</td>
<td>The beginning of the operation time for the metro presented delay time of less than one month.</td>
<td>The contract agreement secured 30 years of concession, but re negotiations took place recently enlarging the scope of the project</td>
</tr>
<tr>
<td>Lima Metro</td>
<td>The planning of the project provided quality standards points that were added in the contract</td>
<td>The contract could not be completed in 1995 due to the lack of resources. Cost increased in more than double planned</td>
<td>The contract could not completed on time. In 1995 only 9.8 km were built.</td>
<td>The initial project includes the construction of 4 lines, from which only 9.8 kms were built</td>
</tr>
</tbody>
</table>

As it is described in table 6.5, only two of the cases succeeded completely through all the different phases of the implementation process. Coincidentally, these successful projects have similar characteristics. The project Rio and Buenos Aires included only works related to maintenance while in Sao Paulo, the project embraced the construction of 12 kms of new line. More specifically, Metro Rio followed the model already done in the Buenos Aires.

Regarding the evaluation, we can infer that the quality construction standards were not appropriate for the implementation of the project (“-”). In the case of Rio and Buenos Aires, the planning of the project provided with appropriate standards methods to develop the maintenance work in the first years. In relation with contract completion both Metro Rio and Buenos Aires subte succeeded in complete project costs (“+”), while Sao Paulo Metro and Lima Metro could not complete the project on time. In the case of Sao Paulo, failures in providing good monitory assurance in the construction of the stations were encounter during the implementation. In Lima case, the implementation was stopped forsaking the project for more than a decade, including a bad planning for the scope of the
6.1 Evaluative Comparison

project. The scope had to reduce in almost 60%.

<table>
<thead>
<tr>
<th>Cases/Performance Criteria</th>
<th>Quality Standard Construction</th>
<th>Contract Completion Costs</th>
<th>Contract Completion Time</th>
<th>Scope of the project</th>
<th>Success in Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Sao Paulo Metro</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Buenos Aires Subte</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Lima Metro</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 6.5: Evaluation of Cases - Implementation Success

Legend: “+” = Fulfill more than expected / “0” = Fulfill minimal requirements / “-” = did not fulfill the requirements

For the successful cases, Buenos Aires and Rio, it is important to notice the factors that influenced the success of these projects. They both provided with satisfactory implementation programs during the first years in order to reduce the subsidies paid by the government. Other factors that influence these projects are depicted:

6.1.3.1 Institutional/Legal Framework

In order to attract private investment at a reasonable cost, governments must make credible commitments to the rules that guarantee the aspects of the project implementation. In the case of Peru, the long procedures for the specific constructions methods for the project disenchanted many private investors. Therefore, the government should remove the long procedures for the approval of the project, approval of the partners, property rights and competency laws; but should provide the necessary safeguards and transparency to not encounter any issue in the implementation process.

6.1.3.2 Political & Socio-Economic Factor

Unexpected changes in the political system or unilateral decision in the political decision bring unforeseen consequences in the establishment of infrastructure project. The priority to first re-establish the economy and no continuation of the any transport project carried out the close of Lima Metro for a decade. Moreover, Latin America is a continent where the economic instability can be present due to the lack of long-term policies in some governments. The macro-economic stability is a good allied to obtain a good investment climate which permits the attraction of private participation. Brazil also protects their economic policies in the same way by lowering external risk.

6.1.3.3 Project Planning

The development of a strong strategic plan helps to build a critical infrastructure planning to support the project. The strategic planning identifies the probable issues and risks in the project. However if the planning is not designed correctly, some unexpected issues can be encountered in the long term. In Lima Metro, the poor strategic planning for a long-term demand service allowed the decrease of the quality service in the project. Moreover, a subway or suburban project always needs a careful planning of the land and the correct design for the application of construction methods. In the case of Sao Paulo Metro, the incorrect design of the structure concept for the tunnel brought the dilution of part of the tunnel area. As a consequence, the Pinheiros accident arose by killing seven people. Nevertheless, this was not the only cause of this accident but was one of the problems that an independent commission found as a casualty of the failure.
6.1 Evaluative Comparison

6.1.3.4 Value of Competitive Procurement

The value for procurement comprised the performance of the different stages of the project implementation. In this aspect, the construction process (only for the case of Sao Paulo and Lima) and short period of the maintenance process are part of the value for procurement. In this context, the government and the private were examined in the study of the cases.

In the construction process, only Metro of Sao Paulo and the concession of Metro Lima included the building of some stations or extension of the line in their contracts. In the case of Sao Paulo Metro, the construction process was divided in two phases. In the first phase, the lack of proper design of the construction method led to an accident in the Pinheiros. As a consequence the project had to stop in order to know the real causes of the problem. In the case of Lima, the construction phase is progressing according to the plan. Some technical problems have been appeared during the implementation.

In the operation and maintenance, different outcomes appeared. In Metro Rio, the operation and maintenance process during the first years carried out many positive consequences such as the rehabilitation of the rolling stock and signaling. This mean that several goals were reached such as increase in the demand and cost in investment. In Buenos Aires, the subway operation provided favorable results in the first phase. In the case of Sao Paulo and Lima, the operation and maintenance is still in progress so the success or the failure in these projects is still unknown.

To ensure the correct construction or operation phase, some mechanism of control and supervision were needed in order to guarantee the correct implementation of the project. Generally speaking, in the four cases, the quality controls and supervision mechanisms were not as effective as in the tendering process. In Sao Paulo Metro, the feeble supervision in the construction of the Pinheiros station increased the risk of the bad quality construction. Metro Rio did not suffered from correct supervision in the maintenance of the system in the short-term. Buenos Aires subway provided many regulatory mechanisms for the implementation of the project.

6.1.3.5 Risk allocation

In the different projects, some risks were encountered as “highly important” which could not be mitigated properly. The unexpected events brought the delay of the process or the revision of the main risk points. In the Metro Rio, the main risks according to the local government, were the political and financial risks. Both of them were highlighted as the most important because of the financial crisis and the political instability at the beginning of the 90s. They were correctly allocated during the implementation process. However, in the case of Lima the risks related to the maintenance of the project could not be controlled correctly due to the lack of monitoring system to assess the quality service. In Sao Paulo Metro, the government put effort in the demand risk for the ridership of the Line 4 which was shared between the public sector and the private party. This risk was assessed in the project planning and some mechanism actions were taken. Nevertheless, the bad design of the building structure and the lack of monitoring actions increased the construction risk causing the Pinheiros accident.

6.1.3.6 Independent Institutions

The local government of Rio de Janeiro included the entity of Rio Stock Exchange which was the responsible for preparing and securing the bidding of the project. It brought a positive outcome of the tendering process. However, this entity only worked for the first phase of the project. The guarantees through the supervisory agencies were not fulfilled entirely in the long term demand and consequently some problems in the post-implementation of the service delivery appeared. The possible root of this problem is the lack of commitment to continuing monitoring the operation and maintenance for a long time.
6.1 Evaluative Comparison

6.1.3.7 *Strong capacities*

The experience of the possible partners marked a difference in the projects. In Latin America, the previous knowledge of the possible concessionaire is part of the requirements of the implementation process. In Brazil and Argentina, this requisite was seen in the implementation phase in which innovative solutions took place.
6.1.4 Post-Implementation Success

The success in the post-implementation of the project is based on the factors that affect the long term planning of the project. The public acceptance of the project and the benefits from the services in long term, will guarantee the future demand of the project. The criteria and the performance indicators have not been correctly fulfilled in the four cases. In other words, the four cases experienced lack of good planning to maintain positive outcomes in the long term (See Table 6.6). In the case of Metro Rio, from 2007 onwards, the service quality of the project declined due to the lack of rapid monitory actions to establish norms and standards for the service delivery. This was reflected in the technical aspects of the metro such as frequency of the trains, renovation of the wagons and security. The same situation happened in the case of Buenos Aires. However, the cause of these issues came from a context factor: economic environment. Moreover, the user satisfaction declined during the last years as well as the ridership. In the case of Sao Paulo, there are not many results yet due to the recent operation and maintenance. In Lima, the project was stopped and the investment for the operation was not recovered due to the financial problems of the company.
### Table 6.6: Cases and Performance Indicators- Durability Success

<table>
<thead>
<tr>
<th>Cases/ Criteria</th>
<th>User satisfaction</th>
<th>Ridership Recovery</th>
<th>Failures in Operation and Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>In a short term (1997-2007), the service quality was acceptable. The train frequency was less than 6 minutes, renovation in rolling stock. In the long term (2007-onwards) problems appeared with the maintenance and specially with security which decrease the public satisfaction.</td>
<td>The ridership recovery in the short term (1997-2007) was more than 70%. The subsidy paid by the government was totally reduce in 10 years. The number of employees were reduced in more than 30%</td>
<td>Failures appeared in the maintenance of the rolling stock and stations at the end of 2008. Inefficiencies in the frequency of trains, lack of trains to deal with the demand, bad maintenance of the stations and non-having a good long-term plan provided.</td>
</tr>
<tr>
<td>Sao Paulo Metro</td>
<td>Part of Line 4 have just been opened to operation and the results are still incipient. However, the public acceptance is high. In the first day of test open more than 20% of the expected visitors used the metro.</td>
<td>There is no complete figures about the ridership</td>
<td>Until now, there were no failures in maintenance of the project.</td>
</tr>
<tr>
<td>Buenos Aires Subte</td>
<td>The acceptance of the operation in the short-term (1991-2001) of the metro was acceptable. The frequency of the train was about 5 minutes, tariffs maintained stable, but there were many protest due to the labor reduction</td>
<td>The ridership increased in the first ten years of operation in nearly 20%. The subsidies paid by the government declined in more than 200%, and also the labor cost were reduced in almost 120%</td>
<td>Failures in the Maintenance in the long term (2006-onwards) due to the economic crisis. Reduce in the security employees, frequency of trains, increase in subsidies again. The decrease in quality service</td>
</tr>
<tr>
<td>Lima Metro</td>
<td>After the construction of the first phase of the metro, the satisfaction of the users was really poor due to the low demand that represent this length of the line.</td>
<td>The operation of Metro was only used in the weekends and not for a commercial use. Thus the ridership can not provided</td>
<td>No failures in operation because the metro was not used commercially</td>
</tr>
</tbody>
</table>

As it is explained above, none of the projects were able to complete the success aspects for the whole life of the project. Some of them (Buenos Aires and Rio de Janeiro) worked well in the first two phases of the project, while others such as the Metro Sao Paulo worked well in one aspect of the project. However, they did not work for a long-term duration of the project. The durability of the project is of high importance and it seems that in Latin America was not taking into account. For instance, in table 6.7 shows that user satisfaction were poorly scored “-” mainly due to the problems of frequency in Metro Rio and Buenos Aires subte, decreasing quality of services.

Moreover Metro Rio and Buenos Aires, could not maintain the same level of long-term demand after 10 years of concessions. The cause of these issues belong to the lack of security in the metro and maintenance faults. These also have consequences on the gradual decrease of the ridership in Rio and Buenos Aires, but still there are some people that are using these means of transport (That is why the score of “0”). In the case of Sao Paulo, the operation was recently opened. Therefore the results...
in the long term are difficult to be compared. In the case of Lima, the project could not fulfill the minimal planning requirements. As a consequence the project was not commercially used.

<table>
<thead>
<tr>
<th>Cases/Performance Criteria</th>
<th>User satisfaction</th>
<th>Ridership Recovery</th>
<th>Failures in Operation and Maintenance</th>
<th>Post-Implementation Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Sao Paulo Metro Subte</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
<td>Not comparable</td>
</tr>
<tr>
<td>Lima Metro Subte</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 6.7: Evaluation - Post-Implementation Success

Legend: “+” = Fulfill more than expected / “0” = Fulfill minimal requirements / “-” = did not fulfill the requirements/ “NC” = not comparable

6.1.5 Influencing Factors - Post-Implementation Success

Factors are essential in PPP projects of infrastructure in Latin America. It is vital to have a good economic, political, legislative and social conditions in order to provide good effective guarantees for the procurement process and implementation of PPP projects. Thus the following lines will confirm the importance of the factors in the post-implementation of infrastructure projects.

6.1.5.1 Institutional & Legislative Framework

Transparency law is a key factor in Latin American projects. The procedures and decision should be designed with high transparency in order to ensure optimal contractor and deterring corruption in all the phases of the project. In the case of Peru, the Lima project was subject to corruption due to the lack of a transparency law that could prevent the strategic behavior of some government officials. The consequences of these corrupting behaviors would put obstacles in the way of durability process and thus lead to commitment problems in the future of the project. The lack of proper regulations to face this problem evolved since the early stages of the project ended in delay in the implementation of more than a decade.

6.1.5.2 Socio-Economic Environment

The economic crisis that suffered Argentina during 2001, brought the decrease in demand in the subte. The subway was seen as an insecure mean of transport. The root of this problem, was that the company dismissed a security jobs, increased the subsidies paid by the government and the frequency of trains were reduced.

The social context has an influence in infrastructure projects. In this context, the problems arise when the project is already implemented. For instance, in the case of Rio de Janeiro, some stations of the Metro are the point of many street crimes and assaults. Gangs are taking it by storm which does lower the public acceptance of the Metro. Moreover, in Buenos Aires Metro, the financial crisis brought the reduction of the security personnel and decreasing the levels of security of the subway. This increased the crime in the capital city of Argentina.
6.2 Factors and Relation

6.1.5.3 Strategic Behavior

In Latin America, this factor has not been completely taken into account by the project coordination. For instance, in the case of Metro Rio some problems arose when renegotiations for the operation and maintenance were carried out in 2007. The private party used as an excuse the problems with the extension of line 1 and 2 in order to avoid the proper completion of the contract. In the case of Metro Sao Paulo, the attempt to change the consortium four days before the opening of the envelopes was a sign of the lack of commitment of the private sector. Moreover, the accident also revealed that some technical information was known only by the contractor without giving some detail to the project quality group. In the case of Buenos Aires, during the renegotiation of the subway, the government could not fulfill their commitment due to the financial crisis that hit the country in the 2001. Therefore, the private party took over the authority of the state and began to decrease the service quality of the subte.

6.1.5.4 Risk Management

This mechanism is used in Latin America as a mitigation factor for reducing the risks in the project. In Brazil, the government has already showed the commitment of their project by incorporating a guarantee fund in their implementations. The other countries, Peru and Argentina still do not have these guarantees but offer other type of methods to attract private investment. For instance, Argentina put a lot of effort in the profitable of the project giving guarantees to obtain financial gains in a short-term. In this case the negotiation among the stakeholders and the possible exchange of risk are depicted. In Latin America, the risk related with the context factors are high, thus the need to make other projected-risks “more attractive” are main points in bringing interest in the private investment. Nevertheless, the continuity of this risks are not working in the long term. They mean that the monitory aspects to deal with these issues are not entirely correct.

6.2 Factors and Relation

As a result of the evaluation, we can state that the performance of a project can be affected by many factors. The characteristics of PPP projects which include factors that surround them; provide an effect in the projects after the initialization or planning stage. Thus, the key role of the influence factors in the outcome of the project is part of the framework of this research.

Some factors are related with the context and others are related with the project itself. These factors are linked with the performance of the projects in many ways. Some of them provide a major influence in more than one criterion, while other give us a better knowledge of the indicators. Generally speaking the influence of the factors can produce a high impact on the indicators. Thus, most of the causes of failures have been analyzed in the factors according to the new framework. Some factors has a strong influence inside the measures taken in the whole life of the projects, while other factors only affect some aspects of the project. In the next lines we will describe the most important facts of this relation (See Figure 6.4).

- The economic viability which is defined as the financial capability of the project is strong related with the contract success. If there are appropriate financial skills to fund a PPP project, the economic sector in this aspect is already guaranteed. In Latin America context, the financial guarantee before the implementation of the project is the first step to provide security and a good investment climate in the partnership.

- Value for procurement has a relation with the procurement success. The procurement began after the tendering process until the implementation of the project. This mean that if there is a transparent process in the different phases of the project, the contract can be completed on time and within budget. The same occurs if the private party has already shown experience in
different projects, a project can have high possibilities to be guaranteed. The quality controls and mechanism in the different phases permit the effectiveness of the process.

- Project Planning is an important influence in the contract and procurement success. First, with a very robust plan, you can increase the possibilities to attract many private investors because they would be interested in applying their innovative capacities to deal with a challenge project. The planning is the most important part of the ex-ante analysis, allowing setting boundaries of the project. Therefore the completion of the project will also be based in the technical plan that the project conceived in the first phases of the project.

- Trust has an influence in the procurement and post-implementation success. The strong commitment from the project between the public sector and the private party, permits the completion of the project. If there is no a good relationship between both parties, a series of conflicts might arise and thus delaying the procurement process. Moreover, the commitment of the project should last in the post-implementation. The strong commitment in the maintenance and operation in the long-term are important to maintain the service quality after the implementation.

- The risk management has an influence in the different criteria for success. The allocation of the risks is a good way to incentive the private partner. For instance, in the actual process of Metro Lima, the government is assuming the demand risk in order to encourage more private parties to participate and give priorities in other aspects of the project. In addition, the good allocation of the risks had an impact in the completion agreement within time. If the partner assumed some risks that are not being able to deal, there would be a delay process in the implementation. Finally the allocation of the risk has an impact in the long-term vision. In Latin America, the bad allocation of some financial risk had led the decrease in the quality service and the reduction of ridership in the operation of the project.

- The context-related factors in Latin America, also has an influence in three aspects for success in PPP projects. The economic environment can encourage the private participation as well as to provide guarantees for the beginning of the project. The laws and regulations aimed to
increase private incentives are also part of the financial success of the project. Moreover, the political stability could bring guarantees to complete the contract on time. The institutions can also support the end of the contract. Furthermore, the social issues can have an impact in the quality of service in the long term. The same happens for any economic or political crisis that could have an effect in the failures of the operation in the project.

As it is already depicted from the explanation above, the context-related factors have a strong influence in the success of the project. They can have an effect in the relation of the financial aspect, the procurement process and the durability of the project. Therefore the analysis of these factors in Latin America is extremely important in PPP projects. Moreover, the key role in these factors can also contribute to bring new recommendations for performance of future projects. Hence, it is vital to take into account the context-related factors which involved the institutional, economic, social and political environment.

Furthermore, this analysis shows that Latin government (Sao Paulo and Rio in Brazil, Buenos Aires in Argentina and Lima in Peru) did not consider the long-term planning. The future implementation of the project which means the obtaining of the post-implementation success has been a difficult task for governments. Many reasons enlarge this issue. Firstly, the short-term culture of most of the different countries did not permit the proper planning for the future. Secondly, the instability of Latin America in many aspects has not been taken into account in the projects. The different political changes in Latin America a decade have also influence in the problem.

In the case of the procurement success and contract success; will depend on various factors which include the intrinsic factors. One of them is risk management factor, which seeks to improve value for money by allocating risks suitably to public or private sectors that are able to control them best. This factor is associated with success because it provides incentives to achieve better performance over time. The essence of applying PPP procurement in a project is allocating risks where they can be managed best-not maximizing risk transfer at any price. Therefore risk-allocation should be clearly communicated between the two parties.

As it is depicted, some factors have more influence in the general context of PPP projects. In this case the context-related factors and risk management are appointed as general critical factors in the Latin American context.

### 6.3 Generic Critical Factors

The theoretical framework in Chapter 2 gave us an idea of how the factors can help to the success of a PPP project. The factors obtained through literature review are a first consideration of the evaluation framework. Among various PPP models could influence the outcomes of applying PPP schemes, thus their natural traits should be given firstly when assessing them. However, from our study we can depict that there are three factors that are present in all the phases of the implementation process (See table 6.8)

<table>
<thead>
<tr>
<th>Type of Factors</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context-Related</td>
<td>Institutional &amp; Legal Framework</td>
</tr>
<tr>
<td>Factors</td>
<td>Political &amp; Socio-Economic Environment</td>
</tr>
<tr>
<td>Intrinsic Factor</td>
<td>Risk management</td>
</tr>
</tbody>
</table>

Table 6.8: Critical Factors

The first two factors correspond to the context-related factors and the third matches with the intrinsic factors. They represented the theoretical framework from the rationality to apply PPP schemes in infrastructure projects. These three factors will contribute to the success of the implementation process in all the phases.
In the case of context-related factor, first the institutional framework should work together with a robust legal context. In other words, regulations and laws should provide certain guarantees from the infrastructure projects. The reinforcement of the transparency law is still an issue in almost all the countries which has consequence, as some corruption acts occurred during the implementation of the agreement contracts. Moreover, the political and socio-economic factors are also important in the implementation of a PPP project in Latin America. Countries such as Brazil, Argentina and Peru suffered from a series of political instability during the decade of the 80s and 90s bringing unexpected consequences. For instance, the political instability of Argentina at the end of the 90s carried a series of re-negotiations in the contracts of many infrastructure projects including the Buenos Aires Metro. The negotiations brought the revision of the agreements and the reallocation of the some risks in order to best manage a political instability in Argentina.

In the case of the intrinsic factor, in Buenos Aires Metro, and Lima Metro, the government did not take account the correct control mechanism to manage an economic risk. In Argentina, the policy of maintain the tariff increased the subsidies paid by the government. Thus without a correct funding policies and a raising economic risk, the government could not stop the decrease of the quality service. In Lima, the apparent economic risk could not be foreseen by the government authorities and permitted the interruption of the project. Risk is likely to eventuate, thus projects should identify them with the purpose of reducing the consequences that they can produce. As a lesson from Latin American, the governments should always make some efforts to mitigate all the risks that seem evident. Thus the focus in only one aspect can not always guarantee the success for the whole project.

The different cases implemented show a slight different perspective from the previous framework. The seven factors are conceived as important, however three of them are critical. In the case of the context-related factors, the inclusion of the public participation and the role of the institutional structure are essential for the development of implementation of PPP in Latin America. The institutional environment and the social context were appointed as highly importance from the analysis of the factors.

On the other hand, the strengths of the intrinsic factor are located in risk management and project planning. As already explained in Chapter 2, many countries agreed that this factors are vital in the infrastructure. Indeed, this is also confirmed in the Latin American cases. These factors were not well-managed in some cases and thus they helped to produce unexpected results. Therefore the importance of considering the factors in the framework for the PPP project. The next chapter will base these findings in recommendations for Lima Urban Rail based on these factors.
Chapter 7

Conclusions and Recommendations

The present research aims to provide answers to the main research question: *How to achieve successful public-private partnerships for the next lines of the projects in Latin American, including the next lines of Lima Urban Rail, considering the most important factors in the railway sector?*. Achieving success in this research is defined as fulfilling three success criteria: contract success, procurement success and post-implementation success. These three aspects are of high importance in all projects. Therefore, it is vital to know the factors that influence these criteria. The underlying critical factors which influence the Latin American criteria were identified and three of them were described as essential for projects.

The examination of the different factors that influence PPPs is a key stone to provide answers to the research question. The process of breaking down factors was executed in order to obtain the source to provide practical recommendations for the Peruvian Government and Latin projects in general. This could permit policy makers to make better decisions in the implementation of PPP projects. Moreover, conclusions will be depicted in accordance to the empirical research, providing a new model which can be used in future projects in Latin America.

The present chapter will describe the most important conclusions of the project (Section 7.1). Then, recommendations for Lima project (Section 7.2) and recommendations in general for Latin American context will be shown (Section 7.3). Finally, a reflection and further study will be depicted in Section 7.4.
7.1 Conclusions

Successful Public-Private Partnership (PPP) in Latin America is still a challenge for government officials and the private party. Directions for obtaining success in PPP projects in Latin America, have been identified throughout the development of the chapters. Thus, the thesis provides extensive knowledge to shed new light upon the success of PPP projects. This research project aimed to break down the most influential factors in PPP projects in Latin America and thus providing clear answers for the sub-research questions. The next section will present the main findings of our research:

7.1.1 Conclusions based on the theoretical content of PPP projects

- The general content is based on the most distinctive characteristics of PPP projects, including their benefits and disadvantages. One potential advantage of PPP projects is the development of the concept *More Value for money*, which allows governments to provide a good delivery method with the same amount of money when it is executed by a traditional procurement. Certainly, it will have repercussions on lightening fiscal pressures from the government as well as improve quality of services. However, not all the projects can achieve all the potential benefits of PPP due to the diverse set of risks that this kind of project carries. Complexity of some contracts and the higher capital costs are part of the detriments incurred on PPP projects.

- There is a great variety in the different models in PPP projects. They embrace from the service/management contract as a simple form of agreement, to the partial privatization. In the Latin America, BOT (Build-Operate-Transfer) and concession contracts are the most common agreement in the urban rail transport system. The study cases exploited the characteristics of a BOT agreement with complex details in the investment structure.

- The implementation of these agreements in Latin America is still in the first phase of the learning curve which permits the increase of possible detriments in the project and failing in provide successful outcomes. Only Brazil and Mexico are situated in the first stage of the sophistication curve studied by Deloitte (2007).

Definition of Success

- The multidimension of the definition of success in a PPP project was aimed to provide a more accurate assessment in all the phases of a project. The environment in which projects are operated can be characterized by the following three components: *Contract Success*: includes success in the preparation phase of a PPP project, *Implementation Success*: includes success in the procurement process of a PPP project, *Post-Implementation Success*: includes success in the durability of a PPP project.

- A new framework was created in order to achieve success in PPP projects in Latin America (Figure 7.1). The structure of this framework is divided in three levels. The first level represents the three dimensions or criteria for success. They aim to adopt the correct definition of success in PPP. The second level represents the performance indicators. The three criteria are being measure by different performance indicators which quantify the actual state of success or failure in a PPP project. The third level represents the context-related and intrinsic factors. In order to know the sources of success or failure, the analysis of the factors that influence the performance indicators and the criteria were taken into account. All in all, this new framework aims to represent the structure for an evaluative comparison of the factors in PPP projects by giving insights on the principles of the success or failure.
7.1 Conclusions

Many key factors were identified in order to develop a new framework that could assist the most important aspects of PPP projects in Latin America. This set of factors is separated in two aspects: the first is related to the environment of the project, Context-related factors. They are: the Institutional & Legal Environment and the Political & Socio-Economic Framework. The second aspect is related to the project itself, named Intrinsic factors. They are: Project planning, Economic viability, Risk management, Trust and Value for procurement (See Table 7.1).

<table>
<thead>
<tr>
<th>Context-Related Factors</th>
<th>Intrinsic Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional &amp; Legal</td>
<td>Project Planning</td>
</tr>
<tr>
<td>Political &amp; Socio-Economic</td>
<td>Economic Viability</td>
</tr>
<tr>
<td></td>
<td>Risk Management</td>
</tr>
<tr>
<td></td>
<td>Trust</td>
</tr>
<tr>
<td></td>
<td>Value for Procurement</td>
</tr>
</tbody>
</table>

Table 7.1: Influencing Factors for PPP projects

7.1.2 Conclusions based on the legal, institutional, social and economic context in the transport infrastructure in Latin America

The environment plays an important role in Latin America in their different sectors. The institutional and legal environment are a prerequisite to foster private investment in public infrastructure. The social environment incorporates poverty and informality with effects on the transport system. The economic framework have helped some projects to born and sink. These four axis have an impact in the transport sector. Some findings include:

- Legal Environment: The different laws and the path dependency of the legislative sector provided from the different countries contribute to the success of the projects. In Argentina, corruption is the result of the lack of an independent judicial system, which permits the progressive decline of PPP projects. In Brazil, the gap of a transparency law and the foggy roles between the state and the local governments, contributed to open a new window for strategic behavior in PPP projects.
7.1 Conclusions

- **Legal Environment**: Brazil made an important attempt to enact a united law to incorporate the basic aspects of Public-Private Partnership. This law unifies different aspects of regulations and approval procedures that belong exclusively to PPP projects. It was already carried out in Sao Paulo project with encouraging results in the first phase of the project.

- **Institutional Environment**: There is a complex relation between the authorities at the federal and local government in Brazil and Argentina. The roles and responsibilities between different institutions can be overlapped thus creating confusion to the stakeholders involved in a project. It is a common problem seen in federal governments.

- **Institutional Environment**: Transparency law is still an important omission in the legislation for PPP projects in some countries such as Peru and Argentina. This law allows clarity on the process by providing an open procedure in all the phase of the project.

- **Economic Environment**: The economic crisis in Argentina and Brazil work as a motor to provide a rapid implementation of concessions agreement. However, it also worked as the source of the problems for other countries such as Peru in 1989. The economic crisis was the root for the debacle of the Lima project in the first phase.

- **Social Environment**: Transportation planning has a huge impact on the lives of people in their communities. However; poverty, crime, corruption and informality are the main issues that affect transport system. For instance, the Latin slum cities, favelas, villa miserias or pueblos jeunes, are still a concern in the inclusion of new transportation plan in this environment.

7.1.3 Conclusions based on the intrinsic factors of PPPs urban rail infrastructure in Latin American cities (Rio de Janeiro, Sao Paulo and Buenos Aires)

- **Economic Viability**: The financial guarantee before the implementation of the project is the first step to provide security and a good investment climate in the partnership. The Brazilian cases were supported by the Guarantee Fund which provided funding for any kind of crisis that could endanger the project. The financial capability of the institution provided a credibility support for the project. This fund also served as a mitigation strategy for reducing some risks.

- **Project Planning**: Metro or Subway comprises complex techniques that require a high level of project planning. The proper analysis of the project embraces the allocation of the risks and the strong economic and technical studies. In the case of Metro Rio, the project planning has been done by the Secretary of Planning and Finance, in Sao Paulo by the Management Council for PPP and in Buenos Aires has been done by the local government with the help of some experts. The three cases were provided with strong analysis in the short term duration of the projects.

- **Project Planning**: The proper project planning also allows the attention of the possible candidates in the tendering process. In average, the number of candidates for the tendering process was high. At least four proposals were examined in the cases of Rio de Janeiro, Buenos Aires and Sao Paulo. Generally speaking, the response of the tendering demonstrated that PPP projects were seen as a new opportunity to be exploited. Furthermore, the Buenos Aires bidding was applauded by many experts.

- **Risk Management**: The incorrect allocation of the risks in the implementation process can produce disastrous consequences. In the procurement process, in the case of Sao Paulo there was not a correct and independent monitoring mechanism to deal with construction risks as well as the strategic behavior from the concessionaire. The poor design of the project in the construction process endangered the implementation process (Accident Pinherios), producing the reallocation of the risks and the delay of the project.

- **Value for Procurement**: The case of Rio de Janeiro and Buenos Aires produced acceptable short-term results. The first years of operation and maintenance provided the reduction of the
subsidies paid by the government, increase in the ridership and reduce the fiscal pressure from the public sector. The results of the maintenance of the Sao Paulo Metro are still initial. However, we can state that in the other two cases, the short-term goals of the governments were achieved

- **Value for Procurement:** The cases of Rio de Janeiro and Buenos Aires produced unsatisfactory results in the long term. Problems associated with the long maintenance of the project can be described as low frequency of the trains, bad maintenance of the stations and less security personnel. This carried out the gradual decrease of the public acceptance. Maintenance problems are strongly linked to the lack of a monitoring system that could maintain the same level of quality of service.

- **Trust:** Problems associated with the poor commitment and asymmetric information deterred trust in PPP projects. In the case of Metro Sao Paulo, the attempt to change the consortium four days before the opening of the envelopes was a sign of the lack of commitment of the private sector. Furthermore, the accident also reveals that some technical information was known only by the contractor without giving some detail to the project quality group.

### 7.1.4 Conclusions based on the intrinsic factors of the first phase of the project Line 1 in Lima Urban Rail

It is possible to draw some lessons from the evaluation of the Line 1 of Lima Urban Rail. The most important are depicted as follow:

- **Economic Viability:** The economic viability did not include the correct strategies for countering the risk of a big financial crisis. In other words, the government did not presuppose a potential economic crisis that would bring the interruption of the project

- **Risk allocation:** The government assumed the majority of the risks including some that could not be possible to handle such as the financial risks. The contract agreement with some constructors involved only the sharing risk in construction and delay in the implementation of the project but the government would assume all the other external risks that might happen

- **Trust:** There was no commitment from both parties to build a trusty relationship. Thus, strategic behavior and corruption appeared. Moreover, the lack of a Transparency Law that could breed corruption was the bust of the project. The results of the tendering process was appointed secretly to an Italian company who had close relation to the Peruvian government. Corruptive behaviors were found in all the phases of the project, due to the lack of a monitoring system and a transparent procedure.

- **Project Planning:** The time of the planning process was very short compared with other projects (nearly three months). Moreover, the master plan of the development of the railway system which proposed four lines, decided to give priority to the line that interconnect the southern districts, city center and the northern areas. In this plan, the government assessed the evaluation for the investment costs and the operative plan.

- **Value for Procurement:** The construction period of the urban train began in 1989 but the implementation of the urban train could not finish in 1992 according with the planning studies. The economic situation of the country and the social crisis in the early 90s did not permit the completeness of the project and the suspect of acts of corruption by some officials raised the possibility of not finishing the project. The project stopped with only 9.8 km constructed.

### 7.1.5 Conclusions based on the success of PPPs projects in Latin American cities (Rio de Janeiro, Sao Paulo, Buenos Aires and Lima)

The success for Public-Private Partnership projects will depend on the results in the three phases of the project: the ex-ante evaluation, the implementation process and the post implementation. The
three criteria of success and the theoretical framework were assessed by the different cases providing us with an important lesson (See table 7.2):

- In the Post-implementation success, none of the project could fulfill the requirements for a long-term viability of the project. Some of the reasons for that are located in the poor actions to deal with unexpected results or any mitigation strategies proposed with anticipation in the project maintenance. In other words, the most important failures in PPP project are related to the operation and maintenance of the subway/urban rail system in the long term. The long vision of the subway system was not properly controlled or partially stated in the contract which brought as a consequence the decline in transport projects.

<table>
<thead>
<tr>
<th>Cases/ Performance Criteria</th>
<th>Contract Success</th>
<th>Implementation Success</th>
<th>Post-Implementation Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Rio</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sao Paulo Metro</td>
<td>Yes</td>
<td>No</td>
<td>Not comparable</td>
</tr>
<tr>
<td>Buenos Aires Subte</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Lima Metro</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 7.2: Evaluation Success

Legend: “+” = Fulfill more than expected / “0” = Fulfill minimal requirements / “-” = did not fulfill the requirements/ “NC” = not comparable

7.1.6 Conclusions based on the most influential factors in PPP projects in Latin America

- The description of the different cases demonstrated that the seven factors related with the project are relevant according to the criteria for success in PPP Latin American projects. This confirmation of the seven factors was possible through the analysis of each of the cases. However, some of the factors were described in more detail combining some aspect inherent from Latin America. The review of the aspects that influence this criterion is vital for attain success in PPP projects. As in figure 7.2 we found that three factors influence all the different phase of a project. This we called critical because of their crucial role in PPP projects. They are Political & Socio-Economic Factor, Institutional & Legislative Factor and Risk Management.

- The Political & Socio-Economic environment in Latin America affected the long term of a PPP project. In the case of Lima, the adverse economic environment was the source of the debacle of the implementation of the project. The lack of funding to deal with the economic crisis was also part of root of the problem. In Buenos Aires, due to the economic crisis, the government could not pay to subsidies stipulated in the contract. Thus decreasing the quality of service after 10 years of implementation.

- The Institutional & Legal framework influenced the duration of a PPP project. The blurry definition of the responsibilities of some supervisory agencies at the federal and local government are also the source of the failure of projects. In Rio de Janeiro, the lack of monitory system from the supervisory agencies at both levels increased the maintenance risks. In Buenos Aires, there were six supervisory agencies during the implementation process without clear responsibilities giving less secure process in the implementation. Moreover, Brazil is working towards the unification of a PPP law which provides guarantees to assure a more clear process but still is lack of a transparent law.

- Risk Allocation also affected in the different stages of the project. If the partner is not capable to deal with high risk (or not proper allocation of the risks), the project will fail. In the case of
Sao Paulo, both parties could not deal with construction risks producing delay in cost and time. In Lima and Buenos Aires, the economic risks were also impossible to mitigate for both parties, carrying out the continuous decline of the project.

All these aspects are identified as critical in defining success within the project. Thus some measurements were taken into account to be consistent with the interests of both sectors. In this framework, some recommendations in order to achieve success in the project were depicted. In doing so, it can prevent overwhelming presence of strategic behavior and create incentives for private partners to participate in transport sector. The measure include a reconstruction of aspects related with the urban rail sector itself but also with measures that have to do with the independence of the institutions and the economic viability of the project.

### 7.2 Recommendations for Lima Project

Public-Private Partnerships can provide many advantages with respect to traditional procurement. One of them is to provide a good service quality. Public users will get higher quality for the public provisions, as well as to decrease the cost and duration of the trips. Thus in order to improve the service level performance, to relieve the budget and most importantly to achieve success Public-Private Partnership in Lima Urban Rail project, we can provide some recommendations for the government of Peru. The next lines will provide a list of recommendations based on the most influential factors for the long term planning of the project in Lima:

**Recommendation 1. Congress should incorporate a Transparence Law in the actual PPP legislation (Institutional Factor)**

Our first recommendation is to include a transparency law inside the PPP legislation. The Peruvian Congress and more specifically the Transport Commission should promote the transparency in the
different phases of a PPP project through a legislative action. The transparency should include the open information of the procedures of a PPP project. In other words, the different phases of evaluation, implementation and post-implementation of the project should be open to the public. This is not an easy task due to the still long procedures for the Peruvian legislative approval. However, it is a necessary law to provide transparency and combat corruption.

The inclusion of this new regulation for Lima should prevent the imminent act of corruptions that are commonly seen inside this city. There are already some reports that clarify these aspects providing new lights to the public management sector. Furthermore, the citizens and independent institutions are able to follow the process. Moreover, transparency allows independent experts to study the validity of assumptions on which such decisions are often predicated and could help to the actual monitoring methods in the public sector decreasing dishonest practices. However, not only does the law have to be enacted, the application of this should also be taken into account. In the case of Peru, they have a high number of laws that simply are not well-applied. The lack of a proper transparency regulation in the different areas of the implementation process can bring problems of corruption and strategic behavior.

Recommendation 2. Government should create a Guarantee Fund (Economic Factor)

Our second recommendation is that the government should create a Guarantee Fund for infrastructure projects. The aim of this fund is to supply with enough guarantees to mitigate some risks such as economic or political during the lifetime of the project. The weakness of some railway projects is the lacking viability to maintain the project in the long-term. The different risks of uncertainties become high when economic and political instabilities appear. The creation of this guarantee fund is possible due to the finance of the major state-owned banks in the Peruvian environment such as the Bank of Nation and the Central Bank of Peru. Even though, they do not have large assets such as those of Bank of Brazil, they are active banks in the financial conditions in Peru.

The planning in the economic aspect is vital, as well as the inclusion of international loans, the attraction of the project and the profitability of the project. The guarantee funds are tailored to meet specific development goals and provide security of the project. Although encountering funding can cause some problems at the beginning of the project, it will definitely provide the necessary security from any crisis. One aspect to take into account is that the necessary funds for the projects can bring a high number of shareholders. Thus, it will be necessary to make some alliances with international banks. Moreover, the guarantee fund should have procedures and a proper scenario analysis in order to indentify the necessary measures to provide the guarantee.

Recommendation 3. Congress should give proper responsibilities to supervisory agencies in PPP projects (Institutional Factor)

Our third recommendation is that the congress should provide to the regulatory agencies the proper responsibilities according to the laws and regulations. In the Peruvian case, there is no clear definition of what will be the responsibilities for each agency at the moment of supervising the project. For instance, the companies Cesel – Pöyry and Ositrán, both entities that have supervisory rules in transport projects, have to share responsibilities in the technical part. Even more, they can make no supervisions or overlap some duties in some parts of the project. Thus, the generation of problems for the private party can arise immediately.

Ensuring responsibilities can also bring more independence to the supervisory agencies. To ensure the independence, the regulators’ mandate should be clearly defined by laws and regulations, rather than the discretion of government authorities. Thus, the improvement of regulations that dictate the roles of the agencies will help to improve the process of PPP in the long term.
Recommendation 4. Government should foster the public participation in PPP projects (Social Factor)

Our fourth recommendation is to include the public participation in the implementation of the project. In the actual process of PPP, the public participation is uncertain. In other words, there is little or no public participation during any of the phases of the project. The government through Pro Inversion, agency of private investment, should include a public consultation in order to provide the necessary information to the citizens throughout the project. One possible effect is the increase on the acceptance of the project and thus the demand for the asset might increase. In Latin America, the social involvement is not a priority in urban projects. This is vital in order to prevent any kind of protest or public frustration, especially in the poorest areas where the concentration of people is high. A phenomenon that occurs in Peru is the misinformation of the popular sector which cause disintegration between the different status. It will help to integrate the project to the end-user providing a bidirectional flow of information between the project and the citizens. An open public dialogue initiated already in the very beginning of a planning phase is therefore crucial for achieving social acceptance. Nevertheless, public consultation embraces some costs such as hiring external agencies in order to gather the information and provide with an accurate control analysis and also time to incorporate public opinions. However, there is a tendency in other Peruvian sectors such as tourism and agriculture which is now including public viewpoint.

Recommendation 5. Government should develop a strong and independent monitoring unit for the maintenance of the project (Risk Management)

Our fifth recommendation is to develop a monitoring unit throughout the maintenance of the project. One of the biggest problems during the Latin American projects is to maintain the service delivery once the project has already been implemented. Thus, the monitoring methods should be developed according to the project development. The Peruvian Government should provide monitoring specifications in order to make the private party fulfill the terms of agreement for the durability of the project. In other words, they should revise the points of the contract and specify the targets for measuring performance results. Moreover, a set of technical criteria related to the quality of service (ridership, time interval of trains, rolling stock, maintenance of the stations) should also be part of the performance results of this unit. Furthermore, they should develop an incentive mechanism to verify the performance of the project and report any inconsistency. This means the inclusion of some penalties or benefits for the quality of service offer by the concessionaire. In addition, the unit should work independently and provide the government with condense information about the durability of the project. This can bring an increase in monitoring costs but is needed in a volatile environment such as Peru.

Recommendation 6. Government should ensure the proper allocation of the risk by including risk-management experts (Risk management)

Our sixth recommendation is to ensure the proper allocation of risk by including independent experts. The evaluation of the risks between the public and private party has led to the conclusion that some projects will need to reallocate some risks when the project has been implemented. The main reason is the changeability of the environment and the lack of experience in similar projects. After the accident in the Sao Paulo Metro, the government had to allocate construction risks. The inclusion of experts which can give recommendations to the government for the best allocation of the risk to improve the actual risk management. Moreover, the Peruvian government lacks of experience on urban rail PPP projects and thus the inclusion of experts in the first project can also provide with knowledge and expertise of previous projects.

Giuseppe Manrique  
August 2010
7.3 General Recommendations for Latin American projects

The different projects in Latin America are quite peculiar and different to other cases already studied. Some issues related to the context have caused the progressive decline of the project. Therefore, apart from the recommendations to deal with PPP projects in Lima, in the next paragraph, we will give more insights about general projects:

**Recommendation 1: Governments should see PPP as a model for a niche market**

The intention of the actual projects is not to build a new market for the urban rail projects. In Latin America, the primordial aim of the project is to finish the works and comply to the promise the current president made at the beginning of his mandate. Thus it could be important that this project can be shown as an example to the next generation of projects. A new market can be developed in order to fulfill the new requirements. Our recommendation is to create a new niche market which can provide guarantees for the next project, as well to ensure the constant development of the urban rail and obtain more profitability in this kind of projects.

**Recommendation 2: Governments should include private partners from the beginning of the project**

Our recommendation is to include the private party since the early beginning of the project. The partnership implies achieving any kind of intensive cooperation in a PPP project. Even though in Latin America, it is difficult to include the private investments due to the type of arrangement in PPP (public sector starts with the planning), the private participation is needed to build trust and confidence between the parties. Therefore our recommendation is to include this partner in the first phase of the project. One option can be to provide any kind of recommendations after the pre-feasibility study is finished. The government can ask the private companies to propose innovative ideas for the project. This is a process that the government should learn to increase its experience.

**Recommendation 3: Governments should provide economic incentives**

The use of economic incentives and disincentives, such as bonuses in order to encourage the *pleasant behavior* and penalties to deter private parties from any *strategic behavior*, has not been implemented in Latin America. In the sector of road and highways, some actions were taken but in the railway sector the implementation can provide more transparency in the process. These instruments have proved to be effective in other countries and thus it has potential benefits in order to increase concessionaire commitment in the project. However, the challenge is to find the suitable mechanism to reward and punish the private party.

7.4 Further Research and Reflection

This research was conducted through the availability of data and a fixed period of time, originating some new topics for future research. Thus our recommendations for further research are based on the new opportunities for obtaining data in different intervals of time. First, the results are collected on information before the implementation of the Line 1 of Lima Urban Rail and the operation of Sao Paulo Metro. Thus, the inclusion of data after these event could contrast more accurately the evaluation of the framework for critical factors. Secondly, due to volatile environment of Latin America, especially in the long-term demand, it would be useful to monitor the results of the others subways projects (Buenos Aires Subway and Metro Rio) in the future. The review of the results over time would be the expanded version of this research in order to cover the transport perspective.
Moreover, this research worked on the interaction between the criteria of success and the factors but it does not cover completely the mutual communication between factors. In other words, the relations within factors requires more analysis. It can provide more insights about the influence of some major force inside the critical factors.

Considering the reflection of the project, we could state that this research was not only instructive due to new theoretical knowledge but also because the application of the theory is a key factor. Developing an integrated design of a framework system and giving this practical interpretation is a challenge for students. Moreover, the biggest value of this research was the discussions with people in the public sector during the interviews. It was very instructive to compare scientific theories to the daily experiences in the Latin American environment. Nevertheless, it was a challenge to obtain interviews with people on the public sector due to their multiple activities. We were pleased with the data obtained.

Moreover, the next step after giving recommendations is to ensure that they can be implemented. The real feasibility of the recommendations should fit the actual Peruvian environment and culture. Thus, some of the recommendations can take more time to implement than others due to the priority that the government gives on them. In the case of Lima, the transparency law and the guarantee fund will take more time due to the vast procedures that the actual legislation embraces. Nevertheless, they are feasible due to the progress that Peru is making in attracting private investors. Moreover, we believe that it is not possible to reduce at a zero level the maintenance issues or strategic behaviors only by implementing these actions due to the “corruption culture” that sorounds high-investment project but at least some of these problems can be reduced.

Finally, it was a personal challenge to work with a methodology based on a major qualitative data. As engineers, we often attempt to convert everything in numbers. However, the qualitative analysis was perceived as an important component to enrich evaluation framework. The data obtained from the interviews increased the robustness of the qualitative analysis.
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Giuseppe Manrique


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Appendix A

Actual BOT Projects in Peru

Figure A.1: Number of concessions in Peru by 2008 (Source: ProInversion)
## Appendix B

### Mitigation Strategies for Risk Management

<table>
<thead>
<tr>
<th>Market Risk</th>
<th>Allocation</th>
<th>Source</th>
<th>Mitigation Actions (in general)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflation Risk</td>
<td>Shared</td>
<td>Lam et al. 2007</td>
<td>• The inflation indexes of past years would be the best indicators for the government to evaluate whether the service price can be linked to the inflation index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ng and Loosemore 2007</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wang et al. 2000</td>
<td></td>
</tr>
<tr>
<td>Interest Rate</td>
<td>Shared</td>
<td>Ng and Loosemore 2007</td>
<td>• The contract might be designed on the establishment of mixed interest rates which include fixed interest rate and floating interest rate. This will avoid some interest fluctuations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arndt 1998</td>
<td></td>
</tr>
<tr>
<td>Tariff change</td>
<td>Private</td>
<td>Ng and Loosemore 2007</td>
<td>• Tariff adjustment should be clarified in the contract</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lam et al. 2007</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wang et al. 2000</td>
<td></td>
</tr>
<tr>
<td>Financial Risk</td>
<td>Shared</td>
<td>Wang et al. 2000</td>
<td>• The government should do sufficient evaluations on the trend of overall financial development and include different scenarios in the contract</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grimsey and Lewis 2002</td>
<td></td>
</tr>
</tbody>
</table>

Table B.2: Risk Mitigation - Market Risks
<table>
<thead>
<tr>
<th>Political Risk</th>
<th>Allocation</th>
<th>Source</th>
<th>Mitigation Actions (in general)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationalization</td>
<td>Public</td>
<td>Li et al., 2005; Wang et al., 2000</td>
<td>• The concession agreement should provide for termination in case of nationalization. The compensation payable should be given to the private sector</td>
</tr>
<tr>
<td>Termination of concession by government</td>
<td>Public</td>
<td>Ng and Loosemore, 2007; Wang et al., 2000</td>
<td>• If the case of the political events affects the project, it can be terminated unilaterally. In such scenario, the compensation payable by the government for transfer of project assets should at least be equal to the outstanding dues to the project lender, thereby protecting them</td>
</tr>
<tr>
<td>Political/Public opposition</td>
<td>Public</td>
<td>Li et al., 2005; Grimsey and Lewis, 2002</td>
<td>• Appropriate insurance package should be designed to provide adequate cover against these risks</td>
</tr>
<tr>
<td>Change in law</td>
<td>Shared</td>
<td>Lam et al., 2007; Li et al., 2005; Arndt, 1998; Wang et al., 2000</td>
<td>• In this case, there should be a period of transition between laws in which the old law rules for the actual period in which the contract was signed while the new law will govern for the new plans.</td>
</tr>
</tbody>
</table>

Table B.3: Risk Mitigation - Political Risks
<table>
<thead>
<tr>
<th>Project Risks Construction</th>
<th>Allocation</th>
<th>Source</th>
<th>Mitigation Actions (in general)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improper design</td>
<td>Private</td>
<td>Lam et al., 2007; Ng and Loosemore, 2007; Wang et al., 2000; Arndt, 1998</td>
<td>• Independent group can monitor the proper design</td>
</tr>
<tr>
<td>Delay in completion</td>
<td>Private</td>
<td>Li et al., 2005; Ng and Loosemore, 2007; Arndt, 1998</td>
<td>• The risk should be mitigated through a Provision under the agreement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Private sector pay liquidated damages for delay during construction</td>
</tr>
<tr>
<td>Site conditions</td>
<td>Private</td>
<td>Li et al., 2005; Ng and Loosemore, 2007</td>
<td>• The risk of unexpected underground conditions in urban rails is allocated to the private partner. The private partner is in the better position to undertake site survey particularly on the underground conditions, such as any existing piles, the earth conditions, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Timely provision of land for construction should be made a condition precedent to the agreement</td>
</tr>
<tr>
<td>Construction changes</td>
<td>Public</td>
<td>Ng and Loosemore, 2007</td>
<td>• If the government makes tremendous changes in output specifications during construction, then the government should allow certain extension of the construction period and provide some degree of financial compensation.</td>
</tr>
<tr>
<td>Construction cost overrun</td>
<td>Private</td>
<td>Ng and Loosemore, 2007; Arndt, 1998; Wang et al., 2000</td>
<td>• The constructor should estimate project costs on a rational basis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The general constructor may sub-contract with several small constructors and in this way it may transfer the cost overrun risk to sub-contractors.</td>
</tr>
<tr>
<td>Poor quality of construction</td>
<td>Private</td>
<td>Lam et al., 2007; Li et al., 2005</td>
<td>• Independent group can monitor the quality construction</td>
</tr>
</tbody>
</table>

Table B.4: Risk Mitigation - Construction Risk
## Project Risks

### Operation

<table>
<thead>
<tr>
<th>Project Risks</th>
<th>Allocation</th>
<th>Source</th>
<th>Mitigation Actions (in general)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in operation</td>
<td>Private</td>
<td>Li et al., 2005</td>
<td>• There are risks during the operation of the project, which will affect the profitability of running the projects, such as the delays in operation. These risks are called operation risks and normally borne by the business that is responsible for the day to day maintenance and operation of the project.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arndt, 1998</td>
<td></td>
</tr>
<tr>
<td>High operational costs</td>
<td>Private</td>
<td>Ng and Loosemore, 2007</td>
<td>• Operator should increase the efficiency of the operation team by increasing the productivity of the staff and the equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arndt, 1998</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Li et al., 2005</td>
<td></td>
</tr>
<tr>
<td>Poor quality of operation</td>
<td>Private</td>
<td>Ng and Loosemore, 2007</td>
<td>• Independent group can monitor the quality of operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wang et al., 2000</td>
<td></td>
</tr>
</tbody>
</table>

Table B.5: Risk Mitigation - Operation Risks

<table>
<thead>
<tr>
<th>Project Risks</th>
<th>Allocation</th>
<th>Source</th>
<th>Mitigation Actions (in general)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of commitment of government</td>
<td>Public</td>
<td>Li et al., 2005</td>
<td>• Include the “performance contract” which is a written agreement that specifies the targets that the state pledges to achieve during the contractual period and that defines how performance outcome will be measured at the end of the contract.</td>
</tr>
<tr>
<td>Lack of commitment of private party</td>
<td>Private</td>
<td>Li et al., 2005</td>
<td>• Strong and continuously enforced incentive schemes should be designed to induce the contractor to be compliant with the contractual terms</td>
</tr>
</tbody>
</table>

Table B.6: Risk Mitigation - Party Risks
Appendix C

List of Interviewees

1. Executive Director of Project Electric Train in Lima  
   Company: AATE

2. Operation Manager of the Project Electric Train Lima  
   Company: AATE

3. Manager of Rail Projects- Tendering Company  
   Company: ProInversion

4. Manager of Concession Works in Lima  
   Company: ProInversion

5. Manager of Road and Rail Projects  
   Company: Ministry of Finance

6. Manager of Works  
   Company: Private Company in charge of the Operation Electric Train in Lima

7. Manager of Construction  
   Company: Private Company in charge of the Operation Electric Train in Lima

8. Standing Director  
   Company: Consultancy Firm
Appendix D

List of Questions

1. What are the roles and responsibilities of the government and the private sector in the project PPP?
2. What about the PPP history in the transport sector?
3. What are the main advantages and disadvantages of working in a partnership?
4. What type of agreement, there are in the Peruvian PPP projects?
5. How is the tendering process in PPP projects in Peru?
6. What are the selection criteria and procedures of the tendering process to choose the right partner?
7. How to ensure the transparency in the tendering process?
8. Can you give a brief explanation of the actual phases of the project life cycle?
9. What are the main risks and how are these risks allocated in these phase?
10. What are the monitoring schemes to ensure the quality of the correct implementation of the project?
11. How is the procedure to choose the right project?
12. How does the government ensure the sufficient profitability for the private partner regarding the rate of return?
13. How is the project management in transport projects?
14. How to incentive the commitment of both parties? And how to counteract any strategic behavior?
15. What are the main benefits/obstacles in the institutional environment of the actual project?
16. How are the risk allocated in general? Is there any procedure or established norms to allocate the risks?
17. What are the priority risks in transport projects?
18. What market environment and opportunities do PPPs bring for the future?
19. How do you evaluate the implementation of the transport system?
20. What are the criteria for the correct construction of the transport system?
21. What are the lessons learnt of the government/private until now regarding the application of PPP?
Appendix E

Map of Lima