

A Three-Layers Theoretical Framework For Analyzing Public Private Partnerships: The Italian Case

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THE APPLICATIONS OF PPP ALL OVER THE WORLD VARY FROM COUNTRY TO COUNTRY. International literature lacks of contributions focusing on cross-country and cross-sector description, analysis and comparison of Public Private Partnerships (PPPs). The present paper aims at developing a framework for characterizing PPPs in various countries. The theoretical framework is divided in three layers: country, sector and project layers. Each layer is characterized by a set of dimensions and each dimension is characterized by a set of variables that are highly relevant to characterize PPPs. The proposed framework has been applied to characterize PPPs implementation in Italy, with a particular focus on the transport sector.

INTRODUCTION

In the 20th century, the more and more widespread adoption of Project Financing (PF) was encouraged by the need for getting financial resources to carry out infrastructure projects without recourse, that is, by offering to the lenders only guarantees about the expected revenues of the project. Public Private Partnerships (PPPs), known as “agreements where public sector bodies enter into long-term contractual agreements with private sector entities for the construction or management of public sector infrastructure facilities by the private sector entity or the provision of services [...] by the private sector entities on behalf of a public sector entity” (Grimsey and Lewis, 2002), became popular because of the possibility to use the instruments offered by PF for the construction of facilities. More specifically, PPPs are collaborations between public governments and private firms aiming at providing services and infrastructures traditionally delivered by public sector.

The earliest adopter of a specific legislation for PPP among European countries was the United Kingdom, where Private Financing Initiative (PFI) was officially introduced in 1992 (Spackman, 2002). Nowadays, PPPs are ruled by specific laws in many EU and non EU countries (Bovis, 2010; Clifton and Duffield, 2006; US Department of Transportation, 2007) and the use of such an instrument to provide public services and infrastructure is more and more widespread. However, the principles of the term PPP are understood in many different ways nationally and even within the various sectors. The implementation of PPP has its own features which are often very different across countries and sectors (Hemming, 2006; Turina and Car-Pusic, 2006). While several studies analyze the characteristics of PPP in some specific countries, such as Akintoye (2009), Smith (2009), Li

and Akintoye (2003), the international literature lacks of contributions aiming at developing a common framework to analyze and compare PPP across sectors and countries. In order to fill this gap the purpose of this paper is to review literature on PPP with the aim at defining a set of parameters/criteria characterizing the whole spectrum of PPP. Based on these parameters/criteria, a three-layer framework for characterization of PPP was developed. At the first layer we pose the country in which the PPP is adopted, at the second layer we pose the sector, and finally the third layer of analysis focuses on the project structure of PPP. Each layer is characterized by a set of dimensions and each dimension is characterized by a set of variables that are highly relevant to characterize PPP. The proposed framework was applied to characterize PPP implementation in Italy. Focusing on the four modes of the transport sector, we test if and how all the dimensions and variables work sufficiently in a cross-sectorial context, thus posing the base for further comparisons of PPP application in different countries.

The remainder of the paper is structured as follows. A brief literature review and the research motivation are presented in Section 2. The PPP analysis framework is proposed in Section 3, while Section 4 applies the framework to the Italian case. Finally, Section 5 concludes the paper.

Research background

An extensive literature has contributed to the debate and the understanding of PPP in a number of ways. This covers multiple disciplines, including public administration (Koppenjan, 2005), public management (Ysa, 2007), construction and project management (Koch and Buser, 2006), legal studies (Tvarnø, 2006) and project finance (Grimsey and Lewis, 2002), just to mention a few.

Researchers have investigated different aspects of PPPs: PPP risks; PPP

finance; the concession selection, the critical success factors and/or barriers for PPP projects, etc. (Garvin and Ford, 2012; Li et al., 2005a; Li et al., 2005b; Jefferies et al., 2002; Schaufelberger and Wipadapisutand, 2003; Zhang, 2005a; 2005b).

However, the analysis of the application, diffusion, and success of PPPs all over the world points out that the PPP projects implementation varies from country to country, from sector to sector, and from project to project (Hemming, 2006; Turina and Car-Pusic, 2006). For these reasons, studies aimed at characterizing PPPs address this issue focusing on a specific country and/or a specific sector or on specific cases of PPP projects.

In particular, studies operating with single country research designs have typically dealt with policy and regulation issues of PPPs (Spackman, 2002; Reeves, 2003; Deakin, 2002; Klijn and Teisman, 2003; Flinders, 2005; Koppenjan, 2005; Johnston and Gudergan, 2007), whereas comparative approaches are generally rare in this field of research (although for a few notable exceptions; see Greve and Hodge, 2007; McQuaid and Scherrer, 2010).

Recognizing that the differentiation in PPP implementation can be traced back to the Government's Role and its capability to manage projects, studies in the field of new public management have investigated the presence of an adequate legal/regulatory frameworks at a country level (Abdel Aziz, 2007; Koch and Buser, 2006; Pongsiri, 2002).

Because of the characteristics of industry sectors are not uniform, researchers have recognized that each sector offers unique challenges and opportunities for PPPs due to differing legal, regulatory and investment considerations. Accordingly, PPP performance and its characteristics vary by sector to sector. Harris (2003) studies the trend of private sector investments in infrastructure by sector, highlighting

the different capability of each sector to attract private participation. ESCAP (2011) points out that physical, natural, and technological characteristics of sectors influence the implementation of PPPs in the planning and design of the project. Roumboutsos et al. (2013), analysing 24 cases originating from 13 countries in Europe, find that the PPP implementation and its successes vary by sector.

A greater number of researchers studies PPP by adopting a case study research approach (Akintoye, 2009; Hodge and Greve, 2005). The review of these cases shows that the diversity of PPP projects is due to the large and complex activities “bundled” into the contractual arrangements, the number of parties and their involvement level in the transaction, and other project-related features (Roumboutsos et al., 2013).

Although there is a wide literature on the analysis of PPP, studies adopt a mono-dimensional perspective, namely a country, sector, and project-specific standpoint, thus not providing a comprehensive understanding of PPP. This study contributes to fill this gap by developing a framework that allows a comprehensive analysis of PPP.

The proposed PPP analysis framework

Recognizing that the PPP implementation is affected by the country context where the project is developed, the structure of the sector, and is project-specific, the proposed framework devoted to a comprehensive analysis of PPP is structured on three layers. At the first layer we pose the country in which the PPP is adopted, at the second layer we pose the sector, and finally the third layer of analysis focuses on the project structure of PPP. Each layer is characterized by a set of dimensions and each dimension is characterized by a set of variables that were identified and defined by reviewing the literature on PPP.

According to the literature, at the country-layer we associated four main dimensions: institutional, legal, economic, and financial (Dewulf et al., 2012). The first two dimensions refer to the presence of a specific institutional mindset supporting the development of PPP and a legal/statutory framework at a national level (Hammerschmid and Ysa, 2010). These could promote the PPP and facilitate the delivery of complex projects by centralizing and streamlining planning approval, or coordinating actions with the private sector in implementing PPP. With this regard, Hammerschmid and Ysa (2010) identify three main aspects that can be expected to have a considerable effect on the diffusion and implementation of PPPs in a country, namely the establishment of a PPP task-forces, PPP legislation, and specific government initiatives to foster PPPs. The other two variables characterize the economic (Qiao et al., 2001; Zhang, 2005c) and financial conditions (Li et al., 2005) of the country. They can be useful to understand the country propensity to use PPP method to deliver public infrastructure.

For the sector-layer the literature suggests the following dimensions: Industry organization, market structure, and performance. The industry organization is characterized by two variables: the regulatory regime expressing the level of regulation of the specific sector (Devapriya, 2006), and the organizational structure explaining the level of private sector participation that characterizes the specific sector (Estache and Serebrisky, 2006). Market structure can be characterized in terms of two variables: the level of demand of the sector and the level of supply. The latter depends on the number of competitors. Finally, the last dimension that characterizes the sector level is the performance that can be evaluated by using attractiveness and/or profitability indexes characterizing the sector.

PPP projects are described in the literature by a set of variables that can be grouped in two categories: the structure of PPP arrangements and financing of PPP arrangements (Carbonara et al., 2012). These represent the two dimensions of the project-layer, which characterize PPP arrangements between public and private parties and can be considered endogenous to the transaction. This justifies why, even if there could be a best practice on each of these dimensions, they often assume different values due to the specificity of the PPP transaction. As far as the structure of PPP/PFI is concerned, the first variable that characterizes this dimension is the PPP model or contract type. In general, PPP comes in a wide variety of models such that there is often no clear agreement on what does and what does not constitute a PPP form (Hemming, 2006). The definition of PPP depends also on the country concerned (Turina and Car-Pusic, 2006), and this in part demonstrates the continued lack of standardization of nomenclature with respect to PPP structures (European Commission, 2004). PPP arrangements range from management contract (with little or no capital investment) through concession contracts (which may encompass the design and build of assets along with the provision of a range of services and the financing of the entire construction and operation), to joint ventures characterized by the sharing of ownership (and sometime also management) between the public and private sectors (Costantino et al., 2009). Based on the legal structure that characterizes the transaction, two main categories can be identified: institutional PPP and contractual PPP (European Commission, 2004). The first involves the establishment of an institutional legal entity held jointly by the private and public partners in order to supply an infrastructure or service to the community. The second only involves a contractual link between the private and

public parties (Bovis, 2010). It assumes that the private party will partially or totally finance the project, in exchange of some form of compensation from final users or through regular payments by the public authority (revenues/payments). The payments from the public sector are generally based on usage volumes or demand (i.e., payments in lieu of fees or tolls for public lighting, hospitals, schools, roads with shadow tolls). Sometimes, however, they are given as lump sum payment, i.e., a form of financial contribution to assure the economic and financial feasibility of the project. From an economic and managerial point of view, the institutional PPP do not differ so much from the contractual ones. Another classification of PPP models is based on operational aspects of the transaction, according to the remit of the private sector. The PPP model usually requires the use of private expertise and management skills, which should be one of the main reasons of a PPP implementation. This variable refers to the complexity and importance of the operational phase (in front of the design and construction phases) in the contract. The development of PPP project usually requires the private sector to be involved in almost all the phases of a project lifecycle. The public sector, in fact, should develop these alliances with the aim of exploiting the private sector's resources and expertise in the provision and delivery of public service and, accordingly, improving the efficiency and quality of services. The PPP relations generally last long (contract duration), for typically 25-30 years (Chinyio and Gameson, 2009). An adequate length of time is often required to ensure investment and profit recovery (European Commission, 2004). When the contract is signed, a new company is generally created which is called 'special purpose vehicle' (SPV). It is an independent legal entity that would generally include a construction company, a facility

management firm and a financial institution (Chinyio and Gameson, 2009). The structure, however, depends on the characteristics of the specific PPP project/transaction. The SPV could be a company completely private or jointly held by the private and public sectors. Risk allocation is another very important aspect of PPP transactions, maybe the most important one. As Bing et al. (2005) state, at the beginning of the use of PPP/PFI, governments appeared to view PPP projects primarily as a way of getting infrastructure costs off the public balance sheet, keeping investment levels up, cutting public spending and avoiding the constraints of public sector borrowing limits. Afterwards, the increasing use of PPP has led governments to see it a new approach to risk allocation in public infrastructure projects (Bing et al., 2005). The principle of risk allocation is to transfer the risks to the party that is best able to manage them. The aim, therefore, is (or should be) to optimise, not maximise risk transfer (Costantino et al., 2009). The second dimension selected to characterize the project layer was the financing of PPP/PFI arrangements. Fundamentally, in fact, the aim of PPP/PFI is to bring the private sector's finance as well as management skills into the provision of facilities and services traditionally delivered by public sector (Katz and Smith, 2003). Usually PPP projects are financed by the private party on a "non-or limited recourse basis" (Ye, 2009). This way, the private sector involvement allows projects to obtain more favorable long-term financing options and obtain this financing in a much quicker timeframe (NCPPP, 2003). At the same time, the possibility to privately finance public infrastructure and projects traditionally funded by public finance allows governments to cope with the ever-increasing demands on their budgets. The private financing can be total or partial. In this last case, there is even a financial contribution

from the public sector. Three general funding options are used in financing a project: equity, subordinate debt (also called mezzanine financing or quasi-equity) and senior debt (Ye, 2009; Chinyio and Gameson, 2009). Each kind of fund is exposed to different level of risks and therefore requires different returns. Consequently, the capital structure falls into ranges from total equity to total debt financing. In general, PPP projects are financed using a combination of both with varying ratios of equity to debt. Usually, debt financing exceeds 70% (Ye, 2009): the debt to equity gearing is often 90:10, but can start from 95:5 (Chinyio and Gameson, 2009). The complexity of a PPP arrangement and the consequent high transaction costs involved in setting up a PPP/PFI transaction require an adequate dimension of the initiative, i.e., a high investment value (Chinyio and Gameson, 2009). Table 1 shows the three-layers PPP framework.

Application of the proposed framework

The proposed framework has been applied to characterize PPPs implementation in Italy, with a particular focus on the transport sector. To do this, we have reviewed the theoretical and empirical studies available in the literature and collected data and information on Italian PPPs. These have been used to assign the values to variables of the framework.

The implementation of PPP in Italy is a very recent practice. In fact, even though in 1994 and 1998 the Merloni law set the framework for using private sector contractors, only later a special PPP taskforce (*Unità Tecnica Finanza di Progetto, UTFP – Technical Unit for Project Finance*), was created and its powers were reinforced in 2001. The first example of Italian PPP can be considered TAV (Treni ad Alta Velocità), a both publicly and privately owned company created in order to carry out a high-speed railway network in Italy

Layers	Dimensions	Variables	Values
Country	Institutional	Political-ideological influences	Existence of national programs supporting PPP
		Design of government institutions	Centralist Federalist
		Attitude towards and use of New Public Management in public administration	Degree of outsourcing of public services to private sector
	Legal	PPP formalization by a Government legal/statutory framework	Degree of level of regulation by the legal framework (all/few aspects of PPP are formally regulated through the framework)
		Taxation and its change	Level of taxation
	Economic	Indebtedness	Level of public debt
		Investment needs	Development of new infrastructure Maintenance of existing infrastructure
	Financial	Access to capital and credit markets	Existence of strong constraints to obtain capital/credit
Sector	Industry organization	Regulatory regime	Regulated Deregulated
		Organizational structure	Level of private sector participation
	Market Structure	Demand	Level of demand Elasticity of demand
			Market monopoly
		Competitors	Existence of substitute services (in other subsectors) Existence of substitute routes (in the same subsector)
	Performance	Attractiveness/profitability	Potential revenues/earnings
Project	PPP arrangement's structure	Contract type	Based on the legal structure of the transaction
			Management contract Leasing model or Build-Lease-Transfer Design-Build (and Design-Build with warranty)
			Design-Build-Operate-Maintain Design-Build-Finance-Operate Build-Operate-Transfer Build-Own-Operate-Transfer Build-Own-Operate
			Use of private resources and expertise
			Degree of involvement of the private sector in the lifecycle of the project (from design to management)
			Medium term (less than 25 years)
			Long term (more than 25 years)
		Revenues sources	Payments based on usage volumes or demand
			By private sector By public sector By public and private sectors
			Public financial contribution
		Special purpose vehicle (SPV)	Company ownership
			Publicly- and privately-held company
		Risk allocation	Partnership structure
			Number and composition of partners
			Private sector Public sector Shared between public and private sectors
	PPP arrangement's financing	Use of private finance	Financing in whole by the private sector
			Financing partially by the private sector
			Government-funded projects (no private capital)
		Type of funding options	Bank debt
			Equity
			Bonds
			Loan from shareholders Mezzanine finance
		Debt to equity gearing	Low (debt below 70%)
			High (debt exceeds 70%)
		Investment value	Low High

Table 1. The three-layers PPP framework: dimensions and variables.

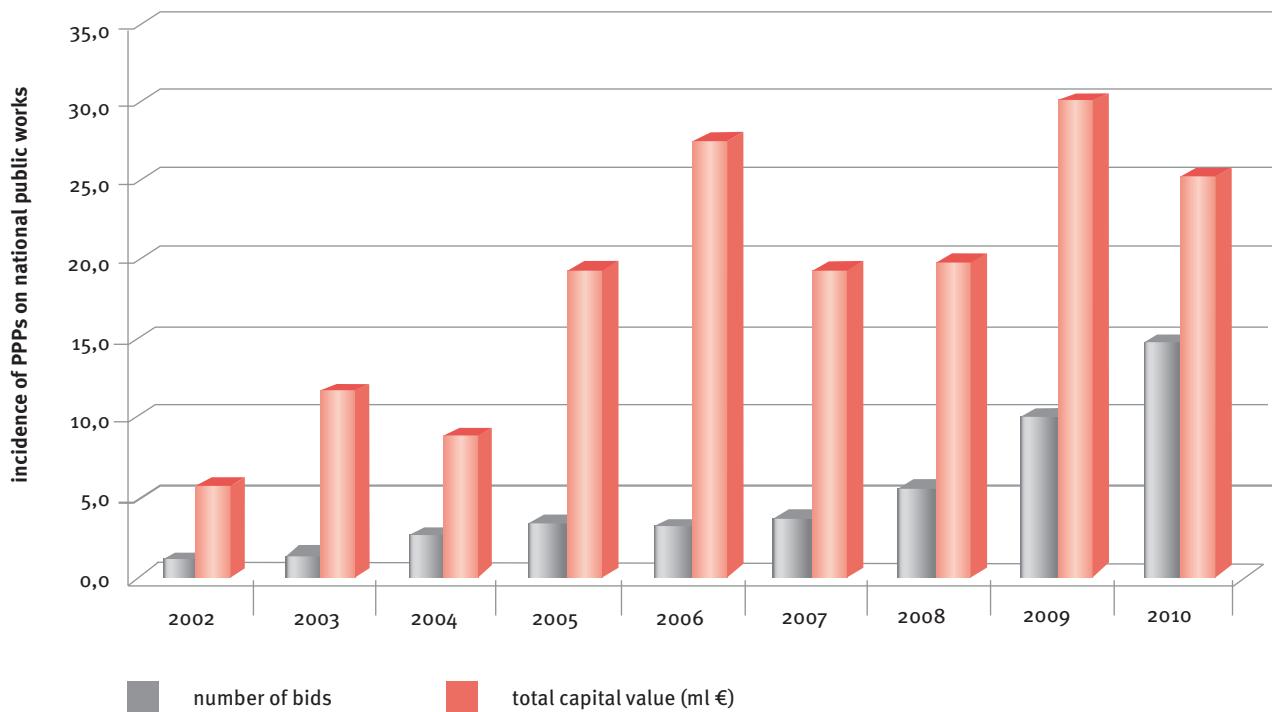


Figure 1. Incidence of PPP Italian projects on the total amount of bids for national public works

(Presilla, 2006). This initiative was encouraged by new apposite laws regarding railway services. The following creation of a complete legislative framework, given by the Merloni law in 1994 and, successively, by the Code of Works, Services and Supplies Public Contracts in 2003 (Vigliano and Bicchieri, 2007), favored the first adoptions of this instrument by both central and local governments and public companies (particularly, ANAS, managing national roads, and RFI, managing national railroads) (OECD, 2010). Most of the Italian PPP contracts have been mainly used in power sectors by involving the private sector on a concession-style basis. Other projects have been in roads, light railway and health services. In Figure 1 shows the incidence of PPP projects on the total amount of bids for national public works during the period 2002-2010.

The Figure shows a significant positive trend in the adoption of PPP as a way of delivering public services and infrastructures. There are a lot

of reasons that make the application and use of PPP less effective and efficient in Italy than in other countries. In particular, with regard to the administrative issues, three main factors contribute to slow down the use of PPP: 1) the complexity of the administrative procedures and the distortions of competition due to the so-called "right of pre-emption"¹, which was used to discourage firms to participate to biddings; 2) the difficulty of regulating through contracts a proper allocation of risks, due to the "civil law" system in force in Italy; 3) the high administrative risk characterizing the

adjudication procedures (Iossa and Antellini Russo, 2008).

With regard to the financial aspects, the main critical issue is the source of funding used for Italian PPP projects. The funding of PPP projects in Italy is generally granted by banks and rarely provided by capital market, by selling bonds or shares to investors (Etro, 2007). Using such a kind of funding gives disadvantages in comparison with other countries: the interest rate is about 10 - 11%, while in UK, for instance, the required spread on the risk-free rate is about 0,75 - 1% (Iossa and Antellini Russo, 2008). In addition to this, Italian banks tend to ask for traditional guarantees for the financing (Bentivogli et al., 2008) and this situation has been exacerbated by the recent financial crisis: nowadays, banks require greater spreads, reduced leverage and more guarantees in order to grant a loan. In addition to this, the mean duration of the loan was reduced (UTFP, 2010). As for the Italian Government's influence on the use of

¹ In the award of a public infrastructure contracts through project finance, if the best bid is the one of the project promoter, the contract is immediately awarded to it. If the best bid is the one of other competitors, the pre-emption right gives the promoter the possibility to adapt its bid to the best one, and award the contract.

The pre-emption right introduced in 2002 was removed in 2007 as a result of the pressures of the European Community that accused Italy of violating the Community principles of transparency and fair competition.

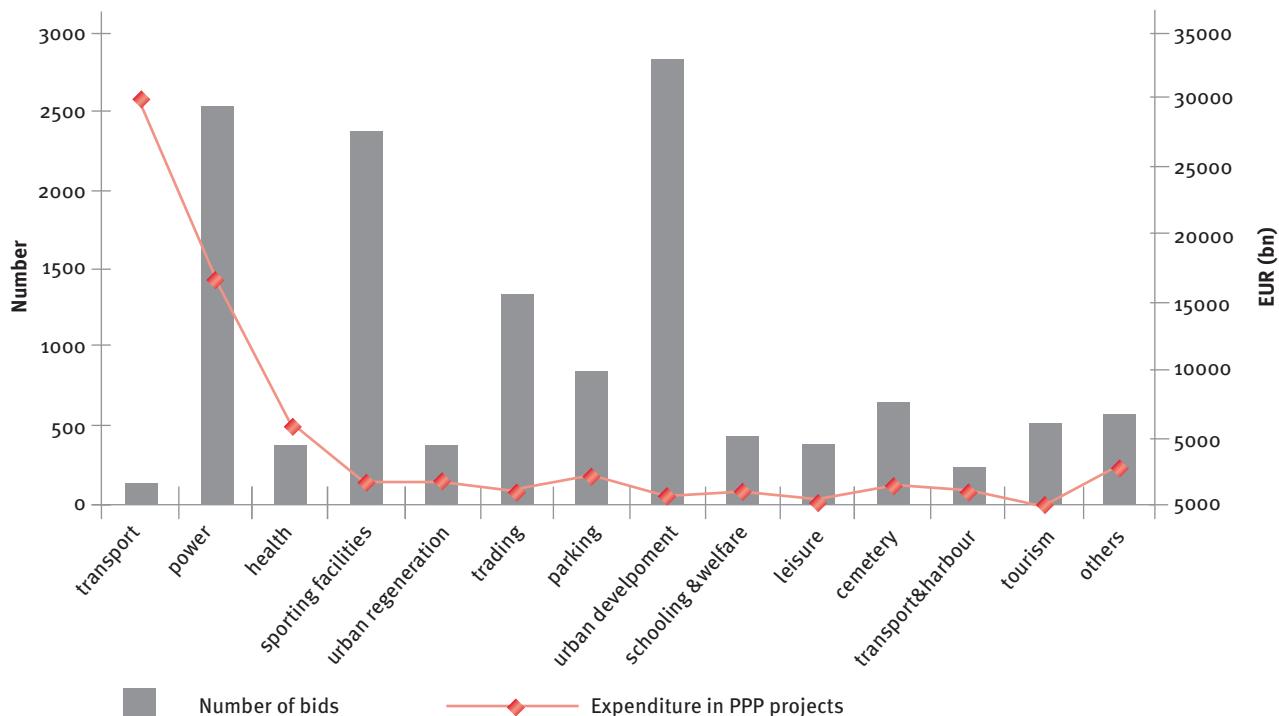


Figure 2. Number of bids and expenditure for PPP Italian projects by sector (2002-2011)

PPP there are still some shortcomings in the legislative regulation that does not allow the PPP to be used in an effective way. First of all, Italian law does not prescribe the estimation of Value for Money before the approval of a PPP project. Nowadays, the evaluation of the feasibility of a PPP project is simply based on the “Economic-Financial Plan” which is made by the private sponsor. Secondly, in Italy the SPV is normally formed by local or national Governments and/or public companies (Bentivogli et al., 2008), as a consequence the level of commitment of the private sector is quite minimized.

Finally, Figure 2 shows that an extensive use of PPP contracts is made for power projects, characterized by 2.527 bids and a total capital value of almost €16.671bn. Other sectors with a relevant amount of PPP projects include sporting facilities, hospitals, urban developments, and other regional activities. Even if the number of transportation PPP projects has little relevance on the total, a significant expenditure characterizes

these, with €29.957bn mainly devoted to road networks. Consequently, the transportation sector becomes the most relevant in terms of expenditure.

Tables 2, 3 and 4 show the characterization of the Italian PPP according to the framework.

Conclusions and Future Research
The applications of PPP all over the world vary from country to country, from sector to sector and from project to project. Such a differentiation has to be considered when the features of PPP and its implementation all over the world are studied. At the same time, research on PPP generally adopts a mono-dimensional perspective, namely a country, sector, and project-specific standpoint, thus not providing a comprehensive understanding of PPP.

The present study has developed a framework that allows a characterization of PPP that involves all these three perspectives. The proposed framework was applied to characterize PPP implementation in Italy. Focusing on

the four modes of the transport sector, we test if and how all the dimensions and variables work sufficiently in a cross-sectorial context.

Future research will be conducted on two directions.

A first research will be devoted to adopt the framework for a cross-country analysis of PPP. Comparing PPP application in different countries, the framework represents a useful tool for deriving guidelines to support the implementation of PPPs that take into account the different contexts in which projects are implemented.

A second research will be devoted to develop a benchmarking tool based on the framework.

Assigning to each variable of the framework the appropriate value on the basis of theoretical studies and the analysis of real cases of successful PPP projects, this tool can be used by sponsors in order to derive managerial guidelines on how PPP projects should be correctly arranged and thus to move towards the best practices in applying PPP.

Layers	Dimensions	Variables	Italian PPP values
Country	Institutional	Political-ideological influences	The PPP rate of progress in Italy during last years has directly been caused by different variables (Di Falco et al., 2009): 1. EU funding especially addressed to PPP (both EIB and structural funds); 2. Increased capacity in national financial market for PPP; 3. Different national programs to support the development of the market both blending grants and loans and building public sector capacity (even by creating at the end of '90s the national Unit for PPP and the Regional Units for Project Financing)
		Design of government institutions	Centralist institutions
		Attitude towards and use of New Public Management in public administration	During the last years (2002-2011), the incidence of PPP on the whole market of public infrastructure has grown from 1% in 2002 to 17% in 2011 in terms of number of bids, and from 5,9% in 2002 to 43,8% in 2011 in terms of total amount invested (Cresme, 2011)
	Legal	PPP formalization by a Government legal/statutory framework	Italian PPPs are ruled by Code of Works, Services and Supplies Public Contracts. This imposes some rules on PPP schemes, call for tenders, SPV, concessionaire default and its substitutions (Vigliano and Bicchieri, 2007). Until 2007, differently than in the other European countries, if there was a private promoter of the project, this had the pre-emption right on the awarding. This discouraged many firms entering the market (Iossa and Antellini Russo, 2008): in Lombardy, the 75% of the PPP tenders with promoter were without any other competitors (Bentivogli et al., 2008). In 2008, a substantial modification about the use of the pre-emption right was introduced, which is expected to reduce the anti-competition effect (Ricchi, 2009).
		Taxation and its change	Taxation of an individual's income in Italy is progressive. In other words, the higher the income, the higher the rate of tax payable. In 2012 the tax rate for an individual is between 23%-43%. In addition to direct taxation (IRPEF), there is also a regional tax of 1.2%-2.03% and a municipal tax of 0.1%-0.8%. There are reduced rates of tax and tax exemptions available to certain income earners. The standard rate of Italy corporate tax (IRES) in 2012 is 27.5%. In addition, local tax (IRAP) is imposed at a rate of generally 3.9%, bringing the effective tax rate to 31.4% (http://www.worldwide-tax.com/italy/italy_tax.asp).
		Indebtedness	Nowadays the level of public debt in Italy is very high, near to the record even reached.
	Economic	Investment needs	The traffic of goods and passengers in Italy is largely based on the existing road network, which was mainly built in the Sixties. Modal split is very unbalanced, with 90% of trips taking place on lorries or cars. Although the recently approved National Transport Plan aims at re-balancing the modal split, there is still a need to revamp the existing road network as well as to build and operate new motorways to reduce actual congestion (de Pierris and Pescarini, 2001).
		Access to capital and credit markets	The financial crisis has made more complex the access to capital and credit markets, for the following aspects (UTFP, 2009): 1. the difficulty in receiving funding and the substantial increase of the bank spread; 2. the reduction in the duration of funding; 3. the requirements of strong guarantees by bank and the increase of the ratio equity to debt if compared to the past threshold.

Table 2. The application of the three-layers PPP framework for the Italian PPP: the country layer

Layers	Dimension	Variables		Italian PPP values						
Sector	Business Model	Business Model	Management system	Regulated	The public infrastructure in Italy is generally regulated since the network (infrastructure) represent a natural monopoly and there are social reasons (they are "public means")					
		Privatization Model	Type of Organization	Road	Ports	Airport	Railway			
				A public company, ANAS, manage the roads and the majority of motorways in Italy. Other public-private companies controlled by ANAS had in concession the rest of the Italian motorways.	The nineties were characterized by a growing process of privatization of both ports and port activities.	Nowadays the management of stopovers is launched towards the privatization through forms of concession that provides for full management (Postorino, 2009)	The property of the majority of the Italian railways is public. They are typically held by a government company. Some routes are managed by local companies, held by public and private parties.			
		Demand	Level of demand	The level of road usage and traffic increased due also to the increased number of cars. In particular, according to ANAS, from 1970 to 1987 the motorway network has grown of about 46% and the level of traffic of about 390%. In the last 15 years the traffic has grown of about 310% versus an increase of motorway network of 16%.	The port network in Italy is very fragmented: there are 42 ports managed by the Port Authority, even if the first two manage about 40% of the total cargo traffic. In 2010, the volume of cargos totally moved within the Italian ports was more than 470 mln of tons (CDP, 2012)	The level of demand of (public) transport means depends on several factors. The most important are: a) number of people who live in that region and their propensity to travel; b) socio-economic factors and offers/ availability of services and infrastructure that support the trip (Postorino, 2009).	Contrarily to the common opinion and to the image of the railway as the "backbone" of transport, the railway usage in Europe is quite low for both cargo and passengers. The same situation characterizes Italy: in 2002 about 7% of passengers*Km and 9% of tons*Km, with an higher use of the railway for small distance (MIT, 2003; Beria, 2008).			
				Elasticity of demand: How the demand changes according to the variation of monetary cost (price) depends on the existence of substitute transport modes and how much the trip is discretionary. Absence of alternative modes and the need of the trip cause a rigid (or anelastic) demand. (Postorino, 2009)						
	Market Structure	Market monopoly	Road	Ports	Airport	Railway				
			Each road and motorway are managed by only one operator (typically ANAS for local roads and the majority of motorways, and other public-private companies controlled by ANAS for the rest of the Italian motorways).	The nineties were characterized by a growing opening to competition in some port activities that are however always regulated (Lex nr. 84/1994).	The airports typically operate in a situation of natural monopoly (Postorino, 2009)	The railway network is a typical example of natural monopoly, while the service could be liberalized.				
		Competitors	Existence of substitute transport services (in other subsectors)	The competitiveness among different transport modes depends on several factors, as geographical, economical and demographic factors (Postorino, 2009)						
				Road	Ports	Airport	Railway			
		Existence of substitute routes (in the same subsector)	All the motorways have alternative routes, even if they can be of a different type or quality in terms of service. The literature in fact suggests the use of toll when alternative routes exist.	Generally there are no substitutes (in the same subsector) for this kind of transport mode	Several airline companies can often compete on the same route, thus giving a potential intermodal substitution (Postorino, 2009).	Generally there are no substitutes (in the same subsector) for this kind of transport mode.				
	Performance	Attractiveness/ profitability	Potential revenues/ earnings	The potential revenue is represented by the toll or the shadow toll, applicable only to the motorways. The literature suggests the use of the toll if there are alternative routes, otherwise the use of the shadow toll. However, Italy does not use the shadow toll.	The ports of Latin countries have as main goal the maximization of the value added generated by the port activities, while other countries such as the Anglo-Saxon ones (CDP, 2012)	The estimated value for the profitability of an airport is about 500.000 WLU per year (Work Load Unit, which is defined as a passenger served or 100 kg of moved freights) or 5 million of passengers per year if there are no cargos. Below this value the airport has very probably losses which can be compensated by public funding (Postorino, 2009)	The revenues that characterize the railway sector in Italy are very low. The fee are in fact controlled with the main aims of guaranteeing the "universal" mobility, reaching environmental performance target, distribute the income to poor families that cannot have an own transport mean (Beria, 2008).			

Table 3. The application of the three-layers PPP framework for the Italian PPP: the sector layer

Layer	Dimension	Variables		Italian PPP values
Project	PPP arrangement's structure	Contract type	Based on the legal structure of the transaction	Italian law allows both contractual PPP (concession, sponsoring and financial lease) and institutional PPP (companies owned by both private and public shareholders) (UTFP, 2009)
			Based on operational aspects	PPP schemes in force according to Italian law are Build-Operate-Transfer (BOT), Design-Build-Operate-Transfer (DBOT), Design-Build-Finance-Operate (DBFO), Design-Build-Finance (DBF, defined General Contractor scheme, where GC is also involved in the search for funding). In addition to this, there are public-private companies, like "società miste" or "Società di Trasformazione Urbana", aiming at providing public services (Vigliano and Bicchieri, 2007).
	Use of private resources and expertise			Some factors, like uncertainty on the rules, complex procedures and the lack of private competences on PPP, hinder the involvement of private operators in PPP. As a consequence, there is a restricted number of firms in the PPP market, which is not competitive enough (UTFP, 2010).
		Time horizon of contract		Italian PPP contracts are generally long-term: for instance, the mean duration of Lombardy projects is 22,6 years in case of public initiative and 28,3 years in case of private proposal (Finlombarda, 2007). In other projects, duration can be longer, e.g., in Florence tramway, concession period is 35 years (incl. 5 years of construction). The Italian law, in fact, establishes that the concession can have a duration longer than 30 years in order to guarantee the investment recovery and therefore financial sustainability.
	Revenues sources	Payments based on usage volumes or demand	Revenues in projects like hospitals, schools, etc. are mainly constituted by an annual fee by the public authority, and only partially by end-user's payments based on demand which concern only no-core activities such as parking, restaurant, and so on.	
		Public financial contribution	Italian PPP often uses grants as main financial support (Martiniello, 2008). Some examples are: Florence Tramway, Hospital of Castelfranco Veneto and Montebelluna, New Mestre Hospital, where public contribution is respectively 52%, 25%, 42% of the total investment (Germani, 2005).	
	Special purpose vehicle (SPV)	Company ownership	In many Italian PPP projects, the SPV is mainly or totally held by local or national Government and /or public companies. Examples are the Stretto di Messina bridge, Malpensa 2000 (Etro, 2007), Florence Tramway (Germani, 2005). For instance, in Emilia-Romagna region, the mean value of private participation is about 17.7% (Bentivogli et al., 2008). The Italian law states that the call for tender gives the right, not the obligation, to constitute a SPV.	
		Partnership structure	The number and composition of the company may vary from project to project.	
	Risk allocation		Private Italian law, based on a "civil law" tradition, does not guarantee a "certain" risk allocation among parties according to a well designed contract, contrarily to "common law" systems such as in Anglo-Saxon countries (Iossa and Antellini Russo, 2008). In addition, public authorities do not still use tools, such as risk matrix, to best evaluate and allocate risks.	
	PPP arrangement's financing	Use of private finance		Generally, private funding is used for these projects, but lenders give funding only in exchange for traditional guarantees (Bentivogli et al., 2008). But PPP are usually financed also by a quote of public funding: an example for this is the Autostrada Cispadana highway (Costantino et al., 2011)
		Type of funding options		The culture of the use of capital market, by selling bonds or shares to investors, for such projects is not spread in Italy: consequently, the financing is generally granted by banks with a deep experience of such projects (Etro, 2007). But even the access to this source of funding is characterized by disadvantageous conditions in comparison with other countries: the interest rate is about 10 - 11%, while in UK, for instance, the required spread on the risk-free rate is 0,75-1% (Iossa and Antellini Russo, 2008)
		Debt to equity gearing		Generally, Italian PPP projects are characterized by high leverage: for instance, debt to equity gearing is more than 80:20 for Vigliena port project in Naples (Micelli, 2009) and it is estimated from 75:25 and 85:15 for wind energy plant projects (Scarnati, 2007)
		Investment value		PPP projects are characterized by little or medium economical dimension (Iossa and Antellini Russo, 2008)

Table 4. The application of the three-layers PPP framework for the Italian PPP: the project layer

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