

Financing infrastructure – International trends

by

Raffaele Della Croce and Stefano Gatti*

The infrastructure financing market has gone through a process of radical transformation starting from the mid-2000s. Different reasons – including a changed macroeconomic environment, more stringent regulations on financial intermediaries, and a modified appetite for long-term asset investments – have led to a reallocation of flows from the banking sector to the institutional investors sector. This article provides an overview of international trends in infrastructure finance. It proposes a map of the different investment channels that private investors can use to access the infrastructure investment on the equity and debt side, highlighting the historical evolution of these segments in the past few years. Recently designed financial structures, such as different forms of partnership between banks and institutional investors, securitisation models and debt/credit fund vehicles, are also taken into consideration.

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* Raffaele Della Croce is the Lead Manager for the Project on Institutional Investors and Long-Term Investment (www.oecd.org/finance/lti) in the OECD Directorate of Financial and Enterprise Affairs. Stefano Gatti is Director of the Bachelor Programme in International Economics and Finance (BIEF) and Associate Professor of Banking and Finance at Bocconi University, Milan, Italy. This paper is part of the OECD Project on Institutional Investors and Long-Term Investment and is based on research produced for the G20. An extended version of this paper will be published as a chapter in S. Caselli, G. Corbetta and V. Vecchi, *Public Private Partnerships for Infrastructure and Enterprise Funding: Principles, Practices and Perspectives*, Palgrave, New York, scheduled for publication in 2015. The authors are solely responsible for any remaining errors. This work is published on the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries. This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

1. Introduction

The problem of public financing of infrastructure is a topic on top of policymakers' agendas worldwide. Budget constraints, past experiments of poor public spending and inefficiencies in managing infrastructure on the public side have led to a reconsideration of the need to shift the investment effort to the private sector and to the development of Public Private Partnerships (PPPs).

However, the gap to be filled is remarkable.

The McKinsey Global Institute (2013) estimates an accumulated infrastructure investment need up to the year 2030 of between USD 57 tn and USD 67 tn, excluding the needs for social infrastructure. In the Western Economies, the European Commission (2011) estimates that, by 2020, Europe will need between EUR 1.5 tn and EUR 2 tn of infrastructure investments.

In the United States, the American Society of Civil Engineers (2013) quantifies a total current infrastructure investment gap of USD 1.7 tn and a need for additional investments of about USD 3.6 tn by the end of 2020.

The situation of emerging markets is similar, although the room for additional public spending is higher than in Western Europe and in the United States due to lower public debt over GDP ratios. The McKinsey Global Institute (2013) indicates that from 2008 to 2017, infrastructure spending is expected to be USD 9 tn in China, USD 2.7 tn in India, USD 2 tn in Russia and USD 1tn in Brazil.

Shifting infrastructure financing from the public to the private sector poses important challenges. First, the amount of money needed to fill the infrastructure gap is far from being negligible. Second, financial markets and intermediaries are required to play an important role in shaping financial contracts and financial solutions able to attract the highest number of investors. In order to play this role, policy makers should better understand who these investors are and which are the most suitable financial solutions that can be tailored to accommodate their investment needs.

It is now widely agreed that large institutional investors such as pension funds, sovereign wealth funds and insurance companies with long-term liabilities and a low risk appetite seem well-suited to invest in infrastructure assets with a low risk profile. Despite the theoretically ideal match between a large source of capital and an asset class in need of investment, the uptake of institutional investors has been slow. In addition to the lack of a transparent and stable regulatory framework this has been *inter alia* due to negative experiences with earlier investments, discontent with the vehicles used to access infrastructure assets, and a lack of government facilitation.

The objective of this article is to provide an overview of international trends in infrastructure finance. As we will show, the infrastructure financing market has gone through a process of radical transformation starting from the mid-2000s. Different reasons – a changed macroeconomic environment, more stringent regulations on financial

intermediaries, a modified appetite for long-term asset investments – have led to a reallocation of flows from the banking sector to the institutional investors sector. We believe that this trend will be confirmed in the years to come.

The rest of the article is organised as follows. Section 2 presents an overview of the different channels that the private sector can use to invest money in infrastructure. We identify two basic sources of financing, debt and equity, which we analyse in more detail in Sections 3 and 4, respectively. In Section 3 we first introduce data of the syndicated loans market for project finance and then explore the evolution of the debt market toward capital market instruments (project bonds) and recently designed financial structures like banks-institutional investors partnerships, the securitisation model and debt/credit fund vehicles. Section 4 is dedicated to equity instruments and to institutional investors that typically provide funds in the form of equity. We first look at the evolution of the market in unlisted equity infrastructure, focusing on the role of institutional investors, to then briefly look at recent initiatives in the equity market. Our focus is on pension funds, insurance companies and sovereign wealth funds. Section 5 concludes.

2. Private capital for infrastructure finance: An overview of the possible alternatives

If we consider the point of view of a private investor, either a debt or pure equity investor, infrastructure represents an interesting alternative asset class. Infrastructure projects show interesting characteristics vis-à-vis more traditional asset classes. We summarise them in Table 1.

Table 1. **Typical characteristics of infrastructure investments**

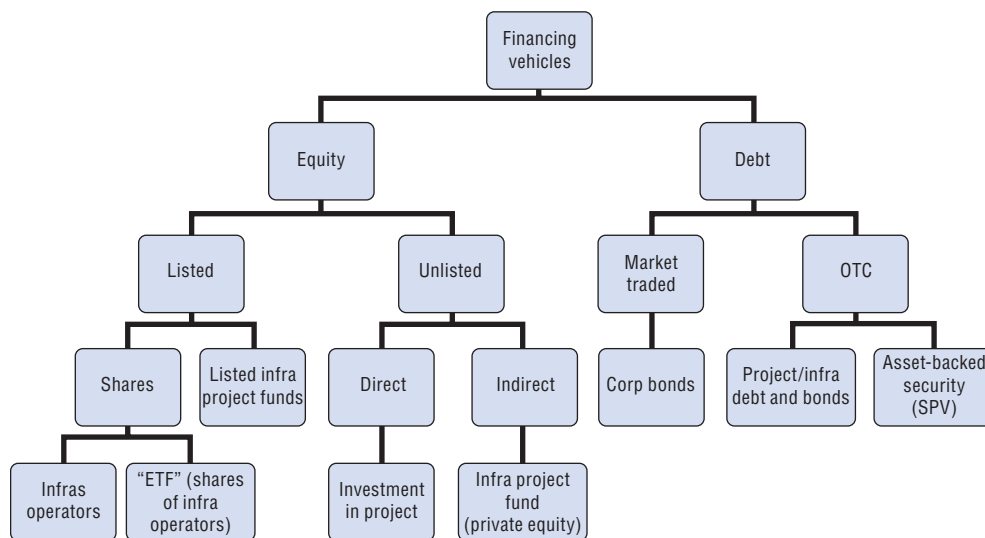
| |
|--|
| Long-term assets with long economic life |
| Low technological risk |
| Provision of key public services |
| Strongly non-elastic demand |
| Natural monopoly or quasi monopoly market contexts |
| High entry barriers |
| Regulated assets |
| Frequent natural hedge against inflation |
| Stable,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

Source: Gatti (2012b).

Infrastructure can be financed using different capital channels. The evolution of capital markets shows that financial innovation develops new financial tools able to attract a larger amount of funds in response to supply (the infrastructure gap shown in Section 1) and demand (the search for asset classes that are suitable for a given asset allocation).

Figure 1 provides an overview of the different alternatives available to private investors. It first divides the instruments into equity and debt. Equity and debt can be listed and traded on an exchange (public) or unlisted and traded over the counter (OTC; private). In the case of listed equity and market-traded debt we make reference to a traditional investment in listed infrastructure. This is the area where mutual funds and exchange-traded funds (ETFs) have developed products to be included in the portfolios of retail investors, high net worth individuals and institutional investors.

Figure 1. **Different channels to infrastructure investments available to the private sector**



Source: Della Croce and Sharma (2014).

Unlisted equity or OTC debt, instead, do not benefit from an active liquid secondary market. For this reason, they are typical “buy and hold” asset classes, suited to long-term investors with a clear preference for stable – rather than exceptionally high – returns.

The lack of liquidity of these instruments implies that the universe of possible interested investors is only a subset of the more general group of investors on debt and equity markets. Not only is it a matter of volumes, but also of different competencies required to assess the risk and return of this asset class. An investor in unlisted infrastructure must be able to assess the risk/return profile of the infrastructure throughout its economic life including its construction phase (greenfield investments) and during the operational phase (brownfield investments). This ability is even more important if the investment is made directly in the equity of the project or if the investor lends directly money to the project (see Section 3.2). However, the need for additional and more sophisticated valuation skills remains also in the case of the indirect investment in unlisted infrastructure (i.e. private equity infrastructure funds or debt/credit funds, see Sections 4 and 3.2 respectively). In fact, the risk analysis process is carried out by the asset management company/general partner on behalf of the investors that must show specialised capabilities in the field.¹

As a result of the liberalisation in the 1980s and privatisation of infrastructure assets, infrastructure investments were often characterised as investments in unlisted equity. Other options for investors have included investing in listed infrastructure companies or listed indices, but the advantages of gaining exposure to true long-term economic infrastructure through these products has been questioned.

However, the most widespread financial technique that financial markets have developed for the participation of private capital in unlisted infrastructure is project financing. In project finance, equity investors, banks and other lenders invest money on the exclusive basis of a stand-alone valuation of a single infrastructure project. This single project is incorporated in a Special Purpose Vehicle (SPV). On the equity side, the project is

financed off balance sheet by industrial developers, public bodies and financial investors (known as project sponsors) while debt is provided on a no – or limited-recourse basis. The assets of the SPV become collateral for the loans although they play a secondary role compared to project cash flows. Furthermore, rights and obligations associated with an investment project are related to the SPV only. The separate incorporation of the project in a specially designed vehicle is justified by the need of investors to enhance the transparency of the valuation process. The existence of a SPV implies that previous liabilities of sponsors do not reduce the credit rights of the lenders of the vehicle and the no- or limited recourse clause excludes the co-insurance effect of a traditional corporate finance transaction. The result is that investors interested in a specific project can focus their valuation only on a given, well ring-fenced transaction.

In the following sections, we provide indications about the development of the market for debt and equity related to project finance starting from the debt side. The reason is twofold. First, project finance is a structured finance transaction characterised by a high debt/equity ratio, a factor in common with other structured deals like securitisation and asset-backed securities. Hence, debt plays a fundamental role for the financing of these transactions. Second, the market of project finance of PPPs – that can be considered a subset of this financial technique if structured in the build-operate-transfer (BOT) or build-own-operate-transfer (BOOT) form – is in all aspects a segment of the syndicated loans market. This market played and still plays today a fundamental role in supporting infrastructure financing. The equity portion, for a very long period of time, was provided by industrial developers and before the mid-2000s institutional investors were almost inexistent.

Starting from debt, then, is convenient for our purposes, also to frame the analysis in a historical perspective.

3. The market for infrastructure debt

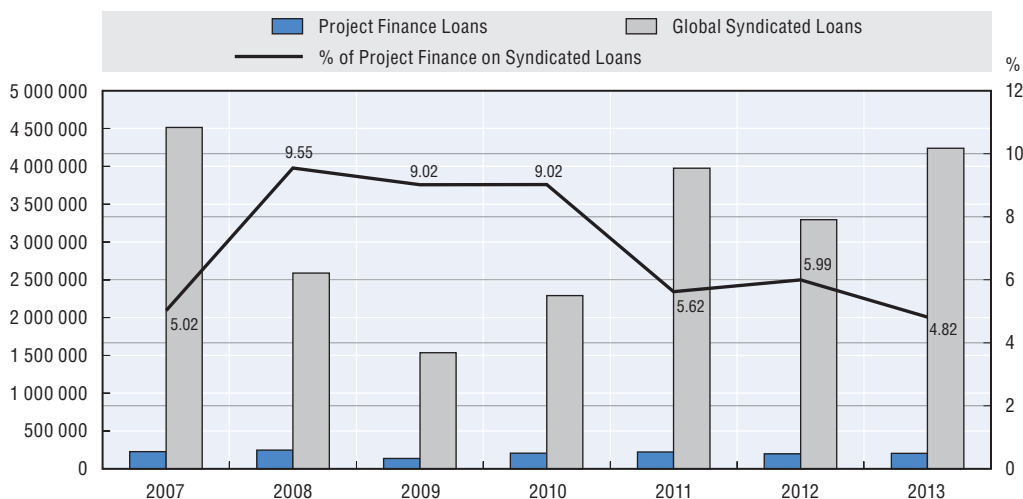
3.1. Project finance and loans

Project finance debt has started to be used in the United States since the early 1930s in oilfield development and later in Europe at the beginning of the 1980s. It has been systematically used since then in a number of sectors in association with large-scale infrastructure projects. Debt has been used in the form of syndicated loans, with a pool of banks headed by one or more Mandated Lead Arrangers (MLAs) that organise the financing package for a single borrower.

The development of the market has seen a period of very significant growth until the outburst of the 2007-08 financial crisis. According to Thomson OneBanker data, in 2008 the global project finance loans market reached a record peak of USD 247 bn but then declined sharply in 2009, and recovered somewhat thereafter, to an amount of USD 204 bn at the end of 2013. At the end of 2013, project finance accounted for slightly less than 5% of syndicated loans worldwide after, again, a peak of over 9% reached in 2008 (Figure 2).

Project finance is used worldwide to support infrastructure financing. The geographic breakdown of loan volumes indicates a concentration of project finance loans in four significant geographic areas – Western Europe, North America, Africa and Middle East, and South Asia – which respectively account for around 19.2%, 18.5%, 14.4%, and 7.3% of the total value of project finance loans in 2013 (Table 2). These figures are pretty stable over time.

Figure 2. **Evolution of syndicated and project finance loans worldwide**
In USD million (l.h.s.) and per cent shares (r.h.s.), 2007-13



Source: Thomson OneBanker.

In terms of sectors where project finance loans are used, data show that developing countries and emerging economies still adopt the technique for economic infrastructure (energy and power, mining and natural resources, oil and gas, transportation and telecoms), whereas industrialised countries increasingly use project finance loans to finance also social infrastructure. Considering global data, Thomson OneBanker data indicate that power, oil and gas (54%, end-2013), and transportation (20%) were the most representative sectors in terms of project finance lending volumes (Table 3).

3.2. Project bonds

The alternative to syndicated loans is represented by the financing of infrastructure projects on the bond market. In this case, we refer to project bonds, i.e. bonds that are issued by the SPV and sold to either banks or, more frequently, to other bond investors. The bond can be a straight bond, whose creditworthiness depends on the cash flow performance of the vehicle, or a secured bond assisted by credit enhancement (CE) mechanisms. In the past few years, at least until the outburst of the financial crisis, one of the most used forms of CE was a monoline insurance provided by highly rated monoline institutions.

By looking at the data, project bonds still represent a limited amount of the total debt committed to infrastructure financing, although increasing rapidly. During the 2007-12 period, the amount issued by SPVs via project bonds bounced between USD 8.5 bn and USD 27 bn (Figure 3). 2013 registered a record amount of USD 49 bn in project bonds issues representing slightly more than 24% of the total debt provided to infrastructure. The strong increase between 2012 and 2013 was in part due to the overall decline of bond yields on all major asset classes and the consequent need for fixed income investors to find other investments with a better risk/return profile than more traditional sovereign and corporate bonds.

The breakdown by geographical areas and sectors shows a clear concentration on some sectors (infrastructure, power, social infrastructure, and oil and gas) and a polarisation in United States/Canada, UK and Western Europe, with the latter losing ground in the final part of the period under examination (Table 4 and Table 5).

Table 2. Global project finance by geographic area
In USD million, 2011-13

| | 2011 | | | 2012 | | | 2013 | | |
|------------------------------|------------|--------|-------------------|------------|--------|-------------------|------------|--------|-------------------|
| | Amount | Number | % of total amount | Amount | Number | % of total amount | Amount | Number | % of Total amount |
| Central America | 1 879.20 | 9 | 0.9 | 7 890.00 | 20 | 4.0 | 2 406.00 | 9 | 1.2 |
| South America | 11 680.60 | 27 | 5.4 | 9 379.80 | 27 | 4.7 | 11 198.50 | 32 | 5.5 |
| Caribbean | 1 156.00 | 3 | 0.5 | 25.00 | 1 | 0.0 | 52.50 | 1 | 0.0 |
| North America | 23 589.40 | 78 | 11.0 | 22 102.70 | 80 | 11.2 | 37 711.10 | 97 | 18.5 |
| Total Americas | 38 305.20 | 117 | 17.9 | 39 397.50 | 128 | 19.9 | 51 368.10 | 139 | 25.2 |
| Africa and Middle East | 16 870.50 | 29 | 7.9 | 20 717.50 | 42 | 10.5 | 29 335.10 | 53 | 14.4 |
| North Africa | 0.00 | 0 | 0.0 | 4 488.80 | 3 | 2.3 | 0.00 | 0 | 0.0 |
| Sub Saharian Africa | 5 786.00 | 15 | 2.7 | 9 403.60 | 25 | 4.8 | 11 032.30 | 35 | 5.4 |
| Middle East | 11 084.50 | 14 | 5.2 | 6 825.10 | 14 | 3.5 | 18 302.80 | 18 | 9.0 |
| Europe | 67 443.80 | 211 | 31.4 | 46 298.40 | 176 | 23.4 | 52 715.20 | 189 | 25.8 |
| Eastern Europe | 15 302.00 | 21 | 7.1 | 9 030.50 | 21 | 4.6 | 13 609.70 | 27 | 6.7 |
| Western Europe | 52 141.80 | 190 | 24.3 | 37 267.90 | 155 | 18.9 | 39 105.50 | 162 | 19.2 |
| Central Asia | 570.00 | 2 | 0.3 | 2 914.00 | 2 | 1.5 | 7 960.00 | 5 | 3.9 |
| Total EMEA | 84 884.30 | 242 | 39.6 | 69 929.90 | 220 | 35.4 | 90 010.30 | 247 | 44.1 |
| Australasia | 23 382.00 | 52 | 10.9 | 42 566.50 | 34 | 21.5 | 21 614.10 | 46 | 10.6 |
| Southeast Asia | 14 035.90 | 41 | 6.5 | 13 530.30 | 31 | 6.8 | 13 709.90 | 53 | 6.7 |
| North Asia | 6 449.60 | 21 | 3.0 | 8 093.30 | 34 | 4.1 | 8 984.00 | 20 | 4.4 |
| South Asia | 45 925.70 | 124 | 21.4 | 21 643.60 | 83 | 11.0 | 14 916.60 | 48 | 7.3 |
| Japan | 1 524.10 | 16 | 0.7 | 2 365.50 | 11 | 1.2 | 3 537.80 | 28 | 1.7 |
| Total Asia-Pacific | 91 317.30 | 254 | 42.6 | 88 199.20 | 193 | 44.7 | 62 762.40 | 195 | 30.7 |
| Total Global Project Finance | 214 506.80 | 613 | 100.0 | 197 526.60 | 541 | 100.0 | 204 140.80 | 581 | 100.0 |

Source: Thomson OneBanker.

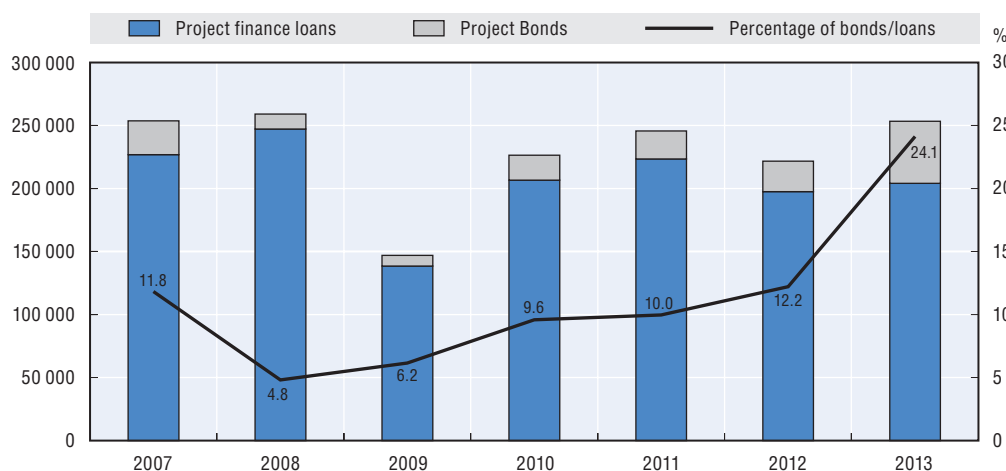
Table 3. Global project finance by sector
In USD million, 2011-13

| | 2011 | | | 2012 | | | 2013 | | |
|--------------------------------|------------|--------|-------------------|------------|--------|-------------------|------------|--------|-------------------|
| | Amount | Number | % of total amount | Amount | Number | % of total amount | Amount | Number | % of Total amount |
| Power | 81 534.20 | 299 | 38.0 | 64 014.60 | 283 | 32.4 | 70 077.00 | 342 | 34.3 |
| Transportation | 44 724.00 | 110 | 20.8 | 40 202.40 | 94 | 20.4 | 40 715.20 | 75 | 19.9 |
| Oil and Gas | 39 391.70 | 63 | 18.4 | 60 681.00 | 56 | 30.7 | 39 862.40 | 60 | 19.5 |
| Petrochemicals | 4 364.80 | 11 | 2.0 | 4 311.10 | 11 | 2.2 | 10 719.00 | 9 | 5.3 |
| Leisure, real estate, property | 14 494.00 | 57 | 6.8 | 10 413.90 | 47 | 5.3 | 7 771.70 | 34 | 3.8 |
| Industry | 12 154.90 | 17 | 5.7 | 7 605.40 | 12 | 3.9 | 16 768.30 | 15 | 8.2 |
| Water and sewerage | 997.20 | 8 | 0.5 | 3 285.20 | 12 | 1.7 | 6 511.80 | 14 | 3.2 |
| Mining | 10 328.60 | 27 | 4.8 | 4 513.60 | 15 | 2.3 | 5 495.70 | 17 | 2.7 |
| Telecommunications | 5 314.00 | 10 | 2.5 | 1 529.10 | 4 | 0.8 | 4 332.10 | 7 | 2.1 |
| Waste and recycling | 724.10 | 8 | 0.3 | 842.30 | 6 | 0.4 | 1 887.40 | 8 | 0.9 |
| Agriculture and Forestry | 479.00 | 3 | 0.2 | 128.00 | | 0.1 | | | 0.0 |
| Total Global Project Finance | 214 506.50 | 613 | 100.0 | 197 526.60 | 540 | 100.0 | 204 140.60 | 581 | 100.0 |

Source: Thomson OneBanker.

Compared to syndicated loans, project bonds present some contractual features that make them more attractive to institutional investors rather than banks. First, bonds are more standardised capital market instruments and show better liquidity if the issue size is sufficiently large to generate enough floating securities. A higher degree of liquidity can trigger a lower cost of funding vis-à-vis syndicated loans. Second, larger issues can become a constituent of bond indices, adding further interest for benchmark strategies of bond

Figure 3. **Trends of project bonds**
In USD million (l.h.s.) and per cent (r.h.s.), 2007-13



Source: Thomson One Banker, Project Finance International.

Table 4. **Project bond issues by country**
In USD million, 2006-13

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------------------------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|
| Americas (ex United States) | 566 | 1 394 | 198 | 200 | 396 | 949 | 2 160 | 3 667 |
| United States | 4 482 | 7 055 | 5 266 | 3 645 | 4 905 | 4 264 | 7 111 | 13 506 |
| Canada | 2 536 | 3 002 | 1 738 | 877 | 4 521 | 4 131 | 2 076 | 2 064 |
| Brazil | 683 | | | | | 3 324 | 3 642 | 3 452 |
| Mexico | 1 080 | 259 | 700 | | | 552 | 2 070 | 3 874 |
| Western Europe | 2 428 | 6 153 | | | 260 | 700 | 104 | 10 552 |
| UK | 8 938 | 4 355 | 2 968 | | 3 276 | 4 732 | 2 538 | 4 214 |
| Central Europe and CIS | 561 | | | | | | | 2 007 |
| Middle East and North Africa | 2 800 | | | 3 477 | | 999 | 1 300 | 2 822 |
| Sub-Saharan Africa | | 246 | 48 | | 1 842 | 115 | 174 | |
| Malaysia | 356 | | 473 | | | 1 500 | 2 406 | 542 |
| Korea | | | 164 | 139 | | | | |
| India | | | | | | | 546 | |
| South Africa | | | | | | | | 111 |
| Thailand and Indonesia | | | | | | | | 500 |
| Australasia | 4 263 | 4 359 | 330 | 188 | 4 590 | 1 013 | | 1 944 |
| Total | 28 693 | 26 823 | 11 885 | 8 526 | 19 790 | 22 279 | 24 127 | 49 255 |

Source: Adapted From *Project Finance International* 2008-2014 various issues.

market investors. Third, project bonds can be issued with maturities longer than the tenors of syndicated loans that banks normally accept.

However, existing evidence on the asset allocation strategies of institutional investors regarding project bonds indicates that some characteristics of this instrument make it not completely suitable for a traditional asset management approach. Gatti (2014) indicates four factors: 1) investors seem more interested to project bonds only if construction risk is over (i.e. brownfield investments); 2) bullet repayments typical of bonds cannot be tailored to the cash flow pattern of infrastructure projects; 3) the bullet repayment structure triggers a refinancing risk; 4) investors find it hard to assess the degree of risk of complex infrastructure ventures and rely on the rating issued by external rating agencies. Although not mandatory, rating is certainly a prerequisite to reach a broad base of bond investors.

Table 5. **Project bond issues by sector**
In USD million 2007-13

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|
| Infrastructure | 10 308 | 6 940 | 539 | 7 665 | 6 033 | 9 796 | 18 884 |
| Power | 7 000 | 378 | 1 613 | 4 877 | 5 448 | 7 108 | 9 099 |
| Social Infrastructure/PFI | 6 115 | | 877 | 2 174 | 5 315 | 961 | 2 643 |
| Oil & Gas | 2 100 | 4 537 | 5 497 | 2 474 | 5 148 | 5 905 | 15 315 |
| Leisure | 1 300 | | | 600 | | | |
| Petrochemicals | | | | | | 183 | 3 200 |
| Telecoms | | | | | | | 114 |
| Mining | | 30 | | 2 000 | 335 | 174 | |
| Total | 26 823 | 11 885 | 8 526 | 19 790 | 22 279 | 24 127 | 49 255 |

Source: Adapted From *Project Finance International*, 2008-2014, various issues.

3.3. Recent initiatives in the debt market for infrastructure

The increased interest of institutional investors for infrastructure investments, coupled with a progressive retreat of banks from the project finance market due to post-crisis deleveraging and higher capital and liquidity requirements under the new Basel III rules, has forced financial markets to develop new financial techniques able to attract capital also from more traditional asset managers with limited knowledge about the risk assessment of an infrastructure project.

The most evident solution, although data on the trends are very scarce given the very recent development of these investment strategies, is the emergence of an “originate-to-distribute” model that sees banks cooperating with institutional investors in channelling debt funds to infrastructure. The available evidence indicates three alternative structures:

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

In the *partnership/co-investment model*, an institutional investor invests in infrastructure loans originated by a MLA bank. The MLA organises a syndicate and retains a pre-agreed percentage of each loan in its loan portfolio, selling the remaining portion to institutional investors. 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. Recent examples are the partnership set up between Natixis and insurance company Ageas and the partnership between Crédit Agricole and Crédit Agricole Assurances.

The *securitisation model* is based on the creation of a SPV that purchases from banks pools of infrastructure investments that become collateral for bond investors. These investors buy asset backed securities (ABS) issued by the same SPV. 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 given the flexibility in creating portfolios originated in different sectors and countries (Buscaino et al. 2012). As an example of this technique, in 2012 Natixis has structured a mechanism that enables institutional investors to invest in infrastructure loans via a securitisation vehicle.

In the *debt fund model*, an institutional investor provides funding to a resource pool (the fund) managed by an asset manager that acts, in all senses, as a delegated agent for the investors with full responsibility for the selection/screening process and monitoring of the investments. These funds typically define the asset allocation strategy *before* the fundraising phase and, for this reason, show lower degrees of flexibility compared to the securitisation or the partnership model. On the other hand, this solution is probably also the easiest way to approach the infrastructure market for less experienced institutional investors that do not have dedicated teams to invest in infrastructure assets. Examples of the debt fund model are the infrastructure debt platform of BlackRock, the Senior European Loan Fund of Natixis AM and AEW Europe, the mid-market loan fund set up by Amundi, and the MIDIS debt platform set up and managed by Macquarie.

4. The market for infrastructure equity

4.1. Trends in the infrastructure equity market

Similarly to what has been shown for the market of infrastructure debt, the equity market has also gone through a process of significant transformation in the past few years.

Before the mid-2000s, almost all infrastructure projects received equity financing by industrial sponsors, typically the offtaker, the Engineering Procurement and Construction contractor, the suppliers or the operation and maintenance agent.

Starting from the mid-2000s, data reported by Probitas Partners (2013) indicate a clear upward trend in global infrastructure fundraising for private equity investments, from USD 2.4 bn in 2004 to the record peak of USD 39.7 bn in 2007, representing 15% of total project finance loans in the same year. After the 2008 crisis, volumes were squeezed and at the end of 2012 they accounted for only slightly more than 10.5% of total project finance loans available.

Table 6 reports the 10 largest infrastructure fund managers at the end of 2013. These asset managers typically focus on brownfield investments and on developed markets, using equity, debt and mezzanine instruments.

Table 6. Ten largest asset managers for infrastructure funds

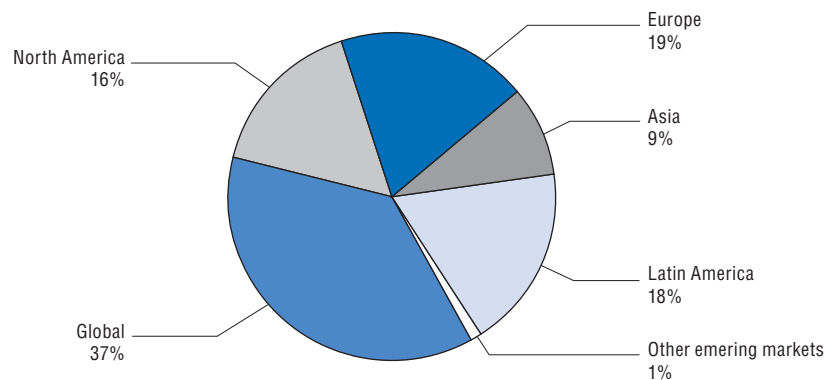
Funds raised in the last ten years, end-2013

| Firm Name | Firm Country | Strategies | Total Funds Raised Last 10 yrs (mn USD) | Est. Dry Powder (mn USD) |
|---|--------------|----------------------------|---|--------------------------|
| Brookfield Asset Management | Canada | Primary | 11 863 | 6 200.02 |
| EIG Global Energy Partners | US | Debt/Mezzanine and Primary | 13 897.4 | 5 890.61 |
| Macquarie Infrastructure and Real Assets (MIRA) | UK | Debt/Mezzanine and Primary | 28 058.8 | 5 802.47 |
| Energy Capital Partners | US | Debt/Mezzanine and Primary | 12 485 | 5 567.61 |
| Global Infrastructure Partners | US | Debt/Mezzanine and Primary | 13 890 | 4 741.85 |
| EnCap Flatrock Midstream | US | Primary | 5 578 | 4 113.55 |
| Mirova Environnement & Infrastructures | France | Debt/Mezzanine and Primary | 552.5 | 4 103.79 |
| First Reserve Corporation | US | Primary | 3 730 | 2 762.35 |
| Antin Infrastructure Partners | France | Primary | 4 245.7 | 2 705.49 |
| LS Power Group | US | Primary | 6 360 | 2 150.18 |

Source: Preqin.

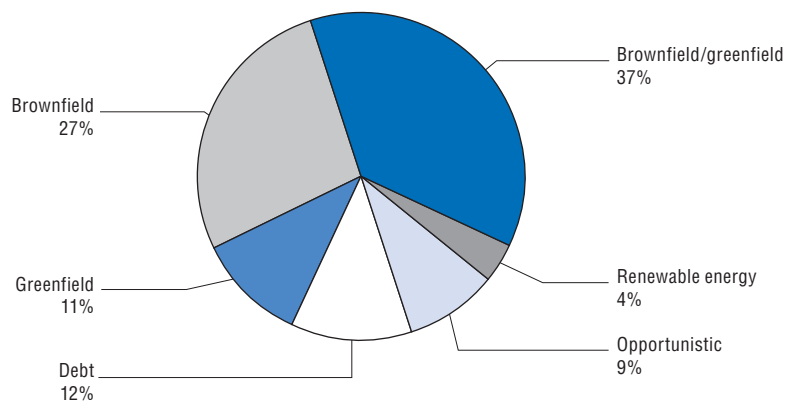
Figure 4 and Figure 5 provide information about the geographical allocation of funds raised and the type of investment breakdown in 2012. Global allocations or allocations to US and European projects still represent a large proportion but Asia, Latin America and other emerging countries represent an interesting 37% of the funds raised in 2012. From the point of view of the type of the investment, brownfield (i.e. investments in infrastructure projects that have already completed their construction phase) and mixed brownfield/greenfield represent more than 60% of the raised capital. The evidence indicates that financial investors still prefer to concentrate their investments on less risky projects than Greenfield (i.e. projects fully exposed to construction risk).

Figure 4. **Infrastructure fundraising in 2012 – breakdown by region (capital raised)**



Source: Probitas Partners (2013).

Figure 5. **Type of infrastructure funds' investment in 2012 – breakdown of capital raised**



Source: Probitas Partners (2013).

Pure Greenfield infrastructure fundraising is still very limited. At the end of 2012, it 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.

4.2. Institutional investors and infrastructure

In recent years diversification benefits and higher expectations of investment returns have increasingly been driving investors to alternative investments, such as private equity, real estate and commodities. Alternative investments generally have lower liquidity, sell in

less efficient markets and require a longer time horizon than publicly traded stocks and bonds. Infrastructure is often included in the alternative investments part of the portfolios.

Institutional investors have traditionally invested in infrastructure through listed companies and fixed income instruments. This still remains the main exposure of institutional investors to the sector. It is only in the last two decades that investors have started to recognise infrastructure as a distinct asset class. Since listed infrastructure tends to move in line with broader market trends, it is a commonly held view that investing in unlisted infrastructure – although illiquid – can be beneficial for ensuring proper diversification. In principle, the long-term investment horizon of pension funds and other institutional investors should make them natural investors in less liquid, long-term assets such as infrastructure.

Infrastructure investments are attractive to institutional investors such as pension funds and insurers as they can assist with liability driven investments and provide duration hedging. These investments are expected to generate attractive yields in excess of those obtained in the fixed income market but with potentially higher volatility. Infrastructure projects are long-term investments that could match the long duration of pension liabilities. In addition, infrastructure assets linked to inflation could hedge pension funds liabilities' sensibility to increasing inflation.

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.

4.2.1. Pension Funds

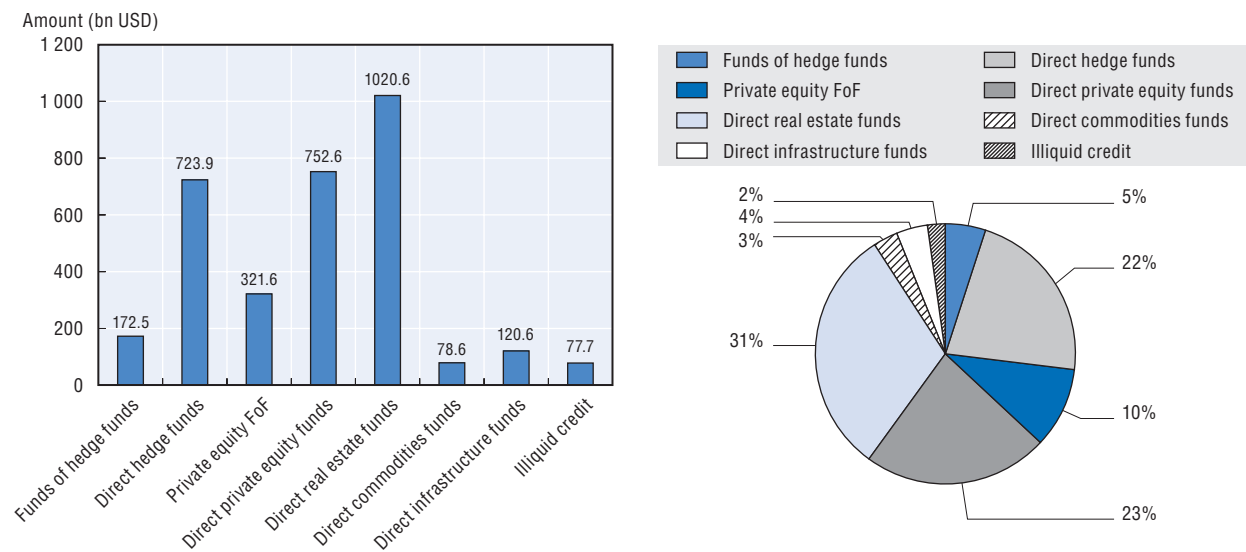
Inderst (2009) provides estimates of the total commitments of pension funds to infrastructure for 2008. A raw estimate quantifies the total commitment in listed infrastructure stocks at USD 400 bn. Excluding utilities, the figure is estimated at around USD 60 bn. The OECD Survey on large pension funds published in October 2013 (OECD, 2013b) 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.

Towers Watson and Financial Times' Investor Survey 2014 reports that, out of the USD 3.26 tn total assets under management (AUM) by the top 100 alternative investment asset managers, USD 120.6 bn were invested in infrastructure (Figure 6). Pension funds, insurance companies and SWFs were the investors more inclined to invest in infrastructure (9% and 10% of their AUM, respectively).

4.2.2. Insurance companies

The information provider Preqin 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 United States, 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.

Figure 6. **Amount and composition of alternative investments**
By top 100 alternative investments asset managers worldwide



Source: Towers Watson (2014).

4.2.3. Sovereign Wealth Funds

A recent paper by The CityUK (2013) reports that, out of a total AUM value of USD 5.2 tn at the end of 2012, USD 52 bn have been invested directly in infrastructure between 2005 and 2012. Furthermore, 56% of Sovereign Wealth Funds declare to allocate resources in infrastructure investments.

In 2013, data reported by the OECD (2013a) indicate that in a sample of the most important SWFs worldwide, the percentage allocation to infrastructure is remarkable with peaks between 10-15% in Temasek and GIC (Singapore), the Alaska Permanent Fund (US) and the Alberta's Heritage Fund (Canada) (Table 7).

Table 7. **Selected SWF Real Estate Investments**

| Country | Sovereign Wealth Fund Name | As % of total |
|-----------------|--|---------------|
| Norway | Government Pension Fund – Global | 0.3 |
| UAE – Abu Dhabi | Abu Dhabi Investment Authority | 5 - 10 |
| Saudi Arabia | SAMA Foreign Holdings | 1.2 |
| Singapore | Government of Singapore Investment Corporation | 10.0 |
| Singapore | Temasek Holdings | 12.0 |
| Korea | Korea Investment Corporation | 1.5 |
| US – Alaska | Alaska Permanent Fund | 12.0 |
| Azerbaijan | State Oil Fund | 0.0 |
| US – Texas | Texas Permanent School Fund | 8.0 |
| Ireland | National Pensions Reserve Fund | 6.0 |
| New Zealand | New Zealand Superannuation Fund | 6.0 |
| Canada | Alberta's Heritage Fund | 15.4 |

Source: Annual reports of SWFs, SWF Institute.

4.3. Recent initiatives in the equity market for infrastructure

A number of new initiatives have emerged to overcome some of the early drawbacks of institutional infrastructure investment vehicles. The main drivers of these initiatives to pool institutional investors' capital have been the recognition that each individual institutional investor might not have the resources and expertise necessary to make direct infrastructure investments, and might also not have the scale and risk appetite to invest. Many investors also voiced concerns over the asset manager – asset owner relationship, and a desire to partner with other like-minded investors. It was felt that asset managers (i.e. infrastructure funds) were not representing the long-term interests of asset owners (i.e. pension funds) and there seemed to be a significant governance gap. Finally in emerging market economies additional solutions are needed to address the large gap between investment needs and investment supply.

With regard to unlisted infrastructure funds, it is recognised that a spectrum exists for the level of fees and terms and conditions of unlisted funds, similar to the spectrum of risk and return characteristics that exists for the different infrastructure investments. For example, funds investing in greenfield projects in emerging economies where risks are greater and the requirements for expertise are greater would be expected to charge higher fees than funds that invest in brownfield core economic infrastructure assets in developed countries. As a result of growing investor dissatisfaction, investment managers have had to make adjustments to the terms and conditions of their funds. Investors in search of stable, predictable, low-risk returns from their infrastructure investments must ensure that the underlying assets reflect the specific definition that they have associated with the asset class.

Investors have also opted to build in-house expertise to strengthen internal capabilities to invest directly or pool resources together into co-investment vehicles. Co-investment platforms have emerged as a way for investors to align interests, achieve larger scale and invest in assets without the expense of fund managers. The United Kingdom's Pension Investment Platform (PIP), Canada-based Global Strategic Investment Alliance (GSIA) and Canada Pension Plan Investment Board (CPPIB)-led syndicate model all provide examples of different co-investment structures that may help institutional investors access infrastructure investments more efficiently.

Recent initiatives have seen governments or development institutions providing assistance in setting up infrastructure funds and contributing directly through seed funds. Equity funds formed as partnerships of public and private institutions could become important sources of finance and providers of organisational capacity and expertise in support of the financing of infrastructure projects. Initiatives such as the establishment of the Pan African Infrastructure Development Fund, the Philippine Investment Alliance for Infrastructure fund and the Marguerite fund in Europe provide examples of how funds can be set up with government involvement to help attract institutional investment in the much needed investment areas of the emerging economies and greenfield infrastructure.

5. Conclusions

Over the past decade institutional investors, such as pension funds, insurers and sovereign wealth funds, have been looking for new sources of long-term, inflation protected returns. Asset allocation trends show gradual globalisation of portfolios, with increased interest in emerging markets and diversification into new asset classes.

Historically, infrastructure investors have predominantly focused on what they perceived as “safer”, less risky developed economies of Europe, North America and Australia. Diversification benefits and higher return expectations are increasingly driving investors to emerging market infrastructure.

At the same time, governments have started to recognise that they need to reconsider their approach to financing to secure new sources of capital to support infrastructure development. With more governments privatising infrastructure assets, a globalisation of the infrastructure fund market has occurred. Developed and developing countries are in effect competing to attract institutional investors to infrastructure.

Despite the theoretical ideal match between a large source of capital and an asset class in need of investment, the overall level of investment in infrastructure by institutional investors has been modest and insufficient to overcome the financing gap.

Financial markets and intermediaries are required to play an important role in shaping financial solutions able to attract the highest number of investors. Infrastructure can be financed using different capital channels. The evolution of capital markets shows that financial innovation develops new financial tools able to attract a larger amount of funds in response to supply (the infrastructure gap) and demand (the search for asset classes that are suitable for a given asset allocation).

As the market continues to grow and information about the asset classes becomes more readily available, the existing vehicles will become more refined and new offerings will emerge. A number of initiatives have been developed to pool the financial and internal resources of large institutional investors to invest jointly in infrastructure projects and assets. Some of these initiatives are market and investor-driven, while others are government-driven. This paper has examined some of the new initiatives that have been developed as a result of the limitations observed in the existing institutional infrastructure investment market.

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