Size-dependent features of public-private partnerships: geographical and sectorial differences, deal size and structuring, and transaction costs

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Abstract
The purpose of this paper is to identify and to review the size-dependent features of public-private partnerships (PPP) which precedes the complex exercise of defining the characteristics of small-scale PPPs. Our paper covers deal size variability across countries, sectors and time; relationship between deal size and structuring and financing of PPPs with respect to maturity, payment mechanism, debt ratio and type of bank debt; and important issues of transaction costs.

Keywords
Small-scale; public-private partnership; PPP; deal size; transaction costs.

1. Introduction
The range of projects where PPP structures are used is quite diverse and differs across countries. The reason why some countries are very active in the lower-end of the PPP market while others remain aloof might indicate that transactions costs and the constitutional and legal context differ across countries. PPP practices strongly differ across countries (Demirag et al., 2009; Argento et al., 2010; Norton and Blanco, 2009). English and Skellern (2005) note that different socio-economic, political and administrative experiences explain the diversity of PPP arrangements across countries. Identifying the countries that are very active on the lower-end of the PPP area provides as a first step to analyse and compare best practices for small projects across countries. The sectors in which small PPPs are recently closed is also quite diverse. Sector prioritization largely varies across countries which raises the question why some countries realize a lot of small-scale PPPs in one sector, while other countries are very active in other sectors. Are some countries using small PPPs in the wrong sectors or are there differences in framework conditions why small PPPs in some sectors are more applicable in one country than another? A key observation is that small projects are often related to non-traditional sectors of which less is known. Since small PPPs are often closed in non-traditional sectors of which relatively little is known, the PPP model seems to be applied on an ad-hoc basis to different sectors. In this study, we identify which sectors are most associated with small projects. To ensure that PPP constructions are used for the right projects, the value for
money potential should be analysed for different sectors. This is not an easy task as the optimal size of a project might vary over countries and sectors. We do not attempt to precisely define what a small-scale PPP is. Our review precedes this complex exercise by reviewing the size-dependent features. Future research could explore more nuanced ways of defining “small-scale-like” projects based on these size-dependent features.

2. Size differences across countries

The share of projects per capital value largely varies across countries. Some countries use the PPP model especially for mega infrastructure projects while others realize a relatively large amount of small constructions. The strong variation in deal size across countries seems to indicate that the optimal size of PPPs differs across countries or that the PPP model is used ad hoc for projects of different deal size. This analysis is based on InfraDeals data containing all European PPP projects between 1990 and 2014. In absolute numbers, the UK is by far the most active in closing small-scale infrastructure projects. The transactions database of InfraDeals registered 374 small projects for the UK from 1990 to 2014 of which 211 with a capital value below EUR 30 million. 119 PPPs were even smaller than EUR 20 million. The UK is distantly followed by Germany and Spain which closed respectively 45 and 30 small projects between 1990 and 2014, of which respectively 21 and 10 were smaller than EUR 20 million (Figure 1).

In relative terms, Germany and the UK close a relatively large share of smaller transactions as more than 40 per cent of the projects were smaller than EUR 50 million (i.e. 45 and 42 per cent respectively, see Figure 2). In the UK, less than five per cent of the projects were mega-infrastructure projects with capital values exceeding 500 million euro (Figure 3). Also in Ireland and Germany, only a small proportion of the projects were larger than 500 million euro (e.g. respectively 7.5 and 9 per cent). Contrary, Italy and Portugal are more active at the higher end of the PPP market. In Italy, almost 40 per cent of PPPs had a capital value exceeding 500 million euro. In Portugal, half of the PPPs closed over the past 20 years were mega-infrastructure projects and only 1 project out of 20 was smaller than EUR 50 million. This is also supported by Figure 4 which shows the average deal size of projects over a 5-year period for five European countries. The average capital expenditure of projects conducted in Italy and Portugal is five to seven times larger compared with Germany and British PPPs. However, Figure 4 also reveals that the capital value of projects evolves over time within countries. Germany first applied the PPP model for small infrastructure projects and then gradually extended the scope of its projects. The opposite evolution occurred in Portugal. Although Portugal closes most project at the higher end of the PPP spectrum, the average deal size in Portugal seems to show a declining trend over time, from about EUR 700 million at the end of the 90s to EUR 500 million over the last five years.

3. Size differences across sectors

Many subnational and provincial governments showed an increasing interest in leveraging private finance for small-scale PPPs. The sectors in which small PPPs are concluded are quite diverse ranging from social infrastructure projects (e.g. primary healthcare), transport (e.g. car parking, small roads), urban amenities (e.g. public toilets) and private real estate (e.g. student accommodation) to many other sectors (e.g. tourism, sport facilities, water and waste management). Moreover, the sectors in which small PPPs are closed differ across countries. The UK PFI database shows several projects below £30 million in sectors such as education, waste management, street lighting and so on. Contrary, the Italian small PPPs are typically parking facilities, graveyards and sport facilities, thus markedly different from the UK healthcare and education dominance (Koch & Jensen, 2009). Solheim-Kile et al. (2014) argues that PPPs in the Norway, which is mainly active at the lower end of the PPP market,
are closed in education, transportation, healthcare, police and court. Australian PPPs with a value below $50 million are mainly situated in the construction and maintenance of government buildings, water and waste water, industrial recycling, prisons, hospitals, and student accommodation among others (World Bank, 2014). South Africa has many small hospital and tourism PPP projects and India has several small projects within sectors as tourism (e.g. sports facilities) and urban amenities (e.g. service centres) (World Bank, 2014).

While most mega-infrastructure projects are closed in the transport sector, most small-scale PPP are closed in the social infrastructure sector. Half of the projects in the social infrastructure sector are smaller than EUR 60 million, compared with only 12 per cent of projects in the transport sector. Figure 5 shows the dispersion of small PPPs with capital value below EUR 50 million across sectors. Over the past 20 years, small PPPs in Europe were dominated by schools and hospitals, both representing more than 60 per cent of all small projects. The health sector accounted for 35 per cent, while school building represented 28 per cent of small PPPs. Many small projects are also related to the leisure sector, prisons, social housing and street lighting. There exist large size differences across infrastructure sectors. For instance, rail infrastructure projects in Europe are on average 25 times larger than projects in the leisure sector. Figure 6 shows the differences in median deal size across subsectors of the transport and social infrastructure sector. The median deal size of the projects in the social infrastructure sector, projects related to leisure are typically the smallest, followed by schools and hospitals. Prisons and social housing are most of the time two to three times larger.

Further, the deal size of PPP projects also seems to evolve over time within sectors. Figure 7 and 8 show the average value of PPPs by sector for four different periods, separately shown for Continental Europe (Figure 7) and the UK (Figure 8). Both in Europe and the UK, the average capital value increased in most sectors over the past 20 years. Although the average value declined over time in some sectors, PPPs in most sectors are scaling up. This indicates that when countries start applying the PPP model to a new sector, they first apply it to a project of modest size. Once the value for money benefits is proven and public sector expertise established, the PPP structure is also used for larger projects in the sector. In Continental Europe, the average value of PPP structures for hospitals strongly increased over the past fifteen years, from EUR 20 million in the early 2000s to EUR 200 million. Also PPP projects for schools and prisons seem to show an upward trend in capital value over time. On the other hand, in the leisure sector average deal size halved over the past 15 years, from EUR 60 million in the period 2000-2004 to less than EUR 30 million over the past five years. The average value of PPPs in the transport sector shows an upward trend over time. Although PPP constructions for car parks are typically very small projects of less than EUR 50 million, average deal value within this sector clearly increased over time. The average value of road construction projects rose from an average value of EUR 600 million at the end of the 90s to EUR 800 million more recently. In the UK, while the average value of projects in the transport sector typically increased, average value of projects in the social infrastructure sector do not reveal a clear upward or downward trend over time. Exceptions are projects in the leisure sector which increased over time and social housing projects which, on average, became smaller. Remarkably, while the average value of PPPs in the leisure sector increased in the UK, it declined in the rest of Europe.

The range in which small PPPs are recently closed is quite diverse. This raises the question why some countries realize a lot of small-scale PPPs in sector X, while other countries focus on sector Y. Are some countries using small PPPs in the wrong sectors or are there differences in framework conditions why small PPPs in some sectors are more applicable in one country than another? Since small PPPs are often closed in non-traditional sectors of which relatively little is known, the PPP model seems be applied on an ad-hoc basis to different sectors. Hodges and Grubnic (2005) note that this might be problematic as sector-
specific factors influence the transferability of the PPP model to new sectors. Since transaction costs are relatively higher for small PPPs it is necessary to analyse in which sectors small projects generate most value for money. The large size differences across sectors seem to indicate that transaction costs and the optimal size of PPPs differ across sectors. This is also suggested in the literature (Dudkin and Välilä, 2005; Soliño and Santos, 2010). These authors assume that the sector (e.g., road infrastructure, schools, rail infrastructure, prisons) has an influence on the magnitude of the transaction costs. Countries should take this into account when defining their minimum threshold values for infrastructure. These values should be differentiated across sectors.

4. Deal size and structuring of PPPs

Deal size plays an important role in the structuring of PPPs. In this section, we analyse the link between deal size and the way PPP projects are financed and structured. More specifically, we address the question whether the loan maturity, payment mechanism, debt-equity ratio and type of bank debt varies with deal size. This analysis is based on InfraDeals data containing information on transaction values and financial variables of European PPP deals closed since 1990. Although we do not want to ignore other factors affecting structuring of projects, the focus is on capital value. The main aim of this section is to show that some key financial variables vary with deal size indicating it should be given a more prominent role in the structuring of projects. This conclusion was recently also reached by World Bank (2014). While the focus of this study is more on developing countries, in this study, the focus is on the European PPP market.

4.1. Maturity and size

The tenor of PPP loans depends on the deal size of PPP projects. The average maturity is approximately 22 years, but this number varies across subgroups of projects with different capital values. Figure 9 shows the average loan tenors of 1732 PPP transactions for five different size classes. The figure is based on data from the transactions database of InfraDeals containing information on the transaction size and tenor of 1732 European PPP projects concluded between 1989 and 2014. The average loan maturity is shown for mini-projects (i.e. deal size below EUR 20 million), small PPPs (i.e. between EUR 20 million and EUR 50 million), projects with medium deal size (i.e. EUR 50-100 million and EUR 100-500 million), large PPPs (i.e. EUR 500-1000 million) and mega-infrastructure projects (above EUR 1000 million). Loan tenors are shortest for mini-projects and highest for projects with deal size between EUR 20 and 100 million. Tenors average just above 18 years for mini-projects, while average loan maturities are above 23 years for projects between EUR 20 and 100 million. As deal size increases, tenors slightly decline to below 20 years for mega-infrastructure projects.

4.2. Payment mechanism and size

A range of payment mechanism models have been used across PPP projects. HM Treasury (2012) emphasizes that the payment mechanism is critical to a PPP contract. The main objective of the scheme is to incentivize the PPP contractor to deliver services to the required standards by specifying the conditions for payment of the authority to the contractor. Three main categories can be distinguished: availability-based, usage-based and mixed payment mechanisms. In availability-based schemes, periodic payments are made by the public authority when the infrastructure is available and meets the predefined performance standards. Yescombe (2007) argues that this mechanism is quite simple in nature as the infrastructure project only must show it is capable of providing the service as required. Under usage-based systems, the fee is based on the number of users of the infrastructure facility. These schemes are mostly used for transport facilities, such as roads, bridges, tunnels, ports, airports and
(light) rail infrastructure. Two types of concessions can be distinguished. First, toll concessions in which the concessionaire obtains the right to collect tolls on the facility. Second, shadow toll concessions in which the public sector instead of the users pays for each vehicle that uses the facility. Sometimes a mix between tolls and shadow tolls is possible. In this case, tolls are paid by users but reduced with public subsidies. Availability-based and usage-based payment structures are not mutually exclusive. Payment schemes of some projects consist of a combination of an availability charge covering construction costs and a usage charge. Recently, some other mixed payment mechanisms are developed. For instance, the A249 Stockbury to Sheerness project in the UK combines availability-based and congestion-based payments where the latter links payment to the level of congestion on the road.

By analysing 1350 European PPPs, data show that, on average, 83 per cent of projects make use of availability-based payment schemes, 15 per cent of usage-based structures and two per cent of mixed structures. Although the large majority of PPPs uses availability-based payment mechanisms, its popularity varies with the deal size of PPPs. Figure 10 shows how payment mechanisms evolve with deal size. While 91 per cent of small-scale projects (which fall below EUR 50 million) use availability-based schemes, this share declines gradually to 57 per cent for projects with deal size above EUR 500 million. Particularly usage-based mechanisms gain importance as capital value increases, increasing from eight per cent for small PPPs to 36 per cent for large projects. Mixed structures are recently gaining popularity, especially for large projects. The share of mixed payment mechanisms varies from one per cent for small projects to eight per cent for mega-infrastructure projects.

### 4.3. Debt equity ratio and size

The financing structure plays an important role in the long-term viability of Public-Private Partnerships. Typically, PPP projects have a highly-geared structure, with debt financing as high as 70 to 90 per cent of the capital investment, while the share of equity would normally not exceed 30 per cent. By analysing more than 700 DBFO projects in the United Kingdom, Hellowell and Vecchi (2013) argue that highly geared structures minimize the Weighted Average Cost of Capital (WACC) for the special purpose vehicles (SPVs), thereby minimizing the final cost to the public sector. Figure 11, which is based on data of 1732 European PPPs, shows the debt-equity ratio for various deal size classes. The average debt-equity ratio is 85.7 per cent, but the ratio slightly varies across size classes from 87.7 per cent for projects with capital value in the range of EUR 50-100 million to 83.9 per cent for projects above EUR 200 million.

### 4.4. Type of bank debt

Traditionally, banks have been a key player in the financing of infrastructure projects. Ehlers (2014) notes that bank lending is usually the largest share of financing, especially in the initial phase of a project. Although several authors (e.g. Bassanini and Reviglio, 2011; and Della Croce and Gatti, 2014) argue that the higher capital and liquidity requirements under the new Basel III rules limits long-term financing of infrastructure projects, Ehlers (2014) and Kappeler (2012) however argue that issuance volumes of bank loans are clearly trending upward again. Kappeler (2012) argues that bank lending volumes in 2010-2012 were significantly higher than in the credit-boom period 2005–07 rising from 58% of total financing requirements in 2009 to 79% in the first half of 2012. As PPP projects are typically characterized by high gearing ratios, bank lending is critical in the financing of PPPs. Bank debt can be raised in different forms. First, term loans are the most common form of bank debt for PPPs. There is a wide variety of term loans which differ per tenor of the loan, currency denomination, repayment facilities and whether interest payments are floating or
The structuring is based on the expectations of project cash flows. Term loans have resource to project assets in case of default. Second, multilaterals are loans provided by multilateral agencies, such as the International Finance Corporation and European Investment Bank among many others. The debt structures of these international organisations are like purely private investors. Third, capex facilities are sometimes provided as a protection against liquidity problems. Since you only pay interest expenses when you need to draw on the facility, capex facilities can reduce interest expenses. Fourth, bank-funded equity bridge loans are loans provided to the project company which are guaranteed by the sponsors pro rata to the equity they invested in the project. These loans are mainly provided for large projects. Yescombe (2007) argues that equity bridge loans are typically repaid by the project company at the end of the construction phase by a committed equity subscription. Due to the guarantee, Yescombe (2007) argues that the loan reduces project costs as the risk is borne by the sponsors instead of the project company. Even more, the loan delays the timing of equity investments of the shareholders to the project further reducing project costs and optimizing shareholders’ return profiles.

Figure 12 shows how the type of bank debt evolves when the capital value of projects increases. For projects below EUR 100 million, bank financing consists almost exclusively of term loans. 96 per cent of bank debt of small projects is in the form of term loans while bank financing in the form of multilaterals, capex facilities and equity bridge loans is almost non-existent. When deal size of projects increases, PPP projects are less financed with term loans in favour of the other types of bank debt. The share of term loans decreases from 96 per cent for small projects to less than 70 per cent for projects with capital value above EUR 1000 million. In contrast the share of multilaterals increases from one to 14 per cent across size classes. Capex facilities and equity bridge loans slightly increase from respectively two and zero per cent to five per cent. The size and complexity of large PPP transactions often requires a combination of different forms of finance.

5. Transaction costs
One issue that has not received much attention so far concerns transaction costs in PPPs. Transaction costs play a crucial role in whether a project delivers value for money. Although PPP’s bring cost savings and higher productive efficiency, the high transaction costs can have the potential to erode the cost savings achieved through a PPP structure (Dudkin and Välilä, 2005). As transaction costs do not increase linearly with size, especially small projects are negatively affected. Coase (1961) was one of the first researchers studying transaction costs. In economics, transaction costs are defined as the cost of participating in the market. This includes search and information costs (discovering who is willing to participate and the terms of trade), bargaining costs (negotiations leading up to a bargain, drawing up an appropriate contract) and enforcement costs (to undertake the inspection needed to make sure that the other party sticks to the terms of the contract).

In the context of PPPs, transaction costs are the costs related to preparing the tender, negotiating, contracting and enforcing the contract (Ho and Tsui, 2009). Dudkin and Välilä, 2005) argue that transaction costs include all legal, financial and technical advisory costs incurred by both public and private sectors in the procurement and operational phases of a project. In the preliminary phase of the project, transaction costs encompass the costs for organizing the bidding process and participating in it. Negotiations for a PPP contract could be very costly as it involves opportunity costs in terms of time, energy and money. After the deal has been closed, there may also be significant costs involved in the private sector partner’s compliance with the contract and renegotiations which may occur over the lifecycle.

of the project. There is a trade-off between transaction costs ex ante and ex post. The more time and effort are put during the procurement phase to allocate risks, the higher the transaction costs ex ante. However, these will lead to lower transaction costs ex post. The complexity and the long lifecycle of PPPs imply that contracts negotiated ex ante are inevitably incomplete in many relevant respects unforeseeable events will occur during the term of the contract. Therefore, it is not possible to allocate every type of risk ex ante. This is illustrated by English (2005) who presents evidence from a public hospital project in Victoria (Australia) that parties associated with the arrangement underestimated risks and failed to understand the ramifications of the funding model resulting in project failure.

Transaction costs in PPPs are usually higher compared to traditional procurement of public investment projects. The characteristics of PPPs are the main sources of higher transaction costs including their long-term character, ownership and financing structures and risk-sharing features (Dudkin and Välilä, 2005). Due to these characteristics, the degree of contractual incompleteness and uncertainties related to PPP projects is high and attempts to deal with this gives rise to high transaction costs. Due to high uncertainty and complexity of PPPs, Dudkin and Välilä, 2005 argue that the search (tendering and bidding), contracting and monitoring processes become more resource-consuming. The complexity of PPPs requires consulting and advisory services making the negotiation process especially costly. As unforeseeable events will occur during the terms of the contract, the long-term nature of contracts makes renegotiation almost inevitable further steeping up transaction costs. Finally, the provision of most services delivered under a PPP construction is costlier to monitor as the service quality is difficult to measure.

Due to the lack of appropriate data the number of studies estimating transaction costs for PPP projects is limited. Dudkin and Välilä, 2005 argue that there is only limited information about transaction costs and even when such information exists, it is often confidential in character. Data collection is difficult due to different interpretations in the definition of transaction cost. Therefore, there is a need to develop a standard cost breakdown structure or cost accounting system to estimate and track transaction cost in PPP projects.

Despite the difficulties, there are some studies in the literature trying to quantify transaction costs. Given limited data availability, most studies are limited to transaction costs in the procurement phase, excluding costs related to contract monitoring and renegotiation in the operational phase. By ignoring the additional costs of monitoring and renegotiating in the operational phase, we are underestimating overall transaction costs in PPPs, possibly by a significant amount. However, clear estimates of the transactions costs over the entire lifecycle of projects must wait until a sufficient number of PPP projects have completed their entire life cycle. In the early 2000s there was some preliminary evidence in the UK that PPPs are associated with higher transaction costs (NAO, 2003; NAO, 2004). The study of Torres and Pina (2001) estimate the extra costs related to the monitoring of the private sector in PPPs in the US between 3 and 25 percent of the contract value. Dudkin and Välilä (2005) was a first systematic attempt at quantifying the transaction costs of PPPs. By analysing data collected from projects financed by the European Investment Bank, these authors estimate the level of transaction costs in the procurement phase of infrastructure projects at, on average, about 10 per cent of the capital value (CAPEX) of the project. Based on their research, the overall transaction cost of the project for the public sector, is about 2-3 per cent of the CAPEX of the project, for the winning bidder 4-5 per cent and for the losing bidders about 2-5 per cent.

By comparing the construction costs between PPP and traditional procurement projects in the European Countries using more than 200 EIB-financed road projects between 1990 and 2005, Blanc-Brude et al. (2006) find that the ex-ante construction costs of PPP road projects are, on average, 24% more expensive than a traditionally procured road. First explanation given in the paper is that the private investor has greater incentives to make investment in the
construction phase to lower subsequent operation and maintenance costs. In addition, this reflects the transfer of the construction risk to the private partner. More recently, KPMG (2010) estimates bid costs at risk have been 0.5-1.2% of project capital value in Australia, partly depending on the project size, with large projects generally costing proportionately less. Bid costs in Australia also compare favourably with those in the UK, though they are higher than those in Canada. Apart from their direct negative impact on the viability of the project, the high cost of bidding constitutes an obvious hurdle for potential bidders to enter the bidding process (RICS Research, 2011). Since the capacity to absorb such upfront costs is beyond many small to medium contractors, it becomes predominantly the domain of a small number of large contractors. This, in turn, undermines the power of ex ante competition, previously considered to be a key component of PPP procurement to create value for money².

Although these studies made a valuable contribution to the literature by quantifying transaction costs in monetary terms, Rajeh et al. (2013) suggest that previous studies have not directly tested the determinants of transaction costs. Understanding these key determinants of a transaction can help decision makers to improve the design of contracts and procurement process to optimize the cost-benefit balance of a transaction between (project) stakeholders. Some studies (e.g. Dudkin and Välilä, 2005; Soliño and Santos, 2010) tried to identify the determinants of procurement phase transaction costs in PPPs. Dudkin and Välilä (2005) shows that project country (approximating differences between legal systems), economic sector, project size (capital value), length of procurement process (reflects the complexity of the project), number of bidders (proxies the intensity of competition at the bidding stage), the year when the project was signed (proxies the experience with PPPs). Based on data collected from different infrastructure projects in the EU, Soliño & Santos (2010) use several variables, such as type of project, capital cost of project, procurement duration, location and number of bidders, to estimate transaction costs. Below, we go deeper into the most important determinants of transaction costs.

As there are substantial differences in maturity levels (legal support for PPPs, resources for PPPs in terms of experienced staff and consultants and previous experience with PPP contracts) across countries, the region in which the PPP project is procured determines transaction costs. Some countries, such as the UK, are very experienced with procuring PPPs, while others are new in the field. This inexperience reflects in higher transaction costs. Although a like-for-like comparison between countries is difficult, due to limited information, substantial variability in bid costs as a proportion of capital costs and differences in project sizes across countries, KPMG (2010) compared Australia, Canada and the UK in terms of bid costs. Bid costs (as a percentage of total capital value) were found lowest in Canada and highest in the UK. The study also shows that differences could be substantial. For smaller projects, Australian bid costs are around 25-45% higher than those in Canada. By analysing Belgian public infrastructure projects, De Schepper et al. (2015) shows that previous partnership and project experience is one of the main factors determining the relative size of the transaction costs in the procurement phase. This creates an additional hurdle for many local or regional governments which have no or limited experience in tendering public infrastructure. Local or municipal governments, depending on its size, often lack expertise in the areas required for a PPP and the necessary resources to fill out a project team. These transaction costs further increase due to the inexperience of many contracting local governments to tender infrastructure projects.

Dudkin and Välilä (2005) find some cross-sectoral variation in transaction costs of PPPs in the UK. This was confirmed by KPMG (2010) who estimated that the winning bidder’s bid costs for Australian infrastructure projects are about 4% of the project’s capital value².

² However, the strong focus on issues related to competition is relaxed by Marty et al. (2005) who emphasize the financial clauses of PPP contracts as steering tools to create VfM.
(US$20.5m) for a hospital project, 6% (US$4.3m) for a school project and 3% for a road project. The differences in bid costs can also be partly explained by differences in project size, as social infrastructure projects tend to be lower in size than economic infrastructure projects. The next factor which plays a role in the percentage of transaction cost is the number of bidders. The lower the number of bidders the lower the pre-contractual transaction costs especially for the government in terms of pre-screening and proposal evaluations but it is likely that the total project cost will be higher due to a weaker competitive procurement process. By investigating the efficacy of PPPs in the UK, The House of Lords (2010) concluded that size is a key driver in delivering value-for-money within PPPs. However, the House of Lords also recommends that PPP projects should not be too large to avoid insufficient competition. As projects increase in value, the number of potential bidders declines (Productivity Commission final report). Financial capacity acts as a barrier to contractors competing for higher value contracts. A larger deal size lowers the number of bidders and a small number of bidders need to be avoided as optimal competition is critical in delivering superior value-for-money (The House of Lords, 2010). Teo et al. (2012) note that a lack of competition amongst potential constructors might have lasting effects on contract price and the potential for time and cost overruns to occur.

Another issue affecting transaction costs is the level of complexity of the project which depends on the way PPPs are organised in practice. By taking procurement time to account for the complexity of the project, Dudkin and Välilä (2005) finds that complex projects have higher transaction costs as projects with long procurement time are associated with significantly higher transaction costs. Rajeh et al. (2013) also argues that uncertainty is an important driver of transaction costs. Complexity increases uncertainty or risk which will result in higher transaction costs.

6. Conclusion
We do not attempt to precisely define what a small-scale PPP is. Our review precedes this complex exercise by reviewing the size-dependent features. Future research could explore more nuanced ways of defining “small-scale-like” projects based on these size-dependent features. Since most small PPPs are conducted by cities and regional governments, many local bodies would benefit from a better understanding of small-scale projects, helping to develop standard documentation, which is especially relevant for small-scale projects given their relatively large transaction and bid costs, supporting the long-term growth of small PPPs. Small-scale PPPs have different characteristics compared with large projects and these characteristics should be studied separately. Although the benefits of small-scale projects are undeniable, relatively few have been undertaken relative to the substantial requirement. A more thorough understanding of small-scale PPPs would help the subset of small projects to reach its full potential. This paper serves as a first step, clearing the ground for further research in specific areas.

One area concerns the influence of the financing structure on the efficiency of the PPP deals. A large part of the literature considers that project finance based arrangements are particularly well fitted to PPPs as they produce adequate incentives for lenders to assess the robustness of the deal (due diligence) and to monitor efficiently the contract implementation. In other words, PPP deals structured through project finance are limited recourse deals. Consequently, the interests of the lenders are aligned with the ones of the grantors. The difficulty at stake is the following such financial structure are particularly expensive. Contracts exhibiting a small or medium capital value are commonly structured with corporate finance. Future research may investigate more precisely this point and analyse the

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3 See Zarco-Jasso (2005) for an excellent overview.
4 We thank an anonymous reviewer for suggesting the alleys of future research.
consequences in terms of incentives. Another area concerns the issue of transaction costs. The British Treasury had expressed doubts about the opportunity to commit into PPP deals if the capital value is too low because of these transaction costs. Can we assume a linear relationship between their level and the size of the deal? Another topic is, for instance, the observation that the lower the capital value is, the higher the number of competitors. This insight may be sustained by more precise case studies. It’s not so obvious if we consider that running for a PPP contract may be resource and time consuming for undertakings. Moreover, the level of the competition for the market does not mandatory depend on the number of the undertakings that compete for the contract. The issue of the teams’ experience is also interesting and deserves more attention. Is the choice of opting for several limited scale PPPs an efficient way to get more experience and to acquire it more quickly?

References


**Figures**

Figure 1: Number of small PPPs (< EUR 50 million) across countries closed between 1990 and 2015

![Figure 1: Number of small PPPs (< EUR 50 million) across countries closed between 1990 and 2015](image1)

Figure 2: Share of small PPPs (< EUR 50 million) across countries closed between 1990 and 2015

![Figure 2: Share of small PPPs (< EUR 50 million) across countries closed between 1990 and 2015](image2)

Figure 3: Share of small, medium and large projects closed between 1990 and 2015.

![Figure 3: Share of small, medium and large projects closed between 1990 and 2015](image3)
Figure 4: Average value of PPPs of some European countries

Figure 5: Dispersion of small PPPs with capital value below EUR 50 million across sectors

Figure 6: Differences in median deal size (in million euros) across subsectors of the transport and social infrastructure sector
Figure 7: Average value of PPPs in the social infrastructure (left) and transport sector (right) in Europe (except UK) by subsector, five year averages

Figure 8: Average value of PPPs in the social infrastructure (left) and transport sector (right) in the UK by subsector, five year averages

Figure 9: Loan maturity and deal size
Figure 10: Payment mechanism and deal size

Figure 11: Debt-equity ratio and deal size

Figure 12: Type of bank debt and deal size