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What discount rates should the Public Sector adopt in a Public Private Partnership?

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Resumo (Português)

O conceito de parcerias público - privadas tem chamado a atenção dos economistas e Governos nas últimas décadas, onde sucessos e fracassos coexistem em todo o Mundo na esperança de atingir o Value for Money. A definição, conceitos e os objectivos das parcerias público - privadas serão abordadas na generalidade da tese. A taxa de desconto que o sector público deverá adoptar numa parceria deste tipo é uma discussão global e a questão principal abordada nesta tese. Não será concluído se a parceria público - privada deveria ser ou não realizada. Há muitas perspectivas diferentes relativas às várias taxas de desconto a utilizar, mas, neste caso, apenas serão abordadas três taxas distintas e será construída e analisada uma estimativa relativa ao valor actual dos pagamentos futuros efectuados pelo Governo às empresas privadas que têm contractos no formato de parceria público – privada.

Executive Summary

The concept of Public Private Partnerships has brought attention to the economists and Public Parties on the last few decades, where success and failure have occurred all over the world, where Governments search for the objective of Value for Money. We will define what a Public Private Partnership is and what are their main goals and conceptions. What discount rate should the Public Sector adopt in a Public Private Partnership is a global discussion nowadays and the main issue on this paper. We will not consider if a Public Private Partnership should or should not be realized, on the other hand we will try to create some scenario basis for the Portuguese experience. There are many different approaches and in this paper we will take a look to three different approaches and develop an estimate through the future payments in the next 50 years of Portuguese governments' payments to the private sector.

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1) Introduction

Governments in order to lead countries in the pursuit of economic wealth, deliver goods and services in different kinds of way. Since some decades ago, governments would produce and provide many trying goods and services, but nowadays there has been a continuous trend with governments trying to boost their value for money by using Public Private Partnerships as a solution to achieve it.

In Europe there is a long experience with Public Private Partnerships, in sectors, such as, water, transportation, energy, education (schools and colleges), health services, etc.

Portugal has an important experience that started under the construction of the giant Vasco da Gama Bridge in 1995. Portugal has Public Private Partnerships in the road sector, and has moved to sectors like water, subways and hospitals.

In a Public Private Partnership, the government establishes a long-term contract with a partner from the private sector to deliver goods or a service. The private partner will be responsible for building, operating and maintaining assets that are necessary to deliver such goods or services. (OECD, 2008)

The main discussion in this paper will focus on what discount rates should be applied in the discount of the future cash flows from the public sector perspective. Some work has been developed on this issue especially from Spackman, Grimsey, Shaoul and Grout. (2002-2005)

We will try to use previous experiences of the discount flows methods and calculate discount rates that could be applied to the Portuguese experience.

2) A brief review of literature

2.1) Important concepts

Over the last few decades, governments from different countries have been developing new strategies regarding the use of Public-Private Partnerships.

Public-Private Partnerships fill a gap between traditionally procured government projects and full privatization, with the government retaining ultimate responsibility over a Public-Private Partnership. (Grimsey and Lewis 2005)

According to the Organization for Economic Co-operation and Development there is currently no clear definition of what constitutes a Public-Private Partnership. (OECD 2008)

One definition can be found by Organization for Economic Co-operation and Development: "*a Public-Private Partnership is an agreement between the government and one or more private partners (which may include the operators and the financers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners.*" (OECD 2008)

As for the International Monetary Fund definition is: "*Public-Private Partnerships refer to arrangements where the private sector supplies infrastructure assets and services that traditionally have been provided by the government. In addition to private execution and financing of public investment, Public-Private Partnerships have two other important characteristics: there is an emphasis on service provision, as well as investment, by the private sector; and significant risk is transferred from the government to the private sector. Public-Private Partnerships are involved in a wide range of social and economic infrastructure projects, but they are mainly used to build and operate hospitals, schools, prisons, roads, bridges and tunnels, light rail networks, air traffic control systems, and water sanitation plants.*" (IMF, 2006:1 and 2004:4, pg. 17)

The mechanics of the arrangements can take many forms and may incorporate some or all of the following features (Pierson and McBride, 1996):

- the public sector entity transfers land, property or facilities controlled by it to the private sector entity (with or without payment in return) usually for the term of the arrangement;
- the private sector entity builds, extends or renovates a facility;
- the public sector entity specifies the operating services of the facility;
- services are provided by the private sector entity using the facility for a defined period of time (usually with restrictions on operations standards and pricing); and
- the private sector entity agrees to transfer the facility to the public sector (with or without payment) at the end of the arrangement.

2.2) Value For Money

The main achievement of a Public-Private Partnership is Value for Money (Grimsey and Lewis, 2005).

According to Grimsey & Lewis, Value for Money can be summarized in six main determinants: Risk transfer, the long-term nature for contracts, the use of an output specification, competition, performance measurement, incentives and private sector management skills.

The achievement of Value for Money, as can be seen as: "*the optimum combination of whole life cost and quality to meet the user's requirements"*. (Grimsey and Lewis 2005)

There are three specific requisitions that should be guaranteed. Firstly, projects must be awarded in a competitive environment. Secondly, economic appraisal techniques, including proper appreciation of risk, must be rigorously applied, and that risk is allocated between the public and private sector so that the expected Value For Money is maximized. Thirdly, comparisons between traditionally procurement and privately financed options must be fair, realistic and comprehensive. (Grimsey, Lewis 2005)

Usually a Public-Private Partnership project depends upon two financial criteria: Value for Money must be demonstrated and the scheme must be affordable to both the government and the purchasers. Both are central to the financial appraisal process. However, while Value for Money is substantiated with the use of discounted cash flow techniques, affordability is less clearly defined and operationalized as a decision role. (Shaoul, 2005)

According to Shaoul (2005), a specific methodology of Value for Money has to be undertaken. It is the primary criterion. In the context of public finance, it is associated with the three Es, economy, efficiency and effectiveness. Value for Money is assumed to be measured using the concept of net present costs, a variant of the net present value technique. The financial costs of the whole life of the projects as financed under conventional procurement, known as the Public Sector Comparator, are discounted to yield a Net Present Cost, and compared against the Net Present Cost of the project as procured under a Public-Private Partnership. Following the Net Present Value rule whereby the investment with the highest Net Present Value is preferred because it maximizes wealth, the option with the lowest Net Present Cost is selecting as yielding the greatest financial benefit. It does consider that:

1 - The suitability of discounted cash flow techniques in the context of public sector investment;

2 - The choice of the discount rate;

3 - The choice of the Public Sector Comparator; and

4 - The risk transfer that lies at the heart of the justification for Public finance initiative.

2.3) Public Sector Comparator

Public Sector Comparator is the calculation of the benchmark cost of providing the specified with the same output and quality defined for the private service under traditional procurement and, second, a comparison of this benchmark cost with the cost of providing the specified service under a Public-Private Partnership scheme. (Grimsey and Lewis 2005)

According to Grimsey and Lewis four main alternatives can be discerned. Most complex to the least:

1 - Full cost-benefit analysis of public and private alternatives (obtaining a Net Present Value);

2 - Public Sector Comparator - Public-Private Partnership comparison before bids are invited;

3 - UK Style Public Sector Comparator - Public-Private Partnership test after bids; and

4 - Competitive bidding process to determine Value for Money once Public-Private Partnership "road testing" has been established.

The calculation of the Public Sector Comparator promotes full costing at an early stage in project development; it provides a key management tool during the procurement process by focusing attention on the output specification, risk allocation and comprehensive costing. It also provides a means for testing Value for Money; it is a consistent benchmark and an evaluation tool. It can encourage competition by generating confidence in the market that financial rigor and probity principles are being applied. (Grimsey and Lewis, 2005)

To be a proper and valid comparative model of traditional procurement, the Public Sector Comparator calculation must be prepared under the same assumptions as the Public-Private Partnership, in terms of: timing, funding, procurement costs, and output specification and performance standards. (Grimsey and Lewis, 2005)

Regarding timing and funding respectively, Shaoul (2005) explains that it is assumed that the costs of public sector investment have to be met in the year in which they occur: in other words, the option for the public sector of spreading costs over time through financing is ignored. This is important because the discounting methodology favors options that defer expenditure over those which have high costs in early years, creating an artificial advantage for Public Finance Initiative options, where costs are spread over period of 20-35 years.

In both UK and Australia, Public Sector Comparators are generally categorized into four core elements:

- Raw Public Sector Comparator (base costs);

- Transferable Risk (the optimal allocation of risk is the key objective of all Public-Private Partnerships and value transferable risk needs to be included in the Public Sector Comparator);

- Retained risk; and

- Competitive neutrality.

Some criticism has been made about the Public Sector Comparator model approach, Grimsey & Lewis divided in four general concerns. Firstly, the Value for Money evaluation usually comes down to a choice between two Net Present Values. Public Sector Comparator is entirely hypothetical, and it is value can be altered by the assumptions made, especially about risk transfer to the private sector. Is by definition a rough estimate compared with a fully specified, fixed price Public-Private Partnership contract. (Shaoul, 2005) Secondly, the Discount rate methodology is faulty. It does not provide a measure of social time preference. Because of the discounting inherent in calculating Net Present Values, even small changes in the discount rate applied will vary the outcome as to which scheme is the best Value for Money. Thirdly, irrespective of how much risk is transferred to the private sector, the main risks are still held by the public sector and costs fall upon the general public. Further the real issue is uncertainty and not risk. Finally, in a longer term evaluation non-financial elements are given more emphasis.

2.4) Risk Transfer

This is an important concept of a Public-Private Partnership, but it will not be set in practice in this paper. According to Shaoul (2005), as well as the financial costs, the comparison includes the cost of the risks associated. There are some risks that are transferred to the private sector, the Public-Private Partnership should provide better Value for Money than if it was traditionally procured, and where the public sector would bear all the risks. Only until a specified level the more risk is transferred, the more expensive the Public Sector Comparator becomes relative to the Public-Private Partnership option. (Shaoul, 2005)

3) Questions about the Discount Rate

The next and most important issue in this paper is the discount rate that will be used in the Value for Money test. In the preparation of the Public Sector Comparator, a financial model of the project is prepared and developed, in this model is included all the forecast of the future cash flows related to the project, assuming that it is carried out in the public sector. (Grimsey and Lewis, 2004)

It is standard practice in private and public project or policy analysis to discount costs and benefits over time, usually at a constant percentage rate per year. (Spackman, 2008)

Between the economics literature there is a broad agreement, firstly, for the use of discount rate that are lower than in the private sector, but in fact all of these assumptions lack of theoretical rigor, and secondly, there should always be chosen a series of discount rates to test the sensitivity of project outcomes and thirdly against the use of opportunity cost approaches. (Shaoul, 2005)

What discount rate should be used is a global discussion among the academics and practioners, and the main discussion of this paper. Therefore, and according to Sarmento (2009), there are five main approaches: Social Rate of Time Preference; Social Opportunity Cost of Capital; a hybrid of the "social rate of time preference" and the "social opportunity cost of capital"; Equity Premium and Risk-free Interest Rate.

3.1) Social Rate of Time Preference

The discount rate should reflect government policy preferences, using a "social rate of time preferences".

According to the Green Book (Grimsey, 2004), social time preference can be defined as the value society attaches to present, as opposed to future consumption. The social time preference rate is used for discounting future benefits and costs, and is based on comparisons of utility across different points in time or even different generations. It can be defined in two components:

1. The rate at which individuals discount future consumption over present consumption, on the assumption that no change in per capita consumption is expected.

2. There is an additional element, if per capita consumption is expected to grow over time, reflecting the fact that these circumstances imply that future consumption will be plentiful relative to the current position and thus have lower marginal utility.

This effect is represented by the product of the annual growth in per capita consumption and the elasticity of marginal utility of consumption with respect to utility. With the first component estimated at 1.5% per annum, and the second at 2% per annum, the social time preference is valued at 3.5% per annum in real terms. (Grimsey and Lewis, 2004)

According to Spackman (2008), Social Time Preference is normally defined as the time preference of the population as a whole for marginal income or consumption. The authors that have studied about the Social Time Preference as a discount rate for the public sector were Eckstein (1958) and Feldstein (1964) and later an influential paper by Bradford (1975). Others like Arrow and Kurz (1970) developed a powerful book. All these different authors adopted the principle that the social value of a public investment is the present value of all its impacts on consumption, discounted at the Social Time Preference rate for consumption. (Spackman, 2008)

As the basis for deriving the rate of Social Time Preference this particular equation should be applied (1):

(I) $STP = \delta + \eta g$ (1)

Where δ = pure time preference, per cent per year;

η = income elasticity of the marginal utility of income (with sign reversed);

and g = rate of growth of per capita income, per cent per year.

The algebra is well set out by Feldstein (1965). The term δ - time preference for marginal utility - defines the extent to which the current population (or its government) cares about future marginal utility. The term ηg measures the extent to which the utility of a marginal dollar declines with increasing income. Note that the Social Time Preference rate can equally be applied to other monetary currencies, such as € (Euro), as long as all the quantities are expressed in, or converted to the same currency. (Spackman, 2008)

According to Spackman (2008) valuation of δ and η is not straightforward. However there is a broad agreement in the literature to derive practical values for most developed countries. (Spackman, 2008)

According to Arrow (1995) this approach is well known and was noted several times at the high powered United States workshop on long term discounting reported in Portney and Weyant (1999) - most clearly in the paper by Cline. Meanwhile there is some controversy about the value of δ and some extent the value of η, and on the extent to which conventional discounting, even with declining rates over time, is adequate for unknowns, over a very long term, such as, those associated with climate changes (Weitzman, 2008).

Grimsey (2005), consider that the discount rate have two elements:

First, Social Time Preference Rate, in the 2003 edition of the Green Book (HM Treasury, 2003) a discount rate of 3.5% in real terms was introduced, based on what it regards as social time preference (i.e. the pure time value of money from society's viewpoint).

This change in the policy was described by the United Kingdom treasury: "Instead of reflecting risk in a risk premium on capital, Government investment decisions reflect risk by calculating the present value capital sum it regards as the necessary contingency for the risks inherent in a project. For example, when deciding between procurement options, project managers calculate an expected value of all risks for each option, and consider how exposed each option is to future uncertainty. They then discount the cost of these options in future years at 3.5% per year to a present value, which purely reflects society's preference for consumption now over consumption in the future, rather than discounting the value of project cash flows at a higher rate to make a compensation for risk. Risks are therefore priced individually for each project option. The discounted costs of these risk-adjusted options can then be compared with each other, or with the cost of a PFI (same as Public-Private Partnership), in a PSC, to determine which procurement option represents Best Value for Money taking account of risk and uncertainty. This approach is consistent with the fact that in conventional procurement the public sector pays for risk not in its borrowing - which for the public sector is at non-risk rates - but when risks crystallize and must be covered in publicly funded projects." (Treasury, 2003b, p.42)

According to Shaoul (2005), it is interesting to note that when the Conservative United Kingdom government adopted the Social Time Preference general approach in 1982, it was assumed that the discount rate for use in the public sector investment appraisal should be a test rate of 5%, a rate that was higher than the 2-4% that was preferred by welfare economists, at a time when interest rate were at an all high.

Second, there are some other factors, mainly to ensure that the public sector does not assess the benefit of projects without taking account of the risk to which it exposes taxpayers in the process (as an example, if things go wrong in a project additional costs may occur). (Sarmento, 2009)

According to Spackman (2002), the United Kingdom's Treasury's Guide on Appraisal and Evaluation (HM Treasury, 1997, Annex G) makes a distinction between the rate of social time preference and the cost of capital. It would probably be unmanageable for any government to administer different general rates for these two quantities. Spackman (2002) reinforces saying that it would be computationally complicated, and probably generate endless confusion.

However, it is essential to distinguish between time preference and cost of public capital.

According to Spackman (2008), Italy uses a theoretical basis of discount rate based on Social Time Preference, 5% in real terms.

3.2) Social opportunity cost of capital

Derivates from the first one, it is argued that the discount rate should reflect the "social opportunity cost of capital".

According to the economics dictionary, social opportunity cost is "the opportunity cost to the society of making a certain good or service, at the expense of using the factor of production for a different good or service." (www.economics-dictionary.com)

In 1991 UK's Greenbook changed their position on the discount rate. Firstly, it was argued that the marginal opportunity costs of capital, as well as, the Social Time Preference were really relevant to the investments decisions in the public sector. Secondly, both were higher than the government's cost of capital and thirdly they were for practical purposes equal. The United Kingdom's government was seeking for a single discount rate, mainly to achieve two different purposes. Firstly, it required the discount rate to equal the social opportunity cost of capital, and thus, in effect, settled on a rate identical to the then prevailing "pre-tax long term cost of capital

for low risk purpose in the private sector". (Treasury, 1991, Annex G, para 2) According to Spackman (2002): "prevent any bias in favor of public sector financing". (Treasury, 1991, para 49) Secondly, the discount rate was supposed to provide a measure of the Social Time Preference when comparing the net present costs of different ways of financing public sector investment. Spackman (1991) set the social time value of money in the range of 4-6%.

3.3) - Is a hybrid of the "social rate of time preference" and the "social opportunity cost of capital"

For most practical purposes, the appropriate cost of public capital is the sum of the tax-exclusive real interest cost of government debt, it's a factor for 'systematic risk', because the quantum of tax paid on marginal returns to private sector capital. UK's Treasury guidance originally drafted when real interest rate were much higher than today's, it is suggested that this cost of capital is in the same range of plausibility as social time preference. (Spackman, 2002) Tax component estimation is very often complex.

The Treasury's derivation of social time preference follows the mainstream welfare economics rationale for giving less weight to marginal consumption in the long-term rather than the short-term. It is suggested that a normal range is 4-6% per year in real terms. Time preference is the appropriate discount rate for most government applications. (Spackman, 2002)

However the adjustment for UK tax, combined with the adjustment for risk, cannot easily justify adding more than about 1 percentage point to the cost of indexed gilts, which in early 2002 was 2-2.5%. (Spackman, 2002)

According to Spackman (2008), he suggests the use of social opportunity cost / Social Time Preference weighted discount rate, and it is sometimes presented as obvious that the opportunity cost of public investment is measured by the commercial rate of return that would be earned on private investment. Meanwhile, there are some fundamental problems.

A first issue is the fact that within the growth of international financial markets, public investment will not have a big impact on private investment. Lind (1990) concluded that, "the crowding out [of private investment by public investment] that has been the focus of most of the closed economy models does not appear to be very important to the analysis of the social discount rate".

Secondly, there has to be a macroeconomic optimization, ensuring that taxation and borrowing are balanced. A competent government guarantees that the social costs of marginal taxation and of marginal borrowing are equal. (Spackman, 2008)

Another weakness is the fact that the opportunity cost of public investment is not completely measured by a rate of return. In fact the true opportunity cost is the present value of the stream of consumption displaced by the tax (or borrowing) used to fund the public spending. (Spackman, 2008)

Arrow (2000), responded to a two page argument by a Harvard professor for the use of a 10% Social opportunity cost rate in an article on climate change, he commented that "for these two reasons [tax and risk] the observed rate of return in the private sector is not the correct one for assessing public investment projects".

Spackman (2008) refers that, the use of a Social opportunity cost rate, or a Social Opportunity Cost /Rate of Time Preference weighted rate, "has a strong intuitive appeal, which is easily sold to senior administrators or ministers, and it remains influential in many countries and international bodies, at least for presentational purposes. As an example, the United States Office of Management and Budget rate for comparing public investment with subsequent benefits in kind of 7% (OMB, 2003) is presented as a Social Opportunity Cost rate. On the other hand, UN (Economic Commission for Europe, 2003) and the World Bank (Birdsall and Steer, 1993) also, for comparing public investment with subsequent benefits in kind, adopt Social Opportunity Cost or weighted rates.

The EC (European Commission, 2008) recommend the use of a Social Opportunity Cost rate for financial analysis, but as noted above this is a required financial rate of return to public sector commercial activities, not a social discount rate. (Spackman, 2008)

3.4) Equity Premium

Is the "equity premium", it is defined as the return that is earned by a risky security in excess of what is earned in a risk free security. For our studies the discount rate should be the pre-tax government borrowing rates.

According to Spackman (2002), the cost of senior debt to Public-Private Partnership projects is typically 2-3% points above the cost of government debt (including the cost of insurance to achieve AAA rating). The average equity premium is itself controversial. (Spackman, 1997)

The perfect capital markets view is that equity premium has been over 5%. Spackman refers that

the premium is much higher than the cost of systematic risk to publicly financed projects and it is also described as the "equity premium puzzle".

3.5) Risk-free interest rate

This is the last approach, it uses the risk-free interest rate of the country depending on the maturity of the project.

According to Damodaran, models of risk and return in finance start off with the simple presumption that there exists a risk free asset and that the expected return on that asset is known.

Damodaran refers that they are two conditions to be a risk free rate:

1 - There can be no risk default associated with its cash flows and

2 - There can be no reinvestment risk

It's important to refer that in the 1970s these approaches were followed by a financial market approach called Efficient Financial Markets. According to Spackman (2008), in a competitive market, equity risk premiums measure a cost of "systematic risk". It is the risk of volatility that is correlated with the equity market average volatility or, in other words, it cannot be diversified elsewhere. Economists believe that this premium measures an inherent social cost of the risk of the activity that will be financed. And if the activity is financed by public debt it makes small or no difference: the cost of systematic risk that would be revealed by the equity premium, if it were privately financed, it is still there (Brealey et al, 1997, Grout, 2003)

This approach implies that the appropriate discount rate for comparing its costs and/or benefits over time should be derived as it is in the private sector, with capital asset pricing model. In the Capital Asset Pricing Model the cost of capital for an activity is the sum of the risk-free rate and a risk premium equal to the equity market average risk premium multiplied by a factor (beta) reflecting the correlation between the expected return to the investment and the market average. (Spackman, 2008)

Grout (2003) refers that it's inappropriate to use similar discount rates for private and public provision in tests between public sector and Public-Private Partnerships. He emphasizes the use of lower discount rates in the public sector when comparing with the private sector.

In "Exhibit 1 – Discount rates table" we have resumed the five approaches, where we divided in: Approach, authors, calculation/formulas and characteristics.

Table 1 - Discount Rates Table

Approach	Authors	Calculation / Formulas	Characteristics
Social rate of time preference	Spackman (1997, 2002 and 2008), Shaoul (2005), Eckstein (1958), Feldstein (1965), Bradford (1975)	(I) $STP = \delta + \eta g$ Where δ = pure time preference, per cent per year; η = income elasticity of the marginal utility of income (with sign reversed); and g = rate of growth of per capita income, per cent per year of capital"	Value society attaches to present, as opposed to future, consumption. The social time preference rate is used for discounting future benefits and costs, and is based on comparisons of utility across different points in time or even different generations
Social opportunity cost of capital	Spackman (1997, 2002 and 2008) and Arrow (1970, 1995 and 2000)	Identical to the then prevailing "pre-tax long term cost of capital for low risk purpose in the private sector"]	Derivates from the first one, it is argued that the discount rate should reflect the "social opportunity cost of capital" . It required the discount rate to equal the social opportunity cost of capital.
Hybrid of the "social rate of time preference" and the "social	Spackman (1997, 2002 and 2008)	The appropriate cost of public capital is the sum of the tax-exclusive real interest cost of government debt	It is suggested that a normal range is 4-6% per year in real terms. Time preference is the appropriate discount rate for most government applications. (Spackman, 2002)
Equity Premium	Spackman (1997, 2002 and 2008)	Pre-tax government borrowing rates	The cost of senior debt to Public-Private Partnership projects is typically 2-3% points above the cost of government debt
Risk-free interest rate	Spackman (1997, 2002 and 2008)	Risk-free interest rate of the country depending on the maturity of the project	

4) Public Private Partnerships in Portugal

4.1.) Brief review

In Portugal Public Private Partnerships have started in 1995 with the Vasco da Gama Bridge, even before the creation of a specific legal framework.

Only in 2003 there was created a legal framework ("Decreto – Lei nº 86/2003) that could coordinate all Public Private Partnerships contracts. Its aim was to apply to all sectors the coordination of conception, building, operation, and the award of Public Private Partnerships. This legal framework was revised and improved in a new legal framework ("Decreto – Lei nº141/2006) particularly with regard to effectiveness of sharing risks and benefits between both sides of the contracts (Public sector and private bidder).

Public Private Partnerships are very common in Portugal, according to the DGTF (Direcção-Geral do Tesouro e Finanças) the department of GASEPC (Gabinete de Acompanhamento do Sector Empresarial do Estado, Parcerias Público-Privadas e Concessões) had in 2010 more than 120 ongoing projects. (DGTF, 2010)

The road sector represents the largest portion of concessions, more or less 41% of all concessions (PPP's Relatório 2010). The new projects of 2009 involve in the road sector the construction of 414km of new highways and the maintenance of older ones. In the Health Sector there are new hospitals that will upgrade some important areas, and in the environment sector there are two new projects: Resinorte and Simdouro.

4.1.1) Road Sector

There are new investments on the road sector. According to "Entidades gestoras de Projectos" there has been a rise of 1.649M in 2010 over 2009 on these investments which represent 74% of the total new investments. This is followed by the health and environmental sector that account with 15% and 11%, respectively.

In 2009 there have been some changes in the Portuguese legislation (Decreto – Lei nº110/2009), specifically about the concession policy with the Estradas de Portugal SA. This is the company that was granted the finance, conception, construction, conservation and development of the Portuguese highways.

Under the new policy of concession, Estradas de Portugal has to evaluate customer satisfaction on the highway service and report its findings to the public sector.

These highways were paid by the people who used them within a process of a virtual toll (scut) that was charged when the user was passing in a certain place. Nowadays, there has been a change of policy and the user pays the toll, in full.

Today there are in operation eleven highways; seven are under the SCUT Program (SCUT highways are under virtual tolls, whose costs are (were) supported by the Portuguese Government) and the construction and maintenance is the responsibility of a utility company. In construction there are eight highways, four of them were signed in 2009 (Baixo Alentejo, Baixo Tejo, Litoral Oeste and Algarve Litoral). In contest there is only one (Pinhal Interior).

4.1.2) Rail Road Sector

Within the Public - Private Partnerships, it is important to refer that the project of a TGV of Lisbon-Porto and Lisbon-Madrid it has been discussed, but the new Prime Minister of Portugal says that it is cheaper to perhaps use TGV's funds to improve the rail road's that already exist, this option can be three to five times less expensive than the first option.

In operation there is the Lisbon-Setubal rail road that uses the Bridge 25th April whose private partner is Fertagus the other project is a small Metro that was granted to the Metro Transportes do Sul. At the end of 2009 there were 2 projects being considered: PPP1 - Poceirão/Caia and PP2 Lisboa/Poceirão.

4.1.3) Health Sector

The Portuguese Government has invested in this area in the last few years, being one of their priorities to achieve a better national healthcare service by investing in new hospitals and revamping older ones.

At the end of 2009 there were 4 new hospitals active: São Brás de Alportel, Centro de atendimento do SNS, Hospital de Cascais and Braga's Hospital. There are three new Public Private Partnerships in contest: Hospital de Vila Franca de Xira, Hospital Lisboa Oriental and Hospital Centro do Algarve.

Table 2 – Resume of all Projects in Portugal

Sector	Concession	Dealer	Year	Deadline	Investment
Transports	Concessão Lusoponte	Lusoponte,SA	1995	30	867,0
Transports	Concessão Norte	AENOR,SA	1999	36	879,2
Transports	Concessão Oeste	A-E Atlantico,SA	1999	30	453,5
Transports	Concessão Brisa	Brisa	2000	35	2.623,8
Transports	Concessão Litoral Centro	Brisal, SA	2004	30	550,7
Transports	Concessão Scut da Beira Interior (IP2/IP6)	ScutVias,SA	1999	30	628,3
Transports	Concessão Scut da Costa de Prata (IC1/IP5)	LusoScut Costa de Prata,SA	2000	30	320,7
Transports	Concessão Scut do Algarve (IC4/IP1)	EuroScut,SA	2000	30	228,5
Transports	Concessão Scut Interior Norte (IP3)	NorScut,SA	2000	30	504,1
Transports	Concessão Scut das Beiras Litoral e Alta (IP5)	LusoScut Beiras Litoral e Alta,SA	2001	30	718,4
Transports	Concessão Scut Norte Litoral (IP9/IC1)	EuroScut Norte,SA	2001	30	318,6
Transports	Concessão Scut Grande Porto (IP4/IC24)	LusoScut,SA	2002	30	492,5
Transports	Concessão Grande Lisboa	LusoLisboa,SA	2007	30	180,0
Transports	Sub-concessão Douro Litoral	AEDL,SA	2007	27	777,7
Transports	Sub-concessão AE Transmontana	A-E 21, SA	2008	30	535,9
Transports	Sub-concessão Douro Interior	Aenor Douro,SA	2008	30	641,7
Transports	Sub-concessão Tunel do Marão	A-E Marão,SA	2008	30	348,2
Transports	Sub-concessão Baixo Alentejo	SPER SA	2009	30	381,9
Transports	Sub-concessão Baixo Tejo	AEBT,SA	2009	30	270,1
Transports	Sub-concessão Litoral Oeste	AELO, SA	2009	30	443,6
Transports	Sub-concessão Algarve Litoral	Rotas do Algarve Litoral, SA	2009	30	165,1
Transports	Gestão Sist.Identificação Eléctrónico	SIEV - Sist. Id. Elect. de Veículos, SA	2009	25	n.a.
Transports	Metro Sul Tejo (1)	MTS,SA	2001	30	268,7
Transports	Transp. Ferroviário eixo-norte/sul (2)	Fertagus,SA	1999	11	900,0
Health	Gestão do Centro de Atendimento do SNS	LCS,SA	2006	4	4,0
Health	Gestão Centro Medicina Fisica Reabilitação Sul	GP Saúde	2006	7	3,0
Health	Gestão do H. Braga - Ent. Gestora do Edifício	Escala Braga, Gestora do Edifício SA	2009	30	122,0
Health	Gestão do H. Braga - Ent. Gestora Estabelecimento	Escala Braga, Gestora do Estabelecimento SA	2009	10	11,3
Health	Gestão H. Cascais-Ent. Gestora Estabelecimento	HPP,SA	2008	10	16,0
Health	Gestão H. Cascais - Ent. Gestora do Edifício	TDHOSP,SA	2008	30	56,0
Health	Gestão H. Loures-Ent. Gestora Estabelecimento	SGHL - Soc. Gestora do Hospital de Loures SA	2009	10	29,3
Health	Gestão H. Loures - Ent. Gestora do Edifício	HL - Sociedade Gestora do Edifíco SA	2009	30	84,6
Environment	Águas do Cávado	Águas do Cávado, SA	1995	30	108,2
Environment	Águas do Centro Alentejano	Águas do Centro Alentejano, SA	2003	30	75,8
Environment	Águas do Douro e Paiva	Águas do Douro e Paiva, SA	1996	30	452,7
Environment	Águas do Oeste	Águas do Oeste, SA	2001	30	294,8
Environment	Águas de Santo André	Águas de Santo André, SA	2001	30	130,3
Environment	Águas de Trás-os-Montes e Alto Douro	Águas de Trás-os-Montes e Alto Douro, SA	2001	30	418,4
Environment	Águas do Algarve	Águas do Algarve, SA	2001	30	457,3
Environment	Águas do Ave	Águas do Ave, SA	2003	33	376,0
Environment	Águas do Centro	Águas do Centro, SA	2001	30	177,0
Environment	Águas do Minho e Lima	Águas do Minho e Lima, SA	2000	30	164,8
Environment	Águas do Mondego	Águas do Mondego, SA	2004	35	232,0
Environment	Águas do Norte de Alentejano	Águas do Norte de Alentejano, SA	2001	30	93,8
Environment	Águas do Zézere e Côa	Águas do Zézere e Côa, SA	2000	30	286,0
Environment	Algar	Algar, SA	1996	25	60,7
Environment	Amarsul	Amarsul, SA	1997	25	70,1
Environment	Ersuc	Ersuc, SA	1997	25	87,7
Environment	Resinorte	Resinorte - valorização e trat. resíduos sólidos, SA	2009	30	190,8
Environment	Resiestrela	Resiestrela, SA	2008	30	34,1
Environment	Resioeste	Resioeste, SA	1998	25	37,0
Environment	Resulima	Resulima, SA	1996	25	31,6
Environment	Suldouro	Suldouro, SA	1996	25	52,9
Environment	Valnor	Valnor, SA	2001	29	24,8
Environment	Valorlis	Valorlis, SA	1996	25	31,0
Environment	Valorminho	Valorminho, SA	1996	25	14,1
Environment	Valorsul	Valorsul, SA	1995	25	291,5
Environment	Sanest	Sanest, SA	1995	25	201,6
Environment	Simarsul	Simarsul, SA	2004	30	235,9
Environment	Simlis	Simlis, SA	2000	30	75,0
Environment	Simria	Simria, SA	2000	30	313,7
Environment	Simtejo	Simtejo, SA	2001	30	536,3
Environment	Simdouro	Simdouro - Saneamento do Grande Porto, S. A	2009	50	72,0
Water	Barragem de Foz Tua	EDP	2008	75	340,0
Water	Barragens de Gouvães, Padreselos, Alto Tâmega, Daivões	IBERDROLA	2008	65	1.700,0
Water	Barragens do Fridão e Alvito	EDP	2008	65	510,0
Water	Barragem Baixo Sabor	EDP	2008	65	257,0
Water	Barragem Girabolhos	ENDESA	2008	65	360,0
Water	Barragem do Alqueva	EDP	2008	35	339,0

Sector	Concession	Dealer	Year	Deadline	Investment
Energy	Armaz. Subterrâneo de Gás Natural (Guarda)	Transgás Armazenagem, SA	2006	40	29,3
Energy	Distribuição Regional de Gás Natural (Lisboa)	Lisboagás GDL Soc. Dist. Gás Natural de Lisboa, SA	2008	40	578,0
Energy	Distribuição Regional de Gás Natural (Centro)	Lusitaniagás - Comp. Gás do Centro, SA	2008	40	289,3
Energy	Distribuição Regional de Gás Natural (Setúbal)	Setgás - Soc. Prod. Distrib. Gás, SA	2008	40	159,8
Energy	Distribuição Regional de Gás Natural (Porto)	Portgás - Soc. Prod. Distrib. Gás, SA	2008	40	307,4
Energy	Armaz. Regasificação de Gás Natural (Sines)	REN Atlântico, SA	2006	40	212,0
Energy	Armaz. Subterrâneo Gás Natural (Guarda, Pombal)	REN Armazenagem, SA	2006	40	114,9
Energy	Distribuição Regional de Gás Natural (Beiras)	Beiragás- Companhia Gás das Beiras, SA	2008	40	69,2
Energy	Distribuição Regional de Gás Natural (Vale do Tejo)	Tagusgás - Empresa Gás Vale do Tejo, SA	2008	40	66,5
Energy	Gestão Rede Nacional Transporte de Gás Natural	REN Gasodutos, SA	2006	40	753,0
Energy	Rede Eléctrica Nacional	REN-Rede Eléctrica Nacional, SA	2007	50	1.291,7
Energy	Exploração da Rede Nac. Distribuição de elect.	EDP-Distribuição Energia, SA	2006	35	1.808,3
Security	SIRESP	SIRESP - Redes digitais de Seg. e Emergência	2002	20	112,0
Port	SIRESP	Terminal de Contentores de Leixões SA	2000	25	68,6
Port	Terminal de Carga a Granel de Leixões	Terminal de Carga Geral e de Graneis de Leixões SA	2001	25	42,8
Port	Silos de Leixões	Silos de Leixões, unipessoal Lda	2007	25	6,2
Port	Terminal Produtos Petrolíferos	Petrogal, SA	2006	25	n.d.
Port	Terminal de Granéis Líquido Alimentares	E.D. & F. Man Portugal Lda	2001	15	n.d.
Port	Terminal Expedição de Cimento a Granel	SECIL - Comp. Geral de Cal e Cimento, SA	2001	15	n.d.
Port	Serviço de Descarga, Venda e Expedição de Pescado	Docapesca - Portos e Lotas SA	1995	25	n.d.
Port	Instalações de Apoio à Navegação de Recreio	Marina de Leixões - Associação de Clubes	1985	25	n.d.
Port	Exploração Turística-Hoteleira	Dourocais - Inv. Imobiliários SA	2001	20	n.d.
Port	Exploração Restaurante e Bar	Companhia de Cervejas Portuárias, SA	2000	20	n.d.
Port	Terminal Sul Aveiro	Socarpor - Soc. De Cargas Portuárias (aveiro), SA	2001	25	6,3
Port	Serviço de Reboque Aveiro	Tinita - Transportes e Reboques Marítimos, SA	2004	10	2,8
Port	Terminal de Contentores de Alcântara	Liscont - Operadores de Contentores SA	1985	57	362,2
Port	Terminal de Contentores de Santa Apolónia	Sotagus - Terminal de Contentores de Santa Apolónia, SA	2001	20	60,8
Port	Terminal Multipurpose de Lisboa	Transinsular, Transportes Marítimos Insulares, SA	1995	15	n.p.
Port	Terminal Multiusos do Beato	TMB - Terminal Multiusos do Beato Op. Portuárias, SA	2000	20	7,3
Port	Terminal Multiusos do Poço do Bispo	Empresa de Tráfego e Estiva, SA	2000	20	3,3
Port	Terminal de Granéis Alimentares da Trafaria	SILOPOR - Empresa de Silos Portuários, SA	1995	30	n.p.
Port	Terminal de Granéis Alimentares da Beato	SILOPOR - Empresa de Silos Portuários, SA	1995	30	n.p.
Port	Terminal de Granéis Alimentares de Palença	Sovena Oilseeds Portugal, S.A.	1995	30	n.p.
Port	Terminal do Barreiro	ATLANPORT - Sociedade de Exploração Portuária, SA	1995	30	n.p.
Port	Terminal de Granéis Líquidos do Barreiro	LBC - TANQUIPOR, S.A.	1995	30	n.p.
Port	Terminal do Seixal - Baia do Tejo	Baía do Tejo,S.A.	1995	30	n.p.
Port	Terminal Multiusos Zona 1	Tersado - Terminais Portuários do Sado, SA	2004	20	11,9
Port	Terminal Multiusos Zona 2	Sadoport - Terminal Marítimo do Sado, SA	2004	20	13,7
Port	Terminal de Granéis Sólidos De Setúbal	Sapec - Terminais Portuários, SA	1995	25	6,0
Port	Terminal de Granéis Liq. De Setúbal	Sapec - Terminais Portuários, SA	2003	25	3,7
Port	Terminal Contentores de Sines XXI	PSA Sines - Terminal de Contentores, SA	1999	30	336,5
Port	Terminal Multipurpose de Sines	Portsines - Terminal Multipurpose de Sines, SA	1992	25	103,6
Port	Terminal de Petroleiro e Petroquímico	Petróleos de Portugal - Petrogal, SA	2003	10	n.d.
Port	Serviço de Reboque e Amarração Sines	Reboport-Soc.Portuguesa Reboques Marítimos, SA	2002	20	n.d.
Port	Terminal de Granéis Liq. e Gestão de Resíduos	CLT - Companhia Logística de Terminais Marítimos, SA	2008	30	n.d.

Source: Entidades Gestoras de Projectos (2010)

4.2) Discount rates

In our tests we will use three discount rates.

First, we will use the legal discount rate defined by the Bank of Portugal of 6%. This rate was applied in Portugal since a 2003 government decision (Led by the Minister of Finance – Manuela Dias Ferreira Leite) to evaluate all projects with a 4% real discount rate and a 2% inflation rate ("Despacho nº13 208/2003).

Second, we will use the yield of Portugal long-term debt and we will use the discount rate that calculates the present value of the future payments (30 years) of the Portuguese debt, and we will assume 2008 prices. According to our calculations, the average yield was 4,8%.
Although this is a lower interest rate that the private sector would have, we will consider that this is an appropriated discount rate, once it represents the opportunity cost for public sector to make this investments in the budget and not, "off-balance sheet". If this investment would considered in the budget of the construction years, it would have increased the deficit and therefore, would also increase the need to raise public debt which pays on average a rate similar to the one used in this study. In fact, the interest rate of new public debt tends to follow the interest rate of treasury bonds of the same maturity in the secondary market.

And thirdly, we will use the Rate of Social Time Preference set on 5,5% for Cohesion countries (EU Benchmark), according to Kabarakis (2008), in the Cost-Benefit Analysis of investment projects Structural Funs Regulation 1083/06.

4.3) Data

In our tests we will be using the annual payments (cash flow payments) of PPP's referring to the State Budget of 2008.

Although more recent data is available (mainly the 2009 and 2010 payments are available both in the Budget Report, and in the Treasury PPP year report), we decided to consider the 2008 data, because:

1. In 2009, payments have started to consider the positive cash-flow after 2029 on the Brisa highway concession that will end by that time. As Brisa is a concession and not a Public Private Partnerships, the positive cash-flows after the end of the concession should not be included in the estimation of Public Private Partnership's net present value. The presence of this data would completely change this analysis. In fact, in the report of the 2011 Budget, the Parliament Technical Budget Unit (UTAO, 2010), has calculated that at constant prices and considering the new data, the net present value would be positive in 20 billion. The Unit have also considered that this value is very much related to traffic estimation for the year beyond 2030, to make it a more realistic.

2. The 2009 and 2010 data is available at constant prices (Orçamento do Estado, 2010), but no information on what is the year base and what was the deflator is available, making it difficult to analyze. Even assuming that they are discounted at the average inflation of 2%, this is a very low rate comparing with the interest rates that the Portuguese Republic is actually paying to finance it. Until 2008 prices are in a current base, making it possible to be discounted.

Table 3 - Annual payments to the public-private partnerships

	Roads sector				Train sector				PPP in health	Others	Total
Year	Roads with toll	Roadas without toll	Concessions	Subtotal	MST	Fertagus	RAV	subtotal			
2008	-185.8	667.4	-	481.6	24.4	11.6	0.0	36.0	11.7	31.0	560.3
2009	57.9	647.8	-240.3	465.4	66.3	11.0	0.0	77.3	138.8	41.0	722.5
2010	26.2	714.6	-2.6	738.2	0.0	9.7	200.0	209.7	235.5	44.3	1227.7
2011	14.6	748.5	-20.7	742.4	0.0	0.0	250.0	250.0	253.0	48.0	1293.4
2012	6.8	739.6	-241.6	504.8	0.0	0.0	300.0	300.0	635.1	42.4	1482.3
2013	6.2	702.8	-240.5	468.5	0.0	0.0	311.3	311.3	529.8	42.4	1352.0
2014	5.7	741.4	376.7	1123.8	0.0	0.0	562.6	562.6	543.9	42.4	2272.7
2015	5.2	738.1	481.9	1225.2	0.0	0.0	529.3	529.3	563.1	42.4	2360.0
2016	4.7	736.1	481.3	1222.1	0.0	0.0	535.5	535.5	584.7	42.4	2384.7
2017	4.2	730.2	486.8	1221.2	-	-	477.1	477.1	607.6	42.4	2348.3
2018	3.7	761.4	495.3	1260.4	-	-	459.8	459.8	631.0	42.4	2393.6
2019	3.1	686.4	494.4	1183.9	-	-	444.6	444.6	456.1	42.4	2127.0
2020	-9.2	723.3	491.1	1205.2	-	-	437.9	437.9	267.9	42.4	1953.4
2021	-9.9	716.1	489.8	1196.0	-	-	430.6	430.6	263.7	42.4	1932.7
2022	-10.6	703.0	490.6	1183.0	-	-	423.0	423.0	145.0	0.0	1751.0
2023	-11.2	708.8	485.0	1182.6	-	-	414.9	414.9	146.8	0.0	1744.3
2024	-11.6	699.5	489.0	1176.9	-	-	406.2	406.2	148.6	0.0	1731.7
2025	-12.2	585.3	491.6	1064.7	-	-	396.9	396.9	150.4	0.0	1612.0
2026	-12.9	538.5	489.2	1014.8	-	-	387.0	387.0	152.2	0.0	1554.0
2027	-13.5	449.7	496.9	933.1	-	-	377.5	377.5	154.1	0.0	1464.7
2028	-14.1	417.8	495.1	898.8	-	-	397.8	397.8	156.0	0.0	1452.6
2029	-14.7	397.2	491.4	873.9	-	-	362.9	362.9	158.0	0.0	1394.8
2030	-8.9	246.2	494.6	731.9	-	-	408.3	408.3	160.0	0.0	1300.2
2031	-3.9	164.2	486.7	647.0	-	-	352.7	352.7	162.1	0.0	1161.8
2032	-4.0	6.3	477.9	480.2	-	-	352.1	352.1	164.2	0.0	996.5
2033	-4.2	0.0	482.1	477.9	-	-	331.3	331.3	166.3	0.0	975.5
2034	-69.4	0.0	482.3	412.9	-	-	345.6	345.6	168.5	0.0	927.0
2035	-61.8	0.0	484.1	422.3	-	-	333.7	333.7	170.7	0.0	926.7
2036	-72.7	0.0	485.3	412.6	-	-	321.1	321.1	172.9	0.0	906.6
2037	0.0	0.0	490.2	490.2	-	-	307.9	307.9	175.3	0.0	973.4
2038	0.0	0.0	433.9	433.9	-	-	293.9	293.9	168.7	0.0	896.5
2039	0.0	0.0	0.0	0.0	-	-	279.3	279.3	137.3	0.0	416.6
2040	0.0	0.0	0.0	0.0	-	-	263.9	263.9	0.0	0.0	263.9
2041	0.0	0.0	0.0	0.0	-	-	247.6	247.6	0.0	0.0	247.6
2042	0.0	0.0	0.0	0.0	-	-	230.6	230.6	0.0	0.0	230.6
2043	0.0	0.0	0.0	0.0	-	-	222.9	222.9	0.0	0.0	222.9
2044	0.0	0.0	0.0	0.0	-	-	188.9	188.9	0.0	0.0	188.9
2045	0.0	0.0	0.0	0.0	-	-	188.4	188.4	0.0	0.0	188.4
2046	0.0	0.0	0.0	0.0	-	-	138.8	138.8	0.0	0.0	138.8
2047	0.0	0.0	0.0	0.0	-	-	115.0	115.0	0.0	0.0	115.0
2048	0.0	0.0	0.0	0.0	-	-	92.8	92.8	0.0	0.0	92.8
2049	0.0	0.0	0.0	0.0	-	-	69.5	69.5	0.0	0.0	69.5
2050	0.0	0.0	0.0	0.0	-	-	-80.0	-80.0	0.0	0.0	-80.0

Source: DGTF (2009)

4.4) Results

When analyzing exhibit 4 and 5 we can verify that a small change of the discount rate (Δ1,2%), in the road sector accounts for differences of 1.753,6M Euros, considering the total Public Private Partnerships projects in exhibit 7 we can calculate differences of 3.241,2M Euros.

Roads with toll represent a negative NPV (-176,2M Euros up to -152,9M Euros), it means that Government has an income because of the tolls that drivers have to pay by using these roads.

Exhibit 4 shows us that Public Private Partnerships in the Road sector represent 7.1% - 8.1% as % of Portugal's GDP of 2008, where roads without tool represent the largest portion.

In Exhibit 5 we can verify that the Train Sector represents 5,058.4M Euros up to 5,964.5M Euros, it is the second sector that has biggest costs relatively to Public payments for Public Private Partnerships. Health Sector represents 4,333.2M Euros up to 4,883.6M Euros being the third sector that has biggest payment costs.

Exhibit 6 shows NPV as a % of the GDP where Public Private Partnerships is on average 13,6% of the Total amount of GDP and when analyzing this 13,6% we can verify that 35,7% of it refers to roads without toll.

Table 4 –NPV of Portuguese PPP in the Road Sector

PPP NPV	Discount Rates					
	Legal discount rate 6.0%	As % of GDP 2008	Yeld 10-year bonds 2008 4.8%	As % of GDP 2008	STPR 5.5%	As % of GDP 2008
Roads with toll	-152.9	-0.1%	-176.2	-0.1%	-161.7	-0.1%
Roads without toll	8,339.8	4.9%	9,258.1	5.4%	8,704.7	5.1%
Concessions	3,960.7	2.3%	4,819.3	2.8%	4,295.1	2.5%
Subtotal for PPP on Roads	12,147.6	7.1%	13,901.2	8.1%	12,838.0	7.5%

Table 5 –NPV of Portuguese PPP in other sectors

PPP NPV	Discount Rates					
	Legal discount rate 6.0%	As % of GDP 2008	Yeld 10-year bonds 2008 4.8%	As % of GDP 2008	STPR 5.5%	As % of GDP 2008
Train sector	5,058.4	2.9%	5,964.5	3.5%	5,410.0	3.1%
Health sector	4,333.2	2.5%	4,883.6	2.8%	4,550.6	2.6%
Others	388.1	0.2%	419.3	0.2%	400.7	0.2%

Table 6 – NPV as % GDP

PPP NPV as % GDP	Legal discount rate	Yeld 10-year bonds 2008	STPR
Roads with toll	-0.1%	-0.1%	-0.1%
Roads without toll	4.9%	5.4%	5.1%
Concessions	2.3%	2.8%	2.5%
Train sector	2.9%	3.5%	3.1%
Health sector	2.5%	2.8%	2.6%
Others	0.2%	0.2%	0.2%

Table 7 – NPV of Portuguese PPP: All projects analyzed

PPP NPV	Discount Rates					
	Legal discount rate 6.0%	As % of GDP 2008	Yeld 10-year bonds 2008 4.8%	As % of GDP 2008	STPR 5.5%	As % of GDP 2008
Total PPP projects	21,927.3	12.8%	25,168.5	14.6%	23,199.4	13.5%

As we look at Figure 1 we can extrapolate that the in the next 10 years, Public Private Partnerships have been and will be responsible for most payments in the period 2008-2050.
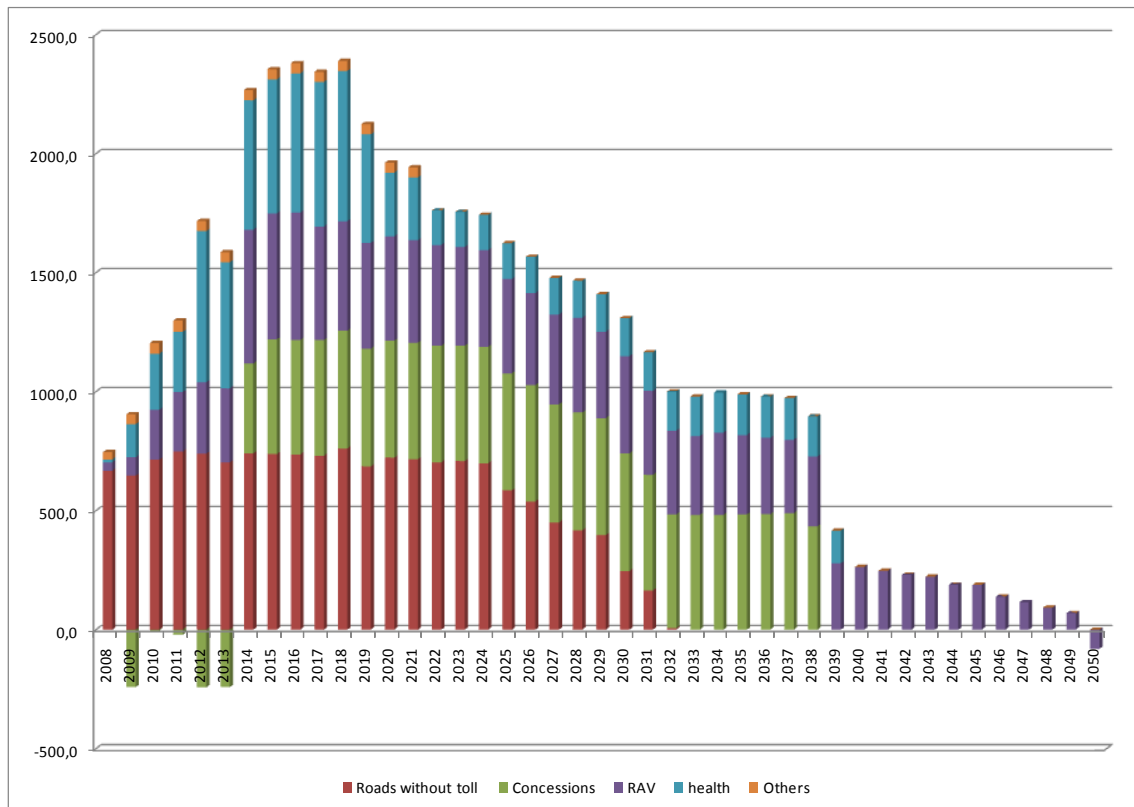
Figure 1 – PPP payments in Million €
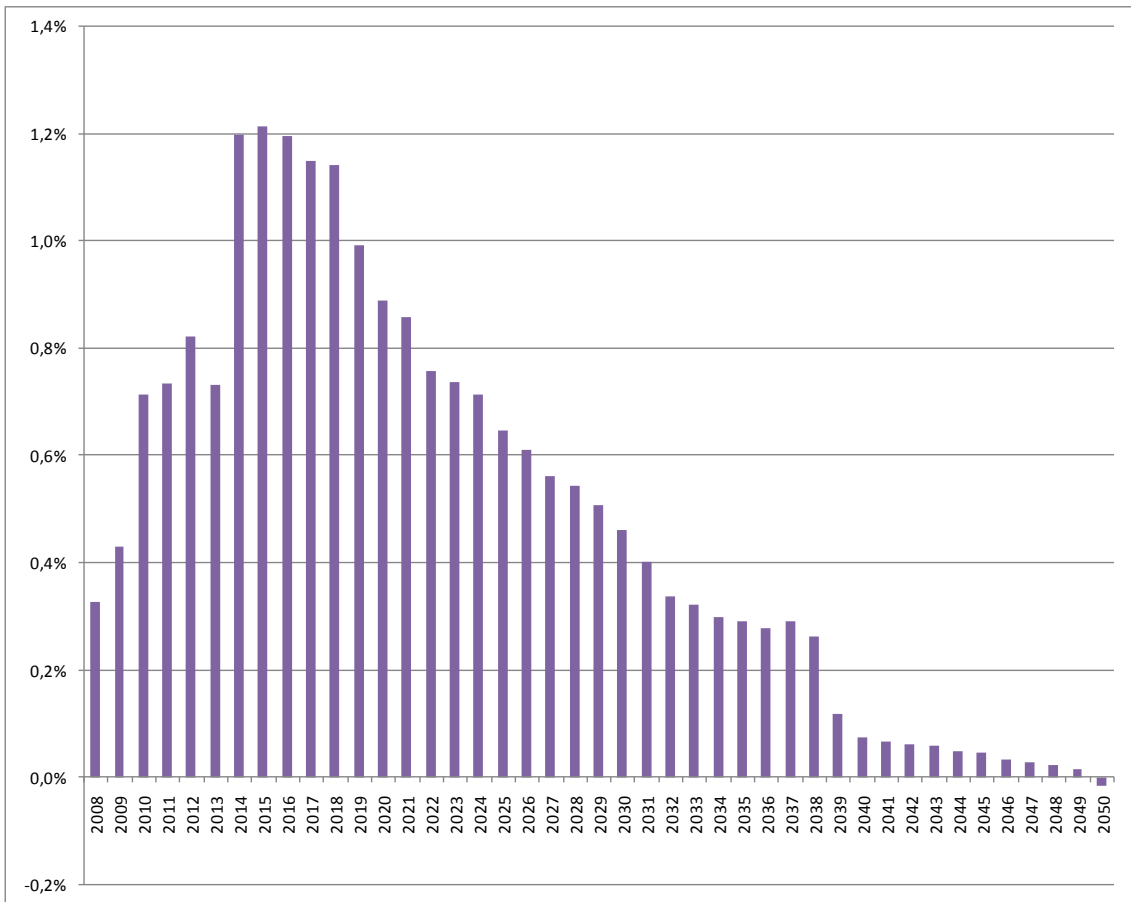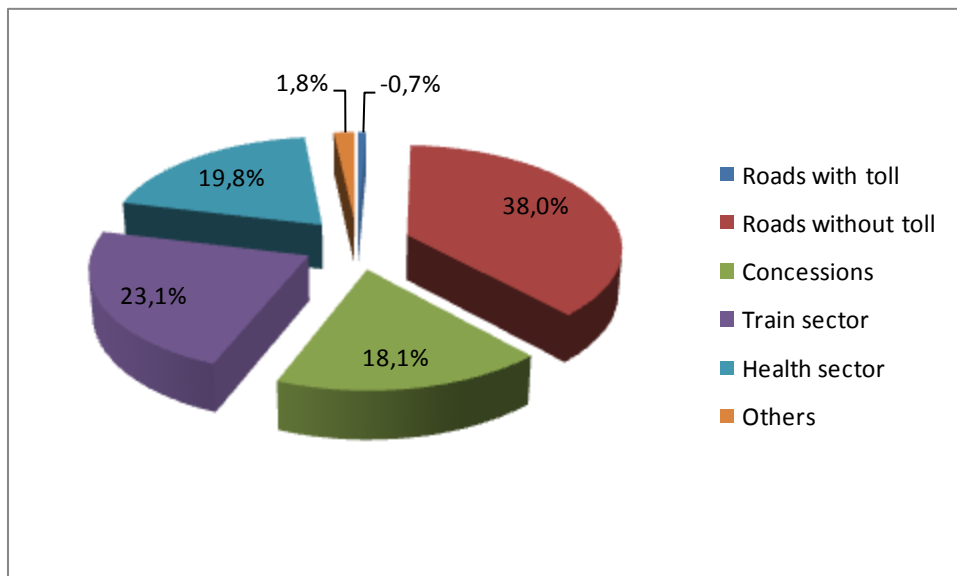
Figure 2 – PPP payments as % GDP

Figure 3 – NPV Sector weight as % GDP

5) Conclusion

We have developed in this paper some solutions to identify the best discount rates in a Public Private Partnership from the Public Sector point of view. We assume that there should be three discount rates in order to provide a good scenario basis for analysis.

We believe that Public Private Partnerships is a solution to provide efficient and better services from the Public Sector. We also considered that there should always be a cost / benefit analysis before deciding to implement a Public Private Partnerships within any public service. Contracts with the private sector have to be reviewed from independent parties to develop different assumptions and achieve a win - win negotiation between both sides of the project. This issue is critical, because when we take a look at the Portuguese example we conclude that the private bidder in the Public Private Partnership has been boosting their incomes, while on the other hand, the Public Sector is facing enormous debts. For example, in the road sector there has been some controversy concerning the social impact of constructing so many highways, especially in the North of Portugal.

According to our studies we propose that Public Private Partnerships discount rates in 2008 should be between 4,8% and 6% depending on the economic environmental of the public participant, and the sector under focus.

When analyzing our results, we come to the conclusion that the Portuguese Experience road sector holds the biggest impact in Public Private Partnerships (55,3 % of total NPV), where roads with and without tolls sharing the most part.

Before 2009, the Health Sector was a small part of the Portuguese experience, but since then there are new projects being developed. We anticipate that in the next years this sector will gain more power.

As we know Portugal is being investigated by the International Monetary Fund mainly because of Portugal's big financial debt and weak economy (recession), putting in risk Portugal's future payments of Public Private Partnerships.

On 17th May 2011 there was issued a "Memorandum of Understanding on Specific Economic Policy Conditionality" with the regards of the Council Regulation (EU) that established a European Financial Stabilization Mechanism (EFSM) with the aim of a financial assistance and a policy programme to Portugal, regarding Public Private Partnerships it was set that the Portuguese Government will:

- Abstain engagements in new Public Private Partnerships until there is a fully review on the existing Public Private Partnerships and legal and institutional reforms proposed;

- Make an assessment of the 20th most significant Public Private Partnerships, including the major "Estradas de Portugal, EC and IMF will perform technical assistance;

- Recruit a "top tier international" accounting firm to undertake a serious and relentless study of Portuguese Public Private Partnerships in consultation with INE and the Ministry of Finance. The aim of the review will be indentify and quantify major contingent liabilities and any amounts that are related with Government debt.

- Create a strengthened legal and institutional framework, within the Ministry of Finance, with the aim for assessing fiscal risks *ex-ante* of engaging into a Public Private Partnership.

- Enhance the annual PPP report prepared by the Ministry of Finance, with a comprehensive assessment of the fiscal risks stemming from Public Private Partnerships. With the liaison of Bank of Portugal there will be an analysis of credit flows channeled to Public Private Partnerships through banks.

In our studies we thought that there were some limitations surrounding Portugal's State public information, in Portugal the public websites have a lack of organized data and reliable data.

For future research we recommend that there should be a European Union analysis regarding PPP, there should be comparisons between different countries regarding the methodology of the PPP's and what discount rates should be applied in each country.

We strongly believe that when taking assumptions in a Public Private Partnerships it's absolutely essential to create two or three scenarios because it's is impossible to guarantee that certain discounts are 100% appropriate to any financial model.

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