



PRIVATE FINANCING AND GOVERNMENT SUPPORT TO PROMOTE LONG-TERM INVESTMENTS IN INFRASTRUCTURE

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This revised report presents an overview of the main types of government (i.e. public) and market (i.e. private) based instruments and incentives able to boost the mobilisation of financial resources to long-term investment. The focus is on public assistance to private investors in infrastructure and on the development of new instruments and techniques that financial markets have developed in response to the recent financial and sovereign debt crisis. The report outlines the typical characteristics of infrastructure as an alternative asset class for private investors and focuses on the riskiness of infrastructure projects from a financial investor's standpoint. When an acceptable risk/return profile cannot be reached, some form of public intervention is needed to leverage private capital intervention. This public intervention refers obviously, but is not limited to, the provision of financial back up and support that can take many alternative forms.

TABLE OF CONTENTS

PRIVATE FINANCING AND GOVERNMENT SUPPORT TO PROMOTE LONG TERM INVESTMENTS IN INFRASTRUCTURE.....	5
EXECUTIVE SUMMARY	5
1. Introduction.....	6
2. Project Finance, PPPs, infrastructure financing and investing	8
2.1 Public Private Partnerships (PPPs).....	11
2.2. The risk profile in infrastructure projects.....	14
3. Infrastructure and private investors.....	18
3.1 Recent trends in infrastructure investing.....	20
3.2 Barriers to private investment in infrastructure.....	35
3.3 The role of the public sector in subsidising private intervention in infrastructure and Instruments and incentives for stimulating the financing of Infrastructure	38
Conclusions.....	40
APPENDIX 1: MAIN PPP CONTRACTUAL SCHEMES	42
APPENDIX 2: EXAMPLES OF INTERVENTION OF NATIONAL DEVELOPMENT BANKS	44
APPENDIX 3: EXAMPLES OF INTERVENTION OF NATIONAL DEVELOPMENT BANKS	45
REFERENCES	46
Tables	
Table 1. A taxonomy of infrastructures.....	8
Table 2. Typical characteristics of infrastructure investments	19
Table 3. Project Finance Collateralised debt Obligations launched between 1998 and 2007	33
Figures	
Figure 1. The Contractual Structure of a Project Finance Deal	9
Figure 2. Different alternatives available to public administration to procure goods and services	12
Figure 3. Cash Flow Behaviour during the Infrastructure Life Cycle	15
Figure 4. A possible map of risk allocation mechanisms in infrastructure investments	17
Figure 5. Global Infrastructure Fundraising	22
Figure 6. Amount and % composition of alternative investments by Top 100 Alternative Investments Asset managers Worldwide	23
Figure 7. Direct Sovereign Wealth Funds' Investment Activity (2005-2012) Data in \$ billion	24
Figure 8. Trends of Project Finance Loans and Bonds (2007-2013)	25
Figure 9. Trends of Project Finance Loans - Breakdown by geographical areas (2007-2013).....	26
Figure 10. Trends of project Finance Bonds - Breakdown by geographical areas (2007-2013)	28
Figure 11. Trends of Project Finance Bonds - Breakdown by sector (2007-2013)	29
Figure 12. European Securitisation Issuance - Retained and placed deals (2002-2012)	33
Boxes	
Box 1. Recent Examples of Bond Issues in Developing Countries	27

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EXECUTIVE SUMMARY*

The focus of this report is the analysis of the main types of government (i.e. public) and market (i.e. private) based instruments and incentives able to boost the mobilisation of financial resources to long-term investment. The report presents an overview of the different types of public assistance to private investors in infrastructure and of the new instruments and techniques that financial markets have developed in response to the recent financial and sovereign debt crisis.

Infrastructure can become an alternative asset class for private investors provided that an acceptable risk/return profile is offered. The private sector is able to internalize and manage some risk components, other risk will need to be supported by public intervention in several alternative forms.

The recent financial crisis and the spillover of the crisis to sovereign debt, the reforms of capital requirements for banks and insurance companies and increased levels of market uncertainty have strongly reduced the availability of public and private capital for infrastructure development in spite of the need to revamp long-term investments worldwide. The infrastructure gap is relevant globally; yet, the capital available to fill in the gap seems not enough.

If traditional public procurement and public spending for infrastructure seem unfeasible in the medium to long term for reasons of inefficiency, resources misallocation and budgetary constraints, then the problem becomes how to create institutional and market conditions able to attract private capital to a greater extent and from investors other than the more traditional bank lenders and industrial developers.

Data indicate the existence of a large funding potential among (traditional, i.e. banks and non-traditional, i.e. other institutional investors) financiers available for infrastructure investments and the willingness especially of long-term investors like insurance companies and pension funds to allocate more resources to this alternative asset class. However, barriers to investments still exist.

From a policymaker's point of view, this paper poses three trade-offs. The first is to strike a proper balance between protective versus restrictive regulations, meaning a balance between financial stability and the abundance of capital governments are looking for to boost infrastructure investments. The second is the need to find a better balance of the share of returns between the public and private sectors in PPP operations. This means to find an equilibrium between public assistance to private investors and affordability issues/value for money in order to avoid excessive risk taking from the public sector and subsequent moral hazard from the private sector. The final aspect to be solved is the trade-off between providing a stable macro political, investment environment vs. providing financial incentives for deals. The current debate has for the most part focused on the second variable. Much more attention should be devoted to more general "rules of the game"/quality of institutions issues.

* This revised report was prepared by Stefano Gatti, Director of the BSc in International Economics and Finance (BIEF) and Associate Professor of Banking and Finance at Bocconi University, Italy. This paper was revised after comments received from the G20/OECD Task Force on institutional investors and long term financing and from the following OECD bodies: the Committee on Financial Markets, the Insurance and Private Pension Committee and the Working Party on Private Pensions, the views contained herein may not necessarily reflect those of the G20 and OECD Members. This research is part of the OECD long-term investment project (www.oecd.org/finance/lti).

1. Introduction

It is well known that global infrastructure needs are a key issue in most developed and developing countries. There is then an urgent need to fill in the infrastructure gap. Data provided by different sources agree on the overall amount of money needed for this purpose. For example, the OECD and McKinsey quantify the total global infrastructure investment requirements by 2030 for transport, electricity generation, transmission and distribution, water and telecommunications in about \$57-67tn and \$71tn¹ respectively. The European Commission estimates that, by 2020, Europe will need between €1.5tn and €2tn of infrastructure investments.²

In the USA, a recent report prepared by the Society of Civil Engineers³ estimates a total current gap of \$1.7tn, with an additional \$3.6tn financial need by the end of 2020.

The situation, however, is similar in developing countries. Data indicate that from 2008 to 2017, infrastructure spending is expected to remain very high, \$9tn in China, \$2.7tn in India, \$2tn in Russia and \$1tn in Brazil. A study of the Asian Development Bank⁴ points out that to sustain and implement the development of the Asian macro region, the funding need is approximately \$8 trillion.

Traditionally, infrastructure investments have been financed with public funds. The public sector was the main actor in this field, given the typical nature of public goods and the positive externalities generated by such investments. However, public deficits, increased public debt to GDP ratios and, sometimes, the inability of the public sector to deliver efficient investment spending and misallocations of resources due to political interferences have led to a strong reduction of public capital committed to such investments. As a result of this increasing public capital shortage, in the past few years, the funding of infrastructure investment in projects characterised by high specificity, low re-deployable value and high intensity of capital has increasingly taken the form of project finance. This technique has later emerged to be the financial solution also for infrastructure involving public entities in the role of either regulator or counterparty (see Section 2). Project finance has proved to be the most suitable financial technique able to attract private capital for infrastructure investments. On the equity side, the bulk of financing has been provided by corporate sponsors and developers. On the debt side, the prominent role has been played by bank syndicated loans. Looking back, before mid-2000, the market for equity other than funds provided by project sponsors was almost inexistent. On the debt side, project bonds were used, albeit not to a large extent, but they almost disappeared after 2008 due to the series of downgrades suffered by the Monoline insurers that before the demise of Lehman Brothers provided credit insurance to these capital markets debt instruments. The collapse of the Monoline insurers has had the effect to reduce the potential amount of funds that institutional investors could have committed to infrastructure investments.

The massive liquidity injections that Central Banks have carried out between 2009 and 2012 in response to the Lehman Brothers and European sovereign debt crises have led to a compression of the yields of debt capital market instruments. The search for yields by institutional investors has found a possible solution in the investment in alternative asset classes like infrastructure (see Section 3.1). In this

¹ OECD (2007), Infrastructure to 2030: Main findings and policy recommendations; McKinsey Global Institute, Infrastructure Productivity. How to save \$1 trillion a year, January 2013.

² European Commission (2011), Stakeholder Consultation Paper, Commission Staff Working Paper, on the Europe 2020 Project Bond Initiative, February. European Union (2013), Regulation (Eu) No 1316/2013 Of The European Parliament And Of The Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010

³ American Society of Civil Engineers (2013), 2013 Report Card of America's Infrastructure, March.

⁴ Asian Development Bank and Asian Development Banking Institute, (2009), Infrastructure for a seamless Asia.

sense, the financial markets have proven to be able to generate new tools to enable institutional investors, who are traditionally unfamiliar with this asset class, to convey money to infrastructure. Data indicate that the development of the market of equity investors interested in infrastructure is promising and that the creation of a liquid market for project bonds can be a good solution to complement syndicated loans for project finance. However, it is not only a matter of financial instruments and ability of capital markets to invent new financing solutions. Infrastructures are very complex projects, characterised by risks inherent to the initiative but also to the regulatory and institutional setting of every country, in particular if the public sector is heavily involved in the project. The risk implied by political instability and interference of political pressures on the regulatory schemes of some sectors where infrastructure is developed and managed is clearly outside the control of the private sector. It is not credible to set up alternative financial instruments if, as a preliminary and essential prerequisite, governments do not reform the rules of the game to attract private capital.⁵ Clear and stable regulation, efficient procurement procedures, support to projects in terms of certainty of timing. More than financial support, which is necessary only for social infrastructure, investors look at these fundamental conditions when deciding in which jurisdiction to direct their available resources.⁶

This report presents an in-depth overview of the main types of government (i.e. public) and market (i.e. private) based instruments and incentives able to boost the mobilisation of financial resources to long-term investment. Inevitably, any analysis of the public intervention aimed at increasing private participation in infrastructure financing partially overlaps with the corresponding analysis of new instruments and tools that financial markets are developing to attract capital from traditional and non-traditional institutional investors with potentially longer-term orientation (life insurance companies, pension funds, sovereign wealth funds, foundations). In this sense, the report outlines the typical characteristics of infrastructure as an alternative asset class for private investors and focuses on the riskiness of infrastructure projects from a financial investor's standpoint. When an acceptable risk/return profile cannot be reached, some form of public intervention is needed to leverage private capital intervention. This public intervention refers obviously, but is not limited to, provision of financial back up and support that can take many alternative forms.

The rest of the report is organised as follow. Section 2 analyses how infrastructure are financed by private investors with project finance techniques, how the public sector can attract private capital in the form of a Public Private Partnership (PPP) and the typical risk profile of an infrastructure from the private investor's standpoint. Section 3 presents an overview of the recent trends of infrastructure investing in the forms of equity, debt and capital markets instruments. After a discussion of the characteristics of infrastructure that makes it an interesting asset class for investors, we analyse the evolution of the market of equity instruments. More precisely, we focus on the recent involvement of institutional investors (asset managers, pension funds, insurance companies and state-linked investors like Sovereign Wealth Funds (SWFs) in equity financing of infrastructure and provide data about the evolution of the market. Then, Section 3 shifts the focus on debt capital market instruments, particularly on project bonds. Moreover, empirical evidence on new debt instruments – partnerships/co-investment agreements, securitization of infrastructure assets and debt funds/direct origination of loans by institutional investors – is provided to illustrate how the market for debt instruments is potentially able to capture a broader number of investors

⁵ *"I think Governments have to be focused on trying to reduce the idiosyncratic risk by the nature of the concessions and the nature of the regulatory environment as much as they can [...] The question is: Can you, in your jurisdiction, compete for that capital effectively by reducing that idiosyncratic risk?"* – Marc Wiseman, President and CEO of the Canada Pension Plan Investment Board.

⁶ Hammami, M., J.-F. Ruhashyankiko and E.B. Yehoue, (2006), Determinants of Public-Private Partnerships in Infrastructure, Washington, International Monetary Fund, Working Paper 06/99. Gatti, S., S. Kleimeier and M. Percoco (2010), Public-Private Partnerships (PPPs) - Contractual schemes, project financing and institutional characteristics, SDA Bocconi School of Management, internal research report.

than simply the banks operating in the syndicated loans market. Section 3 includes an analysis of the existing barriers to private capital investments and the role that the public sector can play in subsidising private intervention in infrastructure. The final Section presents a summary and guidelines for policy makers.

2. Project Finance, PPPs, infrastructure financing and investing

Infrastructure is a term that includes a large number of projects, from physical capital like power generation and transmission, water and sewerage, transportation and telecom, to social infrastructure like hospitals, schools, social housing and prisons (see table 1 for a possible taxonomy of infrastructure).

Table 1. A taxonomy of infrastructures

Sectors	Examples
Power and energy	Energy productions, power distribution
Water and sewerage	Plants for management of the water cycle
Telecom	Satellite communication networks
Transportation	Highways, tunnels, bridges, light rails, ports/harbours, airports
Social infrastructures	Social Housing, Hospitals, prisons, schools

Traditionally, the intervention of private capital in infrastructure financing has been based on project finance techniques. The public sector can be involved in this financial package in a number of roles and with different functions (see Section 2.1), but the principles of risk analysis and risk management from the point of view of the private sector remain unchanged.

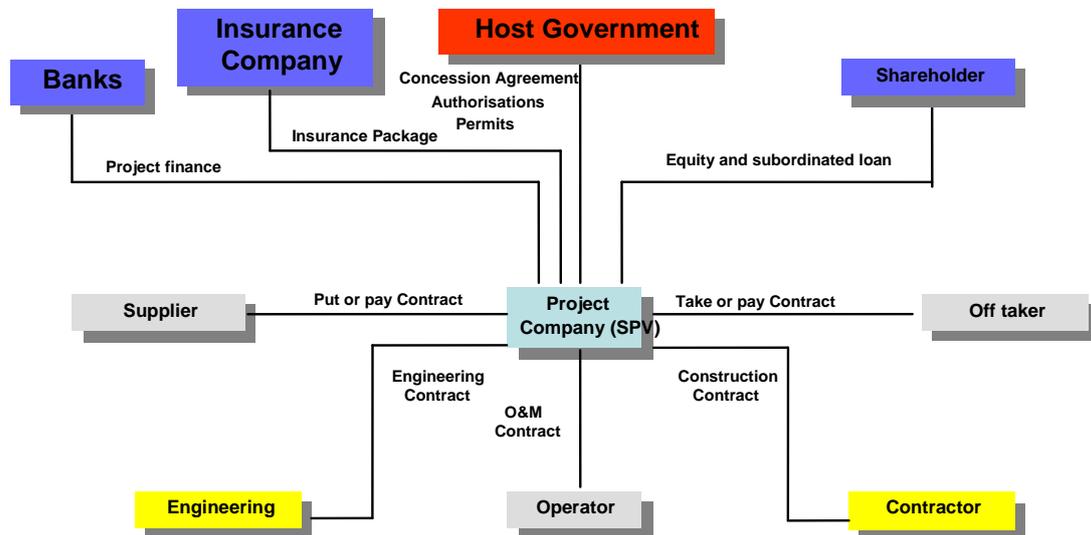
Understanding how private investors approach infrastructure investing requires a preliminary analysis of contractual structures used in private project finance and public-private partnerships (PPPs).

Investing in infrastructure is essentially a problem of risk analysis and risk mitigation. The analysis of how these techniques work in standard market practice is essential to present, later in the report, how financial markets have evolved in response to an increased demand for infrastructure investment by institutional investors.

In a standard project finance deal, the shareholders of the infrastructure set up a project company as a Special Purpose Vehicle (SPV) that becomes the centre of a complex network of contracts⁷. An example is provided in Figure 1.

⁷ Bonetti, Veronica, Stefano Caselli and Stefano Gatti, 2010 Offtaking agreements and how they impact the cost of funding for project finance deals: A clinical case study of the Quezon Power Ltd Co., *Review of Financial Economics*, 9, 60-71. Dailami Mansoor and Robert Hauswald (2007). Credit spread determinants and interlocking contracts: A study of the Ras Gas Project, *Journal of Financial Economics* 86, 248-278

Figure 1. The Contractual Structure of a Project Finance Deal



The reason why this network is set up is that, in most cases, the SPV is a “fictitious” company, created with the sole purpose to capture all the cash flows generated by a new venture. For this reason, everything that is needed in order to design, build, manage and finance the project must be purchased by third parties.

The upper part of Figure 1 shows the relation between the SPV, the host government and the parties that finance the Vehicle (banks – but also bondholders – and sponsor firms) or insurance coverage against risks.

The host government is the entity that can authorise the SPV to carry out the project with authorisations and permits. Frequently, the private sector is authorised to operate the business based on a long-term concession agreement as clarified in Section 2.1.⁸

Banks provide funds on a limited or no-recourse basis and take security on all project assets. It is common that banks provide more tranches of funding for the project, similarly to what happens in other structured finance transactions like LBOs or securitisation. The standard combination is the provision of a base facility for the financing of construction and start-up costs (including capitalised interests), of a value added tax (VAT) facility in countries where VAT is in place, of a stand-by facility covering financial needs once the base facility has been exhausted and finally a working capital facility for the day-by-day needs

⁸ Väilä Timo (2005). How Expensive Are Cost Savings? On The Economics of Public-Private Partnership, in EIB papers, vol. 10, n. 1, pp. 95-145.

once the construction has been completed⁹. In Section 3, we will see that the market for equity and debt instruments dedicated to infrastructure is changing and that these new products are increasingly attracting the interest of institutional investors.

Project sponsors provide equity to the SPV based on an equity contribution agreement. Frequently, the funds are not provided upfront for the whole amount but in proportion to the selected debt/equity ratio for the deal on a pro-rata basis. In addition to pure equity, project sponsors provide also subordinated loans to the vehicle with the goal to avoid a possible dividend trap, particularly in the first years of operations¹⁰.

Regarding insurance coverage, it is an important contractual risk mitigation tool on a par with the other key contracts depicted in the lower part of Figure 1. Banks require the coverage of some risks of the SPV as a pre-condition for their debt financing. The different insurance products available on the market are coordinated and linked to the project's contractual structure in order to protect the SPV against the risks that none of the counterparties involved are able to control and manage.

The lower part of Figure 1 shows the key nonfinancial contracts (NFCs) underpinning the deal¹¹. Numerous NFCs can be drafted in a project finance deal¹² but four are particularly important to the soundness of the venture. Construction contracts and engineering, procurement and construction (EPC) contracts are closed on a turnkey basis to make plant and equipment available to the SPV, usually at predefined prices, times of delivery, and standards of performance. These contractual features are useful to shift the construction risk from the SPV to the contractor¹³. Purchasing agreements stipulated with raw material suppliers guarantee input to the vehicle at predefined quantities, quality, and prices on a put-or-pay basis, meaning that the supplier unconditionally guarantees the needed input or pays liquidated damages to the vehicle. Selling agreements, often known as take-or-pay or off-taking agreements, enable the SPV to sell part or all of its output to a third party (off taker) that commits to buy unconditionally, again at predefined prices and for a given period of time. In this way, market risk is shifted to a third party. Operation and Maintenance (O&M) agreements are designed to provide the SPV with efficient and effective plant maintenance, compliant with predefined service-level agreements, so to avoid operational risk to the SPV.

It is important to note that in most project finance transactions, project sponsors are also contractual counterparties of the SPV. This is perfectly natural if we consider that the primary interest of sponsors is to appropriate the highest share of cash flows generated by the project. The combination of the shareholder role and contractual counterparty role avoids opportunistic behaviour of project sponsors and limit agency costs¹⁴.

⁹ Gatti Stefano (2012), *Project Finance in Theory and Practice*, Academic Press, 2012; Finnerty, John .D. 2007. *Project financing: asset-based financial engineering*, 2nd edition. John Wiley & Sons, New York

¹⁰ Yescombe E.R. (2002). *Principles of Project Finance*, Academic Press, Amsterdam

¹¹ Corielli F., Gatti S, Steffanoni A. (2010), "Risk Shifting through nonfinancial contracts. Effects on loan spreads and capital structure of project finance deals", *Journal of money, credit and banking*, vol. 42, No. 7, 2010.

¹² Esty, B.C., 2003. *The economic motivations for using project finance*. Working paper, Harvard Business School, Boston

¹³ Blanc-Brude, Frederic, Hugh Goldsmith and Timo Valila. 2006. *Ex ante construction costs in the European road sector: a comparison of public-private partnerships and traditional public procurement*, Economic and Financial Report EIB, 01/2006, Luxembourg

¹⁴ Brealey, Richard A. Ian A. Cooper and Michel A. Habib. 1996. *Using project finance to fund infrastructure investments*, in *Journal of Applied Corporate Finance* 9, 25-38

2.1 Public Private Partnerships (PPPs)

Most of the infrastructures included in Table 1 involve the presence of, or the relation with, public entities at the central or local level. In many cases, the public sector plays a regulatory role; in other cases it can also provide financial assistance to private sponsors and investors. Broadly speaking, in these cases project finance becomes a financing tool for a PPP that can be defined as whatever contractual arrangement where the private sector provides public services based on a pre-agreed risk and profit sharing with the public sector and where the public sector retains planning and control functions and can also provide backup financial support to private investors or become the counterparty of the private sector as a purchaser of the goods and/or services¹⁵. In this sense, a broad categorisation of PPPs divides them in *institutional PPPs*, where the public sector becomes the equity partner of a group of private developers, and *contractual PPPs* where the public sector simply retains a planning and regulatory role with or without intervention in the project as a purchaser of the services.

From the point of view of the private investors, their involvement into the domain of public goods can be imagined as a continuum shifting from full-public to full-private initiative. This shift is accompanied by:

1. A simultaneous increase in risks arising from the project and moved to the private sector;
2. The responsibility for provision of the financing, shifted from the public sector to the private counterparts;
3. The governance and control of the project performance, that moves to the private sector.

Risks can be classified in different ways, but it is useful to resort to a well-established classification in broad categories used by mandated lead arranging banks in project finance deals as clarified later in Section 2.2. Figure 2 provides a map of the different alternatives available to the public administration to procure goods and services. Figure 2 is based on broad categories while Appendix 1 reports the most common contractual schemes falling into the category of PPPs.

At one extreme, we find simple O&M services (the O&M, DB and TK schemes of Appendix 1) provided by the private sector where the ownership of the facilities remains to the public sector. Lease of public goods by private counterparties is a possible alternative (like in the Lease-Purchase scheme of Appendix 1). The only risk shifted to the private party is the operational risk, being the construction/investment and commercial risks retained by the public sector. Moving on the right-hand side of Figure 1, the private sector assumes more prominence in the design, construction and management of the project.

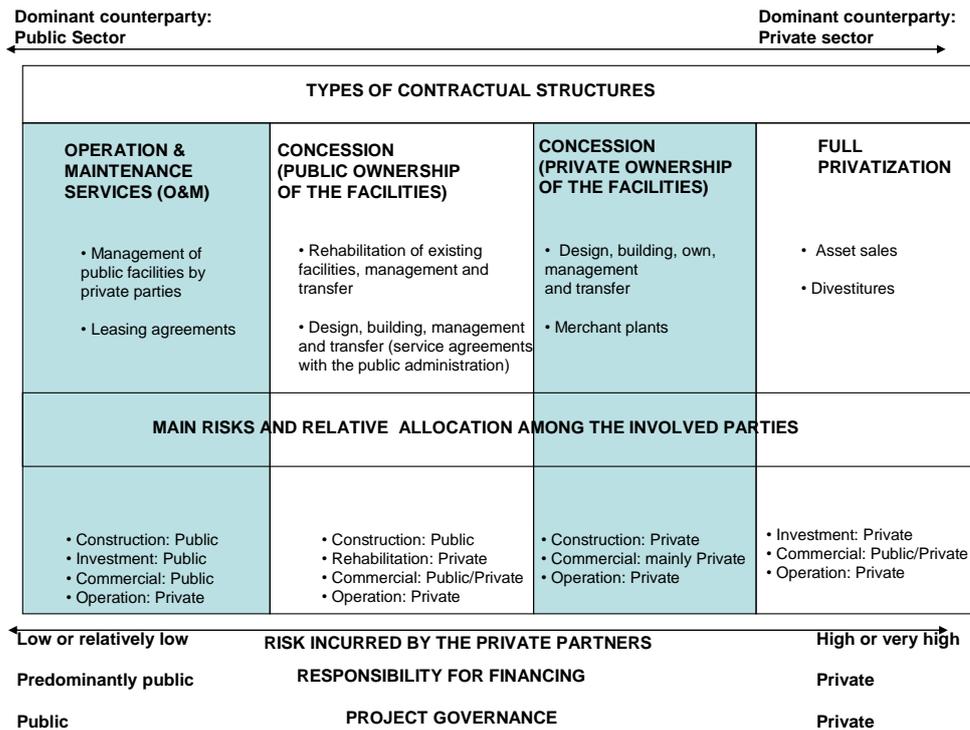
If the public sector retains ownership of the facility, private counterparties can:

1. Rehabilitate an existing facility, manage and transfer it (the Wraparound addition of Appendix 1). At least part of the construction risk is limited by the fact that the facility already exists.

¹⁵ Araújo, Sonia and Douglas Sutherland (2010), "Public-Private Partnerships and Investment in Infrastructure", OECD, Economics Department Working Papers, No. 803, OECD Publishing; OECD (2008), *Public-Private Partnerships: In Pursuit of Risk Sharing and Value for Money*, OECD, Paris; Van Ham H., Koppenjan J., *Building Public-Private Partnerships: assessing and managing risks in port development*, in "Public Management Review, vol.3 n.4, pp.593-616, 2001; Osborne S.P., *Public-Private Partnerships: Theory and Practice in international Perspective*, London, Routledge, 2000.

- Design, build, operate and transfer the facility at no final indemnification for the public administration (the BOT, DBO and BDO schemes in Appendix 1). Here, we are talking about projects where the public administration plays the role of the exclusive buyer of the services (commercial risk is absent or strongly limited by the purchase contract signed by the public administration).

Figure 2. Different alternatives available to public administration to procure goods and services



Source: Adapted from European Commission (2003), Gruber (2003), de Jong et al. (2010)

A further shift on the right-hand side of Figure 1 shows contractual arrangements – often in the form of concession agreements – where the ownership of the facility remains with the private sector (BOOT/DBFO and BOO schemes, and temporary privatisation in Appendix 1). The private sector assumes risks arising from the ownership of the facility¹⁶.

Furthermore, here we include concessions where the public sector is not the direct buyer of the services and the private sector bears part or full commercial/market risk (like in the case of merchant power plants).

¹⁶ Caselli et al. (2009) examine the case of the highways sector and of the possible mechanisms to set the indemnification reimbursement by the public administration to the private partners at the end of the concession period.

At the extreme of the spectrum, we find the full exit of the public sector from the management of businesses through asset sales/divestitures or privatisation processes. Here, the private sector gains full control of the assets and is in charge of all risks involved in the deal.¹⁷

From the point of view of private investors, PPPs are different not only in terms of risks charged on the private counterparty, but also in terms of financial aid that the public sector can provide to the infrastructure financed by the private sector. By looking at Table 1, infrastructure can be split in three basic groups:

1. *Fully self-sustainable infrastructure*: this group includes projects able to generate a stream of revenues allowing the private sector to fully recover the cost of the investment during the operational life of the project. Examples are projects in the power and energy sector from conventional sources or highway projects where the volume of traffic is sufficiently high and stable. In these cases, the public entity plays simply a regulatory and supervisory role without the provision of any back up financial assistance.
2. *Not financially sustainable infrastructure*: this group typically involves social infrastructure (hospitals, schools, prisons, social housing) where the public sector, in addition to a regulatory and supervisory role, becomes the purchaser of the services, often on the basis of availability periodic payments linked to predefined quality standards.
3. *Partially self-sustainable infrastructure*: this group includes infrastructure whose revenues come from tariffs and similar charges paid by end users. However, for reasons of public welfare, the private sector is not allowed to set the prices at a level that would make the project fully self-sustainable. Examples are metropolitan light rails, railways, water and sewerage projects. In these cases, the stream of revenues is not enough to repay the cost of the private investment. In order to enhance the attractiveness of such infrastructure for the private investors, the public party provides additional back up in the form of grants during the construction phase or other kind of benefits like a tax relief during the operational phase or back up guarantee against disruptive risks during the life of the project (see Section 3.3).

For many years, the PPP model has been considered the ideal solution for the public sector to efficiently procure the availability of infrastructure benefiting from the know-how and the underlying incentive schemes brought by the private parties. For the private sector, the possibility to rely upon a strong public sector involvement and sometimes on some form of financial contribution has been seen as a strong risk mitigant and a facilitating element to provide financing to infrastructure.

The most recent debate, however, has cast doubts on the effectiveness of this contractual formula and on its promise to deliver efficient, high quality infrastructure to the general public and, more generally, to contribute to a country's welfare. This debate points also to the effects that PPPs can have on private investors.

The two debated points are i) whether a higher involvement of the public sector, in terms of financial contribution to a PPP, leads to higher propensity of the private sector to invest in infrastructure ("crowding-in") and ii) whether a higher involvement of the public sector really creates value compared to alternative sources of procurement.

¹⁷ In the last few years, in OECD countries, about \$1tn of state-owned assets have been divested and about \$550bn over a total amount of privatisations from 1990 has been in the infrastructure sector. See OECD (2013), The role of banks, equity markets and institutional investors in long-term financing for growth and development, February.

The first point has always received a positive answer in the past. Other things equal, a higher financial contribution by a public entity was considered a catalyst for private money. In reality, many private investors claim that the higher the involvement of the public sector, the more complicated the trade-off the private investors must face. A higher public sector involvement should lead to lower risk for private investors. However, higher involvement of the public entity exposes the private counterpart to higher risk of political influence/creeping expropriation¹⁸. Two recent examples of uncertainty about institutional/regulatory variables are the two tender processes carried out in Brazil to tender the concession for the BR262 Motorway and the rights of exploitation of the Libra deep-water oilfield. The private intervention in such projects was far below the government's expectations. Apparently, the failure to assign the concession for the BR262 was due to the public opposition by local authorities for objecting to toll fees offered to the private investors.

Furthermore, a survey conducted by Berwin, Leighton and Paisner in association with Prequin indicates that the biggest threat to a sustained flow of infrastructure deals in the first half of 2014 is government interference and political risk. Many investors prefer to invest in unregulated assets to reduce regulatory risk. Furthermore, they indicate that Government support via state guarantees or multilateral credits are perceived as not helpful and useful.

The second debated point is related to the fact that the higher the public involvement, the higher the risk that the private sector expropriates too much value from the public sector or is more subject to moral hazard (gives less care to adequate risk management). So, the question becomes whether the PPP model provides enough benefits for the public sector. One academic paper analysed the cost-efficiency of Private Finance Initiatives (PFIs) in the UK health sector facilities and has shown that expected returns by the private sector far exceed the underlying cost of capital, even in a sector with extremely low levels of risk due to availability-based payments and financial contribution by the public sector. The findings highlighted significant problems in current procurement practices and the methodologies by which bids are assessed and call for a more precise valuation of the Value for Money that privately-based solutions can generate for the public sector.¹⁹ However, the UK Government has developed PF2, a new preferred form of PPP which includes significant reforms to address the criticisms of the old PFI model. This includes measures to speed up and reduce the cost of procuring projects (see the PF2 policy document for details <https://www.gov.uk/government/publications/private-finance-2-pf2>).

2.2. The risk profile in infrastructure projects

The design, construction and management of an infrastructure have some important implications for the private sector. While it is sometimes difficult to disentangle the implications for industrial investors (corporate sponsors and industrial developers) from those for financial investors, it is useful to separate them for a better understanding of the implications of funding and financing. In this section, we first introduce the analysis of the risk profile of the infrastructure and then move on in Section 3 with a review of the characteristics of infrastructure for pure financial investors.

Since project finance is a complex network of intertwined contracts and since investors can rely only on the cash generation of a single initiative as a source of repayment of debt principal, interest and dividends, an infrastructure can be imagined as a potential bulk of risks for which a careful and thorough risk management process becomes crucial. If the investment is excessively risky, sponsors and creditors could face situations where the cash flows produced by the new initiative are not sufficient to repay debt

¹⁸ See Berwin, Leighton and Paisner/Prequin (2013), Mid Term Infrastructure market review, London, September.

¹⁹ Gatti, S. (2013), Hellowell, M. and Veronica Vecchi (2013) Does the private sector receive an excessive return from investments in health care infrastructure projects? Evidence from the UK, Health Policy, 110-2, pp. 243-270

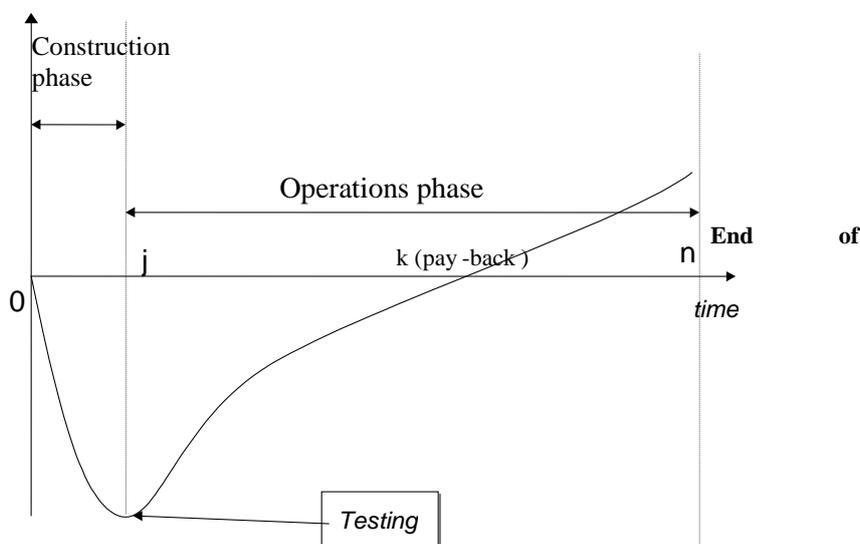
service and if the risk is perceived as higher than their levels of risk tolerance, they will simply refrain from investing.

From an investor's point of view, a careful analysis of all the risks the project will bear during its economic life is crucial. Indeed, the life cycle of infrastructure involves long-term investments with a clear-cut separation between the construction phase (where no cash is generated) and the operational phase (where cash is produced and no or minimum capital expenditures are made). Figure 3 shows the standard behaviour of project cash flows during the life of an infrastructure project.

The analysis of the risk profile should aim at identifying the sources of risks and at finding the best solutions to limit their negative impact on the future cash generation. Typically, a careful risk analysis involves four sequential steps:

1. Risk identification;
2. Risk analysis;
3. Risk transfer, if necessary, to a counterparty best suited to bear the risk or to a professional insurers;
4. Residual risk management.

Figure 3. Cash Flow Behaviour during the Infrastructure Life Cycle



Source: Gatti (2012)

Regarding risk identification, an investor should try to carefully map all the possible risks that could arise during the life of the project and to evaluate the probability of occurrence and the severity of the

risk²⁰. Such risks can arise either during the construction phase, when the project is not yet able to generate cash, or during the operating phase. A standard classification of risks is the following:

1. Pre-completion risks;
2. Post-completion risks;
3. Risks found in both the pre- and post-completion phases.

Regarding pre-completion risks, the most common are bad activity planning, technology risk and construction risk (in the form of delayed completion, cost overruns or completion with performance deficiency)²¹. Pre-completion risks are considered as the most disruptive by private investors, since any flaw affecting the project at an earlier stage can severely hamper the ability of the project to perform as expected at a later stage. The weak available evidence coming from analyses of the performance of failed projects confirms the idea that the worst performing investments were the ones that experienced pre-completion problems.

Post-completion risks are associated with the supply of input, the performance of the plant as compared to project minimum performance standards and the sale of the product or service. Risks found in both the pre- and post-completion phases involve financial risks (interest rate risk, currency risk, inflation risk), regulatory risk related to permits and authorisations, political and country risk and legal risk related to contract enforceability and creditors' rights protection.²² Moody's has estimated that projects that successfully passed the construction phase experience defaults later and emerge earlier from default than projects under construction. Furthermore, average recovery rates are higher for projects experiencing a default during the operational phase. This evidence seems to support the higher propensity of purely financial investors to accept operational risks and their reluctance to be involved from the early stages of infrastructure development.

Once risks are mapped and analysed, the risk management process should identify the strategies to mitigate the impact of risks on project cash flows and verify if the SPV has adopted them. The most used solutions are:

1. Transfer the risk by allocating it to one of the key counterparties
2. Transfer the risk to professional insurers
3. Retain the risk

²⁰ Borgonovo E., Gatti S., Peccati L.(2010), What Drives Value Creation in Investment Projects? An Application of Sensitivity Analysis to Project Finance Transactions, *European Journal of Operational Research*, vol. 205, No. 1, 2010; Borgonovo E., Gatti S., "Risk Analysis with Contractual Default. Does Covenant Breach Matter?", in *European Journal of Operational Research*, vol. 230, n. 2, 2013.

²¹ Standard and Poor's argue that construction risk is seldom the main reason of project default. In the case of power project finance, technical and design issues, unexpected cost overruns and bad performance in the operational phase account for the most part of project risk. See Standard and Poor's (2013a), *How to unlock long-term investment in EMEA infrastructure*.

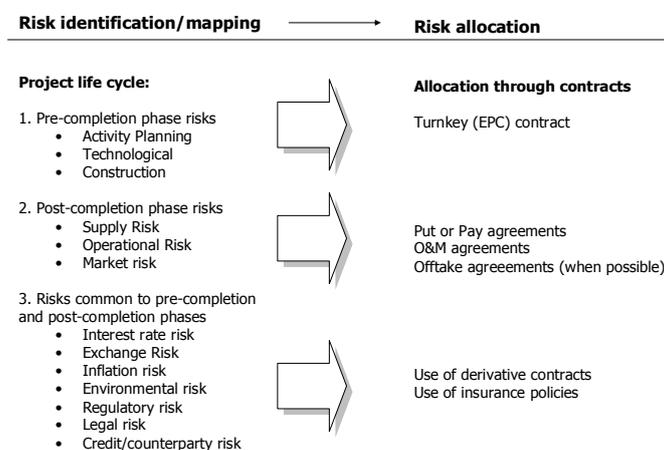
²² Hainz, C. and S. Kleimeier, 2012, Political Risk, Project Finance, and the Participation of Development Banks in Syndicated Lending, *Journal of Financial Intermediation* 21(2), 287–314. Tung, Frederick, Wang Xue and Krishnamurthy Subramanian (2008). Law, agency costs and project finance, Working Paper, Emory University

The risk transfer by means of nonfinancial contracts is the most used risk management strategy in project finance and is based on an intuitive principle. Referring again to Figure 1, the key contracts signed by the SPV (EPC, supply, purchase, O&M agreements) allocate rights and obligations to the SPV itself and to its respective counterparties. These contracts can be used as risk mitigation techniques if the counterparty best able to control and manage the risk is considered responsible for the effects of risk occurrence on project cash flows. If the risk occurs, some form of indemnification must be paid to the SPV. The relation damage-payment due to the SPV incentivises the counterparty to respect the original agreement in order to avoid the negative effects determined by the emergence of the risk in question. If a risk arises and it has been allocated (transferred) to a third party, this same party will bear the cost of the risk without affecting the SPV or its lenders (*risk pass-through*).

The second available option for risk management is risk insurance provided by either Export Credit Agencies (ECAs) or private insurers in the private insurance market. This alternative must be used for risks that cannot be controlled and managed by any one of the SPV counterparties. Insurers can cover the SPV risks against the payment of an insurance premium. These companies can do so because they manage large risk portfolios where the joint probability of emergence of all the risks in the portfolio at the same time is very low. Incidentally, the most active insurance underwriters have started to propose “non-payment insurance solutions” in response to the demise of Monoline intervention in project finance (*wrapped bonds*). These insurance packages represent unconditional obligations by the insurer to guarantee the debt service of the borrower (the SPV) to bank creditors or bondholders. *De facto*, the insurer takes a typical lender risk in addition to the standard risks underwritten under more traditional insurance policies²³.

Taking as an example a typical project financed infrastructure, a summary of the risk allocation tools looks like the following figure (see Figure 4).

Figure 4. A possible map of risk allocation mechanisms in infrastructure investments



²³ While very similar, the two insurance solutions show a clear difference. Wrapped bonds were based on a wrapping insurance solution bought by the SPV, while the non-payment insurance is bought by the lenders (with a premium based on a percentage of the margin over euribor or other leading interest rates). Typically lenders choose to buy such policies to reduce the capital absorption determined by the participation to a syndicate, particularly with big ticket amounts. Discussions with insurers indicate that this solution is required by the same lenders that, for reasons of confidentiality, are more comfortable in showing direct commitment to certain infrastructure and then back up these exposures with a proper insurance hedging without necessarily disclosing it.

Source: Gatti (2012)

The final option to control the risk is to retain it and to try to limit its effects on the infrastructure by means of well-designed internal risk procedures. Risk retention is a common practice in already existing corporations²⁴ because a firm considers risk allocation to third parties too expensive or the cost of insurance policies excessive compared to the effects determined by that risk. Risk retention, as a residual risk management policy, is more effective for existing corporations than for specially created entities operating an infrastructure investment. This is because in standard corporate finance, operational risk can be diversified on the whole portfolio of real assets managed by an existing firm. Instead, operational risk for a SPV cannot be diversified as it refers to a single project. For this reason, the unallocated portion of risk plays a key role in the credit spread and debt/equity ratio setting and represents the most relevant variable that financial investors look at when deciding to commit capital to a given infrastructure.

3. Infrastructure and private investors

In the perspective of an industrial sponsor or corporate developer, a project financed infrastructure is an initiative that can generate a stream of cash flows that is not purely limited to dividends. Referring again to Figure 1, it is pretty common that industrial developers participate in the construction and management of the infrastructure in a dual role of shareholder and project counterparty. From this point of view, the valuation of convenience is based on a joint cash flow profile of dividend plus any other form of revenue coming from the project, either in the form of margins on the construction cost, net profit on servicing fees, cost saving on procurement from the SPV, or cost advantages in terms of off taking prices. The perspective of a pure financial investor is different. A financial investor looks at an infrastructure as an initiative able to generate *only* a stream of dividends, if the investment involves equity, or a stream of debt service payments in case the investor is providing debt financing, much in line with what traditionally happens in syndicated bank loans for project finance.

²⁴ Carter, D., Rogers, D., Simkins, B., 2006. Hedging and value in the US airline industry. *Journal of Applied Corporate Finance* 18, 21–33.

In this sense, an infrastructure can represent an interesting alternative asset class. Provided that a careful assessment of risks and effective risk mitigations have been set up (see Section 2.2), infrastructure shows peculiar characteristics that differentiate it from more traditional asset classes and make it interesting for selected classes of institutional investors. Some of them are summarised in Table 2.

Table 2. Typical characteristics of infrastructure investments

Long-term assets with long economic life
Low technological risk
Provision of key public services
Strongly non elastic demand
Natural monopoly or quasi monopoly market contexts
High entry barriers
Regulated assets
Frequent natural hedge against inflation
Stable, predictable operating cash flows
Low correlation with traditional asset class and overall macroeconomic performance

1. Infrastructures are typically long-term assets, with very long useful economic life and only rarely subject to technological obsolescence.
2. Infrastructures are frequently built to provide key public services that are necessary for the social and economic development of the served areas.
3. The demand for the services is strongly non elastic. Given the characteristics of key public service, the demand is often non sensible to price changes, even in cases of material increases. Looking ahead, the demand is then not volatile and can be predicted with a reasonable level of risk.
4. Infrastructures often operate in conditions of natural monopoly or quasi monopoly with very high entry barriers. Capital expenditures for the production of services can hardly be afforded by new entrants. Yet, the marginal costs for the supply of the marginal unit of service once the infrastructure enters the operational phase are typically rather low. These conditions generate important entry barriers for new potential competitors of the incumbent.
5. Regulated sectors: In most cases, infrastructures are subject to external regulation, also to limit market power derived from conditions of monopoly or quasi monopoly.
6. Hedge against inflation: Infrastructures are typically self-protected from price escalation on a long-term horizon. In fact, the revenues of the investments are frequently linked to the inflation rate by means of price-adjustment mechanisms or availability based payments.
7. Stable and regular cash flows: This characteristic is probably the most interesting feature from an asset manager's standpoint. The combination of points 1-6 above determines the generation of stable and predictable operating cash flows that – in most cases – are also inflation-linked. These investments are then able to perform well also in particularly stressed macroeconomic scenarios.
8. Low correlation with other traditional asset classes and with the general economic cycle: Point 7 above is important in an investor's diversification strategy because, contrary to more traditional

asset classes that tend to present a positive correlation with the general economic cycle, infrastructures are less sensible to macroeconomic performance.

Traditionally, pure financial investors in infrastructure have been classified in accordance to the risk profile they are able to invest in. The dichotomy is between greenfield and brownfield investors, with the first group open to invest in projects from the very early stage of project development (as in Figure 3) and then assuming also construction risk. On the contrary, brownfield investors prefer to allocate resources to projects that are more similar to an operating utility, where construction risk is excluded and the only risk is due to deviations of variables influencing the operating cash flows of the infrastructure from the budgeted values.

3.1 Recent trends in infrastructure investing

For many years, the traditional capital structure used for project finance transactions in infrastructure was based on a simple combination of multiple-tranche syndicated bank loans and equity provided by corporate sponsors and developers.

This business practice has undergone a remarkable change in the past few years. The acceleration of the change was particularly evident starting from the second part of 2000s when an increased risk appetite of institutional investors coupled with a favourable environment of low interest rates spurred a flow of financing from investors other than banks and industrial sponsors. This renewed interest for infrastructure was equally important on the equity and debt sides. On the debt side, the role played by monoline insurers, at least until the outburst of the 2007-2008 crisis and the subsequent series of their downgrades, contributed to attract capital flows into capital market debt instruments.

The default of Lehman Brothers in September 2008 has partially reduced this appetite. However, data seem to indicate that an upward trend is emerging again, with institutional investors still looking for yield on long-term assets with a clear and stable pattern of cash flows.

3.1.1. Infrastructure and equity

Traditionally, most infrastructure projects were financed with high debt/equity ratios and a massive recourse to long-term bank financing. Sponsors of projects provided only a limited equity cushion and – for most initiatives – the ownership of the SPVs was represented by industrial sponsors, typically the off taker, the suppliers or the operation and maintenance agent.

This situation has changed very rapidly in the past few years. The post-Lehman crisis first has reduced the availability of cheap debt financing. Also, the banks that were more active in providing non-recourse project finance loans have progressively withdrawn from the market in response to balance sheets problems and to the need to increase their capital base as required by the more stringent Basel III. The new market situation is then experiencing lower credit availability, higher spreads and shorter maturities²⁵.

A recent presentation on the state of the art of project finance in Europe indicates a progressive reduction of the difference between the cost of debt and the cost of equity, which on one side limits the

²⁵ A recent unpublished paper has compared the characteristics of a large cross section sample of 2,564 syndicated term loans and 294 project bonds tranches for project finance transactions closed between January 1995 and March 2012. Results indicate an increase in spread of about 64 bps for loans and 20 bps for bonds before and after the outburst of the crisis in 2007. See Gatti, Stefano, Carlo Chiarella and Ginko De Franzoni (2013), What's different between syndicated Loans and Bonds in infrastructure project finance?, Bocconi University, Unpublished Working Paper, Milan

convenience to start new infrastructure development and, on the other side, forces industrial sponsors to find alternative funding solutions to move on the projects already in pipeline²⁶.

Apparently, three solutions seem to emerge to overcome the problem of credit retrenchment:

1. Vendor loans;
2. Co-sponsoring with EPC contractors
3. Opening the capital structure of the SPV to pure financial investors in equity for infrastructures.

Vendor Loans. If the EPC contractor is able to bring access to capital to the negotiation table (playing the role of substitute for bank debt financing), the EPC contractor of the infrastructure may be willing to accept a payment settlement diluted in time following a typical “vendor loan” structure similar to the one used for acquisition financing and leveraged buy-outs (LBOs). This vendor loan would be accompanied by a relatively low sponsor back-to-back guaranteed advanced payment. The EPC contract would include contractual terms where delay and performance penalties would be directly compensated with the agreed loan repayment.

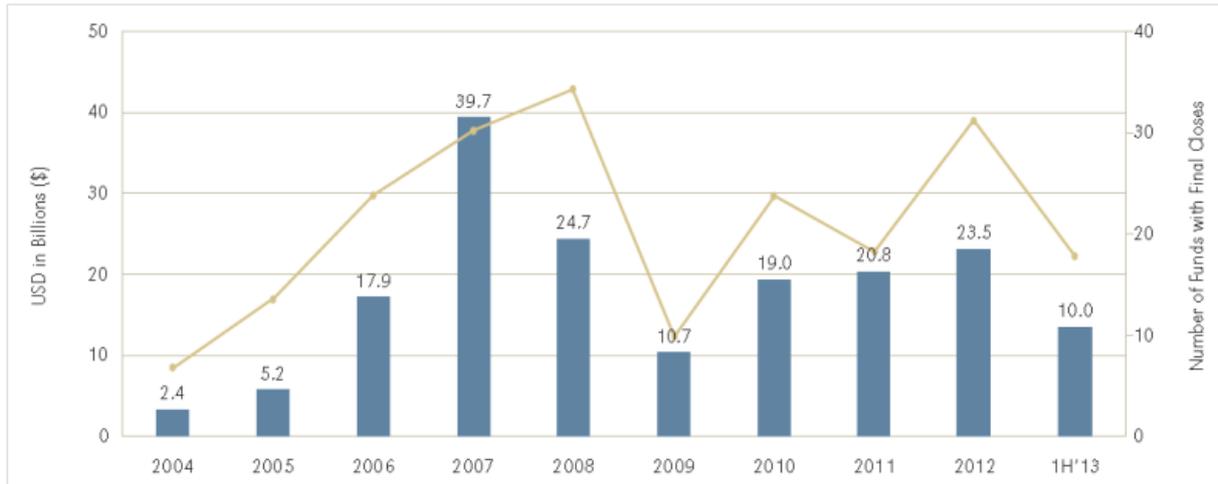
Co-sponsoring with EPC contractors. The EPC contractor may be willing to participate to some extent in the entrepreneurial risk with the other project sponsors, assuming a portion of equity of the SPV. The EPC contractor should be financially sound and/or be a cash generating company and/or be able to get access to bank credit smoothly.

Pure financial investors in equity for infrastructures. In the past few years, the presence of pure financial investors in the equity of SPVs was almost absent. Data reported by Probitas Partners²⁷ indicate that the start-up of global infrastructure fundraising for private equity investments in infrastructures goes back to 2004 with an amount of \$2.4bn. In 2007, the fundraising reached the record peak of \$39.7bn, representing 15% of total project finance loans in the same year. After the collapse of Lehman Brothers, the funds collected for private equity investments have dropped significantly and, at the end of 2012, they counted for only slightly more than 10.5% of total project finance loans available (see Figure 5). Preqin, a provider of data on infrastructure investments and private equity estimates that at the end of 2013 the target for funds committed to infrastructure could reach a remarkable €74bn.

²⁶ Pascucci, V. (2012), Project Finance Market Trends, SDA Bocconi School of Management, Milan.

²⁷ Probitas Partners (2013), Infrastructure Survey and Trends

Figure 5. Global Infrastructure Fundraising



Source: Probitas Partners (2013)

If we limit the discussion to fundraising dedicated to greenfield infrastructure funds – i.e. funds that participate in the development of infrastructure projects from the design phase onwards and that then bear full construction risk – it is clear that the amounts available are still very limited compared to the infrastructure funding needs and, at the end of 2012, they stood at only 11% of total global infrastructure fundraising. However, there are also clear signals of a growing interest of investors for this alternative asset class. Typical investors interested in greenfield funds are institutions looking for long-term, inflation-linked assets able to match the typical structure of their liabilities: life insurance companies, pension funds, non-profit foundations and sovereign wealth funds (SWFs).

Unfortunately, a complete view of the total commitments of all these institutional investors is not available. However, some partial evidence for the different groups of investors does exist.

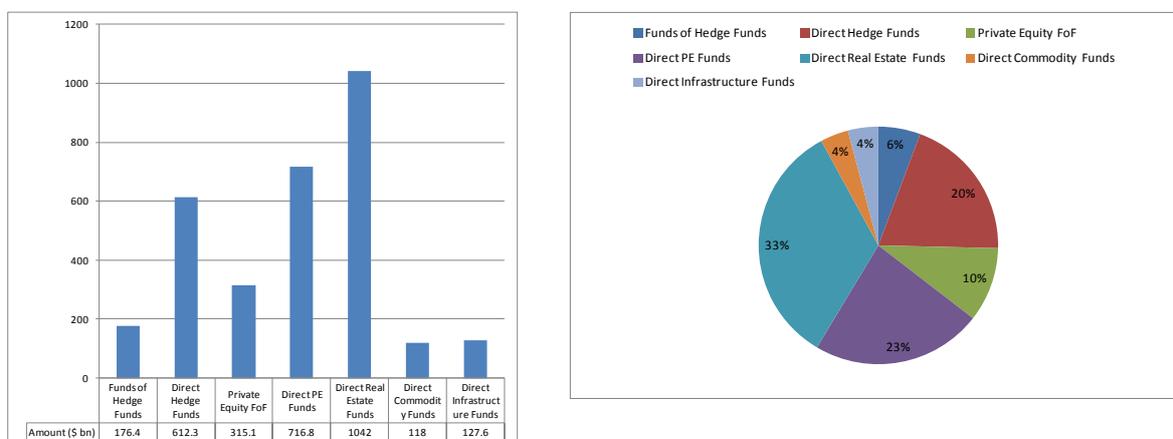
Pension Funds. A paper published by OECD²⁸ provides estimates of the total commitments of pension funds on infrastructure for 2008. A raw estimate quantifies the total commitment in listed infrastructure stocks at \$ 400 billion. Excluding utilities, the figure is estimated at around \$ 60 billion. The OECD Survey on large pension funds published in October 2013 shows that despite a limited direct average allocation to infrastructure some funds are allocating important percentages to infrastructure either in the form of (listed and unlisted) equity or fixed income.²⁹

Towers Watson and Financial Times’ Investor Survey 2013 reports that, out of the \$3.1tn total assets under management (AUM) by the top 100 alternative investment asset managers, \$127.6bn were invested in infrastructure (see Figure 6). Pension funds and SWFs were the investors more inclined to invest in infrastructure (9% and 10% of their AUM respectively).

²⁸ Inderst, G. (2009), Pension fund investment in infrastructure, OECD Working Papers on Finance, Insurance and Private Pensions, No. 32.

²⁹ OECD (2013), Large Pension Funds Survey, Paris, October.

Figure 6. Amount and % composition of alternative investments by Top 100 Alternative Investments Asset managers Worldwide



Source: Towers Watson (2013)

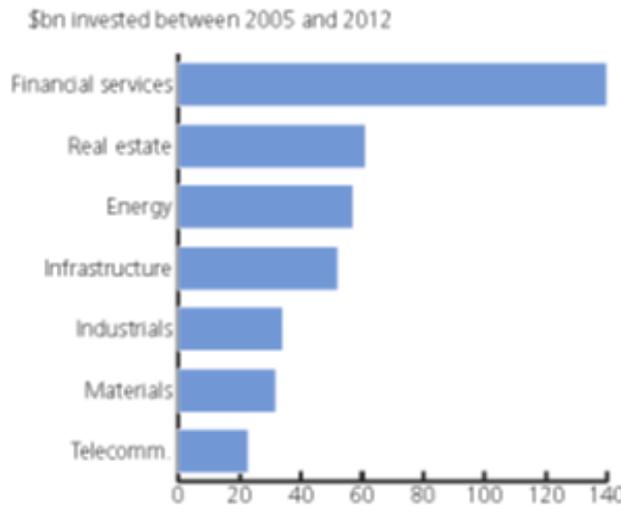
Insurance companies. The information provider Prequin covers a group of about 200 insurance companies worldwide with an asset allocation dedicated to infrastructure. The large majority of the firms are located in Europe and the USA, with Asia representing about 20% of them. The typical investment strategy (85%) is to commit funds to unlisted infrastructure funds managed by external advisors, followed by direct investments in SPVs and by investments in listed infrastructure funds. Insurance companies typically invest in primary equity.

Insurance companies are also planning to invest more in debt instruments related to infrastructure, as shown later in Section 3.1.2.

Sovereign Wealth Funds. A recent paper by The CityUK reports that, out of a total AUM value of \$5.2tn at the end of 2012, \$52bn have been invested directly in infrastructure between 2005 and 2012 (Figure 7). Furthermore, 56% of Sovereign Wealth Funds declare to allocate resources in infrastructure investments.

In 2013, data reported by the OECD indicate that in a sample of the most important SWFs worldwide, the percentage allocation to infrastructure is remarkable with peaks between 10-12% in Temasek and GIC (Singapore) and Alaska Permanent Fund (US).

Figure 7. Direct Sovereign Wealth Funds' Investment Activity (2005-2012) Data in \$ billion



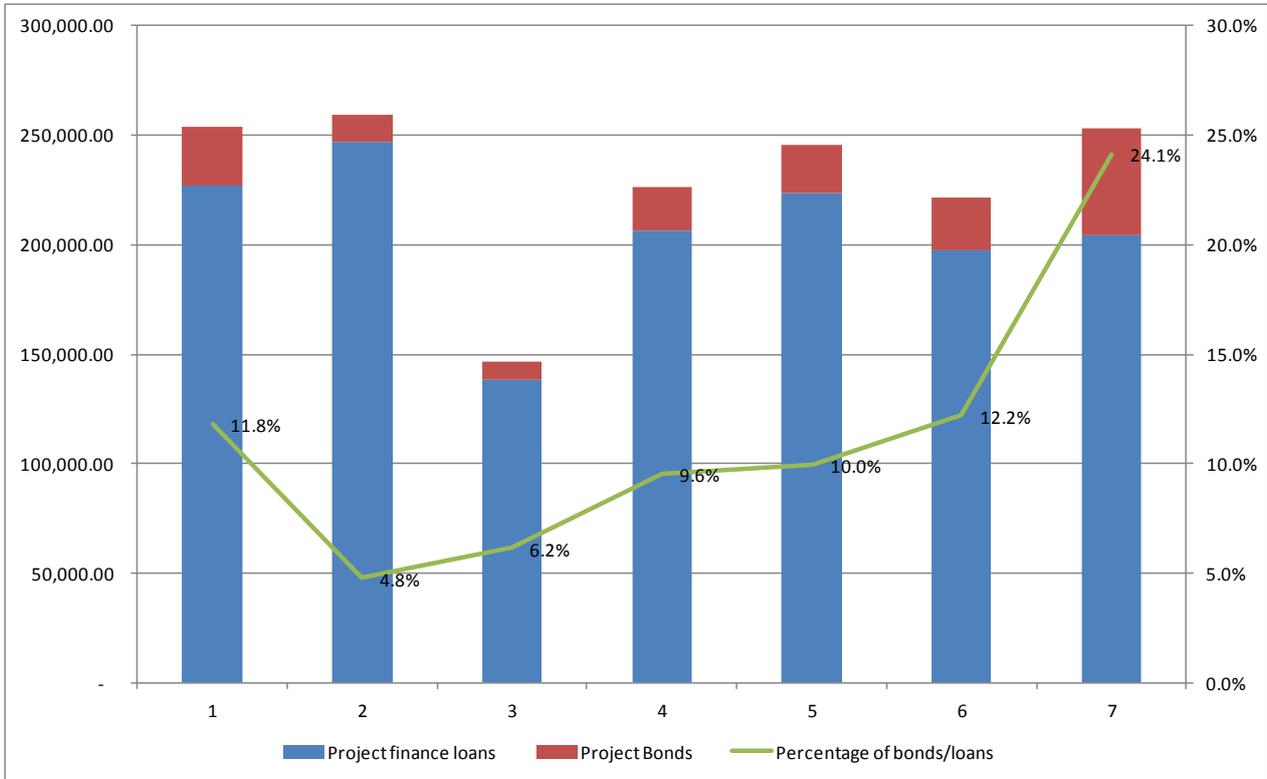
Source: SWF Institute - Sovereign Wealth Fund Transaction Database

3.1.2 Infrastructure and debt capital markets

Still today, non- or limited recourse syndicated loans are the most used source of financing for infrastructure projects. Between 2007 and 2012, project finance loans represented between 5% and 12.2% of the total syndicated loans market, with an amount between \$140bn and \$250bn (see Figure 8). A much lower percentage was represented by funding on the debt capital markets. In the same period, project bonds – i.e. bonds issued by SPVs entitled to design, build/refurbish and manage an infrastructure project – bounced between \$8.5bn and \$49bn. It is clear that funding on debt capital markets is still limited to a marginal fraction of the total debt funding for these kinds of initiatives although data referred to 2013 indicate a sharp increase in the use of project bonds.

Figure 8. Trends of Project Finance Loans and Bonds (2007-2013)

Data in \$ million

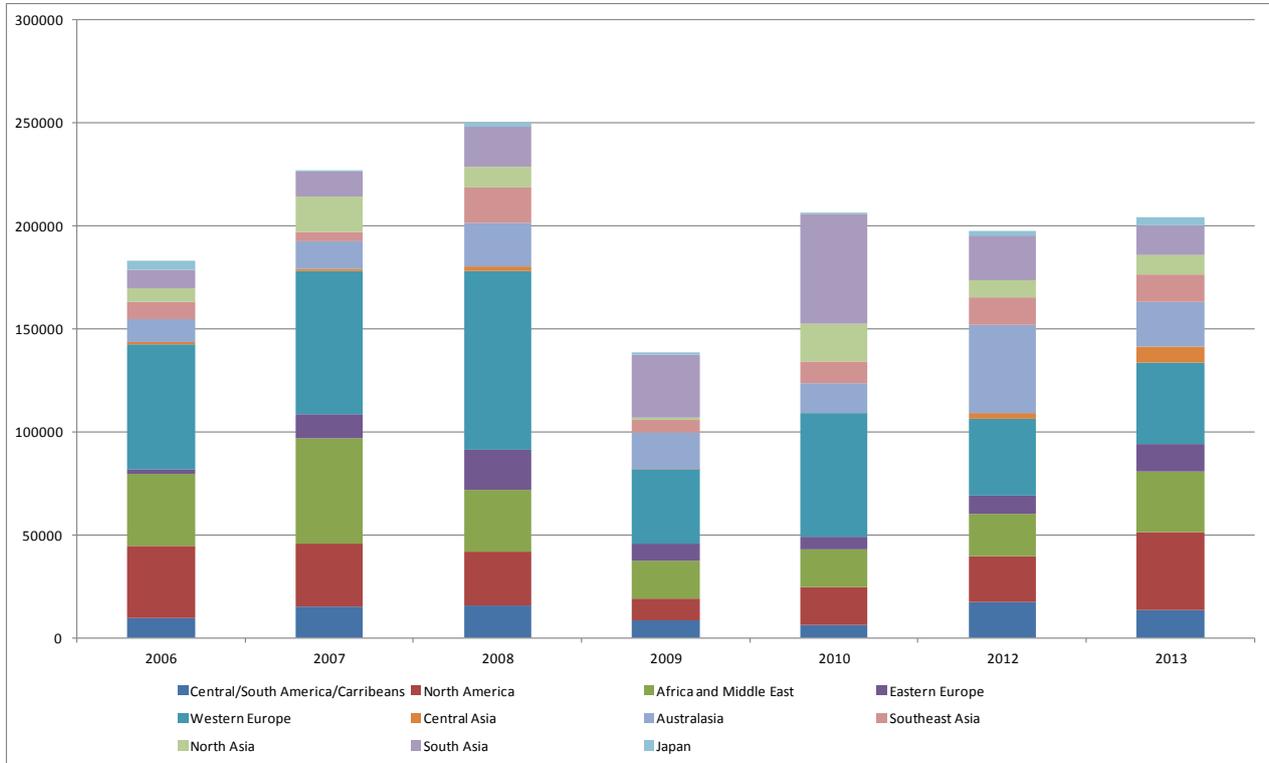


Source: Thomson One Banker, Project Finance International

During the period under examination, the project finance market has experienced a reallocation among different geographic areas, with Western Europe and South East Asia showing a remarkable downward trend from 2010 onwards (Figure 9).

Figure 9. Trends of Project Finance Loans - breakdown by geographical areas (2007-2013)

Data in \$ million



Source: Thomson One Banker

Concerning bonds, the breakdown by geographical areas and sectors shows a clear concentration on some sectors (infrastructure, power and social infrastructure) and a polarisation in USA/Canada, UK and Western Europe, with the latter losing ground in the final part in the period under examination (Figures 10 and 11).

An interesting aspect of the project bond market is that some recent deals have been taking place in countries other than USA/Canada, UK and, more generally, Western Europe. This trend seems to indicate that the market, particularly for refinancing deals of projects that have already completed their construction phase, looks promising (examples of these deals are provided in Box 1).

Box 2. Recent Examples of Bond Issues in Developing Countries

Recently, some relevant project bond issues have been launched in developing countries attracting the interest of international institutional investors. Most of these deals involve refinancing of already built projects, not all of them are backed up by off taking agreements.

One region that has emerged as a benchmark for the use of project bonds is Latin America.³⁰

On November 10, 2010, the 1.5 billion USD Brazilian Odebrecht Drilling Norbe VIII/IX Ltd. bond refinancing marked the first international infrastructure bond in the Latin American region. The project was based on the cash flows related to two charter agreements signed by Petroleo Brasileiro S.A. (Petrobras) for the use of the dynamically positioned drill ships Norbe VIII and Norbe IX until June 2021. The drill ships were serviced and operated by Odebrecht Oleo e Gas S.A. (OOG), the primary sponsor of the transaction and leading operator in ultra-deep-water drilling, pursuant services agreements signed with Petrobras. The notes were due in June 2021, carried an interest of 6.35% and were rated Baa3 by Moody's and BBB by Fitch.

A similar transaction took place on July 2011, when Queiroz Galvão Group (QGOG) Atlantic /Alaskan Rigs Ltd issued a USD700 million 144A / Reg-S senior secured notes carrying a fixed coupon of 5.25% and rated Baa3 by Moody's and BBB- by Fitch. The bonds were issued under rule 144A / Reg-S and, contrarily to more standardized bonds, presented amortizing repayment of the principal with final maturity of 7 years and average life of 3.8 years. Queiroz Galvão Group debuted in the USD capital market to refinance existing bank facilities related to the Alaskan Star and the Atlantic Star drilling rigs. Since their acquisition by the Queiroz Galvão Group in 1994 (Alaskan) and 1996 (Atlantic), both drilling rigs had been chartered to and in operation for Petrobras. The transaction was itself launched on the back of charter agreements with Petrobras expiring in November 2016 and July 2018, respectively.

On April 2012, Terminales Portuarios Euroandinos Paita S.A. issued an amount of about 110 million USD for the first Rule 144A/Reg S project bond for the expansion of the Paita Terminal Port in the region of Piura, Peru. This was the first issue of a Latin American Brownfield project before construction and without credit enhancement³¹. The bonds had a maturity of 25 years (2037), paid a fixed coupon of 8.125% and was rated "BB-" by Fitch and "BB" by Standard & Poor's. The Issuer operated, maintained and developed the infrastructure, the second largest coastal port in Peru based on a 30-year design, build, finance, operate and transfer (DBFOT) concession granted by the Government of Peru in September 2009.

The other region that has started using project bonds is the Gulf. On August 2013 Ruwais Power's (Shuweihat 2) issued \$825 million in project bonds (bearing a coupon of 6% and maturing in 2033), rated A-/BBB by S&P and A3 by Moody's to help refinance a power and water plant in Abu Dhabi. It was the first power and water transaction to be funded in the bond market, and open up venues for other bond/sukuk transactions to be funded through the capital markets in the Gulf Cooperating Countries (GCC).³² Ruwais Power Company PJSC held 100% interest in the Shuweihat 2 Independent Water and Power Plant in Abu Dhabi. The Shuweihat 2 plant combined power generation with seawater desalination and benefitted from 25-year Power and Water Purchase Agreement ("PWPA") with Abu Dhabi Water & Electricity Company, wholly owned by Abu Dhabi Water & Electricity Authority ("ADWEA") a fully owned governmental authority of the Emirate of Abu Dhabi. The terms of the PWPA provided a good degree of resilience against potential downside scenarios to the SPV, including shortfalls in power and water availability and/or increases in the plant's heat-rate³³.

³⁰ The author is particularly grateful to Sergio Monaro, Head of Project Finance Brazil, HSBC for his assistance in providing details on the most important project bond transactions taking place in Brazil.

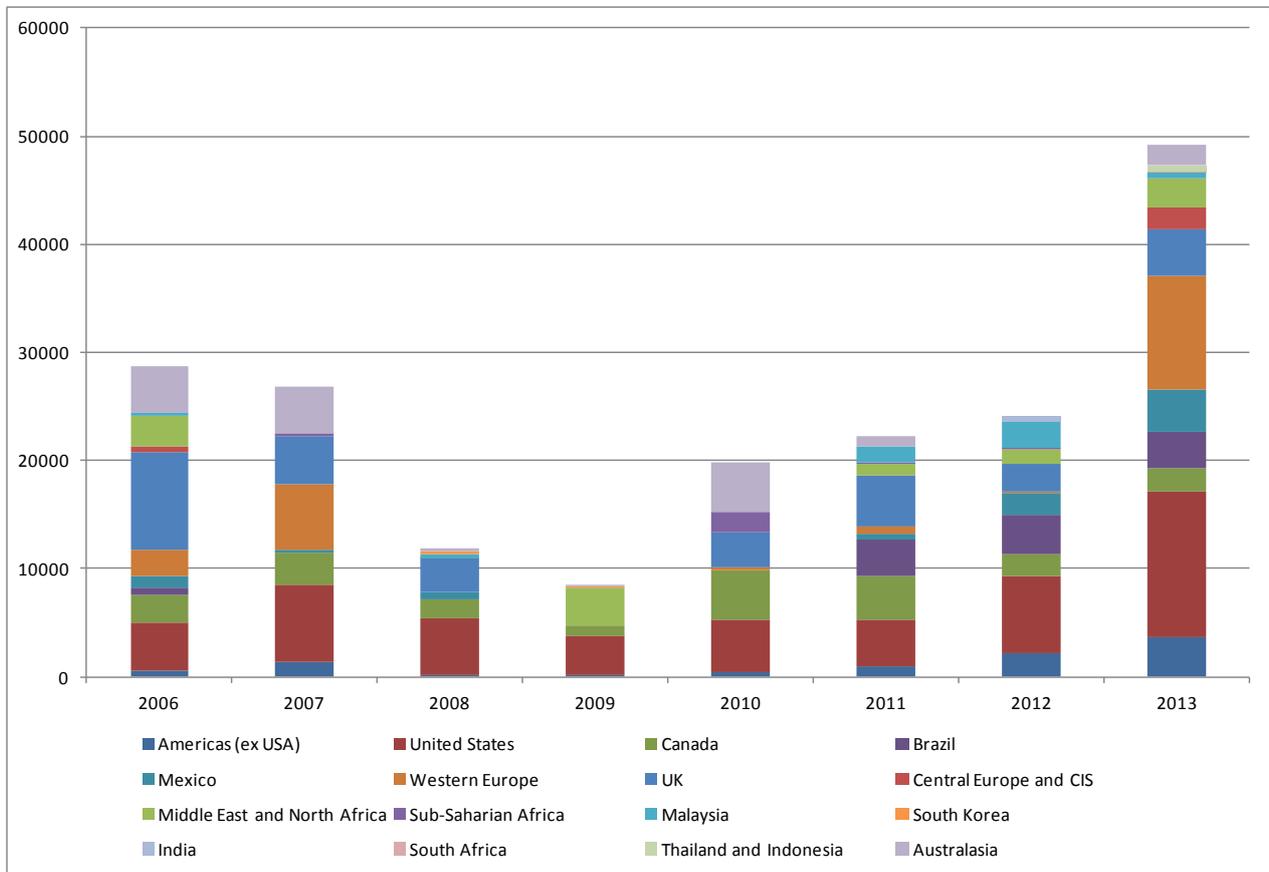
³¹ The Issuer derived all its revenues from tariffs charged for the provision of services to users of the infrastructure as per the Concession agreement and from fees charged for the provision of any special services to users not required under the Concession. See Bacchiocchi, G.(2012) The Project Bond Evolution: Port of Paita Case Study, Latin Infrastructure Quarterly, Issue 4

³² See Nassif, K. (2014), Increasing corporate and infrastructure sukuk issuance could lift the gulf's capital markets, S&P Infrastructure Outlook, April.

³³ See Moody's (2013), Moody's (2013), Rating Action: Moody's assigns an A3 rating to Ruwais Power Company PJSC.

Figure 10. Trends of Project Finance Bonds - Breakdown by geographical areas (2007-2013)

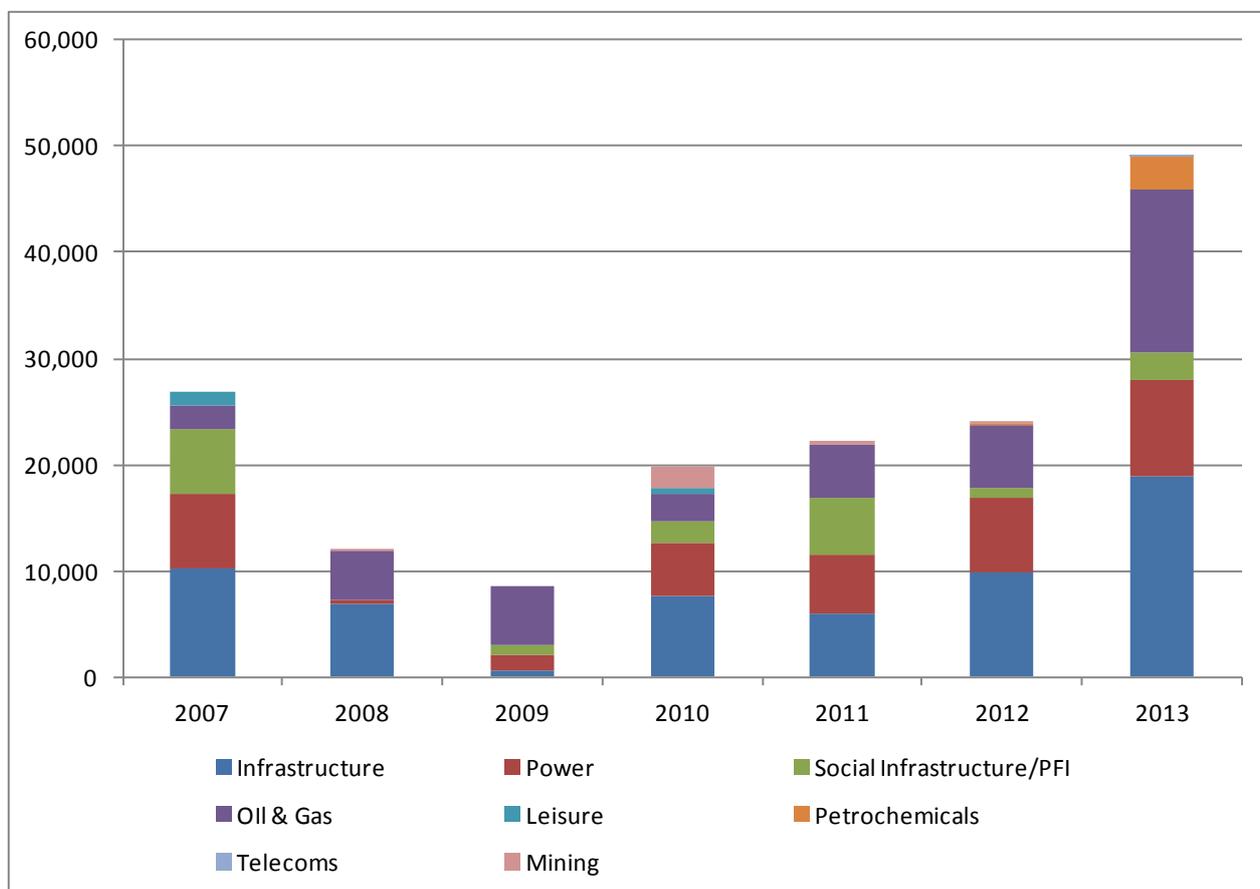
Data in \$ million



Source: Project Finance International

Figure 11. Trends of Project Finance Bonds - Breakdown by sector (2007-2013)

Data in \$ million



Source: Project Finance International

Bonds and loans represent complementary sources of funding of infrastructure from two alternative standpoints:

1. Their contractual design is different and the combination of the two can generate mixes of funding that could benefit infrastructure projects;
2. Project bonds can be an asset class of particular interest for investors other than banks.

Some characteristics of the contractual design of project bonds make them more attractive to investors vis-à-vis syndicated loans. First, compared to syndicated loans, bonds are more standardised capital market instruments. Other things equal, this feature enhances the liquidity of the instrument, provided that the issue size is sufficiently large to generate enough floating securities. Larger issues could also be included in bond indices and this could add further interest for bond market investors.³⁴ Second, larger issue sizes are also attracting the interest of a larger investor base, given the higher liquidity of the instrument. Third,

³⁴ For smaller issues or for private placements, the liquidity of the bond instrument becomes quasi nil since, like syndicated loans, a secondary market for these instruments does exist but is very thin. However, the lower liquidity of a project bond triggers an illiquidity premium that, for buy-and-hold investors seeking a duration match between assets and liabilities, is certainly interesting.

project bonds can be an attractive instrument for long-term investors and can be issued with maturities longer than the tenors of syndicated loans that banks normally accept.³⁵ Finally, if well structured, a project bond issue can benefit from a comparatively lower cost of funding and from less stringent covenants than a traditional syndicated loan.

Although project bonds present comparative advantages over syndicated loans and recently such financial instruments have been considered as the solution to the retrenchment of credit that followed the sovereign debt crisis, particularly in Europe³⁶, their application to infrastructure financing requires careful consideration of some drawbacks that must be solved by sponsors and financial advisors in order to make the instrument sufficiently interesting for institutional investors.

1. Project bonds are less suitable than syndicated loans if used during the construction phase. The construction phase of an infrastructure is typically characterised by the peak of riskiness in the life cycle of the project (see Section 2.2). Academic research had demonstrated that a sound contractual design of EPC contracts and other project contracts can have important advantages for projects. However, in presence of construction risk still pending, it is likely the rating of the bonds will be – other things equal – not particularly high. A study conducted by Moody's on a sample of 2,689 project finance loans in the period 1983-2008³⁷, indicate that the 10-year cumulative default rate of 11.5% is lower than the default rate for corporate issuers of low investment grade/high speculative grade (Ba – 21.13%). However, the same study clearly indicates that infrastructure projects still in construction experience defaults earlier and emerge later from bankruptcy than projects still in operations (as mentioned above in Section 2.2). The average recovery rate is lower for projects experiencing a default during construction and construction phase and construction risk emerge as key factors in determining the future success of the infrastructure investment.

It is clear that lower ratings limit the number of potential (institutional) investors. Furthermore, if used as a main financing instrument from the beginning of the life cycle of the infrastructure, project bonds trigger a negative carry due to the availability of the proceeds as a lump sum at the start of the project. This is a cost that reduces the profitability of the initiative, making it less attractive to project sponsors. These arguments explain why project bonds are more useful for initiatives that have already passed the construction phase and as a refinancing technique for syndicated loans granted to the project during the construction phase. Using bonds after the commercial operating date (COD) offers synergies with bank loans, allowing banks to shorten the maturity of loans or to use mini perm structures doable³⁸. Furthermore, once the construction risk is over, bonds can benefit from a higher rating with investors exposed only to the risk of the operational phase³⁹.

³⁵ This characteristic of bonds could overcome some barriers to the investments determined by the enactment of the Net Stable Funding Ratio imposed by Basel III and reported in Section 3.2. See Linklaters (2011), Basel III and project finance, London and Standard and Poor's (2012), BASEL III Hurdles on Project Finance - Will bond take over loan?

³⁶ Epec (2010), Capital markets in PPP financing, EIB, Luxembourg.

³⁷ Moody's (2010), Default and recovery rates for Project Finance Bank Loans, 1983-2008.

³⁸ Mini-perm loans are typically characterized by the presence of a bullet payment for the total or partial amount of the principal. They finance the construction phase but must be repaid only after a short period of time during the construction phase, forcing the SPV to refinance the loan and exposing it to refinancing risk.

³⁹ Monaro, S. (2011), Project Bonds, HSBC Presentation.

2. **Standardisation:** Institutional investors are more familiar with a traditional contractual design of a bond that pays coupons during its life and repays the whole amount of capital as a bullet repayment at the end of life of the bond. In contrast, syndicated loan repayment schedules are tailored to the specific pattern of unlevered free cash flows generated by the project. If the stream of cash flows is not very stable, it is hard to imagine using only bonds for the financing of an infrastructure project. Furthermore, some technical features of bonds are at odds with the standard way syndicated loans are structured. Loans are typically granted on a floating rate base when instead institutional investors in bonds looks more for fixed rate or index linked rate contracts.
3. **Refinancing risk:** Regardless the use of project bonds from the project's inception or after the COD, the project will be subject to refinancing risk. If mini-perm syndicated loans structures are used during the construction phase, the risk for banks is that general debt market conditions worsen between the loan disbursement and the time when bonds will be issued⁴⁰. If bonds are used only during the operational phase of the infrastructure and its economic life is particularly long, the bond could have a final maturity shorter than the life of the project, which triggers again a refinancing risk for project sponsors.
4. **Rating:** The availability of a large investor base for project bonds depends on the rating these instruments receive from rating agencies. While available evidence demonstrates that project finance loans are not more risky than traditional corporate loans⁴¹, it is undeniable that if a bond does not receive an investment grade rating, it is confined to investors with a specialisation in high yield instruments, not to mention the prohibition to invest in sub-investment grade instruments included in the by-laws of many institutional investors potentially interested in the instrument.

The rating issue has been one the most debated topics in the past three years, particularly in Europe. The EU-EIB 2020 Project Bond Initiative is based on the assumption that the creation of a sufficiently liquid project bond market in the next 5 to 7 years can be achieved only if bonds receive a minimum rating of A. However, a report based on a survey conducted among 100 senior investment officers indicates that a rating of BBB or BBB+ could be sufficient to attract investors in these financial instruments⁴². Incidentally, BBB is the rating at which a large part of project bonds were concentrated in the period 2006-2010. In July 2013, Watercraft Capital S.A. SPV received the first PBCE (Project Bond Credit Enhancement) by the EIB under the 2020 Project Bond Initiative and was assigned a rating of exactly BBB/Negative by Standard and Poor's and BBB+ by Fitch. More recently, in December 2013, the Greater Gabbard offshore transmission link in the UK was the most recent infrastructure project supported by the European Commission and the EIB under the Project Bond Credit Enhancement model. It was assigned a rating of A3 by Moody's, which incorporates a one-notch rating uplift to reflect the credit enhancement provided by the EC/EIB.

⁴⁰ Some recent project bond issues have tried to overcome refinancing risk by means of sinking fund provisions or standby letters of credit issued by a sufficiently highly rated financial institution. See for example Fitch Ratings (2011), Odebrecht Drilling Norbe VIII/IX Ltd, Series 2010-1.

⁴¹ See Standard and Poor's (2009), Project Finance Default Rates from 1992 to 2008 Reflect The Sector Ratings, RatingsDirect, New York.

⁴² Freshfields Bruckhaus Deringer (2011), Outlook for infrastructure 2011: getting Europe back on Track; Standard and Poor's (2009), Industry report card: Most Project Finance Ratings are Holding Up in the Global Downturn and Standard and Poor's (2011), Industry report Card: Global Project Finance Rating Activity is Picking Up.

Regardless of the minimum acceptable level of rating the market is open to accept to invest in project bonds. The problem is how to achieve this level if the minimum rating can be guaranteed only on the basis of infrastructure projects' cash flows, given the complex system of risks these projects face during their life. It is then a problem of identifying proper solutions to ensure the projects get to a level of credit enhancement that is sufficient to reach exactly the desired level of rating. While in the past monoline insurers provided market instruments in the form of monoline guarantees and most project bond issues were backed up by these institutions, the post-Lehman crisis has strongly reduced their activity. Nowadays, government and policy makers are facing the problem of providing indirect support to the projects as they are trying to solve simultaneously the problems of stringent budget deficits and the need of credit enhancement, particularly for the more risky (but also more strategic) ventures. Section 3.3 below presents some of the possible solutions already implemented at an international level.

3.1.3 New forms of debt infrastructure investments

In response to a progressive retreat of banks from lending due to deleveraging and a changed regulatory environment (particularly the enactment of Basel III rules regarding the net stable funding ratio, NSFR) and to an increased interest by institutional investors for long term infrastructure investments, the originate-to-distribute model has rapidly gained ground particularly in Europe.

The originate-to-distribute model sees banks to cooperate with institutional investors in channelling debt funds to infrastructure. Although the market is still in its early stage of development and information is very limited, the practice seems to indicate three alternative structures that enable institutional investors to approach long-term infrastructure investments⁴³:

1. The partnership/co-investment model
2. The securitisation model
3. The debt fund model and direct origination of infrastructure loans by institutional investors.

The partnership/co-investment model

In the partnership/co-investment model, an institutional investor invests in infrastructure loans originated by a Mandated Lead Arranger (MLA) Bank. The fund provision is regulated by a set of eligibility criteria and the MLA Bank retains a pre-agreed percentage of each loan in its loan portfolio. With this co-investment, an institutional investor can build a portfolio of infrastructure loans and can rely on the servicing of the loans in the portfolio provided by the originating bank. The bank can extend the partnership to a number of institutional investors.

Recently, the French bank Natixis has entered into the first partnership agreement with the Belgian insurance company Ageas, one of Europe's 20 largest insurers, whereby Ageas intends to build an infrastructure loan portfolio of around €2bn in the next three years. Similarly, Crédit Agricole and Crédit Agricole Assurances signed a partnership to transfer regional authorities' loans. In the first half of 2012, an

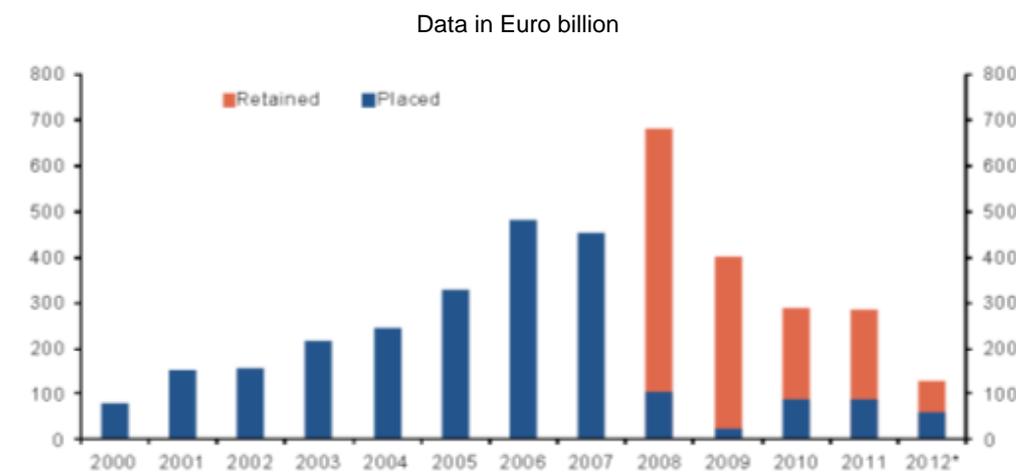
⁴³ It is important to notice that the partnership/co-investment model is very similar to what happens in equity investments as reported in Della Croce, R., Sharma, R. (2014) Pooling of Institutional Investors Capital: Selected case studies in unlisted equity infrastructure, OECD; Paris; Cei, A. (2013), Rethink Infrastructure Finance: an Opportunity for Institutional Investors, Natixis, unpublished mimeo.

amount of €1bn loans originated by the Bank was transferred, with Crédit Agricole keeping 20% of the loans on its own balance sheet.⁴⁴

The securitisation model

After the beginning of the recession period in late 2008 after the demise of Lehman Brothers, the market for securitisation has been undergoing a clear downward trend. Still today, most securitisations are launched with the purpose to generate collateral to be used for refinancing purposes at central banks (Figure 12). This strategy is particularly evident in the Eurozone.

Figure 12. European Securitisation Issuance - Retained and placed deals (2002-2012)



Source: Thomson Reuters

It does not come as a surprise, then, to see that the market for securitisation of infrastructure loans has almost disappeared. A recent academic paper⁴⁵ has analysed 11 cash and synthetic securitisation deals that took place between 1998 and 2007 (see Table 3). Unsurprisingly, the paper indicates that credit rating is the most influential variable to determine the tranche spread at issue. Factors that are important for pricing in the case of corporate bonds, such as market liquidity and weighted average maturity, are also relevant for determining spreads for these securities. What is interesting is that the primary market spread is significantly higher when the underlying project finance loans bear a higher level of market risk and when the proportion of projects still under construction in the securitised portfolio is larger. This confirms the indications coming from Section 2.2 and the findings of Moody’s (2010) and Standard and Poor’s (2009) analyses.

Table 3. Project Finance Collateralised debt Obligations launched between 1998 and 2007

Transaction	Year	Size	Risk	Origina	Maturit
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⁴⁴ The partnership model has been used in Europe also to transfer loans to small and medium firms to institutional investors. In 2012, Société Générale and AXA set up a co-investment agreement. SG keeps 20% of the loans in its own loan portfolio. Similar agreements were entered by Crédit Agricole and AXA and by BNPP and CARDIF.

⁴⁵ Buscaino, V., Corielli, F., Gatti, S. and S. Caselli (2012), Project Finance Collateralised Debt Obligations: an Empirical Analysis of Spread Determinants, European Financial Management, Vol. 18, No. 5, 950–969.

Project Fund Corp I	1998	\$617	True sale	CSFB	2012
Project Fund Corp II	1999	n.a.	True sale	CSFB	n.a.
Project Securitisation I	2001	n.a.	True sale	Citigroup	n.a.
TCW GPF I	2001	\$500	True sale	TCW Group	n.a.
TCW GPF II	2004	\$700	True sale	TCW Group	2016
EPIC I	2004	£392	Synthetic	Depfa Bank	2038
EPIC II	2005	€900	Synthetic	Depfa Bank	2044
TCW GPF III	2005	\$1500	True sale	TCW Group	2017
Stichting PROFILE	2005	£383	Synthetic	SMBC–NIBC	2041
WISE	2006	£1500	Synthetic	Dexia	2041
SMART PFI	2007	£400	Synthetic	SMBC	2044

Source: Buscaino et al. (2012)

The resurgence of the originate-to-distribute model has raised the interest for the securitisation model by institutional investors. The advantage of this model is that these kind of loans structured as bonds can be tailored to the specific needs of institutional investors.

In France, Natixis has just structured a mechanism that enables institutional investors to invest in infrastructure loans. Natixis has created a securitisation vehicle that allows Institutional Investors to invest directly in infrastructure loans structured as bonds. The basic difference between this model and the partnership model is that in the latter the institutional investor becomes one of the lenders directly to the SPV, while in this model it participates to a pool of loans (so, it finances the infrastructure projects only indirectly) originated by the Bank.

Another recent example of securitization of infrastructure investments is represented by the issuance, on August 2013, of USD 1.69 billion Project Bond for Brazilian Odebrecht Oil & Gas (“OOG”) in connection with the refinance of three drilling assets (two drill ships, ODN I & ODN II, and one drilling rig, Norbe VI), which are contracted under charter and services agreement with Petrobras until 2017 and 2022, respectively. The Odebrecht Offshore Drilling Finance Limited bonds are issued under Rule 144A/Reg-S, carry a coupon of 6.75%, have been rated Baa3 by Moody’s, BBB by S&P and a BBB by Fitch and present the typical amortizing structure of securitization notes, with final maturity October 2022 and average life of about 7 years.

The debt fund model and direct origination of infrastructure loans by institutional investors.

The debt fund model is probably the easiest way to approach the infrastructure market for institutional investors, even for the less sophisticated ones and those without a specific, dedicated team to invest in infrastructure assets. In the debt fund model, an institutional investor provides funding to a resource pool (the fund) managed by an asset manager. The strategic asset allocation is defined since inception and allows institutional investors to select the fund that best suits their investment needs. The success of the debt fund model requires a strong deal flow.

While debt funds can represent an important way to convey institutional investors’ money to infrastructure, the drawback is that - compared to partnerships or securitisations - they are based on fixed

and pre-agreed investment criteria, while the other two alternatives have more possibility to adapt the financial structures to their needs.

The market for debt funds is still very young and information available on the trends is very scarce. Probitas Partners (2013) report that infrastructure debt funds are attracting increasing interest. Almost negligible in 2011 in terms of total fundraising (less than 1%), they reached a remarkable 12% in 2012.

In 2012, BlackRock created a European Infrastructure debt platform focused on Germany, France, the UK and Benelux countries hiring a team of three persons from Blackstone's private debt business. In France, Natixis AM and AEW Europe raised €240m for their Senior European Loan Fund. La Banque Postale Asset Management raised €500m in late 2012 for a new real estate and infrastructure debt fund. At the beginning of 2013, Amundi announced that it had launched a €400m mid-market loan fund and La Française REM raised a first tranche of €150m for its senior real estate debt fund. Macquarie launched its infrastructure debt platform MIDIS in late 2012 and obtained a mandate to manage Swiss RE expected \$500m infrastructure investments in projects based in the UK and Northern Europe.

Again in the real estate sector, M&G (Prudential) reportedly has launched a senior debt fund for property lending.⁴⁶

The latest trend of institutional investors' debt financing for infrastructure is the direct origination of loans. This trend is confined to the most sophisticated investors that have decided to invest in internal skills development and to create internal teams dedicated to infrastructure investment. Anecdotal evidence indicates that in early 2012 Allianz Global Investors supposedly originated infrastructure loans. In the UK, Legal & General originated a £121m commercial real estate loan for student accommodation facilities. M&G (Prudential) originated a £266m senior loan to student housing projects in London and in 2013 it committed £290m funding for a hospital facility in Northwest England.

3.2 Barriers to private investment in infrastructure

Section 3.1 has indicated that financial markets have been able to create new financing solutions and contractual schemes to attract the growing interest of private investors for infrastructure. However, there are still some barriers that investors face before a full development of the funding potential.

3.2.1 Unstable regulatory settings/political interference

Contrary to the conventional wisdom according to which one of the barriers to private investment in infrastructure is the lack of financial support by the public sector, most of the surveys targeting infrastructure investors clearly indicate that public money in whatever form supplied to infrastructure *is not* the main concern. A survey conducted by Allen & Overy⁴⁷ demonstrates clearly that what investors require when approaching infrastructure investments is not primarily public financial support. Together with guarantees on funding, it ranks at the bottom of the list. Instead, robust rule of law and attractiveness of the regulatory environment together with a successful track record of other infrastructure projects closed are the most cited elements that drive the choice in which jurisdiction to invest in infrastructure. This piece of evidence is confirmed in the latest annual survey conducted by Probitas Partners. With specific reference to the interest of infrastructure investors for emerging markets, 45% of the respondents indicated a lower

⁴⁶ Although not directly linked to infrastructure, it is important to report also the launch of Debt funds dedicated to SME financing like the €500 mil European SME loan fund created by Rothschild.

⁴⁷ Allen & Overy (2009), Global infrastructure development and delivery - The stimulus for debate. Allen & Overy Global Survey.

degree of interest in the sector due to political, economic or currency risk.⁴⁸ The BLP-Preqin analysis indicates that the biggest threat perceived by 60% of the respondents to a sustained flow of deals in 2014 is government or regulatory interference/political risk.

Overall, the available data indicate a reinforced interest of institutional investors toward infrastructures. However, it is also important to notice that governments must understand that a transparent institutional and regulatory environment does matter and this must be fully implemented in order to attract institutional investors. Infrastructure is a strategic sector for a country and its political leaders, and projects are characterised by risks that refer to the investment (and as such are manageable with standard risk analysis and risk management for project finance deals, as seen in Section 2.2) but also to the regulatory and administrative law uncertainty. This uncertainty cannot be borne and managed by private sponsors and investors. Investors require a regulatory regime that is able to outlive government or a political majority. This is particularly true today when financial constraints have become more stringent and governments are reconsidering public spending in support to PPP projects, with more attention paid to value for money methodologies and affordability. More attention to public spending could lead to excessive political interference, risks of renegotiations and reduced interest by the private sector.

3.2.2. Financial intermediaries' regulatory constraints

The current framework of capital requirements for financial intermediaries has recognised great importance to strengthen their equity capital base. As a consequence, prudential regulation has played a major role in shaping the rules supervising the intervention of banks and institutional investors in investing in infrastructure. Most of the current debate among regulators and policymakers is exactly focused on striking a proper balance between protective versus restrictive regulations, meaning a balance between financial stability and the abundance of capital governments are looking for to boost infrastructure investments.

On the banks' side, the overall Basel II approach is not particularly favourable to project finance.⁴⁹ Furthermore, Basel III's net stable funding ratio (NSFR) rules have forced banks to look for a better maturity match between assets and liabilities and to reduce the tenor of project finance loans. As a result, mini perm structures are now used more frequently than in the past, adding additional refinancing risks with possible negative impacts on the default rate. Furthermore, project bonds and project bank loans are very unlikely to be considered as high quality liquid assets under the current draft of the NSFR rules.⁵⁰

On the insurance side, negotiations on the Directive level are now closed and the Solvency II regime will become applicable on 1 January 2016. In contrast to what happens to Basel II and III rules for banks, pensions funds and insurance companies have to invest their assets in accordance with the "prudent person rule". Assets have to be invested in the best interest of members and beneficiaries and customers and in such a manner as to ensure the security, quality, liquidity and profitability of the portfolio as a whole. According to Solvency II, a longer tenor Investment grade bond would receive a worse capital treatment than a shorter tenor high yield corporate loan⁵¹. Furthermore, EIOPA⁵² has published a technical report in

⁴⁸ Probitas Partners (2013), Infrastructure Survey and Trends.

⁴⁹ See Gatti S. (2012), Project Finance in theory and practice, II Edition, Academic Press.

⁵⁰ See Standard and Poor's (2012), BASEL III Hurdles on Project Finance - Will bond take over loan?

⁵¹ However, the resulting amount of required capital depends on the duration of each insurer's liability profile: the better the duration matching between assets and liabilities, the smaller the resulting capital requirements.

⁵² EIOPA (2013), Discussion Paper on Standard Formula Design and Calibration for Certain Long-Term Investments, April. See also Woodall, L (2012), Investment in infrastructure set to rise as insurers seek yield, Insurance Risk, December 6.

December 2013 taking into account opinions expressed by experts in the previous consultative period. While EIOPA has tried to better calibrate capital requirements for insurers' long-term investments in infrastructure, the results do not seem completely supportive to tailor a new treatment for infrastructure within the Solvency II standard formula.

3.2.3 Accounting Standards

The main purpose of a robust set of accounting standards is to provide investors with a transparent view of what happened to a firm in a given period of time. However, the specific characteristics of infrastructure are sometimes at odds with international standardised accounting principles. Two issues are important:

1. Measurement of profitability vs. cash flow performance;
2. Information uniformity that is imposed by international accounting standards.

Regarding point 1., the accounting treatment reserved to costs and revenues of a long-lived asset based on long-term contracts can be very different and can have different implications for the assessment of the performance of an asset. An example is represented by toll road contracts. Under former standards, the profits of a toll road long-term concession contract were recognised on a straight line basis on the overall life of the contract. This accounting treatment did not consider the real performance of a highway that typically requires a rump up period. Current standards recognise the non-linearity of revenues and cash flows and better reflect the current state of the contract and not the long-term profitability. This is an advantage from an investor point of view.

Regarding point 2., international accounting standards are not always able to recognise the specific business model of an infrastructure project. Reforms underway, particularly the IASB Conceptual Framework revision, will change the present state of play. However, the process will be long and some degree of uniformity in accounting treatment will remain unchanged with possible negative effects on the information provided to investors for the assessment of an asset's value.⁵³

3.2.4 Lack of historical information about infrastructure performance

A clear barrier to investments in infrastructure is the endemic unavailability of reliable data regarding infrastructure performance. Infrastructure investors are not in the position to assess the different degrees of risk of different phases of the project life and the natural effect is to force them to abandon potentially profitable projects simply because they lack a suitable benchmark panel of data. Furthermore, most of the documentation supporting the projects is subject to nondisclosure agreements.⁵⁴

⁵³ Another, more specific issue, refers to the accounting impacts of volatility. The new insurance contracts standard (IFRS4) and changes on classification and measurement under IFRS9 will lead to the recognition of gains and losses due to re-measurement of financial assets and liabilities to Other Comprehensive Income (OCI) rather than the income statement, with benefits in terms of income statement volatility. See Financial Stability Board (2013), Update on financial regulatory factors affecting the supply of long-term investment finance, Report to G20 Finance Ministers and Central Bank Governors, Basel, August.

⁵⁴ Similarly to what highlighted in the text, it is important to remind that in some sectors (ie. gas) there is a structural lack of reliable and widely accepted price indicators, reflecting industry-specific production costs and supply-demand fundamentals. Such a lack dampens long term contracts that are needed to underwrite major projects. For instance the persistent divergence between natural gas and oil prices has made oil-indexed gas price highly distortive and inefficient. Yet, there is no robust mechanism for gas price formation in place, despite the strong demand for different benchmarks and the need for long term

3.3 The role of the public sector in subsidising private intervention in infrastructure and Instruments and incentives for stimulating the financing of Infrastructure

Although public incentives are not perceived as essential by private investors for the participation of private capital to infrastructure financing, the role of the public sector in subsidising and/or incentivising private participation to infrastructure is important particularly in markets where the role of public entities is still dominant and the PPP model (see Section 2.1) is still underdeveloped or at a very early stage of use.

A possible simple taxonomy useful to classify public financial assistance is based on two main categories:

1. Assistance with direct impact on public resources (grants and contributions)
2. Assistance with indirect impact on public resources.

3.3.1 Assistance with direct impact on public resources

In these cases, the public sector subsidises the private intervention with contributions or grants, whose purpose is either to reduce the private commitment or to increase the return of an otherwise unprofitable project.

These contributions can take place during the construction phase or during the operational phase.

During the construction phase, the grants aim at decreasing the capital contributions that lenders and equity holders provide to the infrastructure, leading to higher returns for the private sector. Grants during construction can be for free or could require the payment of a price (usually a concession fee) to compensate the public sector and typically are disbursed based on a milestones timeline and backed up by bank guarantees (advance payment bonds and on-demand retention bonds). Sometimes, the public sector can also require parental company guarantees (PCG) to further strengthen the support packages during the construction phase. While these packages enhance the quality of the project limiting the occurrence of construction risk, it is important to remember that Basel III rules regarding the Liquidity Coverage Ratio (LCR) allow national regulators to set the level of this ratio required for bank guarantees and letters of credit. If the requirements are too high, banks will find it difficult to provide such products at a reasonable cost.⁵⁵

Contributions during the construction phase can also include the provision of public assets (asset recycling) and/or the possibility to use public land for free during the period of the concession. In other cases, the agreement between the public and private sector is focused on the rehabilitation of a public good where the private counterparty provides capital as well as construction and maintenance services without incurring the cost of an ex-novo Greenfield construction.

Examples of grants during construction are used in India and Indonesia, with the Viability Gap Funding Scheme covering up to 20% of the total project cost of infrastructure projects. The Scheme provides financial support in the form of grants, one time or deferred, to infrastructure projects undertaken through public private partnerships with a view to make them commercially viable.

contracts in the industry. The OECD will focus on new areas of research related to infrastructure as an asset class through the OECD Long term Investment Project www.oecd.org/finance/lti

⁵⁵ See Standard and Poor's (2013a), How to unlock long-term investment in EMEA infrastructure and Linklaters (2011), Basel III and project finance, London.

The other form of contribution is represented by subsidies during the operational phase. Typically, these forms of incentives are either revenue increase/revenue stabilisation or a cost reduction, with both contributing to an increased cash flow performance of the infrastructure. Examples of the former are feed-in tariffs in the renewable energy sector (i.e. forms of subsidy paid for producer of renewable energy to incentivize them to move away from conventional fossil fuels), the provision of a floor protection against drop in traffic volumes in the transportation sector, a minimum rental payment in students' accommodation/social housing projects⁵⁶. In a sense, availability-based payments in the schooling/social housing/hospital sectors discussed in Section 2.1 are also examples of revenue contribution. Examples of cost reductions are the contributions to debt service, when the public entity pays a portion of the interest payment/margin that the project bears during the amortising period of the loans or any form of tax relief that reduces the tax burden of the infrastructure project and increases the return to private investors. Examples of tax relief have been used in Brazil and India. In Italy, in May 2013, the "To Do Decree" has introduced a tax credit and a reduction of the concession fee paid to the public entities for PPP projects larger than €200m that do not benefit from public grants in order to allow the private parties to reach economic profitability in investing in the projects. In case of *public projects* – which however are outside the scope of this report – the case of Korea with Social Overhead Capital Bonds and the US with the Build America Bonds are other examples of tax incentives.

3.3.2 Assistance with indirect impact on public resources

The map of the possible interventions the public sector can put in action with indirect effects on public resources is huge and hard to be categorised. However, a broad classification can be done based on two dimensions: i) the type of instruments used and ii) the entity that intervenes in infrastructure projects.

Regarding the first dimension (type of instruments used), the options are typically funded or unfunded.

Funded options include any form of co-investment with the private sector. In contrast with contributions during construction or during the operational phase that are financed by taxation and do not require any form of compensation or compensation below standard market rates of return, the co-investment agreement is based on the assessment of the infrastructure's profitability and the final objective is to get a level of return proportional to the risk taken in the project. The co-investment can take the form of equity, subordinated/mezzanine debt or a debt contribution provided directly to the infrastructure or indirectly via investment vehicles for infrastructure.

Unfunded options are represented by public guarantees or back-up liquidity facilities that are provided to an infrastructure's creditors to overcome structural problems incurred during its development. This back-up support represents a credit enhancement provided to improve the attractiveness of the project for private investors. The guarantee to creditors can include or not a maximum cap in percentage of the total senior debt borne by the infrastructure. Furthermore, unfunded options can include a guarantee in case of refinancing risk; particularly for mini perm structures that require an important bullet repayment after a limited number of years of the operational phase.⁵⁷ Examples of unfunded options are represented by the

⁵⁶ For example, recently the University of Sheffield provided Catalyst Higher Education PLC a guarantee package represented by a minimum rental payment for the construction of a students' accommodation facility. More generally, availability-based payments are ways to provide relief to the private sector against market risk. In these cases, in fact, the public administration (and not the market) pays for the availability of the infrastructure a given periodic payment based on the availability of the infrastructure (from here the term availability payment). See Standard and Poor's (2013b) Why UK University Student Accommodation Projects are satisfying Investors' Appetite for Long-Term Infrastructure Debt, August.

⁵⁷ The cases of Korea and Turkey are very close to a guarantee for refinancing risk. In Korea, the Infrastructure Credit Guarantee Fund provides guarantees on the liabilities of a PPP concessionaire including repayment of

liquidity back-up facility of the 2020 Project Bond Initiative started by the European Union and the EIB, the unconditional UK Guarantee Scheme, the Singapore Government guarantee on debt via Infrastructure Guarantee Fund (IGF). The TIFIA (Transportation Infrastructure Finance and Innovation Act) in the USA is instead a mix of funded and unfunded options. On the funded side, the program can mobilise public capital in co-investment with the private sector with favourable terms as to maturity and debt repayment schedule. On the unfunded side, the Program provides loan guarantees to private creditors and standby letter of credit in the first ten years of the operational life of the project. Similarly, the EIB Loan Guarantee for TEN-T projects in the EU (LGTT) provides guarantees to the private sector by means of a demand risk transfer during the early years of operations of PPP procured transportation infrastructure. If the guarantee is enforced, the EIB funds are subordinated to senior lenders and act as a typical credit enhancement mechanism.⁵⁸

Regarding the second dimension (entity that intervenes in the infrastructure project), funded or unfunded schemes are provided by a number of alternative players.

1. *Multilateral institutions*: in this case, a state participates in the capital of a multilateral bank that in turns participates in infrastructure via funded or unfunded assistance programs.⁵⁹
2. *National development banks*: these are entities set up by the government with the purpose to invest in strategically important initiatives. Their intervention is not limited to infrastructure. Appendix 2 provides a list of examples of national development banks and their scope of intervention.
3. *Publicly sponsored infrastructure funds*: in this case, the State sets up an entity that participates – based on private eligibility criteria – in infrastructure investments in association with the private sector. Similar to infrastructure funds, although with a broader asset allocation policy, are sovereign wealth funds (see Section 3.1.1.). Their intervention is for the most part in equity form but it can be possible to participate with subordinated/hybrid or debt instruments. International examples of publicly sponsored infrastructure funds are provided in Appendix 3.

Conclusions

The recent financial crisis and the spillover of the crisis to sovereign debt, the reforms of capital requirements for banks and insurance companies and increased levels of market uncertainty have strongly reduced the availability of public and private capital for infrastructure development in spite of the need to revamp long-term investments worldwide. The infrastructure gap is relevant globally; yet, the capital available to fill in the gap seems not enough.

If traditional public procurement and public spending for infrastructure seem unfeasible in the medium to long term for reasons of inefficiency, resources misallocation and budgetary constraints, then

bridge loans. In Turkey, the PPP legislation includes a “debt assumption clause” whereby the Treasury assumes the outstanding amount of the loan still due to creditors in case the project is terminated via a takeover of the facility by the public entity.

⁵⁸ The Cession de Créances and the Forfaitierungmodell in France and Germany respectively reach a similar goal. In these schemes, the State guarantees that the service charge it has undertaken to pay to a project sponsor during the operational phase will not fall below the level that allows them to service the debt, irrespective of project performance.

⁵⁹ The complete analysis of multilateral institutions intervention in infrastructure development goes beyond the scope of this report. For a complete review, see Chapter 6 in Gatti S. (2012), *Project Finance in theory and practice*, Academic Press.

the problem becomes how to create institutional and market conditions able to attract private capital to a greater extent and from investors other than the more traditional bank lenders and industrial developers.

Data indicate the existence of a large funding potential among (traditional and non-traditional) institutional investors available for infrastructure investments and the willingness especially of long-term investors like insurance companies and pension funds to allocate more resources to this alternative asset class. However, barriers to investments still exist.

From a policymaker's standpoint, the analysis of this report does not indicate the existence of first best policies to be implemented. This will be the focus of the G20 Survey on Government and Market based incentives to stimulate the financing of long term investment, the OECD will launch in the next weeks. Policymakers face some key trade-offs that require a clear political response, even more than an economic one, to reach the objective an increased flow of funds to infrastructure:

1. *The trade-off between financial stability and certain abundance of invested capital.* While it is legitimate from the regulators' standpoint to care about global financial stability, excessive capital requirements for investors and constraints on their investment choices could penalise the allocations of capital for infrastructure. However it is well understood that there have been - and should be - desirable deleveraging following the financial crisis of 2008. Higher stability implies fewer funds are available for investment; lower stability could shift capital commitments to a less regulated part of financial sector. Furthermore, in some cases, current regulations do not seem to fully understand the peculiar business model of infrastructure investment and their lower default and higher recovery rates as compared to more traditional investments in corporate loans and bonds.
2. The trade-off between increased financial public support (funded or unfunded options) and value for money/risk taking by the private sector. While in the past PPPs have shown good results in terms of cost efficiency, recent data and academic research have demonstrated that excessive risk taking by the public sector de-incentivises the private sector to carry out careful risk analysis and risk management, leading to moral hazard and ultimately to lower value for money for the public sector.
3. A frequent misconception is that the private sector must be incentivised to participate in infrastructure by providing financial support by the public sector in the form of grants, tax reliefs, co-investment, and the provision of guarantees. Actually, empirical evidence indicates that financial public support is not the most relevant factor investors look at when deciding to allocate resources to infrastructure in a given country. More important factors are a clear institutional framework, transparent bidding and awarding procedures, a robust rule of law, and the absence of political interference. Incidentally, higher public intervention with financial support typically triggers a higher probability of political interference in project management and of contract renegotiation, something that private investors are not comfortable with.

APPENDIX 1: MAIN PPP CONTRACTUAL SCHEMES

Type of PPP	Contractual Description	Main fields of application
O&M (Operations and Maintenance)	The public body (<i>contractor</i>), usually a municipality or a local public contractor, negotiates with a private partner (<i>operator</i> , one single firm or a consortium) the management and maintenance of a public infrastructure	Local public services: water and sewerage services, waste management, green parks maintenance, road maintenance, parking lots management
DB (Design-Build)	The public body negotiates with private partners the design and construction of a facility that must be compliant with minimum performance standards set by the public party. Once the construction is completed, the public body retains the ownership of the facility and manages it.	Public infrastructure: roads, toll roads and highways, water and sewerage, leisure facilities (sport centres) and public utility works.
TK (Turnkey)	The public sector provides funding for the project but involves private counterparties for the design, construction and management of the facility for a predefined period of time (usually long-term). The public entity requires the private partner to be compliant with minimum performance standards and is the owner of the facility.	Public infrastructure where the government has the interest to maintain ownership but also wants to get private involvement for the construction and management services (water and sewerage, public buildings, sport facilities and stadiums)
Wraparound Addition	A private partner builds and finances an add-on facility to an existing one and manages the new facility for a predefined period.	Similar to the TK scheme but in this case the public entity does not provide funding which is in charge to the private sector.
Lease-Purchase	The private sector provides funding and builds a new facility that is then leased to the public entity. The public party makes periodic leasing payments to the private party and has the right to acquire the facility at the end of the leasing contract.	Public buildings, water and sewerage, waste management, IT and hardware.
Temporary Privatisation	Similar to the wraparound addition. However, in this case the ownership of a public facility is transferred to a private partner in order to be restructured or expanded. The facility is managed by the private party until the public sector hasn't completely repaid the investment.	Public infrastructure: roads, water and sewerage, parking lots, public buildings, sport facilities, airports.
DBO (Design-Build-Operate)	The private partner stipulates with the public body a single contract whereby it provides design, construction and management of a public facility. The public sector retains the facility ownership.	Similar to temporary privatisation
BDO/LDO (Buy/ Lease-Develop-Operate)	The private party leases or buys a facility from the public sector in order to modernise or expand it. Then, it manages the facility for a period of time that is sufficient to repay the investment and get a sufficient rate of return.	Similar to temporary privatisation

BOT (Build-Operate- Transfer)	<p>The private partner builds a facility compliant with the standards agreed with the public entity. Then, it manages it for a given period of time and transfer the facility at the end of the concession period. The project should repay the investment made by the private sector during the concession period.</p>	<p>Similar to temporary privatisation</p>
BOOT o DBFO⁶⁰ (Build-Own- Operate- Transfer)	<p>The private sector stipulates a concession agreement with the public body and obtains the ownership of the facility. It is entitled to design, build and operate/maintain the facility. Funding is provided by the private partner who has the right to retain the revenues coming from the management of the facility during the concession period. The concession period must be sufficiently long so to enable private partners to pay back the investment and get an adequate return on investment. At the end of the concession, the facility ownership is returned to the public sector.</p>	<p>This is the most used form of Private Finance Initiative (PFI) in UK and involves a wide range of public infrastructure: water and sewerage, sport and leisure facilities, airports, public buildings, parking lots, waste management</p>
BOO/LOO (Build- Own-Operate)	<p>The public sector transfers to the private sector ownership and management of an existing facility or negotiates with the private partner the construction and management of a new facility that will not be transferred by the private sector (as it happens under a BOOT scheme). The provision of funding is in charge to the private sector.</p>	<p>Similar to the BOOT scheme, although this contractual arrangement looks more like a privatisation</p>

⁶⁰ DBFO (Design-Build-Finance-Operate) is the term used in the US to identify BOOT schemes.

APPENDIX 2: EXAMPLES OF INTERVENTION OF NATIONAL DEVELOPMENT BANKS

Country	Institution	Activities
Argentina	Investment and Foreign Trade Bank (BICE)	Funded options
Brazil	Brazilian Development Bank (BNDES – Banco Nacional de Desenvolvimento Econômico e Social)	Funded options and unfunded options
China	China Development Bank (CDB)	Funded and unfunded options for infrastructure development
France⁶¹	Caisse de Dépôts and consignations (CDC)	Operates in “public interest investments” including infrastructure
Germany	Kreditanstalt für Wiederaufbau (KfW)	Operates in funded and unfunded schemes for infrastructure investments
India	National Bank for Agriculture and Rural Development (NABARD)	Funded options at reduced cost for the development of rural infrastructure projects
Italy	Cassa Depositi e Prestiti (CDP)	Funded and unfunded options for infrastructure development
Russia	Vneshekonombank (VEB)	Funded and unfunded options and consulting for infrastructure projects development
Saudi Arabia	Saudi Industrial Development Fund (SIDF)	Funded options and consulting for the development of industrial projects
South Africa	Development Bank of Southern Africa (DBSA)	Funded and unfunded options for infrastructure development
Spain	Instituto de Crédito Oficial	Funded and unfunded options for infrastructure development

⁶¹ CDC, CDP, ICO and KfW participate also in EIB-sponsored infrastructure equity funds, among others the Marguerite Fund (transportation, Energy and environment) and InfraMed (Energy, environment, transportation and social infrastructure).

APPENDIX 3: EXAMPLES OF INTERVENTION OF NATIONAL DEVELOPMENT BANKS

Country	Institution	Activities
Argentina	Sustainable Guarantee Fund (FGS)	Invests resources of the pension system, including investments in infrastructure
India	India Infrastructure Finance Company Ltd. (IIFCL)	Invests resources in private infrastructure projects via loans, refinancing of loans granted by financial institutions, subordinated loans.
Indonesia	Asian Development Bank ASEAN Infrastructure Fund	ASEAN infrastructure fund is a regional pool of resources dedicated to infrastructure investment
Italy	Fondo Strategico Italiano	Operates in a number of sectors, including investments in listed infrastructure/utilities
Mexico	National Infrastructure Fund (Fonadin – Fondo Nacional de Infraestructura)	Operates in the field of infrastructure PPPs and provided funded and unfunded options to projects
Spain	Fond-Instituto de Crédito Oficial (FOND-ICO)	Operates in the investment of equity and hybrid debt/subordinated debt in infrastructure development

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