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Trends in Large Pension Fund Investment in Infrastructure

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ABSTRACT / RÉSUMÉ

TRENDS IN LARGE PENSION FUND INVESTMENT IN INFRASTRUCTURE

Favourable conditions such as the growth of pension fund assets, privatisation trends and changing regulations have increased the interest of institutional investors in infrastructure investment. However, data on pension fund investment in infrastructure is limited. National statistical agencies do not currently collect separate data on these investments, and the different modes available to investors to gain exposure to infrastructure means that information is buried under different headings.

This paper is based on a recent survey of some of the largest pension funds across different regions, accounting for over USD 7 trillion of assets under management. We look at how much these investors have allocated to infrastructure, what is considered as infrastructure, where it fits in the total portfolio allocation, what approaches and forms of investment have been taken, what are recent trends in relation to infrastructure and asset allocation, regulation and green investment. A better understanding of these issues is necessary from a policy perspective in order to be able to attract institutional investors to the infrastructure sector.

JEL codes: G15, G18, G23, G28, J26
Keywords: alternative assets, asset allocation, barriers, diversification, listed securities, infrastructure, pension, private finance, regulatory constraints, risk, return

TENDANCES DANS LES INVESTISSEMENTS DES GRANDS FONDS DE PENSION DANS LES INFRASCTRUCTURES

Des conditions propices, comme la croissance de l'actif des fonds de pension, l'orientation des privatisations et l'évolution de la réglementation, ont attisé l'intérêt des investisseurs institutionnels en faveur des investissements dans les infrastructures. Pour le moment, les données disponibles à ce sujet sont toutefois limitées. Les instituts de la statistique des différents pays ne compilent pas, pour l'heure, de données distinctes sur cette catégorie d'investissements, ces informations étant ventilées et dissimulées sous différents intitulés en raison de la diversité des vecteurs par lesquels les investisseurs peuvent se doter d'une telle exposition.

Le présent rapport se fonde sur une enquête récente consacrée à certains des plus grands fonds de pension des différentes régions du monde, dont l'actif total sous gestion s'élève à plus de 7 000 milliards USD. Y sont analysés : la part allouée aux infrastructures par les investisseurs ; ce qui est considéré comme une infrastructure, la place de ces investissements dans les allocations globales de portefeuille, les approches retenues pour les réaliser et les formes qu'ils prennent, les récentes tendances dans le domaine des infrastructures et en matière d'allocation d'actifs, la réglementation et les investissements verts. Du point de vue des pouvoirs publics, il est indispensable d'acquérir une meilleure compréhension de ces questions pour pouvoir attirer les investisseurs institutionnels vers ce secteur.

Codes JEL: G15, G18, G23, G28, J26
Mots clés : actifs alternatifs, allocation d'actifs, obstacles, diversification, titres cotés, infrastructures, pensions, financement privé, contraintes réglementaire, risques, rendement

TRENDS IN LARGE PENSION FUND INVESTMENT IN INFRASTRUCTURE

By Raffaele Della Croce*

ABOUT THIS PAPER

In order to identify the flows and better capture the underlying trends in asset allocation and investment strategies of institutional investors, in 2010 the OECD launched a pilot survey on investments of selected individual pension funds both within and outside the OECD that are among the largest in their respective countries.

This paper draws on data collected through the OECD Large Pension Funds Survey 2011 ("LPFs").[1] Data has been received from 26 pension funds, a mix of defined benefit (DB) and defined contribution (DC) schemes, mainly public sector pension funds but also some corporate funds managing on aggregate USD 1.6 trillion. This information complements the OECD Public Pension Reserve Funds ("PPRFs") survey also carried out in 2011. Altogether, data has been received from 52 institutional investors from more than 20 countries around the world including some non-OECD countries such as Brazil, Colombia, Peru and South Africa, accounting for over USD 7 trillion of assets under management.[2]

For this report, which focuses on infrastructure investment, we included data from 28 funds out of the total 52 funds (the complete survey). Out of the 28 funds used in this report, 22 are LPFs and 6 are PPRFs. The funds taken in consideration invest in infrastructure and provided information on their infrastructure investment allocation.

Results of the survey are based on a relatively small – although significant in terms of assets under management – sample of investors and are biased towards the larger investors in each respective country. However, the trends that are analysed and the conclusions may be valid for a wider set of investors.

The survey is part of the OECD project "Institutional Investors and Long Term Investment" that was recently launched.[3] Going forward, the survey will be extended to more funds and countries as well as to other institutional investors (e.g. insurers and sovereign wealth funds), providing insights and detailed investment information which will complement the administrative data gathered at the national level.[4]

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[1] OECD Large Pension Funds Survey 2011.

[2] PPRFs are reserves/buffers to support an otherwise PAYG-financed public pension system as opposed to pension funds which support funded pension plans in both the public and private sector. See Annex A for definitions of the types of sovereign and public pension reserve funds.

[3] See www.oecd.org/finance/lti.

[4] See *Pension Market in Focus 2011*, www.oecd.org/dataoecd/63/61/48438405.pdf.

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Investors surveyed

Name of the fund or institution	Country	Assets 2010 USD billions
Stichting Pensioenfonds ABP (ABP)	Netherlands	312,257
Government Employees Pension Fund of South Africa (GEPF)	South Africa	138,572
Canadian Pension Plan Investment Board (CPPIB)	Canada	136,039
Pensioenfonds Zorg and Welzijn (PFZW)	Netherlands	131,780
Ontario Teachers' Pension Plan (OTPP)	Canada	101,655
Previ	Brasil	88,847
Future Fund	Australia	65,824
Ontario Municipal Employees Retirement System (OMERS)	Canada	52,385
PMT	Netherlands	49,426
Pension Reserve Fund	France	49,033
Universities Superannuation Scheme (USS)	United Kingdom	48,889
PFA	Denmark	45,962
AFP Provida	Chile	40,474
AustralianSuper	Australia	33,800
AP-3	Sweden	30,661
AP-4	Sweden	29,560
UniSuper	Australia	25,676
Afore Bancomer	Mexico	16,430
Sunsuper	Australia	15,782
Superannuation Fund	New Zealand	11,162
AFP Horizonte	Colombia	7,930
COMETA	Italy	7,484
Fonditel	Spain	7,328
AFP Horizonte	Peru	7,162
CAJA MADRID	Spain	5,400
Fonchim	Italy	3,915
Banco BPI	Portugal	3,114
Endesa	Spain	2,082
Total		**1,468,630**

EXECUTIVE SUMMARY

Introduction

Institutional investors have traditionally invested in infrastructure through listed companies and fixed income instruments. Only in the last two decades have investors 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 to ensure 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, often included in the alternative investments part of the portfolios.

Infrastructure investments are attractive to institutional investors such as pension funds 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' liability sensibility to increasing inflation.

Despite increased interest from investors in infrastructure there is little evidence on the actual investment ultimately flowing to the sector. National statistical agencies do not currently collect separate data on these investments, and the different modes available to investors to gain exposure to infrastructure means that information is buried under different headings. In order to identify the flows and better capture the underlying trends in asset allocation and investment strategies of institutional investors, the OECD launched a survey on investments of selected individual pension funds both within and outside the OECD that are among the largest in their respective countries: the OECD Large Pension Funds Survey 2011 ("LPFs"). This paper draws largely on the section of the survey related to infrastructure.

Infrastructure Survey – Findings

The majority of the funds surveyed stated they are actively investing in infrastructure with percentage allocation up to 20% of their total portfolios. However, these total allocations are not comparable as they relate to different forms of investing and often imply a different understanding and perspective of the investment proposition in infrastructure.

Investors take different approaches to infrastructure investment. Behind the separate investment allocation to infrastructure lies the investor's decision to consider infrastructure as an asset class in its own right. Pension funds with a dedicated allocation have a target allocation to the asset class as part of the total portfolio and access the investment largely through unlisted equity instruments (infrastructure funds or direct investment). For pension funds that do not have a separate allocation, infrastructure will fit into both the fund's equity and fixed income allocation, according to the type of security or investment used (mainly bonds and listed corporate equities).

Based on the information provided by the 28 funds taken in consideration for this part of the survey, total investment in infrastructure at the end of 2010, considered as direct exposure, was USD 41.8 billion, which represents 2.9% of the total assets surveyed (USD 1.4 trillion). If we consider total assets under management (AUM) for the complete survey (i.e. 52 funds for USD 7.7 trillion AUM) infrastructure investment of USD 41.8 billion represents 0.5% of the total.[5]

Of the total allocation, the largest portion (USD 37.9 billion or 2.6%) relates to unlisted equity (i.e. infrastructure funds or direct investment) and USD 3.9 billion or 0.3% to fixed income (i.e. infrastructure project bonds or loans).

The USD 37.9 billion of unlisted equity allocation to infrastructure was split between USD 30.9 billion in the form of direct investment and USD 7 billion through infrastructure funds. The USD 3.9 billion of fixed income allocation included USD 3.5 billion bond investment and USD 380 million in loans.

Infrastructure Survey – Analysis

In order to better understand what lies behind the headline figures, we divided the pension funds surveyed into two groups based on the infrastructure investment approach (i.e. separate allocation to infrastructure) which relates to different factors such as maturity of infrastructure market, pension funds system (i.e. size of the funds), regulation and experience in the sector.

Group 1

Pension funds belonging to this group have a separate allocation to infrastructure and a target allocation as part of the total portfolio. Infrastructure is normally accessed through unlisted equity instruments (infrastructure funds, direct investment in projects, etc.). Infrastructure loans are considered part of the infrastructure allocation while bond allocation is part of fixed income. For the majority of the funds, investment in listed equity infrastructure is part of the overall listed equity allocation.

This group of 14 pension funds is represented by Australian, Canadian, Danish, Dutch, New Zealand, South African and UK pension funds for a total of USD 1 169 billion AUM at the end of 2010. The size of the funds in terms of total assets ranges from Australian SunSuper with USD 15.7 billion, to the largest, ABP, with over USD 300 billion. Six funds are DB schemes, three are DC, two are hybrid schemes and three are PPRFs.

Based on the information received, total investment in infrastructure at the end of 2010 for this group was USD 42.3 billion, mainly related to unlisted equity (USD 37.6 billion), with fixed income at 2.0 billion and listed equity at USD 2.7 billion of the total.

The unlisted equity allocation of USD 37.6 billion was invested for USD 30.9 billion though direct forms of investment and USD 6.7 billion through infrastructure funds. The fixed income allocation of USD 2.0 billion included OTPP USD 1.6 billion bond allocation, Sunsuper's USD 37 million loan and GEPF's USD 347 million allocation to loan and structured products. While presumably all of the funds

[5] Figures may be understated given that for fixed income the majority of the funds do not report such details on their allocation and infrastructure unlisted equity is often included in other asset classes. Some funds also report their allocation to infrastructure through listed equity (i.e. infrastructure corporates), which we have considered as indirect exposure.

also have allocations to listed infrastructure equity, only three (OTPP, CPPIB and AustralianSuper) report it as a specific allocation (for a total of USD 2.7 billion).

Group 2

Pension funds surveyed in this group do not have a separate allocation to infrastructure. Infrastructure will fit into both the fund's equity and fixed income allocation, according to the type of security or investment used (mainly bonds and listed corporate equities).

The 14 Latin American and European pension funds included in this group had USD 299.4 billion AUM in 2010, with size in terms of total assets ranging from USD 2.1 billion for Endesa to USD 88.8 billion for Previ. As for the type of schemes, eight funds are DC schemes, two are DB schemes, one has a hybrid nature and three are PPRFs.

Based on the information provided at the end of 2010, total investment in infrastructure was USD 18.7 billion, mainly based on listed equity (USD 16.5 billion), fixed income exposure (USD 1.8 billion) and some unlisted equity (USD 330 million).

The unlisted equity allocation of USD 330 million was only invested through infrastructure funds and included the Swedish fund AP3 USD 147 million allocation, AFP Horizonte Colombia (USD 131 million) and Peru (USD 22 million). Fixed income total allocation of USD 1.8 billion only included bond instruments. Listed equity allocation of USD 16.5 billion included Previ's USD 12 billion or 13.5% of total portfolio and AP4's USD 2.6 billion or 9% of total portfolio.

Conclusions

Although it is growing rapidly, institutional investment in infrastructure is still limited. Clearly, different countries are at different stages in the evolution of pension fund investment in infrastructure.

The investors' infrastructure investment approach (i.e. separate allocation to infrastructure) relates to different factors such as the maturity of the infrastructure market, the pension funds system (i.e. size of the funds), regulation and experience in the sector.

Among the funds surveyed, some – mostly larger ones – are able to invest and treat infrastructure as an asset class. However, recent developments in regulation, the trend in alternative investment driven by the need to diversify the portfolio and new interest in "green" investment, have increased investors' attention to infrastructure as a new asset class.

Active investors who have made several investments are more likely to have separate allocations, showing that most of them place infrastructure in separate allocations as programmes mature. Further along the learning curve are the Canadian and Australian pension funds, with the first funds that started investing in infrastructure more than ten years ago having built up since then a significant allocation to the sector (from 4% to 16% of total portfolio). European investors have only started building up their allocation to infrastructure, treating it as a separate allocation (or as a subsector of real estate or private equity), over the last five years, with allocations ranging from 1% to 3% of the total portfolio.

For the majority of these funds the infrastructure strategy is to invest, on a global basis, primarily in unlisted equities and mature infrastructure projects. In general, pension funds prefer to invest in large, mature operating assets that already generate cash flow although they will evaluate and participate in greenfield projects on an opportunistic basis. Funds with large allocations also apply a portfolio

construction approach to their infrastructure investments, making a distinction among different risk/returns opportunities.[6]

The majority of pension funds in the first group of investors analysed are investing directly in infrastructure, mostly co-investing along infrastructure funds but also taking leading roles in consortia, competing with other funds and financial sponsors when bidding for projects. Over the years, these large pension funds have been able to acquire the knowledge, expertise and resources to invest directly in infrastructure. If the pension fund is not large enough it normally invests through infrastructure funds (as in Australia, for example, through closed-ended funds or open-ended vehicles).

On the other hand, smaller and less experienced pension funds do not have a specific investment policy for infrastructure with a target allocation. General infrastructure investment policy is to invest either equity or debt into companies or special purpose vehicles for the development of infrastructure projects. For many funds it is a choice of the fund manager in order to replicate the general benchmark in case of listed investments.

Since it is becoming accepted practice to consider infrastructure as an alternative asset class, in the analysis of the results of the survey, it is interesting to look at the asset allocation across countries and in particular at the trend in alternative assets.

For pension funds in Group 1, alternative assets represent a significant part of the total portfolios with an average target allocation of 30% of the total. Infrastructure sits within the "alternative assets" portfolio or is treated as a subcategory in the "real assets" group; for some funds infrastructure is part of the "inflation sensitive investments" part of the portfolio. OMERS, for example, is targeting 47% of its total portfolio in alternative private markets investments.

For pension funds in Group 2, asset allocation in alternative assets, although still very limited, is increasing for the majority of the funds. For Latin American pension funds, although it is decreasing rapidly (as in Mexico for example), domestic government debt still represents the majority of the fixed income allocation. Investment in unlisted equity infrastructure has been limited so far, although some funds are planning to invest on an opportunistic basis through the private equity or real estate allocation, part of the alternative allocation of their portfolio.

Regulation has a major influence on the asset allocations of pension funds. For Latin American pension funds there are quantitative investment limits on unlisted equity, by credit rating and limitations on bonds issued by new companies and projects. Hence the widespread use of monolines in Chile or listed instruments in Mexico, for example, to allow investment in infrastructure (CKDs in Mexico, structured instruments traded on the Mexican stock exchange).

In general, there seems to be an increasing interest in green investments, including clean technology and renewable energy such as wind and solar projects. However, none of the funds surveyed has a target allocation, nor specifically addresses "green" investment in their investment policy. Environmental aspects of "green" projects will be evaluated in the due diligence process but ultimately the investment decision will be based on the investments' own merit and risk/return profiles.

[6] Based on risk/return profiles, the infrastructure portfolio of the largest pension funds is often divided in different segments: i.e. core, where cash yield is the dominant part of the return, and value added/opportunistic, where capital appreciation forms the dominant part of the return.

Policy recommendations

In order to attract private sector investment, and particularly institutional investment, to the infrastructure sector, policy makers need to approach the issues investors are facing from an asset allocation perspective and make the asset class financially attractive.

While investors are increasingly adopting an international approach to their portfolio allocation, a co-ordinated policy response to the barriers they are facing is still missing at the international level. However, governments have started to recognise that they need to reconsider their approach to financing to secure new sources of capital to invest in infrastructure. Developed and developing countries are, in effect, competing to attract institutional investors to infrastructure.

Infrastructure investing is different from other asset classes as the nature and risks of these investments, such as high up-front costs and the scale of the projects, require dedicated resources to understand them – resources that many smaller pension funds lack and which take years to build up (as has been the case at the Canadian public pension funds, for example, which are some of the most experienced infrastructure investors in the world).

An additional issue for pension funds is the lack of objective, high-quality data on infrastructure investments and a clear and agreed benchmark. This makes it difficult to assess the risks of these investments and to understand correlations with the investment returns of other assets. Without such information, pension funds are reluctant to make such allocations.

A related issue is that, whilst some countries collect data which matches the needs of the relevant authorities, there is no international, official, accurate data on the asset allocation of pension funds in alternative asset classes, which include, *inter alia*, hedge funds, private equity, real estate, infrastructure and commodities.

Definitions of alternative assets, as to ensure that the data collected and reported is comparable across pension funds, is required in order to monitor the flows into different types of alternative assets and their respective costs and performance – which is vital not only for investors but also for regulators and other policy makers, to help them better understand the exposure of pension funds in different countries and produce appropriate regulation.

Some policy initiatives are headed in the right direction. The UK government has a stated policy to attract GBP 20 billion of institutional investment into UK infrastructure[7] and has been active through HM Treasury in leading the discussions with investors. The EU "Project Bonds Initiative" approved in May 2012 aims to finance infrastructure projects in Europe through capital market solutions, i.e. structuring financial instruments, the project bonds. The experience of Mexico and Chile suggests that institutional investors, and in particular pension fund assets, have been instrumental to the growth of the corporate bond market and in turn to the provision of development finance.

Recent G20 meetings (i.e. Los Cabos in June 2012 and Cannes in November 2011) recognised the urgent need to deepen and broaden capital markets for developing countries to put their own financial resources to productive use and to attract foreign capital flows.

[7] Last year, the government used the NIP to announce that it had earmarked an additional GBP 30 billion for investment in infrastructure, comprising GBP 20 billion targeted from pension funds and insurers, GBP 5 billion capital spend committed across the next spending review period and a further, additional GBP 5 billion of infrastructure spending this spending review period. [Autumn Statement 2011, *http://cdn.hm-treasury.gov.uk/autumn_statement.pdf*].

Drawing from international experience and partnering with some of the largest institutional investors, the OECD launched the “Institutional Investors and Long Term Investment” project in February 2012. The project’s ultimate goal is to facilitate long-term investment (LTI) by institutional investors such as pension funds, insurance companies and sovereign wealth funds, addressing both potential regulatory obstacles and market failures. This project will focus on how to engage the private sector in financing infrastructure, thus making the asset class financially attractive to institutional investors.

1. INTRODUCTION

The asset allocation context

In recent years, diversification benefits and higher expectations of investment returns have been increasingly driving investors to alternative investments, such as private equity, real estate and commodities.[8] 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 traditionally invested in infrastructure through listed companies and fixed income instruments. Over the last two decades, they 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 to ensure 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 fund 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 liability sensibility to increasing inflation.

[8] As noted in the IOPS "Good Practices in the Risk Management of Alternative Investments by Pension Funds" (IOPS Good Practices), there is no precise definition of alternative investments. The nature of alternative investments is dynamic and ever-evolving, and closely linked to the development of financial markets. While there is no official definition, the term is usually applied to instruments other than listed equities, bonds and cash. For the purposes of this survey, "alternative" investments comprise the following types of investments: hedge funds, private equity, real estate, infrastructure, commodities and "other" (other includes timber and currency/interest rate overlays).

Definition of infrastructure investment

Infrastructure is usually divided into economic and social sectors. Using a broad definition economic infrastructure typically includes transport (e.g. ports, airports, roads, bridges, tunnels, parking); utilities (e.g. energy distribution networks, storage, power generation, water, sewage, waste); communication (e.g. fixed/mobile networks, towers, satellites); and renewable energy (e.g. solar and wind generation). Social infrastructure – also called public real estate – includes: schools, hospitals and defence buildings, prisons and stadiums.

In addition to the physical characteristics, there are other elements that further define the infrastructure investment opportunity such as the contractual approach, the phase of asset development (e.g. greenfield *vs* brownfield) and stage of development of the market.[9] Overall, the definition of an individual infrastructure opportunity needs to draw on all of these different elements in order to give a meaningful description. For example, a new social project in a developed market is very different from the privatisation of an established economic project in an undeveloped market.

Box 1. Greenfield *vs* brownfield investments[10]

Greenfield or primary projects are assets generally constructed for the first time at a specific site. They may be in the planning, development, financing or construction stage. In contrast, brownfield or secondary projects are already operational and/or have a predecessor of some sort at the same location. These projects may involve the reconstruction, renovation or expansion of existing assets. In other words, the key differences lie in the maturity of the project and the available project-specific experience, which is significantly less in the case of greenfield projects. This may lead to a considerably higher degree of uncertainty and risk.

Investors in greenfield projects do not generally turn a profit in the first years of the development and construction phase; they are merely required to make payments. Initial capital is only returned when the respective facility is operative (making for a J curve which is typical of cash flows from private equity investments). Investors accept the higher risk associated with greenfield investments because of the growth potential of an asset in its start-up phase and the expected value growth. In the secondary market, investors' main interest is in high and stable dividends. This resembles the regular income streams from real estate or bonds. In traditional investment style classifications, secondary market investments would suit income-style investors while primary projects would suit growth-style investors.

From an investor's perspective, depending on the investment characteristics of the specific project, infrastructure will be classified according to its risk/return profile. It is important to incorporate a financing perspective in defining the term infrastructure, as these differences will ultimately attract or deter different sources of private finance. From a financing perspective, any definition needs to take into account both the money flows into and the risk and reward nature of infrastructure.[11]

Ways to access infrastructure

It is not easy to adopt a simple classification of infrastructure as this asset class covers so many different investment products. Investors can access infrastructure in several ways:

[9] See World Economic Forum (2010).

[10] Weber and Alfen (2010).

[11] World Economic Forum (2010).

- *Debt financing*: lending to the owners or operators of the infrastructure (e.g. through project bonds or general obligations bonds).

  Infrastructure investors have a choice of "infrastructure bonds", which can be defined as fixed income securities issued by states/municipalities (i.e. Build America Bonds in the United States) or corporations (i.e. the United Kingdom's water companies) in order to raise capital for infrastructure projects. Bonds may be earmarked to specific infrastructure projects (e.g. to build a tunnel). PPP bonds are a new type of infrastructure bonds popular in certain countries (i.e. the United Kingdom).

- *Listed infrastructure companies*: investment in equity of companies which are exposed to infrastructure, such as utilities, energy or transport companies. In fact, in the past infrastructure projects have been run and operated mainly by publicly-listed companies, including construction and engineering groups. In recent years, new investment vehicles (e.g. indices, mutual funds, Exchange Traded Funds "ETFs") were created for those not able or willing to make their own investment.

- *Infrastructure funds:* investment in publicly-listed equity funds trading on a stock exchange (e.g. Brookfield fund) or in unlisted equity funds that focus on infrastructure investments (i.e. Cube Capital).

  The past few years have seen another trend of significance in the financing of infrastructure – the provision of investment vehicles such as private equity and infrastructure funds targeting mainly opportunities in equity markets. These new investment vehicles allow a broader range of smaller pension funds to also get involved. However, investors' main interest in recent years has been unlisted equity funds.[12] A number of debt/mezzanine funds have also being raising money in the last years.

  Dedicated infrastructure funds were first set up in the mid-1990s in Australia and pension funds were early investors in them. In the 2000s, the availability of cheap debt fueled the increase in fund-raising for mainly unlisted infrastructure funds in other regions such as Europe and North America, opening new investment opportunities for pension funds.

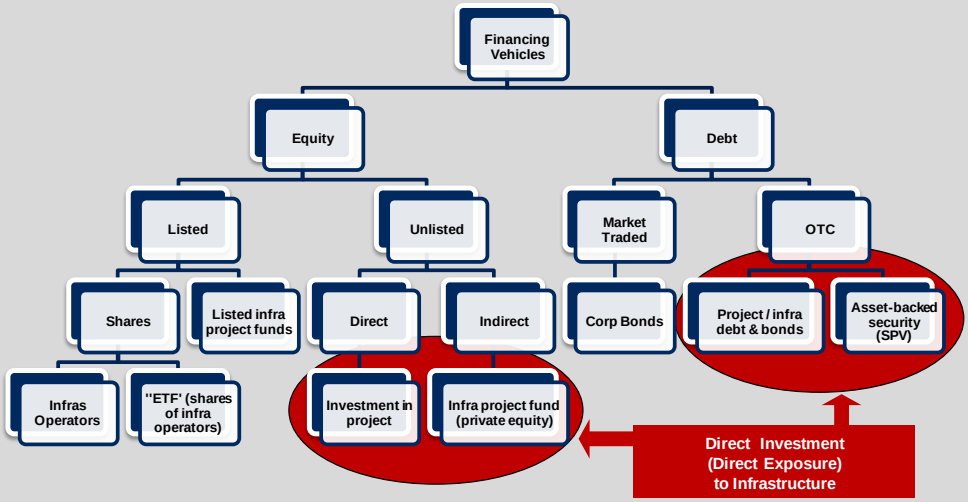
- *Direct investment in projects (or co-investment along infrastructure funds):* investment in the equity of a single-asset project company (e.g. OMERS, OTPP's acquisition of High Speed 1 in the United Kingdom). Some large Canadian pension plans pioneered in this field.

12 Before the financial crisis, a wave of new private equity funds entered the infrastructure market attracted by the growing number of assets being privatised or sold by governments. Assets under management within the unlisted fund market more than doubled between December 2006 and December 2008, from USD 52 billion to USD 111.9 billion.

Box 2. Investing in infrastructure

From an investor's perspective, pension funds with a separate allocation to infrastructure aim to gain direct exposure to the characteristics of the infrastructure asset (i.e. long term, stable, often inflation linked, etc.). Direct exposure is gained mainly through unlisted equity instruments (direct investment in projects and infrastructure funds) and project bonds while indirect exposure is normally associated with listed equity and corporate debt (see below).[13]

From a policy perspective, one way to identify how much finance from institutional investors is reaching infrastructure is by tracking the capital that institutional investors can provide via *direct* investment in these projects as highlighted in red below based on the main financing vehicles for infrastructure investment.



[13] Some funds consider investing in infrastructure projects (i.e. a toll road) as a direct exposure to infrastructure and investing in infrastructure corporate (i.e. a utility) as a way to gain indirect exposure to the characteristics of infrastructure.

Pension fund investment in infrastructure: Factors of growth[14]

As highlighted in a previous OECD survey, several key factors account for the growth of pension fund infrastructure investment, such as the availability of investment opportunities, the maturity and size of the pension fund market, pension fund regulations and the experience in the sector.

The first factor is the availability of investment opportunities for private finance capital and therefore for pension funds in their own country or region. Private finance involvement has taken different routes in different countries, providing different investment opportunities to investors. Although the infrastructure market has effectively become a global market, home bias still play a large influence, especially for funds investing for the first time or for smaller funds.

A second factor driving the growth of investment in infrastructure is the maturity and size of the pension fund market, i.e. the institutional capital available for investment and more specifically the average size of the funds in each market. Although the aggregate OECD pension market is large, the size of domestic markets varies considerably, reflecting the mix of public and private pensions, whether participation is mandatory or voluntary, and investment policies.

A third factor accounting for the growth of infrastructure investment is pension fund regulations, which in part explains why in some countries institutional investors' traditional exposure to infrastructure has been via debt (i.e. bonds).

A final key factor to take into account is that infrastructure investment involves a steep learning curve given the unique nature of each investment. Investing in the asset, either directly or through an infrastructure fund, requires a long lead time to complete due diligence, educate plan sponsors and set up the appropriate structure for investment and risk management.

[14] Source: OECD, Pension Fund Investment In Infrastructure: A Survey, September 2011.

2. INFRASTRUCTURE SURVEY

2.1 Infrastructure Survey - Findings

The majority of the funds surveyed stated they are actively investing in infrastructure with percentage allocation up to 20% of their total portfolios. However, these total allocations are not comparable, as they relate to different forms of investing and often imply a different understanding and perspective of the investment proposition in infrastructure.

Table 1. Infrastructure investment as percentage of total assets (2010)

Name of the fund	Country	Tot assets USD million	Infrastructure investment % of total assets			
			Unlisted equity	Listed equity	Fixed income	Total
ABP	Netherlands	312,257	0.3	n.a.	n.a.	**0.3**
GEPF	South Africa	138,572	0.1	n.a.	0.2	**0.3**
CPPIB	Canada	136,039	6.0	0.8	na	**6.8**
PFZW	Netherlands	131,780	2.0	0.0	0.0	**2.0**
OTPP	Canada	101,655	7.0	0.7	1.6	**9.3**
Previ	Brasil	88,847	0.0	13.5	n.a.	**13.5**
Future Fund	Australia	65,824	4.1	na	na	**4.1**
OMERS	Canada	52,385	15.5	0.0	0.0	**15.5**
PMT	Netherlands	49,426	0.6	n.a.	0.0	**0.6**
Pension Reserve Fund	France	49,033	0.0	na	na	**0.0**
USS	United Kingdom	48,889	2.9	n.a.	n.a.	**2.9**
PFA	Denmark	45,962	0.7	n.a.	0.0	**0.7**
AFP Provida Chile	Chile	40,474	0.0	0.2	1.4	**1.5**
AustralianSuper	Australia	33,800	11.5	0.2	0.1	**11.8**
AP-3	Sweden	30,661	0.5	na	na	**0.5**
AP-4	Sweden	29,560	0.0	9.0	na	**9.0**
UniSuper	Australia	25,676	4.4	n.a.	0.0	**4.4**
Afore Bancomer Mexico	Mexico	16,430	0.0	2.1	0.5	**2.6**
Sunsuper	Australia	15,782	4.3	n.a.	0.2	**4.5**
Superannuation Fund	New Zealand	11,162	3.3	6.6	na	**9.9**
AFP Horizonte-Col	Colombia	7,930	1.7	7.5	2.4	**11.5**
COMETA	Italy	7,484	0.0	2.2	1.5	**3.7**
Fonditel	Spain	7,328	0.0	n.a.	n.a.	**0.0**
AFP Horizonte-Perú	Peru	7,162	0.3	3.0	7.4	**10.7**
CAJA MADRID	Spain	5,400	0.0	0.7	0.2	**0.9**
Fonchim	Italy	3,915	0.0	n.a.	n.a.	**0.0**
Banco BPI	Portugal	3,114	0.0	10.2	10.6	**20.0**
Endesa	Spain	2,082	0.0	8.7	4.7	**13.4**
Total		**1,468,630**				

Infrastructure allocation in the total portfolio

Investors take different approaches to infrastructure investment. Behind the separate investment allocation to infrastructure lies the investor's decision to consider infrastructure as an asset class in its own right. Pension funds with a dedicated allocation have a target allocation to the asset class as part of the total portfolio and access the investment largely through unlisted equity instruments (infrastructure funds or direct investment). For pension funds that do not have a separate allocation, infrastructure will fit into both the fund's equity and fixed income allocation, according to the type of security or investment used (mainly corporate bonds and listed corporate equities).[15]

Table 2. Infrastructure investment: Portfolio allocation (2010)

Name of the fund	Country	Infrastructure allocation	Where does it fit in the porfolio allocation
ABP	Netherlands	Separate	Infrastructure
GEPF	South Africa	Separate	Infrastructure
CPPIB	Canada	Separate	Infrastructure
PFZW	Netherlands	Separate	Infrastructure
OTPP	Canada	Separate	Infrastructure
Previ	Brasil	Not separate	Listed Equity
Future Fund	Australia	Separate	Infrastructure
OMERS	Canada	Separate	Infrastructure
PMT	Netherlands	Separate	Infrastructure
Pension Reserve Fund	France	Separate	Private Equity
USS	United Kingdom	Separate	Infrastructure
PFA	Denmark	Separate	Infrastructure
AFP Provida Chile	Chile	Not separate	Listed equity and Corporate debt
AustralianSuper	Australia	Separate	Infrastructure
AP-3	Sweden	Not separate	Listed Equity
AP-4	Sweden	Not separate	Listed Equity
UniSuper	Australia	Separate	Infrastructure
Afore Bancomer	Mexico	Not separate	Listed equity and Fixed income
Sunsuper	Australia	Separate	Infrastructure
Superannuation Fund	New Zealand	Separate	Infrastructure
AFP Horizonte	Colombia	Not separate	Listed equity and Corporate debt
COMETA	Italy	Not separate	Listed Equity and Corporate debt
Fonditel	Spain	Not separate	n.a.
AFP Horizonte	Peru	Not separate	Listed equity and Corporate debt
CAJA MADRID	Spain	Not separate	Listed equity and Corporate debt
Fonchim	Italy	Not separate	n.a.
Banco BPI	Portugal	Not separate	Listed equity and Corporate debt
Endesa	Spain	Not separate	Listed equity and Corporate debt

[15] Some investors invest on an opportunistic basis in infrastructure as part of their real estate or private equity allocation and consider a separate allocation to the asset class as programmes mature.

Infrastructure investment

Based on the information provided by the 28 funds taken in consideration for this part of the survey, total investment in infrastructure at the end of 2010, considered as direct exposure, was USD 41.8 billion, which represents 2.9 % of total assets surveyed (USD 1.4 trillion). If we consider total assets under management (AUM) for the complete survey (i.e. 52 funds for USD 7.7 trillion AUM) infrastructure investment of USD 41.8 billion represents 0.5% of the total.[16]

Of the total allocation, the largest portion (USD 37.9 billion or 2.6%) relates to unlisted equity (i.e. infrastructure funds or direct investment in projects) and USD 3.9 billion or 0.3% to fixed income (i.e. infrastructure project bonds or loans).

The USD 37.9 billion unlisted equity allocation to infrastructure was split between USD 30.9 billion in the form of direct investment in projects and USD 7 billion through infrastructure funds. The USD 3.9 billion fixed income allocation included USD 3.5 billion of bond investment and USD 380 million in loans.

Table 3. Infrastructure investment as percentage of total AUM (2010)

	USD million	As % of Total Assets Infrastructure Survey*	As % of Total Assets - Complete Survey**
Unlisted Equity	37,961	2.6%	0.5%
Fixed Income	3,920	0.3%	0.1%
Total Infrastructure Investment	**41,881**	**2.9%**	**0.5%**

Notes:

* Infrastructure Investment Survey: Total asset under management (28 funds): USD 1 468 billion.

** Complete survey: Total assets under management (52 funds): USD 7 712 billion.

[16] Figures may be understated given that for fixed income, the majority of the funds do not report such details on their allocation and infrastructure unlisted equity is often included in other asset classes. Some funds also report their allocation to infrastructure through listed equity (i.e. infrastructure corporates), which we have considered as indirect exposure for this survey.

2.2 Infrastructure survey - Analysis

In order to better understand what lies behind the headline figures, we divided the pension funds surveyed in two groups based on the infrastructure investment approach (i.e. separate allocation to infrastructure).

Pension Funds Survey – Group 1

Table 4. Group 1 profile

	Country	Tot Assets 2010 USD mil	Type of Scheme	Target Asset Allocation			
				Fixed Income	Equity	Alternative	Cash
OMERS	Canada	52,385	DB	53%*		47%	0%
OTPP	Canada	101,655	DB	43%	45%	30%	-18%
AustralianSuper	Australia	33,800	DC	11%	54%	30%	5%
PFZW	Netherlands	131,780	Hybrid	38%	34%	29%	0%
UniSuper	Australia	25,676	DC	30%	56%	14%	0%
ABP	Netherlands	312,257	DB	38%	27%	25%	10%
Sunsuper	Australia	15,782	DC	13%	55%	28%	4%
PFA	Denmark	45,962	Hybrid	80%	10%	7%	3%
PMT	Netherlands	49,426	DB	50%	30%	20%	0%
USS	UK	48,889	DB	13%	62%	26%	0%
GEPF	South Africa	138,572	DB	33%	58%	5%	4%
Future Fund	Australia	65,824	PPRF	15%	40%	40%	5%
CPPIB	Canada	136,039	PPRF	n.a.	n.a.	n.a.	n.a.
Superannuation Fund	New Zealand	11,162	PPRF	17%	48%	35%	0%
Total		**1,169,211**					

Notes:

AustralianSuper refers to the balanced fund allocation.

Unisuper fixed income includes cash.

Omers 53% refers to public assets, bonds and equity.

Future fund alternatives includes tangibles (property and infrastructure).

Group profile

This group of 14 pension funds is represented by Australian, Canadian, Danish, Dutch, New Zealand, South African and UK pension funds for a total of USD 1 169 billion AUM at the end of 2010. The size of the funds in terms of total assets ranges from Australian SunSuper with USD 15.7 billion, to the largest, ABP, with over USD 300 billion. Six funds are DB schemes, three are DC, two are hybrid schemes and three are PPRFs.

With the exception of Danish PFA, asset allocation is geared towards equity with target allocations on average 45% of the total portfolio. Alternative assets represent a significant part of the total portfolios, with target allocation on average 30% of the total. OMERS, for example, is targeting 47% of its total portfolio in alternative private market investments.

There are no specific regulations directly constraining investment in infrastructure for this group of pension funds.

Infrastructure appetite

Pension funds in this group have been investing in infrastructure and plan to continue to do so in the future. Canadian and Australian pension funds have been investing in infrastructure for over ten years and have built up a significant allocation to the sector (from 4% to 16% of total portfolio). These funds are actively pursuing new investment opportunities both within their respective country and internationally. European investors have only started building up their allocation to infrastructure, treating it as a separate allocation, over the last five years and allocations range from 1% to 3% of the total portfolio.

Based on the information received, total investment in infrastructure at the end of 2010 for this group was USD 42.3 billion, mainly related to unlisted equity (USD 37.6 billion), with fixed income at USD 2.0 billion and listed equity at USD 2.7 billion of the total.

The unlisted equity allocation of USD 37.6 billion was invested for USD 30.9 billion though direct forms of investment and USD 6.7 billion through infrastructure funds. The fixed income allocation of USD 2.0 billion included OTPP's USD 1.6 billion bond allocation, Sunsuper's USD 37 million loan and GEPF's USD 347 million allocation to loan and structured products. While presumably all the funds also have allocations to listed infrastructure equity, only three funds (OTPP, CPPIB and AustralianSuper) report it as a specific allocation, for a total of USD 2.7 billion.

Pension funds belonging to this group have a separate allocation to infrastructure and a target allocation as part of the total portfolio. Infrastructure is considered as an asset class in its own right and accessed through unlisted equity instruments (infrastructure funds, direct investment, etc.). Infrastructure sits within the "alternative assets" portfolio or is treated as a subcategory in the "real assets" asset class; for some funds, infrastructure is part of the "inflation sensitive investments" part of the portfolio. Infrastructure loans are considered part of the infrastructure allocation while bond allocation is part of fixed income For the majority of the funds, investment in listed equity infrastructure is buried in the overall listed equity allocation.

Table 5. Infrastructure investment as percentage of total assets (2010)

Name of the fund	Infrastructure Investment							
	Unlisted Equity		Listed Equity		Fixed Income		Total Infrastructure Asset	
	millions in USD	% of total portfolio asset	millions in USD	% of total portfolio asset	millions in USD	% of total portfolio asset	millions in USD	% of total portfolio asset
CPPIB	8,193	6.0	1,066	0.8	na	na	9,259	6.8
OMERS	8,057	15.5	n.a.	0.0	n.a.	0.0	8,057	15.5
OTPP	6,863	7.0	696	0.7	1606	2	9,165	9.3
AustralianSuper	3,934	11.5	79	0.2	35	0.1	4,048	11.8
Future Fund	2,702	4.1	na	na	na	ha	2,702	4.1
PFZW	2,649	2.0	n.a.	0.0	n.a.	0.0	2,649	2.0
UniSuper	1,134	4.4	n.a.	n.a.	n.a.	0	1,134	4.4
USS	1,440	2.9	n.a.	n.a.	n.a.	n.a.	1,440	2.9
ABP	845	0.3	n.a.	n.a.	n.a.	n.a.	845	0.3
Sunsuper	642	4.3	n.a.	n.a.	37	0.2	679	4.5
Superannuation NZ	455	3.3	876	6.6	na	na	1,331	9.9
PFA	366	0.7	n.a.	n.a.	n.a.	0.0	366	0.7
PMT	275	0.6	n.a.	n.a.	n.a.	0	275	0.6
GEPF	74	0.1	n.a.	n.a.	347	0.2	421	0.3
Total	**37,630**		**2,717**		**2,024**		**42,371**	

Note: For the majority of the funds, listed equity infrastructure figures are buried in the overall listed equity allocation, making totals understated.

Examples

Borealis Infrastructure acts as the infrastructure investment arm of OMERS. Established in 1999, it was the first group formed by a Canadian pension plan with a mandate to invest in infrastructure as a separate asset class. As at December 2010, OMERS had committed USD 8.3 billion, or 15.5% of its total assets, to infrastructure through unlisted equity and had target allocation of 21.5% of the total portfolio.

CPPIB began investing in infrastructure in 2004 through its Private Investment Department and has since developed a portfolio that represents 6.8% (or USD 9.2 billion) of the total portfolio (as of December 2010). The majority of the infrastructure portfolio, 6% of total assets, is in unlisted equity infrastructure (5.7% direct investment and 0.3% through infrastructure funds).

OTPP began building its infrastructure portfolio in 2001 and it now includes investments in airports, pipelines, electrical power generation, and water and natural gas distribution systems. As of December 2010, OTPP invested USD 9.1 billion or 9.3% of the total portfolio in infrastructure. The unlisted equity allocation to infrastructure, USD 6.8 billion or 7% of the portfolio (in line with the target allocation), is considered part of the infrastructure allocation. The listed equity to corporate infrastructure

(USD 696 million or 0.7%) and bond exposure (USD 1.6 billion or 1.6%) are part of the equity and fixed income allocation.

AustralianSuper's total assets at December 2010 were USD 33.8 billion. The fund started investing in infrastructure in the mid-1990s. In 2000, it started investing abroad, and in 2005 it started to co-invest along with other infrastructure funds. As of December 2010, AustralianSuper had approximately 11.8% of its total assets allocated to infrastructure investments (of which 11.5% was allocated to unlisted equity and the remainder to listed equity and fixed income as bonds).[17]

UniSuper is one of Australia's largest superannuation funds with USD 25.6 billion in assets at December 2010. At the same date, infrastructure investments amounted to USD 1.1 billion, held in direct holdings, such as the Sydney airport and the Anglian Water Group and listed and unlisted infrastructure funds managed by Macquarie.[18]

Infrastructure definition/policy

Definition

The main definition of infrastructure assets is broadly related to "physical structures, facilities and networks which provide essential services within the economy". For some funds, infrastructure comprises the core definition of physical assets but related operations and businesses with little or no commercial risks do as well.

Examples of such sectors include: energy (generation, transmission and distribution networks); transport (transport gateways, rail corridors, ports and airports); institutional facilities (hospitals, long-term care facilities and schools).

According to the funds surveyed, investments in infrastructure typically comprise one or more of the following characteristics: tangible assets; natural monopoly or preferred market positioning (challenging to duplicate economically); regulated revenues or revenues linked to inflation; long capital life warranting long-term investments (i.e. involving leases of 30 to 99 years); high barriers to entry due to regulation and high initial capital costs.

Investment Policy

Pension funds in this group hold a dedicated allocation within their overall portfolio to infrastructure and they manage the infrastructure investment policy as part of their overall portfolio strategy. Funds with large allocation also apply a portfolio construction approach to their infrastructure investments.

For the majority of funds, the infrastructure strategy is to invest, on a global basis, primarily in unlisted equities and mature infrastructure projects (i.e. brownfield projects already in operation with no construction risk as is the case for greenfield projects, see box 1).

The majority of funds of this group invest directly while others do not have any specific policy with respect to the means by which they invest in infrastructure (e.g. direct, pooled funds) nor to the size of any given investment, as this is at the discretion of the investment team and its investment committee.

[17] Figures relate to the Balanced Fund of AUD 28.4 billion, which represents 77% of AustralianSuper's funds.

[18] Macquarie Infrastructure and Real Assets, part of Macquarie Funds Group.

Green investment[19]

None of the funds surveyed has a target allocation, nor specifically address "green" investment in their investment policy.

Within the infrastructure asset class, the asset manager of ABP focuses on proven technologies; hence, clean tech falls outside of the scope of infrastructure. Renewable investments are being made (e.g. wind, solar, hydro), although there is no target allocation for this sector.

In the context of its long-term investment horizon, the CPPIB aspires to integrate environmental, social and governance (ESG) factors into investment management processes, where relevant, for all asset classes within the portfolio. For public equities, the CPP Investment Board's investing team works with internal portfolio managers to assess ESG risks and opportunities as they relate to overall corporate performance. In private market and real estate investments, ESG factors are evaluated, where applicable, in the due diligence process and monitored throughout the life of the investments.

OMERS' Statement of Investment Policies and Procedures encourages the adoption of high standards of behaviour as a means to maximise long-term shareholder value. As part of its due diligence in researching investments and monitoring performance, OMERS incorporates ESG factors into its decision-making processes.

OTPP has corporate governance and climate change risk frameworks that apply to its investment management process across all investments.

Box 3. GEPF's approach to infrastructure

The Government Employees Pension Fund (GEPF) is Africa's largest pension fund. With over USD 138 billion AUM, GEPF is the single largest investor in the Johannesburg Stock Exchange (JSE)-listed companies.

GEPF has recently launched its Developmental Investment Policy (DI Policy), which outlines the GEPF's approach to developmental infrastructure investments through the Isibaya Fund managed by the Public Investment Corporation.

GEPF has, in the strategic asset allocation, set aside 5% of the fund's portfolio for investing in developmental projects – mostly infrastructure projects in South Africa, to be achieved over time.This allocation for both social and economic infrastructure falls under the unlisted alternative assets allocation/ developmental investments allocation, which equates to approximately 5% of the total AUM.

At 31 December 2010, the GEPF had invested USD 421 million in infrastructure, representing 0.3% of total GEPF assets. Direct investments through unlisted equity represented 0.05% of total assets (USD 74million), loans 0.04% (USD 60 million) and investment through fund of funds 0.2% (USD 287 million).

GEPF does not count investments in debt instruments of state-owned enterprises (SOEs) [e.g. ESKOM bonds, Transnet bonds, SANRAL bonds, etc.] as infrastructure investments, even though they raised money for infrastructure investing (e.g. ESKOM building new power plants). Rather, they count such investments in their bond porfolio due to the nature of the instrument.

[19] As for green investment, a broad definition was adopted, including, for example, renewable and clean technology sectors.

Isibaya Fund

The Isibaya Fund finances projects capable of generating good financial returns while supporting positive economic, social and environmental outcomes for South Africa over the long term. The focus on developmental investments demonstrates the GEPF's commitment to its obligations as a signatory to the Principles of Responsible Investment ("PRI"), which ultimately benefits South Africa.

During 2010/11, the Isibaya Fund accelerated investments in developmental projects in four areas:

• Economic infrastructure, including projects in energy, telecommunications, logistics, commuter transport and water infrastructure.

• Social infrastructure, including projects in education, affordable housing and healthcare.

• Economic growth and transformation, investments in sectors that foster growth, job creation and broad-based black economic empowerment, particularly in priority sectors identified by the government's Industrial Policy Action Plan, including agriculture, agro-processing, alternative energy and environmental projects.

• Environmental sustainability, with a focus on renewable energy generation and clean technology, as well as firms, funds and projects active in the environmental goods and services sector.

In each area, the Isibaya Fund maintains a balance between social impact and financial returns. The GEPF has developed an ESG framework to measure the impact of Isibaya's unlisted investments on issues such as job creation, job retention, poverty alleviation, black economic empowerment and regional upliftment.

Pan-African Infrastructure Development Fund (PAIDF)

The PAIDF seeks to play a critical role in helping African economies meet the capital requirements in financing infrastructure investments to enable the continent to achieve sustainable growth. The fund's sector targets are energy, telecommunication, transport and water. The PAIDF's investments as at 31 March 2011 were:

• SeaWolf Oilfields Group, a Nigeria-based oil rig leasing service.

• Aldwych Holdings Limited, an Africa-focused independent power producer with investments in Kenya, Senegal, South Africa and Zambia.

• Essar Kenya Telecoms Limited, a cell phone operator based in Kenya.

• Main One Cable Company, the west coast subsea broadband telecommunications cable.

• Community Investment Ventures Holdings, a sub-Saharan inter-terrestrial broadband telecommunications investor.

• TAV Tunisie, which runs two airport development projects in Tunisia.

• Dark Fibre Africa, which installs, maintains and operates subterranean ducting infrastructure capable of dark fibre optic network services in South Africa. "Dark fibre" refers to cable that has been laid but is not yet in use.

Source GEPF and Annual Report 2011.

Pension Funds Survey – Group 2

Table 6. Group 2 profile

Name of the fund	Country	Tot Assets 2010 USD mil	Type of Scheme	Target Asset Allocation			
				Fixed Income	Equity	Alternative	Cash
AFP Horizonte-Col	Colombia	7,930	DC	55%	44%	1%	0%
AFP Horizonte-Perú	Perú	7,162	DC	52%	48%	0%	0%
Afore Bancomer Mexico	Mexico	16,430	DC	69-81%	15-22%	2-4%	0%
AFP Provida Chile	Chile	40,474	DC	49%	45%	6%	0%
Previ	Brasil	88,847	DB	31-38%	60-64%	2-4%	0%
Banco BPI	Portugal	3,114	DB	45%	30%	20%	5%
COMETA	Italy	7,484	DC	85%	15%	0%	0%
Endesa	Spain	2,082	Hybrid	65%	30%	5%	0%
Fonchim	Italy	3,915	DC	70%	30%	0%	0%
Fonditel	Spain	7,328	DC	51%	34%	15%	0%
P.P. CAJA MADRID	Spain	5,400	DC	56%	24%	3%	17%
Pension Reserve Fund	France	49,033	PPRF	67%	27%	6%	0%
AP-3	Sweden	30,661	PPRF	30%	55%	15%	0%
AP-4	Sweden	29,560	PPRF	35%	62%	4%	0%
Total		**299,419**					

Notes: COMETA fund Fondo Reddito Sub Fund.

AFP Peru, Colombia, Mexico and Chile refers to the weighted average of funds managed.

Group profile

The 14 Latin American and European pension funds included in this group had USD 299.4 billion AUM in 2010, with the size in terms of total assets ranging from USD 2.1 billion for Endesa to USD 88.8 billion for Previ. As for the type of scheme, eight funds are DC schemes, two are DB schemes, one has a hybrid nature and three are PPRFs.

With the exception of Previ and AP-3 and AP-4 which are more exposed to equity, asset allocation is geared towards fixed income, with all of the funds targeting a fixed income allocation higher than 50% of total portfolio. Fixed income is represented by investment grade government and corporate bonds with very limited investments in subordinated bonds and asset back securities. For Latin American pension funds, although it is decreasing rapidly (as in Mexico for example), domestic government debt still represents the majority of the fixed income allocation.

Although asset allocation in alternative assets is still very limited, it is increasing for the majority of the funds in the group. For example, Previ increased its allocation to real estate from 2.76% to 3.2% of

total assets. Fonditel, BPI and Endesa have an allocation to specific assets included in the alternative part of the portfolio such as commodities, real estate and private equity.

Regulation has a major influence on the asset allocations of this group of pension funds. For Latin American pension funds there are quantitative investment limits on unlisted equity, by credit rating and limitations on bonds issued by new companies and projects. Hence, the widespread use of monolines in Chile or listed instruments in Mexico, for example, to allow investment in infrastructure.

Infrastructure appetite

Pension funds surveyed in this group have invested in infrastructure and plan to keep doing so in the future, considering infrastructure as a main investment. However the investment, up to 20% of total portfolio, for BPI for example, is often included in other allocations as infrastructure is not yet taken into consideration as an asset class. Recent developments in the infrastructure market have increased investors' attention to the asset class with different options being considered.

Based on the information provided at the end of 2010, total investment in infrastructure was USD 18.7 billion, mainly based on listed equity (USD 16.5 billion), fixed income exposure (USD 1.8 billion) and some unlisted equity (USD 330 million).

The unlisted equity allocation of USD 330 million was only invested through infrastructure funds and included the Swedish fund AP3 USD 147 million allocation, AFP Horizonte Colombia with USD 131 million and Peru with USD 22 million. Fixed income total allocation of USD 1.8 billion only included bond instruments. Listed equity allocation of USD 16.5 billion included Previ's USD 12 billion (or 13.5% of total portfolio) and AP4's USD 2.6 billion (or 9% of total portfolio).

Pension funds surveyed in this group do not have a separate allocation to infrastructure. Infrastructure fits into both the fund's equity and fixed income allocation, according to the type of security or investment used (mainly bonds and listed corporate equities). Investment in unlisted equity infrastructure has been limited so far, although some funds are planning to gain direct exposure to infrastructure in the near future, investing on an opportunistic basis through the private equity or real estate allocation, part of the alternative allocation of their portfolio.

Also common in Latin America is the use of specific structured instruments to access infrastructure such as *Certificados de Capital de Desarrollo* ("CKDs") in Mexico, structured instruments traded on the Mexican stock exchange (see Box 4 below)

Table 7. Infrastructure investment as a percentage of total assets (2010)

Name of the fund	Infrastructure Investment							
	Unlisted Equity		Listed Equity		Fixed Income		Total Infrastructure Asset	
	millions in USD	% of total portfolio asset	millions in USD	% of total portfolio asset	millions in USD	% of total portfolio asset	millions in USD	% of total portfolio asset
Sweden - AP3	147	0.5	na	na	na	na	147	0.5
AFP Horizonte-Col	131	1.7	593	7.5	191	2.4	914	11.5
AFP Horizonte-Perú	22	0.3	215	3.0	532	7	769	10.7
FRR	17	0.0	0	na	na	na	17	0.0
Sweden - AP4	15	0.0	2,664	9.0	na	na	2,679	9.0
Afore Bancomer Mexico	0	0.0	346	2.1	84	0.5	430	2.6
AFP Provida Chile	0	0.0	62	0.2	550	1	612	1.5
Previ	0	0.0	12010	13.5	n.a.	n.a.	12,010	13.5
Banco BPI	0	0.0	317	10.2	330	11	647	20.8
COMETA	0	0.0	161	2.2	111	1.5	271	3.7
Endesa	0	0.0	182	8.7	97	5	279	13.4
Fonchim	0	0.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Fonditel	0	0.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P.P. CAJA MADRID	0	0.0	6	0.7	1	0.2	7	0.9
Total	**330**		**16,555**		**1,896**		**18,781**	

Box 4. Latin American pension funds' investment in infrastructure

In Latin America, pension funds have gained direct exposure to infrastructure mainly through structured products and project bonds. A new investment channel has appeared recently with the development of dedicated infrastructure funds.

Chile: In Chile, two types of infrastructure bond issuance contracts have been developed: ***Pre-operative bonds*** are issued when construction of the public work has begun but before it is finished. These bonds have been irrevocable and unconditionally guaranteed by international insurance companies, which guarantee full payment of the principal and interests outlined in the insurance contract; ***operative bonds*** are issued during the public work's operational stage. These are pure revenue bonds, as the debt is issued to fund a finished project and the debt repayment is exclusively backed by the project's future revenues. Investment has mostly been in the transport sector (predominantly roads), with some projects in the energy sector (including hydro power).

At the end of 2010, there were only two private equity infrastructure mutual funds in operation in Chile and active in the market with local pension fund involvement.

Mexico: Since 2008, pension funds have been able to invest up to 10% of their assets (for the highest risk fund options) in structured securities known as "CKDs" (*Certificados de Capital de Desarrollo*) and another 10% in Real Estate Investment Trusts (known as "FIBRAS"). These securities are quoted on listed exchanges. The FIBRAS are securities issued by trusts dedicated

to investments in real estate and infrastructure. The structure is consequently an investment vehicle, which due to its design allows pension funds to participate in infrastructure projects from their initial stage, offering, in principle, greater clarity on possible cash flows. Pension funds' participation in the Holders Assembly of the trust under which the instrument is structured strengthens the protection of their rights as investors, improving their ability to supervise the investment of assets and to evaluate the performance of, and indeed to replace if necessary, the project manager. Investment has predominantly been in roads and housing.

In 2009 Macquarie launched the first peso-denominated fund focused solely on investment opportunities in Mexican infrastructure projects. Cornerstone investors in the fund include Mexico's National Infrastructure Fund (FONADIN), and a number of Mexican pension funds.

Peru: In 2009, the Pension Fund Association created an Infrastructure Investment Trust with contributions from the four pension fund administrators (PFA) operating in the pension system. The fund only invests in infrastructure project debt (CRPAOs) which are held to maturity, so far in two water projects. The fund is managed by a company authorised by the supervisory authority, with representatives of the four PFAs sitting on the fund's investment committee – so that they have control over the investment process, the selection of the most adequate projects and the designation of shared sums as well as monitoring and supervisory tasks. The trust structure is believed to overcome some of the difficulties pension funds encounter in making infrastructure projects (including delays and problems relating to concession contracts; lack of external financial advice; better information flow between pension funds and investment agencies; lack of structured instruments adequately sharing risk). This co-operative structure between funds is also important due to the competitive nature of the pension system in Peru, where members can switch pension provider. The performance of the funds is usually compared on a short-term basis and significant relative underperformance has to be made up by the provider.

In Peru, the following are among the most notable mutual funds:

i. *Fondo de Inversión en Infraestructura, Servicios Públicos y Recursos Naturales de AC Capitales*: Created in September 2004 with a duration of 30 years and committed resources of USD 50 million, it finances projects at any stage of development through capital allocations. Currently, the value of investments is around USD 55 million, with the only participants in the fund being PFAs. It participates in major projects, including three electric transmission lines, the railroad in the central area, the Jorge Chávez airport, air freight terminals and an oil and biofuel refinery.

ii. *Fondo de Inversión Larraín Vial Energía Latinoaméricano*: This fund is focused on assets related to the energy sector in Latin America (mainly Chile, Peru and Colombia). It participates in projects and companies in different areas of electricity generation (water, gas and coal) and aims to maintain control of these companies. It currently has around USD 100 million and aims to reach a total of USD 150 million. It has a duration of 12 years, which is extendible for periods of 2 years with the agreement of its contributors. In Peru, the fund has invested in a natural gas plant in Termochilca, which will install up to 200 MW of generation capacity south of Lima. Termochilca has already been awarded an eight-year USD 450 million energy supply contract with the electricity distribution company Edelnor.

iii. *Fondo de Inversión en Infraestructura de Brookfield y AC Capitales :* Created by the Ministry of Economy as a way of financing large investment projects in the context of the 2009 financial crisis. It currently manages just under USD 500 million.

Colombia: Private equity funds dedicated to infrastructure in Colombia have considerably increased shares since 2007, when their investment system was established by Decree 2175. They are currently investing in 35 PEFs, of which the main ones are related mainly to the energy

sector: FCP Interbolsa Energético, FCP CPVAL and FCP Tribeca Fund I.

Brazil: Most infrastructure investment is channeled through private equity investment funds (*fundos de investimento em participaçoes* – FIPs), through investments conducted by subsidiary companies (*empresas participadas*) or through shares, such as the investment of Invepar, an infrastructure company owned and controlled by the three largest pension funds in the country: PREVI, Petros and FUNCEF. Brazilian pension funds invest in unlisted infrastructure through FIPs and subsidiaries like Invepar, Log-In and Neoenergia.

For further information, see OECD (2012), *Infrastructure Investment in New Markets: Challenges and Opportunities for Pension Funds (forthcoming)* and BBVA (2011), *A Review of Recent Infrastructure Investment in Latin America and the Role of Private Pension Funds*, November.

Examples – Latin America

Afore Bancomer Mexico has USD 84 million invested in corporate bonds and USD 346 million (or 2.11% of total portfolio) in listed equity, of which 1.1.% is in structured instruments. Target allocation for the listed equity infrastructure is 3.23% of the total portfolio.

AFP Horizonte Peru has USD 22 million (or 0.3% of total assets) in the unlisted infrastructure funds part of the private equity allocation; listed infrastructure corporate of USD 215 million (or 3.01% of the asset total) part of equity allocation and USD 532 million (or 7.42%) in debt infrastructure. The vast majority of the debt relates to bonds in the fixed income allocation, but the fund also invests through an infrastructure trust.

AFP Provida Chile has USD 62 million allocation to listed infrastructure funds and USD 550 million (or 1.36% of the total portfolio) to bonds.

AFP Horizonte Colombia has USD 131 million (or 1.65% of total portfolio) in the unlisted infra funds part of the private equity allocation, 7.48% in listed corporate and 2.41% in the bonds part of the fixed income allocation.

Previ has investments in listed infrastructure corporate amounting to USD 12 billion, which represents 13.5% of total equity assets of the plan.

Examples – Europe

Caja Madrid does not have a separate allocation for infrastructure, but has a large exposure to transport assets (airports, highways, etc.), through investment in corporate equities (i.e. listed corporate such as the Spanish construction company Ferrovial).

Access to infrastructure can also be achieved through specific bond vehicles designed to finance infrastructure projects. For example, Caja Madrid has invested EUR 1 million in the listed bond Auvisa (or Autovia de los Vinedos) designed to finance a regional highway shadow toll road connecting the regions of Toledo and Ciudad Real in Spain.[20]

[20] On 23 May, Moody's confirmed the negative outlook on Auvisa's B3 ratings reflects the ratings outlook for Castilla-La Mancha as payer under the concession agreement and the macroeconomic pressures in Spain.

Fonditel and Cometa are not actively investing in infrastructure at the moment, but they are considering it as part of the "alternative" allocation to the total portfolio. Cometa has planned to invest 1% in private equity for the sub-fund Reddito and 4% in private equity for the sub-fund Crescita.

Although AP-4 does not have an investment policy for infrastructure, it is actively investing in it. Infrastructure could exist under different portfolios such as "alternative" investments, private equity, global equity, etc.

Infrastructure definition/policy

Infrastructure assets are defined as the essential investment to develop the society and the economy of a region, country or international area. Ultimately the funds invest in different sectors (transport, utilities, communication, etc.) that can be included in a broad definition of infrastructure.

Reasons for investing are its long-term characteristics, which match pensions' retirement maturities; portfolios' diversification as it improves the overall yield; and ultimately the contribution that it provides to national economic and social development.

Pension funds do not have a specific investment policy for infrastructure with a target allocation. At the moment, the investment is not due to a specific strategic asset allocation in infrastructure, but for many funds it is a choice of the fund manager in order to replicate the general benchmark.

General infrastructure investment policy is to invest either equity or debt into companies or special purpose vehicles for the development of infrastructure projects, which demonstrate having a satisfactory structure and contracts in place, well-mitigated risks, a strong and sustainable source of repayment. Other characteristics of the investment include adequate debt coverage ratios, good quality sponsors and counterparts, compliance with applicable regulations, contribution to countries' social and economical development, and appropriate risk/return profile.

For Previ, infrastructure is basic physical and organisational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. Investment in infrastructure is defined in Previ's Investment Policy as investment in the following sectors: electricity, water and sanitation, roads, railways, ports and telecommunications.

Green investment

Environmental aspects of "green" projects will be evaluated in the due diligence process but ultimately the investment decision will be based on the investment's own merit and risk/return profiles.

Green investment is not specifically addressed in the investment policies of the pension funds of this group and no target allocation is specified. However, in recent years, some funds have invested in companies involved in the generation of so-called "green energy" or related firms if part of the benchmark taken into consideration.

Previ is a subscriber of Principles for Responsible Investment (PRI), but it does not have a target allocation for "green investment".

3. CONCLUSIONS AND POLICY RECOMMENDATIONS

Conclusions

Although it is growing rapidly, institutional investment in infrastructure is still limited. Clearly, different countries are at different stages in the evolution of pension fund investment in infrastructure.

The investors' infrastructure investment approach (i.e. separate allocation to infrastructure) relates to different factors, such as the maturity of infrastructure market, the pension funds system (i.e. size of the funds), regulation and experience in the sector.

Among the funds surveyed, some – mostly larger ones – are able to invest and treat infrastructure as an asset class. However, recent developments in regulation, the trend in alternative investment driven by the need to diversify the portfolio and new interest in "green" investment, have increased investors' attention to infrastructure as a new asset class.

Active investors who have made several investments are more likely to have separate allocations, showing that most of them place infrastructure in separate allocations as programmes mature. Further along the learning curve are the Canadian and Australian pension funds, with the first funds that started investing in infrastructure more than ten years ago having built up since then a significant allocation to the sector (from 4% to 16% of total portfolio). European investors have only started building up their allocation to infrastructure, treating it as a separate allocation (or as a subsector of real estate or private equity), over the last five years, with allocations ranging from 1% to 3% of the total portfolio.

For the majority of these funds the infrastructure strategy is to invest, on a global basis, primarily in unlisted equities and mature infrastructure projects. In general, pension funds prefer to invest in large, mature operating assets that already generate cash flow although they will evaluate and participate in greenfield projects on an opportunistic basis. Funds with large allocations also apply a portfolio construction approach to their infrastructure investments, making a distinction among different risk/returns opportunities.[21]

The majority of pension funds in the first group of investors analysed are investing directly in infrastructure, mostly co-investing along infrastructure funds but also taking leading roles in consortia, competing with other funds and financial sponsors when bidding for projects. Over the years, these large pension funds have been able to acquire the knowledge, expertise and resources to invest directly in infrastructure. If the pension fund is not large enough it normally invests through infrastructure funds (as in Australia, for example, through closed-ended funds or open-ended vehicles).

On the other hand, smaller and less experienced pension funds do not have a specific investment policy for infrastructure with a target allocation. General infrastructure investment policy is to invest either equity or debt into companies or special purpose vehicles for the development of infrastructure projects.

[21] Based on risk/return profiles, the infrastructure portfolio of the largest pension funds is often divided in different segments: i.e. core, where cash yield is the dominant part of the return, and value added/opportunistic, where capital appreciation forms the dominant part of the return.

For many funds it is a choice of the fund manager in order to replicate the general benchmark in case of listed investments.

Since it is becoming accepted practice to consider infrastructure as an alternative asset class, in the analysis of the results of the survey, it is interesting to look at the asset allocation across countries and in particular at the trend in alternative assets.

For pension funds in Group 1, alternative assets represent a significant part of the total portfolios with an average target allocation of 30% of the total. Infrastructure sits within the "alternative assets" portfolio or is treated as a subcategory in the "real assets" group; for some funds infrastructure is part of the "inflation sensitive investments" part of the portfolio. OMERS, for example, is targeting 47% of its total portfolio in alternative private markets investments.

For pension funds in Group 2, asset allocation in alternative assets, although still very limited, is increasing for the majority of the funds. For Latin American pension funds, although it is decreasing rapidly (as in Mexico for example), domestic government debt still represents the majority of the fixed income allocation. Investment in unlisted equity infrastructure has been limited so far, although some funds are planning to invest on an opportunistic basis through the private equity or real estate allocation, part of the alternative allocation of their portfolio.

Regulation has a major influence on the asset allocations of pension funds. For Latin American pension funds there are quantitative investment limits on unlisted equity, by credit rating and limitations on bonds issued by new companies and projects. Hence the widespread use of monolines in Chile or listed instruments in Mexico, for example, to allow investment in infrastructure (CKDs in Mexico, structured instruments traded on the Mexican stock exchange).

In general, there seems to be an increasing interest in green investments, including clean technology and renewable energy such as wind and solar projects. However, none of the funds surveyed has a target allocation, nor specifically addresses "green" investment in their investment policy. Environmental aspects of "green" projects will be evaluated in the due diligence process but ultimately the investment decision will be based on the investments' own merit and risk/return profiles.

Policy recommendations

In order to attract private sector investment, and particularly institutional investment, to the infrastructure sector, policy makers need to approach the issues investors are facing from an asset allocation perspective and make the asset class financially attractive.

While investors are increasingly adopting an international approach to their portfolio allocation, a co-ordinated policy response to the barriers they are facing is still missing at the international level. However, governments have started to recognise that they need to reconsider their approach to financing to secure new sources of capital to invest in infrastructure. Developed and developing countries are, in effect, competing to attract institutional investors to infrastructure.

Infrastructure investing is different from other asset classes as the nature and risks of these investments, such as high up-front costs and the scale of the projects, require dedicated resources to understand them – resources that many smaller pension funds lack and which take years to build up (as has been the case at the Canadian public pension funds, for example, which are some of the most experienced infrastructure investors in the world).

An additional issue for pension funds is the lack of objective, high-quality data on infrastructure investments. This makes it difficult to assess the risks of these investments and to understand correlations

with the investment returns of other assets. Without such information, pension funds are reluctant to make such allocations.

A related issue is that, whilst some countries collect data which matches the needs of the relevant authorities, there is no international, official, accurate data on the asset allocation of pension funds in alternative asset classes, which include, *inter alia*, hedge funds, private equity, real estate, infrastructure and commodities.

Definitions of alternative assets, as to ensure that the data collected and reported is comparable across pension funds, is required in order to monitor the flows into different types of alternative assets and their respective costs and performance – which is vital not only for investors but also for regulators and other policy makers, to help them better understand the exposure of pension funds in different countries and produce appropriate regulation.

Some policy initiatives are headed in the right direction. The UK government has a stated policy to attract GBP 20 billion of institutional investment into UK infrastructure[22] and has been active through HM Treasury in leading the discussions with investors. The EU "Project Bonds Initiative" approved in May 2012 aims to finance infrastructure projects in Europe through capital market solutions, i.e. structuring financial instruments, the project bonds. The experience of Mexico and Chile suggests that institutional investors, and in particular pension fund assets, have been instrumental to the growth of the corporate bond market and in turn to the provision of development finance.

Recent G20 meetings (i.e. Los Cabos in June 2012 and Cannes in November 2011) recognised the urgent need to deepen and broaden capital markets for developing countries to put their own financial resources to productive use and to attract foreign capital flows.

Drawing from international experience and partnering with some of the largest institutional investors, the OECD launched the "Institutional Investors and Long Term Investment" project in February 2012. The project's ultimate goal is to facilitate long-term investment (LTI) by institutional investors such as pension funds, insurance companies and sovereign wealth funds, addressing both potential regulatory obstacles and market failures. This project will focus on how to engage the private sector in financing infrastructure, thus making the asset class financially attractive to institutional investors.

[22] Last year, the government used the NIP to announce that it had earmarked an additional GBP 30 billion for investment in infrastructure, comprising GBP 20 billion targeted from pension funds and insurers, GBP 5 billion capital spend committed across the next spending review period and a further, additional GBP 5 billion of infrastructure spending this spending review period. [Autumn Statement 2011, *http://cdn.hm-treasury.gov.uk/autumn_statement.pdf*].

BIBLOGRAPHY

Beeferman, Larry W. (2008), "Pension Fund Investment in Infrastructure: A Resource Paper", *Occasional Paper Series No.3*, Harvard Law School.

Chambers, J. (2007), *Infrastructure Research Report*, Pension Consulting Alliance

Inderst, G. (2010), "Infrastructure as an Asset Class", *EIB Papers*, Vol. 15, No. 1, www.eib.org/attachments/efs/eibpapers/eibpapers_2010_v15_n01_en.pdf#page=72.

IOPS (2011), "Pension Fund Use of Alternative Investments and Derivatives: Regulation, Industry Practice and Implementation Issues", *IOPS Working Papers on Effective Pension Supervision*, No. 13, IOPS.

OECD (2011a), "Large Pension Funds Survey 2011", OECD, Paris.

OECD (2011b), "Pension Fund Investment in Infrastructure: A Survey – Transcontinental Infrastructure Needs To 2030/2050", OECD, Paris.

OECD (2011c), "The Role of Pension funds in Financing Green Growth Initiatives", *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 10, OECD Publishing, Paris.

Stewart, F. and J. Yermo (2008), "Pension Fund Governance: Challenges and Potential Solutions", *OECD Working Papers on Insurance and Private Pensions*, No. 18, OECD Publishing, Paris, www.oecd.org/dataoecd/18/29/41013956.pdf.

Weber and Alfen (2010), *Infrastructure as an Asset Class*, John Wiley and Sons.

Weisdorf, M. A. (2007), "Infrastructure: A Growing Real Return Asset Class", *CFA Institute Conference Proceedings Quarterly*, September, Vol. 24, No. 3.

World Economic Forum (2010), *Paving the Way: Maximizing the Value of Private Finance in Infrastructure*, WEF, Geneva.

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