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**Public-Private Partnerships in the Water Sector:  
A Comparison between Poland and Portugal**

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## **Resumo**

As parcerias público-privadas (PPP) como modalidade de contratação pública têm vindo a definir a sua posição nos mercados atuais como uma das principais formas de participação do sector privado em projetos que, de outra forma, seriam apenas de domínio público. Contudo, o seu uso e implementação contínua ainda a diferir em diferentes partes do mundo, inclusive na Europa seja pela legislação que regem esses países ou pelo seu nível de penetração num dado mercado.

Este trabalho visa comparar o desenvolvimento das PPP em dois países europeus completamente distintos. Por um lado, Portugal, com os seus quase 30 anos de experiência a trabalhar com PPP, realçando um número significativo de casos de sucesso e de insucesso. Por outro lado, a Polónia, um país recém-chegado ao sector das PPP, com apenas alguns anos de prática e uma lista consideravelmente mais curta de casos documentados, a fazer o seu melhor para se juntar ao resto da Europa neste domínio.

O foco principal deste trabalho incidirá sobre o desenvolvimento de projetos de PPP no sector da água e águas residuais, um sector onde ambos os países implementaram projetos nos últimos anos. A finalidade desta análise será então a comparação deste modelo de contratação pública nos dois países e a discussão dos principais problemas e virtudes a si associados, designadamente relativamente ao acesso ao mercado, à partilha e transferência de risco e à gestão de contratos. Serão também identificadas as limitações deste tipo de projetos dentro do sector da água e águas residuais e realçadas as boas práticas. Dois casos reais serão estudados para melhor compreensão da implementação destes projectos.

## **Palavras-Chave**

Parcerias Público Privadas, Água e Águas Residuais, Polónia, Portugal, Análise Comparativa.

## **Abstract**

Public-private partnerships (PPP) have gained their position in today's markets as one of the main tools to allow for private cooperation in projects that otherwise would only be of the public domain. However, their use and implementation still differs in different areas of the world, including Europe, either due to the laws that rule those countries or to their level of penetration and acceptance in a given market.

This paper aims to compare the PPP development in two completely distinct European countries: on the one hand, Portugal, with its 30 years of experience dealing with all kinds of PPP projects, and having a significant number of successful (and unsuccessful) cases. On the other hand, Poland which has recently entered the PPP sector, with only a few years practice and a considerable shorter list of documented cases, trying to jump into the European PPP train.

The main focus of this work will be on the development of PPP projects in the water and wastewater sector in which both countries have implemented projects in recent years. The purpose of this analysis will then be the comparison of this procurement model in both countries and the discussion of key issues and virtues associated with it, in particular concerning the access to the market, risk sharing and risk transfer and contract management. The limitations of this type of projects within the water and wastewater sector will also be identified and good practices will be highlighted. Two real cases will be studied for a better understanding of the implementation of these projects.

## **Keywords**

Public-Private Partnerships, Water Utilities, Poland, Portugal, Comparative Analysis.

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## Index of abbreviations

<b>AdP</b>	Águas de Portugal
<b>ANMP</b>	National Association of Portuguese Municipalities
<b>APA</b>	Portuguese Environmental Agency
<b>APDA</b>	Portuguese Association for Water Distribution and Wastewater
<b>ATO</b>	Optimal Territorial Areas in Italy
<b>BOO</b>	Build-Own-Operate
<b>BOT</b>	Build-Operate-Transfer
<b>BTO</b>	Build-Transfer-Operate
<b>DBFO</b>	Design-Build-Finance-Operate
<b>E&amp;W</b>	England and Wales
<b>EIB</b>	European Investment Bank
<b>ERSAR</b>	Water and Wastewater Services Regulation Authority in Portugal
<b>GWIK</b>	Gdańsk Asset Holding Company
<b>INAG</b>	Portuguese Water Institute
<b>IPPP</b>	Institute for Public-Private Partnerships
<b>KZGW</b>	Polish National Water Management Authority
<b>OFWAT</b>	UK Water Services Regulation Authority
<b>PFI</b>	Public Finance Initiative
<b>PPP</b>	Public-Private Partnership
<b>PPP Centre</b>	Public-Private Partnership Centre
<b>SNG</b>	Saur Neptun Gdańsk
<b>SPV</b>	Special Purpose Vehicle
<b>VfM</b>	Value for Money

# **1. Introduction**

## **1.1. Overview**

In today's competitive international market public-private partnership (PPP) projects have become one of the most popular and challenging methods of cooperation between the public and private sectors. They started to be widely used as a way of procuring and maintaining the public sector infrastructure, especially in sectors such as transportation, social infrastructure, public utilities as well as government offices, accommodation and many others.

In general, PPP arrangements refer to agreements between public authorities and private partners where part of the services or works under the responsibility of the public sector are being provided by a private partner. Between partners there is always a clear agreement which exactly determines the responsibilities of each party and clearly allocates risk, which is borne by those best able to control it. PPP projects recognise that both partners have certain advantages in relation to each other in the performance of particular tasks. By allowing each sector to do what it does the best, public services and infrastructure can be provided in the most economically efficient way. Additionally, the value of the projects is being increased through the usage of private sector skills and competencies.

## **1.2. Objective**

This paper aims to compare the PPP development in two completely distinct European countries: on the one hand, Portugal, with its almost 30 years of experience dealing with all kinds of PPP arrangements, and a large number of successful documented cases. On the other hand, Poland which has recently entered the PPP sector, with only a few years of practice and a considerable shorter list of documented cases, trying to jump into the European PPP train.

The main focus of this paper will be on PPP projects in the drinking water and wastewater sector, a sector on which both countries have shown several projects along the past years. The aim of that analysis will be the comparison of this public procurement model and of its major benefits and problems in both countries. Another aim is to identify the limitations and best practices of PPP projects in the drinking water and wastewater sector. For this purpose two empirical cases-studies will be analysed, one in each country.

### 1.3. Methodology

The cornerstone for the development of this paper was the collection of a long list of sources, including books, journals and publications of several specialists in the topic of PPP arrangements and project management. The knowledge from those documents helped in better understanding this topic through its advanced descriptions, very often presenting both sides of the coin, with positive and negative visions of the sector.

With a strong theoretical basis and comparable data from both countries, an analysis of their current situation was then added to the mix. With this objective in mind, data regarding the water sector and the market were gathered and analysed so that only the most up-to-date and trustful information was regarded. A large number of reports, including statistics, market and player descriptions, as well as reports from regulating and advising entities provided a stable and strong basis for this paper. Legislation, a fundamental part for any work developed in any sector was also carefully researched to make sure that nothing would be left out.

However, probably one of the major triggers in this work, probably the most important, was the direct consultation with specialists in the sector, working daily in the heart of the system.

The most vital information and feedback were provided by Mr João Simão Pires, member of the Portuguese Water Partnership (*Parceria Portuguesa para a Água – PPA*). PPA is a network of organizations aiming to develop synergies and maximize the development potential of the water sector in the world. Its mission is to promote effective partnerships between professionals, institutions and companies as well as to transfer the knowledge and skills of the Portuguese water sector in the world, being Poland one of their target markets. During regular meetings with my source I was able to learn in more detail about the structure of the Portuguese water and the wastewater sector, learning new information with every meeting. At the same time I began gathering information about the structure and situation of the Polish market, allowing for a knowledge transfer with them during the following meetings. This allowed me to create an image of the both countries' water utilities sectors and prepare their comparative analysis. They were very valuable and interesting meetings which significantly contributed to the development of this work. In addition, thanks to ERSAR Institution I was allowed to access to the final auditory report of the Indaqua Fafe S.A. concession it was able to examine it in the case-study part of this thesis.

Another relevant contact was on-line consultations with the representative of the *Polish Economic "Waterworks Chamber"*. They allowed me not only to understand better the structure of the Polish water utilities sector but also to clarify the complexity of the laws regarding this sector in Poland.

Also, some information regarding the Polish case-study was gathered through the contact with Polish company Saur Neptun Gdańsk. They were fresh statistics on the current situation of the company in the market.

It is important to mention that while collecting data from both countries, along with international English reports, both Polish and Portuguese versions of several reports were analysed, providing a more consistent basis and simultaneously making sure that no important details were lost in the translations. Understanding Portuguese materials was possible because of my basic knowledge of this language gained after two language courses as well as friends help and language dictionaries.

## **1.4. Structure**

The work will be divided into three main parts – description of general issues connected with the PPP arrangements, the comparative analysis of the water utilities sector and finally two case-studies of projects undertaken in both countries.

The objective of the first part (chapter 2) is to introduce the general idea of a PPP arrangement. Firstly, its concept will be explained presenting its general characteristics and the history of its origin. Later on a description of the PPP projects in the water sector and general international experience of the private sector participation in the sector will be provided. Afterwards the PPP markets in Poland and Portugal and their unique features will be described in greater detail. The analyses of both countries will show the development of each market throughout time, depending on the specific sectors involvement, scale of projects and other indicators. After that, the general rules of the “*PPP game*” will be explained. The description will include a comparison between different PPP models, the main players, types of agreements and the issues connected with the risk division. Finally, a short description of the tendering procedures and the specific legislations required in each country will be given.

The second part (chapter 3) will focus on the comparative analysis of the water utilities sector. It will start with the Porter’s Five Forces analysis of the drinking water and wastewater market, to better understand the sector’s nature and its players. As of the comparative analysis first of all, it will describe the government and administrative division of the countries and the formal regulation from the sector. The next part of that chapter will focus on comparing the existing management styles. In the last part, a detailed description of the main players in the sector will be provided, as well as an analysis of the existing PPP projects in the water utilities sector.

As for the last part (chapter 4) it will focus on presenting two case-studies from the water sector in each country. Each project will be based on a different PPP model – one case-study will present a contractual PPP while the other one an institutional PPP. This will provide a more practical view of how this type of project looks like in the real world, allowing for a deeper view of all the involved parts, procedures and management required in the creation of a long lasting public private cooperation using the existing PPP models.

## 2. Legal, institutional issues of public-private partnership projects

### 2.1. Description of public-private partnership arrangements

The term “*public-private partnership*” has been widely used around the world for many years; be it for the Suez canal’s construction in the XIX century or the private financed construction of roads and railways in Europe and the US, PPP type arrangements have more than often proven themselves and showed their added value to public-private cooperation’s. In Europe the last twenty years have witnessed an exponential appearance in this kind of cooperation between public entities and private companies, there is, however, no universal definition widely accepted of what truly is a PPP arrangement, not even at the European Union legislation level.

Nevertheless, in the European Union PPP arrangements are categorised into two main major models according to their nature – purely contractual or institutional.<sup>1</sup> Those categories were made due to the big diversity of PPP practises in different countries. The biggest distinction between those models is the formal way of cooperation between the public and private partner. Purely contractual PPP arrangement is a relationship based solely on contractual links, while the cooperation in institutionalised PPP arrangements between the public and private sector include usually the creation of a distinct entity. The ideas behind each of the models will be explained deeper in the following chapters.

Despite the lack of one international common definition describing what PPP projects are, there are some key elements which normally characterise them, such as:<sup>2</sup>

- A long-term relationship, involving a cooperation between a public partner and a private partner;
- The method of funding the projects, mostly by private partners. However public funds might be added to the private funds;
- The public entity concentrates mostly on defining the objectives to be achieved in the term of public interest, it is responsible for the quality of the provided services and pricing policy, additionally it takes responsibility for monitoring the project;
- The private partner is usually responsible for the stages in the project like design, completion, implementation and funding;
- Risk allocation between both parties – public and private. Usually risks are being transferred from the public entity to the private partner. Nevertheless, it does not mean that the private partner always bears all risk, since these are different in each project they are also divided depending on who can better reduce them.

PPP arrangements are strongly tied to the investment in infrastructures and its management. Theoretically, any type of infrastructure can benefit from this kind of arrangement. However, it is

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<sup>1</sup> European Commission (2004). *Green Paper on Public-Private Partnerships and Community law on public contracts and concessions*. COM (2004), nr 327 final, p. 8.

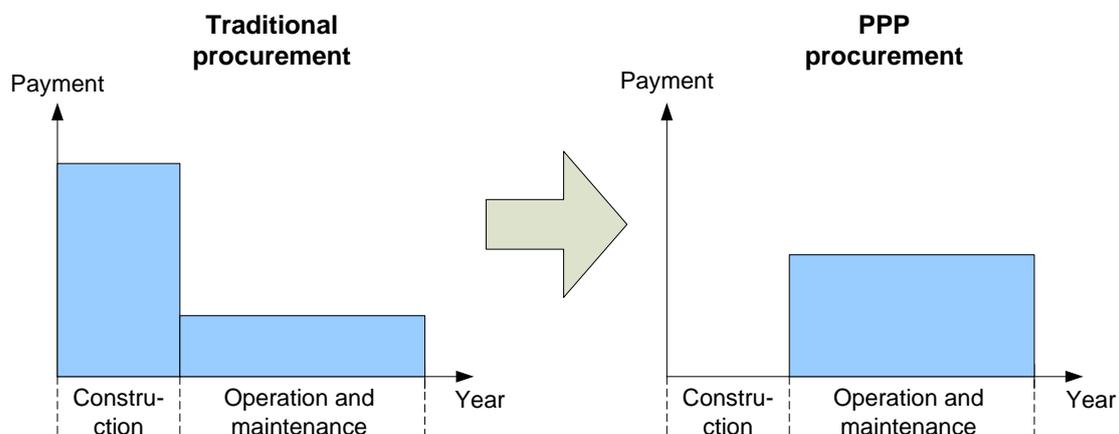
<sup>2</sup> *Ibid.*, p. 3.

possible to pinpoint some of the general sectors where PPP arrangements have continually been used and showed positive results:<sup>3</sup>

- Energy (power generation and supply);
- Transport (bridges and tunnels, toll roads);
- Water (water supply, wastewater treatment, sewerage);
- Telecommunication;
- Social infrastructure (hospitals, prisons, courts, government offices, schools).

Many years have passed since the first PPP projects have been launched. Since then, PPP arrangements have developed in many fields falling within the scope of the public sector.

One of the factors that can explain the increased growth in PPP projects is the lack of financial capability of public entities to cover the costs of the new infrastructure projects. In the typical procurement model which is widely applied, most of the costs occur from the beginning of the project, in particular on the construction phase, with smaller amount of costs later on in the operation and maintenance phase. All of those costs have to be paid during the construction time by the public authority. Nevertheless, some institutions might not be able to find and use that many funds at one time, what limits them to undertake new investments. That situation could be avoided by using the PPP model. With this model, there is no payment by the public sector during the construction phase; it pays only over the long term when services are already delivered. Covering the cost of the building infrastructure is therefore the responsibility of the private partner. Figure 1 illustrates the distribution of payment according to the used model.



**Figure 1.** Payment profiles depending on the model.<sup>4</sup>

Another explanation of the fast development of PPP projects is the desire to benefit more in the public sector from the know-how and working methods of the private sector. In that way the public authority can use the knowledge of the private sector to deliver the most efficient infrastructure or

<sup>3</sup> Grimsey, D., and Lewis, M. (2002). "Evaluating the risks of public private partnerships for infrastructure projects", *International Journal of Project Management*, 20(2), p. 108.

<sup>4</sup> PricewaterhouseCoopers (2005). *Delivering the PPP promise, A review of PPP issues and activity*, p. 12.

service; while at the same time being able to focus mostly on managing and controlling it. A combination of these factors deeply affects the development of PPP projects.

Also, PPP arrangements may be politically attractive to the government since he does not need to sell infrastructure assets to the private sector but merely delegate their management to them. This is very appealing to the government since selling these assets could be a sensitive issue to the society. PPP arrangements also allow for a greater predictability of the costs for the government, as well as revenues for the private partner, since these are exactly specified in their contracts.<sup>5</sup>

It is important for the public authority to fully understand that the PPP procurement is merely one of several options for providing infrastructures and services, and that it should be used only when a particular project is suited for it. As in any arrangement, there are arguments for and against PPP projects.

We can identify some of the main advantages of that model:

- It makes projects affordable by allowing its construction financing to be done by the private sector, which is later repaid by a service charge from the authority or by revenues from the project;
- Budgetary benefits allowing the capital cost of a public-sector infrastructure to be spread out over its life cycle and not covered all in one phase;
- Public sector pays only when services are delivered, therefore the private contractor has a direct financial interest in ensuring that the assets are delivered on time and according to required standards;
- Risks are allocated to the party best able to manage or absorb each particular risk, profiting from the know-how and skills of the private partner, this ultimately results in an added value in the project;
- The quality of service has to be ensured for the life duration of the project by the private partner without deviations on the price committed by him.

However, there is also a darker side to PPP arrangements, what someone can consider as disadvantages:

- Loss of management control by the public sector, which becomes more of a supervising institution;
- The overall procurement timetable from conception to final closure can be relatively long and costly, this is caused by the need of undertaking many studies, to ensure that the project will be feasible and profitable;
- The private sector has higher costs. For start, the transfer of risks to the private entity is more expensive than simply managing them through the public sector. Also the cost of loans undertaken by the constructing company is higher when compared to public institutions.

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<sup>5</sup> Sciuilli, N. (2007). "Public private partnerships: Identifying practical issues for an accounting research agenda", *Journal of Business Systems, Governance and Ethics*, 2(2), p. 20.

Finally, since PPP arrangements are an alternative to the traditional procurement model, it is important to fully explain the differences between them. In typical public procurement almost all the tasks, except construction are responsibility of the public partner. It is the public entity which is covering all expenses and preparing detailed design of facility, which is just being built by private partner who before won the bid process. On the other hand, in the case of PPP model, there are no exact requirements regarding to the design of the infrastructure or the way how it should be provided. It is in the competences of private partner to propose a solution to achieve expected “*output*” and final effect of the project which is set by public authority. A deeper comparison between PPP arrangements and typical public procurement projects is presented in the annex A.

## **2.2. The history of public-private partnerships in the world**

The form of PPP arrangements has lately become one of the dominating organizational ideas for cooperation between the public and the private sector. There are more and more countries which are starting to use the PPP model as a way of delivering public services and to ensure high quality standards. Nevertheless the humble beginnings of the PPP concept which were not always as broadly accepted as they are today should not be forgotten. The more it is known of the past, the less it is likely to repeat the same mistakes.

The idea of cooperation between the public and the private sector has appeared many times in the past centuries. From the historical point of view we can consider France as one of the first countries in which private capital was used to support public investments. The PPP arrangements have been present there for a long period, dating back to the seventeenth century. Since that time, a large number of projects developed under PPP schemes, such as railway networks or drinking water supply infrastructures, have been created. The first agreements under a concession were awarded for the Mediterranean-Atlantic Channel broadly known as the “*Canal du Midi*”, launched in 1666 with the length of 240 km, and also the “*Canal de Briare*” in 1638.

Another important and fine example of the private sector involvement in the public infrastructure is the “*Suez Canal*”. With a length of 160 km it was granted in 1854 and completed in 1869, and was later nationalized by the Egyptian government. Except for canal projects there were also other public infrastructures made in cooperation with a private partner such as bridges and tunnels.

But of course that every rose has its thorn, and even with all its growth, there was also a time during the late nineteenth and early twentieth centuries when the private sector participation through concession agreements fell out of favour. One of the reasons was the financial failures in projects where many of their financiers and founders lost significant amount of money. A great example project of this is the construction of the Panama Canal. The same private French company which was responsible for building Suez Canal won also this project. However, very fast due to many problems

which appeared during the construction process such as difficult terrain, climate or labour shortages stopped the work and the project went into bankruptcy.<sup>6</sup>

However after a short time of slowdown in development, by the end of the 1990s the use of PPP schemes came back to France. The tradition of concessions in France is very strong, even nowadays. Almost all public services are prepared to enter into concession agreements. Even through there was no formal PPP policy in France, in 1995, “75 per cent of the population was provided with water under PPP contracts”.<sup>7</sup> It was the time when only two PPP operators controlled 62 per cent of drinking water supply, 36 per cent of sewage disposal and many other sectors. In most of the other countries the numbers would be remarkable.

The big impulse for wider development of PPP projects was the industrial revolution in the past centuries and urbanization caused by it. The need of major investments had appeared. Unfortunately the countries in those times were not able to bear it that easily. This resulted in more open space for private entities to cooperate with public sector. A country which became pioneer in the area was the Great Britain. The model of financing road construction (water and land ones) by private partners was developed on the large scale. The profits of private partner for financing the construction were later charged through the fees for use of infrastructure. It had its place in XVIII century. Private sector involvement in infrastructure had its boom in the mid-nineteenth century, very often named as “*railway mania*”.<sup>8</sup> It was the time when many railway constructions were taken in Great Britain and many people were employed in railway construction area.

With exception of France and the UK the earliest examples of private activities in public infrastructures took place in the United States especially in the road transport. The idea of fully or partly paid roads was present there, with the aim of repairing or building new roads from the collected fees.

It is relevant also to talk about the Public Finance Initiative (PFI). It is a form of creating public-private arrangements by funding projects of public infrastructure with the use of private capital. It was initially developed by the Australian and the UK Governments. In the UK, PFI was announced by the government in 1992. These arrangements are playing an important role all around and it can be said that current PPP projects are based on the concessions used in the past and on the development of the PFI Model.<sup>9</sup> To emphasize the importance of the PFI Model the contracts with the Tubelines and Metronet consortia should be pointed out. They were signed in 2002 and 2003 to modernize the London Underground system. Until 2003 they were representing the largest signed PFI contracts by the capital value level.<sup>10</sup>

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<sup>6</sup> Lemos, T., et al. (2000). “From concession to project finance and the private finance initiative”, *Journal of Structured Finance*, 6(3), p. 21.

<sup>7</sup> Grimsey, D., and Lewis, M. (2004). *Public-private partnerships: The worldwide revolution in infrastructure provision and project finance*, p. 47-50.

<sup>8</sup> *Ibid.*, p. 41.

<sup>9</sup> Yescombe, E. (2007). *Public-private partnerships: Principles of policy and finance*, p. 9-10.

<sup>10</sup> HM Treasury. (2003). *PFI: meeting the investment challenge*, p. 19.

Both models PFI and PPP have a lot in common and represent similar ideas; however there are some main differences. First of all, a PPP arrangement refers to a broader term of partnerships between public and private bodies while the PFI model is used mostly with the aim of financing infrastructures. However, the main difference is that the PFI model is used only to contract services, not infrastructure, while in PPP arrangements it can be applied more widely.

According to the EU *Green Paper on Public-Private Partnerships and Community law on public contracts and concessions*<sup>11</sup> when looking at the European level the need for using PPP models was strongly recognised while working on the Trans-European Transportation Network known as TEN-T. The idea was created because the project was falling behind the schedule, mostly because of the lack of funding. The aim of the project was to develop the communication network in Europe, specifically for the area of road, rail, air and water transportation networks. The TEN-T network is part of a wider system of Trans-European Network (TENs). In 1996, it was estimated that to deliver the TEN-T network it would be required € 400 billion by 2010. A total of € 125 billion, one third of the entire budget, was needed at one given time to enable 14 subprojects to be completed concurrently and stay in schedule. As time passed, it was noted that renewed effort would be needed to deliver the proposed investment. This developed the idea of using private funds in a big scale to complete the project.<sup>12</sup>

The situations described above are not the only ones from the PPP projects history, but the most important ones. There were many other countries in the past which were using private funds to finance projects, even without knowing that their actions would later be considered as the genesis of PPP projects. After having a look at the rich history of PPP agreements it is time to look forward and concentrate on the present situation and on the water sector.

## **2.3. Public-private partnerships in the present time**

### **2.3.1. Europe**

The first PPP projects in Europe can be dated to 1990 and since then have been appearing in different countries, as well as in the different sectors. In recent years they have evolved from their primary base, the transport sector, to the area of public facilities such as schools, hospitals, waste management and many others. For better understanding its evolution across the EU, some statistics will be given, focusing first in the period from 1990 until 2009, and analysing later only the present years.

To correctly analyse the PPP arrangements development it is not enough to just present project numbers, but also to present their values. Not always a big amount of projects indicates a high capital value, and vice versa. During the time from 1990 to 2009 there were more than 1300 major PPP

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<sup>11</sup> European Commission (2004). *Op. cit.*, p.3.

<sup>12</sup> PricewaterhouseCoopers (2005). *Op. cit.*, p. 7-8.

projects signed, with a total value of almost € 255 billion.<sup>13</sup> Comparing the number of projects in the first years with the more present times we can see the high speed of the PPP market development. More detailed information can be found in annex B.

In general, as it can be read in the European Investment Bank (EIB) financial report<sup>14</sup>, the UK remains the most active PPP market in the recent years in Europe. During the years 1990 – 2009 around two thirds of all European PPP projects were started there. The place of second biggest market was reserved for Spain, however only 10% of the projects took place there. In total, around 92% of all European PPP arrangements are being owned by UK, Portugal, France, Germany and Spain.

The share in terms of projects value in the presented period of 20 years was similar. 53% of the total value of European PPP projects was placed in UK, while the PPP market by value in Spain turned out to be bigger than by number of projects. The third place was reserved for Portugal with one of the largest market by value.

In terms of sector presence the situation in the UK and the rest of EU countries looks a bit different from each other and did not change much in the past 20 years.

Starting with the UK the most filled sector for implementation were education and health, reaching within this time the number of projects around 35% each, from all. Also, by value of projects those sectors were on the top. On contrary, the number of projects from transportation sector was decreasing with the time, falling to only 4% of all PPP arrangements as well as the value of projects which after 20 years dropped by almost 40%.

In case of the continental European countries, the situation has been developing in a different area. While the projects on the health and education areas were just a small percentage of all the projects by number and especially by value, the transport sector was the leading one. In the beginning of 1990s the transportation projects were representing over 90% by the value of the total European PPP projects with almost 70% of projects by number. As the time passed the numbers in transportation sector have slightly decreased, however it still remained the most popular sector for development of PPP projects.

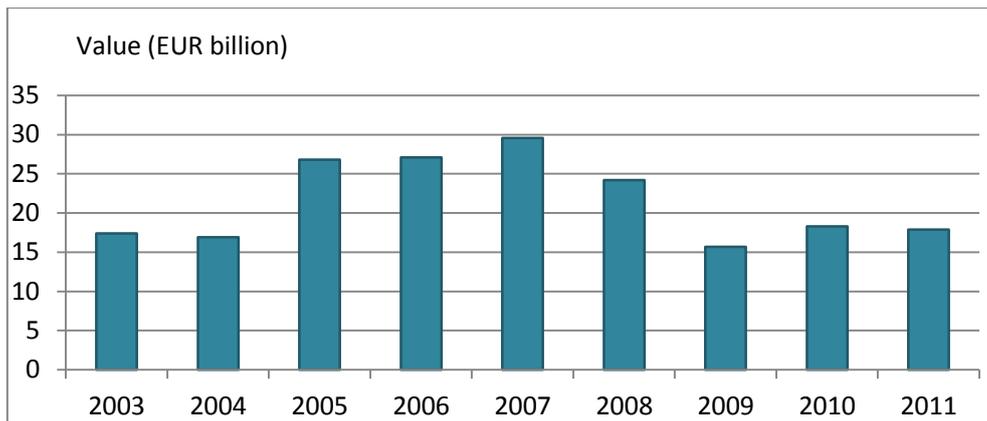
From the economical point of view during the described 20 years period of time, the PPP arrangements' investment flows in Europe represent less than one percentage of the gross domestic product (GDP) in each country. The places where those projects had rather more macroeconomic meaning than microeconomic were only Greece, Portugal and the UK; in a smaller scale also Spain and Ireland.

After the short description of the market in Europe in the period of 20 years starting from 1990, it is time to analyse the last years. The figure 2 presents the PPP market in Europe in a more restricted time frame.

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<sup>13</sup> EIB (2010). *Public-private partnerships in Europe – Before and during the recent financial crisis*, p. 7

<sup>14</sup> Description of 1990 – 2009 based on EIB (2010). *Op. cit.*



**Figure 2.** European PPP market from 2003 to 2011 by value.<sup>15</sup>

As it can be seen from the figure 2, the biggest peak of the PPP projects development had place in years 2005 – 2008; especially in the year 2007 when the value of all the projects reached almost € 30 billion (only projects of value greater than € 10 million were included in statistics).

Looking at the more recent data, in particular the last years of 2010 and 2011, it is possible to better understand the current state of PPP projects. Focusing specifically on the value of the projects, 2011 remained almost in line with the year 2010. It is around this time that larger projects started to be more common. In a more broad view, there are a number of aspects that can be compared between these two years, and that can give a clearer image of the status of PPP projects in Europe during this interval.

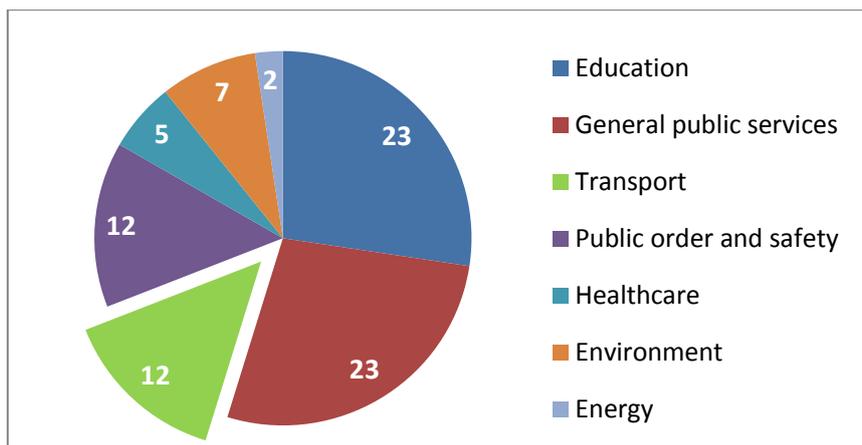
Doing a brief comparison of PPP market between 2010 and 2011<sup>16</sup>:

- In 2011 there were 84 transactions which achieved financial close, while in 2010 there were 112 of them;
- The value of the projects in both years was almost the same with the number of € 18 billion;
- In general and according to the number of the projects, the UK is still the leader on the PPP market in Europe, however it does not remain on the first place with the value of the projects;
- According to the total value of the PPP arrangements in 2010 the leading country was Spain, and in 2011 France, with 62% of the total value of all European projects;
- In year 2010 Portugal was ranked as third, thanks to few very large projects, while in 2011 it remains much less active;
- In 2010 the average transaction size was reaching value of € 163 billion, while in 2011 it was € 213 billion.

Figure 3 presents the number of PPP projects in 2011 by sector. The section that is pulled out of the pie chart has the biggest total value of the projects in that year.

<sup>15</sup> EPEC (2012). *Review of the European PPP market in 2011*, p. 1.

<sup>16</sup> Description of 2010-2011 based on EPEC reports for 2010 and 2011.



**Figure 3.** Number of the PPP projects in 2011 by sector.<sup>17</sup>

Most of the projects in 2011 took place in the education and general public services sectors, with an estimated value of € 1 billion and € 2 billion respectively. The total value of the project arrangements in the public order and safety, healthcare and environment sectors was estimated at around € 4,5 billion. The section that presented the highest value of projects in 2011 was the transport sector, with 58% shares of all European PPP agreements in that year, what gave more than € 10 billion, just for one sector.

As a point of reference, the number of projects in the education and healthcare markets was much higher in 2010 compared to 2011. In total both sectors delivered a value of projects of almost € 7 billion. In terms of value the leader is all the time the transportation sector, but in 2010 there were twice as many projects from that area than the following year. As it can be noticed from the figure 3, not always the biggest amount of projects indicates the highest value. Because of that, it is important to include both aspects while analysing the development of PPP projects.

The year 2011 has been marked by some major PPP projects. The most impressive project, which reached financial close in that year, is the Tours-Bordeaux high-speed railway in France. The purpose of the project is the construction of 303 km of high-speed line for a total capital cost of € 5,4 billion which is going to be carried out during a 50 years long concession agreement. The numbers by themselves illustrate the scale of that project. It might be relevant to mention, that in 2011, most of the larger projects took place in France.

With time the PPP projects have been appearing in new areas, even spreading to the different countries. As a showcase of how diversified these projects can be some interesting examples can be found below:

- The Nice Eco Stadium in France with the value of over € 200 million reached financial close in January 2011. It is supposed to be ready for the UEFA Euro 2016;

<sup>17</sup> [www.eib.org/epec](http://www.eib.org/epec).

- Vincennes Zoo in France with the value of € 160 million, reached financial close in February 2011, is going to be the first PPP zoo project in the world;
- Four PPP prisons in Belgium which reached financial close in 2011, the average deal value was over € 100 million.

During the past years, the idea of delivering services and creating infrastructures using PPP projects has spread around the Europe and the world. Many governments promote and support the use of this partnership, allowing them to spread out into different sectors. Still, many EU countries have only a very limited experience with PPP arrangements, or in some cases none at all. A good example is Poland, slowly entering the PPP market, but without a strong position just yet.

After this description of the past and the present experience with PPP projects in Europe, it is now time to focus on two specific countries – Poland and Portugal which will be compared in the next chapters of this thesis.

### 2.3.2. Poland

Poland is a country situated in the Central-Eastern part of Europe, with Warsaw as its capital. In 1795 Poland was divided between Russia, Austria and Prussia and disappeared from the map for 123 years. It secured its independence only in 1918, but after the World War II it fell under Soviet tutelage, becoming one of the Eastern bloc countries. This led to a slower social and economic development compared to the Western Europe. Since then, there was communism, which finished in 1989. After all this Poland finally had time for breathing, with a strong economic growth as well as trying to overcome the development gap which was created over decades of oppression.

Since 2004 Poland is a member of the EU. This has created an opportunity to catch up with Western European standards and possibility to increase the development of infrastructure and availability of required public services. Nowadays, Poland is a strong country in Europe, one of the least affected by the crisis. In administrative division in Poland there are provinces, districts and municipalities. The table 1 presents general information about Poland.

**Table 1.** General information about Poland

<b>Republic of Poland</b>	
Total area	312.685 km <sup>2</sup> (Wolfram)
Population	38 million people (Wolfram 2010)
Population density	125 people/km <sup>2</sup> (Wolfram 2010)
GDP per capita in PPS*	63/100 (Eurostat 2010)

\* Index of GDP in Purchasing Power Standard, expressed in relation to the European Union (EU-27) average set equal to 100.

The first projects connecting public entities and private partners on a similar base to the current PPP arrangements took place in Poland in the 1990s. Until the formal regulations on PPP projects in 2005 were adopted there were two possible ways of cooperation which could be used.<sup>18</sup> First of all, the agreements could be based on the specific laws regulating the cooperation between the partners, for example in the road sector the *Act of law from 1994 on Toll Highways and National Road Fund*. The second possibility was based on the general rules, especially on the *Act of law from 1996 on Municipal management* which allows units of the local government to delegate tasks of public utilities to the private entities. All of those contracts were not typical PPP arrangements since there was no formal law yet, but they can be considered as an origin of the PPP projects in Poland.

The project that is especially worth of attention is a drinking water supply and sanitation system project in Gdańsk City (north of Poland) by Saur Neptun Gdańsk S.A. Company (SNG).<sup>19</sup> It is important to say, that SNG created together with Gdańsk City the institutional PPP arrangement in the form of joint-venture company, where 51% of the control belongs to the private investor and 49% to the municipality of Gdańsk City. It was the first joint-venture cooperation in Poland which started to provide drinking water and wastewater services. The contract between the public entity of Gdańsk and SNG was signed in 1992, for the period of 30 years.

In this cooperation the mixed company became responsible for the operation and maintenance of the existing infrastructure. It provides its services not just in the area of Gdańsk but also in Sopot City and a few neighbourhood municipalities. The city of Gdańsk (the owner of the infrastructure): leased the property to the SNG Company and is responsible for carrying out periodic maintenance and investment. The municipality also have the right to supervise the work in the infrastructure area. As for the partnership, SNG committed to governance the drinking water and sewerage system, pay to the city for the leased property, and collect tariffs from users.

This cooperation brought many profits for both partners; the quality of drinking water in the area has improved, 700 jobs were created and the newly created mixed company earns high revenues.<sup>20</sup>

The concept of PPP arrangements in Poland was formalized through the polish *Act of law On Public-private partnerships from 28 July 2005*. It was the first document of its kind in the polish legislation. The first works on this law has started in 2003, when the first draft of the act was created. In that time the idea of running special institution to help development of PPP projects was also present. Ultimately, the creation of this institution was rejected under the name of national budget savings and the prevention of too much bureaucracy.

Shortly after the adoption of the act, the first voices of criticism regarding the law appeared, intensifying every day. Time showed that this law was not perfect and it gave a lot of difficulties in its usage. It did not meet expectations of the public and it was not as helpful in creating PPP projects as it should. Furthermore, according to the research of Zieniewski and Sześciło there was no PPP

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<sup>18</sup> Zieniewski, M., and Sześciło, D. (2008). *What to change to develop public-private partnership in Poland?*, p. 18.

<sup>19</sup> *Ibid.*, p. 19.

<sup>20</sup> National institute for the development of public-private partnerships (2008). *Public-private partnership* p. 72.

agreements created under this law until September 2008.<sup>21</sup> This is almost a 3 years interval in which it was not used at all. The only project announced under this law was in January 2009. It was supposed to be a concession project under the name of “*Designing, financing and constructing the complex of 3 underground parking lots in Gdańsk City*”.<sup>22</sup>

The biggest objections related to the law were the over formalization and too detailed regulations in the project preparation. Instead of helping PPP projects take their first steps, the law was making even more barriers. Despite the opportunity and hope which that first law was bringing, it did not fulfil the task. Example of that is the 13<sup>th</sup> article of this law that stated: “*Information on the planned implementation of a certain project on the principles of the public-private partnership needs to be announced in the Public Procurement Bulletin and in the Public Information Bulletin*”<sup>23</sup>. As it turned out, at that time, there was no special form to announce the project, as it was required. According to the further description in this law, without filling up this demand, an agreement would not be valid.

As an example, the situation of Wagrowiec Municipality from Region of Wielkopolska (north-west part of Poland) should be recalled.<sup>24</sup> It was the first Municipality in Poland which was trying to run a project in accordance with the *Act on public-private partnerships from 2005*. In the end, due to being impossible to comply with the 13<sup>th</sup> article, the Municipality decided to use a different form of investment. Except for big bureaucracy, there were other objections to this law, like the long-term delay in the adoption of necessary regulations to the act (almost one year) and the high costs of creating PPP arrangements (due to required complex analyses, which cause extra costs).

Because of those situations a revised law, the *Act of 19 December 2008, On Public-private partnership*, was published (came into the force in January 2009). This new law is already in its fourth year of service and as far as it is known, improved its usability and decreased the difficulty of implementing PPP projects in Poland.

In the new law one of the main changes was the level of detail in the description of projects that can be undertaken as a PPP arrangement. This new regulation was simplified and broadened to include any cooperation based on tasks and risk division between the public and the private partners, allowing for a larger number of projects to apply for PPP status in Poland. The new law also contemplated the different types of business entities that can exist under the PPP investment. Before the PPP investment could be made in the form of private or public limited company. After the changes it allowed also for different arrangements like limited partnership or limited partnership with shares.<sup>25</sup> The two last types of companies exist in the Polish law and have no direct comparison at international level.

Nevertheless, to develop PPP projects not only legislation is needed. Even more important are the guides and good information centres. Those guiding entities were one of the lacking elements within

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<sup>21</sup> Zieniewski, M., and Sześciło, D. (2008). *Op. cit.*, p. 5.

<sup>22</sup> IS (2010). *PPP market in Poland in 2009*, p. 8.

<sup>23</sup> Polish Law (2005, July 28). *On Public-private partnership*, art. 13.

<sup>24</sup> IS (2009). *PPP good practices: Summary of three years of competition for the best public-private project* p. 7.

<sup>25</sup> *Ibid.*, p. 8-9.

Poland's early years in PPP arrangements' experience. Those are the things which Poland was missing within the first years of experience in PPP projects. With time, many helpful documents were appearing, both from the government and from other institutions.

The first independent organization specialising in the topic of PPP arrangements in Poland was the *Institute for Public-Private Partnerships (IPPP)*. This organization started to work in 2003 on the Polish market, and is also present on an international level. The mission of the Institute is to support both, public entities and private partners in the successful implementation of PPP projects. They achieve their goal through “*education in the PPP area and expert advice*” and believing that “*proper preparation of PPP investment from formal, legal and economic side, with understanding each of the parties' needs and interests is key in order to bring a quality PPP project to the market*”.<sup>26</sup>

Another organization to support PPP projects in Poland is the *Public-Private Partnership Centre (PPP Centre)*, formally established in July 2008. The main purpose of this organization is “*to promote public-private undertakings in Poland on a non-profit basis*”.<sup>27</sup> It is worth to add, that the first works on the organisation have started in 2007. The founders of the PPP Centre are 41 entities, both, private and public institutions; banks, law firms, consulting firms, companies, regional development agencies, foundations, and others. Additionally, the PPP Centre is cooperating with the Ministry of Economy, Finance and Regional Development. It is known, that the PPP Centre has a strong support from the Polish government, and lately, together they are working on a formal agreement between them. It will force the PPP Centre to “*perform the role of government agency in preparation of the best practice standards and PPP promotion in Poland*”<sup>28</sup>.

The two described institutions are very similar. First of all, both of them are independent associations and there are considered foundations. They deliver trainings, advices and promote the idea of PPP arrangements in Poland as well as abroad. Additionally both of the organizations are strongly cooperating with the public institutions and the government. The only difference which could be visible is the fact that there are plans to create a formal agreement between the government and the PPP Centre which does not happen in the case of IPPP.

In next part of this chapter more detailed information regarding PPP projects will be presented. As stated before, 2009 was the year when the updated version of the act of law regarding PPP projects brought new light into the area. From that moment the legislation facilitated the creation of this kind of agreements, opening the door to several new projects, never possible before.

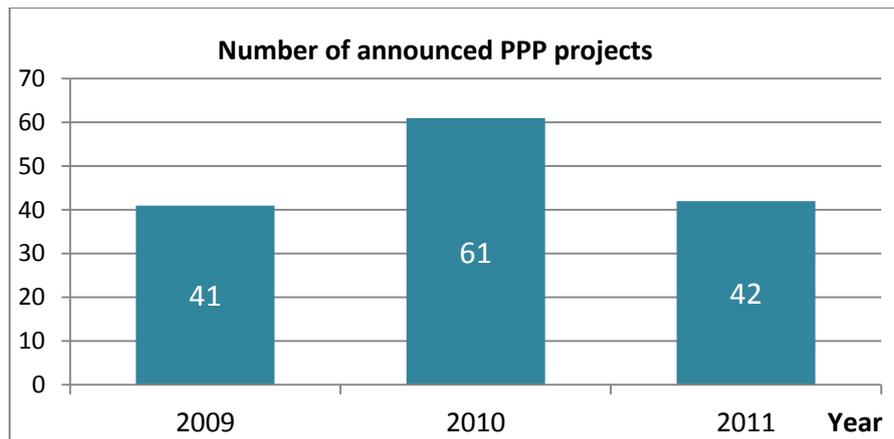
The figure 4 presents the PPP market in Poland from 2009 to 2011 and more specifically, the number of announced projects.

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<sup>26</sup> Institute for Public-Private Partnerships, [www.ippp.pl](http://www.ippp.pl).

<sup>27</sup> Foundation Public-Private Partnership Centre, [www.centrum-ppp.pl](http://www.centrum-ppp.pl).

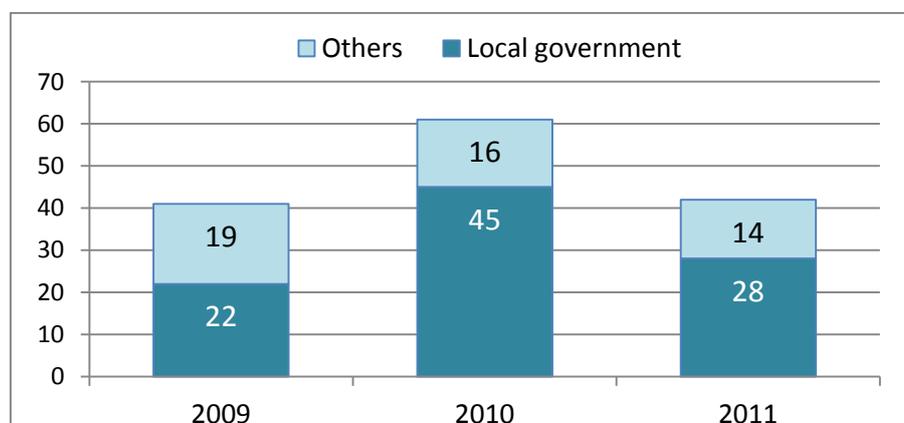
<sup>28</sup> *Ibid.*



**Figure 4.** PPP Market in Poland in years 2009 – 2011.<sup>29</sup>

The first projects under the new law were announced already in April 2009. It might mean that these projects were already prepared before and public authorities were just waiting for new law. In 2009 the total amount of announced projects was 41, where one project was announced under the old act of PPP law; in 2010 the number of announced project was equal to 61 and in 2011 to 42. Due to the cancellation of certain projects or their re-publication the actual number of projects in 2009 was 34 and in 2010 year 51.

In Poland there are three main levels of territory division of the country. The biggest local government entities are called provinces (16 of them), then there are districts, under which are municipalities. Since 2009 the PPP projects were mostly announced by local municipalities. Sometimes this number was more than half of the announced projects in a given year. For example, in 2009 there were 41 announced projects, from which 22 of them were announced by local municipalities, in 2010 it was 45 from 61 and in 2011 it was 28 of them from the 42 announcements. The figure 5 presents described division. It includes projects announced by local governments and others.



**Figure 5.** Number of announced projects by the type of public authority.<sup>30</sup>

<sup>29</sup> Own elaboration based on *PPP Market reports for years 2009-2011*, Investment Support.

<sup>30</sup> *Ibid.*

The sector in which PPP projects were developing the fastest was the sector of sport and recreation. Other important sectors in which they were taking place in the last years are pointed out in the figure 6.<sup>31</sup>



**Figure 6.** Most popular sectors for PPP projects in 2009-2011 in Poland.

According to the report of the Polish PPP market in 2011, the value of 33 projects from the 42 announced was around € 370 million<sup>32</sup>. The value of the market for the years from 2009 to 2011 for the announced PPP projects (where the value of the project was public) was estimated for 1,25 thousands of million euros.<sup>33</sup> It is the value of the announced projects, so it includes also value of projects which later on were cancelled or changed.

The value of the contracted project for the years from 2009 to 2011, which are still valid, was 190 million euro.<sup>34</sup> Additionally, the contracts which dominate are the ones with small value.

From the IPPP it is known, that in the end of February 2012 there were 27 valid agreements of PPP type.<sup>35</sup> Moreover, in February and March, the Institute verified the sources about PPP arrangements and identified 330 projects planned to implement in the PPP model or concession. This number includes also the actually announced procurements.

Many challenges with PPP projects were associated with the preparation of the sports infrastructure and facilities of the EURO 2012, which was co-hosted by Poland. It created a big chance to develop and promote PPP projects. The diversity of the areas in which those partnerships are being implemented, shows that the new law from 2009 is universal and gives tremendous freedom for starting them in any sector.

<sup>31</sup> *Ibid.*

<sup>32</sup> For the easier calculation it was assumed that 4zł = 1€ (zł – Polish currency).

<sup>33</sup> IS (2012). *PPP market in Poland in 2011*, p. 5.

<sup>34</sup> IPPP (2012, March 24). *Polish PPP projects in their development*. Institute for Public-Private Partnerships.

<sup>35</sup> *Ibid.*

### 2.3.3. Portugal

Portugal is a country situated in the Western part of Europe, with Lisbon as its capital. It comprises continental Portugal and two archipelagos – Madeira and Azores. It was founded in 1143, with established borders since the XIII century. There were many discoveries in the XV and the XVI century and emigration overseas what led to the Portuguese foreign policy priorities on the relationship between Europe, Africa and Brazil.

Portugal is a founding member of NATO in 1949 and EFTA in 1960, as well as a member of the EU with full right since 1986. Entering the EU has been followed by a progressive opening of the Portuguese economy. Nowadays Portugal is facing strong economic difficulties because of the crisis, that affected also some other counties. In administrative division in Portugal there are districts, municipalities and parishes.

The table 2 presents some general information about this country.

**Table 2.** General information about Portugal

Portuguese Republic	
Total area	92.090 km <sup>2</sup> (Wolfram)
Population	10.7 million people (Wolfram 2010)
Population density	117 people/km <sup>2</sup> (Wolfram 2010)
GDP per capita in PPS*	80/100 (Eurostat 2010)

\* Index of GDP in Purchasing Power Standard, expressed in relation to the European Union (EU-27) average set equal to 100.

The idea of PPP projects in Portugal was present already in the 1970s in the past century. The first project which can be considered as a start of the PPP arrangements in Portugal took place in the year 1972. The concession was given to the private partner Brisa S.A. for the design, construction and operation of 400 km of the toll highways. The contract has successively evolved until year 1997.<sup>36</sup>

Another project especially worth attention is the Vasco da Gama Bridge which is located on the Tagus River in Lisbon. The contract was signed in 1995 with the Lusoponte Company for the period of 35 years under the concession agreement.<sup>37</sup> An almost 20 km long bridge was built during the period of three years, in the same time becoming one of the longest bridges in Europe. The project turned out to be the biggest and the most successful engineering project in Portugal during the last century. It is important to say, that it was one of the first PPP contracts in Portugal which was funded by international private shareholders.<sup>38</sup>

<sup>36</sup> Leonardo da Vinci Project, Results (2012). *Trans European Promotion of Private Public Partnership*, p. 38.

<sup>37</sup> Cruz, C., and Marques, R. (2011). "Revisiting the Portuguese experience with public-private partnerships", *African Journal of Business Management*, 5(11), p. 4024.

<sup>38</sup> Leonardo da Vinci Project, Results (2012). *Op. cit.*, p. 48.

Nevertheless, also some problems could be noticed in that project. As it is known, the consistence of the public orientation is very important in the PPP arrangements; however its lack could be noticed in the case of the Vasco da Gamma Bridge construction. In that project during the negotiations and also after the signing the contract the Government's orientation changed. It led to the situation that in a particular moment the Lusoponte Company had to deal with the two Ministries at the same time, without having a common orientation. It was a very difficult situation for the private company, as if it had to deal with several partners instead of one.<sup>39</sup>

Portugal is a country where the tradition of PPP arrangements goes back for many years. There are a lot of examples of successful projects, like for example the mentioned above Vasco da Gama Bridge, but also some failures in the area. Before the formal law about the PPP arrangements started to oblige in 2003, there were many projects contracted before that date. It was a very intensive time in the development of that kind of agreements.

The figure 7 presents the cumulated investment in the PPP and concession projects in Portugal.

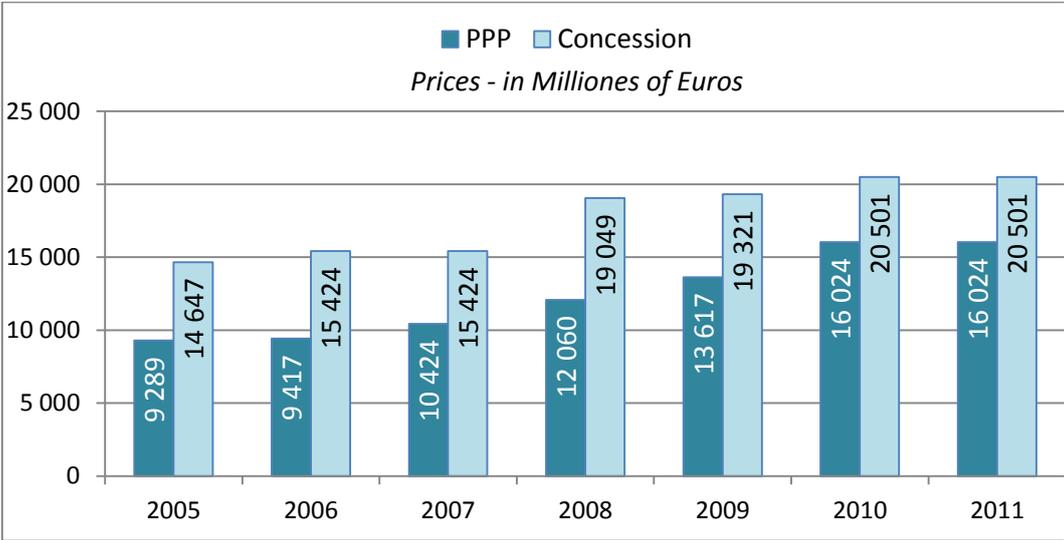


Figure 7. Cumulated investment in the projects in Portugal from 2005 to 2011.<sup>40</sup>

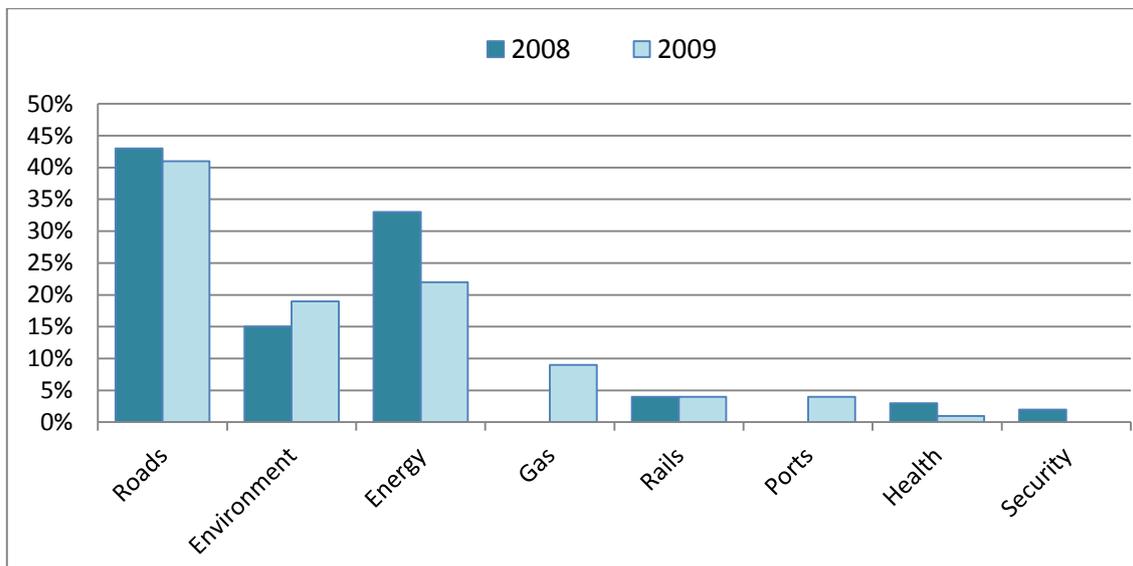
According to the figure 7, the value of concessions represents the major part of the investment in PPP projects. The general growth of the value of investment can be noticed each year. Nevertheless, as it can be seen the value of the investment in the last years is at the similar level, with a slight increase.

The development of PPP arrangements includes several sectors. As it was mentioned before, the first PPP projects were signed for the construction of roads. This tendency is still being continued and the road sector is one of the most popular in the country. It is the sector with the highest importance in the area. This is caused by the big number of projects which are already in operation and the relevant

<sup>39</sup> Lemos, T., et. al. (2004). "Risk management in the Lusoponte concession – A case study of the two bridges in Lisbon, Portugal", *International Journal of Project Management*, 22(1), p. 67.

<sup>40</sup> Portuguese Ministry of Finance (2012). *Public private partnerships and concessions, 4<sup>th</sup> trimester 2011*, p. 4.

amount invested in the construction of roads, bridges or highways. More specific numbers are shown in the figure 8. It presents the PPP projects per sector in years 2008 and 2009.



**Figure 8.** PPP and concession projects – investment by sector in 2008 and 2009.<sup>41</sup>

Analysing the figure 8 it can be said that almost 50% of investment is assigned to the road sector. Next in line is the energy sector, where the decrease in investment can be noticed. Another significant sector is the environment one. It includes areas such as water, sanitation and waste collection and treatment. The remaining sectors represent a smaller part of the total investments in PPP projects in Portugal, but it does not mean that they are less important than the others.

Some interesting facts about PPP projects development in Portugal are the following:<sup>42</sup>

- After 1997, in a period of 10 years in Portugal there has been built about 1,830 km of highways, before that there were only 700 km;
- Thanks to the faster and safer connections the number of fatal accidents on roads decreased by 50% during 10 years;
- During the last 10-15 years there were several PPP projects launched in the environment sector, thirty of them which are already in operation are serving 20% of the Portuguese population, involving investment of around € 4,5 billion;
- The health sector was the first one to launch PPP projects in Portugal in terms of social infrastructure, with the aim to improve the hospital care.

Looking at the past, some authors argue that *“the government went too far in launching, in such a short period, so many projects”*.<sup>43</sup> First of all there was not enough of time to gather all the needed

<sup>41</sup> Own elaboration based on Ministry of Finance of Portugal, Reports of *Public private partnerships and concessions of 2009 and 2010*.

<sup>42</sup> Based on Leonardo da Vinci Project, Results (2012). *Op. cit.*, p. 42- 48.

<sup>43</sup> Cruz, C., and Marques, R. (2011). *Op. cit.*, p. 4024.

know-how in the running PPP projects, what means that the interval between projects was too short to be able to learn from previous mistakes. The second issue was the lack of legislative framework which would be helpful in guiding new contracts. Additionally, the general opinion was to build as quickly as possible, since there was no payment made in the first years of construction. With time, the ability to bear costs became a problem. All of those factors resulted in the absence of accountability. Within time, the ability to launch new projects was becoming more threatened. The growing crisis was causing that private partners had less availability to bear the risk and fund the investments through the loans. It also became more expensive for the government to sell public debt.

Nowadays, Portugal can be considered one of the most affected countries by the global financial crisis. Its effects can be also felt on the development rhythm of the PPP projects in the country due to the lack of funds from bank systems.

To improve the situation of the country Portugal prepared the reform programme. In the official *Letter of Intent* from May 2011 prepared by the Portuguese Government addressed to the International Monetary Fund (IMF), Portugal is asking for support in the amount of € 78 billion for the period of 3 years.<sup>44</sup> According to this agreement, one of the areas in which Portugal has to work more intensively is the area of PPP projects.

Speaking in detail, Portugal obliged in May 2011 to:

- 1) Undertake a wide review of at least 20 the most significant PPP and concession contracts to reduce government's financial exposure with the technical assistance from European Commission and IMF;
- 2) Recruit international accounting firm to assess which PPP or concession contracts could be renegotiated to reduce the financial obligations, without an effect on investors;
- 3) Suspend the implementation of all new PPP arrangements and large infrastructure projects until the special studies will be done.

Some of the projects which were suspended because of that situation are the construction of the New Airport in Lisbon and high speed train project to Oporto.

According to the article from the "*Diário de Notícias*" Magazine, the cost of the PPP projects in Portugal for 2011 was calculated to be almost 80€ per each Portuguese and the cumulated cost until 2050 year for more than 4500 € per capita.<sup>45</sup> It is the bill to pay for the partnerships in 2011 between the government and the private sector; it was amounted to almost € 850 million, while until 2050 it is amounted to reach € 48 billion to finance all the PPP projects.

Those numbers show how big is the scale and number of projects and how much they are going to charge the budget of the government of Portugal.

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<sup>44</sup> The Government of Portugal to the IMF (2011). *Letter of intent, memorandum of economic and financial policies, and memorandum of understanding.*

<sup>45</sup> Baptista, J. (2011). "PPP cost 80 euro per each Portuguese person in 2011". *Newspaper DN Portugal.*

Portugal is a country which provides a lot of examples how to develop PPP arrangements, how to run successful projects and delivers the possibility to learn from its past mistakes in the area. The rich past of Portugal on the subject of PPP projects cannot and should not be forgotten, but analysed and studied so that even in the present state of stagnation on this area that the country finds itself in, we can still learn from its previous and present cases. Maybe this slow in the growth of the PPP area in Portugal can be seen as an opportunity for the country to study itself and prepare in a much better way for all future endeavours.

## 2.4. Rules of the game

### 2.4.1. Models of public-private partnerships

PPP projects can occur in different models. They can differ according to the role of the partners, risk assumption, type of cooperation and others. In the EU they are categorised into two main groups:<sup>46</sup>

- a) Contractual PPPs;
- b) Institutionalised PPPs.

The first model of PPP is based only on the contractual relationship, where all the rights and obligations are regulated by an administrative contract. There are many different kinds of agreements under the contractual PPP model but the best known and the most often applied type is a concession contract (another two are *affermage* and management contract). In that case the private partner is fully responsible for the construction, operation and maintenance of the infrastructure; he delivers the service directly to the final user, under the control of a public authority.<sup>47</sup> In exchange, the private partner is charging users for the facility, and that creates its revenues.

On contrary in the institutional PPP model the public and the private sector create together a district entity, usually being called "*mixed company*". The relationship between the partners is guaranteed only by the status of company and the shareholder agreement between them. In opposite to contractual model, in institutional PPP it is the joint entity which is responsible for ensuring the delivery of a work or service, not just the private partner. Usually in that model the management of technical issues is being carried out by the private partner and general corporate control by the public partner.<sup>48</sup> Additionally, in mixed companies, the public entity plays two roles; contractor and shareholder. It might sometimes lead to complicated situation, what would be unlike to occur in a contractual PPP.

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<sup>46</sup> European Commission (2004). *Op. cit.*, p. 8.

<sup>47</sup> Body of Knowledge on Infrastructure Regulation, Private-Public Partnerships: Contracts and Risks, [www.regulationbodyofknowledge.org](http://www.regulationbodyofknowledge.org).

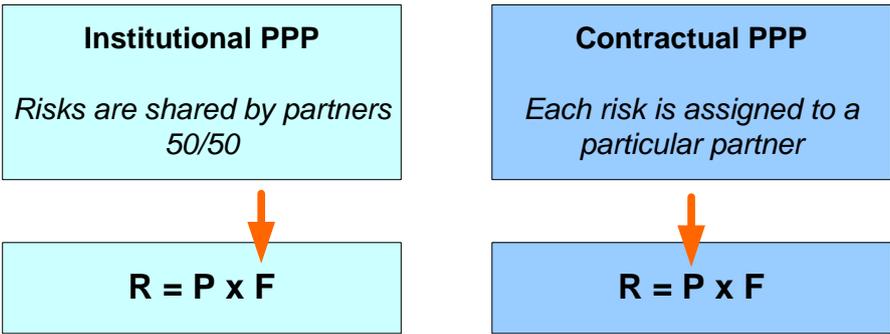
<sup>48</sup> Marques, R., and Berg, S. (2010). "Public-Private Partnership Contracts: A Tale of Two Cities with Different Contractual Agreements", *Journal of Public Administration*, 89(4), p. 7.

There is one more important feature which distinguishes those two models from each other which is the way of sharing the risks.

In the institutional PPPs where the public and the private partners are shareholders of the company, they share all the risk equally and they are both responsible for it. The situation looks different in the contractual model of PPP. In that case each risk is assigned to a particular partner who becomes fully responsible for that specific risk. The way how the risks are allocated depends and varies from the particular agreement between the partners.

In institutional PPPs the risk is shared equally by the partners, this makes it so that the probability of a risk occurring is usually not a deciding factor in the risk measuring. In this case the costs supported by the partners in case of a problem occurring can be considered the most important factor for the risk calculation.

On the other hand, when calculating risks for a contractual PPP, a given risk's probability has a bigger impact on the partner's decisions. In this case individual risks are assigned to each partner, meaning that if a given problem occurs, one partner will have full responsibility for it, which tremendously increases the risk importance of a particular problem occurring. A visual representation of this idea can be seen in the figure 9.



*R – level of risk, P – probability of occurring the risk, F – cost of mitigating the risk*

**Figure 9.** Risk division in the contractual and institutional PPP model.<sup>49</sup>

Both of the models represent different ways of private sector participation in the project. Nevertheless it should not be confused with the privatisation where ownership is being transferred. In the case of PPP projects it is just management which is being privatized, not a full company.

**2.4.2. Main players**

PPP projects involve a range of different players. The list and number of them can differ according to the nature and the scheme type. Nevertheless there are some main players which can be identified:

- Public authority (also called public sector procurer);

<sup>49</sup> Idea of the figure created during the meeting with João Simão Pires, PPA.

- Private entity (who very often is also a contractor);
- Financiers and sponsors;
- Subcontractors;
- Advisers.

### 1) Public authority

The public authority can be any entity which is controlled by the public sector. Usually the public partner is a central, regional or local (municipal) government authority; it also can be a public agency<sup>50</sup>. Public authority as a public procurer is the entity which takes the initiative to run the project; it is responsible for the procuring process, designs the cooperation scheme and chooses the contractor. During the lifetime of the project, public authority is last responsible for the delivery of an asset or service and for the enforcement of the contract terms.

### 2) Private entity (PPP contractor)

In the PPP agreement the private entity is responsible for development and delivery of the project according to the specification given by the public authority.<sup>51</sup> The service or infrastructure can be provided directly by the contractor or subcontractors. There can be one or more private entities involved which are being contractors in the project. It depends on the scale and complexity of the project.

In the case of institutional PPP the private and the public sector create together a joint-venture company. That means that public authority becomes an equity shareholder, together with the private partner. Since then, all the subcontractors are being contracted by the joint-venture company, not just by the private partner. It is also important to say, that the joint-venture PPP projects reduce the possibility of problems arising from extra profits earned by the private sector due to the public authority better access to information; the public authority should have the same access to it and also benefit from that knowledge.<sup>52</sup>

In the contractual PPP model all the private entities normally create a special purpose vehicle company (SPV). It is a “*separate legal entity, generally a company, established to undertake the activity defined in a contract between the SPV and its client, in this case the public procurer*”<sup>53</sup>. This SPV Company also called Project Company is being used to contract with the public procurer and the main subcontractors. Members of the company are the shareholders of the PPP project very often being sponsors; tasks and risks are being clearly defined and divided between them.

The SPV is normally created just for one specific project and there are few reasons to use it.<sup>54</sup> First of all, due to its limited liability nature it allows lending to the project to be non-recourse to the sponsors. Additionally the assets and liabilities of the project do not appear on the sponsors’ balance

<sup>50</sup> Yescombe, E. (2007). *Op. cit.*, p. 3.

<sup>51</sup> CEDR (2009). *Public private partnerships*. Conference of European Directors of Roads, p. 8.

<sup>52</sup> Yescombe, E. (2007). *Op. cit.*, p. 108.

<sup>53</sup> Grimsey, D., and Lewis, M. (2004). *Public-private partnerships: The worldwide revolution in infrastructure provision and project finance*, p. 109.

<sup>54</sup> *Ibid.*, p. 109.

sheet so it is an extra advantage for them. SPV brings also the benefits to the project lenders; it “keeps away” the project from potential bankruptcy of any of the sponsors so the lenders can feel safer.

### **3) Financiers and sponsors**

Usually in the beginning of the project there is needed an initial investment. That investment must be later recovered through a revenue stream. That means that there has to be prepared a proper financial scheme to compensate the cash flows during the lifetime of the project.

Project can be financed through different ways. Firstly, the private partner as contractor is investor who sponsors the project. It is also possible that subcontractors are the sponsors, usually through their participation in the Project Company. Another ways of financing the project are loans from banks, securities or bonds sold on the capital market. Lately, it also happens (but not very often) that banks become the shareholders who finance the investment as a partner, not just as an outside institution.

From the sponsors' perspective, a PPP arrangement is essentially a project financing, relying on direct revenues from which they are able to pay for operating costs and to cover the financing debt, while giving them the desired return on risk capital. However, in some cases the revenues after building the infrastructure occur only at a later date. A great example of it is the Hong Kong Harbour Tunnel which started making a profit only four years after opening.<sup>55</sup>

### **4) Subcontractors**

In the PPP project the contractor (private entity) can directly operate the infrastructure by itself, however sometimes specific knowledge might be needed. In that case it requires the cooperation with subcontractors. Usually they are being contracted to deliver the work through the Project Company, but sometimes the main subcontractors can be also a part of it. The outside subcontractors are under the control of the Project Company which is responsible for them.

The functions which are usually subcontracted out are construction, equipment, supply, operation and maintenance.<sup>56</sup> Each of them has a separate agreement with the contractor.

### **5) Advisers**

To structure the PPP project in a good way, both of the sides public and private sectors should use the services of different advisers; they are providing financial, technical, legal and many other advices. Usually the major part of the advisory work is assigned to the sponsors. Nevertheless it also happens that lenders at the same time use their own advisers to be sure that the investment they plan to enter is a good one.

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<sup>55</sup> Grimsey, D., and Lewis, M. (2002). *Op. cit.*, p. 109.

<sup>56</sup> Grimsey, D., and Lewis, M. (2004). *Op. cit.*, p. 113.

### 2.4.3. Types of agreements

After describing the different PPP models and main players who take place in cooperation, it is time to present some possible contract types between the public and the private sector. Since the list of them is quite long, only the most important ones will be pointed out.

Usually the type of cooperation depends on the risk allocation and the way of financing the planned project. Before taking decision the public entity should first divide the project into particular elements and then consider which of them should be entrusted into private partners. The parts which should be considered are planning, designing, constructing, financing or managing. The following description presents some main types of arrangements.<sup>57</sup>

#### 1) Build-Operate-Transfer (BOT)

The private partner is responsible for financing, building the project according to public sector instructions, operating the infrastructure and after all transferring ownership to the public partner. Private partner operates and maintains a facility for a given period of time; in return it has right to the revenues paid by the public authority or to collect the tariff fees from customers. Risk from those elements is being transferred depending on the risk matrix.

#### 2) Build-Own-Operate (BOO)

The feature which differ this cooperation from previous arrangement is the ownership issue. In BOO type there is no transfer of assets and investments to the public partner; it remains in private partner hands who can charge fees from users of the facility. Private partner is responsible for technical side of the project; it ensures funding of the project and cover expenses during operating and maintaining phase.

#### 3) Design-Build-Financer-Operate (DBFO)

In this type of arrangement the private partner is responsible for designing the infrastructure, financing the construction and operating it. The ownership of facility remains in the hands of public partner. The essence of this type of arrangement is the use of private sector investment possibilities to fulfil the public needs. Additionally, in the DBFO agreement most of the responsibilities and risks are being put on the private partner, especially the financing risk which last till the end of the contract period. Usually it is long term contract of 25 or 30 years where the government uses full service delivered by the private company.

#### 4) Build-Transfer-Operate (BTO)

In that type of arrangement the private sector is responsible for financing, designing and building. During the construction phase the ownership is on the side of private partner, nevertheless after delivering the infrastructure it is being moved to the public side. In this scheme the private company

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<sup>57</sup> Korbus, B., Srokosz, T., and Wawszyniak, M. (2010). *Public-private partnerships: Guidebook*, Polish Public Procurement Office, p. 64-67.

usually leases the constructed facility from the government, operate it and collect fees to cover the expenses and earn reasonable return on investment.

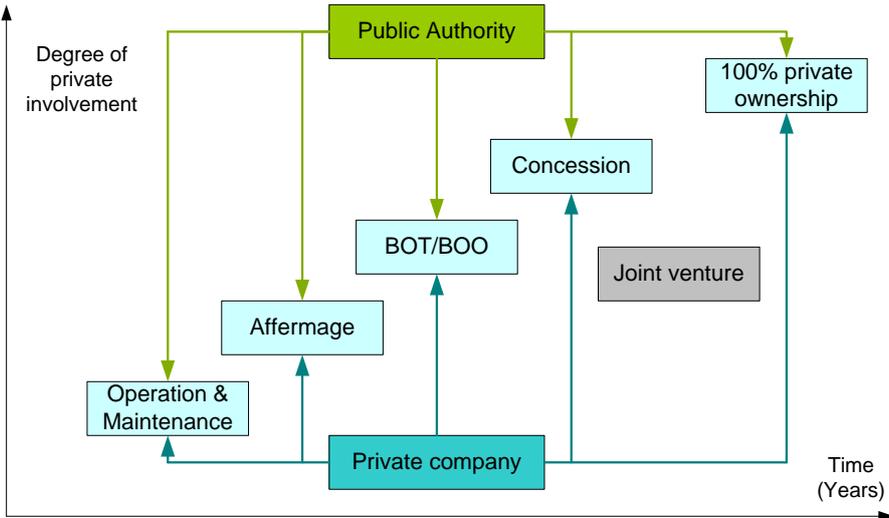
**5) Management contract**

In the management arrangement the private partner is being contracted to manage the specific service; it does not involve designing or building the facility. The agreements are not very long and the aim of them is to improve the level of provided services, also it allows for the fast and direct use of private sector knowledge and experience. In this arrangement responsibility for project management and investments is on the public side.

**6) Other outsourcing contracts**

Outsourcing contracts can be more complex than the management ones; the subject of them could be the whole process of services, not just elements of it. During the contract time, the private partner takes the responsibility for managing the whole process and controls the service delivery including exploration, operation and maintenance of used infrastructure. The agreements usually are signed for shorter periods of time, but according to the situation they can be extended.

As it could be noticed, there are many different types of the PPP arrangements and models which can be adopted. Each of them present different levels of private sector involvement in the project; starting from the provision of services, through designing, financing, building the infrastructure until the operation and its maintenance. Some of them are regulated by the contracts like concessions where private partner is delivering the work described by the public partner and some create a mixed company where the public and the private partners are both shareholders in it. The figure 10 presents time and degree of private involvement according to some chosen arrangement types.



**Figure 10.** Time and degree of private involvement in some PPP models.<sup>58</sup>

<sup>58</sup> PPIRC (2011). *Mixed Private-Public Ownership Companies “Empresa Mixta”*. PPP in Infrastructure Resource Centre for Contracts, Laws and Regulations, p. 3.

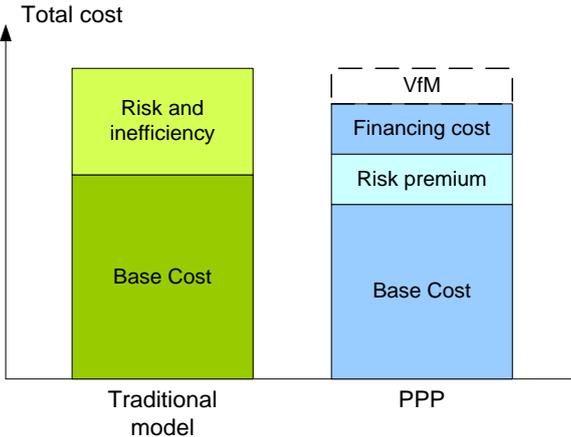
Arrangements where time and involvement of the private partner is very low are services, operation and maintenance (left, bottom part of the figure 10). On the opposite side are concession contracts. The degree of private involvement under that PPP model is the highest one, as well as time of project and contract duration. One step above concession is 100% ownership of private partner contracts what means privatisation. Those models are not considered to be PPP arrangements. In between of all of that there are mixed companies. The time of agreement in joint-venture companies is usually even longer than concession but it includes more or less equal participation of private and public partners.

**2.4.4. Value for money and risk assumption**

Managing risk is an integral part of the PPP projects nature. If shared appropriately between the partners (the risks should be retained by the party who is more capable of better managing them), they can bring positive effects. In general, risks can be bear by the private and the public partner. They can be also transferred to the “end-users” in some cases. Their efficient allocation minimizes economic costs which are associated with them. Therefore the proper management of risks should never be pushed into the background as less important.

Projects under the PPP scheme are viable only if a long-term revenue stream can be established. Therefore, the risk of not materialising the predicted revenues is the greatest risk to the commercial viability of a project.<sup>59</sup>

Risk transfer is a key element of the value for money (VfM) which should be created through the PPP projects.<sup>60</sup> The risks which are transferred from the public partner to the private can be better managed by the private, and because of that the cost of doing this will be lower than if the risks are retained by the public sector. Figure 11 presents the level of cost distribution of an efficient PPP arrangement and of a traditional procurement model.



**Figure 11.** Comparison between the PPP and traditional procurement arrangement.<sup>61</sup>

<sup>59</sup> Grimsey, D., and Lewis, M. (2002), p. 109.

<sup>60</sup> Yescombe, E. (2007), p. 18.

<sup>61</sup> Marques, R., and Berg, S. (2011). “Risk, contracts, and private-sector participation in infrastructure”, *Journal of Construction Engineering and Management*, 137(11), p. 926.

In the traditional procurement model the total cost is higher than in the PPP scheme. Firstly, by providing PPP arrangements the base cost of the project is encouraged to be reduced and at the same time it allows for the private partner to recover its investments in the long run. Additionally, while using the traditional procurement model, the cost of inefficiency risk is much higher than in the PPP projects. This can be caused by the bad management of some risks by the public partner due to its lack of knowledge how to mitigate them. That situation does not occur in the PPP model, where the risks are shared and undertaken by the partners who can better manage them. For example, the construction risk can be better managed by the private constructor company since the public authority does not have an experience in the topic.<sup>62</sup>

Funding by the private sector is more expensive than by the public sector, but even though, including the issues described above, the total cost of the project implemented by the PPP model is lower than by the traditional procurement one, in that way creating the value for money in the project.

It is important to say that the described situation presents the effects of the successful PPP projects where everything is well prepared and risks are properly shared. However, in the real life not always everything is that ideal as in the theory, therefore both of the partners – public and private should be careful while undertaking the PPP project and carry out it only when the value for money would be provided.

Categorizing the risks is not an easy task. This should be always well thought and well planned. The actual future outcome of the specific risk is not predictable with certainty however various probable outcomes are usually know; either from mathematical calculation or from past experiences of similar situations.<sup>63</sup> In the PPP projects usually most of the risks are transferred to the private partner; however the public authority should not transfer the risks that are under its control as well as should not assume the ones that it is unable to control.

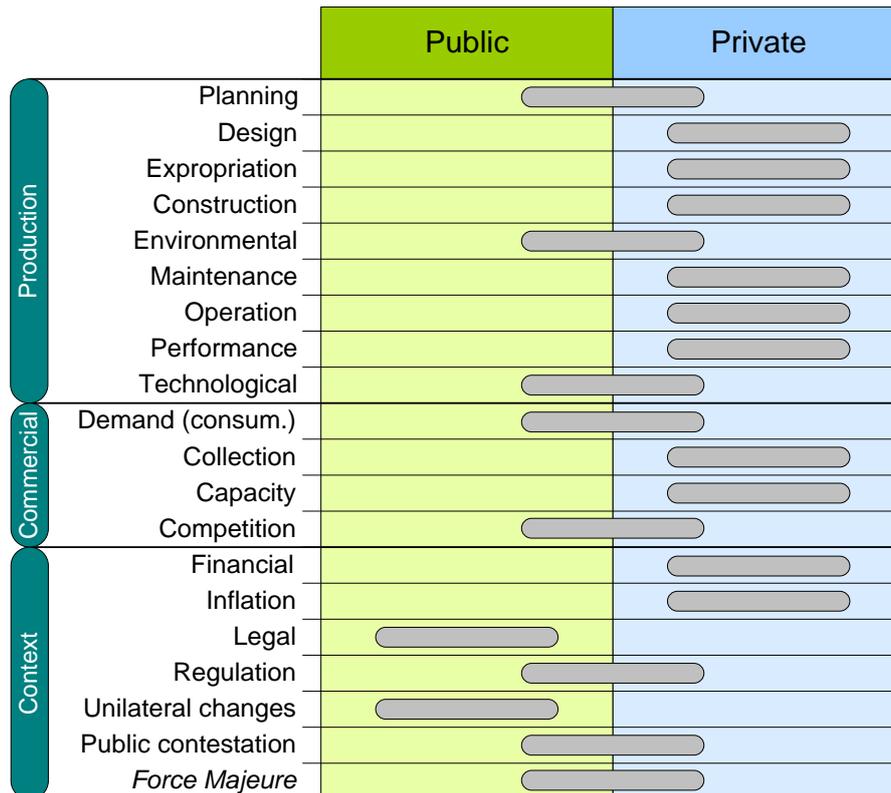
The public partner should remember than assigning the risk to the private partner is more expensive. Therefore, it should transfer only appropriate risks, to keep it in balance. For example, the political risk should not be transferred to the private partner, because the cost of managing it would be probably much higher.

The figure 12 illustrates the list of the major risks which can be identified in the project and their assignment to the partners. This is just the general framework and the risks of course can be assigned to the partners in the different way.

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<sup>62</sup> Marques, R., and Berg, S. (2011), *Op. cit.*, p. 926.

<sup>63</sup> Grimsey, D., and Lewis, M. (2002). *Op. cit.*, p. 111.



**Figure 12.** Allocation of the major risks.<sup>64</sup>

For each project the risk matrix should be defined. It should identify and classify the main risks and allocate them to the partners. Each risk should be described and the probability of its occurring should be estimated. It is also important to decide the way of mitigating the risk in the case it would occur. For the good management of risk all those issues should be specified before the project and be written in the contract.

## 2.5. Tendering procedures to choose the private partner

The procurement procedure of choosing the private partner may be considered not just a technical matter of little importance, but actually a core of the PPP process. If proper studies are made and a whole procedure carried out very carefully, the chance to have a successful cooperation increases significantly. This chapter will present just general aspects of the private partner selection; it will also point out the actual act of laws from Poland and Portugal required following while creating a PPP arrangement.

The whole process of choosing the private partners starts from the announcing the tendering procedure by the public authority, which prepare the specification of the planned project. However, before the exact tendering procedure it is possible to carry out pre-qualification, what is formally called

<sup>64</sup> Marques, R., and Berg, S. (2011). "Risk, contracts, and private-sector participation in infrastructure, *Journal of Construction Engineering and Management*, 137(11), p. 929.

“*Request for Qualifications*”. The reason for that is to exclude straight away the bidders who do not meet the minimum criteria, such as technical or financial possibilities to carry out the project or experience. There are a few possible ways how the tendering procedure (the bidding process) can be conducted, some of them require pre-qualifications. The most known used procedures are described below.<sup>65</sup>

- a) **Open procedure** – in that procedure there is no invitations by the awarding authority and any interested operator can submit a tender with all required documentation. This procedure is not normally used for PPP arrangements;
- b) **Restricted procedure** – this procedure is preceded by pre-qualification; the requirements of the bid can be discussed with bidders, but once bids are received by the public authority, that is the end of the process, the decision is made on the basis of them, and the further negotiations are not allowed. Usually that procedure is used when the requirements are more straightforward and there are a lot of possible suppliers;
- c) **Negotiated procedure** – usually intended for more complex contracts, where bidders may provide different solutions for the specific service. Because of that the selection criterion cannot be easily specified in advance, therefore the further discussion after bids are received is required. However, such clarification should not result in the fundamental changes to the basis of the original bid; the detailed negotiations have to take place with all bidders;
- d) **Competitive dialogue** – in this method the public authority discusses the form of PPP contract and the technical specification of the project only with the pre-qualified bidders, and later on invites them to submit their bids.

The next step after all the documents are submitted, the awarded bid has to be chosen. All the proposals are carefully examined in all their attributions, all the factors that establish award criteria. To do so, the method is needed to compare bids with each other; the various approaches for that are presented below.<sup>66</sup>

- a) **Price comparison** – usually used where bids are submitted on almost identical bases so the final decision may be a simple comparison of the service fees. This method might be workable for the restricted bidding procedure, where all the issues have been clarified before the bid;
- b) **Contract term** – this is another example of the award criteria, in that case the services fees are fixed by the granting authority and then the bidders in their offer has to define the time need to deliver the service. In that situation usually the shortest term bid wins;

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<sup>65</sup> Yescombe, E. (2007). *Op. cit.*, p. 77-78.

<sup>66</sup> *Ibid.*, p. 81-82.

- c) **„Most economically advantageous” bid** – it is more complex system to evaluate bids, it relays on valuing different aspects of the bid – like judge the design, speed of completion, reliability, quality of service, risk assumption by the bidder; it also comments the price and any other characteristics that are important for the grantor. In the end of the selection process the “*most economically advantageous*” offer can be identified and awarded.

The last step of choosing the private partner is signing the contract in which all details, rights and obligations are specified. The scope of the work has to be clearly defined and agreed to by all parties, including the subcontractors. Additionally, the contractual framework should be flexible enough to allow for innovation and performance within the scope of the PPP arrangement.<sup>67</sup>

The tendering process should be conducted as carefully as possible, because later on the whole cooperation is based on it, and the success of project depends largely on that level.

The next two subchapters present the main legal documents which have to be used while applying the PPP model, depending on the country.

### 2.5.1. Polish law

The base law which is currently valid in Poland for the PPP projects is a law named *Act of 19 December 2008, On Public-private partnership*, which has replaced the previous, old one from 2005. This act of law is a framework for the PPP arrangements and presents guidance how to start and maintain a partnership. Together with the other polish laws it creates a consistent network of legislation for the area.

The process of choosing the private partner is regulated by the two different laws. The applied law in each case depends on the revenue process used by the private partner. The two following laws are:

1) *Act of 9 January 2009, Concession for work and services*, applied if:

- The gain for the private partner is the right to receive benefits from the subject of the PPP projects (it means: fees from users) or;
- Mainly that right, together with the supplement payment of an extra sum of money from the public partner (it means: fees from users + small payment from public authority).

2) *Act of 29 January 2004, Public Procurement Law*, applied if:

- The gain for the private partner comes totally or more than 50% of it from the payment by the public authority.

In both cases the process of choosing the partner has to be compatible with the *Act on public-private partnerships*. That division is presented in the figure 13.

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<sup>67</sup> Pagdadis, S., et. al. (2008). “A road map to success for public-private partnerships of public infrastructure initiatives”, *Journal of Private Equity*, 11(2), p. 16.

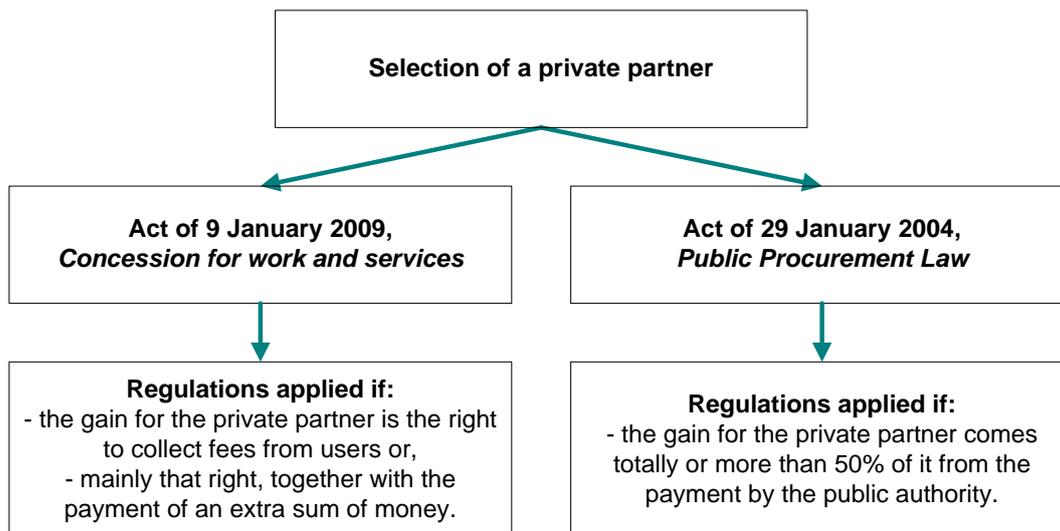


Figure 13. Selection of a private partner.<sup>68</sup>

## 2.5.2. Portuguese law

In Portugal there are two main legislations which deal with the PPP arrangements. First of all the *Decree Law no° 86/2003* should be pointed out. This law defines the general rules of interaction of the State with PPP model, from definition and conception to supervision. Those principles have to be followed by all the public entities at the national level.

This law requires for example the division of risks between public and private partners which has to be clearly identified in each PPP project, as well as establishes the rules to follow while doing so. It also states that all the PPP proposals have to be evaluated by a commission that involves the Ministry of Finance and the other relevant institutions.<sup>69</sup> Later on, this law was altered by the *Decree Law no° 141/2006*.

Another important document is the *Code of Public Contracts (CPC)*, which was approved under the *Decree Law no° 18/2008*. The CPC is a single legal document which concentrates on national and community legal contexts which relate to public procurement. The rules of the CPC apply to the matters related with the purchase of services, public work contracts, and many others as well as they provide a more concise definition of the PPP arrangement.<sup>70</sup>

This document regulates the way how the public procurement should be led, starting from the launching of the tender process until the selection of the successful tender; it covers how the public contracts can be awarded and lays down the specific rules for that. The CPC states the rules regarding the follow-up of the contracts as well include description of possible sanctions and fines.

<sup>68</sup> Own elaboration based on Polish Law (2008, December 19). *On Public-private partnership*.

<sup>69</sup> IMF (2003). *Portugal: Report on the observance of standards and codes – Fiscal transparency module*, p. 8.

<sup>70</sup> Marques, R. (2011/12). *Course of project management*. IST University of Lisbon.

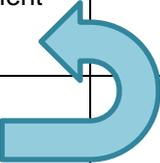
## 2.6. Public-private partnerships in the water sector

The way how the structure of the water sector is arranged depends on each country. The trends regarding private sector involvement vary in different local situations regarding technical complexity, financial pressure or regionalisation. The traditional view of drinking water services has been that it is a natural monopoly and that the competition in the market is not really possible.<sup>71</sup> However, in the last years the global shift toward a larger private participation can be observed. In some cases it is accompanied by regionalisation (municipalities grouping to increase scale of drinking water supply services) and creation of new regulatory systems.<sup>72</sup>

The management systems of the drinking water and wastewater services can be really diversified. However there are four dominant arrangements which can be pointed out. That division is based on the separation level between the responsible and management entities. The management can be direct or delegated and public or private. It creates the matrix of few management possibilities what is presented in the table 3.

**Table 3.** Matrix of institutional arrangements in the water sector.<sup>73</sup>

<b>Private Management</b>	4. Direct Private Management	3. Delegated Private Management
	1. Direct Public Management	2. Delegated Public Management
	<b>Direct Management</b>	<b>Delegated Management</b>



The numbers in the table 3 and direction of arrow signify the degree of separation between management entity and responsible entity, starting from the direct public management until direct private management:

1. **Direct Public Management** – the responsible entity takes full responsibility for the services supply and execute management by itself, in the past it was the most widely used arrangement;

<sup>71</sup> Balance, T., and Taylor, A. (2005). *Competition and economic regulation in water: The future of the European industry*, p. 9.

<sup>72</sup> Golvan, Y., and Bréant, P. (2007). *Organisation and financing models of the drinking water sector – Review of available information on trends and changes*, p. 2.

<sup>73</sup> *Ibid.*, p. 10.

2. **Delegated Public Management** – the responsible entity choose another entity to execute the management of water utilities services on its behalf, management remains in the public hands;
3. **Delegated Private Management** – the responsible entity choose a private company to manage the tasks on the basis of contract;
4. **Direct Private Management** – all the tasks, responsibilities and ownership are in the hands of private entity (privatisation), the public authority only controls and regulates.

Globally the private sector operates just a small amount of the drinking water and wastewater supply however this numbers can vary in each country. There are a few existing models of private sector participation in the supply of the drinking water and wastewater. According to Golvan, Y., and Bréant, P. the two main out of three are the so-called English and French models and they correspond to the different types of privatisation. First one characterise the “*full privatisation*” while the second one is based on the “*privatisation through delegation*”.<sup>74</sup>

### **English Model**

As the name partly indicates, the origins of that model come from England and Wales. This model represents the full privatisation. That means that all the public assets designed to provide the water utilities services are permanently sold to a private investor. Since that moment the services are supplied by the private regional companies. Another characteristic of this model is that even though all the companies are in private hands, the sector remains tightly monitored through the regulating authority. In England and Wales it is the Water Services Regulation Authority (OFWAT).<sup>75</sup> Moreover, since “*everything is sold*” to the private partner, there is no written contract between public and private side for providing services. Presently, this model is an exceptional way of private sector participation and is mostly used only in England.

It is relevant to clarify, that full privatisation represents the private sector involvement. Nevertheless it is not the type of PPP arrangement, in which there is no full divestiture of public assets.

### **French Model**

The French way toward the private sector participation in the water sector is different than the previous model. French Model presents the situation when the management of drinking water and wastewater supply is delegated to the private entity while the assets remain in the public ownership. This model takes place when the potential operators bid competitively for a delegation contract, also known as franchise contract.<sup>76</sup> Due to the history of France the contracts under this model are named the PPP arrangements and are nowadays the most common form of private sector participation in the drinking water utilities provision.

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<sup>74</sup> *Ibid.*, p. 1.

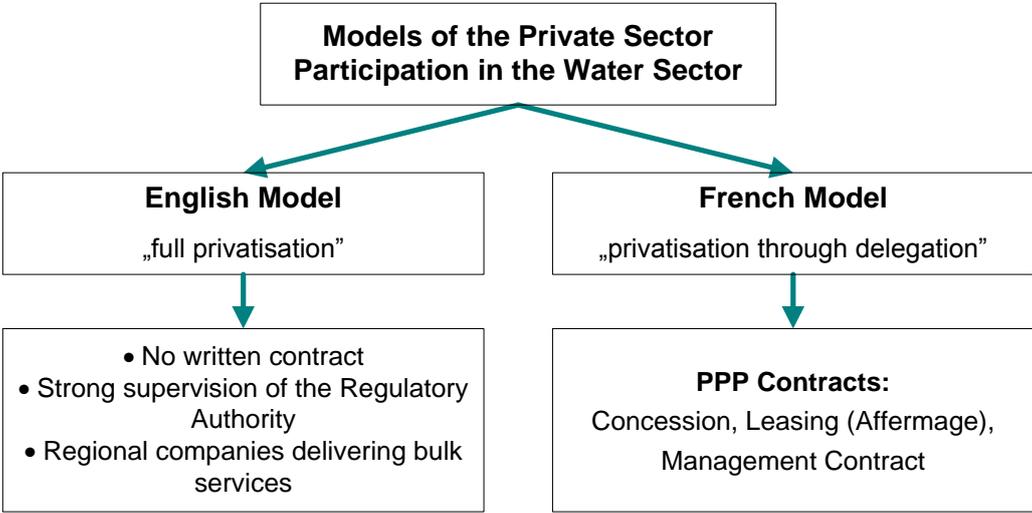
<sup>75</sup> Ménard C., and Peeroo A. (2011). *Liberalization in the water sector: Three leading models*, p. 12.

<sup>76</sup> *Ibid.*, p. 14.

The popular forms used in the French Model are concession, leasing (*affermage*) and management contracts. Significant feature that distinguishes those forms is the way of payment to the private partner. In the case of management contract, a private operator is remunerated by a fixed fee. On contrary in the concession and lease contracts it is remunerated directly from the tariff income earned by the water utility. Because of that, in the contract there always has to be the rule how the tariffs should be set. No matter if these provisions are general or highly detailed they always have to be present.<sup>77</sup> Additionally, in:

- Management contract – the private operator becomes responsible only for running the system in exchange for the payment by the public entity. Investments are financed and carried out by the public sector. Duration: 4-7 years.
- Lease contract – assets are leased to the private operator who usually bears higher commercial risk than under a management contract. Investment is fully or mostly financed and carried out by the public sector. Duration: 10-15 years.
- Concession – the private partner is responsible for running the full system including financing and carrying out the investment and later on managing it. Duration: 20-30 years.

The figure 14 presents the models of the private sector participation in the drinking water and wastewater sector.



**Figure 14.** Models of a private sector participation in the drinking water sector.<sup>78</sup>

<sup>77</sup> Balance, T., and Taylor, A. (2005). *Op. cit.*, p. 122-123.

<sup>78</sup> Based on: Golvan, Y., and Bréant, P. (2007), *Op. cit.*

## 2.7. International experience of private sector participation in the water sector

### 2.7.1. United Kingdom

UK<sup>79</sup> is made up of four countries: England, Wales, Scotland and Northern Ireland, with almost 90% of all the UK population located in the first two countries. Its drinking water and wastewater services are generally known for their excellence and high quality standards. The example of England & Wales (E&W) is a very particular one, since there is no other country which had completely privatise its water sector, receiving special focus while describing the UK water market. Even though all the water services are in private hands, the full sector is tightly monitored through its very transparent and independent regulator, the Water Services Regulation Authority (OFWAT).

The changes in E&W have started with the implementation of the Water Act from 1973 which brought the creation of ten Regional Water Authorities (RWAs) based on the river basins. This caused an organizational revolution in the water sector by merging thousands of entities which were in charge for the water services until that moment. These authorities became responsible for the provision of drinking water and wastewater services. Later on, under the new Water Act from 1989 it was decided to privatize the full water sector and the creation of regional companies.<sup>80</sup> The privatisation of the water sector was based on the sale of company assets. They were sold for around 5% of their estimated value (including the payment of debts). The aim of those incentives was to encourage private companies to get involved in this process.

In 1989 in E&W there were 39 private companies, covering 90% of the population. Ten of them corresponding to the former RWAs and responsible for the provision of drinking water and wastewater services, while the remaining ones were simply supplying water. With the time passage those number have changed and in 2010 there were 12 private companies providing both drinking water and wastewater services and 13 companies supplying only water.<sup>81</sup>

As contrary to E&W, in Scotland and Northern Ireland the services are provided by public operators. In Scotland for a long time there was only a single operator, a state company by the name of Scottish Water, which was supplying the entire population of the country. However, in the last years some new companies' entrants were allowed with the aim of introducing more competition in the market. The situation looks similar in Northern Ireland where drinking water and wastewater services are also supplied by a state company. Nevertheless, in those two countries there are also some examples of PPP arrangements for diversified activities in the sector.

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<sup>79</sup> If not otherwise mentioned, data comes from: Marques, R. (2010). *Regulation of water and wastewater services: An international comparison*, p. 154-169.

<sup>80</sup> OFWAT, RWA description based on: Ménard C., and Peeroo A. (2011). *Op. cit.*, p. 12-13.

<sup>81</sup> Note that the full divestiture does not correspond to a variant of a PPP arrangement, although involve the participation of private sector.

### 2.7.2. France

France is the country example where the private sector participation in the water utilities management is very high. Its participation can be dated many years back, some cases starting even in the XVII century. One of the reasons of high use of private sector was the tight budgets of local public authorities and “*available private funds*” seemed to be perfect to solve that situation. Another reason was the general view that PPP arrangements would enhance efficiency of provided services. However, it is important to say that it never reached the point of full privatisation as for example in England.

The institutional framework governing drinking water and wastewater management was recognised during the early 1990s as in many other EU countries. After the Water Law another important legislation is so-called “*Spanish Law*” dating from 1993. It aims to prevent corruption and favour transparency in economic activities. It specifies exactly the legal framework to be applied in the cases while supplying local public services is delegated to private operators.<sup>82</sup>

In the past there were appearing the criticising opinions about the management practices of both the public and the private sectors. The concerns were related to the poor governance, lack of information and competition and inadequate or non-existing supervision of the private companies. Also the corruption and drinking water price rises were being pointed out.<sup>83</sup> Therefore, the “*Spanish Law*” had a big impact on the operators’ management, aiming to improve it.

It is important to add, that in France there is no special regulatory agency in the drinking water and wastewater sector which would supervise it.

As in many other countries the same in France, the municipalities are responsible for the drinking water and wastewater services management. Due to the deep country administrative division there are around 36 thousands of them. Therefore it is common for them to join forces to create together multimunicipal associations. They are free to choose the organisational form to manage the services (direct or delegated management).

The water and wastewater services in France are characterised by their universality and high quality. The majority of the country’s population (more than 70%) is supplied by private operators. This is the situation when the delegated management is implemented. The most used form of it is leasing contracts (*affermage*) and concession arrangements.<sup>84</sup> It leads to the conclusion that PPP arrangements are widely used in France.

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<sup>82</sup> Marques, R. (2010). *Op. cit.*, p. 82.

<sup>83</sup> Hukka, J., and Katko, T. (2003). *Water Privatisation Revisited*, p. 35.

<sup>84</sup> Marques, R. (2010). *Op. cit.*, p. 85.

### 2.7.3. Italy

In Italy<sup>85</sup> the reform of the water services began with the new law “*Water Act*” in 1994. Its aim was to increase the efficiency and effectiveness of the sector. Before that date for many years the water services had been responsibility of 5000 separate bodies. It led to a very fragmentary and inefficient way of management. It is important to say that Italy is divided into 20 regions where five of them have autonomous status, 110 provinces and 8100 municipalities.

The reform was based on the following pillars:

- Creation of integrated water services (including: abstraction, treatment and distribution of water, collection and treatment of wastewater);
- Each region was ordered to divide its territory into Optimal Territorial Areas (*Ambito Territoriale Ottimale* – ATO), based on hydrographical, political and administrative criteria. The management in each ATO was supposed to be carried out by a single company;
- Creation of the Authorities for the Optimal Territorial Areas (*Autorità di Ambito Territoriale Ottimale* – AATO). It is AATO that is delegating the tasks to the managing company. The aim of those local regulation entities was to plan and monitor the activities carried out by those companies and also to plan the investment that the managing company has to make for the next 20-30 years. Additionally the relationship between those two parties is regulated by a contract;
- Establishment of a government entity to oversee the reform implementation.

In practice this reform introduced compulsory and very radical changes. However its initial ideas were only partly realised and the process of management delegation to all the ATOs took much more time than planned, and until the date of 2010 still was not fully completed. Speaking in numbers, by the end of 2005, 87 of the 91 AATOs has been established and only 43 out of the 91 water service companies (ATOs).

Since 2003 there are allowed the following organizational arrangements to manage the drinking water and wastewater services: delegation to private entities, delegation to mixed capital public companies or delegation to public companies formed by capital derived from participating municipalities within the ATO. In the last case the company has to exclusively provide assigned services (cannot participate in managing any other ones). It has been estimated that in Italy there are over 10% of private companies that are directly responsible for the sector. However, while considering their indirect participation through mixed companies this number grows to more than 50%.<sup>86</sup>

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<sup>85</sup> If not otherwise mention, the data comes from: Argento, D., and Jan van Helden, G. (2010). “Water sector reform in Italy and in the Netherlands: Ambitious change with an uncertain outcome versus consensus-seeking moderate change”, *International Review of Administrative Science*, 76(4), pp. 790-809.

<sup>86</sup> Marques, R. (2010). *Op. cit.*, p. 101, 104.

#### **2.7.4. Sweden**

Sweden<sup>87</sup> is a country highly rich in water. Therefore due to the available resources the water supply does not constitute bigger problem. The drinking water and wastewater management is the responsibility of municipalities, there are 290 of them. The Swedish system in the sector is stable for a long time and drinking water and wastewater issues have been always organised as a municipal utility.<sup>88</sup>

The main law which provided the framework for the regulation of the water sector in the country was the Water and Wastewater Act created in 1970. It is a fundamental legal tool used to regulate the sector, mostly in the context of its modernization and liberalization. In Sweden there is no special regulatory agency which would clearly supervise the sector. However, despite the lack of it, everything seems to be well managed and organized. It is characterised by very effective transversal regulation with the high quality of public services obligations.

In Sweden major part of the drinking water and wastewater services is managed directly by the municipalities. The exceptions are bigger cities which are supplied by their associations. In 2002, 243 municipalities were using direct management to provide services and 34 were municipal companies.

Municipalities can also delegate their tasks to the private entities but it is not very often practiced and their participation is quiet limited. In 2002 there were just 6 PPP arrangements in the form of management contracts and two municipalities were fully privatized. The reason for that is that the sector in the form in which it is currently is working very well. Therefore, there is no need for bigger changes.

#### **2.7.5. Comparison**

The brief countries description presented above shows how much the management of water utilities can differ from country to country. From simple public management, going through the slow increase of tasks delegation to the third parties and private sector participation until the full privatisation of the drinking water and wastewater management. The form and model used to provide those services depends individually on each country, its traditions, market situation and policy. Table 4 presents the management forms applied in the described countries, including Poland and Portugal.

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<sup>87</sup> If not otherwise mention, the data comes from: Marques, R. (2010). *Op. cit.*, p. 140-145.

<sup>88</sup> The Swedish Water & Wastewater Association (2000). *Facts on water supply and sanitation in Sweden*, p. 15.

**Table 4.** Management forms used in the chosen countries.<sup>89</sup>

<b>Private Management</b>	England & Wales	France Spain
	Sweden Poland	Portugal Italy
	<b>Direct Management</b>	<b>Delegated Management</b>

Table 4 includes not only the four countries described above but also Poland and Portugal. Presently Poland is similar to Sweden in the management form, in which most of the sector management is held in the public hands and there is no regulation authority. However, the Polish system by nature is also similar to the delegated private management like in the French case. But to reach it the level of private sector participation has to rise. Portugal on contrary is more similar to Italy where the delegated management is used and a regulation authority exists.

Table 5 presents the level of private sector participation of the several countries, including Poland and Portugal. It includes information about 2010 and predictions of the private involvement by the years 2015 and 2025. While analysing it, it should be kept in mind that this data is estimated and can differ in different sources. Additionally very often the information about the private sector participation is hard to access.

**Table 5.** Private sector participation in the chosen countries.<sup>90</sup>

Country	PSP in 2010		PSP by 2015		PSP by 2025	
	W	WW	W	WW	W	WW
France	70%	52%	75%	71%	76%	76%
United Kingdom	87%	90%	94%	96%	94%	97%
Italy	40%	29%	53%	46%	59%	55%
Sweden	1%	1%	5%	5%	5%	5%
<b>Portugal</b>	<b>25%</b>	<b>23%</b>	<b>56%</b>	<b>51%</b>	<b>61%</b>	<b>56%</b>
<b>Poland</b>	<b>3%</b>	<b>3%</b>	<b>11%</b>	<b>13%</b>	<b>16%</b>	<b>22%</b>

PSP – Private Sector Participation; W – Water; WW – Wastewater.

<sup>89</sup> Adapted from: Golvan, Y., and Bréant, P. (2007). *Op. cit.*, p. 13.

<sup>90</sup> Adapted from: Pinsent Masons. (2010). *Water Yearbook 2010 – 2011*.

### 3. Water utilities sector – comparative analyses

This chapter will focus on the comparative analyses of the drinking water sector in Poland and in Portugal. It will compare and describe the management systems present in each country, as well as the involvement of the private sector and its cooperation with the public authorities. It will also describe the main players in the sector and their role in it. However, to better understand it, firstly the drinking water and wastewater market should be analysed in itself.

#### 3.1. Analysis of the drinking water and wastewater market – Porter’s Five Forces

To analyse the drinking water and wastewater market we can apply the *Porter’s Five Forces* model. It will give us a better understanding of the involved parties as well as a deeper perception of their power in the sector. This analysis will be conducted for markets of both countries to show the similarities as well the differences and are made by the author of this work.

Figure 15 and 16 display the Porter’s Five Forces, extended to the sixth force applied to our particular sector for Poland and Portugal, respectively. The colours signify which forces are strong and which are weak.

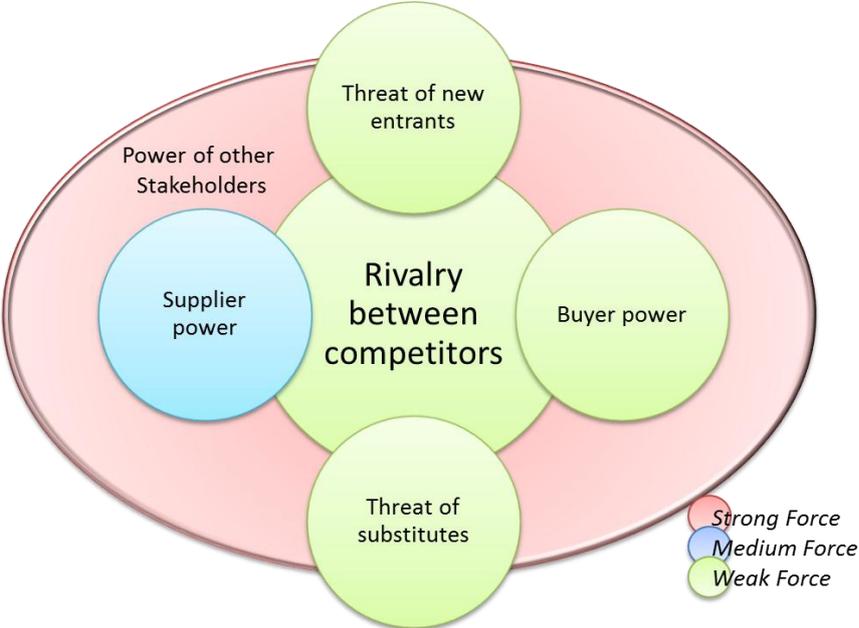
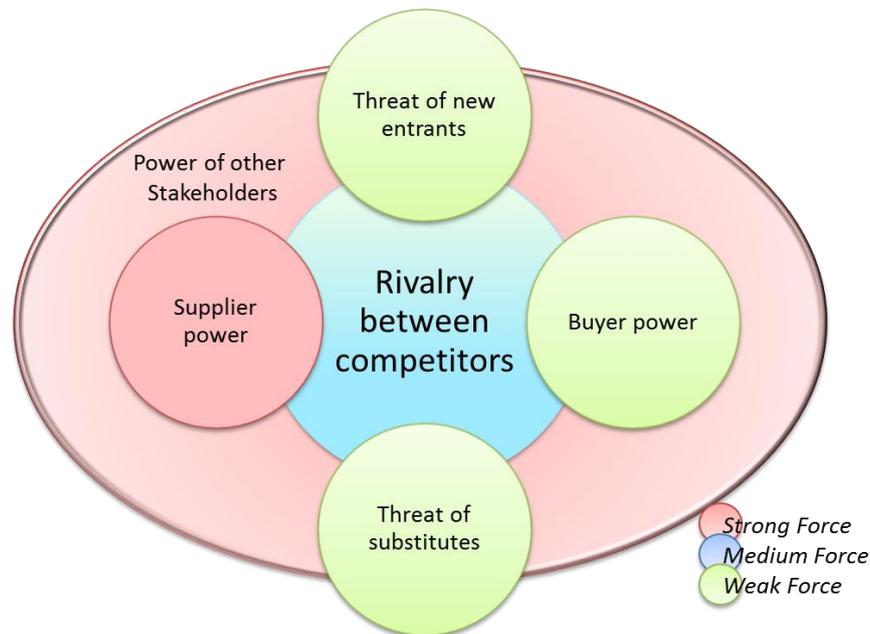


Figure 15. Porter’s Five Forces in the water and wastewater sector in Poland.



**Figure 16.** Porter's Five Forces in the water and wastewater sector in Portugal.

### **Rivalry between competitors**

Water utilities services in Poland are provided by the water and wastewater companies and are usually owned by local governments (municipalities). In this sector the rivalry between competitors is limited. Usually there is one company which supplies the specific region, what means that there is no place for the other one. Especially, since those companies are in the municipalities' hands, they set up just one company to do it. Therefore for the **Polish market** that force was evaluated as **weak**.

On contrary, in **Portugal** this force seems to be stronger and was rated as **medium**. Just the fact that there are more than 20% of operators in the sector which are private companies creates shows that rivalry between competitors exists.

### **Threat of new entrants**

The water and wastewater market is not an easy sector to enter. For start, the cost of investment required is very high, this can disqualify some interested companies strait away. Another limitation is the strict regulations and supervision in the sector made by the government, responsible entities or regulating authorities like in Portugal. They set specific rules about the way services have to be provided what sometimes can create an entry barrier. Additionally, once the company "*gets in*" it is hard to "*get out*" of the system. It is caused by the investment it bears and all the money invested which would be "*lost*" by leaving the sector. In the market of **both countries** this force was rated as **weak**.

### **Threat of substitutes**

In this sector there are no substitutes or not very significant ones. Water is a natural need, impossible to replace, therefore almost all people use the public water supply. However the situation

looks a bit different in the both countries. In Poland connecting to the water system is optional. The possible substitute for the collective water supply is the use of private wells, what sometimes happens, especially in the mountain regions which are rich in underground water sources. On contrary in Portugal since 2009 connection to the water is compulsory and there is no other choice. It is a new regulation, which in practice is not very easy to fulfill due to the inhabitants' reluctance. In turn, if it is about the connection to the collective sewage disposal it is obligatory in the both countries (even if a private well is used). Due to the nature of the analyzed sector and lack of significant substitutes it places this force as **weak in the both countries**, however at present this force is **a bit stronger in the Polish market** than the Portuguese.

### **Buyer power**

Buyers are all the clients who benefits from the collective water supply and wastewater disposal. They can be individual households, factories, institutions and many others. In general their power is rather **weak, both in Poland and in Portugal**.

Of course, it could be said that if the price of services raises a customer can cut off from those services and harm the company interest. Unfortunately it is not really true. First, there are thousands of clients assigned to the specific company, so even if one person gives up, it does not have a big influence on the company. Second, that client cannot easily be supplied by another company for a simple reason – no one will build few kilometres of pipes just for him. The simple fact that the number of clients is so big, removes a significant amount of power in this force. Additionally in Portugal as it was said before both, the connection to the drinking water and wastewater services is just obligatory under the law regulations.

### **Supplier power**

Suppliers are all the people, institutions and companies which directly or indirectly contribute to services provision. They provide needed equipment, materials, sometimes also smaller municipalities buy from them water to deliver to clients. The water and wastewater companies are dependent on its suppliers and in the case of disagreement between them it can lead to breaks in the services supply what harms the interest of clients. For example, labouring people in those companies can organise strikes stopping all the supply. In the **Polish market** their power has **medium** strength.

In Portugal major part of the drinking water and wastewater services are provided in the form of bulk services by the regional systems controlled by the Águas de Portugal Group (AdP). Big country areas are supplied just by a few operators. For example, in 2006 the AdP supplied in average more than a half of all the municipalities. Partially by this situation, the power of suppliers in the Portuguese market is rather **strong**.

### **Power of other Stakeholders**

In some industries there can be identified a *Sixth Porter Force – the Power of other Stakeholders*. In the drinking water and wastewater sector one of the main entities in this group is the government (central and local), since it finances and regulates the sector. Even if there is a private partner involved

to deliver the services, it still remains under the control of the government and all its decisions have to be accepted by the public authorities. The government also has the power to completely change the rules of the sector, creating and changing the laws and obligations that all companies in the sector must follow. Additionally, in Portugal there is a Regulation Authority what makes the sector to be even more under the public control. **In the both countries** we can consider this force as very **strong**.

### 3.2. Government and administrative division

Poland is a democratic country with a two level government. The central government consist of a president as head of the country that is chosen each 5 years in general elections, the Prime Minister appointed by him, the Council of Ministers and the Parliament. The Parliament has a bicameral nature and it consists of 460-member lower house (Sejm) and 100-member Senate (Senat), all these members are being elected by polish voters each 4 years. The second level of the government division is created by local governments which are the outcome of the decentralization of the state.

The situation in Portugal is very similar; being the main difference the structure of the Parliament, which consists only of one chamber, composed of 230 deputies and not two as in the polish case.

The deeper differences between these countries start in the administrative division of the countries. First of all it is important to notice that Poland is geographically more than three times bigger than Portugal. However the population density per square meter is almost the same in both countries.

The figure 17 presents the administrative division of each country, the number of administrative units of each type and average surface of it. The number of districts in Portugal is presented as "18+2". These extra "2" districts are the two Portuguese Archipelagos – Azores and Madeira, which are autonomous regions with their own management.

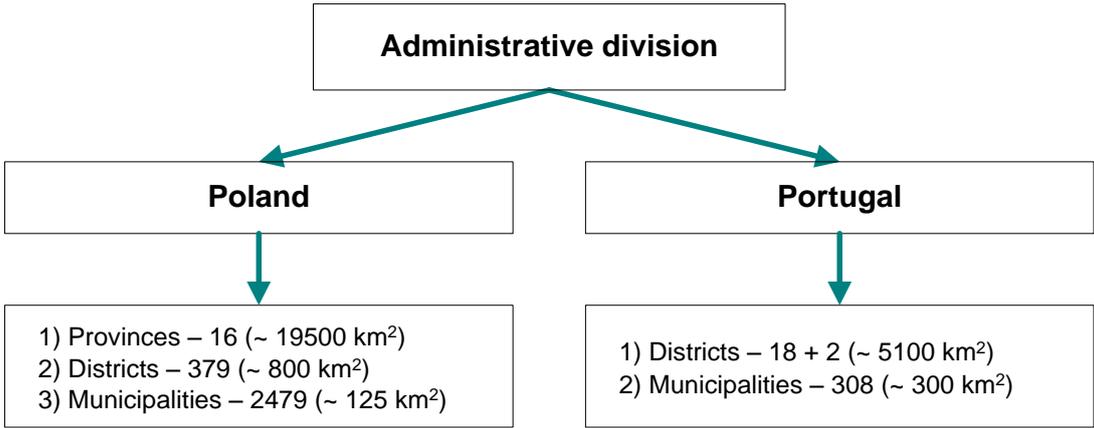


Figure 17. Administrative division of Poland and Portugal.<sup>91</sup>

<sup>91</sup> Statistics from Eurostat, <http://epp.eurostat.ec.europa.eu>.

In the Portuguese administrative division only municipalities have mayors. They are being chosen each 4 years by general elections. However, it is important to notice that just a few months ago each district was being managed by its own civil governor, which was being chosen by the Council of Ministers. This administrative unit was disbanded in September 2011. Municipalities are also divided into parishes but they do not have a significant role.

The situation looks much different in the case of Poland. Each of the administrative levels has its own governor. In municipalities all governors are chosen during the local elections every four years, and in districts and provinces citizens vote for the members of the councils. Later on, the governors of these districts and provinces are chosen by their councils. Additionally, each province has not one but two governors. The “*second governors*” are appointed by the Prime Minister, but none of them is more important, they simply perform different duties. The governors appointed by the Prime Minister represent the central government, while most of local power concentrates in the hands of the governor chosen by its council. It is important to add that districts and municipalities are not under any power of provinces-local government.

As it can be noticed, Poland has a much more complex structure of local governments than Portugal. However, for both countries, in the case of the management of the drinking water and wastewater sector, the municipalities are the most important units of local government, containing most of the decision making power regarding the sector.

### **3.3. Institutional framework**

Both in Poland and in Portugal there is a long list of diversified types of institutions at the administrative level responsible for the drinking water and wastewater issues.

Since those services are included in the environment sector the public institution at the top of the hierarchy of the drinking water management in both countries is the Ministry of the Environment. Nevertheless, the hierarchy under its power differs according to the country.

In Poland the tasks of the water management are being performed by the President of the National Water Management Authority (*Krajowy Zarząd Gospodarki Wodnej – KZGW*), under the guidance of the Minister of the Environment.

According to the *Polish Water Law (Act of 18 July 2001)*, the KZGW is the central government administrative body competent for water management issues, in particular in administrating the water and the water use. Its president is appointed every five years by the Prime Minister, after being proposed by the Minister responsible for the water management. The main tasks of the KZGW President are:

- development of the country's hydro-environmental program;
- development of the flood protection plan;

- supervision of the Regional Water Management Boards;
- creation of the management plans for the river basin;
- leading an information system for water management;
- management of the maritime waters in cooperation with competent authorities of the maritime administration.

Under the National Water Management Authority there are 7 Regional Water Management Boards. They were created in 1991 and they were set to carry out tasks in the hydrographical water management system. Their functions include the development of the water basin conditions, the water management planning, the water protection in the basin and flood prevention.<sup>92</sup>

The borders of these regions are different than the general country division of 16 provinces; they are geographically divided according to the location of the bigger rivers in the country. Using these natural divisions allow for better and easier protection of the water resources and a better management in the case of a flood. The actual division can be found in annex C.

The bottom level of the hierarchy is consisted of the river basin boards. Their task is to manage the rivers, their water and the surrounding areas. This is mainly because of the presence of two very big rivers in Poland, responsible for significant damage in case of a flood. Additionally the EU Water Framework Directive from 2000 requires the integrated river basin management for Europe.

Urban drinking water and wastewater management in Poland are responsibilities of the municipalities. Still, as it could be noticed in the structure of the national water management, there is nothing about the structure of the drinking water and wastewater sector. The reason of this is that there is no central regulatory body responsible for the sector, even though some higher governmental institutions are involved, such as:

- Ministry of Health responsible for the controlling the drinking water quality;
- Ministry of Environment responsible for the protection policy of regions with drinking water sources;
- Ministry of Infrastructure provide instructions to follow during tariffs setting.

Even with their involvement, none of those bodies is directly responsible for the drinking water and wastewater utilities.

In Portugal the drinking water and wastewater services are being delivered the same as in Poland, by the municipalities. However, the administrative structure of water management is a completely different story. In Portugal there are a high number of public institutions directly responsible for the water sector. Below are just a few of the most important ones.<sup>93</sup>

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<sup>92</sup> Polish National Water Management Authority, [www.kzgw.gov.pl](http://www.kzgw.gov.pl).

<sup>93</sup> Description of INAG, APA and CCDRs based on: Marques, R. (2010). *Op. cit.*, p. 118-119.

Starting in 1993 the management of water resources was entrusted to the Water Institute (INAG). Its responsibility and mission consisted of taking care of the national policies in the field of water resources.

Later, in 2007 the Portuguese Environmental Agency (APA) was created. It was made through the connection of several institutions, including the previously described INAG. The mission of APA is to achieve a better effectiveness in the management of environmental policies as well as a sustainable development.

Another important institution of the public administration is the CCDRs; these are decentralized bodies of administration. Their focus is in the area of water collection and wastewater disposal, mostly connected with the environmental regulation. It is relevant to add that the CCDRs are also responsible for the management of funds from the EU intended for the investments in the drinking water sector.

The most important distinction nowadays between both countries in the field of drinking water utilities sector management is that in Portugal there is the Water and Waste Services Regulation Authority named ERSAR, this does not occur at all in Poland.

ERSAR's predecessor, IRAR (Institute for the Regulation of Water and Solid Waste) was created in 1997 under the *Decree-Law no° 230/97*. Upon its creation it became responsible for controlling the drinking water supply, wastewater management and municipal waste management in Portugal. A few years later, the *Decree Law no° 277/2009* from 2<sup>nd</sup> of October 2009 converted IRAR into the present Water and Waste Services Regulation Authority<sup>94</sup> (ERSAR). Under this new law, ERSAR would have a broader focus area; it allowed for the control all operators of services, no matter what management model they were using.

ERSAR is now responsible for monitoring the national strategies for the sector of drinking water and wastewater utilities; it can prepare proposals for the new legislations in the sector and is responsible for supervising operators. It is also allowed to control contracts, to analyse the bidding processes and monitor legal and contractual guarantees of the operators. It ensures economic regulation of operators as well as the quality of services provided by them. Additionally, due to the recognised needs of water utilities stakeholders, since 2004 IRAR started to prepare annual reports about the drinking water and wastewater sector, this task was passed on and is continued now by ERSAR. Every year they present the situation of the sector, as well as all the development in that field, providing up to date statistics and reports to the general public.

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<sup>94</sup> Description of IRAR and ERSAR based on: ERSAR (2010). *Annual report on water and waste services in Portugal 2009: Executive summary*, p. 22-25.

### 3.4. Management of the water and wastewater sector

#### Legislation and management models

In Portugal the local municipalities are responsible for their own drinking water and wastewater services. Until 1993 when the reform of the sector started, municipalities could not delegate the task of providing services to any other institutions. It could only be delivered by the local administrations. This situation has changed under the *Law no° 372/1993* which allowed for the operation of those services through the other companies outside the local administration. It was the time when private-sector companies could finally participate in the sector.

Around the same time some tasks were also assigned to the Central Government. Its responsibility now included the further investment in bulk activities through the creation of multimunicipal systems to serve bigger areas. The aim of these multimunicipal systems was to share the management load between municipalities and achieve a scale economy, as well as create better conditions for the participation of private enterprises.<sup>95</sup>

Another important law is the *Law no° 53-F/2006*. It sets special rules for the providing of services in the local corporate sector (such as municipal companies). Additionally this law states that entities from the local corporate sector participating in the activities of the regulated sector become under the control of the sector's regulatory agency.<sup>96</sup> In the Portuguese case this means that any drinking water providing and wastewater management companies, are also under the supervision of the ERSAR.

In Portugal there are a few management models available to use in the provision of the drinking water and wastewater services. They can be made in State owned systems or in municipal or intermunicipal owned system. The management models which can be distinguished are direct management, delegation and concession:<sup>97</sup>

- Direct management occurs when services are provided directly by the municipality as municipal services or by the association of municipalities;
- In the case of delegation the services can be provided by the company established in a partnership with the State (participation of State and municipalities in the share capital of concession), municipal owned company, established under the commercial law (participation of private companies is allowed, however municipality need to have more than 50% of shares) or by delegation the task to parishes;
- Finally, the concession type includes cooperation between municipality or municipalities and other private sector as a contractual PPP.

Looking at the Polish case, municipalities are responsible for the drinking water and wastewater management only since the 1990. Before that responsibility was in the hands of the Central

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<sup>95</sup> ERSAR (2010). *Annual report on water and waste services in Portugal 2009*. *Op. cit.*, p. 15.

<sup>96</sup> Description based on: Marques, R. (2010). *Op. cit.*, p. 117-118.

<sup>97</sup> ERSAR (2010). *Annual report on water and waste services in Portugal 2009*. *Op. cit.*, p. 18.

Government, and was delivered only through public enterprises. In the 1980s at least 800 of these companies existed all around Poland. Because of the *Act of Law on Local Government from 8<sup>th</sup> March 1990* that situation changed. According to this law the municipalities became legal entities in charge of the management of all their utilities, including the drinking water and wastewater services.<sup>98</sup> The public enterprises previously described became the ownership of the municipalities, and they had to decide what organizational stance to choose to deliver the service. Nevertheless it was not an easy process, aggravated by the lack of examples and knowledge in the area. Additionally, it also became the task of the municipalities to find financial sources to support these services.

The next great change in this process was the *Act of Law on municipal management from 1996*. It also affects the management of drinking water and wastewater services, particularly in articles two and three, specifying how the municipal services can be managed, and stating that public utilities may be delivered by:

- Local authorities especially in the form of local government budgetary establishments;<sup>99</sup>
- Commercial companies;
- Internal tasks related to municipal management, delegated by the local government to different units.

Thanks to that legislation the task of water utilities services can be delegated to outside companies, allowing for the PPP arrangements in the sector.

Nowadays the most important legislation which defines the rules and conditions in the drinking water and wastewater sector in Poland is the *Act of Law on collective water supply and collective wastewater disposal from 2001*. It presents policies for the municipal companies; sets the rules to ensure continuity of supply and the drinking water quality and reliable sewage collection and treatment. It also describes the process of setting tariffs.

According to this law the company which delivers the services is obligated to regularly control its quality of service and the drinking water quality, even though there is a special State institution designed for it. Additionally another duty of these companies is to increase correlation of the service through searching universal solutions. Moreover, in the case of not being a local administration unit the company is required to obtain a licence from the governor of the municipality; its period is usually unlimited.

It is important to note that there are other legislations related to the water resources or environment sector which include drinking water and wastewater services. Those regulations exist in both countries, however due to its wide range and general meaning their description will be skipped.

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<sup>98</sup> Polish Law (1990, March 8). *On local government*, art. 7.

<sup>99</sup> Budgetary establishment (exists in polish system) - an organizational unit of the public finance sector, which carries out, for a fee, separated tasks and covers the costs of its activities from its own revenues.

## Tariffs

In the drinking water and wastewater sector, one important issue is setting the tariffs for the services. In both countries the municipalities approve the tariffs which are calculated to cover the costs. In Poland all the tariffs are being set for just one year, even if there is private sector participation. The process of establishing tariffs is described in the *Act of Law on collective water supply and collective wastewater disposal from 2001*. Also important in Polish system is that the Minister of Infrastructure is involved in the process of setting the tariffs. He is responsible for determining specific rules for it, like preparing the application model for tariffs approval and defining the conditions on which the tariffs for the drinking water and wastewater supply should be calculated. The rules are described in the *Regulation of 28 June 2006, On the determination of tariffs, the model application for approval of tariffs and conditions of the financial settlement for the collective drinking water supply and collective wastewater disposal*. Such a situation does not occur in Portugal.

In Portugal, the municipalities are approving the tariffs and ERSAR does not have any power to influence them. However it can be requested to issue opinions about the proposed tariffs systems. Moreover according to the *Decree Law no<sup>o</sup> 194/2009* in the case of the institutional PPP projects in Portugal the tariffs can be set for five years, what does not happen in Poland.

## Institutions

Legal framework is determinant in the water sector in every country; however institutional framework is also very relevant. In Poland unfortunately there are not many institutions of that type. The only one worth of attention is the *Economic Chamber "Polish Waterworks"*<sup>100</sup> which is the only self-regulatory organization in the drinking water and wastewater sector in Poland; it was created in 1992 and presently brings together 450 enterprises from the sector. Representatives and experts of the "Polish Waterworks" interpret and monitor the legislation changes in the sector, participate in the creation of laws and implementation of new solutions. They represent the interests of the members on the national and local forum, as well as deliver trainings or offer advices.

By the contrary, in Portugal there is a wider array of institutions of that type. Firstly, there is the National Association of Portuguese Municipalities (*Associação Nacional de Municípios Portugueses – ANMP*).<sup>101</sup> It is the representative structure of the local units (municipalities and parishes). Created in 1984 its main aim is to promote, protect and represent the local governments, especially on a national level, to obtain the best solutions for the local problems.

Another organization worth of attention is the Portuguese Association for Water Distribution and Wastewater (*Associação Portuguesa de Distribuição e Drenagem de Águas – APDA*). This entity created in 1986 represents and defends the interests of all the players in the drinking water and wastewater sector. It is also a forum where all the entities with different background and from different areas can actively participate in the water sector.

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<sup>100</sup> Polish Economic Chamber "Polish Waterworks", [www.igwp.org.pl](http://www.igwp.org.pl).

<sup>101</sup> Portuguese National Association of Portuguese Municipalities, [www.anmp.pt](http://www.anmp.pt).

### 3.5. Situation in the market – players

In Portugal the drinking water and wastewater services are supplied as bulk or retail services. The bulk services are provided by the regional systems which are controlled by the Águas de Portugal Group (AdP), which is responsible for the management of multi-municipal systems and its main priority is to fulfil the infrastructural gaps of the country utilities sector. It is also the main player in the market.

The characteristic feature for bulk services is that very big areas are served by just a few operators. In 2006, the AdP supplied drinking water services to 200 municipalities through only 14 companies and wastewater services to 186 municipalities through 16 companies. For better comparison it is important to notice that in total there are 405 operators in the water services and 315 in the wastewater services.<sup>102</sup> According to the fact, that in Portugal there are only 308 municipalities, these numbers are quite impressive. In the case of the retail system the most popular way to serve the users is through municipal services. In 2008 there were 229 companies from 300 in the drinking water sector and 244 from 305 in the wastewater sector, without including parish operators. Table 6 presents a detailed description of this situation.

**Table 6.** Distinct forms of “end-users” systems operating in Portugal.<sup>103</sup>

(Number of companies – data from 2008, Population - as per the 2001 census)

Type of agreement	Water		Wastewater	
	Number	Population	Number	Population
Municipal services	229	40,6 %	244	49,1 %
Semi-autonomous services	26	21,6 %	24	21,4 %
Municipal companies	18	15,3 %	20	16,0 %
Concessionaire companies	24	16,8 %	17	13,5 %
Public companies	3	5,7 %	-	-
Total	300	100 %	305	100 %

In Portugal the drinking water and wastewater services can be categorised according to their management model and delivery system.

In the year 2009 in the drinking water services, the bulk services using the concession model cover more than two-third of the population, even though the number of operators in that particular management model is only 20% of the total number. In the retails water services case, the direct management is the most broadly used model in about 80% of the cases, supplying more than half of the population.

As for the wastewater bulk services, the concessionary management model is used by 21% of the operators and covers over two-thirds of the population, along the same lines as the water bulk services. Also, for this sector, 65% of the population is covered under the direct management model, where most of the operators are concentrated.<sup>104</sup> More detailed information about the drinking water

<sup>102</sup> Description based on: Marques, R. (2010). *Op. cit.*, p. 121.

<sup>103</sup> Marques, R. (2010). *Op. cit.*, p. 122.

<sup>104</sup> ERSAR (2010). *Annual report on water and waste services in Portugal 2009. Op. cit.*, p. 30, 32.

and wastewater services in Portugal, the most used management models and how many operators of each type operate in the sector can be found in annexes D and E.

In the Portuguese market a company worth special attention is the EPAL case, due to its size, history and importance. It is a water company with only public capital, where 100% of shares are held by AdP. EPAL acts in the city of Lisbon, serving directly more than half million inhabitants and indirectly the 26 surrounding municipalities with 2,6 million of people.<sup>105</sup>

Except for AdP and EPAL, the leaders in the sector, there are also some private companies which play a significant role and deserve attention. The first one is the AGS Company, responsible for 8 companies and for supplying 670,000 people. There is also the Veolia Corporation responsible for four companies and supplying 270,000 inhabitants. Lastly we have the case of Indaqua, serving more than half a million of users and cooperating with 5 companies.<sup>106</sup>

In Poland the drinking water and wastewater services can also be delivered by “*wholesale*” companies and directly to the “*end-users*”. However there is no special system like in Portugal. Usually, the first type of system appears in bigger cities, supplying also the surrounding municipalities. A good example is the private company Aquanet from Poznań City, providing services to 770,000 inhabitants from Poznań as well as to 14 of the surrounding municipalities.

Each year the polish magazine “*Rzeczpospolita*” creates the ranking of the 2000 largest and best polish companies registered on the market. The table 7 shows part of it, presenting only the companies in the drinking water and wastewater sector and their ranking.

**Table 7.** Ranking of the drinking water and wastewater companies in Poland in 2010.<sup>107</sup>

Number	Position 2010	Company
1	337	MPWiK Warszawa S.A. (capitol)
2	770	Aquanet S.A. Poznań
3	820	MPWiK S.A. Kraków
4	899	GPW S.A. Katowice
5	931	ZWiK Sp. z o.o. Łódź
6	1055	MPWiK S.A. Wrocław
7	1132	Saur Neptun Gdańsk S.A.
8	1437	ZWiK Sp. z o.o. Szczecin
9	1503	MPWiK Sp. z o.o. Bydgoszcz
10	1662	MPWiK Sp. z o.o. Lublin
11	1737	Aqua S.A. Bielsko-Biała
12	1892	PWiK Sp. z o.o. Gdynia

<sup>105</sup> Marques, R. (2010). *Op. cit.*, p. 121.

<sup>106</sup> *Ibid.*, p. 121.

<sup>107</sup> Polish Magazine „*Rzeczpospolita*”.

The number of operators in this sector in Poland is quite high. According to the report about “*Structural changes in groups of economic entities, 2011*”<sup>108</sup> prepared by the Central Statistical Office, there are the following numbers of companies responsible for:

- Abstraction, treatment and distribution of water – 1767;
- Wastewater disposal and treatment – 2600.

Due to the information from 2010, in Poland most of the drinking water and wastewater services are operated in the form of municipal companies, that is almost 85% from the group of all operators. Furthermore, over 93% of those companies are owned by the municipalities. Lately, more and more private entities are interested in the operation of water utilities, especially in the rural areas.<sup>109</sup>

It is also important to refer that in the end of 2005 there were 440 companies in Poland owned by mixed public-private share capital, out of almost 1800 municipal companies. Between 2002 and 2005, in 22 municipal companies the municipalities sold 100% of shares.<sup>110</sup>

The last years brought a very fast development of the drinking water and wastewater sector, partly caused by the commitments made by Poland in the accession Treaty to the EU for the implementation of the Council Directive 91/271/EEC. For this reason in 2003 the National Program for Municipal Wastewater Treatment was created and approved by the Polish Government. This program defines what actions should be completed out to improve the drinking water and wastewater management until 2015. It covers hundreds of places and predicts to reconstruct and build of many wastewater treatment plants and thousands kilometres of the pipe lines.

### **3.6. Private sector participation**

In Poland the private sector participation in the drinking water and wastewater services is still not as popular as in other countries. Presently this participation is estimated to be only around 2%.

The president of Veolia Woda Company (*Veolia Water*) which is the private partner in the two big cities in Poland in the sector says that Poland is definitely far behind other countries in allowing for private funding in the sector. According to him, the private participation in the management of drinking water and wastewater services is something positive, that can bring clear rules with the benefits for everybody. Additionally, he thinks that the bad financial situation will soon reach also the local municipal companies, and then the private sector will be used more and more.<sup>111</sup>

After the structural changes in Poland in the 1990s, private participation has been very limited, and until 2003 only five municipalities had allowed for substantial private involvement in their drinking water and wastewater services.<sup>112</sup> Even though, there was no formal law yet about PPP arrangements

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<sup>108</sup> Polish Central Statistical Office (2012). *Structural changes in groups of economic entities, 2011*.

<sup>109</sup> Kwast, E. and Bergsland, G. (2010). *The water and wastewater sector: A study of select markets in Central and Eastern Europe, Asia and the Middle East*, p. 119.

<sup>110</sup> *Ibid.*, p. 120.

<sup>111</sup> Widera, A. (2012). “Private water supply can be cheaper”. *Local Government Portal*.

<sup>112</sup> Fay, C. (2003). *Current status of water sector restructuring in Poland*. Working paper., p. 1.

in Poland at that time, the five examples can be considered as PPP projects. These five cases can be found in the table 8.

**Table 8.** Private sector investment in the water and wastewater sector until 2003.<sup>113</sup>

Company and city	Year	Ownership structure
Saur Neptun Gdańsk	1992	<b>51%</b> Saur Neptun Gdańsk 49% Gdańsk City
Aqua S.A. Bielsko-Biała	1999	51% Bielsko-Biała City <b>33%</b> United Utilities Poland B.V. 16% Other shareholders
PWiK Tarnowskie Góry	2001	<b>64%</b> Veolia Water Poland 28% Tarnowskie Góry City 8% Others
PwiK Głogów	2001	51% Głogów City <b>46%</b> Gelsenwasser AG 3% WFOŚiGW in Wrocław
PwiK Dąbrowa Górnicza	2002	53% Municipality of City <b>34%</b> RWE Aqua 13% Workers

The private investors in the table 8 were bold for better distinction. It can be noticed that in two out of five cases they have the majority shares in the companies. Except of Saur Company the most popular private investor in Poland is Veolia Company. As it was mentioned earlier it has shares in two big cities –Tarnowskie Góry and Bielsko-Biała. In the case of Bielsko-Biała, Veolia Company became the shareholder only in 2010 by 33% of the shares. Additionally, in the case of Głogów City the Regional Fund for Environmental Protection and Water Management from Wrocław (*Wojewódzki Fundusz Ochrony Środowiska I Gospodarki Wodnej – WFOŚiGW in Wrocław*) has 3% of shares in exchange for a loan given for building the new wastewater treatment plant.

In the period between 2009 until the beginning of 2012 only a total of three PPP agreements were signed in the drinking water and wastewater sector, all of them as concessions for services.<sup>114</sup> There was only one from those projects which can be considered large scale, it was signed for the period of 15 years with an estimated value of € 4,5 million. The other two projects play rather small role in the market, signed for 1 and 3 years with the total value of both being less than € 1 million.

In total there were less than 10 PPP projects announced (including the three signed), all of rather smaller scale. There are only two big scale projects, but both of them are still in the tendering process, with estimated values for each exceeding € 80 million.

In Portugal in the past the drinking water and wastewater services has been connected only with the public sector. The private management was allowed only after 1993 when the new legislation was

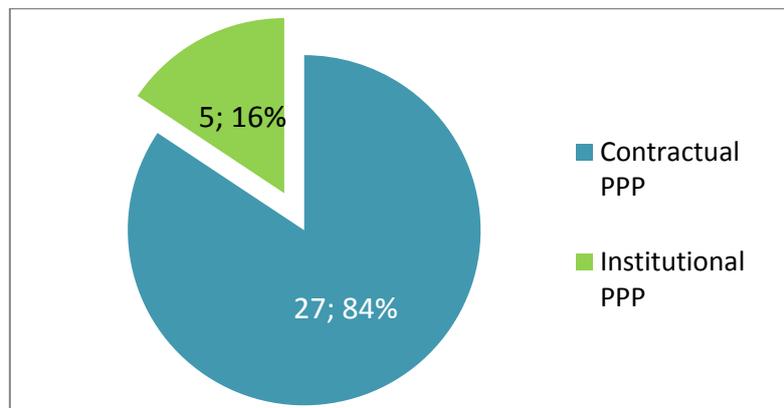
<sup>113</sup> Leszczyński, T. (2010). "PPP versus water and wastewater sector in Poland. Possibilities and challenges". *Magazine MP Environmental Protection*, (5/2010).

<sup>114</sup> IPPP (2012). *PPP agreements in Poland signed between 2009 – II 2012*.

created. After that date the situation has started to change very fast and in 2007 the private sector participation covered almost 20% of the total population.

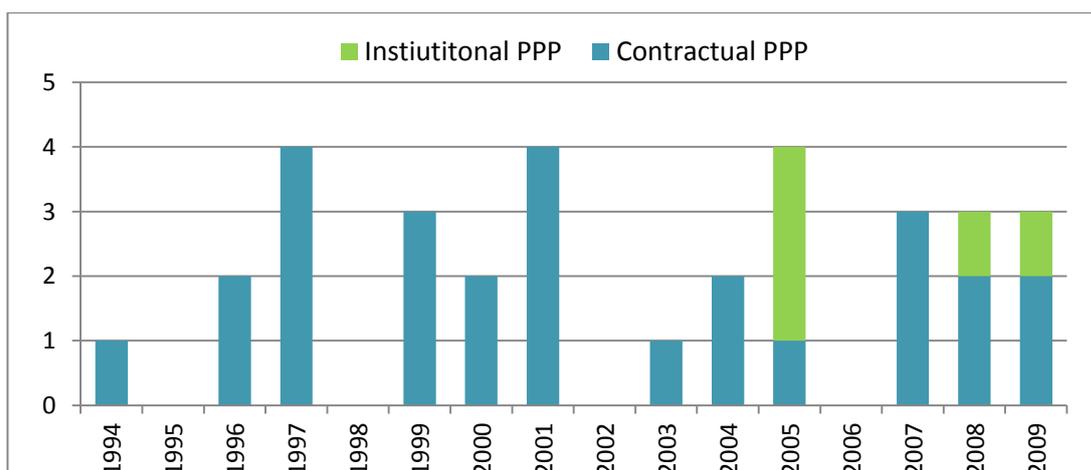
Additionally, at the beginning of 2008 there were 18 municipal companies which were supplying 1,6 million inhabitants and three of them were institutionalized PPPs with the private partners involvement.<sup>115</sup> All those three projects were contracted in 2005 year, the next PPP projects of that type has been signed only in 2008 and 2009.

Until the end of 2009 there were 40 announced public tenders for the management and maintenance of the drinking water and wastewater services under the PPP scheme. From those projects 32 were signed with the private partner, where five of them have an institutional nature and 27 are purely contractual PPPs. The figure 18 presents the number of projects according to the contractual type.



**Figure 18.** Number of PPP projects by the type.<sup>116</sup>

The figure 19 presents the same projects as described above but divided according to the dates of signing the contracts. The biggest amount of projects signed in one year is equal to four, and the average number of projects during that period is two projects per year.



**Figure 19.** Number of the PPP projects contracted until 2009 by the type.<sup>117</sup>

<sup>115</sup> Marques, R. (2010). *Op. cit.*, p. 121-122.

<sup>116</sup> Dinis, S. and Marques, R. (2010). *Analysis of public-private partnerships: Municipal water and wastewater services*, p. 50.

<sup>117</sup> Own elaboration based on Dinis, S. and Marques, R. (2010). *Op. cit.*, p. 47-49.

## **4. Case studies**

### **4.1. Overview**

This section will present two different projects which take place in the water and wastewater sectors in Poland and in Portugal. It was decided by the author to do it in the form of case-studies. The reason for this is that the usage of case-studies, especially of real-life scenarios is one of the best ways to show the application of theory in practice. They are enabling to organize a wide range of information about cases and to analyse issues from a variety of perspective and apply research and problem solving skills.

In this work the case-studies aim is to show how the PPP arrangements can be used in practice in analysed sector, showing both, eases and difficulties of this cooperation. Analyses of real situations are the best way to draw conclusions. This part will show the PPP cooperation from a more practical side, by describing who are the public and the private partner, what agreement was signed between them, how the project is being managed and many other aspects.

The empirical example from Portugal will present a contractual PPP project encompassing the drinking water services in the Municipality of Fafe in the North of Portugal – while the empirical case from Poland will show an institutional PPP project for the drinking water services in the City of Gdańsk. Both the case-studies started in the 1990s and are still in the progress. The main difference between them is the way how the public and private parties cooperate together to deliver the same services. In the Portuguese case-study the relationship between partners is strictly contractual where the private partner becomes the single responsible for the service delivery, while in the polish project the Municipality of Gdańsk City creates with the private partner a mixed company and deliver the service together through that company.

### **4.2. Methodology of the case-studies conduction and their comparison**

In this work the two case-studies of different nature and from different countries will be cross-compared. The aim of it is to isolate any themes or patterns, to notice commonalities in PPP arrangements method applied in our particular sector and how this model was implemented step by step. These similarities and differences might highlight the stages which need extra attention and should be especially carefully supervised and analyzed.

To develop these case-studies, first the data about them was gathered. These are information from the companies' annual reports (Indaqua Fafe and Saur Neptun Gdańsk), regulatory agencies' reports (ERSAR documentary), interviews, direct contact with the Polish Company, published works and available on-line materials. Later on this data for the both case-studies was organized into the sections to highlight the focus of the study regarding: main features, tariffs, responsibilities, contract management and supervision, payment and guarantees and financial sustainability of the operator. In

both cases the same framework structure will be used to achieve the most reliable comparison, based on the same type of information.

After creating a strong, structured base of both case-studies, they will be compared in the three areas. First part will compare the access of the private partners to the water and wastewater market. It will compare the two different strategies used to select the private partner, the similarities and differences in both projects and it will point out the importance of tariffs setting.

The second part of the comparison will refer to the risk management. It will point out some of most possibly risks to occur in the two case-studies. Each risk will be analysed taking into account its level, impact and possible ways to mitigate it. The risks will be then compared according to the nature of the PPP model (institutional or contractual).

The last part will analyse and compare the process of contract management in both situations. Firstly, it will focus on comparing the responsibilities of both, private and public partners in both projects. After that, the contracts management during the lifetime of the projects, and finally conclusions will be drawn.

The structure and methodology applied to describe both case-studies, as well as their comparison are both fruit of the author of this work own elaboration and choice.

### 4.3. Portugal

The Portuguese case study corresponds to a concession contract, one of the forms of a contractual PPP. In this model all the obligations (and rights) of the private partners are carefully described in the contract signed by the both sides. Table 9 shows the main characteristics of the contract of this specific project. In the end a summary of the effectiveness of the project can be found.

#### Project description

This is a “*Concession contract between the Municipality of Fafe and the private company Indaqua Fafe, regarding the operation and management of the abstraction, treatment and distribution system of water for the Municipality of Fafe*”.<sup>118</sup>

**Table 9.** Main characteristics of the Portuguese PPP case-study.

Public authority (Grantor)	–	Municipality of Fafe (North Portugal)
Private partner (Concessionaire)	–	Indaqua (Portuguese Company)
PPP model	–	Concession
Operator	–	Private Company – Indaqua Fafe
Date of the contract award	–	1996
Duration of the contract	–	25 years
Type of services	–	Retail services (to the end-users)
Scope of operation	–	Abstraction, treatment and water distribution
Nature of the cooperation	–	Operation and maintenance

#### Main features of the Portuguese case-study are the following:

- The project was undertaken through a public competition;
- The aim of the cooperation is the delivery of drinking water services. They are provided by the autonomous company Indaqua Fafe, specially created for this concession;
- The operator got the exclusive rights to deliver the services to final users of Fafe’s Municipality, where there are more than 53 thousands inhabitants in an area of 219 km<sup>2</sup>;
- The services were not delivered to one of the parishes. This is against the signed contract and the situation has not been fixed for now;

<sup>118</sup> If not otherwise mention the data comes from: ERSAR (2011). *Final auditory report of the Indaqua Fafe S.A. concession.*

- That subsystem (the not included parish) has to set the same tariffs as the ones under the concession and report all actions to ERSAR, while the situation stays that way. The date of integration (to be included in the concession) is not known but it will have to happen until the 1<sup>st</sup> of January 2015;
- Since this parish was already supposed to be under the private management they do not possess the necessary document allowing them to provide this service at the eyes of the law. This situation needs to be clarified and the responsibility of the water control in that parish need to be established since the annual report by the private partner does not include this parish;
- Because there was no formal beginning of activity by the private partner in the usage of the infrastructure, there was a misunderstanding of the parts regarding the actual beginning of the rent year. This situation was aggravated by the fact that in the concession contract there was no maximum duration of the transition process of the infrastructures into private hands.

**Concerning the tariffs:**

- The tariffs were not defined in the concession contract, but in the specification of the public tender;
- The formula for the calculation of the tariffs as well as any revisions of the tariffs was agreed between the concessionaire and the Municipality as an estimate according to the previous months of water consumption;
- The tariffs are revised every year.

**Regarding responsibilities:**

- The private partner is responsible for the maintenance, reparation and renovation of the systems, expansion and extension of the infrastructure;
- The infrastructures remain as an asset of the local government; it's their responsibility as a grantor to invest in new networks of public water supply, renovation of the existing networks and new construction works in order to increase the capacity of the systems or the sale of services.<sup>119</sup>

**Concerning the contract management and supervision:**

- According to the Strategic Plan for Water and Wastewater Services PEAASAR II, by the year 2013 a coverage of 95% of the population regarding the drinking water service must be in effect, where each subsystem has to cover at least 80% of its area. In the Municipality of Fafe's case there is only 79% of coverage;
- The Municipality supervises very closely the concession arrangement. All the new constructions, complaints, drinking water analyses, etc. are carefully supervised. However only one formal report exists, created in 1999 made by the Municipality;
- In addition, there are also semestrial financial and technical reports by the private partner delivered to the Municipality;
- The private partner presents the annual results of the control of drinking water quality.

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<sup>119</sup> Indaqua Fafe (2012). *Annual report for 2011*.

**Concerning the payment and guarantees:**

- In the contract it is established that the private partner has to pay annual rent for the use of the existing water infrastructures starting in the beginning of normal functioning period;
- Except for the annual increase of the rent according to the Consumer Price Index (CPI), the contract predicts also that the rent will increase a fixed amount of 4% of the expenses supported by the Municipality regarding any construction in the system covered by the concession;
- As for the payment dates the contract demand a first payment summing 1 year of rent in the act of signature followed by semester payments in January and July each year;
- According to the concession contract it was demanded by the Municipality of Fafe that the private partner would provide the bank guarantee for the use of all the infrastructures and systems, as well as any possible new investment;
- Indaqua Fafe has also carried out some payments such as: other purchases of fixed assets, including basic equipment, tools, fixtures and office equipment amounting to approximately € 165 000.<sup>120</sup>

**Concerning the financial sustainability of the operator:**

- Between 2000 and 2009 there has been slight increase in the volume of business, this contributes in a positive way to the operational results. It is also important to point out that the costs with supply and external services, where the rent to the Municipality is included, represents around 60% of the total expenses by the private company;
- While comparing the profits since the beginning of the concession arrangement a slightly higher value of the actual result compared to the company predictions can be observed.

#### 4.4. Poland

The polish case study described below is very popular and often used as a show case when talking about polish PPP cases. It is the oldest and at the same time the biggest example of the private partner involvement in the drinking water and wastewater services in Poland. It is an institutional type of the PPP, where the public and private partners are both shareholders in a joint-venture company created for providing the services, by a shareholder agreement which regulates the relationship between them. The following chapter presents the analyses of the case study, and points out the most important issues related to this PPP scheme, as well as the effectiveness of the project.

**Project description**

This is a “*Provision of the water and wastewater services in the City of Gdańsk and Sopot neighbourhood by the joint-venture Saur Neptun Gdańsk Company*”.<sup>121</sup>

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<sup>120</sup> Indaqua Fafe (2012). *Annual report for 2011*.

<sup>121</sup> If not otherwise mention, the data comes from: Mandri-Perrott, X. (2009). *Optimizing project finance solution in the water sector: Suggestions for enhanced public private partnerships*. Ph.D. thesis, p. 267-269.

**Table 10.** Main characteristics of the Polish PPP case study.

Public authority (Grantor)	–	Municipality of Gdańsk (North Poland)
Private partner (Concessionaire)	–	Saur International (French Company)
PPP model	–	Service contract, operation and maintenance, leasing of infrastructure
Operator	–	Joint-venture Company – Saur Neptun Gdańsk
Shares	–	51% - Saur International 49% - Municipality of Gdańsk
Date of the contract award	–	1992
Duration of the contract	–	30 years
Type of services	–	Retail services (to the end-users)
Scope of operation	–	Abstraction, treatment and water distribution and collection and treatment of wastewater
Nature of the cooperation	–	Operation and maintenance

**Main features of the Polish case-study are the following:**

- In Gdańsk, there was no tender as such, the city issued an invitation to submit offers. There were some offers from Polish companies, but none of them had the required experience;<sup>122</sup>
- In the end the operator was selected through a direct negotiation process. Gdańsk City started the negotiation with Saur in 1990 and signed the contract in 1992. It was the only proper offer, but also the most attractive and sophisticated;
- The aim of the cooperation is the delivery of drinking water and wastewater services. They are provided by the specially created joint-venture company Saur Neptun Gdańsk (SNG). Between partners there is a shareholder agreement which regulates the SNG Company's performance;
- Its shareholders have made an appropriate contribution to SNG: Gdańsk City in the form of fixed assets (not infrastructure) and Saur in the financial way with the purpose of improving the new company's work quality;<sup>123</sup>
- The operator got the exclusive rights to deliver the services to the final users of the Gdańsk City and Sopot neighbourhood (around 30,000 total water connections). Just the Gdańsk City has almost half a million inhabitants, in an area of almost 1800 km<sup>2</sup>;
- The contract duration with Gdańsk City is for 30 years, while with Sopot it is indefinite;
- There is a different operator in one area of the city, which delivers similar services through its own network.

<sup>122</sup> Description of private partner selection based on: *WaterTime case study – Gdańsk, Poland*.

<sup>123</sup> Szoll-Czapczyk, I. (2005). "Partnership for water". *Magazine Municipal Review, Special Supplement*, (3).

**Concerning the tariffs:**

- Tariffs are set and approved by the city of Gdańsk, based on SNG proposals, and are revised every year based on general principles;
- Tariffs adjustments must include the improved efficiencies and different levels for particular consumer groups;
- Tariffs are based on full cost-recovery principles, including provision for investments in capital works;
- A key clause in the contract regarding tariffs setting is that the price increase cannot exceed inflation in the previous year;<sup>124</sup>
- The local government can set lower tariffs for certain consumer groups and compensate the loss of income through direct operating subsidies to SNG;
- Tariffs comprise two parts: an operating fee (which creates the revenue of SNG) and a fixed fee for modernization and capital investments which is transferred to the budget of the municipality.

**Regarding responsibilities:**

- The operator is responsible for management, operation and maintenance, proposing investment programs and advising on investments;
- The operator is obliged to maintain the continuity of services, drinking water, quality, appropriate wastewater discharges, reduce the operating costs and water losses, modernizing the management systems, improve the customer services and achieve the EU water quality standards;
- The local government maintains the assets ownership, approves and proposes investments (with advice from the SNG) and finances investments;
- In Gdańsk, the city plays three roles: grantor, regulating authority and shareholder in the SNG.

**Concerning the contract management and supervision:**

- The contract was amended in 1995, 1999, and 2001 for legal and other reasons. The amendments altered the procedures for the timing of the annual tariff negotiations, as well as the sharing and control of the information, and the operator tariff formula for the private operator (defined on the basis of a fixed return on capital);
- Between 1992 and 2002 the consumption of water drastically decreased by around 50% in total. It led to decreased revenues what meant that the prices per unit increased and the share of fixed costs went up. The price was increased few times to compensate losses of SNG associated with that situation;<sup>125</sup>
- Between 1992 and 2011 the consumption of water was systematically decreased, in total by 55%;<sup>126</sup>
- The public authority supervises the cooperation;

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<sup>124</sup> Motte, R. (2005). *WaterTime case study – Gdańsk, Poland*, p. 13.

<sup>125</sup> *Ibid.*, p. 14.

<sup>126</sup> SNG (2012). *Experiences of SNG*. Presentation.

- Enforcement of performance is also done through the city's members on the Supervisory Board of SNG;
- In the beginning of contract the infrastructure lessor was the Gdańsk City. However in 2004 some major changes in the management scheme were made and a separate Gdańsk Assets Holding Company (*Gdańska Infrastruktura Wodociągowo-Kanalizacyjna* – GIWK) was created, which is fully owned by the Gdańsk City. All the infrastructure assets operated by the SNG were transferred to GIWK which became its owner. Its aim was to allow the Municipality of Gdańsk apply for the public grants;<sup>127</sup>
- The primary contract between SNG – Gdańsk City was divided into two. The previous agreement between SNG and Gdańsk City became only a contract for the services management (as a task delegated by the municipality) while the leasing contract was signed with the GIWK.

#### **Concerning the payment and guarantees:**

- Residents of Gdańsk City pay for the services directly to SNG;
- SNG pays a leasing rent to the city (since 2004 to the GIWK) out of customer revenues. However, tariffs proposed to the city do not include the leasing rent;<sup>128</sup>
- The city provides investment subsidies by funding some of the required investments with its own budgets and loans;
- In 2005 after few years of long preparations the Gdańsk City received a grant from one of the European Union Fund Programs of € 91 million (75% of the project's value). One of the main conditions required for this grant was to make sure that the private operator was not obtaining “*undue profits*” from this grant. The formal beneficiary of the project is the GIWK.<sup>129</sup>

#### **Concerning the financial sustainability of the operator:<sup>130</sup>**

- The financial situation of the SNG is stable. The revenues of the company have a rising tendency;
- Since the beginning of the contract the revenues of the company are generally positive. The only year which did not allow to achieve earning (revenues were lower than costs) was 1995. It was the year when the drinking water consumption and sales decreased by 18%;
- The first three years of the cooperation created revenues on rather small level;
- The revenues between 2002 and 2010 have grown by around 150%.

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<sup>127</sup> Zysnarski, J. (2008). “Lease – the practical experience”. *Magazine Water Supply-Sewerage*.

<sup>128</sup> Motte, R. (2005). *WaterTime case study – Gdańsk, Poland*, p. 13.

<sup>129</sup> Zysnarski, J. (2008). “Lease – the practical experience”. *Magazine Water Supply-Sewerage*.

<sup>130</sup> SNG (2004). *Experiences of SNG*. Presentation.

## 4.5. Comparison

### 4.5.1. Access to the market

In the two presented case-studies the private partners have accessed the market in the same decade, when neither Portugal nor Poland had specific legislation regarding the PPP arrangements. In both countries those projects became basically the first examples of the private sector participation in the water sector. What differentiates them is that in Poland that project was recognised also as the first PPP project in the country at all. This situation places Portugal in the better starting point.

The private companies involved in that projects are one of the main players in the international market – it is a French Saur and Portuguese Indaqua which is part of the international consortium Mota-Engil Group. Their long international experience and good know-how have brought an added value for those projects what was the positive aspect. However, in the Polish case the 90s were very unstable years, it was the time when Poland just got rid out of the communism. Therefore it created very hard start for the international company what definitely did not influence positively on its access to the market. Table 11 compares generally the two case-studies from different aspects point of view.

**Table 11.** General comparison of the two presented case-studies.

	<b>Indaqua Fafe</b>	<b>Saur Neptun Gdańsk</b>
<b>Contract type</b>	Concession	Service and leasing contracts
<b>Private sector participation model</b>	French Model	French Model
<b>Operator</b>	Special Purpose Vehicle Company	Joint-Venture Company
<b>Selection model</b>	Public competition	Direct negotiation
<b>Starting year → duration</b>	1996 → 25 years	1992 → 30 years
<b>Aim of cooperation</b>	Delivery of drinking water services	Delivery of drinking water and wastewater services
<b>Area of services</b>	53 thousands inhabitants 219 km <sup>2</sup>	500 thousands inhabitants 1800 km <sup>2</sup>

Both companies provide similar services, with some differences:

- SNG is responsible not just for drinking water but also for the wastewater services and it serves definitely bigger area and greater number of inhabitants;
- Indaqua Fafe provides services where private partner is its full owner, while in case of SNG they are provided by the joint-venture company, where both private partner and municipality are shareholders;
- In the Portuguese project there is just one contract on the line between Indaqua Fafe and Fafe Municipality, while in Polish project SNG manages two contracts: one with the Gdańsk Municipality for services delivery and second leasing contract with GIWK owner of infrastructure.

In Portugal the private partner was selected through the public competition while in Poland it was made by the direct negotiation between the interested parties. The public tendering procedure creates better competition between private partners and is more transparent for all the interested entities, what does not occur at the same level in the second model. Since Portugal has longer general experience with PPP projects and the society is more prepared for changes that method could work well. At that time situation looked different in Poland and any changes and privatisation of services, even partial was creating mixed feelings among the people and negative comments. It was the time when Poland just got rid out of the communism hard times. Therefore, the direct negotiation with actually the only one properly prepared private partner and permanent participation of the public authority through the mixed company put bigger trust and understanding of the happening changes.

In both cases the different methods of private partner selection were used what shows that the selection method should be appropriate to the specific situation. Here, the methods were chosen correctly what effected in good procurement process.

Important aspect of those projects is also the tariffs, since their collection was entrusted to the private hands. In both cases tariffs are redefined again every year, proposed by the private company and they have to be accepted by the municipal government, in Polish case by the president of the city. In the Portuguese case-study they are estimated according to the previous months of water consumption while in the Polish cases-study they are based on the full-cost recovery principles.

In Fafe Municipality the tariffs incomes are fully assigned to the Indaqua Fafe as its revenues while in Gdańsk Municipality not all the money goes to the private operator, part of it goes to the municipality budget for modernization and capital investments.

There is one more difference in setting the prices for services. In Poland there are few main groups of customers (for example: individual consumers, housing communities or industries) and there is different price assigned to the specific group. In the case of Indaqua Fafe the prices vary according to the volume of used water, and the more water was used the more expensive it is.

#### **4.5.2. Risk management**

Risks assumption and division is the core of the successful PPP project. Each risk should be identified, classified and allocated to the party better able manage it, its probability and possible impact should be evaluated, and the actions to minimize it defined. All of that will be done in the 5 steps. Since both case-studies represent a similar scope of operation and both private partners were contracted to provide almost the same services they also experience similar risks. In this comparison the author identified and analysed the following risks, which are typical for projects in the water and wastewater sector:

- Operation and maintenance;
- Technological;
- Demand (consumption);
- Capacity;

- Competition;
- Financial;
- Inflation;
- Legal;
- Public contestation;
- *Force majeure*.

### **Maintenance, operation and repair risks**

As the logic indicates, since the private partner is responsible for the operation, maintenance and services provision, therefore the risk connected with that activities should be bear by it. Usually in the water sector the private partners' revenues come from charges collected from inhabitants. This situation should motivate the operating company to take as good care as possible of provided services, since it influences the clients' satisfaction. Also, private company is responsible for the running repairs, so it is in its business keep the system in good condition.

In some situations there is required by the public authority a guarantee for the use of infrastructure. This situation took place in the Fafe Municipality where Indaqua Fafe had to provide the bank guarantee for the use of all the infrastructures and systems, as well as any possible new investment.

**Impact:** It might cause temporary intervals in the services provision due to the needed system repairs what effects in lower amount of services consumption. On big scale, this is not very harmful situation for the operator.

### **Technological risk**

To make any system functional and well managed technology plays relevant role in achieving it, it also applies to the water utilities sector. Technology permeates the operation of an entire system, it enables key processes that can be used to develop, deliver and manage the services. The proper technology used will bring positive impact. In the presented case-studies it is the private partners responsible for operation, management and services provision, so they should apply there technical knowledge they have. They can apply it to improve areas such as examining drinking water quality, improving company management and contact with clients through for example creating easier systems to pay for the services use. One of the reasons to apply the PPP scheme in the projects is possibility to use the private partners' knowledge of new technologies; therefore the technological risk should be assigned to them. Moreover, the public authority very often might not be able to assess in 100% that a private partner really have a proper experience and knowledge or not. The public partner is not able to control this risk therefore should not bear it.

**Impact:** No improvement in services provision, their management and water quality, lack of customers satisfaction, failure to meet value for money under the PPP model.

### **Demand (consumption) risk**

The demand risk in the water and wastewater sector can be very problematic in the PPP arrangement. Generally, it should be transferred to the private partner, however on the other hand the

public sector should be in a better position to forecast consumption having good access to historical trends. When the volume of revenues depends on the specific group of customers both sides of the contract should be careful about it. This situation can be dangerous in the transportation sector when for example new railway is being build and it is going to compete with the existing highway what can led to demand ratio change. If the future consumption wrongly predicted, it can lead to losses in revenues. Theoretically this situation is unlikely to occur in the water sector.

However, the Gdańsk case-study is the best example showing that even while providing the services that necessary for the daily functioning like drinking water, its consumption can drastically decrease. What happened in Gdańsk is that this risk was transferred to the customers and to compensate the financial losses of SNG associated with this situation, the tariffs increased by several per cents. Therefore the consumption risk should not encourage to excessive optimism because if it happens it usually leads to prices increase and it is the normal people that suffer from that. In the worst case, it can also lead to the contract failure.

**Impact:** Looses in the revenues of the operator, higher costs for customers of provided services.

### **Capacity risk**

One of the risks directly related with the water utilities services provision is the capacity risk. It refers to fluctuating demand over the year and ability of adapting to it. In our case-studies this are the private companies that are responsible for services provision, therefore this risk should be always assigned to them.

**Impact:** Higher demand than predicted: breaks in services delivery, unsatisfied customers; in case of lower demand than predicted: higher storage costs, lower incomes or their lack.

### **Competition risk**

Competition risk is always present wherever there is a product or service supplied to the customer. This risk refers mainly to threats of new entrants of other companies to the market. It is the public authority that is the last link in the chain to deliver services and it is its responsibility to delegate or not the tasks. It is in its power to allow for the competition in the market or not. However, since the private partner was contracted to deliver those services it should also take care of its own business and try keeping good position in the market. It leads to the conclusion that the competition risk should be managed by both partners – public and private. In this sector the new entrants in the market are rather unlikely, but the risk of them should not be neglected.

**Impact:** Lower number of consumers, need to decrease fees level due to the competition in the market, lower revenues, possible negative cash-flow leading to bankruptcy.

### **Financial risk**

Financial risk is a general term which covers multiple types of risk associated with financing including financial transactions referring to company loans in risk of default, risks associated with loses or uncertainty of a return and many others. Usually it is private side responsibility to ensure economic and financial stability.

One of the financial risks associated with described in both case-studies services is a **credit risk** – it is mainly related to the risk that counterparty, what here means customers will fail in its contractual obligations (mainly by not paying bills for the services). Both, in Indaqua Fafe and SNG this risks are related to operating activities. However, even if there are a few customers not satisfied and delayed in payments, comparing to the scale of general services and sector characteristics, this risk is rather low. **Impact:** Lack of financial liquidity, negative cash-flow, no revenues, can lead to contract failure and operating company bankruptcy, and creating negative image for public authority (grantor).

### **Inflation risk**

Growth of inflation is independent on any of the parties in the PPP arrangement, neither public nor private partner. Inflation influences the level of tariffs, and if it rises, the cost of services also grows. Therefore, usually risk of inflation is in on the private side.

**Impact:** Rise of tariffs level, higher cost of all the used materials and services.

### **Legal risk**

Legal risk refers to the legal side of the cooperation, it relates to regulatory issues and in general to the legislation that can change during the life of a financial contract. Except the full privatization like in England & Wales the drinking water and wastewater sector is regulated by the public authorities and in some countries by the regulatory agencies. It is possible for the public institutions to delegate the tasks to third entities or private partners like in the described two projects, nevertheless still it is a government that decides on the changes in the sector and introduces new laws. Therefore, that risk should remain in the public hands.

**Impact:** Legislation changes can influence the financial stability of private operator; the possible new legal rules might change the structural cooperation.

### **Public contestation risk**

When the provided services refer to issues that basic as water supply the public contestation risk is possible to occur, in particular if the private partner becomes responsible for it. The main source of that behaving usually is increase in the provided services' costs but it also refers to environmental problems. This risk usually should be shared between partners, however if it refers only to the increase in costs it should be only on the private side.

**Impact:** Public strikes, non-payments of invoices by the users.

### **Force majeure risk**

These are the risks very hard to predict, they do not dependent on any of the parties and usually it is almost impossible to mitigate them. They concern the natural catastrophes, vandalism acts, wars and other calamities. One of them which can strongly affect the provision of drinking water and wastewater services is floods. They can damage pipes, treatment plants and the worst is that they contaminate water abstracted to deliver the services for a long time. Those risks are very hard to

allocate, since none of partners have possibility to mitigate them, therefore usually they are shared between them.

**Impact:** Infrastructure damages and loses, long-term breaks in the services provision, lack of incomes, possible bankruptcy.

After identifying the risks it is important to estimate their probability of occurrence and impact level. The assumptions applied below to run the analysis are made by the author, based on the knowledge and skills gained during his academic studies; this refers also to the method used. The scale adopted to evaluate each factor is from 1 to 3, where 1 means – low, 2 – medium and 3 – high. Additionally each risk can be quantified through multiplying the probability of particular risk occurring by its impact. Table 12 presents the risks matrix for the identified risks. It includes the risks allocation to the partners, probability of risks occurrence and their impact level. It also includes final risk quantification. All the points were estimated based on the author’s analysis.

**Table 12.** Risks matrix.

Risk	Risk allocation		Probability of occurrence	Impact level	Risk quantification
	Public	Private			
Maintenance		X	2	2	4
Operation		X	2	2	4
<b>Technological</b>		<b>X</b>	<b>2</b>	<b>3</b>	<b>6</b>
<b>Demand</b>	<b>X</b>	<b>X</b>	<b>2</b>	<b>3</b>	<b>6</b>
Capacity		X	2	2	4
Competition	X	X	1	3	3
<b>Financial</b>		<b>X</b>	<b>2</b>	<b>3</b>	<b>6</b>
Inflation		X	1	1	1
Legal	X		1	3	3
Public contestation	X	X	2	2	4
<i>Force majeure</i>	X	X	1	3	3

As it can be read from conducted risks matrix there are three main risks: technological, demand and financial. All of them were quantified on the top of scale. It means that partners responsible for those risks should carefully manage them. However, the remaining risks also should not be neglected, especially risks such as maintenance, operation, capacity and public contestation, since there are next in the line after three main risks. The less damaging risks are competition, legal and *force majeure* as well as inflation.

Since all the risks were quantified, the last step is to specify how they should be minimized in case they take place. All the details should be written down in the contract between partners. The risks minimization possibilities are contained in table 13.

**Table 13.** Risks minimization possibilities.

Particular risk	Minimization measures
Maintenance, operation and repair risks	Specialized operator companies, insurance in the contract, systematic system controls.
Technological	Contract with warranties, insurances.
Demand (consumption) risk	Conduction of different analysis especially market sensitivity analysis, better understanding of customers' needs, making payments easier.
Capacity	Conduction of more accurate studies and cost-benefit analysis.
Competition	Careful conduction of sensitivity analysis.
Financial	Financial planning for a long term, working out a policy of financial security, being able to find other sources of revenues.
Inflation	Indexation of revenues to inflation, fixed level of prices.
Legal	Properly set all the rules, duties and obligation in the contract.
Public contestation	Conduction of sensitivity analyses, making indicators related with services provision public, discussions with public.
<i>Force majeure</i>	None.

The described projects introduce two different by the structure models of PPP arrangement. First one, where the Portuguese Indaqua Fafe is involved represents contractual type of PPP. On contrary the Polish project with SNG presents institutional PPP. The main difference between them is risk division between partners:

- a) In the Portuguese case-study the specific risks are assigned to each of the partners – to the Fafe Municipality or Indaqua Fafe Company;
- b) In the Polish case-study where both, the public and the private partners are shareholders in one company (SNG) they share risks together and both of them are responsible for it.

Because of that in both cases there is a bit different point of view on risks. For example, in the case of SNG more important for both parties is the cost of risk mitigation, not its probability. If the risk already occur both partners are responsible for it. Also, very often in the case of mixed-companies the risks are transferred to the end-users, to the customers. Again, referring to the same example as before – the demand risk occurred in Gdańsk what affected SNG revenues and in the end it was end users who paid for it.

In situation where there is a contractual PPP, probability of risk occurrence is the most relevant. Assuming that the risks were divided appropriately, if they happen, the partner to whom it was assigned should have the ability to mitigate it. For example, Indaqua Fafe is responsible for the financial risks like: credit risk, liquidity risk and cash-flow risk associated with the interest rate. Minimization of the last risk in case it happen can be achieved change of variable rate into fixed rate if necessary.

Indaqua Group, under which there is Indaqua Fafe Company has developed and implemented a special program to manage the risk. It is monitoring the financial markets and tries to minimize the potential adverse effects on the financial stability.<sup>131</sup>

### **4.5.3. Contract management**

#### **Responsibilities**

In the both cases between the municipality and the private operator (Indaqua Fafe, SNG) there is a written contract which strictly defines all the rules of the cooperation, duties and rights for public and private side. The structure of responsibilities in the presented projects is quiet similar. First of all in the both situations the private partners manage the provision of services, they are responsible for the maintenance and running repairs. They do not invest in the infrastructure, they just cover operation expenses. However, in the both cases the private partners act as advisors. They collaborate in defining the strategy and the development, and they advices on the investments. In the both cases all the infrastructure ownership remains in the public hands with the small difference than in the polish case-study during the project lifetime the special separate company to own the infrastructure was created (GIWK).

In the case of Fafe the local government in the form of the municipality acts both as a grantor and a regulating authority. In the Polish case in addition to these two tasks the public partner is also a shareholder of the joint-venture created company. This small difference can affect the cooperation between the private company and the public authority in a negative way, since the public entity plays two roles simultaneously; the grantor and partner of the newly created company. This can create a conflict of interests where even though it is the public partner's obligation to zeal over the public interest, it needs also to defend the joint-venture company's success. Compared to this situation the concession in the case of Indaqua Fafe offers a much clearer situation - the grantor is responsible for the public interest, while the private takes care of its own. In the case of disagreements between the partners this organisational models guaranties that none plays a double role.

#### **Contract management**

Analysing the contracts management since the beginning of their existence it can be summed up that the management process in the case of SNG was much more troubled than in the case of Indaqua Fafe. Just in the 10 years the contract was amended three times for different reasons. Also, its connection-structure has strongly changed in 2004 when the GIWK was created and present until that moment contract was divided into two. However, that changes regarded only the structural side, the responsibilities of the public and the private side stayed the same.

In the case of Indaqua Fafe the contract management runs more smoothly. The Indaqua Fafe is responsible only for the retail services (law water). The high water management (bulk services) in the Fafe Municipality was entrusted to the Águas do Ave S.A. Company in 2003 through the agreement

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<sup>131</sup> Indaqua Fafe (2012). *Annual report for 2011*.

contract between the Company and Fafe Municipality. In the effect of entry into operation of the Multimunicipal system some new rules and cooperation procedures to not overlap tasks between the Fafe Municipality, Águas do Ave and Indaqua Fafe had to be established. They came into the effect in 2005.

In the Polish case-study when it was decided to start the GWIK both, public and private partners' demonstrated high flexibility and patience to the changes, that in the end brought profits in the form of public grant. In the Portuguese case-study the Indaqua Fafe also had to face some structural changes and be open for the new rules. As long as the changes in the contract improve the cooperation they should not be treated as something negative. It is better to modernize the contract than keep it in ineffective form.

Presently, both private partners are financially stable winning high profits and the provided services have definitely better quality and are well managed. Both companies, Indaqua Fafe and SNG have built good relationship with customers what not always was easy to do. In both cases the modernized systems to manage the contact with clients were implemented, the quality control and management of human resources were improved.

Municipality of Gdańsk showed that even while there is a private partner involved in the services provision it is still possible to receive a grant for project development. It was the municipality that applied for financial support; nevertheless SNG had strong impact on all the works and preparations. The way how it was done is an interesting case, worth analysing and maybe following by the other local governments.

In both projects there were many positive new things implemented to improve contact with clients and the quality of services. However, none of the contract was managed perfectly and always very smoothly. In the case of Indaqua Fafe the services until now were not delivered to one parish. There is a plan to change it soon; nevertheless, it was not done for more than 15 years and situation like that should not take place. First years for the SNG were difficult, because company was generally perceived by people rather negatively. Residents were expecting sudden changes and improvement of services, what of course was not possible just after signing the contract. It has changed, when the improvement. Additionally, maybe SNG should have led better sensitivity analyses to predict that the volume of sold water might decrease instead of increase. Then, this situation would not have an impact on customers in the form of higher tariffs.

Some more detailed statistics regarding the both case-studies can be found in the table 14.

**Table 14.** Statistic data comparison in both case-studies.<sup>132</sup>

Indaquia Fafe	Saur Neptun Gdańsk*
<b>Assets and liabilities in total</b>	
2011 – 1.278.674 € 2010 – 1.296.185 € [1]	2010 – 20.817.249 € 2009 – 18.863.320 € [2]
<b>Net profit</b>	
2011 – 69.278 € 2010 – 86.052 € [1]	2010 – 2.365.450 € 2009 – 1.990.769 € [2]
<b>Water and wastewater price for 2012</b>	
Used water 0-5m <sup>3</sup> /1 month – 0,68 €/m <sup>3</sup> Used water 5-15 m <sup>3</sup> /1 month – 1,08 €/m <sup>3</sup> [3] Average price for 2010 – 1,35 €/m <sup>3</sup> [4]	Water – 0,96 €/m <sup>3</sup> Wastewater – 1,43 €/m <sup>3</sup> [3]
<b>Number of clients</b>	
Number of clients is systematically rising In 1996 – 10,5 thousands, In 2011 – almost 16 thousands [1]	Presently there are more than half a million of clients
<b>Volumes of sold water and wastewater (consumption)</b>	
1996 – 0,8 million m <sup>3</sup> 2011 – 1,55 million m <sup>3</sup> Since 1996 the volume of sold water had generally rising tendency, never felled down drastically [1]	2011 – 24,4 million m <sup>3</sup> of water 2011 – 27,7 million m <sup>3</sup> of wastewater Between 1992-2011 water consumption decreased by 55% [5]
<b>Water quality</b>	
2010 - 97,29% (should be 100%) [4]	In 1992 – only 8% of Gdańsk water met EU standards In 2011 – around 97% [5]
<b>Network failures</b>	
Fault in pipelines in 2010 - 131/100 km/year (should be ≤ 30/100 km) [4]	Between 1992 and 2011 it decreased by 45% Water loses has decreased from 25% in 1992 to 11,7% in 2011 [5]

\* Polish currency “zł” was changed into “€” by the rate 1€ = 4zł.

#### 4.5.4. SWOT analysis

##### 4.5.4.1. Methodology and aim to achieve

This chapter will present the SWOT analysis for the Polish and Portuguese case-studies. They will analyse the participation of the private companies (Saur and Indaquia) in the provision of drinking water services in the case of Fafe Municipality and drinking water and wastewater services in the case of Gdańsk Municipality. The aim of this analysis is to identify all the strengths, weaknesses, opportunities and threats connected with the access of the private companies Saur and Indaquia into the Polish and Portuguese markets respectively.

To define the influence on the specific features the analysis should take into the consideration the following aspects:

<sup>132</sup> Sources of data: [1] Indaquia Fafe (2012). *Annual report for 2011*; [2] SNG (2010). *Annual report 2010*; [3] Prices for 2012 published by each company; [4] ERSAR (2011). *Annual report on water and waste services in Portugal 2010: Volume 3*; [5] SNG (2012). *Experiences of SNG*.

- Do the strengths allow using given opportunities?
- Do the strengths allow overcoming the threats?
- Do the weaknesses limit abilities to use the given opportunities?
- Do the weaknesses exacerbate the risk connected with the specific threats?

In each case-study first the SWOT matrix will be presented and later on it will be carefully analysed.

#### 4.5.4.2. Polish case-study

Table 15 presents the SWOT analysis for the access of the private company Saur into the Polish market.

**Table 15.** SWOT analysis for the Polish case-study.

<b>STRENGTHS</b>	<b>WEAKNESESS</b>
<ol style="list-style-type: none"> <li>1) Long experience in the sector</li> <li>2) Many successful projects abroad</li> <li>3) Good know-how in managing water and wastewater services provision</li> <li>4) Ability to improve quality level of drinking water and its supply</li> <li>5) It supports municipalities in creating and implementing solutions the best fitting for their needs</li> <li>6) First international company to establish itself on the polish market</li> </ol>	<ol style="list-style-type: none"> <li>1) Pioneer in the polish market having no previous example to follow – neither by Polish or international companies</li> <li>2) Language and cultural barriers</li> <li>3) Lack of knowledge of the rules prevailing in the Polish market as well as not knowing all the bureaucracy and Polish legislations very well</li> </ol>
<b>Saur</b>	
<b>OPPORTUNITIES</b>	<b>THREATS</b>
<ol style="list-style-type: none"> <li>1) Strong need to improve drinking water quality and services provision in general</li> <li>2) Need to improve management system</li> <li>3) Possibility of de-centralization of services</li> <li>4) There are not many Polish private companies with that good experience as Saur</li> </ol>	<ol style="list-style-type: none"> <li>1) Lack of public acceptance for private sector participation in the services provision</li> <li>2) Inhabitants' fear that costs of water and wastewater services might increase</li> <li>3) Strong influence of local authorities in shaping the way of water and wastewater supply</li> </ol>

In this SWOT analysis the strengths and opportunities interact together the most. Saur has many strong features which allowed it to enter polish market. Thanks to them the private company was able to use the existing opportunities. First it had required knowledge and experience to improve the quality of drinking water and services provision what in the 1990s was on very low level. Also, the management system could be improved by its good know-how worked out for many years in many other countries. Another opportunity was the shortage in the polish private companies with such good experience in the sector as Saur. The French company specializes in supporting municipalities to

create and implement solutions which fit them the best. Therefore it became suitable company for Gdańsk Municipality to cooperate with.

However, on the other side there are also threats referring to the private company participation in the water sector. One of the bigger threats at that time was negative comments among people connected with access of private company to provide those kinds of services. People were simply afraid that this move will affect the prices level and they will rise. The best way to overcome this situation was to make people understand that knowledge of private company and its skills can just improve the services quality. Many successful projects run by Saur in the past should create a better look at the company.

In Poland all the power to manage the provision of drinking water and wastewater services is in the hands of municipalities, the mayors of them have to accept the tariffs level proposed by the private company every year. It creates the threat of too strong influence of local government causing more difficult cooperation between partners to happen. To level this threat Saur could use its abilities in cooperation with local governments worked-out during many projects in France and other countries.

Of course, Saur had also its weak sides while entering the market in Gdańsk. The company weaknesses have been referring mostly to the cultural differences, not knowing very well the polish market and being the pioneer in this sector in the country. However, in general none of them have limited the access to given opportunities. The need to improve the drinking water and wastewater system in the city was that strong that these weaknesses did not play that important role to use the opportunities.

What more, some Saur's weaknesses can be taken also as its strengths. For example, being pioneer as a private company in the polish market with no previous examples in the sector is evidently a weak side. However, on the other side, it is also a positive thing to be the first international company to establish itself on the polish market in the situation when there is not that many polish private companies being able to satisfy the need of Gdańsk Municipality.

Nevertheless, it is possible for weaknesses to exacerbate the risk connected with the specific threats. For sure being the private company "*from abroad*" trying to access the market could exacerbate the lack of public acceptance. Additionally, the barriers connected with not knowing the bureaucracy and common rules prevailing in the polish market by French company for sure did not influence positively the threat of strong influence of local authorities in shaping the drinking water sector. However, these factors could be balanced by the strengths of the company.

#### 4.5.4.3. Portuguese case-study

Table 16 presents the SWOT analysis for the access of the private company Indaqua into the Portuguese market.

**Table 16.** SWOT analysis for the Portuguese case-study.

<b>STRENGTHS</b>	<b>WEAKNESESS</b>
<ol style="list-style-type: none"> <li>1) It specialises in the water and wastewater sector</li> <li>2) One of the first private companies in Portugal to carry out those services</li> <li>3) It ensures integrated solutions appropriate to various municipalities</li> <li>4) It is a Portuguese company accessing national market</li> <li>5) Good knowledge of all the rules and legislations prevailing in the market</li> <li>6) It is open to work under the PPP model</li> </ol>	<ol style="list-style-type: none"> <li>1) Newly created company</li> <li>2) It has only started to work-out their position in the market and brand</li> <li>3) It has never undertaken any project before</li> </ol>
<b>Indaqua</b>	
<b>OPPORTUNITIES</b>	<b>THREATS</b>
<ol style="list-style-type: none"> <li>1) The system of drinking water provision and the water quality need improvement</li> <li>2) Need to cover bigger area in the services provision</li> <li>3) Openness of the Portuguese market</li> <li>4) Municipality of Fafe has been always open for new ways of management</li> <li>5) PPP projects were seen in Portugal as a good development to the country</li> <li>6) Presence of public institutions supporting the sector development and its players</li> </ol>	<ol style="list-style-type: none"> <li>1) It was only the first years after allowing for tasks delegation by municipalities to the third entities</li> <li>2) Lack of experience among the local authorities in cooperation with private partners</li> <li>3) Possible lack of stability in the formal regulations, due to the plans of creating regulating authority</li> <li>4) There was only one example of concession contract for those services provision in Portugal</li> </ol>

While analysing the access of Indaqua into the market of north Portugal, we can see that the strengths and opportunities strongly interact together. This private company have a lot of strong features which could have been used to seize the spotted opportunities. First, it specializes in the drinking water and wastewater sector so it could meet the needs of Fafe Municipality. It had a specific knowledge to improve the drinking water system and its quality. Additionally, Indaqua offers integrated and flexible solutions, different models of services provision and partnership appropriate to various municipalities. Such attitude could harmonize well with the Municipality's approach of always exceling at pioneering and adopting new ways of managing public services.

Another strong side of Indaqua is its openness to cooperate with the public authorities under the PPP scheme. For sure it was the positive feature, since the PPP projects were seen in Portugal as a good development to the country. Also, the Portuguese market at that time was rather open for the participation of private companies what created good opportunity to use by Indaqua.

When company Indaqua was trying to access the market of Fafe region, there were not just opportunities to catch, but also some threats to overcome. Most of them were referring to the formal regulations of the sector. While the Fafe Municipality was announcing the tendering procedure to choose the private partner it was only the first years when the municipal tasks delegation was allowed. The lacks of experience from the local governments' side of how to create good partnership with the private company could negatively influence the cooperation. In this situation Indaqua which is specialised to work in the water sector could use its knowledge to do it the best, since it also had interest in this partnership. Also, at that time there was no regulating authority in the sector, but there were plans to do so (it was created only in 1997). This could undermine stability in the regulations. It was unknown what changes the establishment of such an institution can bring. This threat could be the hardest to overcome because neither the municipality nor private partner had direct influence on it.

To overpower these difficulties Indaqua could also use the advantage of being fully Portuguese company trying to access own market. It had good knowledge of all the rules and legislation prevailing in the market, what does not happen in the case of foreign company. It could create bigger trust to start the partnership.

Except the strong points Indaqua had also some weaknesses. Its weak sides were referring mostly to being newly created company. It was just trying to work out own position in the market and have not undertaken any projects before. However, they rather do not limit the abilities to use given opportunities. As it was mentioned, the Fafe Municipality has been always open for new ways of management and this is what Indaqua could offer it. Additionally, to overcome own weaknesses Indaqua could use help of existing institutions like for example APDA which support all players in the market.

When Indaqua was trying to win its first contract there were not many examples of PPP contracts in the water sector in Portugal, there was only one signed before. The fact of being newly created company (it was run only in 1994) could in some way exacerbate the risk of this threat. However, Indaqua could learn from other countries examples as well from projects run under the PPP scheme in the different sectors in Portugal.

#### **4.5.5. Case-studies summary**

In the end of the day even with small problems which occurred during the agreements' time in both projects, these cooperation examples can be considered a relative success.

In the case of Fafe Municipality in Portugal most of the small problems are being solved or there are plans though for their solution. Both the public and the private partners have shown positive results since the beginning of the contract and are happy with it. The aim of the private partner to profit with this business was achieved, as well as of the public partner to provide and improve the service to the general population. As long as both parties solve the existing problems, this PPP arrangement has the possibility of endure for a long time.

In the case of SNG in Poland despite many difficulties, long negotiation and harder times in the country the cooperation has been signed. Presently, the PPP project is considered as a successful cooperation with the private partner. It brought huge improvement in the drinking water quality and services provision. Additionally the water losses have dropped down. This cooperation brought profits for both partners – the quality of providing water and wastewater services has improved so the public partner fulfilled its task. For the French company it allowed for expanding for more markets making the profits and planes to reach other markets in Poland.

## 5. Conclusions and comments

### 5.1. Summary

The aim of this dissertation was to analyse and compare the development of the PPP models used both in Poland and Portugal, focusing particularly on the drinking water and wastewater sector. Two case studies were analysed highlighting the two different models of PPP projects. Furthermore, for both countries an example case study was provided to show how a PPP project life cycle looks like in the water sector.

The analysis of both markets revealed that both countries are at a different stage of PPP development. Portugal had an early start, having its first projects dated back to the 70s, while Poland started its PPP project development in the early 90s. This gives Portugal around 20 more years of know-how, both in good and bad experiences. However, the Polish late start allowed the country to have a much smoother development of projects when compared to Portugal. Hundreds of successful and unsuccessful examples created strong foundations and guidelines on which Polish could improve upon.

On the other hand, Portugal was one of the precursors in the development of the European PPP market, having to conquer new ways and learn from its own mistakes how to develop the best solutions and the successful routes of project management.

Nowadays the Portuguese PPP market can be considered one of the most developed in Europe, and it is very often looked upon as an example for the start-up countries, since it has experienced both the successes and failures in project management. PPP arrangements have significantly influenced the development of the country infrastructure; in the period of 10 years starting in 1997 almost 2000 km of new roads have been built.

Nevertheless, this exponential growth boom did not come without problems; in the case study provided, the major problem is the time to payback all the obligations to the private partner. Right now Portugal is entering its highest pick of paybacks since it has entered the PPP market. Additionally, due to the economic crisis that strongly affects the country at the moment, the PPP market has ceased its expansion, all new PPP projects have been stopped and the present ones are under a tight supervision.

On the contrary, Poland is a country where the PPP market is still very fresh and where doors have only now started to open. There are more and more institutions appearing and promoting PPP throughout the country in association with the government; the number of projects being undertaken through this method is rising as never before, but for now the large bulk of the market are only small

projects, like construction of parking lots or sport and recreation facilities. Poland seems to be on the verge of a full adoption of PPP projects as the main method of public-private cooperation.

It is understandable that the long experience in Portugal makes people less afraid of committing to PPP projects, which reflects in the number and scale of the projects. In contrast, Poland has started only few years ago dealing with PPP and even though right now there are a lot of international case studies and institutions helping in the field, the opinions about this model have not changed yet. According to the newest market studies, almost 60% of public institutions stated that they are not ready for the cultural and internal changes that PPP schemes bring. Also, despite the fact that most of those institutions have heard about PPP arrangements, only 4% of them have implemented this scheme of public procurement.

Looking only at the drinking water sector, the differences in the involvement level of the private sector become even more visible. The numbers speak for themselves – in Poland the private companies' participation is estimated at 2% while in Portugal more than 20% of the drinking water and wastewater services are supplied by private partners. In addition, the structure for providing these services is different. In Portugal bulk services are very popular, big areas are served by just a few companies and are then supervised by the government; in Poland that situation does not occur, and usually municipalities deliver services to very small regions.

The rapid development of the drinking water and wastewater sector and the private involvement in Portugal could be noticed even more after the creation of the Regulatory Institute for Water and Waste (IRAR, later ERSAR). Starting in 1994, until 2009 there were 32 big public-private partnership projects signed which translates into two PPP projects per year, just in this sector.

Unfortunately in Poland there is no countrywide regulatory body as in Portugal and every municipality is responsible for its own services supply. This kind of entity would for sure help in guiding and improving the development of the sector. Only three PPP projects were signed in the sector in the last 3 years, however their financial scale and period of activity are almost insignificant.

While in Portugal the implementation of PPP in the drinking water and wastewater sector can be described as having taken place in a friendly way, in Poland there is no easy way of access for private partners. The sector in Poland is still closed and private partners comment that public institutions are not willing to open the water sector to private participation. Additionally, the public opinion has a very big input, since people are against the sector privatisation for fear of higher prices for the utilities. However, it is predicted that with time this situation will slowly change and become more open and an optimistic investment for private investments.

In addition to achieving the main goals of this work – the comparison of the PPP markets in Poland and Portugal, in particular the water utilities sector, it is also important to point out some lessons learned. These are the recommendations made by the author.

One of the sides this work shows is the complexity of PPP arrangements, where additionally through the use of the case-studies it was possible to denote many important aspects of this method of cooperation. Each municipality should carefully analyse if it is ready for this kind of cooperation, and, if the inhabitants of its region are, since it is them directly going to use the services of private company. From the Polish case-study we can learn that the opinion of public is very important and can be strongly negative. Therefore, it would be recommended for the municipalities to prepare people well in advance for possible future changes. It could be made in a form of debates, educating actions, leaflets, posters and other, with the aim to make people aware of what will happen. If this people will feel they are part of the project, the probability of success greatly increases.

It is advised for municipalities to take caution while undertaking a PPP cooperation, especially while not having the experience before. In the both analysed countries there is a long list of institutions supporting and helping new entries in the PPP market, therefore the first step for the municipal authorities should be to learn from them what the PPP model is, what are the possible variants to use, run any needed analyses. And only then when the municipality is ready, even if it would take a couple of years, it can try to apply this method. Very often that institutions offer also special trainings to participate in. Additionally it is also recommended to get the knowledge transfer from others. The simple rule should be applied: the more research there is, the better the model will be applied.

There is one more issue about which the municipalities' majors should be fully aware. PPP arrangements are known as a "tool" to not pay to the private partner at the specific moment, but only in the future. It might create the illusion for the elected mayors that they can do whatever they want to, since the new project would not overflow the predicted and available budget. These "present" mayors should plan far into the future, to not leave their successors with just debts to pay back and no money available to run new investments, very often necessary ones. The best example here to learn from is Portugal, which might have run to many PPP projects in general in the last years and right now is facing the highest pick of paybacks.

Moreover, it is important for the both partners to be flexible during the time of the contract. The Polish case-study shows that even if the municipality is cooperating with the private partner it is still possible to get the supporting grant from the another institution (such as EU funds). This lesson draws an advised for municipalities to carefully analyse all possible scenarios, to not miss any good opportunity and to not be afraid to take an effort to try.

This dissertation was a very interesting research which allowed for comparing two countries characterised by different cultures and points of view, but at the same time some similar aspects can

be found. It allowed for a better understanding of the PPP mechanism in each of the countries. However, not everything was easy; during the development of this work some difficulties were met, being the biggest the lack of homogeneous concepts in both countries. It created difficulties in understanding not only the different concepts but also in identifying differences and similarities between the countries.

## **5.2. Recommendations and future studies**

In the case of further expanding the work developed in this paper, one of the main areas of focus would be the deeper exploration of the Polish situation. The non-existence of a regulatory institution creates a decentralized storage of data related to the sector which makes it difficult to know exactly the full and complete state of all the institutions in the country. There are around 2.5 thousand municipalities, each of them being responsible for its own water utilities system. The only way to collect the general data for full country would be to directly contact each municipality and conduct individual interviews. It would not be an easy work but the collection and treatment of this data would provide an immense knowledge of the real state of the sector and could lead to a further importance of PPP projects in Poland.

Another point of interest that could be better explored is the comparison of the management models in delivering this service. Both countries are quite similar in this aspect, however the amount of legislation in both countries is very extensive, and usually different names are used for similar concepts. A careful analysis to compare the legislation and identify all the overlapping concepts would provide a definitive overview of how the management models in both countries truly operate.

Additionally, the risk management in the case-studies part could be analysed more deep. This work contains just one risk matrix made for the both case-studies, however it is recognised and recommended to do two separate risks matrix. Moreover, one more risk was recognised – the political risk. Since there is a public entity involved in the cooperation, it is one of the most important risks in the PPP arrangements. Nevertheless, due to the lack of access to that information the analysis of this risk was omitted in this analysis.

Moreover, considering the amount of existing PPP projects both in Portugal and Poland, it would also make sense to analyse in higher detail a few of them, providing a wider basis for comparing not only both countries, but also for the projects within each country.

This work shows many aspects of the water utilities sector which should be analysed, what lessons should be learned and as outcome created a good base to do so. However in the same time while drawing the conclusions, the author of this work realizes how much more can be explored in this area and that this research is just a tip of the iceberg.

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## Annexes

### A. PPP arrangements versus typical procurement model

**Table 17.** PPP arrangements versus typical procurement model.<sup>133</sup>

Typical procurement model	Public-private partnership (PPP)
<b>Project specifications</b>	
Public authority sets out the specifications and design for the facility	Public authority specifies its requirements in terms of “outputs”
<b>Facility operator payment</b>	
Infrastructure operator is the public entity, so there is no payment for the operator, private partner is paid just for the construction of it	A private partner receives payments (“service fees”) over the life of the PPP contract
<b>Facility funding</b>	
Full cost of construction is funded by public authority	The facility is being financed by private sector (some public funds might be added)
<b>Overrun costs</b>	
Usually all overrun costs are being paid by public authority	There is no allowance for overrun costs during construction or in operation of the facility.
<b>Handling of the project parts</b>	
Operation and maintenance of the facility are being fully handled by public authority	Design, finance, build and operate of the are being handled by private partner
<b>Risk division and responsibilities</b>	
Private partner takes no responsibility for the long term performance of the facility after construction-warranty period has expired	The risk is being borne by the parties who can better manage it (mostly by private partner)

<sup>133</sup> Own elaboration based on Yescombe, E. (2007). *Public-private partnerships: Principles of policy and finance*, p. 3-4.

## B. Yearly evolution of European PPP projects

The table 18 presents the number of signed contracts from 1990 to 2009, for projects with value of at least € 5 million.

**Table 18.** Yearly evolution of European PPP projects.<sup>134</sup>

Year	Number of projects	Value of projects (in € millions)
1990	2	1386.6
1991	1	73.0
1992	3	610.0
1993	1	454.0
1994	3	1148.4
1995	12	3264.9
1996	26	8488.2
1997	33	5278.0
1998	66	19972.4
1999	77	9602.6
2000	97	15018.5
2001	79	13315.3
2002	82	17436.2
2003	90	17357.1
2004	125	16879.9
2005	130	26794.3
2006	144	27129.2
2007	136	29597.9
2008	115	24198.0
2009	118	15740.4
Total	1340	253744.9

<sup>134</sup> EIB (2010). *Public-private partnerships in Europe – Before and during the recent financial crisis*, p. 7.

### C. Regional Water Management Boards in Poland



**Figure 20.** Regional Water Management Boards with the network of main rivers.<sup>135</sup>

<sup>135</sup> <http://www.kzgw.gov.pl/pl/Regionalne-Zarzady-Gospodarki-Wodnej.html>, accessed 29/05/2012.

## D. Drinking water supply services in Portugal, categorised by management model

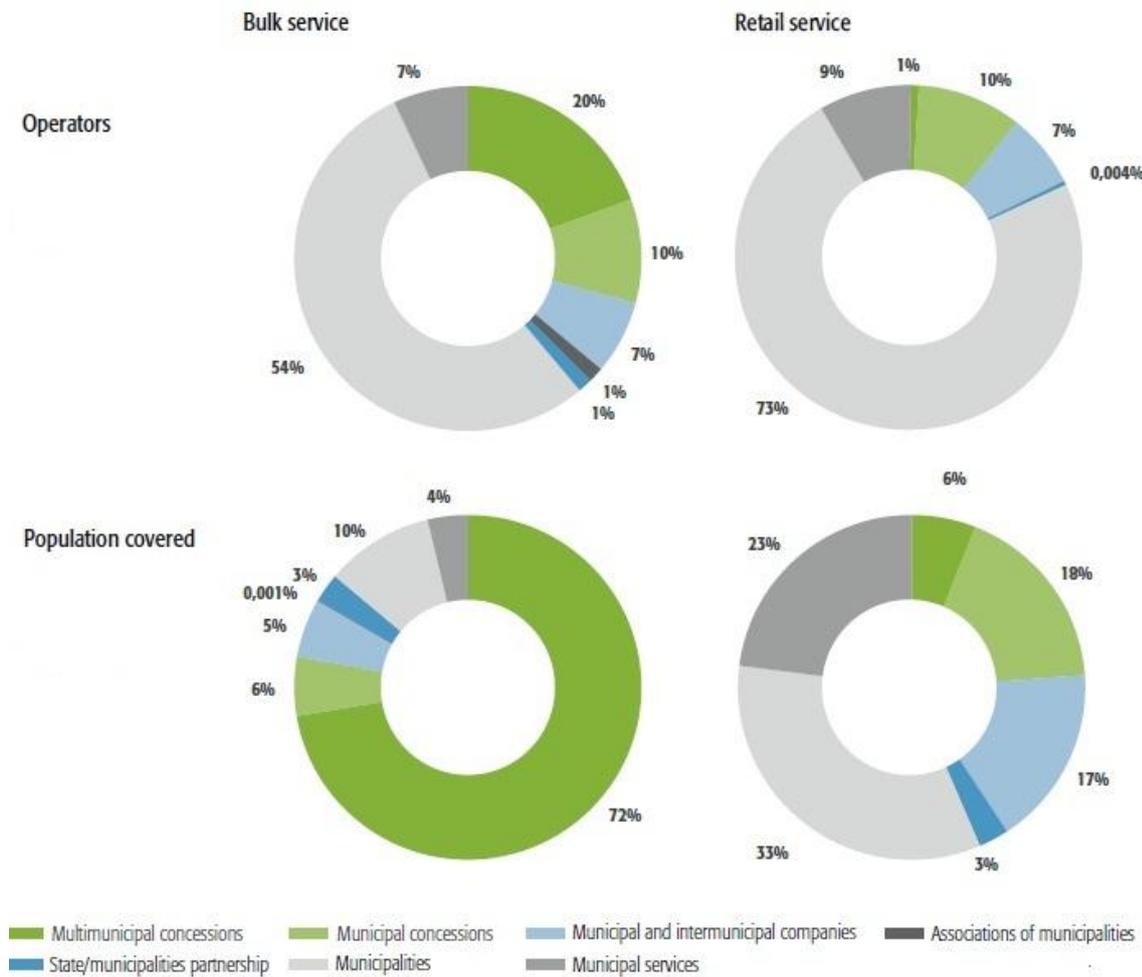


Figure 21. Drinking water supply services, categorised by management model.<sup>136</sup>

<sup>136</sup> ERSAR (2010). *Annual report on water and waste services in Portugal 2009*. Op. cit., p. 30.

## E. Wastewater management services in Portugal, categorised by management model

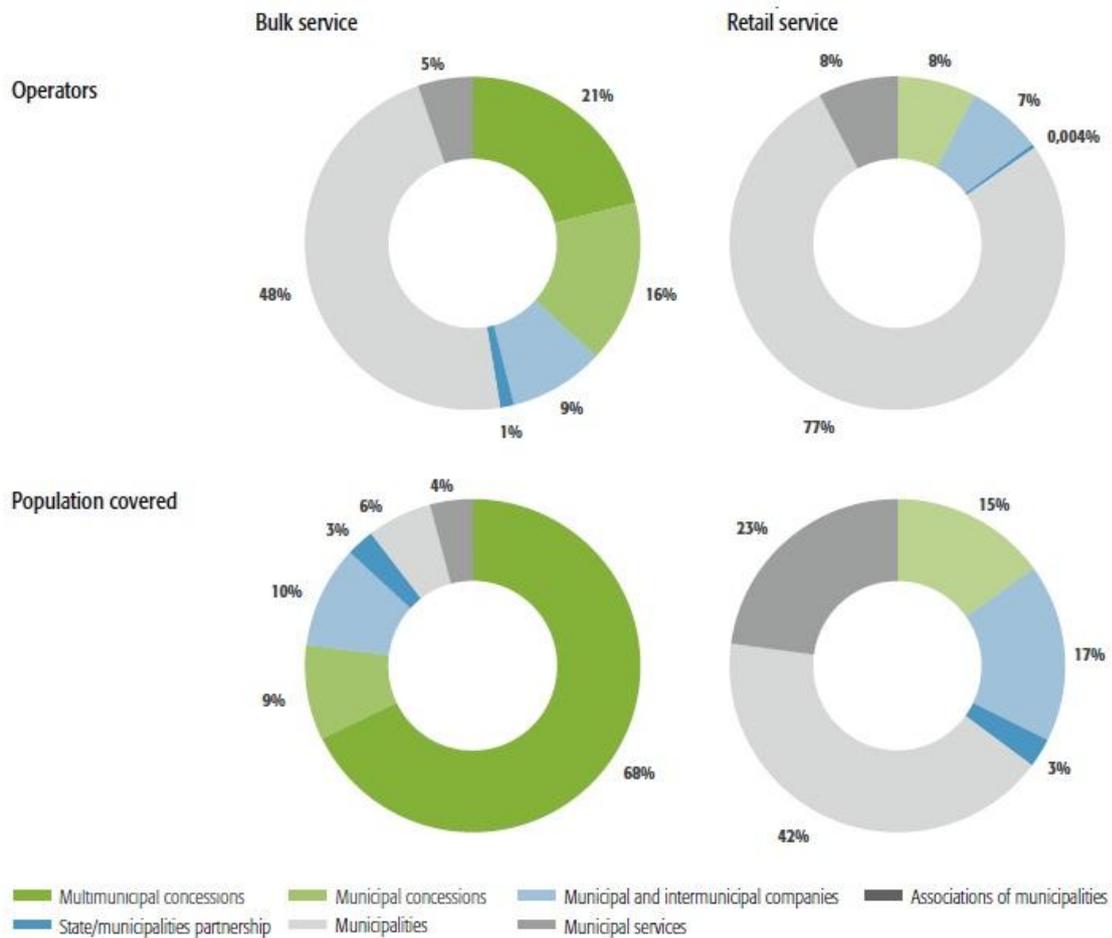


Figure 22. Wastewater management services, categorised by management model.<sup>137</sup>

<sup>137</sup> ERSAR (2010). *Annual report on water and waste services in Portugal 2009*. Op. cit., p. 32.