

Chapter 6

Involving the Private Sector and PPPs in Financing Public Investments: Some Opportunities and Challenges

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Abstract Given the paucity of public resources, it is important to consider relying on the private sector for financing public investments and infrastructure. There are considerable expectations concerning Public–Private–Partnerships (PPPs) in supplementing public resources, but also risk sharing with the public sector. However, these contracts are subject to abuse, given asymmetric information, and game-play across levels of government that lead to the risks being borne by the central government or subsequent administrations. Specialized agencies can play a useful role in supporting subnational governments with the complex contracting arrangements needed for PPPs. We see that strengthened Public Financial Management is needed, to track the build-up of liabilities at the subnational level, and also own-source revenues to ensure accountability. Uncertainty, including with climate change, may require different arrangements—and the options are addressed in a subsequent

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paper Ahmad, Vinella and Xiao (2017), but the risk-sharing aspects of PPPs may be relevant in many cases.

Given that public investment requirements far exceed available resources in most developing countries, there is a need to both channel public resources wisely and also best leverage the opportunities to utilize both national and international sources of private or institutional finance. A range of instruments is possible, involving combinations of public and private management and financing arrangements (see Ahmad 2014, 2017).

Some investments are likely to be predominantly public, especially where there are externalities in the provision of a balanced and inclusive basis for sustainable growth (e.g., education, regional infrastructure and O&M). These are also needed to facilitate the involvement by domestic private investors and FDI. Worldwide there is a growing trend towards the involvement of the private sector in the financing of infrastructure and in the provision of public services.

Private sector involvement takes diverse organizational forms and arrangements. These range from privatization to deregulation, outsourcing, and government downsizing (see Armstrong and Sappington 2006).

An increasingly popular mechanism in which the private and public interests come together is associated with Public Private Partnerships (PPPs), to finance and manage infrastructure projects across Europe, the US, Canada, and in several developing countries. In this paper, we focus both on the form that the investment takes, e.g., PPPs, as well as the sources of financing. **A fundamental issue is the sharing of risk in the presence of information asymmetries.**

It is also clear that the risks facing private investors are particularly high during the development or construction phase. This relates not just to the costs involved, and the subsequent pricing that may be constrained by the state, but also future revenue streams in relation to the usage and demand have yet to be tested. Once the project has been completed and has become operational, it becomes somewhat easier to securitize the potential revenue streams and involve the private sector in the management of the undertaking. However, in spite of there being some evidence that the success or failure of a project is more sensitive to construction risks than operation risks,¹ a fully general classification cannot be made, as the exact kinds of risks are likely to be highly sector- and project-specific.

In this paper we stress that the issue of accurate information on the generation of sub-national liabilities is of critical importance both to generate adequate signals for investment but also for the macroeconomic management. This is especially the case in a multi-level country, and is typically ignored at some peril, as seen in the Mexican crisis exacerbated by the debts for the highway

¹Gatti (2014) reports that, according to a study conducted by Moody's in 2010, infrastructure projects in the construction phase tend to default earlier, to recover more slowly, and to emerge later from bankruptcy, as compared to infrastructure projects in the operation phase.

projects that had been contracted without Federal Government guarantees. We also discuss the specific case of sub-national liabilities that have appeared in China, and point to the measures that might be needed to ensure that these do not degenerate into macroeconomic difficulties, while at the same time, remaining a sustainable mechanism for financing sustainable investments.

In some cases, macro-problems arise due to the failures of PPP contracts, and the ample room for game-play, that leads on the one hand to inefficient investments, and to the other, to a build-up of liabilities that go unheeded until there is a crisis. Following the recent economic crisis, the International Public Sector Accounting Standards (IPSAS) accounting rules for PPPs were tightened to ensure a better recognition of liabilities. Key issues relate to who owns the asset and beneficiary interests at the end of the contract. The sectoral dimensions are important, as are the public finance implications—including the recognition of liabilities, provisioning and generating public finances to cover the public component. Special issues arise in multi-level countries, both regarding the aggregate build-up of liabilities and their sustainability, as well as the credibility of contracts and incentives to renege.

In Sect. 6.1 we describe some general trends in involving the private sector in public projects. Section 6.2 focuses on PPPs and asymmetric information. We draw some policy conclusions in Sect. 6.3.

6.1 Involving the Private Sector—Some Trends

6.1.1 *What Do the Data Show?*

Global trends for PPPs—relating to both the total amount of investment and the number of projects (see Fig. 6.1) come from the Private-Participation in Infrastructure Project Database jointly produced by the Infrastructure Policy Unit of the World Bank's Sustainable Development Network, and the Public-Private Infrastructure Advisory Facility (PPIAF).² The figures present aggregate values from both sectoral and regional data. From 1991 to 2012, the overall trend for the investment in PPP projects was increasing, although a trough was reached around 2002. There was a 5.8% increase in the total nominal amount of investment commitments in year 2012, compared with 2011.³ The number of PPP projects, on the other hand, has oscillated between 200 and 400 projects per year since 1993. In 2012, there was a 13% decline in the number of PPP projects worldwide. Overall, this means that the average size of investment commitments is increased in 2012. In

²See <http://ppi.worldbank.org/index.aspx>.

³*Infrastructure Policy Unit 2012 Global PPI Data Update* at <http://ppi.worldbank.org/features/August-2013/PPI%202012%20Globo%20Update%20Note%20Final.pdf>.

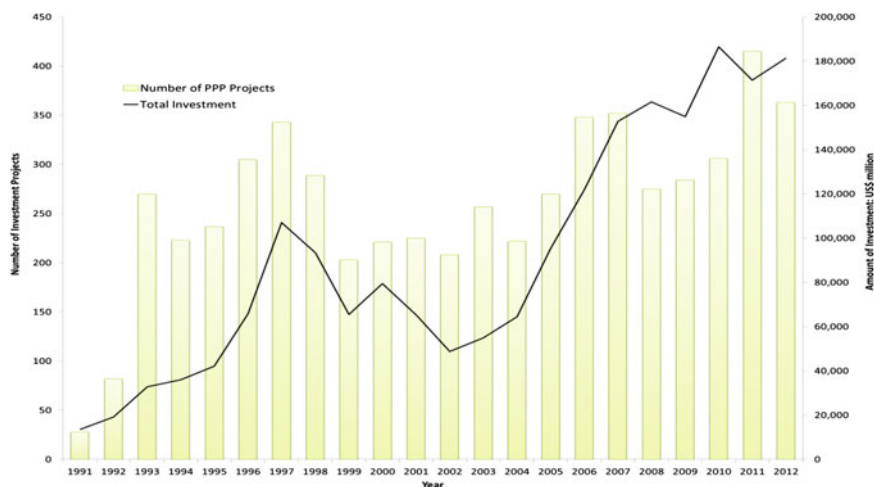


Fig. 6.1 Global Trends for PPP Projects from 1991 to 2012. *Source* World Bank and PPIAF, PPI Project Database

particular, Brazil and India accounted for about 55% of all PPP commitments across the developing countries in 2012.⁴

6.1.1.1 Sector Trends

Figure 6.2 presents the total investments by sector.

The energy sector attracted the largest amount of investments in 2012 with about \$76.8 and 244 projects. From 1990 to 2012, there were 111 countries with energy PPPs and 2653 projects reaching financial closure.⁵ The most important segment was renewable energy, growing at an annual average of 21% since 2007, doubling between 2007 and 2012.⁶ Latin America and the Caribbean (LAC) was the region with the largest investment share (36%). In terms of the format of private participation, Greenfield projects accounted for 68% of the total investment and

⁴For detailed report, see (World Bank Infrastructure Policy Unit 2012) *Global PPI Data Update*.

⁵Financial closure in the PPI Project Database varies among types of private participation. For greenfield projects and concessions, financial closure is defined as the existence of a legally binding commitment of equity holders or debt financiers to provide or mobilize funding for the project. The funding must account for a significant part of the project cost, securing the construction of the facility. For management and lease contracts, a contract authorizing the commencement of management or lease service must exist. For divestitures, the equity holders must have a legally binding commitment to acquire the assets of the facility. The Database includes only projects that have reached financial closure. *Source*: http://ppi.worldbank.org/resources/ppi_faq.aspx.

⁶See sector report: <http://ppi.worldbank.org/features/December-2013/Energy-Note-2013.pdf>.

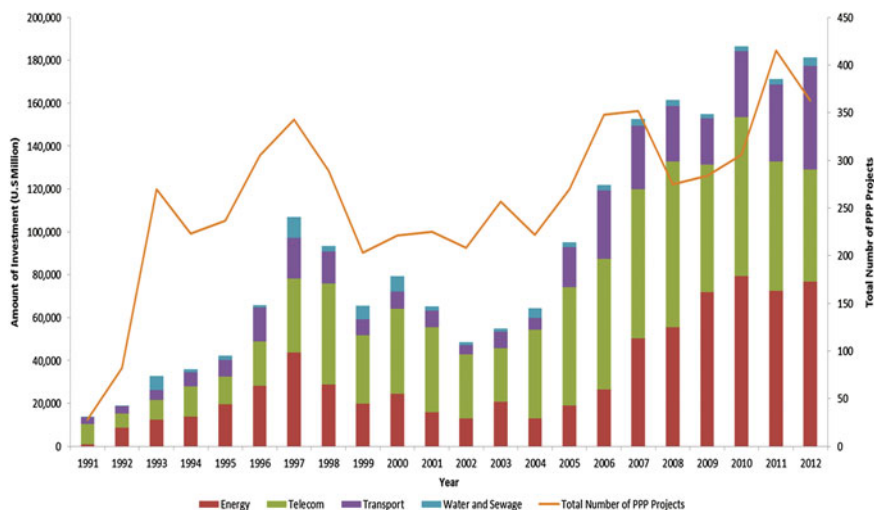


Fig. 6.2 Sectoral Composition of Investments. *Source* World Bank and PPIAF, PPI Project Database

75% of total number of projects. 126 projects were cancelled, or under stress, about 5% of the total investment between 1990 and 2012.

The telecom sector was the second largest sector for PPPs in 2012 with investments of \$52.4 billion (15% lower than the \$60.2 billion in 2011). In terms of investments, this is the smallest value since 2005. The number of PPP projects reaching financial closure is only four, the smallest number since the availability of the time series. Among different segments, 60% of the investments went into stand-alone mobile operators.⁷ Similar with the energy sector, the telecom sector used predominantly greenfield type of projects, which accounts for 61% of the investment and 75% of the total number of projects. LAC was the most active region with 37% of the total investment in telecom PPPs. The number of projects cancelled or under stress was around 3% of the total investment representing 60 cases between 1990 and 2012.

Investments in the transport sector have been increasing over recent years, totaling \$46.2 billion in 2012 with 83 projects, mainly in Brazil and India, which accounted for 78% of the investments in 2012. The investments in this sector grew about 25% between 2002 and 2012.⁸ Unlike the telecom and the energy sectors, concessions were the predominant form of partnership accounting for 59% of the investments and projects. Latin America and the Caribbean is the most active region, with 42% of total investments. The number of projects cancelled or under

⁷See <http://ppi.worldbank.org/features/December-2013/Telecom-Note-2013.pdf>.

⁸See: <http://ppi.worldbank.org/features/December-2013/Transport-Note-2013.pdf>.

stress was around 6% of the total investment representing 78 cases between 1990 and 2012.

The water and sewage sector had the smallest investment with US\$4 billion in 32 projects reaching financial closing in 2012. Despite its small relative size, the total investments and number of projects rose noticeably over the past decade. In 2012, the two countries with the greatest number of water and sewerage projects were Brazil (11 projects) and China (14 projects).⁹ The predominant form of partnership was concession accounting for 62% of total investment and 41% of the overall projects. The projects in this sector were heavily concentrated in East Asia and Pacific with 44% of the total investment. The number of projects cancelled or under stress were around 30% of the total investment representing 63 cases between 1990 and 2012.

6.1.1.2 Regional Trends

The regional decomposition of PPP investment from 1992 to 2012 is shown in Fig. 6.3. **The East Asia and Pacific region grew by 19%** in 2011, reaching \$17.2 billion in 2012. In 2012, most of the investment in this region came from the energy sector (\$8.9 billion), followed by the telecom sector (\$4.3 billion), the transport sector (\$3.5 billion), and the water and sewage sector (\$355 hundred million). China had the most projects (33 in total) in 2012 and Malaysia attracted the largest investment (\$5.1 billion). Greenfield projects accounted for 68% of the projects and 66% of the total investment. The number of projects cancelled or under stress in this region was around 10% of the total investment representing 86 cases from 1990 to 2012.¹⁰

With the economic crisis, the PPP investment in Europe and Central Asia, declined about 48% in 2011 to \$22.5 billion.¹¹ Despite this sharp drop, the region still accounted for 12% of global PPP investment. In 2012, Ukraine was the most active country with 16 energy projects and commitments of \$520 million. The most common partnership in this region was the Greenfield project, covering about 56% of the total investment and 45% of the total projects. The telecom sector captured about 54% of the total investment between 1990 and 2012 and the number of projects cancelled or under stress in this region was around 2% of the total investment representing 36 cases.

The Latin America and Caribbean region saw a sharp investment increase from \$56.9 billion in 2011 to \$87.0 billion in 2012, although the number of PPP projects declined from 95 in 2011 to 78 in 2012. In total, this region accounted for 48% of global investment, the largest global share for a particular region in the past two decades. Between 1990 and 2012, the telecom sector attracted about 42% of the

⁹See: <http://ppi.worldbank.org/features/December-2013/Water-Note-2013.pdf>.

¹⁰See: <http://ppi.worldbank.org/features/December-2013/2012-EAP-Regional-Note-Final.pdf>.

¹¹See: <http://ppi.worldbank.org/features/December-2013/2012-ECA-Regional-Note-Final.pdf>.

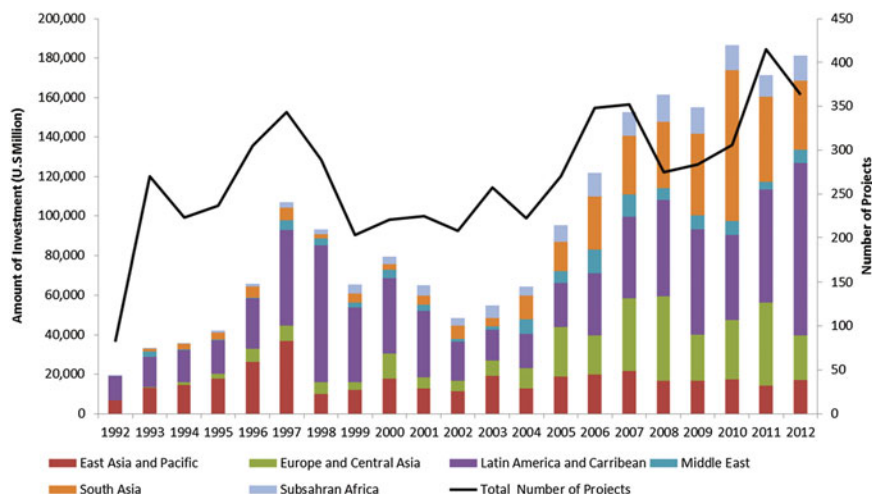


Fig. 6.3 Regional Decomposition of Investment. *Source* Asian Development Bank (2013).

total investment. Like the previous two regions, the greenfield project is the most common type with 41% of total investment and 52% of total projects. The number of projects that were cancelled or under stress in this region was around 7% of the total investment representing 135 cases.¹²

In the Middle East and North Africa region, PPPs investments increased rapidly from \$3.9 billion to \$6.7 billion U.S dollars, although there was a corresponding increase with doubling of number of project closures. However, the investments in this region in 2012 comprised only 4% of the global investment, about 0.4% of the regional GDP.¹³ The telecom sector dominated, increasing 64% from 1990 to 2012. The common type of partnership is greenfield, as in other parts of the world. The number of projects cancelled or under stress in this region was around 1% of the total investment totaling 7 cases.¹⁴

South Asia experienced a 20% decline in PPP project investment in 2012, down from \$43.1 billion in 2011 to 35.1 billion. The number of the projects reaching financial closures remained stable from 123 in 2011 to 128 in 2012. Despite the significant drop in total investments, South Asia was one of the most active regions in the world. India attracted the most regional investments (\$31.2 billion) with 106 projects in 2012. In total, private investment comprised 1.5% of the regional investment. A majority of the projects in Bangladesh and Pakistan had their PPPs backed by payment guarantees from the central government and credit

¹²See <http://ppi.worldbank.org/features/December-2013/2012-LAC-Regional-Note-Final.pdf>.

¹³See <http://ppi.worldbank.org/features/December-2013/2012-MNA-Regional-Note-Final.pdf>.

¹⁴See <http://ppi.worldbank.org/features/December-2013/2012-MNA-Regional-Note-Final.pdf>.

support from Asian Development Bank.¹⁵ Between 1990 and 2012, the number of projects cancelled or under stress in this region was around 2% of the total investment (12 cases).

In Sub-Saharan Africa, PPP investments grew about 16% to \$12.8 billion in 2012, reaching 7% of the global investment. Between 1990 and 2012, 471 projects reached financial closure. The telecom sector accounted for 77% of the investments. As in the other part of the world, Greenfield projects are the most common form of contracts. The number of projects cancelled or under stress in this region over the period of 1990 and 2012 was around 5% of the total investment (50 cases).¹⁶

6.1.1.3 Uneven Recognition of Liabilities Within and Across Countries

The generation of standardized information is likely to be a critical factor in generating the “building blocks” for informed decision making, especially when it comes to involving the private sector (both cross-border as well as of national origin) and removing the scope for game play between governments and private contractors, as well as between levels of government. Of course, generating accountable governance is a more complex problem, involving as it does appropriate assignments, as well as institutional arrangements that provide the incentives to manage liabilities efficiently and not pass them on (see for example, Ahmad 2013).

The IMF’s revised standards in the Government Financial Statistics Manual (GFSM) provide a comprehensive measure for the coverage and reporting on public transactions, **especially including investments and recognition of liabilities** (IMF 2001). This is fully consistent with the System of National Accounts; hence the linkages between the financial flows and the real sector become clear. The full operation of the GFSM is difficult in many cases, involving as it does a shift towards accruals, and some complexity in both budget frameworks and the ability to track the flows through systems of Government Financial Information Management Systems (GFMISS) and concomitant management of cash flows through a unique Treasury Single Account (TSA) or nested TSAs (as might be needed in large multilevel countries such as China).

The absence of standardized information within and across countries, e.g., in the EU, makes it harder for the private investors to judge the risks involved in particular countries. While this leads to the possibility of being able to “game the system”, especially if the down-side risks are likely to be covered by higher levels of government, it may result in inefficient decisions—such as overbuilding of tourist facilities in Spain or Portugal.

¹⁵See <http://ppi.worldbank.org/features/December-2013/2012-SAR-Regional-Note-Final.pdf>.

¹⁶Please consult regional report: <http://ppi.worldbank.org/features/December-2013/2012-AFR-Regional-Note-Final.pdf>.

In some Federal countries, particularly Canada, subnational governments do not comply with national standards of reporting, given the high degree of autonomy of the provinces.¹⁷ This was also the case in Brazil, until the economic crisis in the 1990s required the use of common standards for the operation of the Fiscal Responsibility Legislation. While a step in the right direction, the Brazilian standards do not comply with the GFSM standards on the recognition of liabilities. In Germany too, the Länder have disparate systems, and the 2010 Debt Brake legislation hopes to persuade them to conform to common standards and balanced budgets within a ten-year period.

Improvements in IT systems and GFMIS technology now permit relatively easy and inexpensive web-based solutions that facilitate a central repository of data with decentralized accounting and operating systems. This is clearly work in progress including through a community of practice that involves a network of countries and international agencies, and could be supported by technical assistance from a new multilateral bank, or the existing agencies.

In Russia, the effort to introduce a new Treasury System, involving both GFMIS and TSAs, facilitated the introduction of GFSM2001 standards in a comprehensive manner. The shift from legacy systems is not simple, especially when it comes to assets and liabilities.

The Chinese case is also of interest. A decision in the early 2000s was taken to move to the GFSM framework as well as to create TSAs in the Provinces as well as the Center. However, Chinese provinces are larger than many countries around the world, and the issues relating to the full implementation of the GFSM framework at the sub-provincial level still remain to be designed and implemented. This reform has to go in parallel with the reform of the budget law that prohibits direct borrowing by provinces from the private sector, but allows state owned companies (UDICs) to borrow for investments (see Ahmad and Wang 2013; National Audit Report 2011; National Audit Office 2013). Given that the PPPs were creating liabilities that were hard to manage at the local levels, after an initial spurt, the PPPs were reigned in (see Fig. 6.4). Similarly, the indirect borrowing by UDICs expanded considerably, but was reigned in in the recent past. Thus, while China has made considerable progress with the GFSM framework, full implementation to cover all the potential investment-based liabilities still remains to be addressed, and would be among the preconditions along with clarity of responsibilities and local own-source revenues, to ensure the orderly access to credit needed for a more balanced development strategy. Indeed, making better use of the efficiencies generated by private management with PPPs could be better utilized in China, provided the supporting framework to recognize and manage local liabilities is also strengthened. The new budget law enunciated in 2014 permits local governments to issue general purpose and special bonds, subject to oversight and overall limits to

¹⁷Municipalities, however, are subjected to strict control by provinces, but there are no national standards, which make it difficult to report to the GFS Yearbook on general government operations.

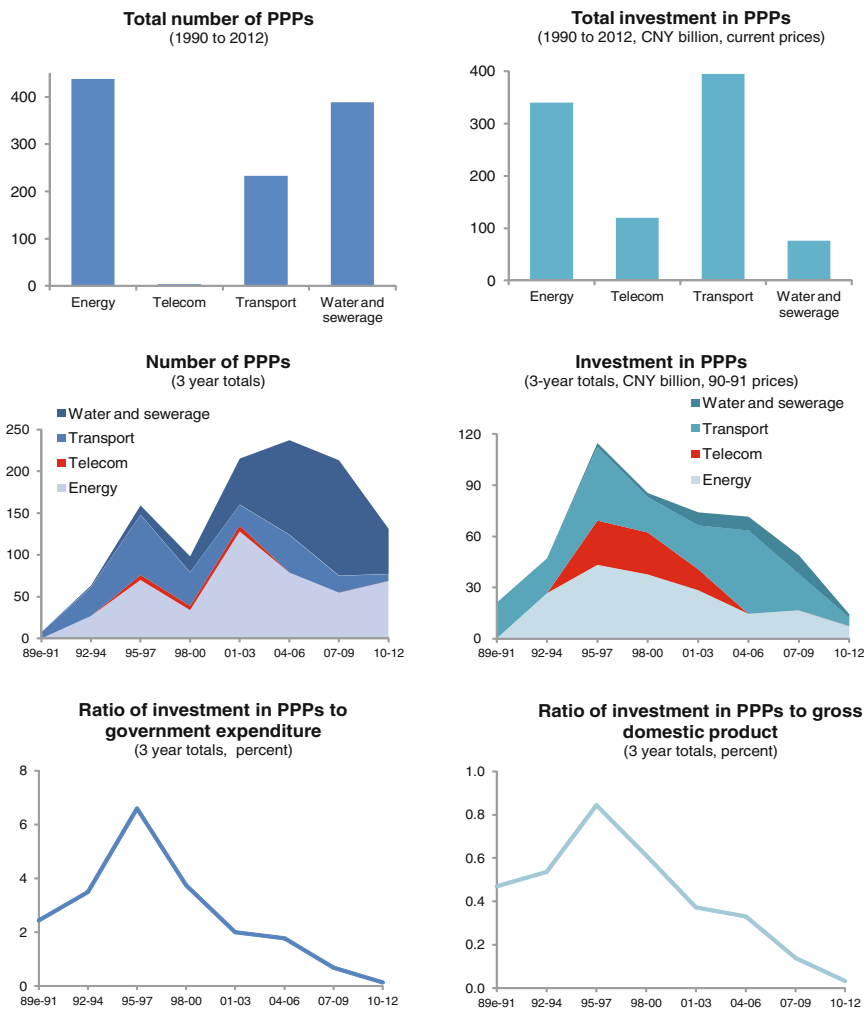


Fig. 6.4 A Snapshot of PRC’s Infrastructure PPPs. *Notes* The data show the number of PPP projects and the value of the investment committed to by the project. Data for 1989 are estimated as the average of 1990 and 1991. Constant prices estimates use the gross domestic product deflator. The data show PPPs that involve a private partner, where state-owned enterprises or their subsidiaries that remain majority owned by government entities are not considered private sponsors

be coordinated by the central government (State Council Communiqué, September 26, 2014).

6.1.2 An Approach to Managing Risks While Encouraging Investments

Despite the promises and opportunities associated with PPPs, there are clearly some challenges. The difficulties arise because of the sharing of risks that are complicated by asymmetries in information. The first set of issues relate to the ability of the private partner to mask the costs of the projects and the effort extended. Thus, there are incentives for the private party to renege on contracts, and at the minimum to hide effort and costs of provision. These issues are examined in Sect. 6.2, where we take a sectoral perspective to examine the possibilities to hide information and renege on commitments.

A second set of difficulties concerns the overall public finances at different levels of government—particularly the government’s ability to manage current and future liabilities. As the bulk of the investments are likely to involve sub-national governments, that tend to have limited own-sources of revenue, there is a tendency to “kick the can down the road” or to upper levels of government.

Clearly, from an investor’s perspective, the credibility and sustainability of government finances is a critical element in taking sound investment decisions. Given that an increasingly large share of investments is being undertaken at the sub-national level, the generation of accurate and timely information on general government liabilities (that include all levels of government and public enterprises) becomes a critical element in an assessment of investment sustainability, especially where cross border investments might be involved. These issues are discussed in Sect. 6.3.

In general, the absence of standardized and timely information on the buildup of liabilities is likely to have two distinct effects. **In periods of boom, this is likely to lead to “irrational exuberance”**, and to the generation of inadequate and unsustainable investments. The problems are likely to be magnified at the sub-national level, especially when there are no effective own-sources of revenue or incentives to ensure that the liabilities will not be passed on to the center, Brussels or to future generations.

The obverse is also likely to be a greater problem in developing countries—as investible capital fears to tread in areas where the enabling environment is problematic. Thus, even though there is no standardized information on sub-national operations in Canada, the expectation is that since they have own-source revenues, and the Federal Government is not likely to intervene, that the local governments will “behave well.” This would clearly not be the case if there were no effective hard budget constraint, as may be the case at the sub-national level in most developing countries, e.g., including China.

Indeed, the “risk management” framework needs to be flexible enough to accommodate excess private liabilities that are translated into public liabilities—e.g., as seen in the US sub-prime crisis, or the excess building in Ireland and Spain (both countries that had been praised by the IMF for fiscal prudence prior to the 2008 economic crisis). In Europe, it is likely that the presence of a supranational tier blinded markets to the risks involved in specific countries (especially in Southern Europe, from Portugal and Spain to Greece). It is not enough to “assume” that there are hard budget constraints and that markets will adequately assess and discount the risks involved in specific investments. Consequently, the empty buildings in Spain are reminiscent of the Asian crisis of the late 1990s, and the earlier difficulties in Latin America.

6.2 PPPs and Information Asymmetries

A PPP, for the sake of brevity, consists of a long-term contractual arrangement between a governmental body (whether an agency at the central level or a local authority) and a private firm. Under this arrangement, the firm is delegated the delivery of some services, including provision of the associated infrastructure. This includes several tasks, namely financing the investment as well as building, managing, and maintaining the infrastructure that is necessary to provide the services. The firm takes the responsibility for accomplishing all these tasks. PPPs are aimed, on the one hand, at using private capital, together with (or in lieu of) public funds, for the realization of public projects. The fact that the private sector does not spontaneously provide the services suggests the need for public interventions of some sort, and this typically has a financial obligation that may not be realized immediately. Thus, the temptation to think of PPPs as kicking the fiscal can down the road is likely to be short-sighted and problematic.

A key feature of PPPs is the potential for generating more efficient project outcomes. Often, private investment is needed to utilize more efficient management practices than is generally possible in the public sector. Indeed, the greater efficiency in management can provide a benchmark for the improvements in the management of sectors that might have to remain largely in the public sector. Initially utilized in transportation, energy and water sectors, PPPs are currently employed in a significantly larger variety of projects. These include, *inter alia*, prisons, waste management, schools, hospitals, leisure facilities, and housing.

Despite the widespread utilization of PPPs, the evidence to date on their performance is mixed. In the UK, private finance initiative (PFI) projects have started yielding cost savings, relative to traditional procurement arrangements. However, PPPs have failed to deliver the expected benefits, e.g., in specialized IT projects. This suggests that reliance on PPPs is not equally desirable in all sectors and, in particular, that PPPs are not particularly suitable for sectors that evolve very rapidly (Iossa and Martimort 2008). The French experience in the water sector is also not especially positive, and water prices have been found to be higher under

PPP arrangements than under traditional procurement arrangements (Saussier 2006). A particular difficulty in most PPPs is that contracts are renegotiated before reaching their agreed termination date. Renegotiation phenomena are pervasive, especially (though not exclusively) in less developed countries. In Latin American and Caribbean countries a large number of projects were abandoned due to the private (or public) partners' inability to abide by contractual obligations (see, among others, Guasch 2004, and Iossa and Martimort 2008).

Given the evidence, it is now clear that structuring PPPs properly and ensuring that they deliver agreed benefits, is a complex and far from obvious task. Much of the difficulty arises due to asymmetries in information that make it easy to renege on contracts. Ensuring effective risk sharing, including the provision of public resources as agreed within the requisite timeframe is critical in making PPPs work effectively. We will also posit the need for third party arbiters in ensuring that contracts are honoured. In order to accomplish this task, it is first necessary to understand the main features of PPPs as well as the incentives that partners display in PPP arrangements. One can, thus, discuss ways in which the different incentive issues can be tackled, and identify instruments to ensure the effective delivery of services.

6.2.1 Key Features of PPPs

As mentioned above, a PPP is a long-term contractual arrangement between a governmental body and a private firm, under which the former delegates to the latter the delivery of some services. Under a PPP arrangement, the firm is made responsible for financing the investment as well as for building, managing, and maintaining the infrastructure that is used to provide the services. When a PPP is created, the whole project is delegated to the private firm through a global contract. This combines the financial aspects of the investment together with the conditions under which the infrastructure is to be built, managed, and maintained. Moreover, this contract allows for the firm and the investors to be compensated over a long period. This is likely to have budgetary consequences, over the life of the project.

The engagement of the private sector does not mean that there is no role for the public sector. Quite the opposite, governments and more generally, public institutions should ensure that social obligations are met. This requires both effective sectoral reforms as well as adequate public financial management. For successful PPPs it is important to recognize that the public and the private sectors each have certain advantages, relative to the other, in performing specific tasks. The government can contribute to a PPP in several ways. First, it can provide capital for its share of the investment (through tax revenues), transfer assets, make guarantees, or provide in-kind contributions that ease the functioning of the partnership. The government also provides social responsibility, environmental awareness, local knowledge, and an ability to mobilize political support. In its turn, the private sector provides expertise in commerce, management, operations, and innovation to run the

business efficiently. The private partner is often required to invest in the project, although this may depend upon the specific contractual agreement (see, for instance, Asian Development Bank 2008). In fact, transferring responsibility to the private sector for mobilizing finance for infrastructure investment is one of the major differences between PPPs and conventional procurement (The World Bank 2012).

PPPs have several specific objectives. First, they are meant to **improve the quality and the performance of public services** to the benefit of users/consumers. Second, they are supposed to reduce or, at least, to **ease the time-profile of the tax-payers' burden**. Third, they should help the public authorities, which are responsible for delivery of the services, to **optimize the realization and quality of those services**. These objectives are pursued, in turn, by two main means. First, the public partner takes advantage of the **financial resources and the technical expertise of the private sector**. Second, the **risks associated with the project are allocated between partners so that each partner bears those that it can handle more efficiently**.

Despite some common features of PPPs, they are not approached everywhere in the same way. Some countries choose to concentrate PPPs in certain sectors. This can reflect priorities for investment or for improvement in service performance, or the willingness to prioritize **sectors** in which PPPs are expected to be most successful. Other countries, conversely, identify sectors (or services within sectors) for which reliance on PPPs is ruled out. These are sometimes called *core services*, *i.e.*, services that should be provided exclusively by the government and, hence, should not be delegated to the private sector through a PPP. Nonetheless, definitions of core services can vary across countries, mirroring local preferences and perceptions (The World Bank 2012).

6.2.2 A Sectoral Investigation

PPPs potentially provide flexible tools for decision makers to promote efficient infrastructure and/or service delivery. However, for a PPP to be successful, it must be designed with attention to the exact context within which it will be implemented. This involves tailoring the partnership to accommodate the main technical characteristics and constraints of the concerned sectors. **Developing a comprehensive and reliable investigation, thus, requires an initial sectoral analysis.**

We discuss, first, characteristics and circumstances, under which PPPs are more suitable in certain sectors than in others.¹⁸

***Bundling.* An essential feature of a PPP is that different phases of the project are bundled in a single contractual agreement, which concerns design,**

¹⁸A rich discussion on this subject is proposed in Iossa and Antellini Russo (2008), who refer widely to the Italian PPP experience.

construction, financing, operation, and maintenance. The various firms, which will develop the project jointly, form a consortium for the Special Purpose Vehicle (SPV), which becomes the private contractual partner. Bundling the different phases of the project is useful when governmental bodies are aware of the needs that the project should address, but do not know the best way to do so. Because of this, they rely on the private sector for the design and the realization of the whole project. The contract should be designed to provide the private sector appropriate incentives to find innovative solutions and to effectively employ their technical and managerial expertise. The risks of the project must be allocated efficiently. For instance, the private partner must bear risks associated with the design, construction, and timely delivery, which it can control. If the rewards match the risks, the private partner will have incentives to complete the infrastructure and to start providing the service within the stipulated termination date and budget.

Positive externalities between phases of the project. **When the risks are allocated efficiently between the partners, the very fact of bundling the phases of the project may lead to efficiency gains if positive externalities (synergies) are present between the design/construction activities and the management/maintenance activities.** For instance, this is the case when the quality of the infrastructure, which typically affects the quality of the service, decreases the costs of management and maintenance. As bundling induces the private partner to account for the impact that the quality of the infrastructure has on the costs of management and maintenance, it helps mitigate under-investment problems, which arise whenever some quality aspects cannot be specified in contracts, but can be curbed by the private partner in order to contain the costs. We can thus say that, in general, bundling can lead to significant efficiency gains, and, hence, is desirable if building an infrastructure of a sufficient quality reduces the costs of management and maintenance. This is the case with *hospitals*. The quality of both the infrastructure and the medical equipment has an important positive effect on the performance. It is also the case in *transportation*. Both the costs of maintenance and the user benefits are strictly linked to the quality of the transport infrastructure. *Prisons* are another good example. Improvements in the infrastructure design allow for significant reductions in management costs.

Contractual length. **The presence of externalities between construction and operation is a reason for which PPP arrangements must have a long duration.** This is a core aspect that determines how carefully the private partner will account for the effects that the construction investment will have on the costs of management and maintenance. If the duration is too short, the private partner will not have the incentive to internalize those effects and consequently under-invests. On the other hand, it may not be a good idea to lengthen the duration excessively. There are two possible reasons for this. First, the prolonged absence of any competitive pressure may lead the private partner to become inefficient. Second, when the users' preferences evolve quickly over time, the contractual terms tend to become rapidly obsolete. This may require renegotiation of the contract. Therefore, PPP arrangements may not be suitable in the sectors in which the users' preferences evolve

quickly. Difficulties of this kind have been experienced with the *information technology* services in the UK.

Absence of positive externalities between phases of the project. Bundling is of little use—or not useful at all—when there are limited positive externalities— or are completely absent for instance between construction and operation. This is the case, for instance, with the so-called *soft services*, such as, meal preparation and distribution, cleaning, laundry, maintenance of buildings and technological services, parking, etc. In the UK, these services, initially embodied in PPP arrangements, are currently regulated under independent contracts. Very often, these contracts are relatively short-term with the aim of encouraging participation by a larger number of firms. Lastly, negative externalities may arise between phases of the project, e.g., when building an infrastructure of high quality leads to an increase in the costs of management and maintenance even if generating larger social benefits. A good example is found in the *security dimensions of the plants*. It is, then, advisable not to induce the private partner to internalize the externalities because that would exacerbate the problem of under-investment in quality/security. Unbundling may, thus, be optimal.

We shall now look more closely at PPP arrangements in the provision of three services of general interest, namely transport, energy, and telecommunications. Without the ambition of being exhaustive, we shall focus on a few aspects, which seem to be especially important in those sectors.

6.2.3 Transport

6.2.3.1 European PPP Trends

Over the past two decades, the European public transport sector has experienced a substantial institutional evolution. First, reliance on contracting has become widespread over all transport modes. This has led to transfer more risk to private operators. Second, competitive tendering practices have progressively replaced direct awarding of contractual rights. Lastly, many municipal operators have been privatised. The utilization of PPPs for the realization of transport projects is a substantial part of this trend (Iossa and Martimort 2009). The Isle of Skye Bridge, which connects the Isle of Skye to the mainland was the first European transport project realized in 1992, under the UK PFI (Private Finance Initiative) approach (Grout 1997). Since then, PPPs have become widespread in urban transportation projects. They have also been used for big infrastructure projects and isolated links, such as the Eurotunnel and the London Underground upgrade-and-maintain project. After becoming very popular also in France, Italy and Spain, they have been recently adopted in Eastern Europe for the realization of transport infrastructure (European Investment Bank 2004).

6.2.3.2 Non-European Developed Countries

The trend is analogous outside Europe. In the U.S., the introduction of PPPs in transportation infrastructure goes back to the 1970s, when they were used to build inner-city infrastructure. Over time, PPPs have been extended to other road projects, such as the Dulles Greenway highway in Virginia and the SR-91 and SR-125 toll roads in California (CBO 2007), although the main interstate highways are largely public. In many cases in the US, PPPs are being used as a mechanism to raise financing for infrastructure, given the political difficulties in implementing taxes or even user charges. In Australia, toll roads were first built, through PPP arrangements, during the Nineties in New South Wales (Iossa and Martimort 2009).

6.2.3.3 Developing Countries

A more and more substantial involvement of the private sector in financing and building transport infrastructures has evolved, since the 1990s, the private sector has invested US\$180 billion to develop transport projects in LDCs. Furthermore, in 2006, 1000 private projects were in progress, most of them concerning roads and many others concerning railroads (Iossa and Martimort 2009).

6.2.3.4 The Main Features of Transport PPPs

We identify four main features (see also Martimort and Iossa 2009):

1. Bundling—typically including design, building, financing, and operating—are contracted out to a consortium of private firms, which takes the responsibility for the development of the entire project.
2. A significant part of the risks involved in the project is transferred onto the private partner, but are dependent on tolls.
3. The use of private capital is a crucial aspect of the partnership. User charges are often set to reward the private investors. For instance, highway users pay a toll in countries like Italy and France¹⁹; airlines and lessees pay, respectively, a landing fee and a rental charge to airport contractors; train operating companies, which obtain revenues from passengers, pay railway contractors for the right to access the rail infrastructure.
4. The contractual relationship typically ranges from 20 to 35 years.

¹⁹We should, however, mention that, in some countries such as the UK, highway contractors receive payments directly from the budgets, or like *shadow tolls* from the government.

6.2.4 Risks in Transport Projects

Transport projects involve both construction risks and operational risks. Construction risks are related, *inter alia*, to incorrect time estimates, unforeseen ground conditions, failure to obtain necessary services, protestor actions. Operational risks include demand risk (directly affecting revenues—e.g., in the 1990s Mexican case), interest rate and foreign exchange risks, risks associated with hydro-geological and weather conditions.

6.2.5 The Relevance of Demand Risk

Demand risk in the operation phase is especially problematic. Actually, in the majority of cases, it is cumbersome to make reliable forecasts of future traffic flows.

- **One difficulty arises when other transportation modes and facilities are available.** Then, demand can be dramatically influenced by the competition that they induce. For instance, whether a toll road project is successful or not depends on whether alternative toll-free roads are available.
- Furthermore, **both user needs and, more generally, macroeconomic conditions tend to change over time.** In order to establish the exact extent to which these risks should be transferred onto the private firm, it is necessary to assess how efficiently the firm can tackle them.
- **In transport projects, as the service is sold to end-users,** rather than to one or few off-takers (as is the case of oil and gas, for instance), **it is difficult to hedge the demand risk** that private firms cannot efficiently tackle, say, by fixing revenue levels affecting earning and cash flows. It is, thus, necessary to rely on other instruments to mitigate demand risk in PPPs. For instance, in highway development projects, the public sector can provide the private partners with guarantees on the traffic level, in the form of traffic floors or collars (Gatti 2014).
- **The firm can influence demand** for the service in two essential ways: (1) by exerting an effort to build an infrastructure of good quality, and (2) by exerting an effort to provide the service as well as it can.

In motorway projects, for instance, the benefit that users obtain depends on how safe the motorway is. This, in turn, is related both to the quality of the motorway and to how carefully it is maintained.

In railway projects, demand is heavily affected by quality dimensions, such as comfort of trains, reliability of both transport services, and on-the-train services. Some quality dimensions are observable and verifiable. As an illustration, think about train punctuality and crash rates in rail concessions; schedule reliability in bus concessions; congestion levels and mortality rates in highway concessions. These dimensions can be contracted, and in principle it is not problematic to design the contract so that the firm takes care of them. Specifically, quality targets can be

stipulated in the contractual agreement, and the firm can be motivated to meet them by means of “rewards” and “punishments.” This is common practice in many real-world contexts.

Data collection on verifiable quality dimensions of services of general interest, for regulatory and accountability purposes, is by now widespread. Bergantino et al. (2011) report a few examples in transportation sectors. In the U.S., the Bureau of Transportation Statistics of the Research and Innovative Technology Administration provides detailed information about departure and arrival delays for a variety of transportation modes (ranging from aviation to maritime, highway, transit, and rail). In France, the *Observatoire des retards du transport aérien* collects and publishes data on flight punctuality. In Italy, the regulated rail company is currently compelled to disclose information about arrival delays.

Things are, of course, more problematic with effort dimensions that are not verifiable. These are at the root of the *moral-hazard problems*.

In addition, there can be adverse-selection problems. The firm may well hold some private information, say, about the costs of the activity, from which it can take advantage in its contractual relationship with the government. When this is the case, it becomes then necessary to find contractual solutions that address the two information issues at once. Nonetheless, in some kinds of projects, such as of highway projects, the presence of adverse selection is less likely. The reason is that the marginal cost of providing the service is very small (close to zero); and the private party often faces the same demand uncertainty as the public party. Hence, moral hazard is the main concern, in these projects.

Consequences for the profitability of the project and the enforceability of the contract. Given the difficulty in making precise demand forecasts, the firm's profits are largely uncertain before the operation phase begins. One natural consequence is that it becomes difficult to attract private investment, especially when projects are big and private sponsors are averse to risk. For instance, so far, cross-border infrastructure has received very little attention from private financiers in Europe (EC White Paper 2006). Even if private investors do show up, they tend to behave opportunistically. This is possible because, at the time when the right to run the project is awarded, they are generally required to present traffic forecasts, which are used to define the contractual arrangements. Thus, at that stage, they have an incentive to present overoptimistic forecasts, in order to obtain the right to the activity. However, once this is acquired, it becomes clear that traffic flows are poor, in fact.

Changing demand parameters paves the way for costly renegotiation, default, or bail out. For instance, in Latin America, many contracts for highways projects were renegotiated, during the Eighties, at the private operators' initiative (Guasch 2004). In a recent motorway project, in Hungary, the traffic flow proved to be very low during the operation phase. The private operator in charge of designing, financing, building, operating, and transferring the infrastructure, earned very little revenue and stopped paying back its debt. The public partner had to intervene to take over the debt obligations and bail out the concession (European Commission 2004). The realization of the Eurotunnel experienced several cost overruns. The list

of examples of failures of PPPs in transport is extensive and we report some additional cases in Sect. 6.3.2.

6.2.6 Energy

This subsection looks at the energy sector, focusing on the EU approach to PPP arrangements in this sector. It is useful, first, to understand the EU Energy Policy objectives that govern the approach.

6.2.6.1 The EU Energy Program

The main priority of the EU Energy policy is to coordinate and optimise the network development on a continental basis. As specified by the European Commission (2011), this means that:

- i. **Solidarity** among member States should become fully operational;
- ii. **The internal market** should be completed;
- iii. **Security of supply** dictates that alternative supply/transit routes should be made available;
- iv. **Environmental concerns** require that renewables should be further developed and begin to compete with traditional generation supply.

Accordingly, the attempt is to ensure that strategic energy networks and storage facilities will be **completed** by 2020. Twelve trans-European priority corridors and areas have been identified to this end. They include electricity and gas networks as well as carbon dioxide transport infrastructures.

It has been established that the goals must be achieved by identifying specific energy infrastructure projects (through a diligent and severe selection process), which will be attached the label of “Projects of common interest.” For instance, it is expected that many such projects will focus on the European transmission system; and operators will certainly need to build many more related projects than in the past.

Financial aspects and PPP arrangements. The EU program is ambitious and calls for huge investments. This posits difficulties at a juncture at which resources are very scarce. It is unlikely that significant public resources can be used, especially in countries, which have developed very high public debts due to counter-cyclical policies or the realization of past liabilities. Also private resources are limited, because commercial banks have drastically reduced infrastructure investments over the last years.

Thus, two main solutions are being considered:

1. **Involvement of institutional investors** (namely, pension funds, insurance companies, mutual funds, sovereign wealth funds);

2. Issuance of project bonds.²⁰

Involving institutional investors may be useful because their liabilities are long-term. Hence, they may buy and hold investments in long-dated productive assets, acting in a counter-cyclical manner. The EU would work as a catalyst for these investors. Actually, already in October 2011, the Connecting Europe Facility (CEF) was launched to fund €50 billion of investments in the trans-European networks for energy as well as transport and digital services between 2014 and 2020. The CEF (to be fully implemented soon), is meant to use many financial instruments, as an alternative to traditional grant funding: special lending, guarantees, equity investments.

More than institutional investors, **project bonds are viewed as the main EU financing instrument for the trans-European networks for energy, transport, and digital services.** A pilot phase was launched in 2012. The idea is that PPPs would be created to run specific projects. However, rather than relying on bank loans, these companies would issue long-term well-rated bonds. In order to mitigate the risk, at least to some extent, the European Commission and the European Investment Bank (rather than the single States) would participate in the projects.

This strategy seems to be supported by the following logic. As the concerned projects are essentially trans-European (rather than national), they are huge, and involve risks that involve several countries at once, and capital is to be attracted from as many countries as possible. At the same time, risks are to be shared as widely as possible across countries—The private sector is still destined to be involved. **However, the PPP companies, responsible for specific projects, will share risks with the public sector with guarantees at the EU level more than at the country level. This puts greater premium on ensuring that the public finance data across countries is standardized.**

6.2.7 Information and Communication Technology

PPP/PFI solutions do not seem to be particularly appropriate for ICT projects, especially because of the fast-moving features of (and preferences for) the involved services. This inappropriateness has been stressed in the economic literature—Iossa and Martimort (2008) for example argue that “PPP’s seem unsuitable for fast-moving sectors; performance failures have been widespread in PPPs for specialised IT in the UK.” Iossa and Antellini Russo (2008), concur that “in sectors where users’ preferences change rapidly over time, PPP arrangements are inappropriate, as the UK experience in IT projects witnesses.”²¹

²⁰A broad overview of the financial perspectives for the European energy infrastructure is found in Tagliapietra (2013).

²¹Translation from Italian by the authors.

Apparently, real-world practice is moving in the same direction. For instance, the *Public Private Partnership Policy Framework and Guidance* of the Northern Ireland Department of Finance and Personnel (Sect. 5.2.6) states that “(...) resources should not be wasted investigating PPP solutions where they are clearly not appropriate. For instance, PFI solutions are not usually considered appropriate for Information and Communication Technology (ICT) projects.” This approach seems to be confirmed by the Broadband Delivery UK project, currently in progress.

Broadband Delivery UK is meant to improve the UK’s broadband network, with particular emphasis on making high-speed broadband available in rural communities. Specifically, the ambition is to provide superfast broadband to at least 90% of premises in the UK, and to provide universal access to standard broadband with a speed of at least 2Mbps. This is one of the major infrastructure projects in which there is capital investment from the *public* sector, to which Infrastructure UK (IUK) provides support. The government has allocated £530 million to stimulate commercial investment to roll out high-speed broadband in rural communities. BDUK is responsible for managing the rural program, whereas local authorities and the devolved administrations are responsible for individual projects. Local authorities can run mini-competitions to select a specific supplier to deliver broadband services for a local project.

As this project is largely targeted to rural areas, it is unlikely to be very profitable, or attract private investors. Moreover, the “social” benefits of the project are a pretty good justification for the public contribution. Nonetheless, this story seems to confirm that **PPP arrangements are not regarded as an appropriate instrument for IT projects, or where social concerns place a constraint on the user charges that might make a project interesting for the private sector.** The latter may also apply with some other rural infrastructure, such as feeder roads.

6.2.8 Informational Asymmetries Between Partners

As the creation of a PPP involves **delegation of some tasks from the government to a private firm, a natural question is whether and, if so, under which circumstances this can be done at no cost.** This depends on how aligned the interests of the partners are to being with, or can be aligned in the stipulated contract.

An immediate difficulty that arises in PPPs is the presence of informational asymmetries between the government and the firm. Hence, these must be taken into account in contract design. In many situations, during the execution of the contract, the firm is (or becomes) better informed than the government about both some relevant aspects of the activity, and its own actions that can have an impact on those aspects. For instance, the government cannot observe (or, even if it does, no third party, such as a court of justice, can verify this) whether the firm exerts a specific level of effort, which is desirable from the social perspective in building the

infrastructure. **Because providing effort is costly for the firm, but the degree of effort cannot be specified in contracts, a moral-hazard problem arises**, as is usual when the source of private information is “endogenous.” That is, the firm has an incentive to shirk from exertion of effort during the construction phase in order to maximise returns.

In addition, the government is unlikely to observe the exact conditions under which the firm manages the activity once the infrastructure is in place. For instance, it may not know whether the service demand or the production cost is high or low. By contrast, the firm learns this information by the time the project is in operation. **This is the root of an adverse-selection problem, as usual when the source of private information is “exogenous.”** That is, the firm has an incentive to cheat, *vis-à-vis* the government, about the conditions under which it actually operates, because this allows it to raise its profits.²²

The two information problems are not disjoint, in general. This is due to the presence of synergies between phases of the project, which is one of the main reasons for which various tasks are bundled in a unique activity and entrusted to a single responsible firm. The effort that the firm exerts during the construction phase has an impact on the conditions that it faces during the operation phase. For instance, exerting effort may increase the likelihood of facing a high demand for the service (because the infrastructure is more reliable) or a low cost of production (because the cost is an inner characteristic of the infrastructure). This is why effort provision by the firm is desirable.²³

From standard agency theory, we know that moral hazard is not an issue (and can be handled at no cost) as long as the firm is risk-neutral and not protected by limited liability. Nor is adverse selection an issue if contracting occurs *ex ante*, *i.e.*, when not only the government but also the firm is uncertain about the future operating conditions, as is very often the case with PPPs. Under these circumstances, the government can prevent the firm from exploiting its informational advantage and implement the efficient allocation (namely, recommend the efficient output level and give up no rent to the firm) by offering a *state-*

²²Private observation by the firm of the operating costs is, perhaps, the most common root of adverse selection issues in delegation problems. However, this is not a feature of all types of projects. A word of caution is, thus, needed. For instance, according to Engel, Fischer and Galetovic (1997, 2001), private information on costs is not an issue in highways franchise contracts. The authors argue that, once the infrastructure is built, the costs of operating and maintaining highways are known to be close to zero and, hence, there is little room for firms to cheat. This is instructive. It means that, although some problems are very widespread and can thus be legitimately accounted for in a general discussion, **a more appropriate approach to PPP issues should pay attention to the different characteristics that the various sectors and activities display.** This leads us to the sectoral analysis developed in this paper.

²³To be more precise, effort provision by the firm is desirable as long as the expected additional benefit that it induces, as compared to a situation in which no effort is exerted, exceeds the cost that providing effort entails for the firm. When effort has a probabilistic impact, the possibility of an additional benefit follows from the fact that the operating conditions are more likely to become favourable.

dependent compensation scheme. **Differentiating the compensation to the firm across states of nature is useful for incentive purposes.**

This is backed by the well known *Revelation Principle* (Gibbard 1973; Green and Laffont 1977; Dasgupta et al. 1979; Myerson 1979). According to the latter, in principal-agent relationships, there is no loss of generality for the principal (the government, in the context of our paper) in restricting attention to *direct revelation mechanisms*. “Directness” of an incentive mechanism resides in whether the agent (the firm, in the context of our paper) has no other actions to take, besides merely reporting private information to the principal (or, equivalently, picking one particular option, within a menu of contractual options, each tailored to a different possible state). In order to make such a mechanism “truthful,” it is necessary to construct it in such a way that the incentive-compatibility constraints of the agent are satisfied. **This involves motivating the agent to announce the information correctly to the principal, rather than to camouflage it** (see, for instance, Laffont and Martimort 2001).

On the one hand, moral hazard requires that the firm bear some risk. The firm is not motivated to engage in costly effort unless it is inflicted a sufficiently significant penalty when a bad state is realized, while being assigned a sufficiently large reward when a good state occurs. A compensation scheme with this characteristic mirrors the need to transfer, in the words of OECD (2012), a “sufficient and appropriate” amount of risk to the firm. In long-term PPP agreements, in which not only the level of output and the compensation to the firm are contractual variables, but also the termination date is stipulated, the firm should be allowed to enjoy the benefits of its effort for a sufficiently long period of time (see, for instance, Iossa and Martimort 2008, and Danau and Vinella 2014).

Adverse selection requires that the compensation to the firm should be sufficiently higher in good states than in bad states, though not excessively higher. The former requirement discourages the firm from claiming, *vis-à-vis* the government, that the state is bad when, in fact, it is good. Conversely, the latter prevents the firm from claiming that the state is good when, in fact, it is bad.²⁴

The bottom line is that, as long as no friction arises, other than the two information problems described so far, delegation to a risk-neutral private firm generates no agency costs for the government. The firm can be induced to deliver the efficient level of output, without the need to concede any information rent to it. This goal is achieved by **designing a sufficiently dispersed compensation scheme, under which the firm breaks even *ex ante*, obtaining a higher return when the operating conditions are favourable and a lower return when they are not.**²⁵ This conclusion might induce one to believe that, after all, it is not

²⁴For a general presentation of *ex-ante* contracting with adverse selection, see Laffont and Martimort (2001). With specific regards to PPP projects, see Danau and Vinella (2014).

²⁵Risk neutrality of the firm is not an irrelevant aspect. When the firm is risk averse, it is necessary to insure it against the possibility of facing unfavourable operating conditions and, hence, a low return from the activity. In that case, a trade-off arises between provision of incentives and provision of insurance. The power of incentives that the government can provide to the firm is

very difficult to set up a successful PPP because information issues can be handily circumvented. In fact, an important clarification is here in order.

The conclusion above is drawn under the implicit assumption that both the government and the firm fully commit to contractual obligations within the PPP arrangement. However, in practice, the partners are often unable to do so. Then, difficulties arise with the enforcement of the contract. Consequently, delegation to the private firm is more problematic and may become costly. **One should, thus, try and understand how the contract, which decentralizes the efficient allocation under full commitment, can be made self-enforcing as it is implemented.**

6.3 Limited Ability to Commit to Contractual Obligations

In the literature on contract design, **situations where the contractual parties are unable to commit to their obligations have been labelled as situations of *limited commitment*.** Estache and Wren-Lewis (2008) illustrate that this label can be used to encompass different possible situations. First, with “limited enforcement,” the firm may renege on the contract during its execution, even if the government disagrees. Conversely, in a second situation, referred to as “non-commitment,” the government may renege on the contract, even if this is detrimental for the firm. Then, there is also a third situation, referred to as “commitment and renegotiation,” in which the parties commit to their obligations but, if they both wish so, the contract can be renegotiated at a later stage.²⁶

Examples of PPP projects, in which the firm reneges on the contract during its execution and attempts to reach a more favourable deal, are pervasive worldwide, and illustrated in Sect. 6.1. In institutionally weak contexts, such as in many developing countries, the rule of law often can be circumvented. Thus, contract renegeing and, possibly, renegotiation is a likely consequence. For instance in Ghana, the current monopoly enterprise for fixed telephony entered the mobile business, despite being explicitly prohibited. In Tanzania, the regulator failed to enforce regional mobile licenses and the dominant operator began to expand at the national level (Estache and Wren-Lewis 2008). A large fraction of infrastructure

weakened. Note, however, that not only the attitude to risk of the firm but also that of the government is relevant. With *ex-ante* contracting, a risk-averse government may want to rely on a *sell-out* contract, under which the firm makes a payment up-front in order to have the right to produce. Thus, the government obtains a fixed payoff, regardless of the state of nature. This insurance may be interesting for small local governments, for which the project represents a significant share of the budget. Outside investors may be better diversified and, hence, they may be prone to insure small governments that privatize crucial infrastructures and services for insurance reasons (see Martimort 2006).

²⁶In this case, the contract is bound to be efficient *ex post*.

renegotiations in Latin America are found to occur at the initiative of the firm.²⁷ Though more rarely, firms renege on contracts also in advanced economies. In principle, in the latter, institutions are more solid and, hence, contracts are more easily enforced. For instance, a firm that refuses to produce can be fined heavily. Nonetheless, very often, governments prove reluctant to engage in litigation, which can be costly and time-consuming. As an illustration, in France, a progressive increase has been detected in the subsidies awarded to urban transport concessionaires (Gagnepain et al. 2013).

There are (at least) two other reasons why governments may accommodate firms' requests. **The first set relates to "electoral" concerns.** When high-profile projects, generating much media attention, are at stake, and/or projects involving critical infrastructure and services that are essential for the population, governments may be afraid of a severe backlash, if the contractual relationship with the initial partner breaks up, and the project completion is delayed until after a new agreement is achieved, starting from scratch, with another partner. In those cases, the threat of imposing sanctions on reticent firms is, in fact, not credible. Governments end up being stuck in the partnership, and keep increasing the contractual terms as appears to have happened in some cases in India.

Corruption and rent-seeking are important as well. Politicians/bureaucrats may be ready to accept bribes from firms, together with other kinds of present or future benefits (such as, the promise of career promises for friends and relatives), in exchange for a favourable revision of the contractual conditions. In infrastructure projects, corruption may also take the form of softer *ex-post* price regulation, which allows both firms (through larger profits) and officials (through rent-seeking) to benefit at consumers' expense. Focusing on this form of corruption, Martimort and Straub (2008) show that reliance on a private firm may open the door to more corruption, as compared to public provision. This occurs, when the shadow cost of public funds, to be borne by taxpayers as long as a public firm receives subsidies out of the state budget to provide the service, is low, relative to the distortion that the price raise induces, to the detriment of consumers, when a private firm is delegated the activity. This would hold even if the taxation systems are largely inefficient, if officials and bureaucrats are corrupted at various levels in the governmental hierarchy, and are biased towards and/or influenced by the private sector. In general, countries with multi-level governments are especially prone to corruption phenomena. In many cases, this reflects a weak and opaque institutional framework especially at the sub-national level, poor information on comparable local information and term limits that reduce electoral discipline. Capture and lack of transparency are far from negligible issues, as in an increasing number of

²⁷For examples in Latin America and the Caribbean regions, see Guasch (2004) and Guasch et al. (2006), (2008).

countries, regional and local governments are responsible for a large part of the total national capital investment.²⁸

While it is expected that firms will renege on contracts, in fact, it is equally plausible that the concerned governments will lack the desire or ability to commit to contractual obligations. In developing countries, governmental failure to honour contractual terms is even more serious a concern than the firm's failure. This is because, as Estache and Wren-Lewis (2008) stress, **the governments' inability to secure investors' remuneration may discourage large-scale investments, which are desperately needed in those countries, especially in utility sectors** (see also Banerjee et al. 2006). Political risk heavily challenges public-private contracting also in transition economies, such as those in Central and Eastern Europe. For instance, in Hungary, transportation projects have been delayed by the repeated changes in political attitude towards PPPs (Brench et al. 2005).

In environments characterized by limited commitment, the obvious reason under which either the firm or the government might renege on the stipulated contract is that this may allow for a higher payoff than would be attained if the contract were honoured. At the initiative of one or the other party, a new negotiation can take place and can be successful or not. If renegotiation succeeds, then the partnership continues under a new deal. Otherwise, the partnership breaks up. In that case, the project is abandoned. Alternatively, another firm may be required to bring it to completion.

Incentives to renege on the contract arise very naturally in the environments that we have been considering along our discussion. To see why, recall that, if willing to solve information problems, the government needs to design a compensation scheme under which the firm, while breaking even *ex ante*, is "rewarded" when the state of nature comes out to be favourable, and "punished" otherwise. Consequently, one possibility is that, once the true state is observed by the firm and correctly revealed to the government, the firm is unlikely to be happy if the operating conditions are actually bad because, in that case, it receives the low compensation stipulated in the contract. Another possibility is that the government is unhappy if the operating conditions are good because, in that case, it owes to the firm the high compensation that the contract prescribes. This suggests that, while offering an **incentive-compatible scheme is helpful to tackle information problems *ex ante*, this is less safe as a strategy *ex post***. It may well cause enforcement difficulties.

²⁸Allain-Dupré (2011) reports that, in OECD countries, sub-national governments are in charge of nearly half of total capital expenditures. The reason is that regions and municipalities are considered to "better spend," *i.e.*, to identify the most appropriate paths for promoting the territorial development and competitiveness (Charbit 2011). It is thus clear that sub-national governments play a core role in public investment. Although the general strategies are designed at the national level, the implementation and completion of investment projects and the subsequent management of the activity depend crucially on the regional and local levels. For instance, even in federal countries like Germany, local governments provide utilities and manage local infrastructure, and have a claim to state funding, up to a level that is sufficient for a correct functioning (Fink and Stratmann 2011).

Two core points are worth making. First, the incentive issues that arise on the firm's side, because of the information advantage that it enjoys *vis-à-vis* the government, do not exhaust the list of incentive issues that potentially challenge the overall performance of PPPs. For a proper arrangement to be set up, it is essential to take into account another important temptation—namely, to stop abiding by the obligations during the execution of the contract. Remarkably, this temptation concerns not only the firm but also the government. Therefore, for PPP arrangements to be successful, it might be (and, in general, is) necessary to find ways to incentivize *both* partners to take a virtuous behaviour.

Second, the contractual payoffs of the two partners underline how difficult it is to have the contract honoured. In fact, **whether enforcement is problematic depends on what is at stake for each of the partners** in the renegotiation process (if any). Thus incentives to renege may appear even in the absence of information concerns, which induce the government to differentiate the firm's compensation across possible states of nature.

Thus, a clear strategy is needed, together with a set of instruments to prevent the two partners from behaving opportunistically. This requires, to begin with, a full understanding of how a hypothetical renegotiation process might unfold and what each party could lose and gain as a consequence.

6.3.1 How to Secure Contract Enforcement

Finding a way to ensure that the contract is enforced even in environments in which the partners are unable to commit is an intriguing challenge. The appropriate recipe finely depends on the particular context to which it is tailored and, hence, on the issues that are to be addressed specifically.

With regard to environments that display the characteristics previously described, *i.e.*, ***ex-ante* contracting and information issues on the firm's side**, Danau and Vinella (2014) suggest a strategy to tackle enforcement problems, which rests on a **proper choice of the financial structure of the PPP project**. We now briefly describe the recommendations that are drawn from their analysis.

First, in order to induce the firm to honour the contract, it must be required to invest a sufficiently significant amount of money up-front, and it must be allowed to recover that investment “as time goes by” during the implementation period. As the firm is aware that break-up of the partnership would impede recovery of the initial investment, it will have an incentive to preserve the relationship with the government. Of course, this involves that the private partner must be wealthy enough to be able to provide as large a contribution as necessary to motivate it to honour the contract. The bottom line is that, to be admitted to participate in the partnerships, private firms must be well endowed to begin with. This should deter the speculative and likely volatile investors.

Second, the firm's own investment should be complemented with the injection of some external/debt capital, regardless of whether this is truly

necessary to complete the investment. In other words, even a very wealthy firm, which could finance the investment entirely, should be instructed to take out a loan. This may look counterintuitive. In fact, it is explained by considering that **debt finance can play a strategic role.** Danau and Vinella (2014) show how the outcome can be attained. Specifically, the government should provide guarantees for the debt of the firm. It should be stipulated, in addition, that the guarantees will operate *conditionally* on the partnership continuing under either the initial contract or a new deal. However, the magnitude of the guarantees are not necessarily equal in the two cases. The guarantees provided for the hypothetical new deal should be made large enough to eliminate any benefit that the firm and the government could obtain by renegotiating. As a result, renegotiation would not be in the partners' interests. Then, break-up of the partnership would represent the only alternative to honouring the contract that the partners would be ready to consider. As far as the firm is concerned, we know that this option is not appealing, provided that the firm is required to put enough money on the table at the outset of the project. Thus, the only remaining concern is to find a way to make the option equally unattractive for the government.

As Danau and Vinella (2014) show, **the government may be tempted to terminate the partnership when the private investment is large and, hence, there is much to appropriate,** if the relationship breaks up. The gain would include not only the firm's investment but also the external capital, which is not covered by the governmental guarantees when the PPP is terminated prematurely. Of course, the government trades off the expropriation gain against any cost that the interruption of the partnership would generate.

A cost would come naturally, for the government, in the form of a loss of reputation and/or credibility. Reasonably enough, this may follow from the government not being sufficiently authoritative to have the contract honoured by the private firm, despite the fact that the latter invested in the project up-front (Guasch et al. 2006). It may also follow from the inability of the government itself to keep promises *vis-à-vis*, *in primis*, the private financiers involved in the project and, additionally, other potential investors, customers, and voters (Irwin 2007). It is, thus, clear that, in order to incentivize the government to honour the contract, the gain must be made small, relative to the costs associated with the failure of the partnership.

This leads to the third ingredient of the Danau-Vinella recipe. **That is, the private liabilities should be contained to a sufficiently small size.** In addition to requiring that the firm not invest too much in the project, regardless of its wealth, this requires that the firm not rely on debt massively, even if it has unlimited access to the credit market. In other words, PPP projects that are to be efficiently run and should not be excessively leveraged (see Danau and Vinella 2014).

In sum, the financial structure of the project, and, in particular, the exact mix of private and public funds (i.e., own funds of the firm, funds provided by external sponsors and, possibly, governmental transfers) to be used to cover the investment, becomes the instrument for boosting commitment to contractual obligations and, hence, to promote contract enforcement.

6.3.2 *A Few Examples of PPP Failures*

To illustrate the relevance of the various aspects discussed and the policy recommendations previously described, **we provide a few examples of PPP arrangements that failed to achieve the desired outcomes.** The list is far from exhaustive and, yet, these stories appear instructive.

The first example is interesting in that it shows how pressed governments are to bail out projects which are especially important from a social perspective. Consequently they have to support banks when such projects become financially distressed, and in some cases can generate significant macroeconomic problems (e.g., excess building in Spain recently and road building in Mexico in the 1990s).

The second and the third examples illustrate how vulnerable projects are to renegotiation and default, respectively, when they are excessively leveraged and when debt obligations are supported by unconditional governmental guarantees.²⁹ Especially in cases where there is limited local government accountability, or own source revenues, there can be little accountability (Ambrosanio and Bordignon 2006).

6.3.2.1 **The 1990s Mexico Road Building Project**

Between 1989 and 1994, Mexico embarked on an ambitious road-building program. More than fifty concessions were awarded for 5500 km of toll roads. **The concessions were highly leveraged. Debt financing for the projects was on a floating-rate basis and provided by local banks.** Many such banks were owned by sub-national governments and faced pressure to lend money to concessionaires. Since the local governments had no own source revenues, they could not compensate the concessionaires, who ceased to repay the banks. In fact, because traffic volumes came out to be lower than forecasted and interest rates rose over time, the banking system absorbed a considerable increase in liabilities.

Although there were no explicit federal government guarantees, the failure of the projects exacerbated a banking crisis. Eventually, the government needed to restructure the entire toll road program, and it bailed out the concessions, taking over twenty-five of them, and assuming US\$7.7 billion in debt (Ehrhardt and Irwin 2004).

²⁹For further examples, see, for instance, the Reference Guide on PPPs published by the World Bank in 2012.

6.3.2.2 Victoria Trams and Trains

The State Government of Victoria, in 1999, awarded five franchises (which are similar to concessions) for operation of trams and commuter rail in Melbourne, as well as regional trains in the State of Victoria. According to the government's estimation, this would lead to total savings of A\$1.8 billion over the life of the contract. However, the total equity contribution from the sponsors was only A\$135 million, or only 8% of the total gains.

The payment structure of the PPP relied heavily on the expected growth in patronage and reduction in costs. In fact, the growth and cost reductions were not realized. Consequently, the franchisees experienced losses. Because the project was highly leveraged and the equity at stake relatively low, the operators had little to lose in quitting the projects. For this reason, they could credibly threaten the government to walk away from the franchises rather than to endure the losses, or striving for improvements. This weakened the position of the government *vis-à-vis* the existing operators. Eventually, the government was induced to renegotiate the contractual terms with those operators (Ehrhardt and Irwin 2004).

6.3.2.3 The London Underground Project

Even in developed countries, the central government can foot the bill in case of a default at the local level, without actually having been involved in a PPP. In 2002–3, Greater London Council launched a project for maintaining and upgrading the London underground. The public sector was uncertain whether Metronet, the consortium responsible for the realization of the project, could borrow enough funds to cover the investment. To motivate the banks to lend money to Metronet, **Transport for London, a local government body, guaranteed 95% of Metronet's debt obligations.** Eventually, the consortium failed and the partnership broke up. In spite of this, the guarantee came into force because it had been provided without specifying any condition and, hence, regardless of the continuation of the partnership.

Eventually, the tab was passed to the central Department for Transport, which had to make a £1.7 billion payment to help Transport for London meet the guarantee (House of Lords 2010). The debt risk was transferred to taxpayers, who incurred a direct loss of between £170 million and £410 million (National Audit Office 2008-9).

6.3.3 *Some Policy Implications*

6.3.3.1 **The Need for Reliable Third Parties and the Separation of Powers**

For a government with a limited ability to commit to contractual obligations, it is difficult (and, perhaps, impossible) to provide credible guarantees to the firm's financiers. This opens up a more institutional perspective on the enforceability of PPP contractual arrangements and, hence, on the attainment of desirable outcomes in PPP projects.

If the partners' interests in renegotiating the contract are to be eliminated, **it is essential that the project be partially financed with external funds, and that debt finance be employed strategically.** Danau and Vinella (2014) however argue that a credible third party should be involved, which is able to pursue its commitments, under whose aegis external sponsors can be involved and receive guarantees for their credits.

One could also think of creating some ad hoc institution, which should perform the specific task of acting as an "external guarantor" in the enforcement of PPP contracts in institutional environments where the partners (and, in particular, the government) fail to commit to their contractual obligations. This possibility implicitly calls for an appropriate separation of powers and specialization of tasks at the institutional level.

One option would be the suggestion by Bhattacharya et al. (2012), who argue for the creation of a new development bank, specifically dedicated to promote infrastructure and sustainable development as well as to deliver the technical assistance capacity in the selection, management, and funding of infrastructure projects, which is particularly needed in developing countries. The existing development banks, including the World Bank and the regional development banks, are also increasing their focus and financing on the question of public investment gaps. This issue is taken up further in Sect. 6.3.

6.4 **Some Policy Design Issues and Case for Multilateral Risk Mitigation**

In this paper, **we have emphasized the need to involve private sector in investments to ease the national fiscal constraints and to enhance efficiency in provision of key services.** Incentive problems arise given the asymmetric information concerning risks. This is exacerbated by the limited information on projects and on buildup of liabilities at the relevant level of government (affecting credibility of government contracts). Standardized information such as using the IMF's GFSM standard is critical for recording and reporting liabilities on an accrual basis over the medium-term. The limitation of information leads to a potential for renegotiation in

favor of firms, with high risk projects together with a potential for rent-seeking, even though there are likely to be sectoral variations.

The lack of credible and complete time series at the local level is a critical concern for performing cross-country fiscal analysis, affecting potential for enhanced long-term cross-border investments. Addressing these gaps requires not only a technical framework for data collection but also political-economy mechanisms through which local authorities might be willing to generate and share consistent information.

6.4.1 Tightening the Definitions of PPP Liabilities

As a result of the difficulties above, the International Accounting Standards Board (2011) has issued a new set of guidelines (IPSAS 32)³⁰ that force an upfront accounting for PPPs, and would significantly affect deficits and recognition of liabilities for general government—i.e., for both central and sub-central governments and related agencies. This ensures that the operator is effectively compensated for services rendered during the period of the concession period. It requires the government or granting public agency to recognize assets and liabilities in their financial statements, when the following are met:

- The government or granting public agency controls or regulates the services to be provided, the target beneficiaries or the price; and
- If the grantor controls through ownership, beneficial entitlement or otherwise, a significant residual interest in the asset at the end of the arrangement.

This avoids the situation where neither the public nor private partner recognizes the asset/liability at the end of the period. Of course, as has been seen in Ireland and Spain recently (and with Mexican road in the early 1990s), even if there are no explicit guarantees by the federal or state governments and there is sufficient pressure on the banking system, it is likely that the central government will assume a significant portion of the liabilities.

The implications are that

1. **The annual budgets for each level of government must be cast in a medium-term framework; and**
2. **It is essential to undertake a full and careful evaluation of assets and liabilities and associated accounting and reporting of risks with a sufficiently long time horizon** (using international standards for budgeting and tracking liabilities, such as the GFSM 2001, which also provides consistency with the System of National Accounts).

³⁰See IASB (2011), IPSAS 32. This standard is also likely to affect the guidelines of Eurostat that are not so tightly defined.

6.4.1.1 Importance of Contract Guarantees and Technical Assistance —Role for Multilateral Agencies

Overall, the role of a new development bank or the existing multilateral banks would span measures at the national and international levels, ranging from financial and risk mitigating aspects, as well as the provision of technical advice.

- At the **national** level, the concerned bank would provide national authorities **with technical assistance**, helping them quantify their knowledge of the country-specific factors, which are relevant for the selection, development, and management of projects displaying the highest social returns. In addition, it would enhance institutional credibility, synergies and complementarities, **fostering commitments and risk mitigation** both in the relationships between public and private sectors and in the relationships between different governmental tiers, as far as multi-level governance contexts are concerned.
- At the **international** level, it would provide **financial assistance, pledging guarantees** and **sharing the best international practices for project evaluation and risk assessment**, the most suitable instruments for risk mitigation/insurance, and the most innovative finance techniques.

In Europe, initiatives of this kind have already been undertaken, some at the country level, others at the EU level, with both technical and financial purposes. At the country level, the most important example is found, perhaps, in the UK, where the creation of **Infrastructure UK (IUK)** was announced in the 2009 Pre-Budget Report. This agency is tasked with advising the government on strategic long-term infrastructure planning, prioritization, financing, and delivery across sectors, ranging from energy and waste to water, telecommunications and transport. It was established that, to pursue these objectives, IUK would bring together, under the Treasury umbrella, the program and project delivery capability of Partnerships UK (PUK), the lending capability of the Treasury Infrastructure Finance Unit (TIFU), and the policy development capability of the Treasury PPP policy team (see World Bank Institute 2012). **This rich bulk of institutional and technical expertise reflects how complex it is to ensure that only valuable infrastructure projects are undertaken and that the risks specifically involved are properly assessed and efficiently shared between the public and the private sector so that each such project is well-structured and technically and financially viable.**³¹

³¹In Italy, under the 2002 Stability Law, ISpa was created with the task of involving the private sector in the construction and management of important infrastructures, requiring significant long-run investments. However, being an off-budget agency, ISpa serves an important budgetary purpose as well. It can issue state-guaranteed bonds to raise capital for the new infrastructure projects, while allowing the government to comply with the European Stability and Growth Pact. See, for instance, Maskin and Tirole (2008) on the practice, often adopted by governments, to push debt finance off their own books to quasi-public agencies not consolidated in the national budgets.

At the EU level, as previously illustrated, the **European Investment Bank, under the aegis of the European Commission, has launched the CEF programme** to promote new forms of private financing, including the participation of pension/mutual funds and insurance companies, as well as the issuance of project bonds. Arguably, involving institutional funds would be even more useful in emerging economies as their financial systems are essentially bank-based, and their financial markets are still small relative to the size of their economies (Schwartz et al. 2014). Over time, the support of the development bank would stimulate those markets to grow and consolidate, paving the way for the use of more sophisticated financial instruments, such as project bonds.

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