Instituto Superior de Economia e Gestão
UNIVERSIDADE TÉCNICA DE LISBOA
DESDE 1911

MESTRADO EM FINANÇAS

TRABALHO FINAL DE MESTRADO
DISSERTAÇÃO

PUBLIC-PRIVATE PARTNERSHIPS

Risk of Default Measured by Financial Ratios in EP Road Sub-concessions

Ana Patrícia Ferreira Vieira da Silva

SETEMBRO - 2012

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ABSTRACT

The road infrastructure in Portugal experienced a great development in recent years, making it one of the countries with the highest relative extension of motorway network in the world. In fact under the National Road Plans reported to 1985 and 2000, a vast network of motorways was built initially through a model at no charge to the user and at a later stage by the sub-concessions model of Estradas de Portugal, SA.

For these investments was privileged the use of Public Private Partnerships (PPPs), allowed a strong involvement and participation of the private sector and also the use of a form of financial structuring known as Project Finance.

This paper analyzes one of the key aspects in public-private partnership model - the financing. What's the behavior of debt through the life of the concession and how the financing entities seek to assess the risk of default.

The methodology used consisted in estimating the cash flows of the various sub-concessions then calculate some of the ratios commonly used in the measurement of default risk and the volatility of cash flows.

The results show that with high maturity and stability of existing cash flows, projects can ensure compliance with the debt service, reducing counterparty risk to lenders.

Key Words: Public private partnerships, road infrastructure, project finance, default risk.

RESUMO

As infraestruturas rodoviárias em Portugal viveram um grande desenvolvimento nos últimos anos, tornando-se um dos países com maior extensão relativa de rede de autoestradas no mundo. De facto, através dos Planos Nacionais Rodoviários elaborados em 1985 e 2000, foi construída uma vasta rede de autoestradas, inicialmente através de um modelo sem nenhum custo para o utilizador e posteriormente através do modelo de subconcessões da empresa EP - Estradas de Portugal, SA.

Para a realização destes investimentos foi privilegiado o uso das Parcerias Público-Privadas (PPP), que, assim, permitiram um forte envolvimento e participação do setor privado, e uma forma de estruturação financeira conhecida como *Project Finance*.

Este artigo analisa um dos elementos chave nos modelos de parceria público-privada - o financiamento. Qual é o comportamento da dívida durante a vida da concessão e de que forma as entidades financiadoras procuram avaliar o risco de incumprimento.

A metodologia utilizada consistiu em estimar os fluxos de caixa das várias subconcessões e então calcular alguns dos rácios mais utilizados na medição do risco de incumprimento e da volatilidade dos fluxos de caixa.

Os resultados permitem concluir que com maturidades elevadas e existindo estabilidade dos cash-flows, os projetos conseguem assegurar o cumprimento do serviço da dívida, reduzindo o risco de contraparte para as entidades financiadoras.

Palavras-chave: parcerias público-privadas, infraestrutura rodoviária, *project finance*, risco de *default*.

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DSCR -   Debt Service Coverage Ratio

EC   European Commission

EIB -   European Investment Bank

EP -   EP - Estradas de Portugal, SA

ESCAP -   Economic and Social Commission for Asia and Pacific

ICR -   Interest Coverage Ratio

InIR -   Instituto de Infra-estruturas Rodoviárias, IP

JV -   Joint Venture

LLCR -   Loan Life Coverage Ratio

OECD -   Organization for Cooperation and Development

PPC -   Public Contract Code

PFI -   Private Finance Initiative

PPIAF -   Public Private Infrastructure Advisory Facility

PPP -   Public Private Partnership

PSC -   Public Sector Comparator

SPV -   Special Purpose Vehicle

VFM -   Value for Money

1. INTRODUCTION

Infrastructure, namely roads are extremely important for most countries, being considered as a kind of pre-requisite for obtaining basic goods and services and simultaneously as drivers of growth. Governments soon realized that they did not have the resources necessary to implement all the necessary projects.

This issue is global and not restricted to a limited number of countries, or emerging economies where the lack of infrastructure is more evident. It's in this context that the concept of Public Private Partnerships becomes more popular, as a structure that allows the involvement of private entities in sectors that typically were restricted and only in the sphere of public sector, and improving the quality and time execution of projects.

These structures have allowed bypassing, the public sector budget constraints, which in the case of Portugal and other countries, has greatly contributed to the growing use of public-private partnerships in recent years. In this type of structure the initial investment, usually substantial, is replaced by annual flows of availability, performance and use. Also how they are accounted for in government accounts (less harmful to the calculation of the public deficit) has contributed to its "success".

The objective of this thesis is to analyze how these projects are typically financed and how financial institutions seek to detect warning signs for the risk of default at the time of award and in the monitoring of credit facilities.

The work starts with the introduction, shortly followed by the literature review that, besides presenting the view of several authors on the concept of public-private partnership, also presents some fundamental aspects associated with this issue. In the next chapter is briefly presented the framework of partnerships in Portugal, in legal terms and the use by sector, besides framing the road sector in terms of organization.

Structuring the required funding to build infrastructures through public-private partnerships is of great importance. Thus, Chapter 4 presents the methodology most used (project finance) and how risk of default is assessed.

Motorways are assets that typically have low default rates. However, in recent years some projects were subject to periods of stress, in part due to the undeniable difficulty in accurately predicting the level of traffic and therefore of revenues. Some projects were subject to renegotiations, and restructurings, resulting from deficient projections and other externalities [1] (for example, the financial crisis experienced in recent years and the restrictions in the access to credit). Chapter 5 aims to understand the behavior of sub-concessions EP, on this subject, and the results obtained.

Finally, the last chapter contains the conclusions of the study and suggested future research works.

2. PUBLIC-PRIVATE PARTNERSHIPS – A SURVEY OF LITERATURE

2.1. The Concept

In the available literature on the subject, we are faced with a very broad range of definitions of the concept of Public Private Partnership.

The Organization for Economic Co-operation and Development (OECD, 2008) defines a public-private partnership "*as 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*".

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[1] Eurodisney, Channel Tunel, Global Star, Iridium.

For the European Investment Bank (EIB, 2004:2), *"public-private partnerships is a generic term for the relationships formed between the private sector and public bodies often with the aim of introducing the private sector resources and/or expertise in order to help provide and deliver public sector assets and services".*

The Portuguese legislation, which regulates the state intervention in public-private partnership, provides the following definition [2]: *"a contract or union of contracts, by which private entities designated by private partners, undertake before a public partner, to perform upon a payment the development of an activity aimed to satisfy a collective need and where the responsibility for the investment, financing, operation and associated risks are entrusted in whole or in part, to the private partner"*.

As already mentioned, there are several definitions for Public Private Partnerships however there are some features that are common to them all (Robinson, H., Carrillo, P., Anumba, C. & Patel, M., 2010):

- The existence of a contract between private and public organizations to develop a specific project;

- The relationship between the parties involved is long term and aims to provide services of public interest;

- Risk sharing between the public and private entity, bearing in mind that the risks should be allocated to the entity best able to manage them;

- Private partner should bring to the PPP, all his experience and innovation;

- In general, the financing is mainly assured by private entities, often through project finance transactions.

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[2] Decree-Law n º 111/2012 of 23 May, revokes Decree-Law n º 86/2003 of 26 April.

2.2. Reasons to make use of PPP's

Generally speaking, around the world exists what one might call the "infrastructure gap", which reflects the difference between the needs for infrastructure and the level of investment that has historically been performed by governments to meet those needs and which are reflected, on congested roads, bridges needing repair, inefficient traffic management systems, deteriorated schools and hospitals, as well as waste management systems (Deloitte, 2006).

In addition to the needs of infrastructure that result from economic growth, the sharing of risks, the reduction of costs associated to the projects, through the use of innovative solutions that represent gains of efficiency and effectiveness, makes the use of PPP's very attractive for many public entities.

A significant difference between traditional procurement and PPPs is related to the timing for payment of the public and private sector. In fact, in terms of cash flows profile, in a traditional procurement all costs are supported by the State, including overruns and delivery delays, with all charges being made in the initial phase of the project. Often in PPPs the state only begins to make payments when services start being provided. The investment is made by the private partners, mainly using debt and shareholders' capital. Their return will depend on the quality of services provided (Figure 1).
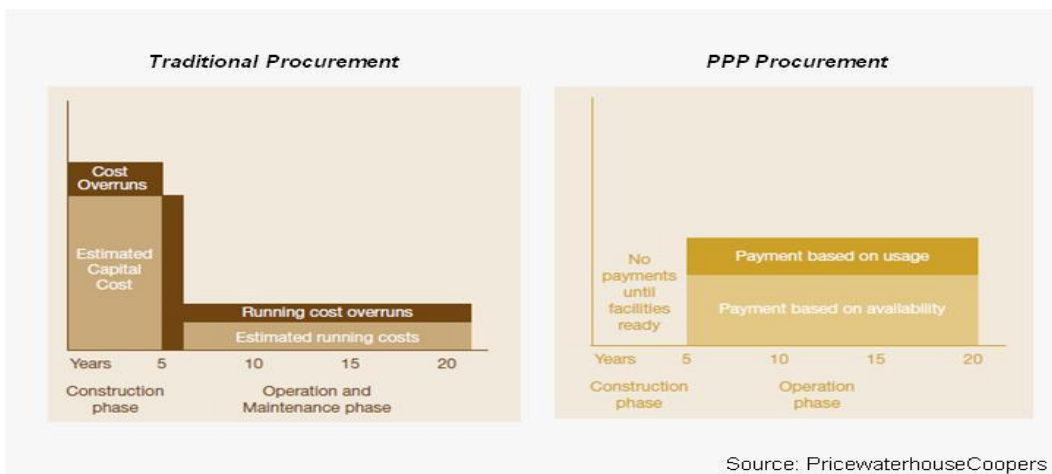
Figure 1 - Contrasting public sector payment profiles of traditional and PPP procurement models

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This has allowed governments to gain access to additional funding and finance projects without reaching the borrowing limits to which they are obliged. The accounting treatment applied to PPPs, has been a major concern[3] as it is referred to by Grimsey and Lewis (2005), at the expense of other aspects, such as the efficiency levels that can be enhanced. In fact the use of PPPs allow to maximize efficiency by transferring risk to the private, that thereby have an incentive to set prices and produce efficiently; improve the allocation of resources and agency problems may also be more easily solved by discipline and market incentives (Grimsey and Lewis, 2005).

In European Union countries, Eurostat set rules for the accounting of government spending with PPP. In order for the assets to be considered as private infrastructure, must be fulfilled the following conditions, the private sector assumes the construction risk and simultaneously at least one of the following risks, availability or demand.

2.3. Types

Public-Private Partnerships can take various forms, depending on the allocation of responsibilities and risks between public and private partners. The most common are (Deloitte, 2006):

- *Design Build (DB):* In this model government engages a private partner to design and build a facility in accordance with the requirements set by government. After the completion of construction, the government takes responsibility for the operation and maintenance.

- *Build Operate Transfer (BOT):* In this type of contracts the private sector is responsible for financing, design, construction, maintenance and operation of infrastructure for a specific period of time. Ownership of the facility is transferred to the public sector at the end of that period.

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[3] Whether or not these transactions should be considered for the calculation of the state deficit.

- *Build Own Operate (BOO):* In this type of agreement the control and ownership of projects, remains in the hands of private, namely the private partner is responsible for financing, design, construction, maintenance and operation of equipment in perpetuity.

- *Build Own Operate Transfer (BOOT):* The private sector receives a franchise to finance, design, build and operate a facility for a specific period of time. Ownership of the facility is transferred back to the public sector at the end of that period.

The standard PPP can also be used in existing facilities and services. In such circumstances models commonly used are:

- *Lease:* The government grants a private entity the lease of an asset. The private partner operates and maintains the asset in accordance with the terms of the lease.

- *Joint Venture:* Occur when private and public sector, agree to jointly finance, maintain and operate an infrastructure.

- *Service Contract:* The government contracts with a private entity to provide services the government previously performed.

- *Management Contract: A* management contract differs from a service contract, to the extent that the private entity is responsible for all aspects of the operation and maintenance of facilities under contract.

- *Concession*: The government gives a private entity, exclusive rights to provide, operate and maintain an asset for a long period of time in accordance with the performance requirements set by the government. The public sector retains ownership of the original asset, while the private operator retains ownership of any improvements carried out during the concession period.

- *Divestiture*: The government transfers an asset, in whole or in part, to the private sector. Generally, the government includes certain conditions, to ensure that improvements are made in assets and citizens continue to be served in the best possible conditions.
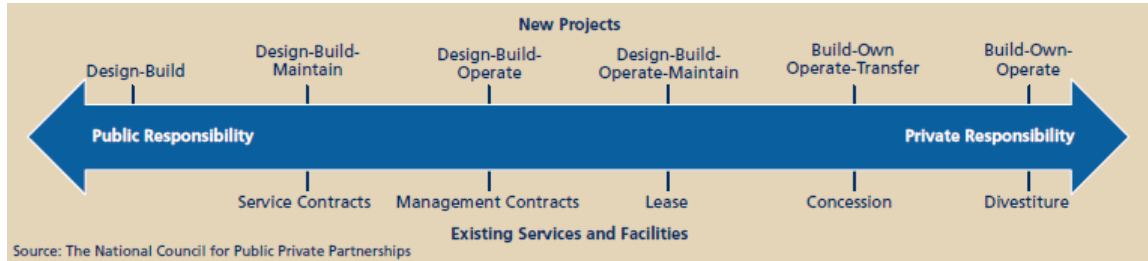
Figure 2- Types of PPP's

There is no single model that fulfills all requirements of a project in terms of location, technical and financial resources. Each partnership model has its advantages and disadvantages. The PPP selection, should take into account the size, characteristics of the public project, the type and management capacity of public organizations that perform the control and management of PPP, the public interest and urgency in the implementation, operation and management of the public project (ESCAP, 2011).

2.4. Value For Money (VFM) and Public Sector Comparator

VFM analysis allows public entities to compare the costs of developing a project through PPP versus developing the same project through a process of regular procurement. The difference between the two methodologies is the VFM.

The concept of Value for Money, has a very broad range of meanings. For instance, the United Kingdom's Her Majesty's Treasury defines VFM (HM, 2006) *"as the optimum combination of whole-life costs and quality (for fitness purpose) of the good or service to meet the user's requirement. VFM is not the choice of goods and services based on the lowest bid".*

As mentioned in the concept above, Value for Money is based not only on the concept of minimum purchase price, but also the maximum efficiency and quality, to ensure the needs and requirements of users. According to Shaoul (2005), VFM is associated with the three "E": economy, efficiency and effectiveness.

Although some of the critical factors to achieve VFM, might differ from project to project, there are six that can be considered common to all (Arthur Anderson, 2000):

- Proper risk allocation;

- The long duration of contracts, including reduced life cycle costs (contracts should have long maturities in order to enable the recovery of initial investment);

- The use of an output specification (revenue earned by the private partner should be associated with the quality and timing of services provided);

- Competition (encourages competitors to submit an efficient bid);

- Performance measurement and incentives (ensures that the specifications set forth in the original contract are in fact fulfilled);

- Private sector management skills.

The methodology used by Partnerships Victoria to determine VFM is very similar to those used by other entities in other countries and is based on the analysis of two components: quantitative and qualitative. The quantitative includes all factors that can be quantified, and is usually used a methodology that consists in comparing the PPP with an alternative scenario, called Public Sector Comparator (PSC). The qualitative component aims, to evaluate factors such as market characteristics, competitive bidding, resources and capacities of the parties involved and other costs that have not been considered in the quantitative analysis.

The calculation of the PSC: (i) allows to perform a complete analysis of the costs of a project at a very early stage of its development, (ii) provides a management tool throughout the procurement

process, (iii) allows testing VFM (iv) provides a consistent reference and assessment tool and (v) encourages competition through the principles of accuracy that emerges to the market (Victorian Department of Treasury and Finance, 2001).

According to Grimsey and Lewis (2005) there are four alternative methodologies for assessing the existence of VFM, listed in descending order of complexity:

- A complete analysis of costs / benefits for all the available methods at disposal of government and the private sector (methodology most complex applied by countries like Germany and that require a significant amount of information and some assumptions);

- Public Sector Comparator calculation before the bidding process, in order to assess whether or not PPP's in general represent better value-for-money (method used in countries such as Japan, the Netherlands and South Africa in which the PSC is compared with a "shadow" or reference of the PPP);

- Public Sector Comparator estimation after the bidding process (methodology used in the United Kingdom in which the PSC is compared with the bids, verifying whether or not VFM exists);

- Competitive Bidding, without having to place a comparison between methods provided by public and private partners (is the most commonly used method within the context of concessions and in countries like France and the United States).
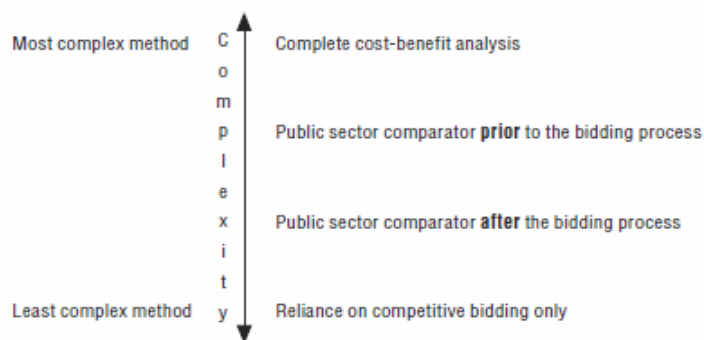
Source: OECD (2008)

Figure 3 – Spectrum of methods to assess value for money

In the calculation of the PSC are considered all costs to be incurred by the public agency if the project were to be developed through a traditional procurement. The methodology used is the DCF (discounted cash-flow analysis) to provide a projection of the NPV (net present value) of expected cash-flows.

Moralos and Amekudzi (2008) quoting Partnerships Victoria (2001), state that PSC typically consists of four components:

- *Base Costs*: represents the base cost (capital and operations) to achieve the benchmark project, which is identical to a hypothetical PPP project, except that it would be accomplished through traditional procurement. To be able to make a comparison between the PPP and the benchmark project, it is necessary that both are subjected to the same level of specifications and standards especially with regard to: timing, funding, procurement costs and output specifications and performance standards.

- *Transferable Risks:* to determine the PSC, it is advisable to include total risk matrix design to give a more accurate picture of overall cost. Transferable risk measures the cost government would expect to pay for that risk over the term of the project in a public procurement scenario. The risk transfer is often a determining factor of VFM in PPPs, and that may need to be updated in light of negotiations and changes in the allocation of risks.

- *Retained Risk*: the risks that by their nature are usually allocated to the public sector. Costs associated with this type of risk are generally equal in PSC and the private sector.

- *Competitive Neutrality*: allows the PSC and PPP to be compared at the same level, removing the advantages or disadvantages that are available to a government agency that seeks to establish the PSC, but inaccessible to the private sector that will materialize the PPP.
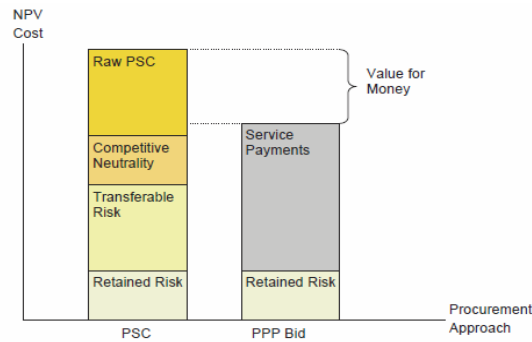
Source: Morallos, D. e Amekudzi, A. (2008)

Figure 4 – VFM quantitative assessment

Grímsey and Lewis (2005) recommend that the calculation of the PSC is carried out before the evaluation of each proposal, to ensure that in fact represents the point of view of public partner and allow the decision maker to view what the private proposal should improve in order to represent VFM. It is thus evident the importance of maintaining updated the PSC, because in fact represents an important tool for public sector managers, since helps them to understand the project and the risks involved and how to deal with them contractually.

2.5.   Discount Rate

As previously mentioned, the calculation of the PSC is done using the method of the estimated discounted cash flows during the life of the project. To do so, it is of most importance the choice of the discount rate. Regardig this theme, and having as reference Sarmento (2010), is presented a summary of the five approaches:

1. The discount rate should reflect government policies through a "*social rate of time preferences*". Grimey and Lewis (2005), suggest that this discount rate should have two elements: the basic social time preference rate [4] (STPR, which in some developed countries is 3.5% - 4% in real terms) and other factors, to ensure that the state does not

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[4] According to the *Green Book* (HM Treasury, 2003), social time preference is 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 different generations.

assess the benefits of the project without taking into account the risks that exposes taxpayers;

2. The discount rate should reflect the "*social opportunity cost of capital*", which corresponds to the internal rate of return (IRR) before taxes that you can expect from private investment with the same level of risk (it's used in Canada and New Zealand);

3. The discount rate it's a hybrid of the "*social rate of time preferences*" and the "*social opportunity cost of capital*". This approach assumes that the cost of public funds suitable for most projects represents the sum of the actual cost of interest, excluding tax, public debt, the marginal income tax paid on the capital of the private sector and a systematic risk factor;

4. "*Equity premium*", where the cost of capital for the public sector is considerably lower than the values calculated using the CAPM, and therefore, the discount rate should match the government borrowing rate before taxes;

5. The interest rate of the debt of a country (risk-free interest rate), according to the maturity of the project.

In Australia, for example, the Department responsible for management and evaluation of PPP's (Victoria Department of Treasury and Finance, 2003) recommends the use of discount rates specific to each project, taking into account the risk associated with each project. This corresponds to the application of the CAPM model for the evaluation of PPP's. The model should recognize that the cost of capital is specific to each project and is a function of the risks involved. .In a perfect market, this would lead to the conclusion that as long as there is sufficient competition to drive every component of the deal to the maximum efficiency the appropriate discount rate would be the rate of return implicit in the winning bid and therefore one would not need to develop specific discount rate for the analysis.

2.6. Risk Allocation

The notion of risk usually evokes the damage that someone will have to endure when things go wrong. For the state, usually means spending a sum higher than expected and to the private partner means loss or income falling below the forecast.

During the life cycle of a project developed in the form of PPP, shapes assumed by risks, differ according to the type of partnership and the phase that is going through when the risk assessment is made (Figure 5).
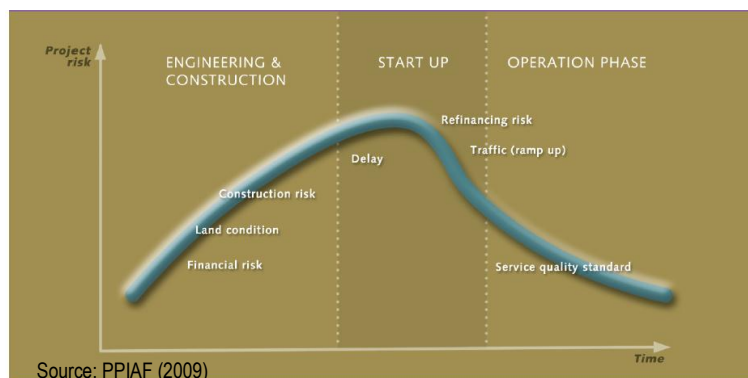
Figure 5 - Main Projects Risks Over Time

One of the key features in a Public-Private Partnerships is Risk, since influences the global cost of the project. Risk analysis should involve all entities linked to the project and must take place in the following phases: (i) risk Identification, where all risks should be listed and identified those who may cause the most potential adverse impact; (ii) risk assessment, (iii) risk allocation[5], which should be made to the entity which gathers the best conditions to ensure their management and control and (iv) risk mitigation where each player can use the instruments available to reduce their exposure to risk (PPIAF, 2009).

For instance, according to Grimsey and Lewis (2005), when we are in presence of a project to build infrastructure, we can consider the following risks:

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[5] Arthur Anderson (2000), refers that risk transfer valuations accounts for 60% of the total cost savings, in 17 of 29 projects (Full Business Cases projects that were reviewed).

- Technical, faults associated with technological and engineering;

- Construction, due to errors or defective performance, increased costs and delays in implementation;

- Operation and Maintenance, due to higher costs than expected;

- Revenue loss due to breaks in traffic, volatility of demand for products / services and prices;

- Financial, arising from incorrect assembly of financing transactions, with no matching between the inflows and outflows of the project;

- Major Force which comply to unpredictable and compelling events, for which there is no control by the entities involved (war and other disasters);

- Regulatory / Political, because of legislative changes and changes in terms of government policies;

- Environmental, since such projects usually raises questions of this nature due to impacts that may cause to the environment;

- Failure project in itself due to the occurrence of one or more of the risks mentioned above.

Also according to these authors, the risks can be classified as global or specific. Global risks are those which allocation is done through the project contract and typically include political risks, legal, commercial and environmental. The specific risks are those associated with the construction, operation and maintenance, financing and revenues.

For others authors, the level of complexity, scale and timeframe for implementation affects the range of risks that could jeopardize the expected results of the project. Ng. and Loosemore (2006), in a very simple manner, classify risks as: general and project risks. *General risks* are those that are not directly associated with the project but which can significantly impact on how

they stem and its end result. This category identifies the risks of political, regulatory, legal and economic nature. The *project risks* arise from how the project is managed and the occurrence of events that affect their microenvironment. This category identifies the problems of natural origin related to soil and climate, the technical problems related facilities and equipment, the organizational problems associated with subcontracts, the human resource issues related with unions, problems associated with contractual issues *Joint Ventures* (JV) or *Special Purpose Vehicle* (SPV) agreements and environmental problems related to pollution.

Once identified the risks and their potential impact, the players have to work in order to choose the risks that they can better manage (endogenous risks). The mitigation tools are diverse and include insurance, contract arrangements, export credit agency guarantees, political risks, insurance and employment of financial guarantees.

In terms of response, OECD (2008) identifies five major types:

- Risk Avoidance: the source of risk is eliminated or ignored by the non-realization of projects that he can affect;

- Risk Prevention: the entities involved work towards reducing the probability of the risk occurring or alternatively mute its impact;

- Risk Insurance: one of the parties involved purchase an insurance plan (is one of the most common ways to transfer the financial risk);

- Risk Transfer: reallocation of risks to the entity that demonstrates best ability to ensure its management;

- Risk retention, because the costs associated with their management are superior.

2.7. Phases of a PPP

The development of successful public-private partnerships should start with creating a legal and institutional support structure used to direct and manage PPPs on behalf of the public sector. Within the framework of implementation of a Public Private Partnership, we can consider that there are five stages: (i) project identification, (ii) project appraisal, (iii) design and agreement, (iv) procurement and (v) implementation (European Commission, 2003).
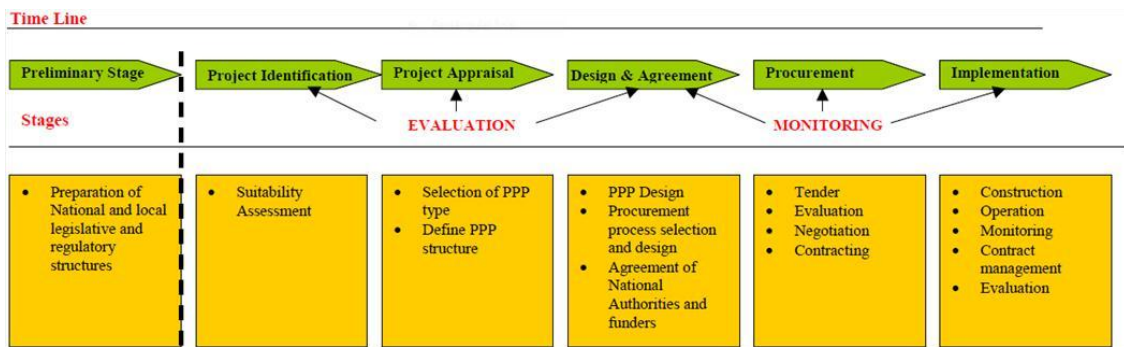
European Comission (2003)

Figure 6 – Public Private Partnerships Phases

3. GENERAL FRAMEWORK OF PPP IN PORTUGAL

3.1. Legal /Regulatory Structure

Although the use of PPPs in Portugal has emerged in 1972[6], its legal system was only established in 2003 through the publication of Decree-Law No. 86/2003. With the application of that DL, the projects that had already been started were also covered by that procedure while taking into consideration the stages in which they found themselves and contractual commitments already made.

Decree-Law 86/2003, applies to all industries and defines the general rules for state intervention in the definition, design, preparation, tendering, procurement, modification, inspection and monitoring of overall PPPs. This legislation also establishes the obligation of calculating the public sector comparator as a way to assess the existence of Value for Money, however, in most

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[6] Concession Agreement Brisa

cases, this analysis is not performed, as noted in several audits by the Court of Auditors (2008, pg 41).

In July 2006 was published the Decree-Law No 141/2006, which claims to be a review of previous DL, incorporating the experience of ongoing contracts. The document aims to improve coordination between agencies involved, particularly among the various ministries, increase requirements for transparency, accuracy and control in the preparation and development of PPP's. It also seeks to clarify the model of risk sharing and promote flexibility and efficiency in the design of PPPs.

Another important tool in terms of legislation for PPPs, is the Public Contract Code (PCC)[7]. Regarding PPPs, the changes are not significant, almost always referring to sectorial regulation, but improves the procedures for evaluating proposals and increases transparency and at the same time simplifies certain processes.

More recently was published the Decree-Law n °111/2012 of 23 May, which seeks to fulfill the commitments undertaken in the Memorandum of Understanding (MoU) with Troika. It also provides the reinforcement of the requirements in terms of affordability and cost/benefit analysis, at all stages of the partnership. The Decree-Law also establishes the creation of a Technical Unit of Project Monitoring under the Ministry of Finance, which centrally now assumes tasks that were previously allocated to a wide range of entities.

The inspiration for the methodology used in Portugal is the Anglo-Saxon model[8]. One of the main differences compared to the English model, is the involvement of financial institutions. While in the UK, negotiations with banks only initiate when the transaction with the concessionaire is

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[7] Approved by Decree-Law No.18/2008, revalidated by the Declaration of Rectification No.18-A/2008 and amended by Decree-Law No. 278/2009. Reflects the transfer into national legislation of European Community Directives No. 2004/17/EC and 2004/18/EC. It should be noted that doesn't exist a clear framework for PPPs in the European Union.

[8] Undoubtedly the best developed PPP program is the United Kingdom's Private Finance Initiative (PFI), which began in 1992 (Hemming R., 2006).

closed, in Portugal banks participate alongside the candidate in negotiations with the state and also sign the contract, since in most cases they are also part of the winning bid consortium.

3.2. Its Use By Sector – Comparison With Other Geographies

In most countries, the use of Public Private Partnership model started with projects in transport sector, passing later, as benefits become more visible, to other areas. Most of the projects are focused on transport infrastructure, namely: airports, roads, tunnels, bridges and rail road lines. Other sectors that have become interested in the use of these models are: treatment of waste, water network management, hospitals and schools, nursing homes and prisons. This reference is evidenced by the chart below, which summarizes the use of PPPs in several European Union countries, clearly emphasizing its use in road construction.

Member States	Central Accommodation	Airports	Defence	Housing	Health & Hospitals	IT	Ports	Prisons	Heavy Railway	Light Railway	Roads	Schools	Sports & Leisure	Water & Wastewater (incl solid waste)
Austria	○	○			◔	○		○	◔		◔	○		○
Belgium		◔		◔					◔	○	◔	○		◔
Denmark	◔							○		○	○	◔	○	
Finland			○		○				○	○	◔	◔		○
France	◔	○	○		◑		○	◔	◑	◑'	●'		◔	●'
Germany	◑	○	◑		◔	◔		◑	○	○	◑	◕	◔	◑
Greece	◔	●			○						◕	○	◑	
Ireland	○			◑	◔			○		◔	◕	◑		◕
Italy	◑	◔		◔	◕		◔	○		◑	◕		◔	◕
Luxembourg		○				◔								
Netherlands	◔		◔	○	○		○	◔	◑		◑	◑		◑
Norway (not EU)	○		○		◔			○			◑	◔	○	
Portugal	○	○		○	◔	◔	◑	○	○	◑	●	○	◕	●
Spain	◔	◔			◑		●	◔	○	◔	●	○	○	◕
Sweden			○		○				○	◑	○			
UK	●	●	●	●	●	●		●		●	●	●	●	●

Legend
○ Discussions ongoing
◔ Projects in procurement
◑ Many procured projects, some projects closed
◕ Substantial number of closed projects
● Substantial number of closed projects, majority of them in operation

Source: PwC (2005)

Figure 7 - Summary of PPP's by country and sector

Portugal is mentioned in several studies as one of the countries that most enthusiastically adopted the public-private partnerships, being clear that the area of road concessions is dominant, since is responsible for 86% of the total cumulative investment in PPPs (Appendix 2). In Portugal, the big jump in terms of PPP came with the National Road Plan 2000, which allowed to grow about 7.5 times the existing network of motorways, from 400 km to 3.000 km, exclusively through concessions (1/3 of them through the model of SCUTS [9]). In Appendix 3, is presented a summary of currently existing highway concessions.

This enthusiasm is also visible through the analysis of Figure 8, which shows that between 2000 and 2005, Portugal was the European country with the highest percentage of PPP in relation to GDP.
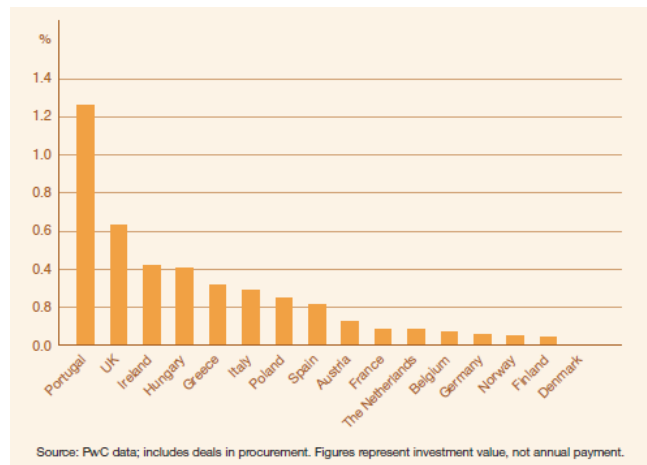
Figure 8 – Average 2000 to 2005 PPP activity as a % of mean GDP

Despite the jump recorded in terms of number of PPPs, the reality is that Portugal has failed to create an organizational structure that allows it to fit the PPP programs and projects at national level as well as ensuring its monitoring. In fact, in several reports prepared by the Court of Audits of Portugal, are referred some aspects revealing this gap in terms of organization and management. "*The multiplicity of players in the management of PPP, cannot fail to be a factor of*

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[9] SCUT: Sem Custos para o Utilizador (No Tolls to the User)

inefficiencies, ineffectiveness and dilution of responsibilities, in addition to show itself substantially irrational and bureaucratic" (Court of Audit, 2008, pag. 22).

3.3. Road Sector Management Model

The model of management and financing of the road sector which lasted until July 2007 was as follows (Court of Audit, 2012):
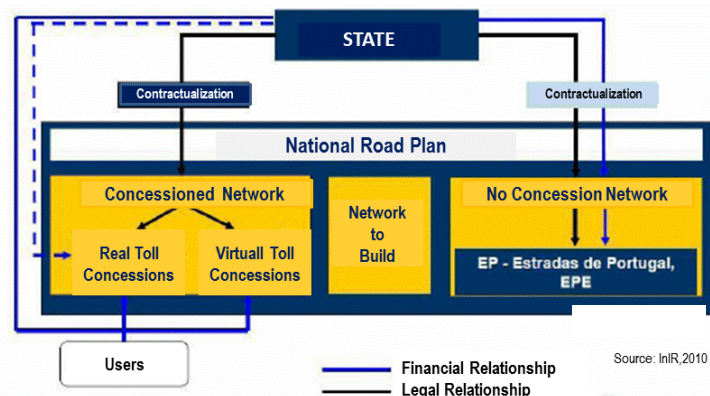
Figure 9 - Previous model of management and financing of road sector

In this model the EP - Estradas de Portugal, E.P.E. accumulated the roles of state grantor representative and regulator, with the funding being provided by transfers from the state budget through PIDDAC[10].

Aiming to reduce the dependence of EP - Estradas de Portugal, SA of the high transfers from the state budget, and providing more autonomy in the execution of the National Road Plan the PIDDAC funds were replaced, by the so called contribution of road service (CSR), which consists of a road tax to be paid by all taxpayers.

This methodology proved however insufficient to ensure the fulfillment of all the financial commitments made by EP within the concessions, and the result has been the increased leverage of this company whose net debt at the end of 2011 amounted to 3,5 billion euros. Thus,

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[10] PIDDAC: Programa de Investimentos e Despesas de Desenvolvimento da Administração Central (Capital Expenditure and Development Expenditure of Central Administration).

under the NMGFSR [11], the state gave the EP, SA the concession of the overall national road network for 75 years, transferring the public-private partnerships to a sub-concession scheme.

The Court of Audit, in a report (2012) considers that the introduction of this new model, in such turbulent period, right in the middle of a financial crisis, led to the coexistence of multiple models simultaneously, which ultimately introduce more complexity to the regulation model. In this new model it is possible to identify the existence of the following models of Public-Private Partnerships:

i) Direct grants from the state in favor of toll concessionaires;

ii) Direct concessions of the state with real tolls in favor of EP, in exchange for availability payments;

iii) Direct concessions of the state under a SCUT, with tolls concerted or negotiated in favor of EP (SCUT concessionaires) in exchange for availability payments;

iv) EP new sub-concessions, based primarily on availability payments;

v) The concession of the state with the EP.
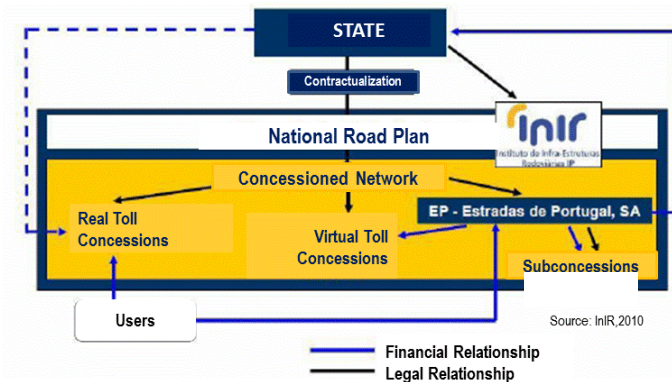
Figure 10 - New model of management and financing of the road sector

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[11] NMGFSR – Novo Modelo de Gestão e Financiamento do Setor Rodoviário (New Management and Financial Model for the Road Sector).

Apart from this greater complexity in terms of regulation, the introduction of the new model also increased the risk premium demanded by lenders, with the respective consequences in terms of costs, because the concessionaire becomes the EP and not the State.

The financial crisis has resulted in a lower willingness on the part of the financing entities, which adds worse conditions in terms of interest rate and more demanding bankability terms (loans with less maturity than the useful life of assets and lower tolerance to risk traffic).

4. FINANCING

4.1. Main Concepts

Typically associated with infrastructure projects, capital intensive and whose investment in the initial phase is extremely high is the concept of "project finance" (Chan, *et al*, 2009). By their nature, it's a framework often used in public-private partnerships (in Appendix 4 is presented an example of a structure type of a project financing). In fact the features of Project Finance seem to be tailored to the needs of funding that normally exist when we are in presence of Public-Private Partnerships. The main characteristics of project finance are as follows (Whalen, 2006 and Yescombe, 2002):

- Form of lending, which is usually granted to a company formed solely to develop a single project, that can be applied to a wide range of industries such as oil and gas, petrochemicals, mining, power, transportation, telecommunications;

- The repayment of debt is (in full or for the most part) dependent on cash flows generated by the project and its assets, with such debt facilities being "limited"[12] or "non-recourse"[13] to the shareholders;

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[12] Lenders rely on a mix of guarantees, formed by the cash flows generated by the project and other personal and real conventional guarantees, assigned by the shareholders/promoters, such as pledge, mortgage and bail, which remain valid for part of the period and jointly guarantee the borrower.

- Usually such a structure may involve one or more sponsors, as well as a package of financial instruments granted to the SPV, by a syndicate of banks, and/or capital markets and/or other sources of debt;

- This kind of structures present high levels of gearing (the relation between debt / equity is usually of 60:40 - 80:20), in which the balance for all parties depends on the economic aspects of the project and how it is achieved by the sharing of risk between shareholders and creditors.

- The main guarantee for the creditors are the project company's contracts, licenses, or ownership of rights to natural resources, even though the physical assets are likely to be worth much less than the debt if they are sold off after a default on the financing.

The use of this type of structure also brings some disadvantages, namely (Yescombe, 2002):

- High costs in terms of financial, technical and legal advisory;

- Lenders engage in defining the terms of the contracts, which may not be pleased by the sponsors;

- Need for thorough due diligence, so that lenders feel comfortable with the granting of credit facilities and the ability of the project to refund, which makes the process time consuming;

- The need for control and monitoring by lenders may place some limitations on the managing freedom of promoters.

In the case of PPP's setup for the construction of tolls and roads, revenues are rooted in the revenue streams from the contractual arrangements and/or from the tariffs from end users which will only commence once the construction has been completed and the project is in operation.

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[13] Payment of debt having only as collateral the cash flows of the project. This type of debt does not allow access to the assets of shareholders/promoters.

4.2. Risk of Default

For the financing entities of PPPs is extremely important to assess the risk of default. According to Damodaran (1997), risk of default of a company is a function of two variables:

- Company's ability to generate cash flow (firms that generate high cash flows relative to their financial obligations should have lower default risk than firms that generate low cash flow in comparison to their debt);

- Volatility of those cash flows (stable cash flows are often associated with lower default risk).

In order to anticipate any signs of default, lenders will seek to have trigger events, which allow them to have additional rights and powers in case of their occurrence. To do so, most models of default risk commonly use financial ratios (measuring the cash flow coverage and evaluating the cash flows variation stream). They are used before and after financial close: before in scenarios and sensitivity analysis and after as a tool for the project monitoring and control.

Whenever certain ratios fall below the required levels, lenders may trigger some actions, including blocking the distribution of dividends, paying off existing accounts, create a reserve account to ensure compliance with the debt service, taking control of additional rights of the borrower or its shareholder. If violations persist, they might be considered events of default, allowing lenders to suspend or cancel credit facilities, change terms of contracts, including interest rates, fees and penalties.

Below are presented some of the ratios that are usually more attractive to lenders and used by many rating agencies and investment banks:

✓ **Debt-equity (D/E) Ratio**

It's calculated as long term debt / shareholder's equity. Lenders prefer a lower D/E in order to ensure a greater involvement and commitment of the shareholders. On the other hand, shareholder's try to negotiate a higher ratio, reducing their capital inflows in the investment phase

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and increasing the potential profitability of the amount invested. The ratio agreed between the project company and lenders will be the result of a compromise which takes into consideration several factors, including: the overall risk of the project, the proportion of risk that is assumed by creditors, the project characteristics, the activity sector and market.

$$\frac{Debt}{Equity} = \frac{Long\ Term\ Debt}{Shareholder'sEquity} \qquad (1)$$

✓ **Debt Service Coverage Ratio (DSCR)**

This ratio measures the cash-flows available to meet payments of interests and principal on debt on each period. Allowing lenders to analyze, through the project financial model, the ratio of total revenues available for debt service (EBITDA usually is considered a good measure) during a given period of time (typically annual, but may be intra-annual especially for projects exposed to seasonality) and compare this to the amount of debt service owed. The analysis is performed based on the minimum and average values thereby attempting to evaluate the cash flows volatility.

The difference between the debt service coverage ratio and other measures of financial strength is that DSCR takes into consideration the actual debt service of the loan. It's very similar to LLCR (the next ratio), but while the last gives a broad view of the ability to meet debt service as a whole the DSCR allows analyzing each of the period's part of the repayment plan.

$$DSCR\ t = \frac{Cash-flows\ available\ for\ debt\ service\ t}{Total\ Debt\ Service\ (principal, interest\ and\ comissions)\ t} \qquad (2)$$

✓ **Loan Life Cover Ratio (LLCR)**

Is defined as a ratio of the net present value of project resources (internal liquidity at the time of the projection and available future cash flow for debt service until the legal maturity of the debt), divided by outstanding debt. Represents the number of times the NPV (throughout the life of the

loan), can pay the amount outstanding. The discount rate used to calculate de NPV is the weighted average interest rate of all debt; similar to WACC but only for debt finance.

$$LLCR = \frac{NPV\ of\ cash-flows\ available\ for\ debt\ service\ (during\ debt)\ discounted\ at\ debt\ rate}{Outstanding\ Debt} \quad (3)$$

The table below presents the average values by sector of DSCR e LLCR in various sectors where project finance is utilized:

Project Sector	Average DSCR	Average LLCR
Power		
Merchant Plants (plants with no offtake agreement)	2.00x - 2.25x	2.25x - 2.75x
With a tolling agreement	1.50x - 1.70x	1.50x - 1.80x
In cases involving regulated business	1.30x - 1.50x	1.30x - 1.50x
Transportation/shipping	1.25x - 1.50x	1.40x - 1.60x
Telecom *	1.20x - 1.50x	n.a.
Water	1.20x - 1.30x	1.30x - 1.40x
Waste to energy	1.35x - 1.40x	1.80x - 1.90x
PFI **	1.35x - 1.40x	1.45x - 1.50x

* In the telecom sector, the average DSCR is determined by the security package. The data provieded in the table refer not only to project finance deals in the strict sense, but also to refinancing existing positions on a nonrecourse basis.

** As regard PFIs, one should consider the makeup of the base case used as a point of reference. The relevant data slotted into the table do n ot take into account market risk due to revenue variables. Insted, they assess only counterparty risk and the transfer of project risk underwritten in the concession agreement to the concession awarder.

Source: Gatti, S. (2008)

Figure 11 - Average DSCR and LLCR

✓ **Project Life Cover Ratio (PLCR)**

Corresponds to the NPV of cash flow generation capacity of the project beyond the scheduled maturity of the debt, over the amount owed on the reference date of the calculation. Normally the reference to the life of the project refers to the expected economic life of the asset. When we are in presence of a concession, this period refers to the number of years that remain until the end of the concession date. This metric is very useful and can be an alternative to LLCR, in situations where long-term debt is not available and the cash flow coverage is too narrow to retire debt over

the shorter available debt life. The discount rate used to calculate the NPV of cash flows available to cover the debt service is the interest rate of loans that are in progress.

$$PLCR = \frac{NPV \text{ of } cash-flows \text{ } available \text{ } for \text{ } debt \text{ } service \text{ } (during \text{ } project \text{ } life) discounted \text{ } at \text{ } debt \text{ } rate}{Outstanding \text{ } Debt \text{ } (on \text{ } the \text{ } refered \text{ } date)} \quad (4)$$

✓ **Interest Coverage Ratio (ICR)**

This ratio determines how easily a company can meet the interest inherent in outstanding debt. It's calculated by dividing cash-flow available for debt service by interest for the same period - the smaller the value the greater the level of indebtedness of the company.

$$ICR \text{ } t = \frac{Cash-flows \text{ } available \text{ } for \text{ } debt \text{ } service \text{ } t}{Interest \text{ } t} \quad (5)$$

5. THE CASE OF EP SUB-CONCESSIONS

Between 2007 and 2010 Portugal Government launched a group of highways through company Estradas de Portugal, SA, under a system of sub-concession. These sub-concessions (presented in Appendix 5), were launched on the basis of development under Public Private Partnership, but without previous calculation of PSC.

The funding model for these facilities would be conducted only partly through tolls, while the State, through EP, compensates the respective concessionaires by means of availability and service payments.

More recently, and in the face of obvious imbalances of these projects and overall program of highway concessions as a result of high debt levels, was performed a review of these contracts to reduce its object, including not only sections of conception / construction (on which works have not yet been started or are at an early stage) but also sections of rehabilitation, improvement,

operation and maintenance, which can be canceled. All works of preservation and maintenance will be responsibility of EP. In order to evaluate the behavior and the presence of warning signs regarding the performance of the loans associated with the EP in study, some ratios mentioned in the previous chapter were calculated: (i) Loan Life Coverage Ratio, (ii) Debt Service Coverage Ratio and (iii) Interest Coverage Ratio. These ratios are commonly used as covenants[14] in the financing agreements.

5.1. Assumptions used to estimate the Cash Flows of Sub-concessions

In the absence of information provided by sub-concessionaires the information used as reference in this study, were reports prepared by consultants (Deloitte, KPMG and Efisa) at the request of EP - Estradas de Portugal, SA under the process of awarding the sub concessions (Douro Interior, Baixo Tejo, Baixo Alentejo, Algarve Litoral e Litoral Oeste). The referred documents were developed with the primary objective of supporting EP in the decision-making process. The table below presents a summary of the main features of the studied sub-concessions in terms of investment, length (in miles) and expected sources of funding.

	Baixo Alentejo	Baixo Tejo	Algarve Litoral	Douro Interior	Litoral Oeste	Average Road Sub-concessions
End of Construction / Star Operation	January 2012	January 2012	January 2014	January 2012	February 2014	
Initial Capex ('000)	424.000	260.000	130.000	526.000	350.000	338.000
Total Km for Construction	186	72,7	29,5	226	85	120
Total Km Exploration	354,2	72,7	257,3	242,3	111,6	208
Tolls / Total Km	18,90%	31,40%	0,00%	0,00%	17,40%	n.a.
Capex Inicial / KM ('000)	1.233	3.714	476	2.174	3.211	2.162
Term	30	30	30	30	30	30
Debt - %	73,00%	86,00%	61,00%	81,00%	85,00%	77%
Debt	309.520	223.600	79.300	426.060	297.500	267.196
Equity - %	27,00%	14,00%	39,00%	19,00%	15,00%	23%
Equity	114.480	36.400	50.700	99.940	52.500	70.804
Debt/Equtiy	2,7	6,1	1,6	4,3	5,7	4,07
Cost of Equity	10,00%	10,00%	10,00%	10,00%	10,00%	10%
Cost of Debt	5,60%	5,80%	5,80%	6,20%	6,30%	6%
Cost of Equity	10,00%	10,00%	10,00%	10,00%	10,00%	10%
Tax	26,50%	26,50%	26,50%	26,50%	26,50%	26,50%
WACC	5,81%	5,07%	6,68%	5,65%	5,56%	5,75%
IRR Base case (Shareholders)	8,48%	11,00%	6,37%	7,98%	13,10%	9,39%

Source: IEP - Portuguese Public Road Institute and E&Y Report (2012)

Figure 12 - Summary of sub-concessions features

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[14] Indirect financing guarantees represented by a set of accessory obligations in order to ensure payment of the debt. These obligations can be positive or negative, such as requirements for compliance with certain ratios or limitations on the freedom of managing directors.

The financing costs are high in the concessions Douro Interior and Litoral Oeste compared to the other projects. The IRR of the initials Base Case are substantially higher in sub-concessions Baixo Tejo and Litoral Oeste, which could be considered an opportunity for the state to reduce the income of shareholders. With the exception of Baixo Alentejo and Algarve Litoral, all sub concessions exhibit high levels of leverage.

Operating Income of sub-concessionaires is mainly from payments made by EP, regarding availability and service. The global economic impact studies and economic viability analysis for each of the sub concessions[15], state that in line with the requirements of Tender Specifications the Annual Remuneration of the Sub concessionaire will be calculated as follows:

$$Rt = Dis\ t + Serv\ t - Dedt - Pen\ t\ \pm\ \sum(Sin\ t) \qquad (6)$$

Where:

R_t =   Annual remuneration of the sub-concessionaire in year t

Dis_t =   Component of annual remuneration concerning the availability of routes actually recorded in year t

$Serv_t$ =   Component of annual remuneration for service provided by the sub-concessionaire effectively verified in t

Ded_t =   Component corresponding to the deductions to be made due to the occurrence of performance and availability faults in year t

Pen_t =   Component corresponding to the penalty resulting from environmental externalities and accidents

Sin_t =   Corresponding amount of deduction or tax increase as a result of developments in accident rates for year t.

The <u>Service Component</u> (concerning the services provided by the sub concessionaire in each year) is given by:

$$Serv\ t = \sum_j L\ j\ \times ts\ t\ \times TMDAt\ (j) \times ndt\ (j) \qquad (7)$$

$L\ (j)$ =   Extension expressed in Km of Subsection j;

ts_t=   Value of the daily rate per km for service in year t, which is equal to € 0.06671, excluding VAT, at prices of December 2006, applied to the effective length of each subsection with rounding to hectometer, updates being calculated according with the formula for updating the toll tariffs

nt_t =   Number of days that the subsection is found in the service;

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[15] Baixo Alentejo (KPMG, 2008), Baixo Tejo (Deloitte, 2009), Algarve Litoral (Deloitte, 2009), Douro Interior (KPMG, 2008) e Litoral Oeste (Efisa, 2008).

t =   Period of one calendar year

TMDA =   Annual Average Daily traffic

And the <u>Availability Component</u> (concerning the availability for each subsection j, in each year):

$$Dis\ t = \sum j\ td\ t\ \times nd\ t(j) \times \frac{L(j)}{Ltotal} \quad (8)$$

td_t =   Value of the daily rate of availability in year t;

nd t(j) =   Number of days that the subsection is found in service;

L (j) =   Extension expressed in Km of Subsection j;

L total =   Total extension of Sub-concession.

t =   One year calendar period.

In order to simplify the calculations, other operating revenues that concessions usually have (revenue from the service areas and from customer service) weren't considered, since they represent residual amounts (not exceeding 5% of total revenues), with a tendency to decrease in the face of latest news that point to a breakdown of traffic.

In terms of operating costs, this reflects an overall value that includes operating expenses, conservation and routine maintenance, supplies and services (rent, specialized services, insurance, etc.) and personnel costs. To these costs must also be added a Management Agreement Rate which aims to compensate EP, for the costs incurred with the monitoring and supervision of the project. This fee is computed as follows:

$$T = K\ \times \frac{CA}{1.000.000} \quad (9)$$

T =   Annual Management Agreement Rate

K =   Constant value of 100 Euros updatable annually according to the Consumer Price Index excluding
         housing published by the National Statistics Institute for the Continent in the previous year (Euro)

CA =   Sum of the annual circulation of each of the sub-sections being this measured as TMDA (Annual
         Average Daily Traffic) x km x day of the year

Some components were not considered, such as deductions for failures of availability and annual increments of income associated with accident rates.

Typically in this type of project cash flows generated first pay expenditure on operation and maintenance and subsequently their sources of funding (debt and equity). Appendix 6, seeks to illustrate a typical cash-flow "waterfall".

5.2. The Financing

All analyzed projects have been financed through *project finance*, so that the refund must be provided by the cash flow generated by each one of the concessions.

Regarding to the financial costs, it was considered that the cost of debt indicated in Figure 9 corresponds to the "all-in", i.e. considers reference rate, spread and commissions related to funding (the most common are the immobilization, structure and agency). In terms of funding options were considered two lines: (i) VAT facility and (ii) senior debt.

If a project takes place in a region where VAT is in force and reimbursement time is long, then the SPV will be entitled to a tax credit but will not be able to recover it from VAT on sales, and so, cash will be needed to finance VAT on construction and development costs.

For the senior debt, on average was considered a period for use / grace of six years and twenty for amortization. The exception to these assumptions is Algarve Litoral sub concession, which assumes the existence of large repairs, of significant amount in terms of investment, which affect cash flows and the financial needs during throughout the life of the concession. Important part of the project concerns the rehabilitation of National Road 125, in order to reduce accidents in one of the Portuguese roads where accidents are more frequent. In Appendix 7 are presented the estimates made for each of the sub-concessions.

5.3. Results

In the previous section was explained the methodology used in the cash flows projections and financial costs associated with each sub concessions. It is now time to present through graphical representation, the results obtained for three of the coverage ratios mentioned – Loan Life Coverage Ratio (LLCR), Debt Service Coverage Ratio (DSCR) and Interest Coverage Ratio (ICR).

	2015	2018	2020	2023	2025	2028	2030	2033
Douro Interior	1,55	1,76	1,94	2,35	2,66	3,19	3,77	5,13
Baixo Alentejo	1,80	2,06	2,27	2,67	2,98	3,53	4,25	6,19
Baixo Tejo	1,62	1,89	2,09	2,49	2,83	3,51	4,25	7,22
Litoral Oeste	1,37	1,52	1,63	1,87	2,04	2,42	2,80	4,23
Algarve Litoral	3,58	3,79	2,27	3,39	3,93	5,20	6,93	14,03
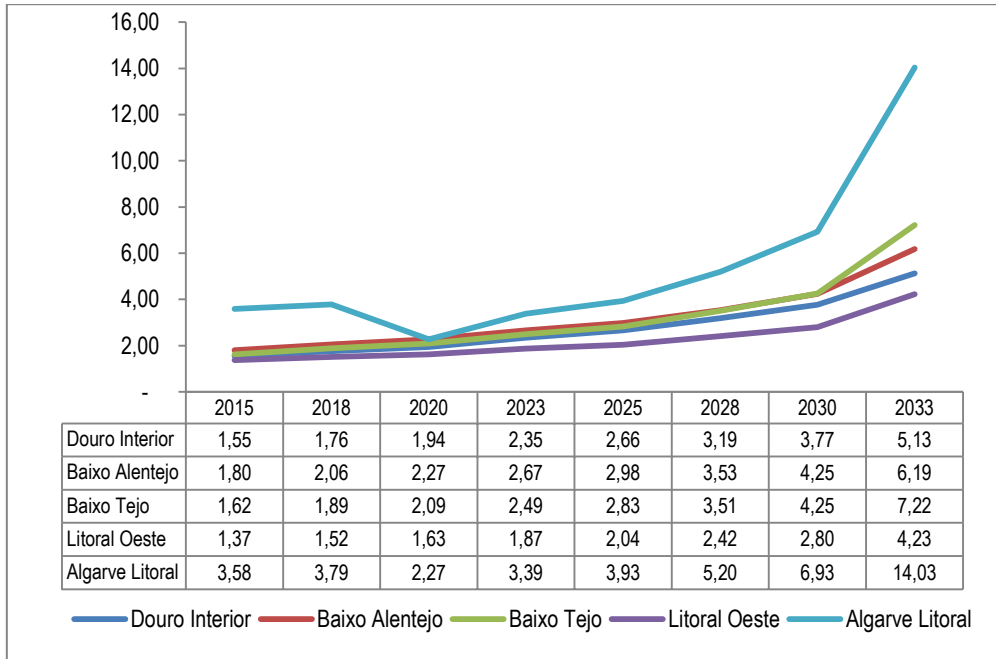
Figure 13 - LLCR (Loan Life Coverage Ratio)

	2015	2018	2020	2023	2025	2028	2030	2033
Douro Interior	0,61	0,98	1,29	1,38	1,71	2,04	1,98	3,26
Baixo Alentejo	0,68	1,30	1,46	1,46	1,95	2,34	2,66	2,11
Baixo Tejo	0,48	1,04	1,13	1,38	1,58	1,87	2,17	2,43
Litoral Oeste	0,66	1,04	0,93	1,25	1,36	1,57	1,42	1,89
Algarve Litoral	2,88	3,41	-	1,80	2,21	2,72	3,09	8,21

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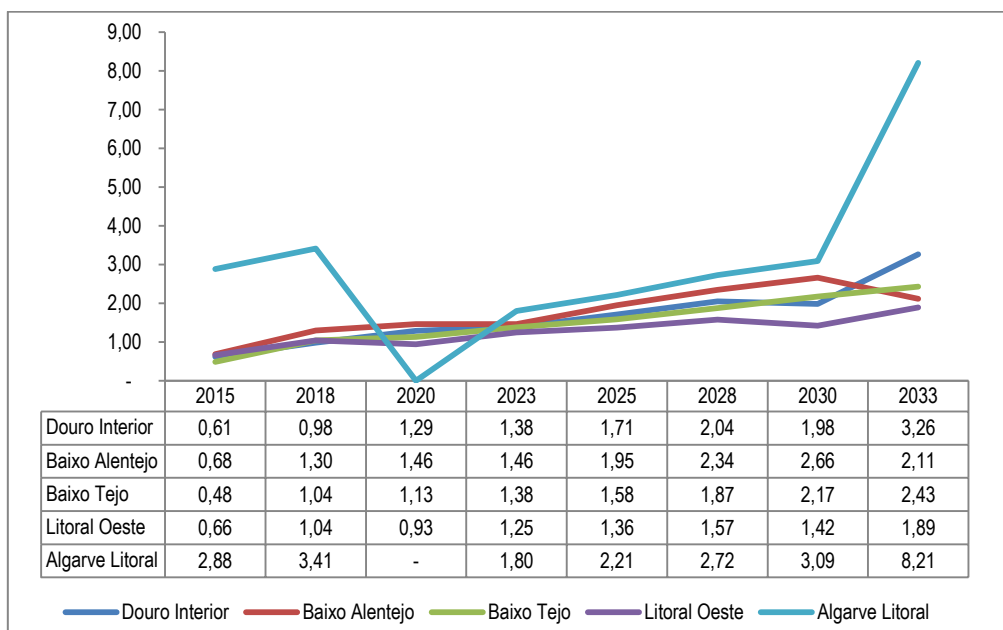
Figure 14 - DSCR (Debt Service Coverage Ratios)

According to the Report of Ernst & Young (2012), the DSCR required by lenders, lies in values equal to or superior than 1.20. By analyzing the graphs, one can conclude that in the first years of operation there will be great difficulties in ensuring compliance of such values.

	2015	2018	2020	2023	2025	2028	2030	2033
Douro Interior	1,66	1,81	2,51	2,98	4,03	5,76	7,01	14,39
Baixo Alentejo	1,92	2,49	2,96	3,29	4,81	6,97	11,43	13,17
Baixo Tejo	1,50	2,00	2,29	3,11	3,91	5,57	9,87	18,15
Litoral Oeste	1,55	1,85	1,74	2,54	3,00	4,04	5,69	8,48
Algarve Litoral	5,12	6,50	-	4,39	6,08	9,81	14,96	44,75
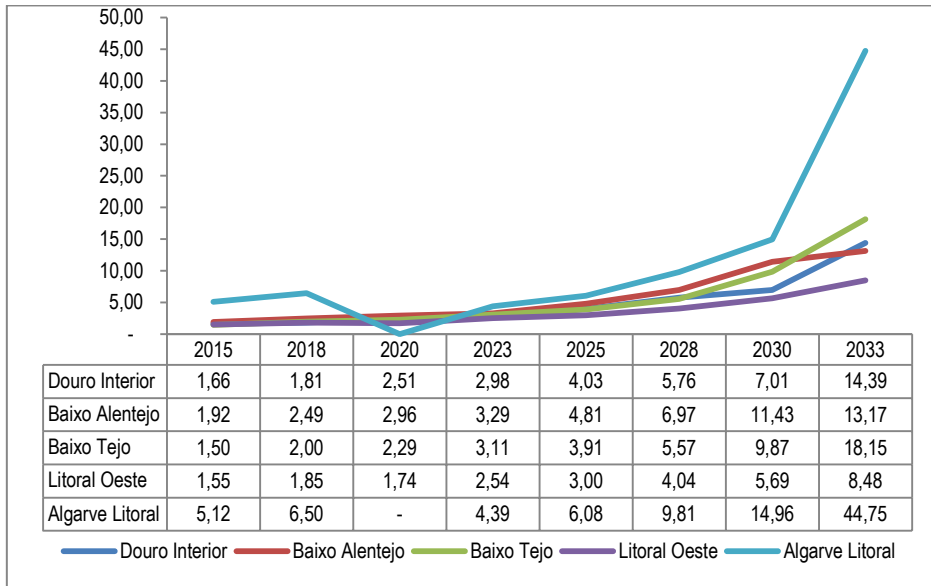
Figure 15 - ICR (Interest Coverage Ratio)

Bearing in mind that only in the Algarve Litoral concession, were considered investments in major repairs, in periods of 10 years from the start date of operation, is possible to verify the impact on the curve profile in each of the covenants.

As expected this kind of project only begins to generate revenues when operation period starts, being of great importance that the anticipated proceeds are properly secured and that the forecasts are as accurate as possible.

With regard to projects studied, they show some difficulties in meeting the debt service planned in the early years of repayment, however positively reveal the stability and consistency of cash flows produced. Whereas the ratios are lower in the initial period it's a scenario which can be considered normal, and the intervention of lenders it's not expected.

Once again the exception is the Algarve Litoral, since cash flows are quite volatile and the project is perceived as of higher risk, due to the investments projected.

6. CONCLUSIONS

6.1. Considerations

Funding a project finance transaction is very complex. The funding associated with projects of large infrastructures generally have high maturities, above the average of other lines that usually commercial banks make available to their clients. Therefore, the perceived risk analysis is extremely important.

In a project finance transaction, the lenders will want to ensure that the revenue stream is protected and that the project performs as it is supposed to perform so that the lenders recover their loan and the project company does not default. Lenders will therefore require that there are a number practical control mechanisms of the company, such as limitations on what the project company can do without the lender approval and the ability to step into management of the project company in the event the project is nonperforming, and that they take security over project assets.

In a way, as an answer to these questions, and in the Portuguese experience, the involvement of financial institutions in some cases exceeds the role of funds provider - sometimes commercial banks also present themselves also as shareholders of the SPV. Nevertheless like any other form of financing, lenders of this type of projects seek to obtain compatible return with perceived level of risk. Additionally they try to get additional income through other products and services required for the SPV (hedging, advisory, project accounts).

Regarding revenues, the scenarios studied were based on the assumption that automobile traffic will grow during the concession period, although in general the growth rates only follow inflation.

Currently these assumptions are clearly optimistic. In fact according to multiple reports, including of InIR, in most motorways automobile traffic has declined significantly. Changes to this variable, penalize the State since the grantor's revenue comes mainly from tolls and also for the concessionaires, through the service component revenue.

6.2. Future Developments

The present study has many limitations, especially in terms of the information available. For instance the real funding conditions of each project and how they were affected by the need of financial institutions to diminish their participation and reduce levels of leverage, due to the severe financial crisis. The behavior of credit spreads of these transactions compared with the conditions of the base case, would also be interesting to study

The assessment of the impact for sub concessions and their financing structures, of recent decisions of Portuguese government in terms of investment and renegotiations initiated with sub concessionaries to reduce costs for the EP, would also be an interesting contribution to the subject of Public Private Partnerships.

7. BIBLIOGRAPHY

- Akintoye, A., Beck, M. & Hardcastle, C. (2003). *Public-Private Partnerships: Managing risks and opportunities*, Blackwell Science.

- Akintoye, A., Taylor, C. & Fitzgerald, E. (1998). Risk Analysis and Management of Private Finance Initiative projects, *Engineering, Construction and Architectural Management,* vol. 5, pp. 9-21.

- Arthur Andersen (2000). Value for Money Drivers in the Private Finance Initiative, London: Arthur Andersen and Enterprise LSE.

- Asenova, D.,Beck, M., Akintoye, A. & Hardcastle, C. (2002). Partnerships, Value For Money and Best Value in PFI Projects: Obstacles and Opportunities, *Public Policy and Administration,* vol. 17 number 4, pp. 5-19.

- Ball, R., Heafey, M. & King, D. (2003). Risk Transfer and Value-for-Money in PFI Projects, *Public Management Review*, vol. 5, pp. 280-290.

- Bing Li, Akintoye, A. Edwards, P. & Hardcastle, C. (2004). The allocation of risk in PPP/PFI construction projects in the UK, *International Journal of Project Management*, vol. 23, pp. 25-35.

- Chan, C., Forwood, D., Roper, H. & Soyens, C. (2009). *Public Infrastructure Financing – An International Perspective*, Productivity Commission, Australian Government.

- Damodaran, A. (1997). *Corporate finance: theory and practice*, New York, John Wiley & Sons

- Deloitte Research Study (2006). *Closing the Infrastructure Gap: The Role of Public-Private Partnerships*.

- EC, European Commission (2003). *Guidelines for Successful Public-Private Partnerships,* Bruxelles.

- EIB, European Investment Bank (2004). *The EIB's role in Public-Private Partnerships (PPPs)*

- Ernst & Young (2012). *Estudo de 36 Contratos de Parcerias Público Privadas do Estado Português, Lisboa.*

- ESCAP, Economic and Social Commission for Asia and the Pacific (2011*). A guide book on Public Private Partnerships in Infrastructure*, Bangkok, United Nations.

- Fitch (2009). Rating Criteria for Infrastructure and Project Finance.

- Gatti, S. (2008). Project Finance in Theory and Practice, Academic Press.

- Gaynor, M. & Gertler, P. (1995). Moral hazard and risk spreading in partnerships, *The Rand Journal of Economics*, vol. 26, number 4, pp. 591-613.

- Grimsey, D. & Lewis, M. (2000). Evaluating the risks of public-private partnerships for Infrastructure projects, *International Journal of Project Management* 20 (2002), 107-118.

- Grimsey, D. & Lewis, M. (2004). *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance*, Edward Elgar Publishing Limited, Cheltenham.

- Grimsey, D. & Lewis, M. (2005). Are Public Private Partnerships Value for Money? Evaluating Alternative Approaches and Comparing Academic and Practitioner Views, *Accounting Forum 4* (29 December), 345-378.

- Gruneberg, S., Hughes, W. & Ancell, D. (2007). Risk under performance-based contracting in the UK construction sector, *Construction Management and Economics*, vol. 25, pp. 691-699.

- Hemming, Richard (2006). Public-Private Partnerships, Government Guarantees and Fiscal Risk, International Monetary Fund, Washington DC.

- HM Treasury (2003). The Green Book – Appraisal and Evaluation in Central Government,

London

- HM Treasury (2006) Value for Money – Assessment Guidance, London.

- Hodge, G. (2004). The risky business of public-private partnerships, *Australian Journal of Public Administration*, vol.63, pp. 37-49.

- Instituto de Infraestruturas Rodoviárias (2011). Gestão e Acompanhamento das Concessões Rodoviárias, Análise Financeira e Gestão de Risco Relativa às Renegociações das Concessões.

- International Monetary Fund (2004). Public-Private Partnerships.

- Irwin, T. (2007). *Government Guarantees: Allocating and Valuing Risk in Privately Financed Infrastructure Projects,* The World Bank.

- Marques, R., Silva, D. (2008). As Parcerias Público-Privadas em Portugal, *Revista de Estudos Politécnicos,* vol. VI, number 10, pp. 33-50.

- Moralos, D., Amekudzi, A. (2008). The State of the Practice of Value for Money Analysis in Comparing Public Private Partnerships to Traditional Procurement, *Public Works Management & Policy*, vol 13, number 2, pp. 114-125.

- Ng, A., Loosemore, M. (2006). Risk allocation in the private provision of public infrastructure, *International Journal of Project Management* 25, pp. 66-76.

- Organisation for Economic Co-operation and Development (2008). *Public Private Partnerships: in pursuit of risk sharing and value for money*, OECD.

- Page, S., Ankner, W., Jones, C. and Fetterman, R. (2008). The Risks and Rewards of Private Equity in Infrastructure, *Public Works Management & Policy*, vol 13, number 2, pp. 100-113.

- PPIAF, Public Private Infrastructure Advisory Facility (2009). *Toolkit for Public Private Partnerships in Roads and Highways.*

- Kenneth, J. & Lind, R. (1995). Uncertainty and the Evaluation of Public Investment Decisions, *The American Economic Review*

- Quiggin, J. (2004). Risk, PPP's and the Public Sector Comparator, *Australian Accounting Review*, vol. 14, pp. 51-61.

- Robinson, H., Carrillo, P., Anumba, C. & Patel, M. (2010). *Governance & Knowledge Management for Public-Private Partnerships*, Wiley-Blackwell

- Sarmento, J.M. (2010). Do public private partnesrships create value for money for the public sector? The Portuguese Experience, *OECD Journal on Budgeting*, Vol. 2010-1, 93-119

- Savvides, C. Savvakis (1994). Risk Analysis in Investment Appraisal, Project Appraisal, vol. 9 number 1, pp. 3-18.

- Shaoul, Jean (2005). A critical analysis of the Private Finance Initiative: selecting a financing method or allocating economic wealth? *Critical Perspectives on Accounting,* number 16, 441-471.

- Tribunal de Contas (2008). *Auditoria à Gestão das Parcerias Público-Privadas – Concessões Rodoviárias, Volume I.*

- Tribunal de Contas (2012). *Auditoria ao Modelo de Gestão, Financiamento e Regulação do Setor Rodoviário, Volume II.*

- Victorian Department of Treasury and Finance (2003), "Partnerships Victoria: Use of Discount Rates in the Partnerships Victoria Process", *Technical Note*, July, Victoria Department of Treasury and Finance, Melbourne, Victoria, Australia.

- Victorian Department of Treasury and Finance (2001), "Partnerships Victoria Guidance Public Sector Comparator ", *Technical Note*, June, Victoria Department of Treasury and Finance, Melbourne, Victoria, Australia.

- Whalen, Michael (2006). *Role of Private Finance Project Finance*, HSBC.

- Yescombe, E.R. (2002). *Principles of Project Finance*, Academic Press, Oxford.

APPENDIX

Appendix 1

Project Finance Transactions by country (2010)

	Country	US$m	%
1	India	54,801.70	26.32%
2	Spain	17,376.10	8.35%
3	Australia	14,592.10	7.01%
4	United States of America	13,423.80	6.45%
5	United Kingdom	13,020.80	6.25%
6	Taiwan	12,064.40	5.80%
7	Saudi Arabia	10,000.20	4.80%
8	Switzerland	5,371.20	2.58%
9	France	5,350.70	2.57%
10	Italy	5,014.50	2.41%
	Top 10 Total	**151,015.50**	**72.54%**
	Global Total	**208,173.90**	**100.00%**

Source: Thompson Reuters Project Finance International

Project Finance Transactions by sector (2010)

Sector	US$m	%
Power	73,300.40	35.21%
Transportation	52,315.40	25.13%
Oil & Gas	25,950.80	12.47%
Leisure & Property	13,824.20	6.64%
Telecommunications	13,382.70	6.43%
Petrochemicals	11,306.40	5.43%
Mining	8,857.70	4.25%
Industry	6,306.00	3.03%
Water & Sewerage	1,577.50	0.76%
Waste & Recylcing	1,266.60	0.61%
Agriculture & Forestry	86.30	0.04%
Global Total	**208,173.90**	**100.00%**

Source: Thompson Reuters Project Finance International

Appendix 2 – Sectorial Breakdown of Global Investment in PPP (prices 2012)
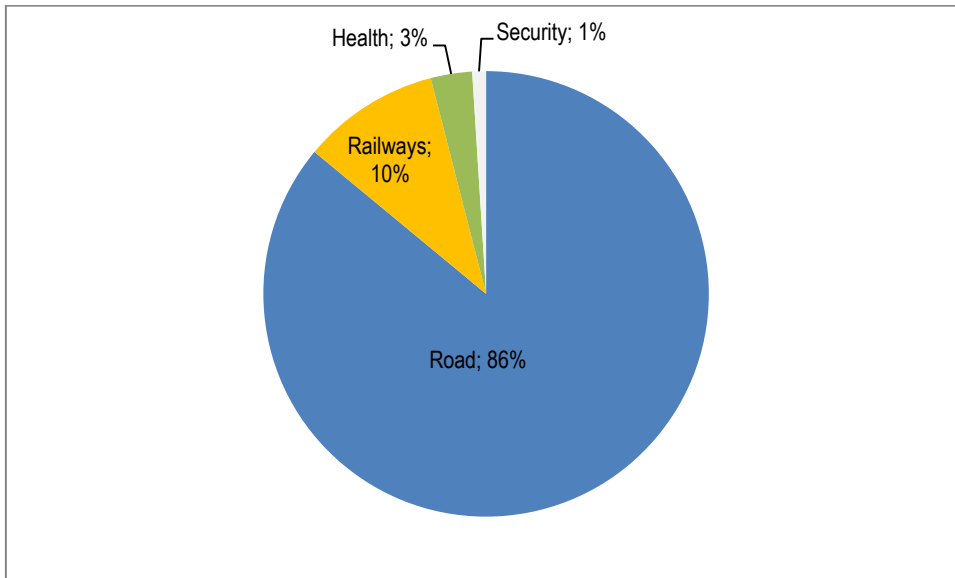
Source: DGTF (General Direction of Treasury and Finance)

As can be seen from the graph above the road sector forms the most significant share of the total cumulative investment made in public-private partnerships, with a weight of 86%.

Appendix 3 - Road Sector - PPP's Concessions

Concession	Concessionaire	Length (Km)	Year	Term	CAPEX (M€)
In Exploration					
BRISA	Brisa- Auto-Estradas de Portugal, SA	1.089	2000	35	2.624
Travessia da Ponte	Lusoponte - Conc. Para a Travessia do Tejo em Lisboa, SA	24	1995	30	897
Norte	Ascendi Norte - Auto Estradas do Norte, SA	175	1999	36	1.317
Oeste	Auto-Estradas do Atlântico, SA	85	1999	30	792
Litoral Centro	Brisal - Auto-Estradas do Litoral, SA	92	2004	30	744
Beira Interior IP2/IP6	Scutvias – Auto-Estradas da Beira Interior, SA	178	1999	30	925
Costa da Prata IC1/IP5	Ascendi Costa da Prata – Auto-Estradas da Costa da Prata, SA	110	2000	30	531,5
Algarve IC4/IP1	Euroscut – Soc. Concessionária da SCUT do Algarve, SA	127	2000	30	323
Interior Norte IP3	Norscut –Concessionária de Auto-Estradas, SA	158	2000	30	645
Beiras Litoral Alta IP5	Ascendi Beiras Litoral e Alta – AE das Beiras Litoral e Alta, SA	173	2001	30	1.136
Norte Litoral IP9/IC1	Euroscut Norte – Soc. Concessionária da SCUT Norte Litoral, SA	111	2001	30	457
Grande Porto IP4/IC24	Ascendi Grande Porto – Auto-Estradas do Grande Porto, SA	56	2002	30	732
Grandes Lisboa	Ascendi Grande Lisboa – Auto-Estradas da Grande Lisboa, SA	89	2007	30	271
Douro Litoral	AEDL – Auto-Estradas do Douro Litoral, SA	129	2007	27	806

Source: DGTF (General Direction of Treasury and Finance)

Appendix 4 - Project Finance Structure Diagram
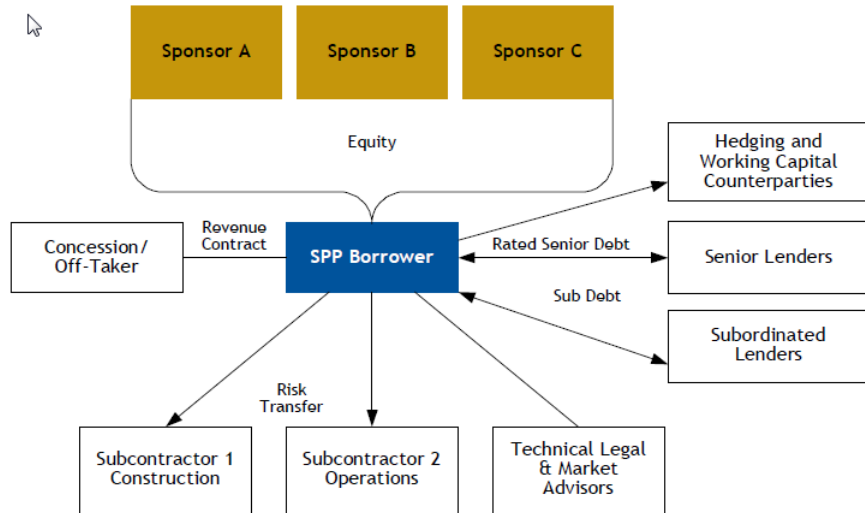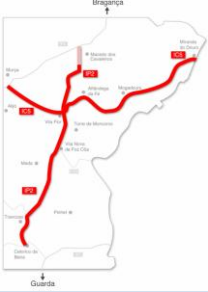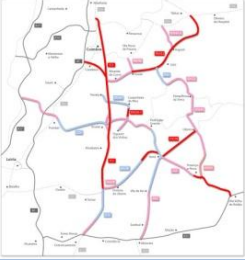
Source: Fitch (2009)

A group of companies (sponsors) join together with the purpose of developing a project in a consortium. In order to create a clear separation between the promoters and the project itself is set up a vehicle company. Sponsors then become shareholders in a SPV (special purpose vehicle) and their liability is limited to the amount of capital invested in the new company. Once the SPV does not have the necessary skills in matters like construction and operation, sub-contracts are made with other companies to develop these tasks (in most situations, these companies are builders / operators and shareholders of the SPV).
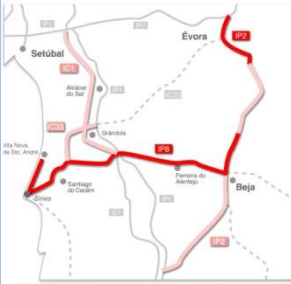
The sole purpose of the vehicle company is to obtain the necessary funds to pursuit the investment, generate financial flows and provide their redistribution by the various parties involved.

The exposure of lenders to this type of projects, may vary from 80% - 90% of the total investment. Since they have limited recourse to the project, they seek to mitigate the risks as much as possible, so usually is required full access to the revenues of the project.

Appendix 5 – Subconcessions EP

Douro Interior	Legislation: Council of Ministers Resolution nº177/2007 of 11 December and Decree-Law nº380/2007 of 13 November.
	Was awarded on 25 November of 2008, to AENOR – Douro Interior, S.A., current ASCENDI DOURO, Estradas do Douro Interior, SA. With an extension of 242 Km divided by two major highways: IP2 with 111 km between Macedo de Cavaleiros and Celorico da Beira, and IC5 with 131 km, linking Murça to Miranda do Douro. **Revenues:** Avalilabilty / Service.
Transmontana	**Legislation**: Council of Ministers Resolution nº177/2007 of 11 December and Decree-Law nº380/2007 of 13 November.
	The sub-concession contract was signed between the EP - Estradas de Portugal, SA and Auto-Estradas XXI, SA, December 9, 2008 Will have a total length of 186 Km, and 130 Km of new construction. Will link the districts of Bragança and Amarante. **Revenues**: Avalilabilty / Service / Toll.
Litoral Oeste	**Legislation**: Council of Ministers Resolution nº181/2007 of 11 December.
	Was awarded to AELO – Auto-Estrada do Litoral Oeste. It's the connection point between A1 - Autoestrada do Norte, A17 - Autoestrada Litoral Centro e a A8 - Autoestrada Loures/Leiria. Will have a length of 109 km (construction/operation 85 km plus 24 km of operation). **Revenues**: Avalilabilty / Service /
Pinhal Interior	**Legislation**: Council of Ministers Resolution nº106/2008 of 7 July..
	Awarded in early 2010 to ASCENDI Pinhal Interior – Estradas do Pinhal Interior, S.A., through a public tender. It's one of the largest road projects ever developed, with a total length of 567 km. The main axis will link A13/IC3, Tomar to Coimbra and IC8 linking Pombal (A17/A1) to Vila Velha de Ródão (A23). **Revenues**: Avalilabilty
Baixo Tejo	**Legislation**: Council of Ministers Resolution nº181/2007 of 29 November.
	It was awarded to Auto-Estrada do Baixo Tejo. This Sub-concession includes a set of infrastructure, in a total of 70 km, 32 km of which concern to construction, maintenance and operation, and 38 km correspond to an increase in the number of pathways, maintenance and operation. It links the two bridges that currently connect the north and south of the Rejo river, comprising 5 sections. **Revenues**: Avalilabilty / Service / Toll.

Baixo Alentejo	**Legislation**: Council of Ministers Resolution nº181/2007 of 29 November. Was awarded to SPER – Sociedade Portuguesa para a Construção e Exploração Rodoviária, S.A.. This Sub-concession includes a set of infrastructure, in a total of 344 km.The underlying contest, includes the design, financing, construction and operation. With the construction of this road infrastructure is intended to provide a link of port of Sines to A2 motorway and also provide a link between major urban centers and of these with major ports, airports and borders. **Revenues**: Avalilabilty / Service / Toll.
Algarve Litoral	**Legislation**: Council of Ministers Resolution nº181/2007 of 11 December. Was awarded to Rotas do Algarve, SA, and will have a total length of 273 km. Includes the requalification of N125, linking the urban areas of the region, and linking them with the main routes IP1 and A22. **Revenues**: Avalilabilty / Service.

Source: DGTF (General Direction of Treasury and Finance) and Sub-concessionaires.

Appendix 6 – Cash-Flow Waterfall
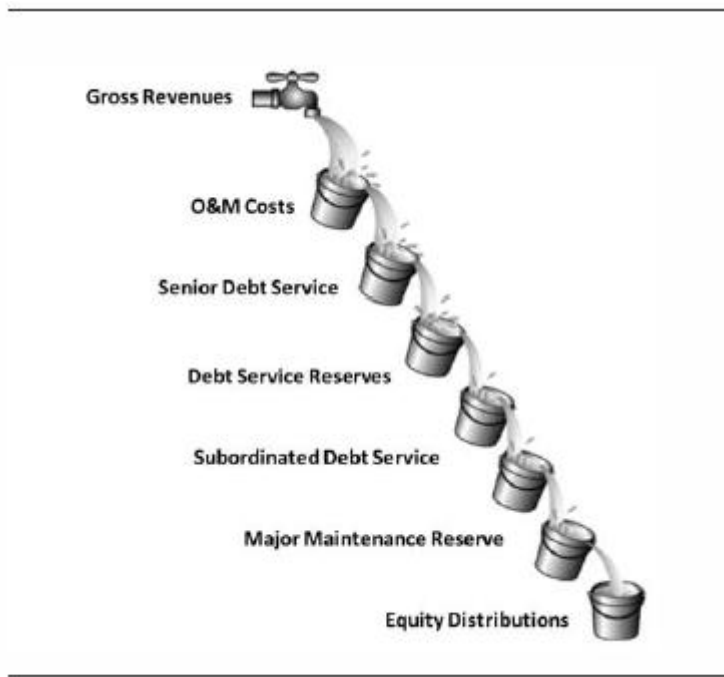
Source: The Risk and Rewards of Private Equity in Infrastruture (2008)

Typically in financing an infrastructure project, gross revenue from tolls or availability, first pay the expenses of operation and maintenance, capital expenditures, and only then the senior debt service, reserve accounts, repayment of subordinated debt and ultimately dividends to investors.

Appendix 7

Douro Interior

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Availability Revenues																														
Availability	-	-	-	-	-	49.919	63.398	64.701	65.923	67.278	68.624	70.034	71.358	72.824	74.280	75.808	77.240	78.827	80.403	82.056	83.607	85.325	87.031	88.821	90.499	92.358	94.205	96.142	97.959	99.972
VAT	-	-	-	-	-	5.858	7.892	8.056	8.206	8.375	8.543	8.720	8.882	9.066	9.247	9.438	9.614	9.813	10.009	10.217	10.407	10.622	10.835	11.059	11.265	11.498	11.728	11.970	12.193	12.445
Service Revenues																														
Service	-	-	-	-	-	4.527	5.789	5.985	6.120	6.304	6.453	7.102	7.478	7.772	8.045	8.482	8.762	8.961	9.243	9.537	9.816	10.128	10.533	10.828	11.326	11.712	12.235	12.802	14.858	15.952
VAT	-	-	-	-	-	2.916	4.014	4.164	4.297	4.472	4.671	4.842	5.011	5.183	5.302	5.641	5.797	5.929	6.094	6.353	6.492	6.610	6.935	7.182	7.286	7.500	7.743	8.045	8.192	8.442
O&M	-1.098	-1.122	-3.188	-8.668	-8.843	-9.021	-9.203	-9.388	-9.577	-9.770	-9.967	-10.167	-10.372	-10.581	-10.794	-11.011	-11.233	-11.459	-11.690	-11.925	-12.165	-12.411	-12.661	-12.916	-13.177	-13.442	-13.714	-13.991	-14.273	-14.561
VAT	-231	-236	-669	-1.820	-1.857	-1.894	-1.933	-1.971	-2.011	-2.052	-2.093	-2.135	-2.178	-2.222	-2.267	-2.312	-2.359	-2.406	-2.455	-2.504	-2.555	-2.606	-2.659	-2.712	-2.767	-2.823	-2.880	-2.938	-2.997	-3.058
Gestão Contrato																														
Contract Management Rate	-1	-2	-10	-36	-40	-42	-44	-46	-48	-51	-53	-55	-58	-60	-63	-65	-68	-71	-74	-77	-81	-84	-88	-92	-96	-100	-104	-109	-113	-118
VAT	-0	-0	-2	-8	-8	-9	-9	-10	-10	-11	-11	-12	-12	-13	-13	-14	-14	-15	-16	-16	-17	-18	-18	-19	-20	-21	-22	-23	-24	-25
VAT (other)	-	17.636	61.351	32.565	1.828	-6.871	-12.171	-12.825	-11.673	-10.999	-12.968	-13.977	-10.058	-7.787	-12.799	-12.678	-15.432	-15.987	-16.122	-16.666	-14.655	-14.335	-12.524	-25.616	-19.051	-18.955	-17.393	-16.497	-20.317	-21.212
Operational CF	-1.330	16.276	57.481	22.033	-8.921	45.383	57.733	58.665	61.227	63.547	63.198	64.352	70.051	74.182	70.938	73.290	72.307	73.592	75.393	76.974	80.849	83.231	87.383	76.534	85.265	87.727	91.797	95.401	95.478	97.837
Investment	-82.882	-291.023	-151.874	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Reppairs	-	-	-	-	-	-	838	-	-7.350	-11.632	-2.428	-	-22.238	-33.699	-8.278	-13.100	-	-	-1.063	-	-12.282	-14.752	-25.957	41.079	-1.197	-	-10.498	-16.613	-	-
Investment CF	-82.882	-291.023	-151.874	-	-	-	838	-	-7.350	-11.632	-2.428	-	-22.238	-33.699	-8.278	-13.100	-	-	-1.063	-	-12.282	-14.752	-25.957	41.079	-1.197	-	-10.498	-16.613	-	-
CF Available for debt service	-84.212	-274.747	-94.393	22.033	-8.921	45.383	56.895	58.665	53.877	51.915	60.770	64.352	47.813	40.483	62.660	60.190	72.307	73.592	74.330	76.974	68.567	68.479	61.426	117.613	84.068	87.727	81.299	78.788	95.478	97.837
Financial Cash Flow																														
Equity	16.482	58.316	34.943	8.285	8.754	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt																														
Amortizing	70.267	248.612	148.970	35.321	37.320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet	7.027	24.861	14.897	3.532	3.732	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility warthdrow	17.636	43.715	-	-	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility Repayment	-	-	-	-	-	-34.263	-34.263	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow Available for Senior Debt	20.174	75.896	89.520	65.639	37.191	11.120	22.632	58.665	53.877	51.915	60.770	64.352	47.813	40.483	62.660	60.190	72.307	73.592	74.330	76.974	68.567	68.479	61.426	117.613	84.068	87.727	81.299	78.788	95.478	97.837
Interest																														
Amortizing	-1.992	-11.032	-22.304	-27.528	-29.588	-30.646	-29.880	-28.347	-26.815	-25.283	-23.750	-22.218	-20.686	-19.154	-17.621	-16.089	-14.557	-13.024	-11.492	-9.960	-8.428	-6.895	-5.363	-3.831	-2.436	-904	0	0	0	0
Bullet	-221	-1.226	-2.478	-3.059	-3.288	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-3.405	-1.703	0	0	0	0
VAT	-556	-2.523	-4.059	-4.315	-4.316	-3.238	-1.079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repayment																														
Amortizing	-	-	-	-	-	-	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-24.322	-19.958	-28.686	-	-	-
Bullet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-54.049	-	-	0
Cash Flow available after initial equity contributions and debt	17.405	61.115	60.679	30.737	-0	-26.169	-36.054	2.591	-665	-1.095	9.293	14.407	-600	-6.397	17.312	16.373	30.023	32.840	35.110	39.287	32.412	33.857	28.336	86.055	58.269	2.386	81.299	78.788	95.478	97.837

Baixo Alentejo

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Availability Revenue	-	-	-	-	-	27.895	37.583	38.360	39.075	39.883	40.681	41.522	42.296	43.171	44.034	44.945	45.783	46.729	47.664	48.650	49.557	50.581	51.593	52.660	53.642	54.751	55.846	57.001	58.063	59.264
VAT	-	-	-	-	-	5.858	7.892	8.056	8.206	8.375	8.543	8.720	8.882	9.066	9.247	9.438	9.614	9.813	10.009	10.217	10.407	10.622	10.835	11.059	11.265	11.498	11.728	11.970	12.193	12.445
Service Revenue	-	-	-	-	-	13.885	19.115	19.829	20.461	21.294	22.242	23.059	23.864	24.682	25.246	26.861	27.604	28.232	29.018	30.251	30.914	31.478	33.022	34.200	34.696	35.715	36.870	38.308	39.009	40.199
VAT	-	-	-	-	-	2.916	4.014	4.164	4.297	4.472	4.671	4.842	5.011	5.183	5.302	5.641	5.797	5.929	6.094	6.353	6.492	6.610	6.935	7.182	7.286	7.500	7.743	8.045	8.192	8.442
O&M	- 7.807	- 7.983	- 8.142	- 11.191	- 11.415	- 11.643	- 11.876	- 12.114	- 12.356	- 12.604	- 12.856	- 13.112	- 13.375	- 13.643	- 13.915	- 14.193	- 14.477	- 14.767	- 15.062	- 15.363	- 15.671	- 15.984	- 16.304	- 16.629	- 16.962	- 17.302	- 17.648	- 18.001	- 18.361	- 18.728
VAT	- 1.639	- 1.676	- 1.710	- 2.350	- 2.397	- 2.445	- 2.494	- 2.544	- 2.595	- 2.647	- 2.700	- 2.754	- 2.809	- 2.865	- 2.922	- 2.981	- 3.040	- 3.101	- 3.163	- 3.226	- 3.291	- 3.357	- 3.424	- 3.492	- 3.562	- 3.633	- 3.706	- 3.780	- 3.856	- 3.933
Contract Management Rate	- 75	- 91	- 95	- 99	- 103	- 108	- 112	- 117	- 121	- 125	- 130	- 135	- 140	- 145	- 150	- 156	- 162	- 167	- 171	- 177	- 182	- 187	- 193	- 199	- 205	- 211	- 217	- 224	- 229	- 235
VAT	- 16	- 19	- 20	- 21	- 22	- 23	- 24	- 25	- 25	- 26	- 27	- 28	- 29	- 30	- 32	- 33	- 34	- 35	- 36	- 37	- 38	- 39	- 40	- 42	- 43	- 44	- 46	- 47	- 48	- 49
Bank guarantee cost	- 49	- 76	- 69	- 58	- 59	- 60	- 62	- 62	- 64	- 65	- 66	- 68	- 69	- 70	- 72	- 74	- 75	- 76	- 79	- 80	- 81	- 83	- 84	- 87	- 88	- 90	- 92	- 93	- 96	- 90
VAT	-	4.362	45.174	44.695	2.371	- 3.362	- 9.132	- 9.629	- 8.064	- 9.986	- 8.003	- 10.532	- 11.033	- 7.253	- 9.179	- 11.843	- 12.315	- 12.583	- 12.879	- 13.272	- 8.271	- 13.335	- 14.266	- 14.673	- 9.958	- 14.837	- 13.116	- 15.915	- 16.457	- 16.870
Operational CF	- 9.586	- 5.484	35.139	30.976	- 11.625	32.913	44.905	45.918	48.813	48.571	52.355	51.514	52.599	58.096	57.559	57.606	58.696	59.973	61.395	63.314	69.836	66.307	68.073	69.978	76.071	73.346	77.361	77.264	78.410	80.445
Investment	- 12.889	- 207.042	- 204.597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Reppairs								-	- 9.344	-	- 12.766	-	-	- 21.173	- 10.523	-	-	-	-	-	- 27.412	-	-	-	- 25.810	-	- 13.346	-	-	-
Investment CF	- 12.889	- 207.042	- 204.597	-	-	-	-	-	- 9.344	-	- 12.766	-	-	- 21.173	- 10.523	-	-	-	-	-	- 27.412	-	-	-	- 25.810	-	- 13.346	-	-	-
CF Available for debt service	- 22.475	- 212.526	- 169.458	30.976	- 11.625	32.913	44.905	45.918	39.469	48.571	39.589	51.514	52.599	36.923	47.036	57.606	58.696	59.973	61.395	63.314	42.424	66.307	68.073	69.978	50.261	73.346	64.015	77.264	78.410	80.445
Financial Cash Flow																														
Equity	5.778	60.007	62.320	9.463	9.936	- 6.838	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt																														
Amortizing	15.622	162.240	168.496	25.584	26.863	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility warthdrow	4.362	40.812	-	-	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility Repayment	-	-	-	-	-	- 24.752	- 24.752	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow Available for Senior Debt	3.286	50.534	61.358	66.023	25.222	1.323	20.153	45.918	39.469	48.571	39.589	51.514	52.599	36.923	47.036	57.606	58.696	59.973	61.395	63.314	42.424	66.307	68.073	69.978	50.261	73.346	64.015	77.264	78.410	80.445
Interest																														
Amortizing	-	- 408	- 5.050	- 13.682	- 18.748	- 20.117	- 20.818	- 20.297	- 19.256	- 18.215	- 17.175	- 16.134	- 15.093	- 14.052	- 13.011	- 11.970	- 10.929	- 9.888	- 8.847	- 7.807	- 6.766	- 5.725	- 4.684	- 3.643	- 2.602	- 1.503	- 462	0	0	0
Bullet	-	45	- 561	- 1.520	- 2.083	- 2.235	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 2.313	- 1.157	0	0	0	0
VAT	-	126	- 1.444	- 2.711	- 2.868	- 2.870	- 2.153	- 718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repayment																														
Amortizing	-	-	-	-	-	-	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 17.946	- 19.958	- 15.934	-	-	-
Bullet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 39.881	-	-	-
Cash Flow available after initial equity contributions and debt	2.707	43.479	43.445	42.324	0	- 23.961	- 21.121	6.402	994	11.137	3.196	16.162	18.288	3.652	14.807	26.418	28.548	30.867	33.329	36.289	16.440	41.364	44.171	47.117	26.487	15.912	64.015	77.264	78.410	80.445

Baixo Tejo

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Availability Revenues																														
Availability	-	-	-	-	-	7.499	9.373	9.394	9.378	9.373	9.373	9.394	9.378	9.373	9.373	9.394	9.378	9.373	9.373	9.394	9.378	9.373	9.373	9.394	9.378	9.373	9.373	9.394	9.378	11.248
VAT	-	-	-	-	-	1.575	1.968	1.973	1.969	1.968	1.968	1.973	1.969	1.968	1.968	1.973	1.969	1.968	1.968	1.973	1.969	1.968	1.968	1.973	1.969	1.968	1.968	1.973	1.969	2.362
Service Revenues																														
service	-	-	-	-	-	16.624	21.515	22.519	23.485	24.529	25.377	26.250	27.048	27.904	28.806	29.804	30.719	31.698	32.730	33.872	34.922	36.048	37.234	38.547	39.755	41.052	42.417	43.924	45.298	56.182
VAT	-	-	-	-	-	3.491	4.518	4.729	4.932	5.151	5.329	5.513	5.680	5.860	6.049	6.259	6.451	6.657	6.873	7.113	7.334	7.570	7.819	8.095	8.349	8.621	8.908	9.224	9.513	11.798
O&M	- 3.444	- 6.845	- 8.250	- 6.066	- 6.774	- 7.610	- 7.653	- 8.083	- 8.185	- 8.168	- 8.484	- 9.348	- 9.282	- 9.398	- 8.827	- 8.657	- 8.569	- 8.644	- 8.759	- 9.877	- 9.972	- 9.685	- 11.170	- 10.401	- 10.757	- 11.627	- 11.296	- 11.149	- 12.232	- 11.726
VAT	- 723	- 1.437	- 1.733	- 1.274	- 1.423	- 1.598	- 1.607	- 1.697	- 1.719	- 1.715	- 1.782	- 1.963	- 1.949	- 1.974	- 1.854	- 1.818	- 1.799	- 1.815	- 1.839	- 2.074	- 2.094	- 2.034	- 2.346	- 2.184	- 2.259	- 2.442	- 2.372	- 2.341	- 2.569	- 2.462
Contract Management Rate	- 107	- 113	- 120	- 128	- 135	- 143	- 151	- 160	- 169	- 179	- 186	- 194	- 201	- 208	- 216	- 225	- 233	- 242	- 251	- 261	- 271	- 281	- 292	- 304	- 315	- 327	- 339	- 353	- 366	- 380
VAT	- 22	- 24	- 25	- 27	- 28	- 30	- 32	- 34	- 35	- 38	- 39	- 41	- 42	- 44	- 45	- 47	- 49	- 51	- 53	- 55	- 57	- 59	- 61	- 64	- 66	- 69	- 71	- 74	- 77	- 80
Operacional CF	- 4.297	- 8.419	- 10.128	- 7.495	- 8.360	19.807	27.931	28.640	29.656	30.921	31.557	31.584	32.601	33.482	35.254	36.683	37.867	38.944	40.042	40.085	41.209	42.900	46.602	51.778	53.251	54.319	57.119	59.569	59.956	79.495
Investment	- 74.758	- 81.865	- 102.826	- 1.229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Reppairs																														
Investment CF	- 74.758	- 81.865	- 102.826	- 1.229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CF Available for debt service	- 79.055	- 90.285	- 112.954	- 8.723	- 8.360	19.807	27.931	28.640	29.656	30.921	31.557	31.584	32.601	33.482	35.254	36.683	37.867	38.944	40.042	40.085	41.209	42.900	46.602	51.778	53.251	54.319	57.119	59.569	59.956	79.495
Financial Cash Flow																														
Equity	11.278	13.709	17.624	4.397	4.479	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt																														
Amortizing	62.351	75.790	97.435	24.312	24.763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet	6.928	8.421	10.826	2.701	2.751	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility warthdrow	4.362	40.812	-	-	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility Repayment					- 24.752	- 24.752																								
Cash Flow Available for Senior Debt	5.864	48.447	12.931	22.687	23.681	- 4.945	3.179	28.640	29.656	30.921	31.557	31.584	32.601	33.482	35.254	36.683	37.867	38.944	40.042	40.085	41.209	42.900	46.602	51.778	53.251	54.319	57.119	59.569	59.956	79.495
Interest																														
Amortizing	- 1.808	- 5.814	- 10.838	- 14.368	- 15.792	- 16.510	- 16.097	- 15.271	- 14.446	- 13.620	- 12.795	- 11.970	- 11.144	- 10.319	- 9.493	- 8.668	- 7.842	- 7.017	- 6.191	- 5.366	- 4.540	- 3.715	- 2.889	- 2.064	- 1.099	- 274	0	0	0	0
Bullet	- 201	- 646	- 1.204	- 1.596	- 1.755	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	- 1.834	917	0	0	0
VAT	- 126	- 1.444	- 2.711	- 2.868	- 2.870	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repayment																														
Amortizing	-	-	-	-	-	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 14.232	- 19.024	- 9.441	-	-	-
Bullet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow available after initial equity contributions and debt	3.728	40.543	- 1.822	3.853	3.265	- 23.289	- 28.985	- 2.698	- 857	1.234	2.695	3.547	5.390	7.096	9.694	11.948	13.958	15.861	17.784	18.652	20.602	23.119	27.646	33.648	31.294	43.687	57.120	59.569	59.956	79.495

Litoral Oeste

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Receitas Disponibilidade																															
Receitas de Disp.	1.084.851	-	-	-	-	-	34.995	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744	43.744
VAT	227.819	-	-	-	-	-	7.349	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186	9.186
Receitas de Serviço																															
Receitas de Servt	443.852	-	-	-	-	-	8.423	10.928	11.464	11.887	12.357	12.894	13.452	14.123	14.607	15.020	15.861	16.458	16.903	17.571	18.657	19.197	19.985	20.645	21.523	22.056	22.806	24.059	24.997	25.879	32.100
VAT	93.209	-	-	-	-	-	1.769	2.295	2.407	2.496	2.595	2.708	2.825	2.966	3.067	3.154	3.331	3.456	3.550	3.690	3.918	4.031	4.197	4.335	4.520	4.632	4.789	5.052	5.249	5.435	6.741
O&M																															
Custos O&M	- 404.259	- 1.895	- 2.326	- 6.327	- 10.982	- 11.680	- 11.544	- 11.718	- 11.958	- 12.190	- 12.440	- 12.690	- 12.951	- 13.202	- 13.472	- 13.744	- 14.025	- 14.298	- 14.591	- 14.885	- 15.190	- 15.485	- 15.802	- 16.121	- 16.451	- 16.771	- 17.114	- 17.459	- 17.817	- 18.163	- 20.968
VAT	- 84.894	- 398	- 488	- 1.329	- 2.306	- 2.453	- 2.424	- 2.461	- 2.511	- 2.560	- 2.612	- 2.665	- 2.720	- 2.772	- 2.829	- 2.886	- 2.945	- 3.003	- 3.064	- 3.126	- 3.190	- 3.252	- 3.318	- 3.385	- 3.455	- 3.522	- 3.594	- 3.666	- 3.742	- 3.814	- 4.403
Gestão Contrato																															
Taxa de Gestão do Contrato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Custos c/ garantia p/ caução	-																														
VAT	- 150.959	-	- 14.804	- 33.602	- 27.793	- 2.743	- 3.019	- 8.817	- 9.077	- 8.679	- 9.125	- 9.110	- 7.551	- 8.771	- 9.259	- 9.409	- 9.559	- 9.634	- 9.669	- 8.657	- 9.802	- 9.121	- 7.874	- 9.432	- 10.196	- 10.144	- 10.323	- 10.553	- 10.684	- 10.797	- 10.640
CF Operacional		- 2.293	11.989	25.946	14.505	- 11.390	35.548	43.158	43.255	43.885	43.705	44.067	45.985	45.274	45.045	45.065	45.593	45.910	46.059	47.524	47.324	48.301	50.118	48.973	48.872	49.181	49.495	50.363	50.934	51.469	55.759
Investment	- 352.302	- 68.599	- 157.683	- 126.020																											
Big Reppairs	- 49.075				- 2.081	- 2.658	- 549			- 2.288			- 592	- 8.960	- 2.309	- 633	- 164				- 5.648		- 4.368	- 10.941	- 2.635			- 771	- 199		- 4.279
CF Investimento		- 68.599	- 157.683	- 126.020	- 2.081	- 2.658	- 549	-	-	- 2.288	-	-	- 592	- 8.960	- 2.309	- 633	- 164	-	-	-	- 5.648	-	- 4.368	- 10.941	- 2.635	-	-	- 771	- 199	-	- 4.279
CF Disponível para o serviço da dívida		- 70.892	- 145.694	- 100.074	12.424	- 14.048	34.999	43.158	43.255	41.597	43.705	43.475	37.025	42.965	44.412	44.901	45.593	45.910	46.059	41.876	47.324	43.933	39.177	46.338	48.872	48.410	49.296	50.363	50.934	51.469	51.480
Financial Cash Flow																															
Equity		10.949	25.584	22.953	5.945	6.498	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt																															
Amortizing		62.043	144.976	130.070	33.689	36.822	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility warthdrow		14.804	18.798	-	-	268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility Repayment		-	-	-	-	-	- 19.137	- 19.137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow Available for Senior Debt		16.903	43.664	52.949	52.058	29.540	15.862	24.020	43.255	41.597	43.705	43.475	37.025	42.965	44.412	44.901	45.593	45.910	46.059	41.876	47.324	43.933	39.177	46.338	48.872	48.410	49.296	50.363	50.934	51.469	51.480
Interest																															
Amortizing		- 1.815	- 7.870	- 15.915	- 20.705	- 22.768	- 23.845	- 23.248	- 22.056	- 20.864	- 19.672	- 18.480	- 17.287	- 16.095	- 14.903	- 13.711	- 12.518	- 11.326	- 10.134	- 8.942	- 7.749	- 6.557	- 5.365	- 4.173	- 2.981	- 1.736	- 544	0	0	0
Bullet		- 202	- 1.076	- 2.441	- 3.396	- 3.735	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 3.974	- 2.649	-	0	0	0
VAT		- 481	- 1.604	- 2.320	- 2.470	- 2.479	- 1.866	- 622	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repayment																															
Amortizing		-	-	-	-	-	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 18.342	- 19.958	- 16.726	-	-	-
Bullet		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 40.760	-	-	-
Cash Flow available after initial equity contributions and debt		14.406	33.113	32.273	25.487	558	- 13.823	- 22.166	- 1.117	- 1.583	1.717	2.679	- 2.578	4.554	7.193	8.874	10.758	12.267	13.609	10.618	17.258	15.060	11.496	19.849	23.575	22.742	- 11.383	50.363	50.934	51.469	51.481

Algarve Litoral

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
AvailabilityRevenues	-	-	-	-	-	15.974	15.974	16.018	15.974	15.974	15.974	16.018	15.974	15.974	15.974	16.018	15.974	15.974	15.974	15.974	15.974	15.974	15.974	15.974	15.974	15.974	15.974	15.974	15.974
Availability	-	-	-	-	-	13.202	13.202	13.238	13.202	13.202	13.202	13.238	13.202	13.202	13.202	13.238	13.202	13.202	13.202	13.202	13.202	13.202	13.202	13.202	13.202	13.202	13.202	13.202	13.202
VAT	-	-	-	-	-	2.772	2.772	2.780	2.772	2.772	2.772	2.780	2.772	2.772	2.772	2.780	2.772	2.772	2.772	2.772	2.772	2.772	2.772	2.772	2.772	2.772	2.772	2.772	2.772
Receitas de Serviço	-	-	18.652	22.256	29.062	30.150	31.254	32.489	33.590	34.597	35.914	37.154	38.229	39.442	40.695	42.101	43.319	44.696	46.117	47.500	48.797	50.084	51.407	52.908	54.158	55.591	57.054	58.715	60.097
Service	-	-	15.415	18.393	24.018	24.917	25.830	26.850	27.760	28.593	29.681	30.706	31.594	32.597	33.632	34.794	35.801	36.939	38.113	39.256	40.328	41.392	42.485	43.726	44.759	45.943	47.152	48.525	49.667
VAT	-	-	3.237	3.863	5.044	5.233	5.424	5.639	5.830	6.004	6.233	6.448	6.635	6.845	7.063	7.307	7.518	7.757	8.004	8.244	8.469	8.692	8.922	9.182	9.399	9.648	9.902	10.190	10.430
	-	-	11.346	13.557	20.497	20.908	21.326	21.752	22.188	22.632	23.084	23.545	24.016	24.496	24.987	25.486	25.996	26.516	27.046	27.587	28.139	28.702	29.276	29.862	30.458	31.068	31.689	32.323	32.969
O&M	-	-	9.377	11.204	16.940	17.279	17.625	17.977	18.337	18.704	19.078	19.459	19.848	20.245	20.650	21.063	21.484	21.914	22.352	22.799	23.255	23.721	24.195	24.679	25.172	25.676	26.189	26.713	27.247
VAT	-	-	1.969	2.353	3.557	3.629	3.701	3.775	3.851	3.928	4.006	4.086	4.168	4.251	4.337	4.423	4.512	4.602	4.694	4.788	4.884	4.981	5.081	5.183	5.286	5.392	5.500	5.610	5.722
Contract Fee	-	-	131	133	190	197	204	213	221	230	237	246	254	263	271	281	290	300	310	320	330	340	350	361	370	381	393	405	416
Taxa de Gestão do Contrato	-	-	108	110	157	163	169	176	183	190	196	203	210	217	224	232	240	248	256	264	273	281	289	298	306	315	325	335	344
VAT	-	-	23	23	33	34	35	37	38	40	41	43	44	46	47	49	50	52	54	55	57	59	61	63	64	66	68	70	72
Custos c/ garantia p/ caução	-	156	168	171	175	178	182	185	189	193		201	13	209	213	217	222	226	230	235		245	249	254	260	265	270	275	281	287
VAT	-	4.540	16.418	3.451	1.239	4.091	4.450	4.594	4.704	4.801	4.945	413	10.826	749	1.259	5.449	5.719	5.863	6.016	6.161	6.290	6.414	6.542	6.697	6.812	6.951	7.094	7.268	7.398
Operational CF	-	156	4.372	23.292	11.708	6.768	20.549	20.858	21.545	22.036	22.679	23.183	28.735	40.296	30.931	32.183	26.400	26.772	27.461	28.175	29.087	29.437	30.013	30.610	31.344	31.857	32.515	33.184	34.007	34.585
Investment	-	21.620	78.181	23.571	5.760	607																							
Big Reppairs												75.835	28.304	47.168	8.685														
VAT																													
Investment CF	-	21.620	78.181	23.571	5.760	607	-	-	-	-	-	75.835	28.304	47.168	8.685	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CF Available for debt service	-	21.776	73.809	279	5.948	6.161	20.549	20.858	21.545	22.036	22.679	23.183	47.100	11.992	16.237	23.498	26.400	26.772	27.461	28.175	29.087	29.437	30.013	30.610	31.344	31.857	32.515	33.184	34.007	34.585
Financial Cash Flow																													
Equity	8.696	29.904	2.433	368	-	-	-	-	-	-	-	20.343	-	8.758	-	-	-	-	-	-	-	-	22.663	-	17.837	-	-	-	-
Debt																													
Amortizing	13.601	46.772	3.805	575	-	-	-	-	-	-	-	31.819	-	13.698	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullet	830	2.853	232	35	-	-	-	-	-	-	-	1.941	-	836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility warthdrow	4.540	11.878	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VAT Facility Repayment	-	-	-	6.095	6.095	6.095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow Available for Senior Debt	5.060	14.745	5.959	796	66	14.454	20.858	21.545	22.036	22.679	23.183	5.063	11.992	6.218	23.498	26.400	26.772	27.461	28.175	29.087	29.437	30.013	7.947	31.344	14.020	32.515	33.184	34.007	34.585
Interest																													
Amortizing	379	2.209	3.777	3.913	3.930	3.930	3.832	3.636	3.439	3.243	3.046	3.836	4.626	4.854	4.941	4.462	3.983	3.505	3.026	2.547	2.069	1.590	1.111	632	295	98	0	0	0
Bullet	26	140	236	244	245	245	245	245	245	245	245	305	365	391	417	417	417	417	417	417	417	417	417	417	417	417	417	417	98
VAT	141	658	1.067	945	567	189																							
Repayment																													
Amortizing	-	-	-	-	-	-	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	3.170	-	-	-
Bullet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow available after initial equity contributions and debt	4.514	11.738	879	4.305	4.676	10.090	19.951	20.834	21.522	22.361	23.062	4.091	10.171	4.143	21.309	24.690	25.541	26.709	27.902	29.293	30.121	31.176	9.588	33.464	16.478	35.169	32.767	33.590	34.488