INTERNATIONAL FUTURES PROGRAMME

PROJECT ON STRATEGIC TRANSPORT INFRASTRUCTURE TO 2030

PENSION FUNDS INVESTMENT IN INFRASTRUCTURE

A SURVEY

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Contact: Raffaele.DELLACROCE@oecd.org
Pierre-Alain.SCHIEB@oecd.org
Barrie.STEVENS@oecd.org

ABOUT THE STUDY

The OECD Project on Infrastructure to 2030, published in 2006/7, already recognized the growing importance of investment needs to 2030 for infrastructure in telecommunication, electricity, water and transport, while highlighting at the same time the notion of an emerging "infrastructure gap". To bridge this "infrastructure gap" institutional investors were identified as one of the most promising candidates and it was decided to further review opportunities and barriers to investment in infrastructure from the standpoint of pension funds.

A survey of a sample of the most significant actors was then launched by the OECD within the framework of the OECD Project on Transcontinental Infrastructure 2030-2050. The main countries that have been covered by the study are Australia, Canada, South Korea, USA and various jurisdictions throughout Europe.

The objective of this survey-based study was to understand the main problems encountered by pension funds when investing in infrastructure. In order to do so, a brief analysis of the evolution of the infrastructure and pension fund market in each country was undertaken. On the basis of the barriers to investment identified in the study some policy initiatives are proposed.

The focus of the study was mainly on (unlisted) equity investment given the different dynamics and drivers underlying pension fund investment in debt infrastructure and different subjects involved in the investment decision.

The analysis was structured on a country-by-country basis to underline different stages of evolution of investment in infrastructure and specific problems encountered and solutions proposed in each market. Although the development of each pension and infrastructure market has taken a unique path, they may provide useful examples and lessons in understanding the potential of infrastructure investment markets now developing in other countries.

Findings are mainly based on interviews with industry professionals as the existing data sources are limited, particularly with regard to infrastructure investment policy and risk management. The information acquired in interviews complements that obtained from a literature review, selected pension fund annual reports, and an analysis of the available data sources.

The selection of interviewees was tilted towards large-sized defined-benefit, occupational pension funds, since these funds represent a large share of overall infrastructure investment and in some cases have developed investment policies specific to infrastructure. Interviews were held with managers of institutional investors holding assets that collectively totalled over US$4tn at the end of 2010. Besides pension funds themselves, a number of investors from the insurance sector, and prominent financial consultants, infrastructure funds, multilaterals, academics, advisors to treasury and infrastructure departments, were also consulted.

The inputs to the present report also incorporate advice and guidance from participants in the Steering Group of the OECD Project, as well as work and publications of line Directorates of the OECD.

The study was conducted by the OECD's International Futures Programme. The principal author was Raffaele Della Croce, working under the direction of Barrie Stevens and Pierre-Alain Schieb. Valuable comments were also provided by John White. Hyung soo Woo conducted research into and interviews for the Korean country study.

Steering Committee

European Investment Bank

Overseas Infrastructure Alliance – India

Ministry of Transport – Turkey

Ministère de l'écologie, de l'énergie, du développement durable et de la mer – France

Institut National de Recherche sur les Transports et leur Sécurité (INRETS) – France

Flemish Department of Mobility and Public Works – Belgium

Swedish Road Administration – Sweden

State Planning Organization – Turkey

Macquarie Group – Australia

Ministry of Transport and Communications – Finland

Federal Ministry of Transport, Innovation and Technology (BMVIT) – Austria

Ministry of Transport – Denmark

Ministry of Transport, Public Works and Water Management – The Netherlands

CDC Infrastructure – France

Federal Department for Environment, Transport, Energy and Communications – Switzerland

Oliver Wyman – United States

Invited Experts and Guests

ATP – Denmark

Von Dewall Advisory & Management – Netherlands

Global Infrastructure Fund Research Foundation – Japan

List of Interviewees[1]

Institutional Investors

California Public Employees Retirement System (CalPERS) – USA

California State Teachers Retirement System (CalSTRS) – USA

Los Angeles County Employees Retirement (LACERA) – USA

Illinois State Retirement System (SURS) – USA

Teacher Retirement System of Texas (TRS) – USA

New Jersey State Investment Council – USA

University of Texas Investment Management Company – USA

Union Labor Life Insurance Company (ULLICO) – USA

John Hancock – USA

Ontario Municipal Employees' Retirement System (OMERS) – Canada

Canada Pension Plan Investment Board (CPPIB) – Canada

Ontario Teachers' Pension Plan (OTPP) – Canada

OPTrust – Canada

PGGM – the Netherlands

APG – the Netherlands

ATP – Denmark

University Superannuation Scheme (USS) – United Kingdom

Varma Mutual Pension Insurance Company – Finland

London Pension Fund Authority (LPFA) – United Kingdom

Prudential (M&G) – United Kingdom

Aviva Investors – United Kingdom

[1] Over sixty interviews were conducted through mainly face to face meetings or if not possible through conference calls between May and December 2010. Additional comments were also provided during the drafting of the document.

Zurich Insurance – Switzerland

National Pension Service – South Korea

Public Employees Pension Service – South Korea

Korea Teachers Pension (KTP) – South Korea

AustralianSuper – Australia

Queensland Investment Corporation (QIC) – Australia

Industry Funds Management (IFM) – Australia

Fonds de Réserve pour les Retraites – France

Caisse de Dépôts Infrastructure (CDC) – France

Cassa Depositi e Prestiti (CdP) – Italy

Fondazione Cariplo – Italy

Other interviewees

Infrastructure Australia (IA)

Infrastructure Partnerships Australia

Macquarie Korea

Hewitt Associates

Pension Consulting Alliance

Cambridge Associates

Townsendgroup

Ennis & Knupp

Probitas Partners

IFC – World Bank

CP2 – Australia

European Investment Bank (EIB)

Marguerite Fund

Hewitt Associates

Tower Watson

Mercer

Macquarie Group

Morgan Stanley Private Equity – USA

Axa Private Equity

F2i

Prometeia

RREEF

Barclays Private Equity

Meridiam

Campbell Lutyens

Bfinance

UBS

Goldman Sachs

Infrastructure UK

Dexia Bank

Société Générale

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ACRONYMS

DB: Defined Benefit

DC: Defined Contribution

EIB: European Investment Bank

IA: Infrastructure Australia

IRR: Internal Rate of Return

GDP: Gross Domestic Product

OECD: Organisation for Economic Co-operation and Development

PPP: Public Private Partnerships

WB: World Bank

EXECUTIVE SUMMARY

PART I – A GENERAL PERSPECTIVE

The financial crisis has aggravated the infrastructure gap further reducing the scope for public investment, while at the same time affecting traditional sources of private capital. Institutional Investors such as pension funds may therefore play a more active role in bridging the infrastructure gap.

The OECD report on Infrastructure to 2030 (volumes 1 and 2) published in 2006/2007, estimated global infrastructure requirements to 2030 to be in the order of US$50 tn. The International Energy Agency also estimated that adapting to and mitigating the effects of climate change over the next 40 years to 2050 will require around US$45 tn or around US$1 tn a year.[2]

Such levels of investment cannot be financed by traditional sources of public finance alone. The impact of the financial crisis has exacerbated the situation, further reducing the scope for public investment in infrastructure within government budgets. The result has been a widespread recognition of a significant infrastructure gap and the need for greater recourse to private sector finance.

At the same time traditional sources of private capital such as banks, have restrained credit growth and may be further constrained in the coming years when new regulations (e.g. Basel III) take effect.

Institutional investors – pension funds, insurance companies and mutual funds – have been called to play a more active role in bridging the infrastructure gap. With over US$65 tn in assets held at the end of 2009 in OECD countries alone, institutional investors could be key sources of capital, financing long-term, productive activities that support sustainable growth, such as green energy and infrastructure projects.[3]

1. Infrastructure Investment – Why it is important and Why Pension Funds are interested

Failure to make significant progress towards bridging the infrastructure gap could prove costly in terms of slower economic growth and loss of international competitiveness. Economic infrastructure drives competitiveness and supports economic growth by increasing private and public sector productivity, reducing business costs, diversifying means of production and creating jobs.

The OECD general definition of infrastructure is the system of public works in a country, state or region, including roads, utility lines and public buildings. Infrastructure is typically used for performing long term capital activities which provide essential services to the public.

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2 See International Energy Agency (IEA) (2008), *Energy Technology Perspectives: Scenarios and Strategies to 2050.* The estimate is that around half the investment will involve replacing conventional technologies with low-carbon alternatives with the remainder being additional investment.

3 See OECD 2011, *The Role of Pension Funds in financing Green Growth*.

Infrastructure investments are expected to produce predictable and stable cash flows over the long term. Infrastructure assets normally operate in an environment of limited competition as a result of natural monopolies, government regulation or concessions. Investments are usually capital intensive and include a tangible asset that must be operated and maintained over the long term.

Pension Fund investment in infrastructure seems to be a reasonable proposition given the potentially good match of interests. Pension funds are increasingly looking at infrastructure investment (however investment is still limited).

Infrastructure investments are attractive to institutional investors such as pension funds as they can assist with liability driven investments and provide duration hedging. 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 sensitivity to inflation.[4]

Pension funds are increasingly looking at infrastructure to diversify their portfolios, due to the low correlation of infrastructure with traditional asset classes. Since listed infrastructure tends to move in line with broader market trends, it is a common 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.

Despite these reasons for increased interest, so far institutional investment in infrastructure has been quite limited overall. It has been estimated that less than 1% of pension funds worldwide are invested in infrastructure projects, excluding indirect investment in infrastructure via the equity of listed utility companies and infrastructure companies.

2. Setting the Scene – the Infrastructure Market

Over the last decades, in OECD countries, as the share of government investment in infrastructures has declined, the private sector share has increased. Privatisations and public-private partnership models (PPPs) offered further scope for unlocking private sector capital and expertise. Looking ahead in the coming decade at the large and increasing investment needs, the supply/demand balance seems to be significantly in favour of infrastructure investors.

In recent times, most countries' infrastructures have been built and maintained with public money. Infrastructure was viewed as a public good and supportive of broader investment policies. During the 1980s and the early 1990s, increasing constraints on public finances associated with growing demands for social expenditures, delayed the maintenance of existing systems and the construction of new facilities.

Over the last decades, public capital investment in infrastructure has on average declined in OECD countries. The OECD average ratio of capital spent in fixed investment (mainly infrastructure) to GDP fell from above 4% in 1980 to approx 3% in 2005. This reflected a decline in public investment in both countries with traditionally high and low public investment rates between the early 1980s and late 1990s, though it has subsequently stabilised.

In the past public provision of infrastructure has sometimes failed to deliver efficient investment with misallocation across sectors, regions or time often due in part to political considerations.

[4] Since the benefits of active employees are typically linked to their wages and retiree benefits are increased in line with some portion of price inflation by many plan sponsors.

Constraints on public finance and recognised limitations on the public sector's effectiveness in managing projects have led to a reconsideration of the state's predominant role in infrastructure provision.

As the share of government investment in infrastructures has declined that of the private sector has increased. Privatisations have been an important driver. New business models with private sector participation, notably variants of public-private partnership models (PPPs) have been increasingly used particularly in OECD countries, offering further scope for unlocking private sector capital and expertise.

Key Developments

The limited availability of investment opportunities – i.e. the limited supply of projects – has created bottlenecks in the infrastructure market. However, looking ahead at the huge investment needs in the coming decade, the supply/demand balance seems to be significantly in favour of the infrastructure investors.

Public finances have become so strained in many developed countries that financing options for governments are limited and further recourse to private capital would seem to be the only realistic option. At the same time, traditional sources of private finance (debt and equity) for infrastructure projects are becoming more constrained in their capacity to provide long term capital.

It has become more difficult to obtain bank loans with the long maturities required by infrastructure projects as commercial banks face capital and liquidity constraints. The demise of monolines has also frozen capital markets for infrastructure in Europe, depriving the infrastructure market of a limited but valuable source of financing. Multi-lateral lending institutions have increased their support to the infrastructure sector during the crisis but by themselves cannot offer a solution to the "infrastructure gap".

3. Setting the Scene – The Pension Fund Market

Over the past two decades, there has been a marked shift towards funding and private sector management in pension systems, driven largely by the introduction of mandatory private pensions. Despite the recent financial crisis, the prospect for future growth for institutional investors is unabated. Diversification and an increased interest in matching assets to liabilities are fuelling demand from pension funds for good quality – income oriented – investments that can match their liabilities.

Over the past two decades, there has been a marked shift towards funding and private sector management in pension systems, driven largely by the introduction of mandatory private pensions.

Funding has also become increasingly important within publicly managed pension systems. Many countries have established public pension reserve funds (PPRFs) to provide financing support to otherwise pay-as-you-go systems.

The main institutional investors in the OECD, pension funds, insurance companies and mutual funds, held over US$65 tn at the end of 2009. Pension funds assets and liabilities have been rapidly growing in the last decades as the workforce has aged and coverage has broadened.

Assets managed by OECD private pension plan[5] managers reached an absolute figure of US$17.0 tn in 2009 up from US$10.7 tn in 2001.

Reforms were partly due to governments' objectives of reducing the fiscal liabilities of public pension systems by scaling back benefit promises, and partly due to the advantages of financial markets in providing old-age support via better diversification of risks and positive macroeconomic repercussions, such as capital market development.

Key Developments

Despite the recent financial crisis, the prospect for future growth for institutional investors is unabated, especially in countries where private pensions and insurance markets are still small in relation to the size of their economies. Emerging economies generally face an even greater opportunity to develop their institutional investors sectors as, with few exceptions, their financial systems are largely bank-based. Whether such growth materialises will depend on some key policy decisions, such as the establishment of a national pension system with a funded component which is nowadays a common feature in most OECD countries.

Traditionally, institutional investors have been seen as sources of long-term capital with investment portfolios built around the two main asset classes (bonds and equities) and an investment horizon tied to the often long-term nature of their liabilities. However important developments are having an impact on their investment strategies.

The impact of the crisis, the gradual maturing of pension plan's demographic profiles, the underfunding of Defined Benefit plans (accounting for more than 60% of OECD pension assets), have underlined liquidity issues and at the same time a lower risk appetite for many investors.

Better appreciation of the interest rate sensitivity of plan liabilities and the risks of large mismatch in the characteristics of a plan assets and liabilities, translates in an increased interest in asset/liability matching, ultimately fuelling pension funds' demand for good quality – income-oriented – inflation-linked investments that can match their liabilities.

At the same time pension funds exposure to alternative assets continues to grow, extending a long- established trend and reflecting pension funds' growing appetite for diversification. In recent years investors have been considering changes in the policy asset mix to reduce exposure to the volatility of returns on publicly traded equities. However, due to low yields on fixed-income securities, they have been implementing the change through an increased allocation to alternative assets, including real estate, private equity and infrastructure.

The increase in "Socially Responsible Investing" (SRI) has raised demand for what are seen as ethical projects including "green infrastructure" such as renewable energy, especially in Anglo-Saxon countries such as Ireland, UK and the US.

4. Setting the Scene – Regulation

Pension fund investment regulations at country level have evolved over the years in accordance with the different national public policy decisions. In general, Anglo-Saxon countries adopt the prudent person rule (PPR) in pension fund investment which requires only that funds be

[5] OECD private pension plan assets include Defined Benefit and Defined contribution plans and Corporate and Public (i.e. pension plan for public sector employees), see Box 2.2.

invested "prudently" rather than limited according to category. Furthermore, there are few restrictions on investment in specific assets. In many other countries, however, different quantitative restrictions have traditionally been applied, normally stipulating upper limits on investment in specific asset classes, including equity.

Investment regulations should be based on the level of development of each country's capital markets and the level of sophistication of fund managers. However requirements to have a high domestic weighting for investment or to fund government debt have resulted in investment rules in most emerging countries favouring the construction of portfolios dominated by government bonds.

Regulation is one of the major drivers of pension funds investment strategies. Pension funds in fact, due to their fiduciary responsibility, tend to be heavily regulated, particularly with regard to their risk profiles and how risky assets are treated in their accounts. In general minimum levels of creditworthiness for allowable investments –often based on the investment grade rating assigned by rating agencies – limit the choice of investment opportunities for pension funds.

In addition to quantitative investment limits, other regulations can have an indirect impact on investment decisions. Defined benefit pension funds face pressure from regulators to either maintain funded status even in the short term or to make up any shortfall in funding. Regulations sometimes also exacerbate the focus on short-term performance, especially when assets and liabilities are valued referencing market prices.

Key Developments

The recent financial crisis and its subsequent severe impact on growth and employment have led to several proposals and actions to strengthen prudential regulation frameworks. While enhancing stability of the system these proposals may at the same time raise the long term cost of capital and affect the capability of pension funds to invest long term in assets such as infrastructure.

New regulation recently approved and to be implemented in the coming years will affect sources of finance (debt and equity) for infrastructure potentially limiting their availability. Proposed EU legislation could bring occupational pension schemes under the Solvency II rules having an impact also on infrastructure investment. Basel III will affect in particular long term bank lending. The Volker Rule and the AIFM Directive might have consequences on infrastructure funds and fundraising in the future.

PART II – COUNTRY ANALYSES

5. Evolution of Pension Fund Investment in Infrastructure – Appetite for Infrastructure

Clearly different countries are at different stages in the evolution of pension fund investment in infrastructure. The survey focussed on pension funds in Canada, Australia, the United States, South Korea and a number of funds in Europe. Country specific results are set out below.

Looking ahead, it can be expected that favourable conditions such as the growth of pension funds, privatisation trends and changing regulations, will continue to increase the interest of institutional investors in general, and of pension funds in particular, in infrastructure investment.

Canada

Canadian pension funds are among the most active investors in infrastructure with some investors having portfolio allocation to equity infrastructure of 10% or more.

Canadian pension funds over the years have been able to acquire the knowledge, expertise and resources to invest directly in infrastructure. Not only are they able to co-invest but also to take leading roles in consortia, competing with other funds and financial sponsors when bidding for projects. This also means that these investors have in-house resources to produce their own research and risk assessment of infrastructure projects without being dependent on external consultants.

For the largest investors in Canada, infrastructure is treated as a separate asset and is part of the allocation to inflation sensitive investments which tend to correlate closely with changes in inflation acting as a hedge against increases in the cost of future pension benefits.

Australia

Australian pension funds – superannuation funds – are active investors in infrastructure. The first Australian superannuation funds started investing in infrastructure more than ten years ago and have built up since then a significant allocation to the sector (for some above 10% equity investment of their total portfolio).

The average size of Australian investors does not allow them in most cases to have the right resources in place to invest directly in infrastructure. If the superannuation fund is not large enough it would normally invest through closed-ended funds or through open-ended vehicles. Infrastructure is commonly treated as a separate allocation in the overall portfolio.

United States

US pension funds have been investing little in infrastructure in the past, acquiring an exposure mainly to the energy sector through a few active funds in the country. Recent developments in the infrastructure market have increased investors attention to this asset class however, and investors are taking different approaches towards investment in infrastructure.

The majority of the investments in infrastructure are made on an opportunistic basis through the private equity or real estate allocation. There seems to be a trend in placing infrastructure as a separate allocation as programs mature. Infrastructure is still perceived to be riskier by some investors than real estate and private equity. The infrastructure asset is often included in an inflation-linked allocation group. Despite recent direct investment of a few public pension funds, the large majority of US pension investors invest in infrastructure through funds.

European Union

Despite the maturity of the infrastructure market, especially in countries such as the UK, France, Spain, European investors have started building up their allocation to infrastructure, treating it as a separate allocation, only in the last five years. Allocations to such assets are still limited (e.g. 1 to 3% equity allocation of total portfolio) even if targets have been slowly increasing in recent years.

In Europe pension funds utilise the indirect market route to benefit from the experience and expertise offered by infrastructure fund managers. Only the largest pension funds have the right resources in place to invest directly in infrastructure.

South Korea

In Korea the traditional view of infrastructure was as an investment of strategic importance, a major public good where there may have been difficulties in raising funds. Investment in infrastructure was therefore considered a government responsibility. With the involvement of private capital since the end of the 90s, new investment opportunities in the infrastructure sector were offered to investors in Korea. More recently Korean public pension funds have been aggressively investing in infrastructure in foreign countries.

6. Evolution of Pension Fund Investment in Infrastructure – Factors of Growth

Several key factors account for the growth of pension fund infrastructure investment.

The first factor is the ***availability of investment opportunities for private finance capital and therefore for pension funds. Private finance involvement has taken different routes in different countries.***

Following the wave of privatisation that has swept mainly the industrialised countries of the world over the last 25 years or so, the involvement of the private sector in the provision and operation of infrastructure has rapidly increased. In some sectors full privatisation is not always possible, or politically viable. Therefore, governments increasingly propose new forms of cooperation between public and private sector in infrastructure called Public Private Partnerships (PPPs or P3).For reasons of history as well as public policy, public-private partnerships are more widely developed in some countries than in others.

The US and Canada for example have historically relied on public financing of infrastructure such as highways, bridges, ports, canals. Federal and provincial governments in fact invested directly in infrastructure projects rather than rely on private sector financing. The Australian and European transport sectors on the other hand, have experienced higher private sector participation.

In Australia as the number of infrastructure transactions grew, so did the availability of financial instruments, predominantly infrastructure funds, providing investors with access to infrastructure investment opportunities. This lead to the development of investor understanding of infrastructure investment and investor demand for suitable infrastructure assets ultimately outstripping local supply of investable projects. The scale of the programme has been such that it has formed a base from which Australian investors have been able to play an active role in the development and ownership of infrastructure projects and assets elsewhere in the world.

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. 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.***

The growth of Australia’s investment industry has been a consequence of the introduction in 1992 of the compulsory Superannuation system as part of a major reform package addressing Australia's retirement income policies.

The largest European investors in infrastructure are in countries such as UK, the Netherlands, Sweden, Denmark and Finland with well developed pension markets. On the other hand the state-run pay-as-you-go (i.e. unfunded) public pension tier in countries like Greece, Italy, Spain and Turkey still plays a major role in the old-age retirement system, limiting the growth of private pensions and the potential for investment in infrastructure.

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

Regulations at country level have been evolving over the years following different public policy decisions to protect people's retirement savings but also to require a high domestic weighting for investment or to fund government debt. In particular local investment rules have traditionally favoured highly rated and liquid debt instruments.

Eastern Europe and Latin America, being new funded pension systems for example, exhibit a high degree of regulation and higher exposure to fixed income assets, while Australia, Ireland, New Zealand, the UK, the US, the Netherlands and Luxembourg do not impose any rules on pension funds' asset allocation and have higher exposure to equity investments.

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

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. Despite the maturity of the infrastructure market, especially in countries such as the UK, France, Spain, European investors have started building up their allocation to infrastructure only in the last five years.

Active investors who have made several investments are more likely to have separate allocations, showing that most place infrastructure in separate allocations as programs mature: infrastructure is commonly treated as a separate allocation in the overall portfolio in Canada and Australia while it is in most cases a subsector of real estate or private equity for European and American investors.

7. Barriers to Investment in Infrastructure

A high proportion of pension funds are not currently investors in infrastructure. There are some important hurdles to be overcome before infrastructure becomes a priority interest.

In order to attract pension fund investment in infrastructure and guarantee the success and sustainability of the investment in the long term, several barriers to investment need to be addressed, some specific to pension funds, others affecting investors more generally.

Infrastructure investing offers different characteristics from other asset classes which could represent barriers to entry to potential investors. High upfront cost, lack of liquidity and long asset life involved in infrastructure projects, require significant scale and dedicated resources to understand the risks involved, resources that many investors are lacking. These characteristics imply that infrastructure investment – at least in the forms it is currently offered – may not be a suitable proposition for all investors.

Although barriers need to be considered in the context of each different country, general barriers to pension fund investment in infrastructure include:

The Investment Opportunities

- Lack of political commitment over the long term
- Regulatory instability

- Fragmentation of the market among different level of governments
- Lack of clarity on investment opportunities
- High bidding costs involved in the procurement process of infrastructure projects
- Infrastructure investment opportunities in the market are perceived as too risky

The Investor Capability

- Lack of expertise in the infrastructure sector
- Problem of scale of pension funds
- Mis-alignment of interests between infrastructure funds and pension funds
- Short-termism of investors
- Regulatory barriers

The Conditions for Investment

- Negative perception of the infrastructure value
- Lack of transparency in the infrastructure sector
- Shortage of data on performance of infrastructure projects, lack of benchmark

8. The Way Forward

What is needed in the coming decades is sustained and steady investment in infrastructure. The challenge is to find ways and means of framing long term strategies, securing long term sources of finance and shielding them as effectively as possible from short term exigencies.

Institutional investors, in particular pension funds can play a more active role in the financing of long-term, productive activities that support sustainable growth, such as infrastructure projects.

However, before pension funds will commit large amounts of capital to infrastructure there must be transparent, long-term and certain regulations governing the sector. Such investments will only be made if investors are able to earn adequate risk-adjusted returns and if appropriate market structures are in place to access this capital.

Moving from the current mindset to a longer-term investment environment requires a transformational change in investor behaviour, i.e. a new "investment culture". The market, by its nature, is unlikely to deliver such a change. Major policy initiatives, in a variety of areas are needed. Some of these initiatives are considered below.

9. Main policy actions to promote long-term investments

Government support for long-term investments: designing policy measures that are supportive of long-term investing

The limited number and sporadic nature of investment opportunities in the infrastructure sector are perceived as the main barrier preventing investors from including infrastructure in their long-term investment strategy. Government support, such as long-term policy planning, tax incentives and risk transfer mechanisms may be required to engage investors in less liquid, long term investments such as infrastructure.

Reforming the regulatory framework for long term investment

Policymakers need to promote greater professionalism and expertise in the governance of institutional investors. Collaboration and resource pooling can also be encouraged in order to create institutions of sufficient scale that can implement a broader investment strategy and more effective risk management systems that take into account long-term risks. Regulators also need to address the bias for pro-cyclicality and short-term risk management goals in solvency and funding regulations, and ease quantitative investment restrictions to allow institutional investors to invest in less liquid assets such as infrastructure.

The Conditions for Investment: A Transparent Environment for infrastructure investment

Investment in infrastructure is a relatively new investment which entails a new set of challenges for institutional investors. Shortage of objective and comparable information and quality data make difficult to assess the risk of infrastructure deals.

The financial crisis – which had significant impact on the performance of many infrastructure deals – greatly damaged the relationship and trust between the infrastructure industry and investors. As a consequence many institutional investors have a negative perception of the value of investing in infrastructure and are not considering investment in the sector in the short to medium term, unless market conditions improve.

All stakeholders – including governments, regulators, the infrastructure industry and long term investors – will need to work cooperatively and actively to promote and create the environments and the opportunities needed to ensure the potential for pension fund involvement in infrastructure becomes the reality.

PART I

A GENERAL PERSPECTIVE

1. INTRODUCTION

1.1 The Infrastructure Gap

The infrastructure requirements of OECD countries and the larger non-OECD countries, such as China, India and Brazil are growing. To a large extent, this has to do with economic growth, a general underinvestment in the past and new challenges such as climate change.

The OECD report on Infrastructure to 2030 (volumes 1 and 2) published in 2006/2007, estimated global infrastructure requirements to 2030 to be in the order of USD 50 trillion. The International Energy Agency also estimated that adapting to and mitigating the effects of climate change over the next 40 years to 2050 will require around USD 45 trillion or around USD 1 trillion a year.[6]

Such levels of investment cannot be financed by traditional sources of public finance alone. The impact of the financial crisis exacerbated the situation further reducing the scope for public investment in infrastructure within government budgets.[7] The result has been a widespread recognition of a significant infrastructure gap and the need to greater recourse to private sector finance.

A further consequence of the crisis was the disappearance of some significant actors active in the infrastructure market such as monoline insurers in the capital markets.[8] At the same time traditional sources of private capital such as banks, have restrained credit growth and may be further constrained in the coming years when new regulations (e.g. Basel III) take effect.

Institutional investors – pension funds, insurance companies and mutual funds – may play a more active role in bridging the infrastructure gap. With over USD 65 trillion in assets held at the end of 2009 in OECD countries alone, institutional investors could be key sources of capital, financing long-term, productive activities that support sustainable growth, such as green energy and infrastructure projects.[9]

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6 See International Energy Agency (IEA) (2008), *Energy Technology Perspectives: Scenarios and Strategies to 2050.* The estimate is that around half the investment will involve replacing conventional technologies with low-carbon alternatives with the remainder being additional investment.

7 Fiscal deficits and government debt are approaching record levels in OECD countries. Fiscal deficits are estimated to have amounted to 8% of GDP in OECD countries in 2010 and debt-to-GDP ratios is estimated to be over 100% of GDP on average in 2011. Source OECD Economic Outlook Vol. 2010/2, OECD Publishing

8 One way to raise the attractiveness of infrastructure project bonds to institutional investors has been to obtain insurance from specialist insurers known as monolines. However, with the demise of the monolines due to the financial crisis, issuance of such "wrapped bonds" funded in the capital markets practically disappeared

9 For more on the potential role of pension funds see also OECD 2011, *The Role of Pension Funds in financing Green Growth*.

1.2 Importance of Infrastructure

Infrastructure projects are not an end in themselves. Rather, they are a means for ensuring the delivery of goods and services that promote prosperity and growth and contribute to quality of life, including the social well-being, health and safety of citizens, and the quality of their environment.

Addressing the challenge of climate change and "green growth"[10] more generally will require shifting from fossil fuels and conventional technologies to newer clean technology and infrastructure (on the current trajectory, energy-related emission of CO_2 are expected to double by 2050).

Like other investment, infrastructure expansion typically adds to the productive capacity in an economy. However, OECD empirical analysis suggests that infrastructure investment can have effects on growth over and above those arising from adding to the capital stock (OECD 2009).

These effects can occur through a number of different channels, such as facilitating trade and the division of labour, competition in markets, a more efficient allocation of economic activity across regions and countries, the diffusion of technology and the adoption of new organisational practices or through providing access to new resources.[11]

1.3 Infrastructure Investment

The OECD general definition of infrastructure is the system of public works in a country, state or region, including roads, utility lines and public buildings. Infrastructure is typically used for performing long term capital activities which provide essential services to the public.

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. Social infrastructure – also called public real estate – includes: schools, hospitals and defense buildings, prisons and stadiums.

In addition to the physical characteristics, there are other elements that further define the infrastructure investment opportunity such as contractual approach (e.g. concession contract); type of financing (e.g. corporate vs. project financing); maturity of the market (e.g. new vs. tested technology) and phase of asset development (e.g. Greenfield vs. Brownfield projects).[12]

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10 Green growth can be seen as a way to pursue economic growth and development while preventing environmental degradation, biodiversity loss and unsustainable natural resource use. It aims at maximising the chances of exploiting cleaner sources of growth, thereby leading to a more environmentally sustainable growth model (see *OECD Interim Report of the Green Growth Strategy*).

11 Such effects, which reflect the influence of infrastructure on efficiency throughout the economy, appear to be stronger at lower initial levels of provision. At the same time, these effects are not shared by all OECD economies, with some evidence suggesting cases of both under and over-provision and of both efficient and inefficient use of infrastructure. Cost-benefit analysis of individual projects is key to ensuring efficient infrastructure investments. For further reference see *Going for Growth*, OECD, 2009.

12 Greenfield or primary projects are assets generally constructed for the first time while Brownfield or secondary projects are already operational.

Infrastructure investments are expected to produce predictable and stable cash flows over the long term. Infrastructure assets normally operate in an environment of limited competition as a result of natural monopolies, government regulation or concessions. Investments are usually capital intensive and include a tangible asset that must be operated and maintained over the long term.

1.4 Pension funds and Infrastructure

Infrastructure investments are attractive to institutional investors such as pension funds as they can assist with liability driven investments and provide duration hedging.[13] 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 pensions liabilities. In addition infrastructure assets linked to inflation could hedge pension funds liability sensibility to increasing inflation.[14]

Pension funds are increasingly looking at infrastructure to diversify their portfolios, due to the low correlation of infrastructure to traditional asset classes. Since listed infrastructure tends to move in line with broader market trends, it is a common 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.

Despite these reasons for increased interest, so far institutional investment in infrastructure has been quite limited overall. It has been estimated that less than 1% of pension funds worldwide are invested in infrastructure projects, excluding indirect investment in infrastructure via the equity of listed utility companies and infrastructure companies (see Box 1.1 below).

[13] Chambers (2007).

[14] Since the benefits of active employees are typically linked to their wages and retiree benefits are increased in line with some portion of price inflation by many plan sponsors.

Box 1.1. **How much is invested in infrastructure?**

There are limited data on pension fund investment in infrastructure. 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.

Institutional investors can access infrastructure in several ways:

- *Debt financing*: lending to the owners or operators of the infrastructure (e.g. through bonds).
- *Listed infrastructure companies*: Investment in equity of companies which are exposed to infrastructure.
- *Infrastructure funds:* Pensions can invest in publicly-listed equity funds trading on a stock exchange (e.g. Brookfield fund, Macquarie Power and Infrastructure Corporation) or in un-listed equity funds that focus on infrastructure investments (i.e. Cube Capital, Alinda).
- *Direct investment (or Co-Investment along infrastructure funds)* in equity of a single-asset project company (e.g. OMERS, OTPP acquisition of High Speed 1 in the UK).

Infrastructure investment is rarely part of a separate allocation usually often being considered part of the private equity or real estate allocation. Pension fund investment in listed infrastructure vehicles is reported by national statistics agencies as national or foreign equities and lending to infrastructure vehicles is reported as fixed interest, while direct investment or participation in private equity vehicles is often reported within the category "other".

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

The Global Alternatives Survey 2010 undertaken by Tower Watson shows Real Estate as the largest block of alternative assets for pension funds (around 52%) followed by Private Equity (21%) Hedge Funds (13%) and Infrastructure (12%). Infrastructure increased its proportion of alternative assets in 2010 from 9% to 12% of total alternative assets. In terms of geographical distribution of infrastructure assets, Europe has the highest proportion with 43%, followed by North America with 36%. (*Based on Alternative assets managed on behalf of pension funds globally by the top 100 managers, approx USD 817 billion).*

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. The peak of pension funds participation in infrastructure came in the year 2007 when fundraising was at a record level and sector valuations were high.

Despite this recent growth, however, so far institutional investment in infrastructure has been limited. It has been estimated that less than 1% of pension funds worldwide is invested in infrastructure projects, excluding indirect investment in infrastructure via the equity of listed utility companies and infrastructure companies.[15]

15 A survey of 119 investors worldwide by Russell Investments (2010) sees the share of infrastructure at 0.3 per cent in 2009, but expects it to rise to 1.4 per cent of overall assets in three years' time. See also the survey conducted by IOPS 2011 *Pension fund use of Alternative Investments and Derivatives.*

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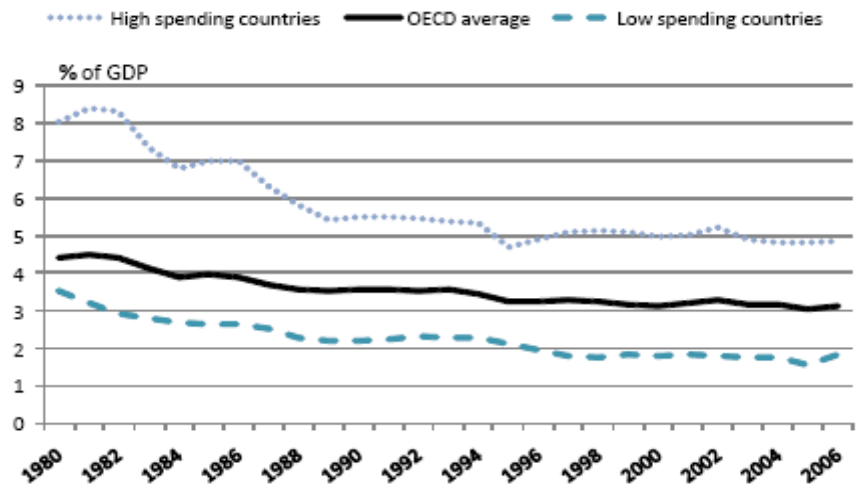
2. SETTING THE SCENE

2.1 Infrastructure Investment[16]

Previously, most infrastructure projects were built and maintained with public money.[17] Infrastructure was viewed as a public good and supportive of broader investment policies. During the 1980s and the early 1990s, increasing constraints on public finances associated with growing demands for social expenditures delayed the maintenance of existing systems and the construction of new facilities.

Figure 2.1. **Government gross fixed capital formation**[18]



Note: The series for high and low public spending are the means of public gross fixed capital formation as a share of gross domestic product (GDP) for 5 countries, which on average over the period had the highest or lowest public investment rates. The high-spending countries are Japan, Korea, Mexico, New Zealand and Turkey. The low-spending countries are Australia, Belgium, Denmark, Germany and the United Kingdom.

Source: SNA.

16 Main sources of information for this section are: *Going for Growth OECD 2009*; Araujo, S. and D. Sutherland (2010); Araujo, S., Sutherland D., Egert, B., Kozluk, T. (2009).

17 Private financing of infrastructure is not a new concept. In recent times however there have been significant developments. In post war Europe in particular, most of the infrastructure was owned and controlled by state institutions.

18 In some cases the apparent fall in investment may be exaggerated due to accounting conventions. As gross fixed capital formation is the sum of additions less disposals in countries where there is significant privatisation, it can fall and even become negative as assets change ownership. There are difficulties in comparing the rate of public sector investment across countries, given the different scope of governments. In this light, comparisons of public gross fixed capital formation can be deceptive, both when made across time and across countries.

Over the last decades, public capital investment in infrastructure has on average declined in OECD countries. The OECD average ratio of capital spent in fixed investment (mainly infrastructure) to GDP fell from above 4% in 1980 to approx 3% in 2005. This reflected a decline in public investment in countries with both traditionally high and low public investment rates between the early 1980s and late 1990s, though it has subsequently stabilised.

In the past public provision of infrastructure has sometimes failed to deliver efficient investment with misallocation across sectors, regions or time often due to political considerations. Constraints on public finance and recognised limitations on the public sector's effectiveness in managing projects have led to a reconsideration of the role of the state in infrastructure provision.[19]

As the share of government investment in infrastructures has declined, that of private sector has increased, with privatisations being an important driver. In OECD countries alone, some USD 1 trillion of state-owned assets have been sold in recent decades. Out of total privatisations of around USD 900 billion since 1990, more than 550 billion (63%) have been accounted for by infrastructure, notably utilities, transport and telecommunications.[20]

The majority of the private sector's infrastructure investment is made directly by corporates such as utility and transport companies. However, since the 1990s national policies of many countries have sought to increase private sector participation in the financing and implementation of infrastructure projects – especially new projects – by other complementary means, notably through "project finance" (EC 2011).

New business models with private sector participation, variants of public-private partnership models (PPPs) – often using project finance technique – have been increasingly used particularly in OECD countries, offering further scope for unlocking private sector capital and expertise.[21]

[19] The state changes its role from owner and provider of public services to purchaser and regulator of them. The private sector comes in as financier and manager of infrastructure expecting an attractive return.

[20] Data from the OECD Privatisation Database, and The Privatisation Barometer.

[21] The growth and spread of PPPs around the world is closely linked to the development of project finance, a financial technique based on lending against the cash flow of a project that is legally and economically self-contained. Project finance arrangements are highly leveraged and lenders receive no guarantees beyond the right to be paid from the cash flows of the project. Moreover as the assets of the project are specific, they are illiquid and have little value if the project is a failure (Yescombe 2007).

Box 2.1. **Public Private Partnership ("PPP")**

A public private partnership ("PPP") arrangement differs from conventional public procurement in several respects. In a PPP arrangement the public and private sectors collaborate to deliver public infrastructure projects – such as roads, railways, airports or hospitals and schools. PPP contracts typically involve not only the delivery of the infrastructure, but also the management of the facility, maintenance and service delivery. PPPs typically share the following features:[22]

- a long-term PPP contract between a public contracting authority (the "Authority") and a private sector PPP company based on the procurement of services, not of assets;
- the transfer of certain project risks to the private sector, notably in the areas of design, build, operations and finance;[23]
- a focus on the specification of project outputs rather than project inputs, taking account of the *whole life cycle* implications for the project;
- the application of private financing (often *project finance*) to underpin the risks transferred to the private sector;
- payments to the private sector which reflect the services delivered. The PPP company may be paid either by users (e.g. toll motorway), by the Authority (e.g. availability payments, shadow tolls) or by a combination of both (e.g. low user charges together with operating public subsidies).[24]

The UK and Australia are the most mature adopters and PPPs account for around 10 and 5% respectively, of public investment in infrastructure. Many other countries have recently started using PPPs. Most countries initially developed PPPs in the transport sector and later extended their use to other sectors such as education, health, Government accommodation, water and waste treatment.

In sectors such as social infrastructure PPP projects are typically structured as availability based payment projects. The UK for example through the Private Finance Initiative (PFI) has largely used this model in the school and hospitals sectors.[25] Other countries following the UK experience are Australia, Canada and South Korea.

One consequence of the rapid growth of infrastructure PPPs is that countries remain at vastly different stages of understanding and sophistication in using these innovative partnership models. PPP maturity and deal flow vary across countries due to differences in: legal and procurement frameworks; institutional arrangements; the level of political commitment and public acceptance; experience and competence levels; procurement approaches adopted.[26]

22 A Guide to Guidance for PPPs – European Investment Bank – January 2011.

23 For more on different types of risks entailed in a PPP project, see OECD (2008), *Public-Private Partnerships: In Pursuit of Risk Sharing and Value for Money*, OECD, Paris; and IMF (2004), *Public-Private Partnerships*, Fiscal Affairs Department, International Monetary Fund, Washington DC.

24 In availability based projects, the revenue is not subject to a material element of price or volume risk and payments are made by the Authority for operating and maintaining a public asset as per contracted standards.

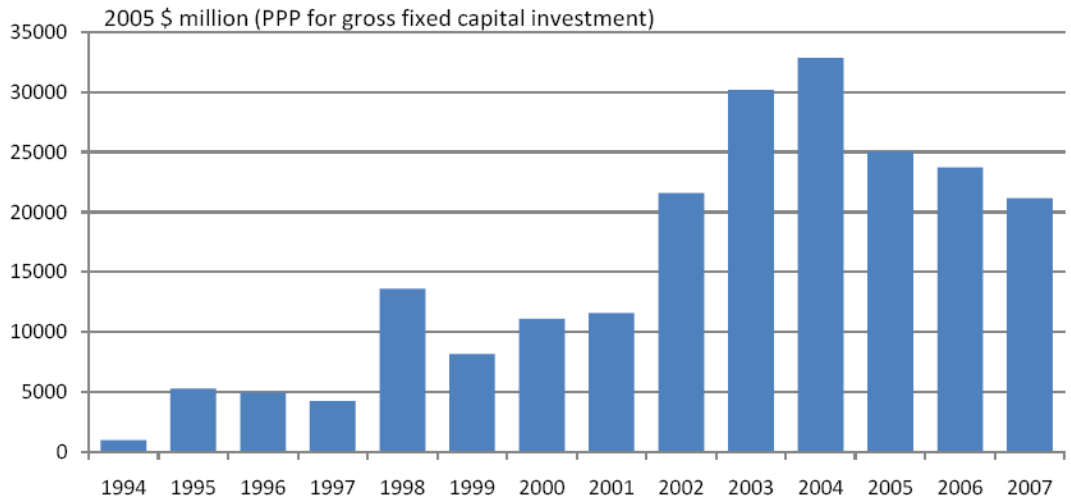
25 However the Building Schools for the Future (BSF) programme in the UK was revisited by the Coalition Government in 2010.

26 KPMG – PPP Procurement – Review of Barriers to Competition and efficiency in the procurement of PPP projects. May 2010.

2.1.1 Public-private partnerships in OECD countries[27]

Over the last two decades, PPPs have been gaining importance in many OECD countries as an alternative way to provide infrastructure. The number of infrastructure projects undertaken through PPPs has increased, roughly doubling between the beginning of the decade and 2007, though falling somewhat after the middle of the decade.

Figure 2.2. **Value of announced PPP deals, 1994-2007**



Source: Dealogic Projectware database (data extracted 19/2/08).

Most of the contracted PPPs are in the transportation sector, particularly roads, with very few projects signed in the telecoms and energy sectors. While PPP projects are relatively frequent in the water and sewerage sectors, they tend to be comparatively small such that their share in cumulative PPP projects is quite modest. At the same time, the median size has remained relatively stable at around US$200-US$300 million. Individual projects, however, can be extremely large.[28]

27 Data used draw from the Dealogic Projectware database, which gives a broad range of information on the use of public-private partnerships in OECD countries. In total, this database contains information on nearly 2 000 PPPs, of which around one-fifth are in infrastructure sectors. These data are based on project finance data, which covers: "The financing of long-term infrastructure, industrial projects and public services based upon a non-recourse or limited recourse financial structure where project debt and equity used to finance the project are paid back from the cash flow generated by the project".

28 In particular, transportation infrastructure projects – such as the UK's channel tunnel rail link in 1998, the London Underground in 2002 and the Italian Autostrade in 2002 – can account for around one-third of total announced investment in any given year.

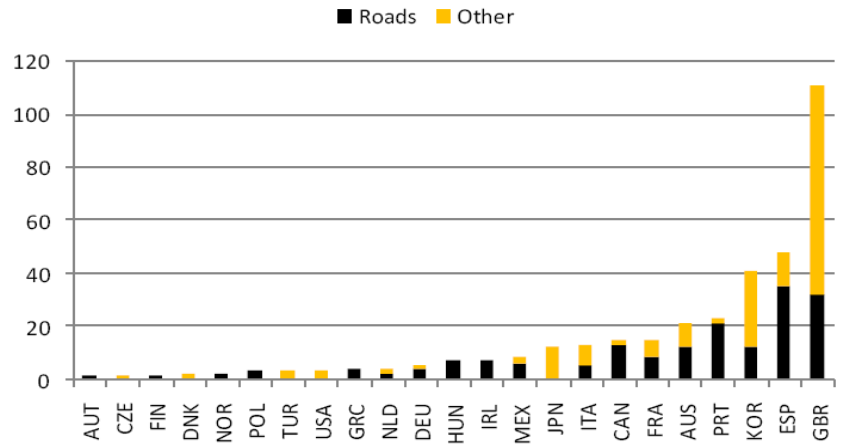
Table 2.1. **PPPs in Infrastructure by sector**

		Share in cumulative total 1994-2007	Number of projects	Share 1994-2000	Share 2000-2007
Energy		1.75	17	0.99	1.96
Water		2.05	45	2.14	2.01
Transport	Road	51.76	163	58.32	50.15
	Rail	26.60	38	24.28	27.10
	Other	14.37	49	9.88	15.60
Communications		0.86	6	3.23	0.14
Other		2.61	44	1.14	3.04
Sum		100	362	100	100

Source: Dealogic Projectware database (data extracted 19/2/08).

Project finance deals in the infrastructure sector were recorded in 23 OECD countries by the end of 2007, but only a small number of countries account for the majority of contracted projects. In particular, the United Kingdom accounts for around 30% of the total number of recorded PPPs and the cumulative volume of deals in the OECD area, which together with projects in Spain and Korea comprise more than half of all signed PPPs (see Figure 2.3 below).

Figure 2.3. **Distribution of the number of contracted PPPs in the OECD**



Source: Dealogic Projectware database (data extracted 19/2/08).

For most OECD countries, PPPs are concentrated in the road sector, with Austria, Finland, Greece, Hungary, Ireland, Norway and Poland having signed PPPs exclusively in this sector (at the time the data was extracted). On the other hand, the Czech Republic, Denmark, Japan, Turkey and the USA had not contracted any PPP in the road sector at the time the data was extracted. Countries that have a more diversified distribution of PPPs across sectors include Italy, Japan, Korea and the United Kingdom. The United Kingdom, Korea, Spain and France register a higher number of PPP contracts in the railways sector, with the United Kingdom being the only country to have signed PPPs in the IT sector.

2.1.2 Impact of the Financial Crisis

In recent years a small boom and bust in the infrastructure sector has been experienced.[29] Before the financial crisis fierce competition between financial and operational investors coupled with the availability of cheap debt led to a rapid appreciation of infrastructure asset values. Aggressively-bid infrastructure deals resulted in a number of projects taking on more and increasingly complicated levels of debt (i.e. accretive interest rate swaps). Valuation and debt multiples in infrastructure deals were rapidly increasing, while equity contributions were generally decreasing. As a result, the credit quality of infrastructure deals deteriorated.[30]

With the collapse of Lehman Brothers in September 2008 the fundraising market in all areas of illiquid alternatives declined and the infrastructure sector was also affected. However, fundraising recovered significantly in 2010 suggesting that investor confidence and appetite for infrastructure funds is slowly returning.

Lack of debt, due to the banking crisis and the disappearance of monolines in the capital market negatively impacted infrastructure markets. As a consequence, deal volumes in 2009 were at an historic low, despite the closing of large transactions with governments support.

Even though the full impact of the crisis remains to be fully assessed and complete data is lacking, some preliminary conclusions can be drawn:

- PPP projects relying on availability-based revenue streams with modest exposure to price or volume risk (e.g. PFI projects for schools and hospitals in the UK), in general have been well insulated from the recession;[31]

- in the transport sector (ports, airports, toll roads), which is exposed to variations in GDP and demand risk, there have been signs of a downturn in markets that suffered most during the crisis such as Europe and the US;[32]

- the few distress situations witnessed so far, have been mainly related to excessive leverage at some listed infrastructure funds and holding companies (e.g. Allco, Babcock & Brown).

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29 John Howell and Company Ltd: Building Infrastructure into the Portfolio – March 2010 and Standard & Poor's *The Amazing Growth of Global Infrastructure Funds: Too good to be true*? 2006.

30 Debt-to-EBITDA multiples in airport deals were ranging from 12x to 30x. For example in 2007, BAAs acquired Budapest airport at a ratio of 23x debt to EBITDA or in 2008 London City Airport acquired by a consortium of American International Group Inc at a ratio of 24x. Source: Partners Group Private Market Navigator, H2 2010.

31 From January 2009 until 30 September 2010, Moody's took 17 rating actions from a total portfolio of 46 publicly monitored deals. Positive actions have out-weighted negative by 15 to 2. Source Sector Outlook on EMEA PFI/PPP, Moody's Investors Service, 11 October 2010.

32 In 2009, world GDP fell by 2.3%. In the European Union GDP fell 4.2%, while in the United States GDP dropped 2.4%. A specific feature of the crisis was the globally synchronised trade collapse, with world trade volumes dropping 12%. World container traffic (TEUs) fell by 26% while air freight ton-km fell 10%. Preliminary estimates based on the ITF Quarterly Statistics indicate a 23% reduction in rail T-km and over 21% fall in road T-km in the EU. Rail data for the United States show declines of nearly 14%. Source: Key Transport Statistics 2009, International Transport Forum, OECD.

2.1.3 Key Developments

The limited availability of investment opportunities – i.e. the supply of projects – has created a bottleneck in the infrastructure market. However, looking ahead to the coming decade at the huge investment needs, the supply/demand balance seems to be significantly in favour of the infrastructure investor.

Public finances have become so strained in developed countries that financing options for governments are limited and further recourse to private capital seems to be the only option.[33] At the same time traditional sources of private finance (debt and equity) for infrastructure projects are becoming more constrained in their capacity to provide long term capital.

It has become more difficult to obtain bank loans with the long maturities required by infrastructure projects as commercial banks face capital and liquidity constraints. The demise of monolines has also frozen capital markets for infrastructure in Europe, depriving the infrastructure market of a limited but valuable source of financing.[34] Multi-lateral lending institutions have increased their support to the infrastructure sector during the crisis but do not represent the ultimate solution to the infrastructure gap.

Supply of infrastructure projects

Infrastructure needs will be shaped in the future by an array of factors such as demographic developments (ageing populations, population growth or decline, urbanisation trends, and population movements to rural and coastal areas); the expanding role of international trade and technological progress (for example in information and communication technology).

Addressing the challenge of climate change and "green growth" more generally will require shifting from fossil fuels and conventional technologies to newer clean technology and infrastructure (on the current trajectory, energy-related emission of CO_2 are expected to double by 2050).[35] Renewables and clean technology will also drive infrastructure spending, although recent setbacks in Spain with solar power (i.e. the Spanish government announced in December 2010, plans to retroactively cut pre-agreed "trade-in tariffs" for the country's solar-photovoltaic energy producers by 30%, or EUR 3bn over the next three years) and fiscal constraints limiting the scope of public support, pose serious issues for the future

Owing to the fact that infrastructure networks and systems are, broadly speaking, in place, in OECD countries, the investment focus is on a backlog of neglected or poorly maintained infrastructure

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33 For most OECD countries, general government debt is set to continue drifting up as a proportion of GDP over the next couple of years as a result of large underlying deficits, moderate economic growth and mounting interest payments. Unprecedented consolidation efforts will be required for some countries. In emerging market economies fiscal positions vary considerably though in most cases they are more sustainable than in most OECD countries, reflecting the comparatively low level of their debt to GDP ratios, their moderate primary deficits and/or their relatively strong growth prospects. Source OECD Going for Growth 2011 and OECD Economic Outlook – May 2011.

34 In the UK, more than 50% of UK Private Finance Initiative projects with a funding requirement exceeding £200 million used such "wrapped bonds" funded in the GBP capital markets. The bond market for PPPs has shown to be resilient to the crisis in countries such as Canada, owing to little involvement of monolines. Source: EIB EPEC paper.

35 For further details see forthcoming OECD *Green Growth Synthesis Report* (OECD 2011a).

systems in need of repair or replacement. In most developing countries, by contrast, investment is likely to go to new construction as governments strive to expand inadequate networks.

In developed economies fiscal constraints will force Governments to favour asset divestments over other expenditure reductions to restore fiscal balance. As for example the UK Government has recently done with the sale of High Speed 1 in October 2010 and Spain[36] and Greece have announced they will do in the coming years.

Emerging economies will see more greenfield assets coming in the next few years, and those deals would be able to attract private finance if regulatory obstacles are reduced and if projects have guarantees and support from international development banks.

The recent trend has been toward larger projects. The capital requirements of these projects naturally require investors with sufficiently large balance sheets. Recent trends illustrate that the number of deals that manage to get the funding have steadily declined owing to bigger competition for scarce capital, however high-ticket deals, those in excess of USD 1 billion, are slightly on the rise.[37]

Source of Capital – Debt

After the crisis, some of the most active banks in the infrastructure sector have largely withdrawn from the market (i.e. Depfa and more recently Espírito Santo Bank, Commerzbank and Mizuho) due essentially to liquidity issues.

Another factor limiting the willingness of banks to lend long term is that many banks active in project finance have loans – a legacy of pre-crisis over-pricing – sitting on their books, which are difficult to refinance. It would be impossible to sell these loans in the secondary market without offering a big discount.

Before the credit crunch, project banks could free up regulatory capital using synthetic collateralised debt obligations ("CDO") that shifted credit risk from their balance sheets. This is now more difficult because of the collapse of both the monolines and investors' appetite for CDOs.

The demise of monolines has also impacted the capital markets for infrastructure in Europe, depriving the infrastructure market of a limited but valuable source of financing. This was important in particular for institutional investors who lack the appetite for the diversity of project risks and do not have the specialist expertise required to appraise and monitor projects

In the coming years, according to many, there will be a huge number of loans in need of refinancing to come to the market. The absence of an efficient capital market for infrastructure would represent a barrier to the financing of new projects (e.g. impeding recycling of capital).

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36 Elena Salgado, Spain's finance minister, revealed plans to cut the country's new sovereign debt issuance by about a third in 2011 compared to its original plans, by privatising parts of the state lottery system and the airports authority. Spain plans to raise EUR 8bn ($10.5bn) by selling 49% of Aeropuertos Españoles y Navegación Aérea (Aena), the state airports authority, and will allow Madrid and Barcelona airports to be run by private concessions. Source Financial Times 1 December 2010.

37 In terms of the investment capital for example in the first half of 2010 almost 68% of all capital went to fund deals which required investments in excess of US$1 billion. Source: Infrastructure Journal.

Source of Capital – Equity

According to several sources at the moment, there is still a surplus of equity capital available for investment compared to the low number of infrastructure transactions in the market.[38] Large amounts of equity capital that have been allocated to the infrastructure asset class remain in fact un-invested. This could be explained by a combination of factors which vary depending on regions and sub-sectors, including high returns thresholds and uncertain regulatory framework.

However, the availability of equity could be impaired in the long term. Traditional providers of equity to PPP projects such as construction and contracting companies have become reluctant to invest and less able to hold the investments for the longer term.

Also, owing to the lack of debt, many deals in the future will be more dependent on increased equity ratios with sponsors likely to shoulder more risk.

Source of Capital – Multilaterals

The financial crisis shifted funding sources more towards a higher level of multilateral loans and government support in the financial structure of projects. Increased activity on the side of international financial institutions such as the European Investment Bank has been important during the crisis and is likely to continue for some time.

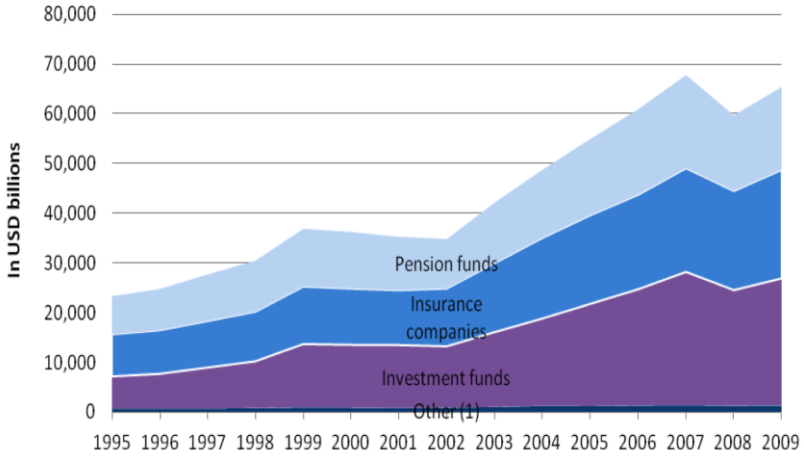
[38] According to Preqin, as of January 2011 there were 122 unlisted infrastructure vehicles in the market targeting US$85.8 bn in capital commitments.

2.2 Pension funds[39]

Over the past two decades, there has been a marked shift towards funding and private sector management in pension systems, driven largely by the introduction of mandatory private pensions. Funding has also become increasingly important within publicly managed pension systems. Many countries have established public pension reserve funds (PPRFs) to provide financing support to otherwise pay-as-you-go systems.

The main institutional investors in the OECD, i.e. pension funds, insurance companies and investment funds, held over USD 65 trillion of assets at the end of 2009 (see Figure 2.4 below). Pension funds assets and liabilities have been rapidly growing in the last decades as the workforce has aged and coverage has been broadened. Assets managed by OECD pension funds[40] reached an absolute figure of USD 17.0 trillion in 2009 up from USD 10.7 trillion in 2001.

Figure 2.4. **Assets held by institutional investors in the OECD area, USD billions, 1995-2009**



Note: 1. Other forms of institutional savings include foundations and endowment funds, non-pension fund money managed by banks, private investment partnership and other forms of institutional investors.

Source: OECD Global Pension Statistics and Institutional Investors databases, and OECD estimates.

Large pension fund asset pools have also been accumulated in non-OECD economies, although these remain relatively small in absolute terms compared to the OECD area. In non-OECD countries with mandatory defined contribution plans, assets are smaller but growing more rapidly than in OECD countries.[41]

39 Main sources of information are OECD Pension Markets in Focus – November 2007, Issue 4; October 2009, Issue 6 and July 2010, Issue 7.

40 In this report, pension funds include Defined Benefit and Defined Contribution pension funds and Corporate and Public pension funds (i.e. pension funds for respectively private and public sector employees), see box page 37.

41 In Latin America, total assets of private pensions funds are much smaller, amounting to USD 283 billion in June 2008. Their smaller size is due to the only recent introduction of mandatory DC pensions, to the low coverage of pension systems and, to the smaller GDP size in these countries. However, assets grew at an annualised value of 22 per cent in the period 2003-2008, double the average growth in OECD countries. Brazil is considered one of the fastest growing pension markets.

Traditionally, pension systems have combined two distinct components: one public, the other private. Public pensions were mandatory, financed on a pay-as-you-go (PAYG) basis, and managed by public sector institutions. Private pensions, on the other hand, were voluntary, employment-based (occupational) pension plans, or individual retirement arrangements (personal pension plans) based on the principle of asset accumulation (funding) or book reserve financing.

The mix of public and private pensions varied across countries. The shift towards funding and private sector management has been especially strong in Latin America and Central and Eastern Europe, where mandatory personal accounts systems have been introduced to replace part of social security benefits.

Reforms were partly due to governments' objectives of reducing the fiscal liabilities of public pension systems by scaling back benefit promises, and partly due to the advantages of financial markets in providing old-age support via better diversification of risks and positive macroeconomic repercussions, such as capital market development.

In addition to the increase in funded pension funds the global pension landscape is also expanding with the emergence of new sovereign and public pension reserve funds (PPRFs). PPRFs have grown rapidly in recent years and have received considerable attention from politicians, regulators and industry participants. Total PPRFs assets in selected OECD countries were worth USD 4.5 trillion at the end of 2009.[42]

Table 2.2. **Size of public pension reserve fund markets in selected OECD countries, 2009**

Type of fund	Country	Name of the fund or institution	Founded in	Assets		
				USD billions	% of GDP	% increase
Social Security Reserve Fund	Canada	Canadian Pension Plan	1997	108.6	8.5	13.8
	France (1)	AGIRC-ARRCO	n.d.	72.4	2.5	n.d.
	Japan (1)	Government Pension Investment Fund	2006	1,137.7	23.2	n.d.
	Korea	National Pension Fund	1988	217.8	26.1	17.9
	Mexico	IMSS Reserve	n.d.	3.6	0.3	3.3
	Poland	Demographic Reserve Fund	2002	2.3	0.5	64.4
	Portugal	Social Security Financial Stabilisation Fund	1989	13.1	5.7	12.8
	Spain	Social Security Reserve Fund	1997	83.4	5.7	4.9
	Sweden	National Pension Funds (AP1-AP4 and AP6)	2000	108.8	27.2	13.2
	United States	Social Security Trust Fund	1940	2,540.3	17.9	5.0
Sovereign Pension Reserve Fund	Australia	Future Fund	2006	51.6	5.9	11.0
	Belgium	*Zilverfonds*	2001	23.5	5.0	4.4
	France	*Fond de Réserve des Retraites* (FRR)	1999	46.3	1.7	20.6
	Ireland	National Pensions Reserve Fund	2000	31.0	13.7	38.5
	New Zealand (2)	New Zealand Superannuation Fund	2001	8.3	7.1	-6.7
	Norway (3)	Government Pension Fund - Norway	n.d.	19.0	5.0	32.9
Total selected OECD countries (4)				4,467.7	18.6	7.3

Source: OECD Global Pension Statistics.

42 Although there is no single, widely accepted definition, PPRFs can be defined as funds set up by governments or social security institutions to contribute to the financing of the relevant pay-as-you-go pension plans. Some of the PPRFs, especially those of the sovereign kind, are relatively new. For example, Australia's Future Fund was established in 2006, while New Zealand's Superannuation Fund and China's National Social Security Fund (NSSF) were established in 2001. Given their short history, their assets are smaller than those in the more mature funds. However, some of these funds are growing rapidly. For example, in 2006, the Future Fund in Australia had assets worth USD 13.7 billion, increasing to USD 51.6 billion as of 2009.

Box 2.2. **Private pension plan: The OECD classification**

The OECD defines as "private pension systems" all funded and book reserved[43] pension systems. Following that definition, the special, funded regimes for public sector workers that exist in some countries are also classified as private by the OECD (e.g. Calpers, OTPP etc.).

There is a large variety of pension arrangements across OECD countries. Pension provision through private pension arrangements can take the form of *mandatory* or *voluntary* arrangements. They could be linked to an employment relationship, making them *occupational pension plans*, or they may be based on contracts between individuals and private pension providers, making them *personal pension plans*. Moreover, pension provision can be achieved through either *defined contribution* or *defined benefit* arrangements.

Defined benefit (DB) and defined contribution (DC) are the two basic types of benefit formulas. Occupational pension plans can take either form, while personal pensions are exclusively of the DC type. Approximately 60% of OECD pension assets are in DB plans. Occupational DB and DC plans are defined in the official OECD classification as:

Defined contribution (DC) occupational pension plan: occupational pension plans under which the plan sponsor pays fixed contributions and has no legal or constructive obligation to pay further contributions to an ongoing plan in the event of unfavourable plan experience.

Defined benefit (DB) occupational pension plan: occupational plans other than defined contributions plans. DB plans generally can be classified into one of three main types – traditional, mixed and hybrid plans.

DB pension funds bear longevity and investment risk, being required to pay a set amount to their beneficiaries at a point of time in the future. In DC plans these risks are assumed by participants, retail investors who predominantly invest via mutual funds.

Occupational pension plans in OECD countries have traditionally been DB. However in recent years there has been a shift to DC plans, in particular in the United Kingdom and the United States.

In almost all OECD countries the main type of private pension arrangement remains occupational or employer-based. Occupational pensions are overwhelmingly funded through pension funds in most OECD countries, the main exception being countries such as Denmark, Norway and Sweden where pension insurance contracts play a larger role and Germany where book reserves are the main type of financing vehicle.

Within pension funds, we can further distinguish between public sector and corporate pension funds, covering public and private sector employees respectively, which implies different regulation, accounting, and incentive structures. Corporate pension funds generally have more restrictive accounting and regulatory guidelines and are more likely to receive pressure from stakeholders to minimise fund volatility. Public sector pension funds are unfunded in some countries so that taxpayers ultimately bear the cost of public pension deficits.

[43] Book reserves are balance sheet provisions made by companies that sponsor pension plans for their employees.

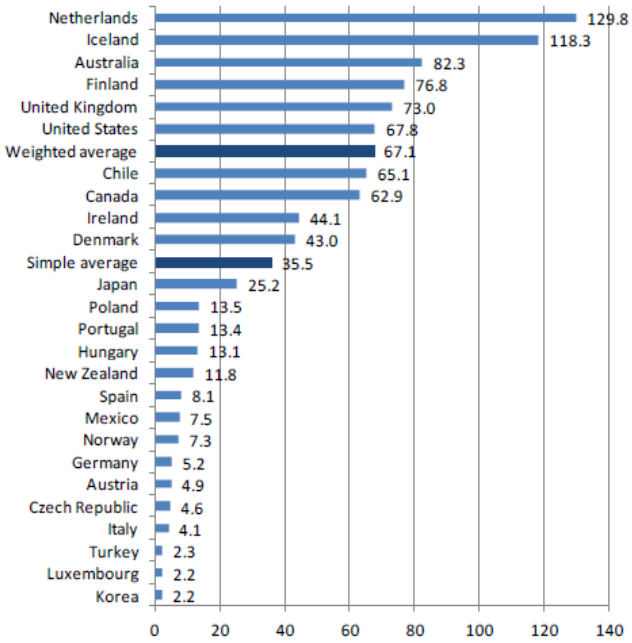
2.2.1 Pension Market Maturity

Although the aggregate OECD pension fund market is large, the size of domestic markets varies considerably, reflecting a range of factors. These include the mix of public and private pensions, whether participation is mandatory or voluntary, and investment policies. These factors have largely determined the different paths of asset accumulation. For ease of comparison, the OECD divides the markets into three categories: mature, growing and sluggish, based on the pension fund assets-to-GDP ratios.[44]

"Mature market" countries, countries with the largest pension fund markets (in terms of assets relative to GDP), usually have a long tradition of occupational pensions, which has ensured a positive contribution to asset accumulation. These countries include Australia, Iceland, the Netherlands, Finland, the United Kingdom and the United States – and also Canada, Denmark, Ireland, Japan, Switzerland and Chile.

When compared with the "mature market" countries, many of the countries falling within the "growing" and "sluggish" categories have a short history of private occupational pensions. In addition, the state-run public pension tier in countries like Greece, Italy, Spain and Turkey still plays a major role in the old-age retirement system, limiting the growth of and need for private pensions.

Figure 2.5. **Pension assets as percentage of GDP in OECD countries, 2009**



Source: OECD Global Pension Statistics.

44 Markets considered "mature markets", are those for which the value of the ratio is generally above 20%, "growing markets", where the value of the ratio is less than 20% but increasing at a fast pace, "sluggish markets", where the ratio is less than 20% and has remained more or less stable since 2001.

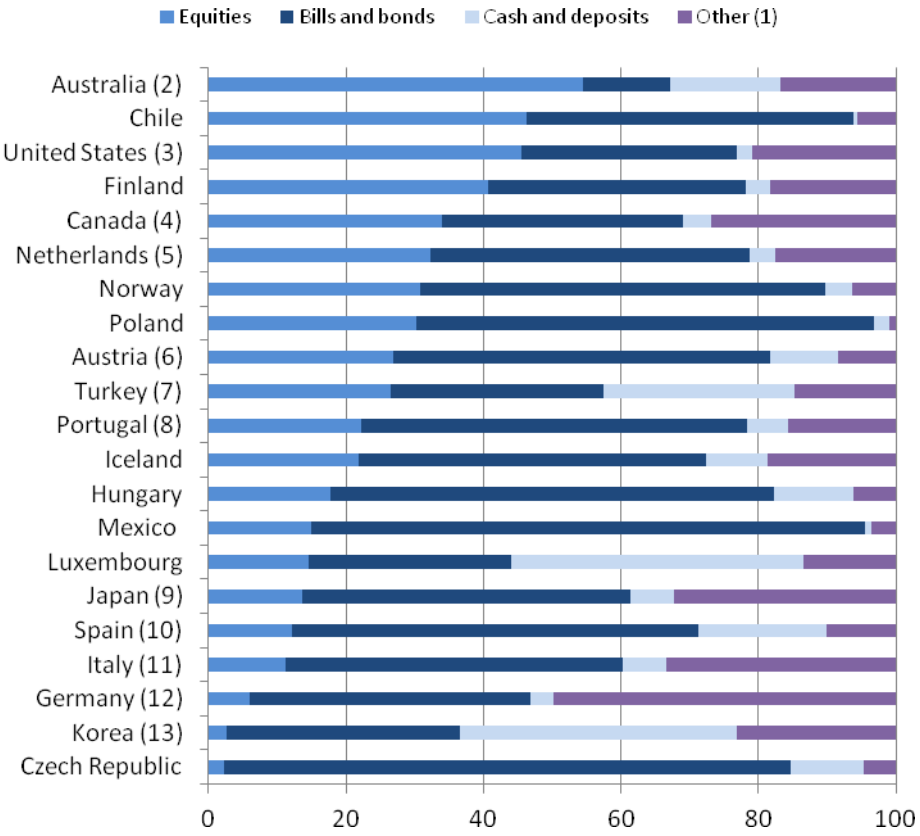
2.2.2 Portfolio Allocation

Pension funds' asset allocation differs significantly across countries. Asset allocation is influenced by a variety of factors, such as country specific regulation, sponsor strength and liability considerations for DB plans (e.g. open versus closed plans), cultural factors, governance structures, tax issues and ultimately domestically available assets.

In the majority of countries for which 2009 data were available, fixed income remained the dominant asset class, accounting for over 40 per cent of total assets in thirteen OECD countries out of twenty-one for which such information was available. Equities ranked first in Australia, Finland, and United States, or are in the same range as bonds in Canada and Chile, with more than one third of all investments.

Figure 2.6. **Asset allocation of OECD Private Pension Plans 2009**

(As a % of total investment)



Note: See end of this section for footnotes.

Source: OECD Global Pension Statistics.

Investment strategies of the PPRFs are closely linked to their specific circumstances and mandates. In contrast with the more conservative asset allocation in the United States and Spain, PPRFs in other countries tend to have a low weighting in cash and bonds, and a high weighting in

more risky assets including shares (both domestic and foreign), and alternative investments, which may include infrastructure**.**

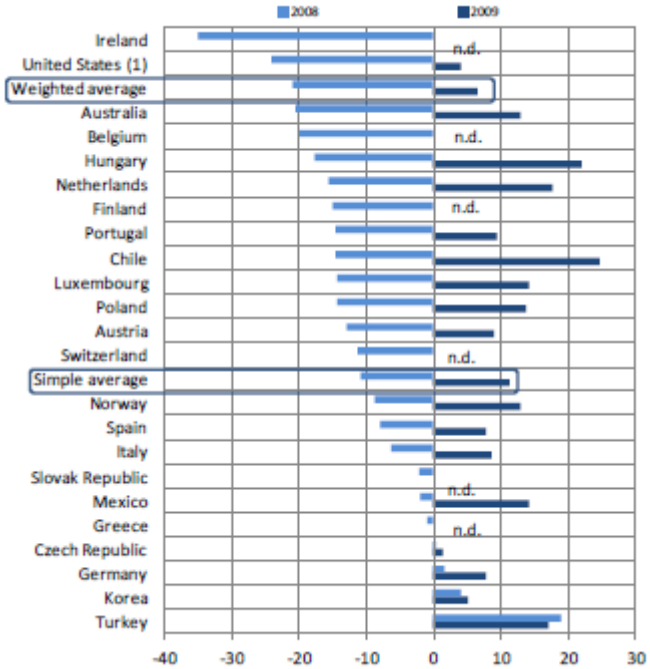
2.2.3 Impact of the Financial Crisis

The 2008 financial crisis had a major impact on global pension assets, with the OECD estimating declines of USD 5.4tn (over 20%) at the end of 2008. The impact of the crisis on investment returns varies greatly between countries. It has been greatest among pension funds in countries where equities represent a large part of total assets invested such as Australia, Ireland, US and UK.

Thanks to the rebound in equity prices that started in March 2009, pension funds in the OECD recovered part of what they lost in 2008. Despite this recovery, pension fund assets in most OECD countries have not climbed back above the level managed at the end of 2007 and it will be some time before the 2008 losses are fully recovered.

Public Pension Reserve funds have come under pressure as governments have turned towards them to alleviate the impact of the financial crisis. In Ireland, the parliament approved the use of 25% of the reserve funds assets to recapitalise failed domestic banks, and in France in November 2010 the parliament agreed the transfer of assets of the French pension fund – Fonds de Réserve pour les Retraites – to finance the social welfare system's debts.

Figure 2.7. **Pension funds' nominal investment return in selected OECD countries 2008-2009**



Note: Estimated data including IRAs. 2009 data refer to the period January-June 2009.

Source: OECD Global Pension Statistics and OECD estimates.

2.2.4 Key Developments

Despite the recent financial crisis, the prospect for future growth for institutional investors is unabated, especially in countries where private pensions and insurance markets are still small in relation to the size of their economies.[45] Emerging economies generally face an even greater opportunity to develop their institutional investors' sectors as, with few exceptions, their financial systems are largely bank-based. Whether such growth materialises will depend on some key policy decisions, such as the establishment of a national pension system with a funded component which is nowadays a common feature in most OECD countries.

Traditionally, institutional investors have been seen as sources of long-term capital with investment portfolios built around the two main asset classes (bonds and equities) and an investment horizon tied to the often long-term nature of their liabilities. However important developments are having an impact on their investment strategies.

The impact of the crisis, the gradual maturing of pension plan's demographic profiles, the underfunding of Defined Benefit plans (accounting for more than 60% of OECD pension assets), have underlined liquidity issues and at the same time a lower risk appetite for many investors.

Better appreciation of the interest rate sensitivity of plan liabilities and the risks of large mismatch in the characteristics of a plan assets and liabilities, translates in an increased interest in asset/liability matching, ultimately fuelling pension fund's demand for good quality – income oriented –, inflation linked investments that can match their liabilities.

At the same time pension funds exposure to alternative assets continues to grow, extending a long-established trend and reflecting pension fund's growing appetite for diversification. In recent years investors have been considering changes in the policy asset mix to reduce exposure to the volatility of returns on publicly traded equities. However, due to low yields on fixed-income securities, they have been implementing the change through an increased allocation to alternative assets, including real estate, private equity and infrastructure.

The increase in "Socially Responsible Investing" (SRI) has raised demand for what are seen as ethical projects including "green infrastructure" such as renewable energy, especially in Anglo-Saxon countries such as Ireland, the UK and the US.

Demographic profile

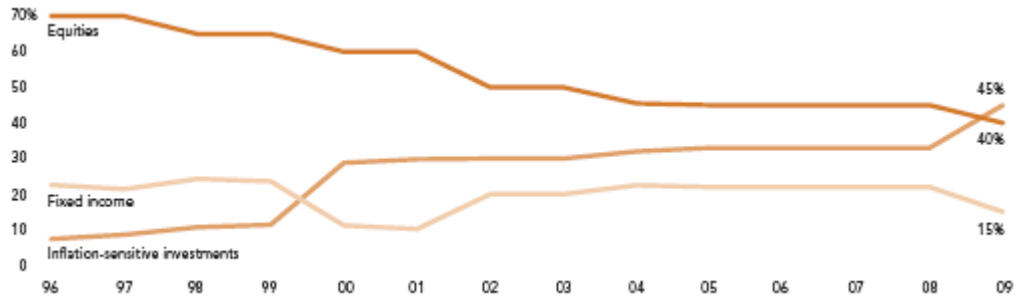
The gradual maturing of DB plan's demographic profiles is having an impact on investment strategies and ultimately infrastructure allocation.

With the first wave of the baby-boomers generation approaching retirement, the ratio of active workers to retirees is projected to fall in the next years. As a result, a declining proportion of pension members will carry an increased responsibility for meeting the plan's funding requirements. Furthermore, increasing longevity has lengthened the period over which payments need to be paid further increasing the duration of pension fund liabilities.

[45] However, owing to rising public debt certain countries such as Poland and Hungary, struggling to close budget gaps, are rolling back reforms designed to make their national pension systems sounder in the long run.

Relatively mature demographic profiles result in a lower risk tolerance in the investment strategies of pension funds reflected in a moderate equity allocation within the asset mix. Infrastructure can play a role facilitating the shift of funds toward a conservative preservation focus.[46] For example as the Ontario Teachers' Pension Plan (OTPP) has matured and the plan's risk tolerance has decreased, its exposure to equity assets has declined and the percentage of inflation-sensitive assets (including infrastructure) has increased. In 2009, the asset-mix policy was 45% inflation-sensitive investments, 40% equities and 15% fixed income.

Figure 2.8. **Ontario Teachers' Pension Plan – How the policy asset mix has grown more conservative**



Source: OTPP annual accounts 2009.

However, for mature funds facing negative cash flow, it is difficult to justify the introduction of additional illiquid assets to the portfolio given ongoing liquidity needs. Therefore any allocation to infrastructure investment would likely come from a corresponding reduction to the real estate or private equity programmes. For example, this is the case for Lacera, a US mature pension fund, facing a negative cash flow, with 25% of its portfolio exposed to illiquid assets through current allocations and known commitments.

Public Pension Reserve Funds are not – in general – forced to seek the short-term returns that many other market participants must achieve due to their investment objectives, yield requirements or business models, nor are they driven by short-horizon market dynamics and liquidity issues. For instance the Canadian Pension Plan, compared to other pension funds, has a relative certainty of the asset base as well as amount and timing of future cash flows. This is because the Plan is not expected to use any investment income to help pay benefits until 2021.

Underfunding

In recent years, many DB pension plans have become underfunded, driving a re-assessment of investment and risk-management practices.[47] In the US as in Canada and the UK, funding deficits have highlighted the challenges of managing the financial risks of older DB pension plans that have a high ratio of retired to active employees.

46 Young pension systems with funds that are still growing thanks to new entrants are likely to have a more aggressive investment focus on growth and asset accumulation (there will be many years before there is net cash flow out).

47 The underfunding is due to falling asset prices after the crisis and pension liabilities rising at the same time because of lower interest rates.

As pension funds come out from the crisis, they face the choice of more conservative investment strategies, leading though to lower returns and leaving the underfunding problem unresolved or pursue aggressively the higher rate of returns they need, increasing the chances they will incur further losses if investments turn out to deliver below estimated returns.

For pension funds suffering from poor funding ratios and insufficient future contributions the need to provide liquidity to pay benefits over the next decades, mean they can't increase or maintain existing allocations to alternative assets such as infrastructure.

Asset Liability Matching

Historically, pension fund investment has tended to focus on asset returns. Investment tended to be asset driven with performance measured on a relative basis by comparing returns with those of the appropriate asset class benchmark. An acceptable return for the overall pension fund was typically defined by comparing the plan's performance against the median of a universe of pension plan returns.[48]

A recent survey by EDHEC Risk Institute has shown that many European pension funds do not assess the adequacy of their asset-liability management and do not hedge asset and liability management risks – accounting risk and sponsor risk are not properly addressed.[49]

The economic downturn is likely to have a longer term effect on the fund management industry and more in particular on pension funds, in prompting more cautious investment strategies in the coming years.

In DB pension funds a greater focus on plan liabilities is likely to affect pension investment and risk management. Better appreciation of the interest rate sensitivity of plan liabilities and the risks of large mismatch in the characteristics of a plan assets and liabilities, translates in an increased interest in asset/liability matching.[50]

However there is limited supply of debt instruments (e.g. inflation linked bonds) with maturities longer than 15 or 20 years able to accommodate increased pension sector demand. Some pension funds are trying to achieve an extension in the duration of their portfolios by investing in certain alternative assets.[51]

Infrastructure consists of long term investments often 30 years or more 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.

Diversification

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48 Some pension funds, such as ATP, have adopted a risk-budgeting framework that applies techniques of financial risk management to pension funds.

49 Kalpana Titzpatrick, 13 September, 2010, "Pension Funds use Infrastructure to Build Up Risk Defences", European Pensions.

50 Pension funds liabilities are sensitive over time to emerging inflation since the benefits of active employees are typically linked to their wages and retiree benefits are increased in line with some portion of price inflation but many plan sponsors.

51 Other reasons why pension funds are struggling to implement liabilities matching is due their state of underfunding and the high cost this strategy would imply given current low interest rates.

Pension funds exposure to alternative assets continues to grow, extending a long- established trend and reflecting pension fund's growing appetite for diversification. The alternative asset classes are the investment products, "alternative" to mainstream equities and government bonds. The major categories include hedge funds, real estate, private equity and more recently infrastructure.

In recent years investors have been considering changes in the policy asset mix to reduce exposure to the volatility of returns on publicly traded equities. However, due to low yields on fixed-income securities, they have been implementing the change through an increased allocation to private markets and alternative assets.[52]

In investment strategies, infrastructure investment is increasingly viewed as a distinct asset class, based on properties that distinguish them from other alternatives.

Recently PPRFs have started to invest in infrastructure or have increased their existing allocations, although allocations to infrastructure still only account for a relatively small portion of total assets. For instance, the Korea National Pension Service (NPS), which is the world's fifth largest pension fund, has increased its investments in alternative asset classes.[53] Recently a Norwegian government commissioned report called the Norwegian Government Pension Fund to capitalise more on its long term nature expanding exposure to illiquid assets such as infrastructure.[54]

Defined Benefit – Defined Contribution shift

Although 60% of OECD pension assets are still in DB plans, in recent years occupational pension plan sponsors in many countries have shown an increasing interest in defined contribution (DC) plans; as demonstrated by the number of employers that have closed DB plans to new entrants and encouraged employees to join DC plans. The DB-DC shift may lead to a different asset allocation.

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52 For example:

- For the past several years, OPTrust has been implementing a multi-year diversification strategy aiming to reduce the fund's total investment risk – and the volatility of annual returns – by gradually reducing the plan's weighting to public equities, which currently have a policy benchmark weight of less than 50%. Infrastructure investment is among the adjustments made to the portfolio to improve its diversification.
- In May 2009 OMERS confirmed it would be implementing a portfolio shift in 2010 that will see the pension fund gain greater exposure to private markets, including infrastructure.
- The asset allocation strategy adopted by SURS, following an asset/liability study conducted in 2008, is designed to manage portfolio risk by transitioning a segment of the portfolio from public market securities into private market or alternative investments strategies.
- APG started looking at infrastructure in 2004 to diversify the portfolio and protect its clients against inflation risk. APG's new strategy shifted its overall portfolio away from fixed income investments towards equities and alternative investments, transitioning its portfolio from public to private markets.
- USS is building up its alternative allocation (current target 20%), with a corresponding reduction in the allocation to quoted equities. Infrastructure is part of USS allocation to alternative assets.

53 It allocated 37.2% out of its total alternative funds of KRW 8 804.4 billion to infrastructure investment in 2008 and 32.4% of KRW 12 524.1 billion in 2009.

54 Financial Times 6 December, 2010.

For example, in countries where DB plans are very mature, there may be more investment in bonds, while DC funds catering mainly for younger workers are likely to have a greater allocation to more risky assets (such as shares). However, the transfer of risk from plan sponsors to employees that results from the DB-DC shift may also lead to a general aversion to higher risk portfolios on the part of individuals and hence lower allocations to shares on aggregate.

Consolidation of smaller pension funds

There is a trend to increasing concentration and ongoing consolidation of the pension fund industry (e.g. the Netherlands, Australia**)**. Continuing consolidation of funds and the resulting growth in the average size of funds is a positive outcome in terms of long-term sustainability and infrastructure investment.

It appears in fact that the most active investors in infrastructure are also the largest funds. The size of such funds allows them to invest in this sector and still maintain the liquidity necessary to meet the required prudential requirements.

Socially Responsible Investing

The increase in "Socially Responsible Investing" (SRI) has raised demand for what are seen as ethical (including "green infrastructure" such as renewable energy[55]) projects and this has been furthered by the creation of Environmental, Social and Governance (ESG) focus lists for investment banking equity research desks.[56] Asset owners representing more than US$15 trillion have recently signalled their support for U.S. and international action on climate change publicly.[57]

For example for the infrastructure mandate issued by PFZW, PGGM hired three ethical advisers to consult on its investment portfolio, on climate change, human rights and the arms industry. ATP's ESG team is an independent but integrated team of ATP Investments. It is actively involved in infrastructure asset review and investment decisions.

55 See OECD 2011 "The Role of Pension Funds in Financing Green Growth Initiatives".

56 See for example the Goldman Sachs GS SUSTAIN Methodology, available: http://www2.goldmansachs.com/ideas/environment-and-energy/goldman-sachs/gs-sustain/index.html

57 http://www.incr.com/Page.aspx?pid=1294

2.3 Regulatory Framework

Pension funds investment regulations at a country level have been evolving over the years following different public policy decisions. In general, Anglo-Saxon countries adopt the prudent person rule (PPR) in pension fund investment which requires only that funds be invested "prudently" rather than limited according to category. Furthermore, there are few restrictions on investment in specific assets. In many other countries, however, different quantitative restrictions have traditionally been applied, normally stipulating upper limits on investment in specific asset classes, including equity.

Emerging market economies have typically maintained quantitative investment limits due to the lack of minimum conditions to operate a pension system under a prudent investor rule. Such a system in fact requires an efficient court system with well-trained and informed judges, capable of establishing clear jurisprudence on prudent investor behaviour and of guaranteeing its swift enforcement for market participants.[58]

Investment regulations should be based on the level of development of each country's capital markets and the level of sophistication of fund managers. However requirements to have a high domestic weighting for investment or to fund government debt have resulted in investment rules in most emerging countries favouring the construction of portfolios dominated by government bonds.[59]

As systems mature and quantitative limits in specific asset classes are relaxed, pension funds can diversify their portfolios and search for higher risk-returns opportunities. Ultimately, the impact of easing quantitative limits will be constrained by the depth of local capital markets and availability of domestic instruments.

Regulation is one of the major drivers of pension funds investment strategies. Pension funds, due to their fiduciary responsibility, tend to be heavily regulated, particularly with regard to their risk profiles and how risky assets are treated in their accounts. In general minimum levels of creditworthiness for allowable investments – often based on the investment grade rating assigned by rating agencies – limit the choice of investment opportunities for pension funds.

Whilst highly country specific, investment restrictions can be grouped into three broad categories: limits on pension fund investment in selected assets, limits in foreign assets and other quantitative regulations.

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58 Source World Bank (2007) Structured Finance in Latin America.

59 In addition to funding government debt and financing the domestic economy, other reasons explaining the resistance to higher foreign asset limits are the fact that pension funds have local currency liabilities, and the complexity of understanding global financial markets (home bias).

Table 2.3. **Investment Regulations**

Quantitative Regulations	Examples
1. Portfolio limits on pension fund investment in selected assets	
Equity Investment	Several countries impose limits on the proportion of equity held: Austria, Czech Republic, Denmark, Finland, Germany, Greece, Iceland, Korea, Norway, Poland, Slovak Republic, Sweden, Switzerland and Turkey. Pension funds in Germany have equity limits of 35% if listed and 10% non-listed
Private Investment Funds	Funds in Denmark and Spain may not invest more than 10% and 30% respectively in private investment funds and real estate. Investments in private investment funds are entirely excluded in South Korea (corporate pensions), Chile and South Africa
2. Portfolio limits on pension fund investment in foreign assets	
Global investment limits in foreign assets	Austria has a global investment limit in foreign assets of 30%. Korea and Mexico put a ceiling of 20% on global investment and Switzerland has a 30% limit on foreign investment. Other countries restrict overseas investments to a specific group of countries such as the OECD or the EU. These include Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Iceland, Italy and Portugal
3. Other quantitative investment regulations	
Ownership concentration limits	In Canada funds may own maximum of 30% of voting shares of one company (with the exception of real property, resource properties or other permitted investments)
Investment limits in single issuer/issue	Denmark allows a maximum investment of 5% of a fund to be invested in a single property

Source: OECD – Survey of Investment Regulations of Pension Funds 2010.

Some countries have recently experienced major changes to pension fund investment regulations allowing the development of infrastructure investment. Among them Mexico, which during the period 2002-2009, has seen the following changes:

- In 2005 investment limits in equities increased from 0 to 15% and investment limits in foreign investment increased from 0 to 20%.

- In 2006 investment limits in equities for non mandatory funds (voluntary savings) was expanded from 15 to 30%.

- In 2007 new instruments were allowed as well as new limits: investment limit in equities was expanded up to 30% only for Basic Fund 5 (26 years and younger); investment in Mexican private equity was allowed through listed structured notes in the Mexican Stock Exchange.

- In 2008: Limits for AA and A bonds from issuer different than Federal Government were raised to 50% (from 35% previously) and 20% (from 5% previously) respectively. Non-

convertible subordinated obligations were permitted under the same asset class as the structured instruments.

- In March 2008, Mexico reformed the investment regulatory framework for pension funds to allow direct investment in infrastructure through instruments such as the Certificates of Capital Development (CKDs), opening the door to financing of infrastructure projects located in the country.[60]

- In 2009: Individual stocks of companies who are not listed in any authorised index, IPOs, subordinated debt and convertible obligations were included in the structured instruments asset class.

2.3.1 Other Regulation Affecting Pension Fund Investment

In addition to quantitative investment limits, other regulations can have indirect impacts on investment decisions.[61]

Minimum liquidity requirements

Regulatory requirements for daily or monthly valuation and for high liquidity of investments may penalize long term, illiquid securities often associated with infrastructure investments.

Many countries in Latin America have allowed for only a small percentage of investments not to be regularly marked to market (for example, private equity funds up to 5 per cent of all assets in Chile, Peru, and Colombia).

Minimum size of issue or issuer requirements

Small issuers of good quality or new issuers with no track record may be excluded by regulators.

Capital adequacy and reserve requirements.

Risk-adjusted capital requirements favour government debt, which carries a zero risk weighting. To maximize their return on equity and minimize the locked-in equity amount, fund managers will therefore try to invest in government debt, which carries the lowest risk weighting.

Minimum return guarantee

Most emerging countries require a minimum return guarantee from pension funds – usually the average return of the pension industry – which influences their investment decisions. This may intensify the herding behaviour of pension funds (though pension funds are known to be susceptible to herd behaviour even where there are few or no portfolio restrictions and no minimum return guarantees).

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60 CKDs are long term, high returns, illiquid securities which pension funds can buy and hold until they mature. Through these certificates pension funds have financed approx US$1.6 billion of infrastructure projects in Mexico. Source: Comision Nacional del Sistema de Ahorro para el Retiro, Mexico.

61 For more on this, see World Bank (2007) Structured Finance in Latin America.

Value-at-risk limits

Risk-based supervision and value-at-risk limits – more common in mature pension systems – to avoid leading to short-termism should take into account the longer time horizon of pension fund assets under management

Fee structure

Contribution-based fee structures – typical of young pension systems – do not link pension funds revenues to their financial performance, which can have an impact on optimization of portfolio returns. In order to better align incentives of pension fund managers and those of their members, countries with more mature pension markets have normally adopted performance based fees system. The decision to adopt performance based commissions however, will be based on the depth of capital markets and the consequent potential for active management.

Solvency regulation

Solvency regulations drive pension funds investment strategies. Recently, many pension funds have not been able to comply with solvency regulations, due to the impact of the financial crisis, low interest rates and the increase of average age of pensioners

For example, the fact of having a surplus over the required capital, allows investors to invest in more illiquid/high returns assets.

For defined benefit plans the funding of plan liabilities is mainly influenced by pension regulations specifying minimum funding rules. More conservative regulations forcing pension funds to be fully funded in any moment would force funds into conservative assets which match their liabilities.[62]

2.3.2 Key Developments[63]

The recent financial crisis and its subsequent severe impact on growth and employment have led to several proposals and actions to strengthen prudential regulation frameworks. While enhancing stability of the system these proposals may at the same time raise the long term cost of capital and affect the capability of pension funds to invest long term in assets such as infrastructure

New regulation recently approved and to be implemented in the coming years will affect sources of finance (debt and equity) for infrastructure potentially limiting their availability. Proposed EU legislation could bring occupational pension schemes under the Solvency II rules which could have an impact on infrastructure investment. Basel III will affect in particular long term bank lending. The Volker Rule and the AIFM Directive might have consequences on infrastructure funds and fundraising in the future.

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62 Solvency regulation in Denmark forces pension funds to be fully funded in any moment. ATP current funding is 118%. If it gets above 120% there is an increase in pension payments. This has an implication on the diversification strategy which needs to cover the fund in any type of "weather". So what is important is not the type of asset but the characteristics of the asset.

63 The aim of this section is to briefly list regulatory changes announced or already implemented, which could potentially affect long term investment. The OECD is undertaking further in depth research on these issues as part of its "Institutional Investors and Long Term Investment Project".

Solvency II

Proposed EU legislation could bring occupation pension schemes under the Solvency II rules, which is in the process of being applied to life insurance companies.

The Solvency II directive sets new requirements on capital adequacy and risk management for insurers. Equities will need to be backed by reserves of 30-40% while European sovereign debt is deemed risk free. The EU rules may force EU investors to move further from equities into bonds. Investment in structured credit such as infrastructure, which incurs higher capital charges, could be affected.

The European commission suggested in a Green Paper launched on July 2010 that the insurance standards – known as Solvency II – might be used as the basis for the European pension fund solvency regulation.[64]

The European Insurance and Occupational Pension Authority (EIOPA), created in January 2011 as a response to the financial crisis, will have to address the question of what type of solvency regulations should apply to pension funds

Basel III

In September of 2010 global banking regulators approved a new package of rules called Basel III. The new rules will be phased in from January 2013 through to January 2019.[65]

Implementation of the new rules will effectively triple the size of the capital reserves that the world's banks must hold against losses. Tougher capital standards are considered critical for preventing another financial crisis and to ensure long term financial stability. Banks will be asked to ensure short-term liquidity by better matching the tenor of their liabilities with appropriate assets.

Basel III, sets a new key capital ratio of 4.5%, more than double the current 2% level, plus a new buffer of a further 2.5%. Banks whose capital falls within the buffer zone will face restrictions on paying dividends and discretionary bonuses, so the rule sets an effective floor of 7%. Also new liquidity ratios and leverage ratios will be introduced.[66]

The new regulation is expected to increase credit and liquidity costs, affecting in particular long term bank debt as project finance loans, limiting its availability. Although tightly-covenanted project financings have experienced low loss given default levels and usually have a low probability of default, project loans could be negatively affected by the new regulations.[67]

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64 EC (2010).

65 With respect to the liquidity framework, short term liquidity coverage ratio will become a minimum standard in 2015 while the longer term net stable funding ratio will become a minimum standard in 2018.

66 One example is the liquidity cover ratio defined as "Total Liquid Assets: Net cash outflow over a 30 day period". Given that project loans are illiquid, banks will have to commit extra capital and incur extra costs to hold appropriate liquid instruments to cover their project debt portfolio.

67 See Default and Recovery Rates for Project Finance Bank Loans, 1983-2008; Moody's Investors Service October 2010.

Mark to market accounting

Recent changes in pension accounting rules in the OECD area (e.g. FAB 158 in US and IAS19[68]) moving towards fair-value accounting, have put increasing pressure to reduce funding gaps in DB plans and could accelerate the shift to DC plans for corporate sponsors, due to the volatility in earnings that is likely to create.

While improving transparency and comparability, earnings volatility associated with fair value accounting may encourage more pro-cyclical market activity. Pro-cyclicality can also affect long term investment strategies for investment such as infrastructure.

The Volker rule

The Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States, including the "Volker rule", was adopted in the United States in July 2010.

The rule prohibits banks from trading on their own account or investing in private equity or hedge funds. The stated purpose is to prevent any financial group that benefits from insurance of deposits or access to support from the Federal Reserve to engage in risky trading for its own profit.

In relation to private equity and hedge funds, banks are allowed only a *de minimis* investment in a fund, representing no more than 3% of the ownership of the fund and 3% of the tier one capital of the bank. These provisions will impact infrastructure funds which have banking entities as investors.[69]

The AIFM directive

The European Union Alternative Investment Fund Managers (AIFM) directive was approved by the European Parliament on the 14th of November 2010 and will take effect in 2013.

In the interests of financial stability, the directive intends to increase the oversight of hedge fund and private equity managers improving transparency through reporting of systemic data to supervisors.

Non EU Alternative investment managers will be allowed to market investors across the EU through a new "marketing passport" initiative. This will only be available to countries that meet the "minimum regulatory standards".

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68 The International Accounting Standards Board IASBs proposed changes to International Accounting Standard No. 19 (IAS 19) are expected to go into effect as of 2013. IAS 19 is the current standard for the financial reporting of company pension obligations that stem from defined benefit (DB) and similar plans. It is required for exchange-listed companies in many parts of the world. If enacted, the changes to IAS 19 proposed by the IASB are expected to have a significant impact on company financials on a global basis. Severinson, C. (2010), "The New IAS 19 Exposure Draft", OECD Working Papers on Finance, Insurance and Private Pensions, No. 5, OECD Publishing.

69 The Financial Stability Oversight Council completed a study in January 2011, making recommendations regarding the implementation of the Volcker provisions. Within nine months after the study is completed, the appropriate federal banking agencies and the Fed will jointly issue final regulations implementing the Volcker provisions. Then there will be a transition period before the regulations become effective.

There are concerns that the Directive could negatively impact both the alternative asset management industry globally and also European investors, increasing barriers to investing in hedge funds.

Further information with regard to Figure 2.6

The GPS database provides information about investments in mutual funds and the look-through mutual fund investments in cash and deposits, bills and bonds, shares and other. When the look-through was not provided by the countries, estimates were made based on asset allocation data for open-end companies (mutual funds) from the OECD Institutional Investors' database. Therefore, asset allocation data in this figure include both direct investment in shares, bills and bonds and cash and indirect investment through mutual funds.

1. The "Other" category includes loans, land and buildings, unallocated insurance contracts, private investment funds, other mutual funds (i.e. not invested in cash, bills and bonds or shares) and other investments.
2. For self-managed superannuation funds, "Cash and deposits" include debt securities and fixed interest and "Other investments" include overseas investment. "Other investments" include receivables, other investments (including derivatives and leased assets) and deferred tax assets.
3. "Other investments" include private pension funds' and state and local government employee retirement funds' unidentified miscellaneous assets, private pension funds' insurance or pension fund claims contributions receivable, and federal government retirement funds nonmarketable Treasury securities from the Civil Service Retirement and Disability Fund, the Railroad Retirement Board, the Military Retirement Fund, the Foreign Service Retirement and Disability Fund , and the Judicial Retirement Fund.
4. "Other investments" include accrued interest and dividends, accounts receivable, derivatives and partnerships.
5. "Other investments" include participations and loans to daughters, real estate for own use, other assets (everything not mentioned elsewhere), reinsurance part of provisions, and non financial assets including capital assets.
6. Part of "Bills and bonds" are held-to-maturity and hence book-value. "Other investments" include derivatives (reported with their market value) and outstanding accounts against the plan sponsors.
7. The vast majority of the "Other investments" for personal pension plans includes Reverse Repo investments which constitutes 14.74% of the total investments.
8. "Other investments" include short term payable and receivable accounts.
9. "Other investments" include outward investments in securities, representing around 26% of total investments, but the split between various securities is not available.
10. "Other investments" include structured products.
11. "Other investments" refer chiefly unallocated insurance contracts and investments in affiliated companies (generally with a 100% holding) that hold land and buildings.
12. The high value for the "Other" category is mainly driven by loans (30%) and other mutual funds (16%).
13. For personal pension plans, retirement insurance plans and retirement trust, "Other investments" include tangible assets and other assets (accounts receivable, an amount prepaid). For employer-sponsored DB&DC plans, "Other investments" include lending to banking account.

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3. MAIN FINDINGS AND CONCLUSIONS

3.1 Evolution of Pension Fund Investment in Infrastructure

Clearly, different countries are at different stages in the evolution of pension fund investment in infrastructure. The survey focussed on pension funds in Canada, Australia, the United States, South Korea and a number of funds in Europe. Country specific results are set out below.

Looking ahead, it can be expected that favourable conditions such as the growth of pension funds, privatisation trends, changing regulations, will continue to increase the interest of institutional investors in general, and more particular of pension funds, in infrastructure.

3.1.1 Appetite for Infrastructure

Canada

Canadian pension funds are among the most active investors in infrastructure with some investors having portfolio allocation to equity infrastructure of 10% or more.

Canadian pension funds over the years have been able to acquire the knowledge, expertise and resources to invest directly in infrastructure. Not only they are able to co-invest but also to take leading roles in consortia, competing with other funds and financial sponsors when bidding for projects. This also means that these investors have in-house resources to produce their own research and risk assessment of infrastructure projects without being dependent on external consultants.

For the largest investors in Canada, infrastructure is treated as a separate asset and is part of the allocation to inflation sensitive investments which tend to correlate closely with changes in inflation acting as a hedge against increases in the cost of future pension benefits.

Australia

Australian pension funds – superannuation funds – are active investors in infrastructure. The first Australian superannuation funds started investing in infrastructure more than ten years ago and have built up since then a significant allocation to the sector (for some above 10% equity of their total portfolio).

The average size of Australian investors does not allow them in most cases to have the right resources in place to invest directly in infrastructure. If the superannuation fund is not large enough it would normally invest through closed-ended funds or through open-ended vehicles. Infrastructure is commonly treated as a separate allocation in the overall portfolio.

United States

United States pension funds have been investing little in infrastructure in the past acquiring an exposure mainly to the energy sector, through a few active funds active in the country. Recent developments in the infrastructure market have increased investors' attention to this asset class; however investors are taking different approaches towards investment in infrastructure.

The majority of the investments in infrastructure are made on an opportunistic basis through the private equity or real estate allocation. There seems to be a trend in placing infrastructure as a separate allocation as programmes mature. Infrastructure is still perceived riskier by some investors than real estate and private equity. The infrastructure asset is often included in an inflation-linked allocation group. Despite recent direct investment of a few public pension funds, the large majority of United States pension investors invest in infrastructure through funds.

European Union

Despite the maturity of the infrastructure market, especially in countries such as the United Kingdom, France, Spain, European investors have started building up their allocation to infrastructure, treating it as a separate allocation, only in the last five years. Allocations to such assets are still limited (e.g. 1 to 3% equity of total portfolio) even if targets have been slowly increasing in recent years.

In Europe pension funds utilise the indirect market route to benefit from the experience and expertise offered by infrastructure fund managers. Only the largest pension funds have the right resources in place to invest directly in infrastructure.

South Korea

In Korea the traditional view of infrastructure was as an investment of strategic importance, a major public good where there may have been difficulties in raising funds. Investment in infrastructure was therefore considered a government responsibility. With the involvement of private capital since the end of the 90s, new investment opportunities in the infrastructure sector were offered to investors in Korea. More recently Korean public pension funds have been aggressively investing in infrastructure in foreign countries.

3.1.2 Factors of Growth

Several key factors account for the growth of pension fund infrastructure investment.

The first factor is the **availability of investment opportunities for private finance capital and therefore for pension funds. Private finance involvement has taken different routes in different countries.**

Following the wave of privatisation that has swept mainly the industrialised countries of the world over the last 25 years or so, the involvement of the private sector in the provision and operation of infrastructure has rapidly increased. In some sectors full privatisation is not always possible, or politically viable. Therefore, governments increasingly propose new forms of cooperation between public and private sector in infrastructure called Public Private Partnerships (PPPs or P3). For reasons of history as well as public policy, public-private partnerships are more widely developed in some countries than in others.

The United States and Canada for example have historically relied on public financing of infrastructure such as highways, bridges, ports, canals. Federal and provincial governments in fact invested directly in infrastructure projects rather than rely on private sector financing. The Australian and European transport sectors on the other hand, have experienced higher private sector participation.

In Australia as the number of infrastructure transactions grew, so did the availability of financial instruments, predominantly infrastructure funds, providing investors with access to infrastructure investment opportunities. This led to the development of investor understanding of infrastructure

investment and investor demand for suitable infrastructure assets ultimately outstripping local supply of investable projects. The scale of the programme has been such that it has formed a base from which Australian investors have been able to play an active role in the development and ownership of infrastructure projects and assets elsewhere in the world.

The 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. 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.**

The growth of Australia's investment industry has been a consequence of the introduction in 1992 of the compulsory Superannuation system as part of a major reform package addressing Australia's retirement income policies.

The largest European investors in infrastructure are in countries such as the United Kingdom, the Netherlands, Sweden, Denmark and Finland with well developed pension markets. On the other hand the state-run pay-as-you-go (i.e. unfunded) public pension tier in countries like Greece, Italy, Spain and Turkey still plays a major role in the old-age retirement system, limiting the growth of private pensions and the potential for investment in infrastructure.

The 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)**.

Regulations at country level have been evolving over the years following different public policy decisions to protect people's retirement savings but also to require a high domestic weighting for investment or to fund government debt. In particular local investment rules have traditionally favoured highly rated and liquid debt instruments.

Eastern Europe and Latin America, being new funded pension systems for example exhibit a high degree of regulation and higher exposure to fixed income assets, while Australia, Ireland, New Zealand, the United Kingdom, the United States, the Netherlands and Luxembourg do not impose any rules on pension funds' asset allocation and have higher exposure to equity investments.

The 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

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. Despite the maturity of the infrastructure market, especially in countries such as the United Kingdom, France, Spain, European investors have started building up their allocation to infrastructure only in the last five years.

Active investors who have made several investments are more likely to have separate allocations, showing that most place infrastructure in separate allocations as programmes mature: infrastructure is commonly treated as a separate allocation in the overall portfolio in Canada and Australia while it is in most cases a subsector of real estate or private equity for European and American investors.

3.2 Barriers to investment in infrastructure

A high proportion of pension funds are not currently investors in infrastructure. There are some important hurdles to be overcome before infrastructure becomes a priority interest.

In order to attract pension fund investment in infrastructure and guarantee the success and sustainability of the investment in the long term, several barriers to investment need to be addressed, some specific to pension funds others affecting investors more generally.

Infrastructure investing offers different characteristics from other asset classes which could represent barriers to entry to potential investors. High upfront cost, lack of liquidity and long asset life involved in infrastructure projects, require significant scale and dedicated resources to understand the risks involved, resources that many investors are lacking. These characteristics imply that infrastructure investment – at least in the forms it is currently offered – may not be a suitable proposition for all investors.

Although barriers need to be considered in the context of each different country, general barriers to pension fund investment in infrastructure include:

The Investment Opportunities

- Lack of political commitment over the long term
- Regulatory instability
- Fragmentation of the market among different level of governments
- No clarity on investment opportunities
- High bidding costs involved in the procurement process of infrastructure projects
- Infrastructure investment opportunities in the market are perceived as too risky

The Investor Capability

- Lack of expertise in the infrastructure sector
- Problem of scale of pension funds
- Mis-alignment of interests between infrastructure funds and pension funds
- Short-Termism of investors
- Regulatory Barriers

The Conditions for Investment

- Negative perception of the infrastructure value

- Lack of transparency in the Infrastructure sector

- Shortage of data on performance of infrastructure projects, lack of benchmark

3.3 The Way Forward

What is needed in the coming decades is sustained and steady investment in infrastructure. The challenge is to find ways and means of framing long term strategies, securing long term sources of finance and shielding them as effectively as possible from short term exigencies.

Institutional investors, in particular pension funds can play a more active role in the financing of long-term, productive activities that support sustainable growth, such as infrastructure projects.

However, before pension funds will commit large amounts of capital to infrastructure there must be transparent, long-term and certain regulations governing the sector. Such investments will only be made if investors are able to earn adequate risk-adjusted returns and if appropriate market structures are in place to access this capital.

Moving from the current mindset to a longer-term investment environment requires a transformational change in investor behaviour, i.e. a new "investment culture". The market, by its nature, is unlikely to deliver such a change. Major policy initiatives, in a variety of areas are needed. Some of these initiatives are considered below.

Main policy actions to promote long-term investments

- **Government support for long-term investments: designing policy frameworks that are supportive of long-term investing**

  The limited number and sporadic nature of investment opportunities in the infrastructure sector are perceived as the main barrier preventing investors from including infrastructure in their long-term investment strategy. Government support, such as long-term policy planning, tax incentives and risk transfer mechanisms may be required to engage investors in less liquid, long term investments such as infrastructure.

- **Reforming the regulatory framework for long term investment**

  Policymakers need to promote greater professionalism and expertise in the governance of institutional investors. Collaboration and resource pooling can also be encouraged in order to create institutions of sufficient scale that can implement a broader investment strategy and more effective risk management systems that take into account long-term risks. Regulators also need to address the bias for pro-cyclicality and short-term risk management goals in solvency and funding regulations, and ease quantitative investment restrictions to allow institutional investors to invest in less liquid assets such as infrastructure.

- **The conditions for investment: a transparent environment for infrastructure investment**

  Investment in infrastructure is a relatively new investment which entails a new set of challenges for institutional investors. Shortage of objective and comparable information and quality data make it difficult to assess the risk of infrastructure deals.

The financial crisis – which had significant impact on the performance of many infrastructure deals – greatly damaged the relationship and trust between the infrastructure industry and investors. As a consequence many institutional investors have a negative perception of the value of investing in infrastructure and are not considering investment in the sector in the short to medium term, unless market conditions improve.

All stakeholders – including governments, regulators, long-term investors – will need to work co-operatively and actively to promote and create the environments and the opportunities needed to ensure the potential for pension fund involvement in infrastructure becoming a reality.

PART II

COUNTRY ANALYSES

4. CANADA

4.1 Country Profile[70]

Canada is a constitutional monarchy, structured as a federal state with one federal government, ten provincial and three territorial governments and thousands of municipalities and lower level governments.

With a relatively small population of 33.6 million spread over a vast area of almost 10 million square kilometres Canada is particularly dependent on transport infrastructure for movement of goods and people. Passenger travel is dominated by car, but movement of Canada's substantial resource output still relies on road, rail and port infrastructure.[71]

However, lack of funding during the 1980s and 1990s, new demographic trends such as urbanisation and aging population, have contributed to an infrastructure deficit in sectors such as roads, transit and water. In addition, in recent years the government's focus on public education and health care has highlighted further infrastructure needs.

Canada's overall public finances compare favourably with those in other OECD countries.[72] Fiscal tightening should nevertheless begin in 2011 both at the federal level and in nearly all provinces and territories following the decision to return to budget balance over the medium term. To achieve this objective, measures will focus primarily on expenditure restraint, limiting further public investment in infrastructure in the future.

Historically, Canada's characteristics – its vast geography and small population – limited the flow of private money into infrastructure and explain why the State has traditionally led infrastructure development.[73] As a result, Canadian pension funds have been investing in infrastructure mainly abroad. However recent developments in the Canadian PPP market are offering new investment opportunities to pension funds in the country.

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70 See OECD (2010), *OECD Economic Surveys – Canada*, September 2010.

71 Canada has large reserves of oil, natural gas, coal and uranium, and it is the world's third largest producer of natural gas and the seventh largest producer of crude oil, producing 3.3m barrels/day in 2007. Source: *Economist*.

72 However, the crisis had an impact. Canada's fiscal situation went from a general government surplus of 1.6% of GDP in 2007 to deficits of 5.1% of GDP in 2009 and a projected 3.4% in 2010. While relatively small at the federal level, this total government deficit hides a significant variation at the sub-national level, with some provinces such as Ontario and Quebec facing large structural deficits, though others are in much better shape.

73 Adam Ostry, Ex-Director General Policy and Strategic Initiatives at Infrastructure Canada: *"If you think the population is small today, it was less than 2 million in 1867 – difficult to find private money for any significant project with a national market that small. The country was founded on the promise by the central government to build the transcontinental railway. The State either paid for it or provided loan guarantees in the event of company default. This history explains the traditional and still dominant public aversion to private investment/ownership of public infrastructure".*

4.2 The Infrastructure Market

Canada's highways, bridges, ports, canals and municipal sanitation systems have been predominantly built and maintained with public money. Federal and provincial governments in fact invested directly in infrastructure projects during the 1960s and 1970s rather than rely on private sector financing. The decision was motivated by the desire to ensure rapid economic growth and aided by balanced budgets, low levels of debt and relatively inexpensive sources of financing (such as the Canadian Pension Plan).[74]

During the 1980s and the early 1990s, the deterioration of the fiscal position of many governments coupled with rising debt levels limited the capacity to undertake large new capital programmes further underlying an historical trend of declining investment in infrastructure.

In Canada responsibility over infrastructure investment is quite mixed. The federal government maintains a strong interest in projects of national significance, such as major ports and borders, and provides financial support to provinces and territories. In general, provinces have responsibility for hospitals, large intercity highways and schools while municipalities have responsibility for local infrastructure such as roads, water and sewage services.

While municipal grants were being scaled back, Canadian local governments were asked to take on added responsibilities for infrastructure investment. Owing to restrictive provincial legislation municipalities have remained heavily reliant on funding these growing needs through the use of property tax – a revenue instrument that does not tend to grow over time at the same pace as the cost of service delivery.[75]

Need for Infrastructure

The lack of infrastructure funding during the 1980s and 1990s created a backlog of neglected or poorly maintained infrastructure in need of repair or replacement (roads, hospitals, schools, transit water treatment etc). In addition new demographic trends such as urbanisation and aging population have contributed to an infrastructure deficit in Canada estimated to be between C$ 50 billion and C$ 125 billion.

In 2007 the Federation of Canadian Municipalities undertook a national survey to determine the size of the municipal infrastructure deficit, estimated to be C% 123 billion, in order to help bring attention to the state and performance of municipal infrastructure.[76]

4.2.1 Development of PPPs

Despite closing some high profile projects in the early 1990s (including the Confederation Bridge linking Prince Edward Island and New Brunswick) when measured against comparable western jurisdictions such as the United Kingdom or Australia, Canada generally has lagged behind in the past in the use of PPPs.

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74 Source *The Fiscal Impact of privatisation in Canada* (1997), Bank of Canada Review, Levac M. and Wooldridge P.

75 Source TD Bank Financial Group, "Mind the Gap: Finding the Money to Upgrade Canada's Aging Public Infrastructure" (May 2004).

76 Federation of Canadian Municipalities, "Danger Ahead: The Coming Collapse of Canada's Municipal Infrastructure" (November 2007).

Some of the initial PPPs have been controversial. According to some industry observers for example, the dispute that arose in 2004 between the ETR consortium and the government in effect slowed further private investment in infrastructure projects.[77]

PPP projects have been procured at provincial or municipal level, mainly in the transport sector and for healthcare and accommodation projects. Various jurisdictions across Canada are at various stages in their development of the PPP market with Ontario and British Columbia the most active and more recently Quebec closing some important projects. Federally procured projects are expected to increase following the recent initiatives taken by the Canadian government (see 4.1.7, Steps taken to date).

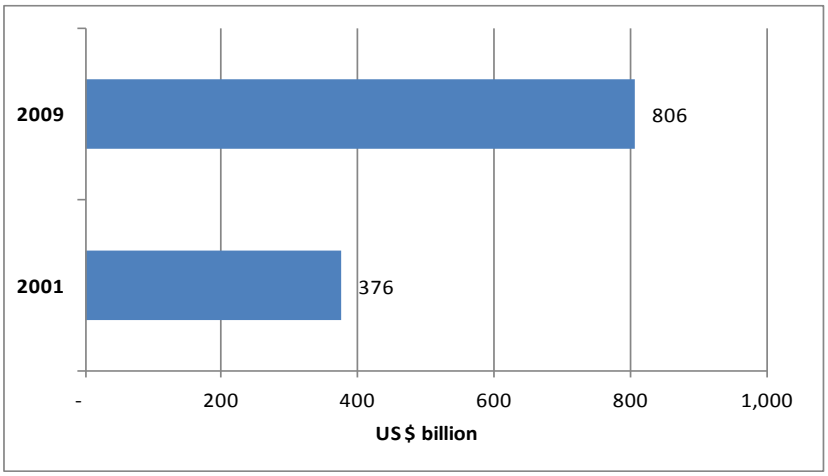
In recent years there have been signs of a pick-up of the PPP market in Canada. In 2010, PPP Canada closed the second round of competition for the C$ 1.25 billion fund dedicated to PPPs, receiving funding requests for 73 proposals across 11 provinces and territories.

[77] In 1999 the ETR consortium (including Concesiones de Infraestructuras de Transporte (CINTRA), SNC Lavalin and Grupo Ferrovial) paid C$ 3.1 billion for a 99-year lease on the 108 km highway, called 407, that runs north of the urban region of Toronto. The road's construction cost totalled C$ 1.5 billion. The contract lacked terms to provide the government with adequate control of toll road increases, allowing the 407 ETR full discretion in this area.

4.3 Pension Market

Over the past decade the assets of Canadian pension funds have grown to a market value of USD 806 billion, equivalent to 62.9% of GDP in 2009, compared to USD 376 billion in 2001. Almost all of the schemes in Canada are Defined Benefit schemes and Canada is one of the few countries where Defined Contribution assets have fallen compared to Defined Benefit in the last years.

Figure 4.1. **Evolution of Canadian pension assets 2001-2009**



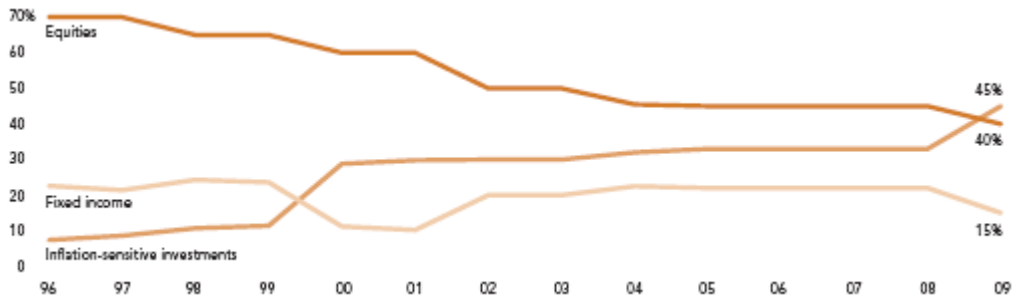
Source: OECD Pension Database.

4.3.1 Key Developments affecting the infrastructure investment

Demographic trends

The gradual maturing of Canadian plan's demographic profiles is having an impact on investment strategies and ultimately infrastructure allocation. For example as the Ontario Teachers' Pension Plan ("OTPP") has matured and the plan's risk tolerance has decreased, its exposure to equity assets has declined and the percentage of inflation-sensitive assets (including infrastructure) has increased. In 2009, the asset-mix policy was 45% inflation-sensitive investments, 40% equities and 15% fixed income.

Figure 4.2. **Ontario Teachers' Pension Plan (OTPP) – How the policy asset mix has grown more conservative**



Source: OTPP annual account 2009.

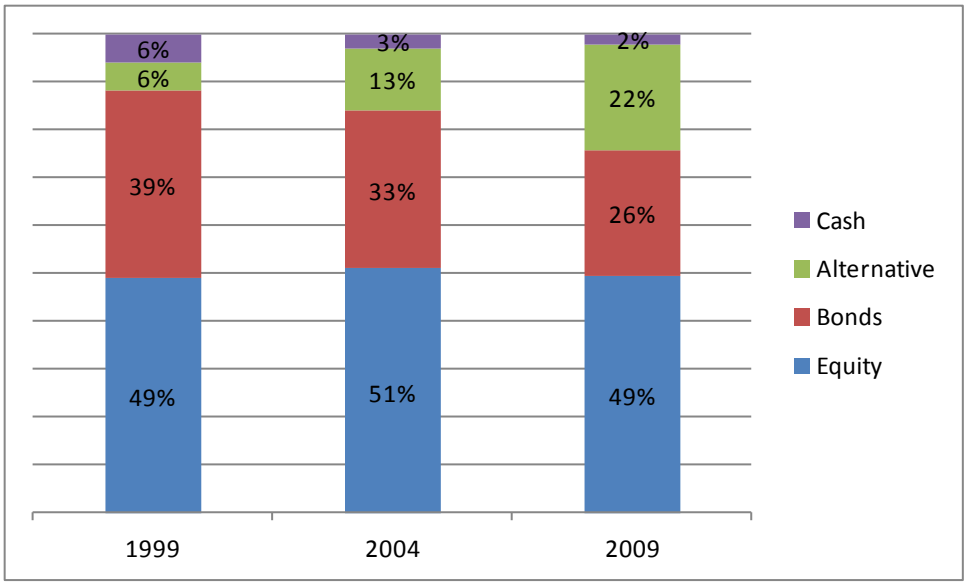
Diversification

Canadian pension fund's exposure to alternative assets continues to grow, extending a long-established trend and reflecting pension fund's growing appetite for diversification.

For example, for the past few years, OPTrust has been implementing a multi-year diversification strategy aiming to reduce the fund's total investment risk – and the volatility of annual returns – by gradually reducing the plan's weighting to public equities, which currently have a policy benchmark weight of less than 50%. Infrastructure investment is among the adjustments made to the portfolio to improve its diversification.

In May 2009 Ontario Municipal Employees' Retirement System ("OMERS") confirmed it would be implementing a portfolio shift in 2010 to allow the pension fund to gain greater exposure to private markets, including infrastructure.

Figure 4.3. **Canadian Pension Asset Allocation Aggregate end 1999 versus end 2004 versus end 2009**



Source: Towers Watson 2010 Global Pension Asset Study.

Foreign Investment limit (Foreign Property rule or "FPR")

The Foreign property rule set a ceiling on the share of assets that Canadian pension funds can invest outside of Canada. The ceiling had been incrementally increased from the original 10% in 1971 to 30% in 2001 to be finally eliminated in 2005.

In practice however, the largest investors managed to circumvent the FPR ceiling through the use of derivatives which were not considered financial assets. The ceiling though had a larger impact on the foreign investment allocation of small funds.

4.4 Infrastructure Investment of Canadian Pension Funds

The first Canadian pension plans started investing in infrastructure more than ten years ago and have built up since then a significant allocation to the sector. Other pension funds started investing more recently, but have been rapidly increasing their allocation, setting higher target allocation to infrastructure.

Canadian pension funds such as Ontario Teachers, Caisse de Dépôt et Placement du Quebec ("CDP"), OMERS, the Canadian Pension Plan Investment Board ("CPPIB") and OPTrust are active investors in the infrastructure market. Over the years, these investors have been able to acquire the knowledge, expertise and resources to invest directly in infrastructure. Not only they are able to co-invest but also to take leading roles in consortia, competing with other funds and financial sponsors when bidding for projects. This also means these investors have in-house resources to produce their own research and risk assessment of infrastructure projects without being dependent on external consultants.

For the largest investors in Canada, infrastructure is treated as a separate asset and is part of the allocation to inflation sensitive investments which tend to correlate closely with changes in inflation acting as a hedge against increases in the cost of future pension benefits.

According to the Pension Investment Association of Canada at 31 December 2009 aggregate assets invested in infrastructure amounted to CAD 34.9 billion which represents 3.84% of total managed assets.[78]

Canadian pension funds are often investing in public infrastructure projects in other countries (e.g. CDP at December 2010 had only 21.2% of its infrastructure portfolio invested in Canada).

Owing to the small scale of the Canadian market – by global standards – Canadian pension funds need to diversify their portfolio investing a higher proportion of their assets in international markets. Infrastructure investment offers global opportunities to Canadian pension funds.

Canadian pension funds primarily focus on infrastructure deals originating in North America and Western Europe and look at other regions on an opportunistic basis if they offer stable regulatory, economic and political environments.[79]

Investment in infrastructure in Canada has been limited in the past mainly due to a lack of investment opportunities. There are signs however of increasing involvement of pension funds in Canada.[80]

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78 Total pension fund assets at 31 December 2009 – approx. C$ 910 billion. Source: Pension Investment Association of Canada, http://www.piacweb.org/publications/index.html

79 For example: in June 2011, a consortium formed by CPPIB, Allianz Capital Partners GmbH (Allianz) and the Abu Dhabi Investment Authority (ADIA) entered into an agreement to acquire a 24.1% stake in the Gassled Joint Venture which owns the majority of the gas transport infrastructure on the Norwegian Continental Shelf; OTPP and Borealis in December 2010 were successful bidders for the GBP 2.1bn High Speed 1 rail link in the UK; also in December 2010 the Alberta Investment Management Corp. bought a US$850 mn stake in a Chilean toll road, Autopista Central; in November 2010, OPrust Private Markets Group completed an innovative transaction, investing in US-based energy transmission infrastructure assets through the use of a real-estate investment trust structure.

4.5 A closer look at a few selected investors

Findings of this section draw in part on interviews with industry professionals, in part on information obtained from a literature review, selected pension fund annual reports and an analysis of the available data sources. Interviews were conducted with representatives of selected investors in infrastructure, consultants and infrastructure funds.

4.5.1 Appetite for Infrastructure

Ontario Municipal Employees' Retirement System ("OMERS")

OMERS was established in 1962 as the pension plan for employees of local governments in Ontario. OMERS total assets as at December 2010 were C$ 53.3 billion.

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 C$ 8.3 billion or 15.5% of its total assets to infrastructure and had target allocation of 21.5% of the total portfolio.

Ontario Teachers' Pension Plan ("OTPP")

OTPP is Canada's largest single profession pension plan with total assets of C$ 104.7bn at December 2010.

OTPP began building its infrastructure portfolio in 2001 and it now includes investments in airports, pipelines, electrical power generation, water and natural gas distribution systems. As of December 2010, OTPP had allocated to infrastructure C$ 7.7 billion or 7.7% (compared to C$5.6 billion in 2009), in line with its target allocation.

OPTrust

The OPTrust is a defined benefit pension plan with total assets of C$13.3 billion as of December 2010.

OPTrust is an active investor in the infrastructure asset class and launched its internal investment team – which also invests in private equity – in 2006. The long term target allocation for infrastructure is 15% and by the end of 2010 represented just under 5% of the plan's total assets.

The Canadian Pension Plan Investment Board ("CPPIB")[81]

CPPIB is an arm's length government corporation that invests the assets of the Canada Pension Plan, a defined benefit plan with total assets of C$ 148.2 billion as of March 2011.

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[80] For example: CPPIB in October 2010 announced a deal for 10% interest in Ontario's Highway 407 for US$894 million.

[81] CPPIB, compared to other pension funds, has a relative certainty of the asset base as well as amount and timing of future cash flows. This is because the Canadian Pension Plan is not expected to use any investment income to help pay benefits until 2021. CPPIB is not forced to seek the short-term returns that many other market participants must achieve due to their investment objectives, yield requirements or business models, nor are they driven by short-horizon market dynamics.

CPPIB began investing in infrastructure in 2006 through its Private Investment allocation and has since developed a portfolio that represents 6.4% (or C$ 9.5 billion) of the total portfolio as of March 2011.[82]

Organisation model/Investment Style

Unlisted funds are a very limited part of OTPP and OMERS pension plans infrastructure portfolios and they have no plans to make further investments in such vehicles in the future. Other funds such as OPTrust or CPPIB invest in infrastructure both through unlisted infrastructure funds and via direct investments in projects and infrastructure related companies. For OPTrust, the balance between fund and direct investments has shifted to more closely resemble that of OTPP and OMERS.

In order to make direct investments Canadian pension plans have built or are building large teams dedicated to such purpose. Borealis in fact has built an expert team of about 25 transaction people and CPPIB has 26 professionals dedicated only to infrastructure**.** OPTrust has a combined team of 35 investment professionals and support staff dedicated to investing in infrastructure and private equity. This also means these investors have in-house resources to produce their own research and risk assessment of infrastructure projects. All of these pension plans maintain overseas offices to manage increasingly global portfolios.

4.5.2 Infrastructure Investment Strategy

Definition of infrastructure

In general, Canadian pension funds prefer to invest in large, mature operating assets although will evaluate and participate in Greenfield opportunities on an opportunistic basis.

Infrastructure includes traditional sectors exhibiting significant governmental or regulatory barriers to entry as well as industry sectors and businesses exhibiting strong, stable cash flows linked to inflation or underpinned by long-term contracts. Infrastructure investment is associated with low technology replacement risk and minimal substitution risk.

CPPIB and OTPP having a more conservative approach do not invest in greenfield projects. OPTrust on the contrary has a larger exposure to Greenfield investment compared to other funds and has built global expertise and profile in the field of renewable and traditional energy.

Renewable projects in general are not considered to be economic viable investments, especially if relying too heavily on subsidies.

[82] CPPIB's major infrastructure direct investments as at 31 March 2011, include: 407 ETR – toll highway, Greater Toronto Area, in Canada; Westlink M7 – toll road Sydney, Australia; Airwave Solutions – a communication services provider to UK's police force; Arqiva – a communications and media services company in UK; Broadcast Australia; Puget Energy Inc., Washington State's oldest and largest energy utility; AWG plc, parent of Anglian Water, a UK-based water and sewage company; Transelec S.A., the largest electricity transmission company in Chile; Wales & West Utilities – a natural gas distribution network that serves Wales and south-west England.

Geographical exposure

OMERS currently has investments located in Canada, the United States and the United Kingdom. The pension fund will consider rail assets in North America and airports in North America or Europe and regulated water asset opportunities.

OPTrust's infrastructure portfolio construction is currently split evenly between Europe and North America in line with long-term targets and has an allocation for Asia and emerging markets as well.

CPPIB has approximately C$ 1.7 billion invested in Canada, and is seeking international opportunities for infrastructure. The fund is initially focusing on deals originating in North America and Western Europe, but will look at other investment grade jurisdictions on an opportunistic basis if they offer stable regulatory, economic and political environments.

Returns and Benchmarks

Expected returns from infrastructure range from 9 to 13% IRRs net of fees. For Greenfield projects expected IRRs are higher, in the 13-16% range.

OMERS, as a benchmark for infrastructure investment, uses an absolute return set at the beginning of each year. The overall infrastructure return for 2010 was 10.1% compared with a benchmark of 8.5%.

Leverage

In general there are no specific requirements at project level concerning leverage, it depends on the asset. However a few investors stated that projects below investment grade are not taken into consideration. What is most important is the ability of the projects of paying the interest due (i.e. focus on interest cover).

Liquidity

Many investors indicate illiquidity of the infrastructure asset as one of the major constraints when considering its allocation in the portfolio. Infrastructure in fact would be counted in the illiquid assets part of the portfolio.

Ticket Size

Investors when investing directly consider minimum equity investment of at least C$ 100 million hence some attractive opportunities could be rejected because they are too small to make an appreciable contribution to the overall returns of the fund. For example CPPIB does not consider social infrastructure assets such as hospital and schools, to be viable investments opportunities, as it looks to invest C$ 300-600 million in a single investment.

Alignment of Interest

Investors require that each of their partners, including operating partners, invest substantial equity in investments in the projects alongside them. This is to ensure alignment of interests and results in better ongoing corporate governance amongst the owners of the investment.

OMERS for example will only pursue investments where they can significantly influence the strategic direction of the infrastructure asset. This means they typically do not acquire less than 25% ownership in any investment and always negotiate for appropriate governance and control rights in order to have an active voice on all matters related to the asset and the business.

4.5.3 Drivers for investment in infrastructure

- Why invest in infrastructure?

Infrastructure investments are expected to produce predictable and stable cash flows over the long term and returns in excess of those obtained in the fixed income markets but with potentially higher volatility. The main objective of investing in infrastructure is strong long term income.

Public and private equity are primarily return enhancers which reduce contributions, while real return bonds, real estate and infrastructure primarily support the liabilities to lower the volatility of contributions. Fixed income offers opportunities to enhance returns as well as support the liabilities.

In addition, for large investors such as CPPIB, infrastructure offers the opportunity to deploy large sums of capital.

At OPTrust the infrastructure investment allocation is funded from a combination of publicly traded equity and fixed income portfolios as the pension fund prefers investments with holding periods and cash flows that better match its long term liabilities.

- Where does it fit in the portfolio allocation?

For many investors in Canada, infrastructure is treated as a separate asset and is often part of the allocation to inflation sensitive investments which tend to correlate closely with changes in inflation acting as a hedge against increases in the cost of future pension benefits.

For example OTPP, considers infrastructure part of the Liability Hedge Group. In this category are included assets that have a positive correlation with OTPP's liabilities. These assets generally reduce funding risk.

OMERS' asset classes are categorised into two broad asset groups: (i) Public Investments (fixed income, public equities and real return bonds) and (ii) Non-Public Investments (infrastructure, private equities and real estate).

OPTrust's private markets programme was launched in 2006 to build diversified infrastructure and private equity portfolios, which will together eventually account for up to 30% of the Plan's assets.

Infrastructure investments primarily fall within the real return asset portion of the CPP Fund portfolio, providing a strong match with the fund's inflation-linked liabilities.

4.6 Main barriers to Investment in Infrastructure

Investment Opportunities

- Historical negative public perception of private investment in infrastructure sectors.
- Lack of visibility of project pipeline and investment opportunities in the long term.
- Amounts of equity involved are too small for the minimum allocation to infrastructure that the large Canadian pension funds are looking for.
- Many PPPs are not attractive as an inflation hedge, only providing a fixed return not increasing with inflation.
- Infrastructure investment opportunities in the market are perceived as too risky.

The Conditions for Investment

- Infrastructure characteristics do not properly fit any other class, difficult for investors to decide where the infrastructure allocation fits in the overall portfolio.
- Especially when investing abroad, lack of transparency in the infrastructure sector (i.e. rule of law, expropriation risk, strength of governments etc.).

4.7 Steps taken to date

In 2006, the Government of Canada released a C$ 33 billion infrastructure plan, *Building Canada.* This infrastructure plan will provide more funding, over a longer period of time from 2007 to 2014 than any previous federal infrastructure initiative.

Through *Building Canada*, the Government of Canada's aim is to provide funding but also to promote knowledge, research, best practices, long-term planning, and capacity building. In addition, the *Building Canada* plan will also create a new framework for different orders of government to come together to assess infrastructure needs and priorities on a regular basis and to plan investments to meet these needs.

The *Building Canada* plan also encourages the development and use of PPP best practices by requiring that PPPs be given consideration in larger infrastructure projects funded through the Gateways and Border Crossings Fund and by the Building Canada Fund.

Infrastructure Canada

Infrastructure Canada was established as a department of the Transport, Infrastructure and Communities (TIC) portfolio in August 2002. Since then, the department has worked to:

- provide a focal point for the Government of Canada on infrastructure issues and programmes through the Building Canada plan;
- lead the Government of Canada's efforts in addressing the infrastructure challenges of the country;
- support infrastructure initiatives across the country; and
- facilitate world-class public infrastructure for Canada and Canadians.

Government focus on PPPs

The Government of Canada took a leadership role in developing PPP opportunities within Canada through two initiatives, both part of the Building Canada plan approved in 2006.

The first is the C$ 1.25 billion *Public Private Partnerships Fund*. This programme will support innovative projects that provide an alternative to traditional government infrastructure procurement. The PPP Fund will help expand infrastructure financing alternatives in Canada, provide incentives to attract investments from the private sector, and increase knowledge and expertise in alternative financing.

The PPP fund will provide up to 25% of the value of a project's direct capital costs leveraging municipal and provincial commitments which will cover for the rest of the costs. The C$ 1.25 billion fund is expected to directly leverage C$ 5 billion in PPP infrastructure investments in Canada.

In addition, the Government of Canada is committing C$ 25 million over five years to establish a federal PPP Office. The PPP Office will facilitate a broader use of PPPs in Canadian infrastructure projects, including through the identification of PPP opportunities at the federal level.

The Building Canada plan also encourages the development and use of PPP best practices by requiring that PPPs be given consideration in larger infrastructure projects funded through the Gateways and Border Crossings Fund and by the Building Canada Fund. Specifically, all projects seeking C$ 50 million or more in federal contributions will be required to assess and consider the viability of a PPP option.

In its 2009 budget, the Canadian Government announced that it would provide almost C$ 12 billion in new infrastructure stimulus funding over two years for federal investments in infrastructure projects, some of which will be procured as PPP projects.

Infrastructure bonds

The Canadian bond market for PPPs debt has developed rapidly in recent years and prospects seem to be promising for institutional investors such as pension funds.[83]

The market has proved to be resilient to the financial crisis owing to the small monoline insurers' involvement pre-crisis. The creditworthiness of the Canadian provinces, reflected in their high ratings,[84] ensures a low counterparty risk for availability payment PPPs. More importantly, projects were designed to be very strong from a credit perspective (i.e. good contractor, large amount of security, good liquidity, relatively simple projects, etc.) in order to reach a high level of rating.[85] Some investors in Canada can analyse project risk and have also been able to invest in PPP bonds on an unrated basis (private bonds).

Some large transactions have been completed successfully in recent months. For example, the Montreal University Hospital Research Centre project, which closed in 2010, where Fiera Axium and Meridiam sold C$ 400 million of A-rated bonds to a mix of pension funds as well as the more traditional life insurance plans.[86] The McGill University Health Centre bond issue, which closed in July 2010, attracted 51 buyers, including traditional buyers such as Canadian life insurers Canada Life, Manulife and Sun Life and new investors such as money managers.

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83 Altogether, the 2010 bond issuances were C$ 1.47 billion making 2010 the busiest year yet for PPP bonds in Canada. Issuances in 2007, 2008 and 2009 totalled C$ 214 million, C$ 420 million and C$ 472 million respectively. Source: *Infrastructure Investor*.

84 For example, Moody's ratings for a few provinces: Alberta Aaa; British Columbia Aaa; Ontario Aa1; Quebec Aa2.

85 In Canada, as of June 2011, there has not been any PPP rated bond market for projects rated below A3/A on a stand–alone basis (before credit enhancement provided by the monolines).

86 Source *Infrastructure Investor Canada – an Intelligence Report*, December 2010.

Box 4.1. **Building Canada Plan**

Over half of the total C$ 33 billion funding under the *Building Canada* plan will be provided as base funding for municipalities. In total, over C$ 17.6 billion over seven years will be provided through the Gas Tax Fund and the GST Rebate. This funding is stable, predictable, and flexible. It allows Canadian municipalities to plan for the longer-term, using a dedicated source of funds to address their ongoing infrastructure needs.

C$ 33B Infrastructure Plan – 2007-2014

Program	**Amount**
Municipal GST Rebate	C$ 5.8B
Gas Tax Fund	C$ 11.8B
Building Canada Fund	C$ 8.8B
Public-Private Partnerships Fund	C$ 1.25B
Gateways and Border Crossings Fund	C$ 2.1B
Asia-Pacific Gateway and Corridor Initiative	C$ 1B
Provincial-Territorial Base Funding	C$ 2.275B
Total	**C$ 33B**

In addition the *Building Canada* plan also includes three new national infrastructure programs. The *Gateways and Border Crossings Fund* (C$ 2.1 billion) and the *Public Private Partnerships Fund* (PPP Fund) (C$ 1.25 billion) are targeted investment programs, focused on addressing specific national priorities. The third new program, the C$ 8.8 billion *Building Canada Fund* is being used for Core National Highway Systems, drinking water, wastewater, public transit and green energy, as well as other projects that deliver environmental, economic or social benefits to communities, such as solid waste management, rail and sea shipping, broadband connectivity, tourism, local airports, local roads and bridges, and cultural and sports facilities.

4.8 Conclusions

Canadian pension funds are among the most active investors in infrastructure with some investors having portfolio allocation to equity infrastructure of 10% or more.

Canadian pension funds over the years have been able to acquire the knowledge, expertise and resources to invest directly in infrastructure. Not only are they able to co-invest but also to take leading roles in consortia, competing with other funds and financial sponsors when bidding for projects. This also means that these investors have in-house resources to produce their own research and risk assessment of infrastructure projects without being dependent on external consultants.

Investment in infrastructure in Canada has been limited in the past mainly due to a lack of investment opportunities. Despite closing some high profile projects in the early 1990s when measured against comparable western jurisdictions such as the United Kingdom or Australia, Canada generally has lagged behind in the use of PPPs. As a result Canadian pension funds are often investing in public infrastructure projects in other countries.

There are signs however of increasing involvement of pension funds in Canada. Recent federal initiatives such as the Building Canada Plan or the creation of a dedicated PPP fund, were successful in providing a pipeline of projects to investors.

The Building Canada plan also encourages the development and use of PPP best practices by requiring that PPPs be given consideration in larger infrastructure projects funded through federal funds. Specifically, all projects seeking C$ 50 million or more in federal contributions will be required to assess and consider the viability of a PPP option.

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5. AUSTRALIA

5.1 Country Profile[87]

Australia is a federal parliamentary democracy, structured as a federal state with one federal government, six states and two territories.

Infrastructure is important for Australia because of its size, the geographical dispersion of its population and production centres, and its remoteness from other markets. In particular movement of Australia's natural resources to the far export markets relies strongly on road, rail and port infrastructure.[88]

Nevertheless, Australia has an important infrastructure deficit. This is in part owing to underinvestment in the 1980s and 1990s, while the rebound in capital spending at the beginning of the 2000s has been insufficient to deal with capacity shortages exacerbated by the strong demand generated by the mining boom, expected population growth, technological progress and environmental concerns.

In contrast to many OECD countries, low public debt and good growth prospects put Australia in a solid fiscal position.[89] Although the budgetary outlook remains strong, Australia's fiscal policy will be challenged by a number of efficiency issues[90] and the expected rise in volatile mining revenues. It is likely that in the coming years the need for fiscal consolidation will constrain the growth of public infrastructure investment.

In the last decades, the private sector has been actively involved in the provision of infrastructure in Australia. Australian pension funds – superannuation funds – have been largely investing in the country and abroad and are likely to continue to do so.[91]

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87 See OECD (2010) *OECD Economic Surveys: Australia 2010*, OECD Publishing.

88 Australia is the world's largest coal exporter and one of the largest exporters of iron ore according to the Economist Intelligence Unit.

89 In fact Australia's 2009 deficit was the first after eight years of surpluses.

90 In the coming years the increased value of the nation's mining and energy wealth will create issues from a fiscal standpoint such as sharing of the rent, transitory effects on the budget, etc.

91 Sir Rod Eddington, Chairman Infrastructure Australia: *"... many investment priorities do not require the support of public funds but rather the active engagement of private and superannuation funds and expertise"*, "Getting the Fundamentals right for Australia's infrastructure priorities", letter to Anthony Albanese – Minister for Infrastructure Transport, Regional Development and Local Government Infrastructure Australia, June 2010.

5.2. The Infrastructure Market

In Australia historically the public sector has provided most of the country infrastructure. Infrastructure was viewed as a public good and with successive interventionist federal and state governments, most infrastructure assets and businesses were owned and managed by state agencies or corporations. Following the recession of 1989-1990 many infrastructure assets were reformed or privatised.[92]

Australia's infrastructure market was launched in the 1990s with a series of large scale infrastructure asset privatisations in the financial services, energy, transport and communication sectors. The landmark transactions included private sector participation in the construction and operation of Sydney toll roads in 1989, the privatisation of Victoria's electricity assets in 1992 as well as the privatisations of airports across Australia in 1994.[93]

Since the early 2000s, half of the sector's capital investment has been undertaken by private companies. The private share is lower, however, in the energy and water sectors (35%) and in transport (45%). In telecommunications all capital investment has become private following the total privatisation of the historical operator, Telstra, in 2006.[94]

Australia is a federal country and as such infrastructure planning has been strongly influenced by the States.[95] The States are the main public-sector players with spending on infrastructure acting primarily through public enterprises under their control, but also directly via budget expenditures, as in the transport sector. The federal government has an important role in regulation, and in fostering and co-ordinating capital investment in all these areas. The influence and the form of these public interventions vary from one industry to another.

Need for Infrastructure

Strong demand for Australian commodities, predominantly coal and iron ore, coupled with a growing economy and population, has highlighted significant capacity constraints. Lack of investment in new infrastructure led to bottlenecks in some major ports, particularly those serving the rapidly expanding coal mining industry. For example at the Dalrymple Bay Coal Terminal in Queensland (the third largest in the world) up to 50 ships at a time were forced to moor off the terminal waiting for an opportunity to load coal.

In 2008, Citigroup estimated the economic infrastructure investment in the decade at more than A$ 770 billion, if the quality of capital stock was to return to a level that will sustain Australia's ongoing prosperity. It was predicted that a large demand for private sector finance would be necessary, estimated to be around A$ 360 billion.

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92 See Regan M. (2009).

93 Colonial First State: Investing in Infrastructure, the Australian experience, 3 November 2006.

94 OECD (2010)

95 Section 51 of the Australian Constitution sets out the areas where the Commonwealth has power to legislate. The building of infrastructure such as roads, etc., other than railways, is not covered in this section, thus the power falls to the States. The States are in turn bound by their fiscal budgets.

In 2009, the infrastructure deficit in Australia was estimated to be A$ 700 billion over the next decade by R. Oakeshott.[96] Recent infrastructure plans at State level have further highlighted the need for infrastructure.[97] However the vast majority of these plans remain unfunded and many projects are consequently delayed.

5.2.1 Development of PPPs

In Australia, PPPs have been adopted as a key form of procurement for the delivery of major infrastructure projects. In 2006-07, PPPs in Australia accounted for around 5% of public investment in infrastructure.[98]

New South Wales and Victoria have made the greatest use of private provision of capital for public infrastructure.[99] In terms of volume the activity has been primarily based on toll roads even though in recent years social infrastructure projects such as schools, public housing or hospitals have become more common.

Recently investors in toll roads have taken several losses as for example in projects such as the Cross City Tunnel or the Lane Cove Tunnel project. In both projects the winning consortium bidding for the projects overestimated traffic forecast and what drivers would ultimately pay.[100]

The scale of the Australian toll roads programme – typically urban motorways with a high construction cost and sophisticated operation – has been such that it has formed a base from which Australian investors have been able to play an active role in the later development of toll roads elsewhere in the world.

Australian jurisdictions typically only commit to a PPP project following the allocation of its full capital cost within the relevant Government budgetary cycle.[101] As a consequence, PPPs are released to the market in accordance to jurisdictional budget priorities, making it more difficult in the Australian Federal system to create a steady pipeline of projects.

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96 R. Oakeshott, "Matters of public importance: infrastructure", House Debates, 19 August 2009.

97 The South East Queensland Infrastructure Plan and Programme (SEQIPP) with A$ 124 billion to 2026, the Victorian Transport Plan with A$ 38 billion to 2017; the Metropolitan Transport Plan in New South Wales (NSW) with 52 billion.

98 Chan, C., Forwood, D., Roper, H. and Sayer, C. (2009). Public Infrastructure Financing: An International Perspective. Productivity Commission Staff Working Paper, Australian Government Productivity Commission.

99 Establishment of Partnerships Victoria policy and guidelines in 2000, the Working with Government Guidelines for Privately Financed Projects in NSW and similar policies in other states defined the PPP model in the country.

100 Traffic through the A$ 789 million Cross City Tunnel in Sydney never reached the levels forecast and after December 2006 just over one year of operations, the company was insolvent with debts of over A$ 500 million.

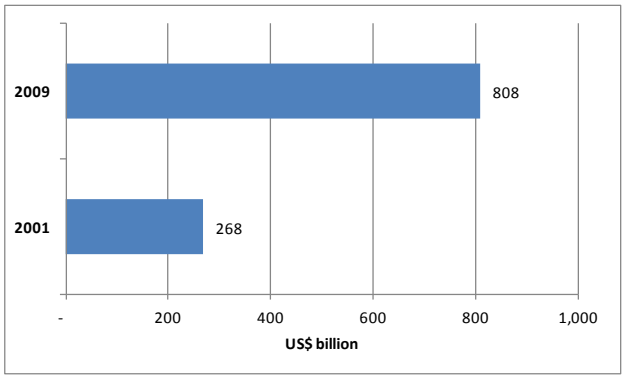
The Lane Cove Tunnel, north-west of Sydney, opened in 2007 and collapsed after falling short of its original traffic target. It was placed into receivership in January 2010 with debts of more than A$ 1.1 billion.

101 KPMG – PPPs procurement Review & Barriers – May 2010.

5.3 Pension Market

Over the past decade the assets of Australian pension funds, have grown to a market value of USD 808 billion equivalent to 82.3% of GDP in 2009, compared to USD 268 billion in 2001. In Australia the majority of the schemes are defined contribution schemes.[102]

Figure 5.1. **Evolution of Australian pension assets 2001-2009**



Source: OECD Pension Database.

Superannuation funds are the vehicles for the superannuation system to deliver the intended retirement savings outcomes. The Australian Prudential Regulatory Authority (APRA) divides Australia's superannuation funds into five main segments: corporate, public sector, industry, retail and small funds.[103]

- Corporate funds are funds operated for the benefit of employees of a particular company or corporate group.
- Industry funds are funds formed to provide access to superannuation for employees working in the same industry, although an increasing number of industry funds are now open to the public.
- Public Sector funds are funds that provide benefits for government employees, or are schemes established by a Commonwealth, State or Territory law.
- Retail funds offer superannuation products on a commercial basis and their trustees are typically a part of a larger financial conglomerate.
- Small funds are those with less than five members.

102 The portability of the pensions means that retirees can change fund managers when they want. This works in Australia thanks to the great liquidity of the market due to the compulsory nature of the contributions and the fact that plans are still growing.

103 As of March 2010, corporate funds accounted for 4.8% of Australia's total superannuation assets, industry funds 18%, public sector funds 14.1%, retail funds 27.9% and small funds 32%.

5.3.1 Key Developments affecting the infrastructure investment

The Superannuation system

The growth of Australia's investment industry has been a consequence of the introduction in 1992 of the compulsory Superannuation system as part of a major reform package addressing Australia's retirement income policies.

Since its introduction, employers have been required to make compulsory contributions to superannuation on behalf of most of their employees. This contribution was originally set at 3% of the employees' income, and has been incrementally increased by the Australian government. Since 1 July 2002, the minimum contribution has been set at 9% of an employee's ordinary time earnings (to increase to 12% by July 2019).[104]

The compulsory nature of super contributions means that by 2035, Australians are projected to have increased their collective super savings to A$ 6.1trillion (A$ 3.2 in real terms).[105]

Demographic trends

Compared to other countries, Australia has a relatively young demographic profile resulting in a higher risk tolerance in the investment strategies of superannuation funds. Funds that are still growing are likely to have a more aggressive investment strategy.[106]

However, as a greater proportion of superannuants transition from pre-retirement accumulation to post-retirement a new focus on savings preservation has begun to emerge. This is likely to grow in line with the ageing of Australia's population. Infrastructure can play a much greater role facilitating the shift of funds toward a conservative preservation focus.[107]

Diversification

Australian pension fund's exposure to alternative assets continues to grow, extending a long-established trend and reflecting pension fund's growing appetite for diversification.

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104 It was anticipated that Australia would experience a major demographic shift in the coming decades, resulting in the anticipated increase in age for pension payments placing an unaffordable strain on the Australian economy.

The proposed solution was a "three pillars" approach to retirement income:

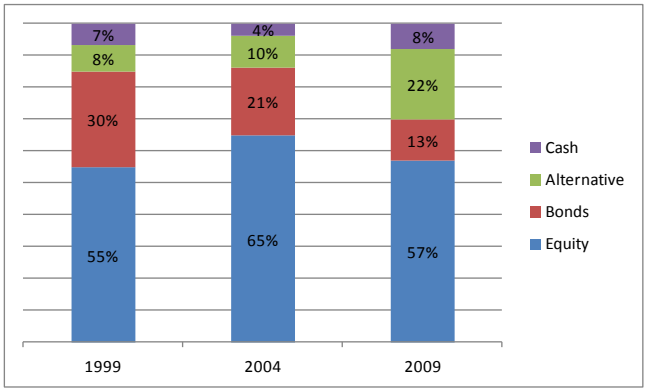
- A safety net consisting of a means-tested Government age pension system
- Private savings generated through compulsory contributions to superannuation
- Voluntary savings through superannuation and other investments.

105 AustralianTreasury estimates – Super System Review: Final report August 2010.

106 [The Australian system] is a young system and there will be many years before there is net cash flow out. At the moment the focus is on growth and asset accumulation. Interview with Kyle Mangini, IFM global head of infrastructure, Infrastructure Investors, September 2010.

107 Source: "The Role of Superannuation in Building Australia's Future", Infrastructure Partnerships Australia 2010.

Figure 5.2. **Australian Pension Asset Allocation Aggregate end 1999 versus end 2004 versus end 2009**



Source: Towers Watson 2010 Global Pension Asset Study.

Consolidation in the superannuation sector

The superannuation sector in Australia is undergoing a process of consolidation: smaller funds are merging, corporate funds are closing, with existing large superannuation providers (both industry and retail funds) taking over most of these assets under management.

Treasury projections (see Table 5.1 below) show a quite dramatic decrease in the number of funds so that the large APRA fund sector is dominated by fewer, larger super funds (leaving aside the growth in the number of small self-managed funds). Larger funds will be more likely to be able to consider investment in infrastructure.

Table 5.1. **The Australian superannuation industry in 2035 (including SMSFs)**

	1996	**June 2009**	**2035 (nominal)**	**2035 (current)**
Overall industry scale	$245b	$1.1t	$6.1t	$3.2t
Biggest Fund		$41.5b	$350b	$187b
Number of large APRA funds	4734	447	74	74
Average large APRA fund size	$40m	$1.5b	$53b	$28b
Total Super Assets - % of GDP	**47%**	**90%**	**130%**	**130%**

Source: Super System Review: Final report August 2010.

Self Managed Super Funds (SMFS)

Self Managed Super Funds (SMFS) are the fastest growing sector of the industry. They represent over 400,000 funds with total assets of more than A$ 330 billion. This is A$ 330 billion that is not available for direct investment into infrastructure. The Australian Taxation Office's latest statistics report a 7% growth in the number of funds in the 12 months to June 2009.[108]

108 Source: *APRA Quarterly Superannuation Performance June 2009.*

5.4 Infrastructure Investment of Australian Pension funds

Australian superannuation funds started investing in infrastructure more than ten years ago and have built up since then a significant allocation to the sector. Infrastructure is commonly treated as a separate allocation in the overall portfolio.

Several Australian funds including AustralianSuper, Unisuper, Victorian Funds Management Corporation (VFMC), the Motor Traders Association of Australia (MTAA) Superfund, the Military Superannuation fund, are significant infrastructure investors.

In 2002, infrastructure investment by superannuation funds was estimated at A$ 8 billion, or about 2% of the total fund assets. By 2012, projected investment in infrastructure was estimated to be about A$ 65 billion or about 5% of projected superannuation assets.[109] Infrastructure investment by Australian superannuation funds is currently estimated to be already above past forecast at between A$ 40 billion and A$ 65 billion,[110] i.e. between 5 and 8% of total assets.[111]

The largest funds in Australia are pushing to invest directly or co-invest in infrastructure to avoid paying high management fees. However the average size of Australian investors, (smaller for example than Canadian funds), does not allow in most cases to have the right resources in place to invest directly in infrastructure. If the superannuation fund is not large enough it would normally invest through closed-ended funds or through open-ended vehicles.

Australian open-ended vehicles such as Industry Funds Management ("IFM") and Queensland Investment Corporation ("QIC") have a very long investment horizon and provide lower fee and carry structure that implies a very long term hold by investors. (See Box 5.1 for more on open-ended funds.)

Superannuation funds have been active investors in infrastructure in Australia. Recent examples of projects that reached financial close in 2010 with pension fund involvement are the Port of Brisbane project, and in 2009 the Victoria Desalination Plant and the Peninsula Link road project (where three domestic pension funds provided 75% of equity).

However, strong competition for limited investment opportunities in Australia is forcing many Australian investors to look for investment opportunities abroad. For example AustralianSuper's international infrastructure exposure equates to a little over 50% of its total infrastructure allocation.

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109 ABN AMRO, Private Financing and Defence Infrastructure, June 2004.

110 Source: "The Role of Superannuation in Building Australia's Future", Infrastructure Partnerships Australia 2010.

111 SuperRatings examined the average asset allocations of the balanced options in the largest 50 superannuation funds (includes industry funds, corporate funds, public sector funds and retail funds) from June 2005 to June 2009 and found that, on average, 8.1% of assets were invested in direct or unlisted infrastructure.

5.5 A closer look at a few selected investors

The findings of this section draw in part on interviews with industry professionals, in part on information obtained from a literature review, selected pension fund annual reports and an analysis of the available data sources. Interviews were conducted with representatives of selected investors in infrastructure, consultants and infrastructure funds.

5.5.1 Appetite for Infrastructure

For MTAA, the Military Fund and UniSuper the first infrastructure investment was their commitment to one of Macquarie's infrastructure vehicles, the 1996 Macquarie Global Infrastructure Fund.

AustralianSuper total assets at December 2010 were A$ 36.8 billion. The fund started investing in infrastructure in the mid-1990s. In 2000, it started investing abroad, and in 2005 started to co-invest along with other infrastructure funds. Australian Super as of December 2010 has approximately 13% of its total assets allocated to infrastructure investments (of which 12% is allocated to unlisted funds and the remainder to listed funds and direct investments) in line with its current strategic asset allocation.[112]

The Military Superannuation Pension fund has an extensive portfolio of investments in unlisted infrastructure funds and direct investments that equates to more than 8% (or A$ 259 million) of the A$ 3.1 billion total assets under management as of June 2010.

MTAA's infrastructure portfolio equates to 24% or (A$ 1.3 billion) of the total A$ 5.8 billion of assets under management as of June 2010**.**

UniSuper is one of Australia's largest superannuation funds with A$ 25.4 billion in assets at 30 June 2010. At the same date, infrastructure investments amounted to A$ 1.2 billion, held in direct holdings, such as the Sydney airport and the Anglian Water Group and listed and unlisted infrastructure funds managed by Macquarie.[113]

VFMC managed A$ 34.3 billion of assets, as of June 2010. VFMC's infrastructure portfolio has steadily increased over time from 2% to 5.5% as of June 2009.

Organisation model/Investment style

In September 2007 VFMC made its first direct investment in infrastructure when it purchased a minority stakes in Birmingham Airport in the UK with the Canadian pension fund Ontario Teachers.

The majority of AustralianSuper's unlisted infrastructure fund investments to date have been in open-ended funds managed by IFM. Australian Super has a long standing relationship with IFM which manages 70% of the superannuation fund's exposure to infrastructure. The open-ended vehicles invest in an array of economic and social infrastructure assets and include transactions that utilise the PPP structure.

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112 Figures relate to the Balanced Fund of A$ 28.4 billion, which represents 77% of Australian Super funds.

113 Macquarie Infrastructure and Real Assets, part of Macquarie Funds Group.

AustralianSuper's unlisted closed-end fund commitments are made to vehicles managed by Macquarie Funds Group. Over the long term AustralianSuper expects to reduce its target allocation to unlisted funds as it plans to increase the number of its direct investments.

Investments with third party fund managers accounted for approximately 30% of QIC's infrastructure portfolio and the remainder 70% was made up of direct investments in infrastructure assets.

MTAA's infrastructure portfolio consists of listed and unlisted funds with direct investments in assets such as the Adelaide and Sydney airports and Southern Water and Thames Water in the UK.

5.5.2 Infrastructure Investment Strategy

Definition of Infrastructure

The infrastructure portfolio is normally diversified across a range of sectors, including:

- transportation (including airports and toll roads)
- utilities (such as water and energy), and
- natural resources (including timber and mining).

Investments within these sectors are further diversified by selecting assets in different geographical locations and by investing at various stages through a particular asset's life cycle.

AustralianSuper makes a distinction between core and value added infrastructure. It currently has 80% of its capital invested in core and 20% in value added infrastructure.

For the Military Superannuation fund infrastructure includes utilities and essential assets that serve the community's developmental and operational needs. Infrastructure assets include power generation and distribution facilities, water and sewer systems, rail, airports, toll roads, bridges and tunnels. Examples of investments made by the funds include the Brisbane airport, US Power funds II, ANZ IS Energy, Saltbush Parking Services.

QIC stated a preference for Brownfield assets, making a distinction between core, core Plus and Opportunistic. In terms of lifecycle breakdown, as of 30 June 2010, 49% was invested in core-plus, 37% in core and 14% was invested in opportunistic infrastructure. The core sectors QIC considers within its definition of infrastructure are:

- Transport (road, rail, airports, seaports)
- Utilities (gas, electric, water)
- Telecommunications (telecom towers)
- Social availability PPP

Returns and Benchmarks

Returns expectations for core and core Plus infrastructure varies in the 10-15% IRRs range. For Greenfield and emerging market investments expected returns are 15% IRR or higher.

Unisuper considers as benchmark for the alternative investments, which include infrastructure, UBSA Government Index (10+) and the Australian Government 10 year bond yield.

Geographic allocation

AustralianSuper's international infrastructure exposure equates to a little more than 50% of its total infrastructure allocation.

In terms of geographic focus, as at 30 June 2010, 41% of QIC capital in the infrastructure portfolio was invested in Europe, 6% in emerging markets 48% in Australia/NZ and 5% in the US.

Sector Allocation

QIC's infrastructure portfolio's industry allocation as at 30 June 2010 was made up of 23% in water, 21% in airports and 10% in ports, 16% in toll roads, 9% in diversified assets, 19% in energy assets and 2% in communications.

Illiquidity

The illiquid nature of the infrastructure asset is perceived as one of the main constraint by investors. Infrastructure along with private equity and real estate is part of the illiquid allocation of the portfolio that is limited and dependent on different asset strategies of the investors (e.g. 10/25% limit for illiquid assets).

The nature of Defined Contribution plans in Australia further underlines illiquidity as a major constraint in considering investment in unlisted infrastructure due to portability and liquidity requirements.

5.5.3 Drivers for investment in infrastructure

Why invest in infrastructure?

Including infrastructure in a well diversified portfolio offers good potential for capital gain and income which is not correlated to listed investments such as shares.

Answers collected indicate that investors have different objectives when investing in infrastructure depending on the type of scheme and their demographic profiles.

If the objective is capital preservation investors would look at Core/Core plus infrastructure (e.g. Defined Benefit Schemes that are closed). What superannuation funds are looking for in this case is stable inflation hedge characteristics that are an appropriate match for their long term liabilities. The focus is on cash returns.

If the objective is capital growth investors would look at Value Added/Opportunistic infrastructure (e.g. Defined Contribution schemes which are still growing and can be more aggressive).

Where does it fit the portfolio allocation?

Unisuper perceives infrastructure and private equity as the main asset class's part of its alternative portfolio.

The Military Superannuation fund includes infrastructure in its alternative investments with private equity, uncorrelated alpha and alternative debt. Alternative investments generally refer to assets that are not traded on public markets.

VFMC invests in infrastructure through its 26% allocation to inflation linked assets. It perceives infrastructure investment as positive as it believes that with property and inflation linked bonds provide a closer match to its underlying liabilities together with inflation protection and portfolio diversification.

Infrastructure debt

Superannuation funds would consider infrastructure debt on an opportunistic basis as mezzanine and subordinated debt, or unwritten not investment grade. They would generally buy debt on the secondary market or even consider primary loans (i.e. making loans directly).

Direct loans and infrastructure bonds would be part of the fixed income allocation, a different allocation in the portfolio of superannuation funds compared to mezzanine and subordinated debt.

5.6 Main barriers to Investment in Infrastructure[114]

Investment Opportunities

The Australian infrastructure market despite being a mature market has provided a limited number of projects as PPPs in recent years. Main reasons are:

- Failure to put in place long term plans for infrastructure
- Lack of transparency about project pipeline and investment opportunities
- High bidding costs involved in the procurement process of infrastructure projects
- Infrastructure investment is perceived as too risky

The Investor Capability

- Problem of scale of pension funds
- Illiquidity constraints due to the DC nature of Australian pension schemes
- An insubstantial consideration and offering by super funds of annuities and other like products, meaning that the apparent advantages of infrastructure as a long term, cash-flow stable asset class are of less value to super funds than might be initially thought
- Insufficient internal expertise in infrastructure
- Concern that trustees focus too much on short term returns and infrastructure returns are more variable in the short term.

[114] See also Super System Review – Final Report, results of consultation process – August 2010.

5.7 Steps taken to date

In recent years Australia's infrastructure sector has been experiencing significant reforms facilitating the harmonisation of policies relating to, nationally significant infrastructure projects.

With the appointment of Australia's first Federal Minister for Infrastructure and the establishment of Infrastructure Australia in 2008, the Australian Government has announced a new, national approach to planning, funding and implementing the nation's future infrastructure needs.

The Building Australia Fund was set up to finance infrastructure projects, endowed with a portion of the pre-crisis budget surpluses. In addition as from 2012/13 the Regional Infrastructure Fund will be funded by the new federal tax on mining industry profits.

In its 2011-2012 federal budget the Australian Government signalled its desire to encourage superannuation fund and private sector investment in infrastructure projects by proposing to remove tax impediments, reduce sovereign risk and increase transparency around the pipeline of proposed projects.

Infrastructure Australia

Infrastructure Australia (IA) was established by the Australian Government in April 2008 to bring all levels of government and the private sector together to streamline the assessment, prioritisation and procurement of infrastructure across the nation.

Infrastructure Australia completed an audit of Australia's transport, water, energy and communications infrastructure in 2008 to determine where the greatest infrastructure challenges lay. From this, it created an initial "Infrastructure Priority List" to guide reform initiatives and investment in nationally important infrastructure.

One of the early priorities for the new organisation was the development of national Public-Private Partnership guidelines for infrastructure projects, in conjunction with the States and Territories. Infrastructure Australia published National Public-Private Partnership Guidelines in November 2008.

In May 2009, Infrastructure Australia published "National Infrastructure Priorities: Infrastructure for an economically, socially, and environmentally sustainable future" identifying the most important infrastructure objectives for the nation in seven sectors: broadband Internet, ports, the rail freight network, urban transport, the energy market, water supply and infrastructure for Indigenous communities (IA, 2008).

In these sectors, nine priority projects and an additional list of 28 other projects, accounting for aggregate investment in excess of A$ 60 billion, were identified (IA, 2009). In the short term, this planning effort led to funding of seven of the nine priority projects selected as part of the 2009/2010 budget thanks to the resources of the Building Australia Fund.

The infrastructure priority list was updated in June 2010 and more recently in June 2011.[115]

[115] See Communicating the Imperative for Action at http://www.infrastructureaustralia.gov.au/2011_coag/files/2011_Report_to_COAG.pdf

Infrastructure Australia has pledged to follow an objective and stringent investment selection process. It is based on a published methodology using cost/benefit analyses.[116]

Infrastructure Australia has recently set up an Infrastructure Financing Working Group to identify new ways of financing infrastructure. The Group includes experts from the public and private sectors and will consider:

- Encouraging superannuation funds to invest in infrastructure by restructuring how projects are put to the market;
- Updating guidelines on public-private partnerships, particularly in the area of demand risk;
- Recycling of Government assets to fund investment in new infrastructure; and
- Finance models such as land value capture.

Building Australia Fund

In December 2008 with the *Nation-building Funds Act 2008,* the Australian Government established the Building Australia Fund. The fund initially had a target allocation of A$ 20 billion to fund critical infrastructure in the transport, communications, water and energy sectors of the economy.

In the 2009-10 budget, the Government committed A$ 8.5 billion to projects for road, rail and port infrastructure, of which A$ 7.6 billion was to be funded through the Building Australia Fund.

The government has created a new A$ 6 billion Regional Infrastructure Fund, partly funded by proceeds from the Minerals Resources Rent Tax (MRRT), to invest in roads, ports and other infrastructure in mining-intensive states and communities, to support the mining sector.

Infrastructure bonds

Infrastructure bonds were introduced in Australia in 1992 through a taxation scheme which was designed to stimulate private investment in infrastructure with a tax exemption of interest derived from qualifying loan facilities.

The programme was modified and extended in 1994 as the Infrastructure borrowing Taxation Concession and replaced in 1997 with the Infrastructure Borrowings Tax Offset Scheme. The latter programme was limited to large scale land transport projects and the largest and last major infrastructure project to take advantage of bond financing in Australia was Transurban Group's Citylink tollway in Melbourne.

These programmes granted a tax benefit to secured private lenders but not the unsecured risk taking equity investors. It followed that the scheme was mainly employed by promoters to develop hybrid tax advantaged debt securities for high net worth individual investors. The scheme was phased out in 2004.[117]

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116 See Better Infrastructure Guidelines at http://www.infrastructureaustralia.gov.au/publications/

117 A Survey of Alternative Financing Mechanisms for Public Private Partnerships – Michael Regan Research report 31 July 2009.

The Liberal Coalition running for government in August 2010 proposed a scheme offering tax rebates equivalent to 10%, to help funnel the superannuation pool of funds into priority economic infrastructure. According to the proposal an initial cap to the scheme of A$ 150 million would have covered about A$ 20 billion of infrastructure finance.[118]

In September 2010, DBNGP Finance Co. Pty Ltd. issued A$ 550 million five-year bonds in the biggest local debt sale by an Australian non-financial company in more than three years. The Dampier to Bunbury Natural Gas Pipeline (DBNGP) feeds domestic and industrial gas consumers in and around Perth and also supports the region bauxite mining and alumina refining industry. Major investors in the bond issue – rated investment grade (Baa3/BBB-) – were superannuation funds.

Box 5.1. **Open Ended Funds**

Queensland Investment Corporation (QIC)

QIC is an open-ended fund owned by the State of Queensland. QIC commenced operations in 1989 and was formally established in 1991. Since then, it has grown to be one of the largest institutional investment managers in Australia, with more than 80 institutional clients and A$ 64 billion in funds under management.

QIC is an active investor in infrastructure assets with a long term horizon of 30/40 years and lower fees compared to other fund managers. The infrastructure team established in 2006 aims to gain exposure to a diverse portfolio of infrastructure investments across lifecycles, sectors and geographies. QIC prefers to invest directly in the Australian infrastructure market and via externally managed funds featuring strong co-investment opportunities for its global investments. QIC's investments to date include an array of infrastructure industries including transport social infrastructure and utilities.

Industry Funds Management (IFM)

IFM is an open ended fund with over A$ 23.4 billion in funds under management worldwide as at 30 June 2010. The fund is wholly owned by 35 major Australian "not for profit" superannuation funds (i.e. member owned pension funds) who are also major clients.

IFM track record dates back to 1990 with the formation of Development Australia Fund, a fund created by Australian superannuation funds to invest in growing Australian private and public companies and infrastructure. In 1995, Industry Fund Services Pty Ltd ("IFS") assumed management of this fund with Development Australia Fund Management Limited as trustee.

IFM specialises in the management of diversified investment portfolios across the infrastructure, private equity, publicly-traded equities, and debt investment sectors.

[118] The Australian 18 August 2010.

5.8 Conclusions

Australian pension funds – superannuation funds – are active investors in infrastructure. The first Australian superannuation funds started investing in infrastructure more than ten years ago and have built up since then a significant allocation to the sector (for some above 10% of their total portfolio).

The average size of Australian investors does not allow them in most cases to have the right resources in place to invest directly in infrastructure. If the superannuation fund is not large enough it would normally invest through closed-ended funds or through open-ended vehicles. Infrastructure is commonly treated as a separate allocation in the overall portfolio.

Australia, along with the United Kingdom, is one of the most mature infrastructure markets and PPPs are adopted as a key form of procurement for the delivery of major infrastructure projects throughout the country. Australia's infrastructure market was launched in the 1990s with a series of large scale infrastructure asset privatisations in the financial services, energy, transport and communication sectors.

The growth of Australia's investment industry has been also a consequence of the introduction in 1992 of the compulsory Superannuation system as part of a major reform package addressing Australia's retirement income policies.

In recent years Australia's infrastructure sector has been experiencing significant reforms facilitating the harmonisation of policies relating to nationally significant infrastructure projects.

With the appointment of Australia's first Federal Minister for Infrastructure and the establishment of Infrastructure Australia in 2008, the Australian Government has announced a new, national approach to planning, funding and implementing the nation's future infrastructure needs.

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6. UNITED STATES

6.1 Country Profile[119]

The United States of America (United States, the U.S.) is a federal constitutional republic comprising fifty states and a federal district and various territories. In the American federalist system, there are three levels of government: federal, state and local; the local government's duties are commonly split between counties and municipal governments.

At 9.83 million km^2 and with over 302 million people, the United States is the third largest country in the world by total area, and the third largest by population. The United States economy is the world's largest national economy, with an estimated 2009 GDP of US$14.2 trillion. Historically infrastructure has played an important role in the development of the U.S. economy and more in general of the American society.[120]

There has been severe underinvestment in US infrastructure over the past decades. The US on a national and regional level has neglected its critical infrastructure. Supply has failed to meet growing demand as exemplified by an aging infrastructure, expanding demand for services with a growing population, and state/local government deficits that have restrained needed expenditures.

The United States is emerging from the recession with a large budget deficit and a rising public debt. Many state and local governments also face a challenging long-run fiscal outlook, limiting the use of the municipal bond market to finance infrastructure projects in the future.[121]

While the US has a long experience in the privatisation of the utility, railroad and telecom sectors, it has lagged behind Australia and Europe in privatisation of infrastructure such as roads, bridges and tunnels. This explains US pension funds limited exposure to infrastructure aside from the energy sector. Recent developments in the infrastructure market and new policy objectives could offer more investment opportunities in the future.[122]

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119 See OECD (2010), OECD Economic Surveys – United States – September 2010.

120 "Historically infrastructure has physically bound the US together, from the times of the earliest settlers, to unifying the 13 colonies into a new nation, to expanding westwards in the 19th century, to healing the nation after the civil war and in putting it back to work after the Great Depression". A brief history of US infrastructure, Euromoney, 1 April 2010.

"…a modern, efficient highway system is essential to meet the needs of our growing population, our expanding economy and our national security" President Eisenhower's State of the Union Address 1955.

121 The federal deficit is estimated to exceed 10% of GDP in both 2009 and 2010 and the federal debt held by the public will reach the highest level since the early 1950s. The Government Accountability Office (2010) estimates that, on unchanged policies, the 50-year fiscal gap facing states and local governments could be as high as 12% of GDP.

122 President Barack Obama: "*We'll put more Americans to work repairing crumbling roads and bridges. We'll make sure this is fully paid for, attract private investment, and pick projects based (on) what's best for the economy, not politicians"*. State of the Union speech on 25th January 2011.

6.2 The Infrastructure Market[123]

There have been two distinct phases of financing infrastructure in the United States. From the colonial times to the Great Depression, the state and federal governments saw the need to build infrastructure but they did not have the money to do so. They adopted a two-tier approach, where some infrastructure was paid for by the government, while at the same time land grants were given to encourage the private sector to invest to build the rest.

With the onset of the Great Depression, the government took over the wholesale development of infrastructure and it became more a social good that not only supported economic development but also provided jobs.

These two different approaches can be seen in the way the railroads of the 19th century were financed by the private sector using federally granted land, whereas the Eisenhower Interstate highway system built in the 1950s and 1960s was created, built and financed entirely by the government.

After WWII, the implementation of a number of federal laws (the Armed Services Procurement Act of 1947, Federal Property and Administrative Services Act of 1949, Brooks Act of 1972) mandated a separation of the designer from the builder of infrastructure projects, thereby instituting design/bid/build as the only delivery system allowed for federal construction projects. Many states soon followed with their own similar restrictions. By default, public financing therefore became the dominant funding strategy for infrastructure projects.

Unlike most countries, in the US public-sector funding for highways has generally come from dedicated fuel and vehicle taxes and tolls were expressly forbidden on federal-funded roads (although allowed on bridges and tunnels). State funding has also come from public bond issues which are usually tax exempt (i.e. interest is not taxable) and are issued either by the state, specific Public Authorities, or publicly-controlled projects.

Tax exempt bonds gave public sector funding of infrastructure a substantial further financing cost advantage over private sector funding, for which tax-exempt bonds generally could not be issued, and was thus a significant factor in the slow development of private capital.[124]

In recent years, the growth in the federal tax revenues – the traditional raising of gasoline taxes to generate revenue for road spending – has not kept pace with the growth in demand for highways. In addition the deteriorating fiscal deficit of many states forced from the early 1990s to explore various methods of private-sector involvement in highway construction [such as the TIFIA, Private Activity Bonds ("PAB")] (see 4.3.7. Steps taken to date).

Need for Infrastructure

The American Society of Civil Engineers (ASCE) released its 2009 Report Card for America's Infrastructure, grading the top infrastructure categories. The summary results are reported below. The grade point average (GPA) for the United States was an overall "D" showing no significant improvements since the last report published in 2005, ASCE estimated that $2.2 trillion needs to be

123 See A brief history of US infrastructure, Euromoney, 1 April 2010 and Public-private partnerships: principles of policy and finance – Yescombe 2007, KPMG (2007) – America's Infrastructure Strategy: Drawing on History to Guide the Future.

124 In 2006 for example US$260 billion or about 70% of all infrastructure finance in the United States was raised via municipal revenue bonds.

invested over five years to bring the nation's infrastructure up to a good condition. Current spending amounts to only half of the needed investment, which means the United States must invest an additional $1.1 trillion over the next five years.

Table 6.1. **2009 Report Card for America's Infrastructure and estimated 5-year Investment Needs**

($ billions)

Category	***Report Card***	***5- year need (bn)***	***5-year investment shortfall***
Aviation	*D*	*87*	*-40.7*
Roads & Bridges	*C &D-*	*930*	*-549.5*
Dams	*D*	*12.5*	*-7.45*
Drinking Water & Wastewater	*D-&D-*	*255*	*-108.6*
Energy	*D+*	*75*	*-29.5*
Hazardous Waste & Solid Waste	*D &C+*	*77*	*-43.4*
Inland Waterways	*D-*	*50*	*-20.5*
Levees	*D-*	*50*	*-1.13*
Public Parks and Recreation	*C-*	*85*	*-48.17*
Rail	*C-*	*63*	*-11.7*
Schools	*D*	*160*	*-35*
Transit	*D*	*265*	*-190.1*
USA Infrastructure G.P.A.	***D***		
Total Need		***$2.2 trillion***	***-$1.2 trillion***

Source: 2009 Report Card for America's Infrastructure.

6.2.1 Development of PPPs

In the United States, development of PPPs has been slow and problematic. In the early 2000s, promising signs of the opening of a US PPP market, were not followed by provision of a steady pipeline of projects owing to a long series of problems.

Many state and local governments looked at PPPs as a way to monetise the market values of toll roads in order to use the proceeds to alleviate public sector budget deficits. A number of brownfield transactions came to market in 2005 and 2006 in states such as Illinois, Virginia and Indiana.[125]

While successfully financed, these projects relied heavily on senior leverage whereby private developers and equity funds competed to maximise the upfront payment to the public sector in return for the right to fully operate the infrastructure for up to 99 years. This procurement approach suffered from various setbacks, including a lack of senior funding, bullish economic valuations by bidding consortia and continuing concerns over the protection of the public interest.[126]

Additionally, various greenfield projects (such as the Trans-Texas Corridor) were put to tender by state agencies but did not succeed in obtaining the necessary political and private support to complete the process which led to many projects being delayed and cancelled.

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125 Examples of private investments in existing public toll roads include the Chicago Skyway toll bridge (2005), the Pocahontas Parkway in Richmond, Virginia (2006), the Indiana Toll Road (2006).

126 Source: P3 Development in the US, Brian Chase, Campbell Lutyens, December 2010.

Although currently 25 states in the US have enacted some kind of PPP programme for the transportation sector, the number of projects effectively coming to the market is still limited. States where some PPP activity has emerged in recent years include Florida and California.[127]

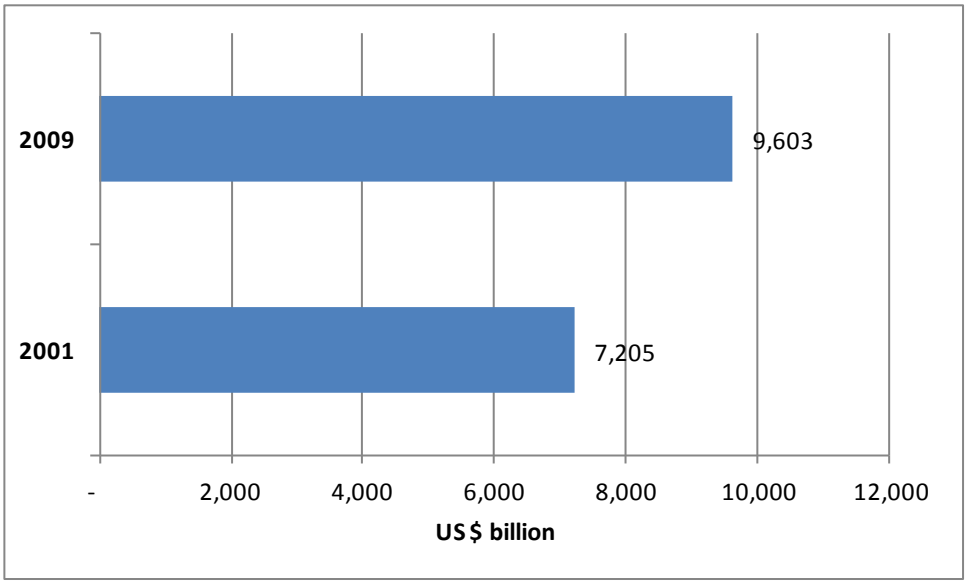
[127] In Florida, the Department of Transportation entered into two separate agreements for constructing a US$2 billion tolled expressway expansion in the south of the state, the I-595 and a $1 billion tunnel for the Port of Miami. The I-595 corridor improvement was the first US PPP structured as an availability-based payment mechanism in the country.

California's first public private partnership, the Presidio Parkway project closed at the end of 2010 overcoming fierce opposition of the unions. This will be the first project financed under legislation approved by state lawmakers in 2009 to push for greater use of PPP financing. California signed an agreement in December 2010 for construction of a $490 million new courthouse in Long Beach. The project was chosen as a PPP pilot project to distill best practices that could be applied to similar projects in the future.

6.3 Pension Market

Over the past decade the assets of American pension funds, have grown to a market value of US$9 603 billion equivalent to 67.8% of GDP in 2009, compared to US$7 205 billion in 2001. Pension funds are approximately evenly split between Defined Benefit and Defined Contribution Schemes.

Figure 6.1. **Evolution of American pension assets 2001-2009**



Source: OECD Database.

6.3.1 Key Developments affecting the infrastructure investment

Demographics Trends

The gradual maturing of United States plans' demographic profiles is having an impact on investment strategies and ultimately infrastructure allocation.

For example, Los Angeles County Employees Retirement Association ("Lacera") is a mature fund, facing a negative cash flow, with 25% of its portfolio exposed to illiquid assets through current allocations and known commitments. Introducing additional illiquid assets to the portfolio is difficult to justify given the fund's ongoing liquidity needs. Therefore any allocation to infrastructure investment would likely come from a corresponding reduction to the real estate or private equity programmes.

Underfunding

The state of underfunding of many pension funds in the United States is critical. Seeking higher returns, to try to compensate, many funds shifted their investment strategies towards riskier strategies.

As pension funds come out from the recent financial and economic crisis, they face the dilemma of choosing more conservative investment strategies, leading consequently to lower returns and leaving the underfunding problem unresolved or pursue aggressively the higher rate of returns they need, increasing the chances to face further losses.

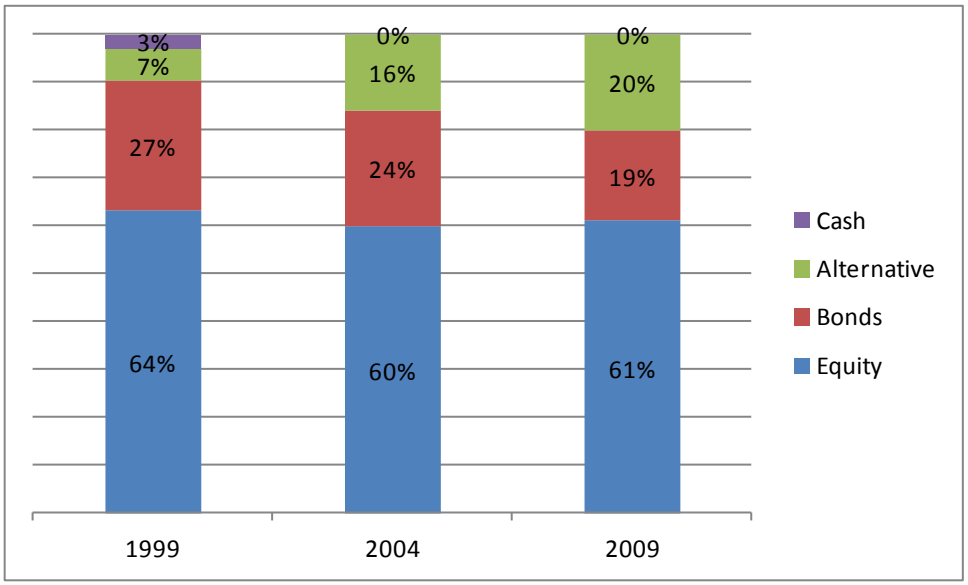
Diversification

American pension funds' exposure to alternative assets continues to grow, extending a long-established trend and reflecting pension fund's growing appetite for diversification.

For example, in 2008, Teacher Retirement System of Texas ("TRS") began a transition to a more diversified investment strategy. The transition is on target despite one of the most volatile markets in history.

The asset allocation strategy adopted by State Universities Retirement System of Illinois ("SURS"), following an asset/liability study conducted in 2008, is designed to manage portfolio risk by transitioning a segment of the portfolio from public market securities into private market or alternative investments strategies.

Figure 6.2. **American Pension Asset Allocation Aggregate end 1999 versus end 2004 versus end 2009**



Source: Towers Watson 2010 Global Pension Asset Study.

6.4 Infrastructure Investment of US pension funds

US pension funds have been investing little in infrastructure in the past acquiring an exposure mainly to the energy sector, through a few infrastructure funds active in the country. Recent developments in the infrastructure market have increased investors attention to this asset class.

US investors take different approaches towards investment in infrastructure as demonstrated by Florida State Board of Administration that in June 2010 revised its investment strategy to allow infrastructure investment or CalSTRS currently in the process of setting up a dedicated team and on the other hand by Lacera's decision in March 2010 not to pursuit a separate allocation to infrastructure.

The majority of the investments in infrastructure are made on an opportunistic basis through the private equity or real estate allocation. However there seems to be a trend in placing infrastructure as a separate allocation as programmes mature. Infrastructure is still perceived riskier by some investors than real estate and private equity. The infrastructure asset is often included in an inflation-linked allocation group.

Despite recent direct investment of a few public pension funds, the large majority of US pension funds invest in infrastructure through funds.

Pension funds' infrastructure portfolio allocation is biased towards the US market. For example, for TRS portfolio, allocation is approximately: 75% US, 20% other OECD, 5% Emerging Markets.

In December 2009 Dallas Police & Fire Pension System bought 10% of the US$427 million equity portion of the US$2 billion North Tarrant Expressway project in Texas, becoming the first United States pension fund to invest directly in the construction and maintenance of a major infrastructure project.

CalPERS has announced in June 2010 its intention to buy a US$157 million stake or 12.7%, in Gatwick airport the UK's second largest airport.

6.5 A closer look at a few selected investors

Findings of this section draw in part on interviews with industry professionals, in part on information obtained from a literature review, selected pension fund annual reports and an analysis of the available data sources. Interviews were conducted with representatives of selected investors in infrastructure, consultants and infrastructure funds.

6.5.1 Appetite for Infrastructure

California Public Employees' Retirement System ("CalPERS")

CalPERS is the largest public pension fund in the US with a market value of US$239.1 billion at April 2011. At the same date, CalPERS infrastructure portfolio consisted of more than four funds with US$700m in commitments representing 0.4% of the total asset mix.

CalPERS has been investing opportunistically in infrastructure in the past acquiring an exposure mainly to the energy sector. In August 2008 CalPERS announced its infrastructure investment policy and appointed an Investment Officer responsible for infrastructure. In December 2010 as part of change of the overall fund's asset allocation it was decided to increase the infrastructure target allocation from 1 to 3% of the total portfolio.

California State Teachers' Retirement System ("CalSTRS")

CalSTRS is the largest teacher pension fund in the US with a market value of US$154.6 .5 billion at March 2011.

CalSTRS target allocation for the infrastructure asset class is 2.5% (approx. US$3.5bn) of the total portfolio. The allocation decided in 2008 will be implemented over a 5/6 years investment horizon.

CalSTRS has been first researching the infrastructure class in 2006 through its real estate asset class. In July 2008 the CalSTRS Investment Committee approved a 5% allocation to a new asset class, the Absolute Return asset class of which 2.5% to be dedicated to infrastructure. In February 2010 a Portfolio Manager for infrastructure was appointed to set up the investment team and the target allocation.

State Universities Retirement System of Illinois ("SURS")

SURS is a mature public pension fund with net asset value of US$13.2 billion as of May 2010.

In 2008, SURS decided to establish 1% target allocations for both infrastructure and commodities in order to initiate its programme and assess the performance of the asset class.

In the past the fund gained limited exposure to energy infrastructure through a commitment to an infrastructure fund, made in 2004. The investment was made through the allocation to private equity and provides access to a portfolio of North American and European infrastructure assets in the energy sector.

In October 2009 SURS made its first infrastructure investments, committing US$80 million to two managers as it builds up its 1% allocation to the asset class. As of 31 August 2010, US$28 million has been funded to the infrastructure managers.

Los Angeles County Employees Retirement Association ("Lacera")

Lacera is a mature pension fund with a market value of US$35 billion as of March 2010.

As of March 2010, Lacera had indirect exposure to infrastructure assets via publicly traded securities that include approximately US$169 million of equity and US$57 million of fixed income. The fund also has a US$119 million exposure to infrastructure via project investments made by private equity general partners. These investments are concentrated in energy, transportation and utility companies.

Lacera has been investing in infrastructure on an opportunistic basis. In March 2010, Lacera undertook an analysis of the infrastructure market to decide the merit of a separate portfolio allocation to the sector. Lacera concluded that the state of the marketplace for infrastructure investments was not yet adequately developed to merit a separate allocation.

Teacher Retirement System of Texas ("TRS")

Net assets of TRS pension fund were US$1.2 billion at 31 August 2010. As of June 2010, TRS had committed US$1.2 billion in infrastructure mainly via three unlisted infrastructure funds. To date TRS has only ever utilised an opportunistic investment strategy for its infrastructure investments.

In 2008 TRS announced plans to create a dedicated asset class for infrastructure targeting a 3% allocation of the total portfolio. However it decided in the end to invest in infrastructure funds through its 5% "other real asset" allocation. TRS does not have an official allocation to other real assets anymore; infrastructure is now part of the "real assets" allocation of 15%.

Organisation Model/Investment Style

The large majority of US pension investors invest in infrastructure through funds. CalPERS and Dallas Police & Fire Pension System are the only two funds who recently tried the direct investment route.

CalPERS has announced its intention to start investing directly in infrastructure. The decision is based on the willingness to exercise greater control over the investments and higher margins. The public pension fund is planning on making US$400m of direct investment in infrastructure and has hired two portfolio managers bringing the infrastructure investment staff to five people.

CalSTRS will consider any type of investment structure and has stated that direct investment will likely be implemented at some point in the future.

6.5.2 Infrastructure Investment Strategy

Definition of Infrastructure

CalPERS consider investments in infrastructure in transportation, energy, natural resources, utilities, water, communications and certain social infrastructure projects. CalPERS' infrastructure portfolio is divided in four segments: Core, Value Added, Opportunistic and Public.

CalSTRS' current infrastructure portfolio is divided in three segments: Core, Value Added and Public. Over the long term it will be further divided in Core/Mature, Value Added/Hybrids, Opportunistic/Greenfield and Public.

CalSTRS does not take into consideration investments in prisons, schools, airports and other large public employment based infrastructure.

Geographic Allocation

Pension funds' infrastructure portfolio allocation is generally biased towards the United States market.

For TRS there are no specific restrictions. TRS current allocation is approximately 75% United States, 20% other OECD countries, 5% emerging markets.

CalSTRS has a global infrastructure mandate but its geographic focus is on core/mature market in North America and Europe.

Leverage

Coming out of the recent financial and economic crisis there is a particular attention to the level of leverage of infrastructure projects. Several investors consider in general a 60% gearing as appropriate. CalPERS and CalSTRS have specific restrictions in relation to leverage.

For CalPERS the average leverage for the portfolio should not exceed 65%. Individual investments may exceed the average leverage guideline depending upon the rating of the debt, debt service coverage and the general characteristics of the investments. The infrastructure allocation can carry an average debt rating of BB+ by Standard & Poor's and Ba1 by Moody's or better. Where debt ratings are not available for individual investments, the amount of leverage has to approximate the average rating of the infrastructure portfolio.

For CalSTRS leverage at the aggregate infrastructure portfolio level is monitored with a long term goal of maintaining it a no higher than 60% (measured quarterly comparing the principal amount of debt secured by infrastructure investments in the portfolio to the aggregate gross fair market value of the portfolio). Individual strategies and/or relationships in the Core portfolio may have leverage up to 65% provided the aggregate does not exceed the 60% limit.

Tax consideration

Pension funds being tax exempt entities, benefit from investing in the United States. Other jurisdiction could be not considered due to the tax burden.

6.5.3 Drivers for investment in infrastructure

Why invest in infrastructure?

Broadly speaking, investment in infrastructure improves the diversification of the portfolio and reduces its volatility, gaining exposure to investments that offer long-lived, predictable income and provide some inflation protection.

Among CalPERS and CalSTRS strategic objectives of their infrastructure allocation:

- preserve investment capital;
- attractive risk-adjusted returns (cash flows plus capital appreciation);

- hedge against inflation;
- hedge against long term liabilities;
- diversify portfolio investments.
- Where does it fit in the portfolio allocation?

At portfolio level the infrastructure asset is included either in an inflation-linked allocation or in the private equity/real estate allocation.

CalPERS' infrastructure allocation is part of the Real Assets category.[128] It used to be part of Inflation-Linked Asset Class ("ILAC") which was created in 2007 following Pension Consulting Alliance advice. Before 2007 infrastructure was part of the Alternative Investment Management Program ("AIM") and real estate portfolio.

SURS' infrastructure allocation is part of the Opportunity Fund Asset class, the asset class created to provide new investment opportunities to the pension fund. Strategic policy allocation of the Opportunity fund is 3%, to be allocated to infrastructure, commodities and the Public Private Investment Program. The Opportunity fund cannot exceed 5% of total SURS' total portfolio.

Infrastructure is part of TRS' Real Asset class, the asset class created in 2007 to achieve a greater degree of diversification in its overall portfolio through exposure to real assets, with low or negative correlation to public equity and fixed income. The Real Asset portfolio focus on private or public real estate equity, private or public real estate debt, infrastructure, timber, agricultural real estate, oil and gas, real asset mezzanine debt or equity, mortgage-related investments, entity-level investments, real estate investment trusts ("REITs"), master limited partnerships ("MLPs"), non-fixed assets and other opportunistic investments in real assets.

[128] In December 2010 CalPERS board approved a new a portfolio allocation framework based on five new categories: liquidity, growth, income, real assets and inflation linked assets. The real assets class will combine – starting 1 July 2011 – real estate, infrastructure and forestland for returns that are less sensitive to inflation risk.

6.6 Main barriers to Investment in Infrastructure

The Investment Opportunities

The United States infrastructure market is immature and has not provided many opportunities to investors. Lack of deals is mainly due to:

- Historical negative public perception of private investment in (certain) infrastructure sectors
- Presence of and competition from an efficient municipal bond market to fund infrastructure
- Absence of a competitive national construction industry
- Opposition of labour unions to privatisation of infrastructure[129]
- Failure to put in place long term plans for infrastructure
- Fragmentation of the market among different states
- Lack of transparency about project pipeline and investment opportunities
- Infrastructure investment is perceived as too risky

The Conditions for Investment

- Infrastructure characteristics do not properly fit any other class, difficult for investors to decide where the infrastructure allocation fits in the overall portfolio
- Shortage of data on performance of infrastructure projects, lack of benchmark
- Mis-alignment of interest between investors and infrastructure funds

The Investor Capability

- Lack of resources and expertise in the sector
  - At the level of trustees and consultants
  - At management level

[129] The unions however are showing signs of changing their attitude.

In November 2009, Carlyle closed a US$178 million deal to buy and then develop 23 highway service stations in Connecticut in a transaction in which it co-invested with the Service Employees International Union (SEIU).

ULLICO (which is the holding company for the Union Labor Life Insurance Company and also serves as the investor for many union pension funds), is currently raising a fund to invest in infrastructure in the United States.

6.7 Steps taken to date

Obama's Infrastructure Plan

In September 2010 President Obama revealed plans for a USD 50 billion public works programme focusing mainly on road, rail and airport infrastructure.

The plan would reform the way America currently invests in transportation, changing the focus to enhancing competition, innovation, performance, and real analysis that gets taxpayers the best value, while moving away from the earmarks and formula debates of the past.

As part of the plan the following objectives were mentioned:

- in order to create incentive for new investments in American innovation, 80 per cent of America's electricity to come from clean sources by 2035, including wind, solar, nuclear, clean coal and natural gas;

- a national rail network so that, within 25 years, 80 per cent of Americans have convenient access to the high-speed rail system;

- a National Wireless Initiative to help business extend the next generation of wireless coverage to 98 per cent of the population.

The plan should also include the creation of an infrastructure bank that will help infrastructure finance, leveraging government resources through attracting private capital to build projects of national and regional significance.

Box 6.1. **The Transportation Infrastructure Finance and Innovation Act (TIFIA)**

The program's fundamental goal is to leverage Federal funds by attracting substantial private and other non-Federal co-investment in critical improvements to the nation's surface transportation system.

TIFIA was created because state and local governments that sought to finance large-scale transportation projects with tolls and other forms of user-backed revenue often had difficulty obtaining financing at reasonable rates due to the uncertainties associated with these revenue streams, particularly during the initial "ramp-up" years after construction of a new facility.

TIFIA credit assistance is often available on more advantageous terms than in the financial market making it possible to obtain financing for needed projects when it might not otherwise be possible. TIFIA credit support has become an increasingly important component of US PPP financing strategies, partly in response to credit market conditions.

The TIFIA credit program offers three distinct types of financial assistance designed to address the varying requirements of projects throughout their life cycles:

- Secured (direct) loan – Offers flexible repayment terms and provides combined construction and permanent financing of capital costs. Maximum term of 35 years from substantial completion. Repayments can start up to five years after substantial completion to allow time for facility construction and ramp-up.

- Loan guarantee – Provides full-faith-and-credit guarantees by the Federal Government and guarantees a borrower's repayments to non-Federal lender. Loan repayments to lender must commence no later than five years after substantial completion of project.

- Standby line of credit – Represents a secondary source of funding in the form of a contingent Federal loan to supplement project revenues, if needed, during the first 10 years of project operations, available up to 10 years after substantial completion of project.

TIFIA credit assistance is limited to a maximum of 33 per cent of the total eligible project costs. Senior debt must be rated investment grade. The project also must be supported in whole or in part from user charges or other non-Federal dedicated funding sources and be included in the state's transportation plan.

US$122 mn has been authorised for each fiscal year from 2005 through 2009. This level of funding can support more than US$2 bn of average annual credit assistance.

Examples of TIFIA assistance include the I-595 corridor roadway improvement in Florida (TIFIA loan of US$603 mn), the Port of Miami Tunnel (TIFIA loan of US$341 mn), the Washington Metro Capital Improvement Program (TIFIA loan guarantee of US$600 mn), the Warwick Intermodal Station (TIFIA loan of US$42 mn), and the Central Texas Turnpike (TIFIA loan of US$900 mn).

Build America Bonds (BABs)

In 2009 the Obama administration introduced the Build America Bonds (BABs) programme as part of the US$787 billion American Reinvestment and Recovery Act. Through BABs municipalities could issue taxable debt and have the option of receiving a 35% rebate on their interest cost from the US Treasury.

Since the programme began in April 2009 more than USD 165 billion of BABs were issued by local government or municipalities with institutional investors buying more than a quarter of the debt.

The BABs programme ended on 31st of December 2010. There are talks of a return of the bond programme in 2011 however with a lower tax rebate.[130]

BABs represent a significant shift in the way municipal debt is structured. Historically, interest earned on municipal bonds issued for most governmental purposes has been exempt from federal income taxation. This implicit subsidy limited the investor base mainly to retail and individual parties (they hold an estimated two thirds of the USD 2.8 trillion US muni market investors through mutual funds or individual accounts)

Many institutional investors such as pensions who are tax exempted, were natural buyers of BABs, which provided a perfect match of long term demand and supply and an introduction to infrastructure exposure via debt linked to capital project like schools, road expansion and bridge construction.

Private activity bonds (PABs)

In 2005, legislation was amended to add highway and freight transfer facilities to the types of privately developed and operated projects for which private activity bonds may be issued. This change allowed private activity on these types of projects, while maintaining the tax-exempt status of the bonds.

Passage of the private activity bond legislation reflects the Federal Government's desire to increase private sector investment in US transportation infrastructure. Providing private developers and operators with access to tax-exempt interest rates lowers the cost of capital significantly, enhancing investment prospects.[131]

Tax-exemption does come at a cost to the federal government. For example, the US Department of the Treasury estimated a revenue loss of USD 7.2 billion for the fiscal year 2007 (Belmonte 2006).

In 2006, Texas became the first state to receive federal approval to raise around US$1.8 billion in private-activity bonds for the development of State Highway 121.

As of August 2010, PAB allocations approved by DOT total nearly US$5 billion for eight projects. More than US$2.0 billion of PABs have been issued at the same date. The law limits the total amount of such bonds to $15 billion and directs the Secretary of Transportation to allocate this amount among qualified facilities.

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130 Republican Congressman John Mica chair of the House Transportation Committee said: "I can almost guarantee that a bond program will be one of a number of options considered in legislation to finance America's infrastructure projects. However BABs terms were considered too generous and any future bond program would need to be a new iteration or reformed version". Source Wall Street Journal, 30 December 2010.

131 For example, the US Department of Transport estimated that tax-exempt PABs can reduce interest rates by as much as two percentage points below rates on comparable taxable bonds. On a US$100 million bond, this differential would amount to a debt service cost savings of US$2 million per year (USDOT 2004).

6.8 Conclusions

United States pension funds have been investing little in infrastructure in the past acquiring an exposure mainly to the energy sector, through a few infrastructure funds active in the country. Recent developments in the infrastructure market have increased investors' attention to this asset class however investors are taking different approaches towards investment in infrastructure.

The majority of the investments in infrastructure are made on an opportunistic basis through the private equity or real estate allocation. There seems to be a trend in placing infrastructure as a separate allocation as programmes mature. Infrastructure is still perceived to be riskier by some investors than real estate and private equity. The infrastructure asset is often included in an inflation-linked allocation group. Despite recent direct investment of a few public pension funds, the large majority of US pension investors invest in infrastructure through funds.

The US infrastructure market is immature and has not provided many opportunities to investors. The development of PPPs, has been slow and problematic. While the United States has successfully privatised the utility and telecoms sectors, it has lagged behind Australia and Europe in privatisation of infrastructure such as roads, bridges and tunnels. There is little direct private investment in the nation's highway and transit systems due to the current method of financing infrastructure mainly based on municipal bond markets, which lacks effective mechanisms to attract and repay direct private investment in specific infrastructure projects.

However some recent signs in the infrastructure market and more importantly the burden of the fiscal deficit at municipal level are likely to drive policy actions towards adoption of PPPs. Given the huge infrastructure needs, involvement of investors such as pension funds would be greatly needed.

Establishing a United States national infrastructure bank could lend support to PPP structures by drawing more private equity and debt capital into infrastructure development, as well as helping to establish voluntary, uniform, frameworks across states for PPP structures. A federal infrastructure bank could help establish procurements protocols and standards facilitating the bidding process.

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7. EUROPEAN UNION

7.1 Country Profile[132]

The European Union (EU) is an economic and political union of 27 member states. The EU was established by the Treaty of Maastricht in 1993 upon the foundations of the European Communities.

With over 500 million citizens, the EU generated a GDP of US$15.2 trillion in 2008 5 (around one quarter of the world GDP). Transport infrastructure is fundamental for the mobility of the persons and goods and for the territorial cohesion of the European Union. The transport industry is also an essential component of the European economy accounting for about 7% of GDP and for over 5% of total employment in the EU.[133]

The quality and density of infrastructure varies considerably across the EU with significant investment needs for new infrastructure in some areas and for maintenance and upgrades of existing infrastructure in others. Over the next decade, unprecedented investment volumes in Europe's transport, energy, information and communication networks will be needed in order to achieve the Europe 2020 Strategy and to foster the completion of the internal market.

However, the recent financial and economic crisis has placed renewed pressure on public finances forcing many EU member states to go through severe measures of fiscal consolidation. At the same time the crisis made it more difficult to secure long term private investment in capital intensive projects. Looking ahead, it will be essential to mobilise additional sources of private finance, if the EU's infrastructure needs are to be met.[134]

Europe is considered a mature market for infrastructure and PPPs. However, the experience varies greatly between sectors and from one country to another. Despite the maturity of the infrastructure market, European pension funds have recently started building up their allocation to equity infrastructure, treating it as a separate allocation, only in the last five years.

7.2 The Infrastructure Market

Private investment in infrastructure has been used in the past in many European countries. Concession contracts can be traced back to the ancient Greeks, and were widely used by the Romans. They were given a modern form under the Napoleonic code, allowing most 18th and 19th century

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132 See OECD (2009) – OECD Economic Surveys: European Union.

133 A Sustainable Future for Transport 2009 – Directorate General for Energy and Transport, European Commission.

134 President of the European Commission, José Manuel Barroso: "… we should also *explore new sources of financing for major European infrastructure projects. For instance, I will propose the establishment of EU project bonds, together with the European Investment Bank. We will also further develop Public Private Partnerships*". State of the Union speech to the European Parliament on 7 September 2010.

As a concrete measure of Barroso's words, the Project Bond initiative was announced, to provide EU support to project companies issuing bonds to finance large-scale infrastructure projects. The aim is to access new pools of capital such as institutional investors.

infrastructure (canals, railways, water systems etc.) to be built using private capital, frequently with implicit or explicit subsidies or other forms of government support.

Many infrastructure projects were subsequently taken into public ownership. In the second half of the 20th century, infrastructure finance entered a new phase with privatisation, new regulation models and Public-Private Partnerships (PPPs).

In recent years, infrastructure investment has been largely influenced by countries joining the European Union. Infrastructure investment is on average lower in old member states (OMS) than in new member states (NMS) where the public sector makes a significantly higher contribution. Transport is the single largest infrastructure sector by investment. It accounts for more than half of total infrastructure in Europe.[135]

Trans-European networks

Most of the European transport infrastructure has been developed under national policy premises. In order to establish a single, multimodal network that integrates land, sea and air transport networks throughout the Community, the European policymakers decided to establish the Trans-European transport network, allowing goods and people to circulate quickly and easily between Member States and assuring international connections.

Transport infrastructure, including road, rail, sea ports and airports is in general well developed and of a high quality in countries which first joined the EU and Scandinavia, and has expanded considerably in countries such as Spain, Portugal and Greece thanks to EU Structural funds. There are substantial EU funds put aside for transport infrastructure investment in the new member states of central and eastern Europe, but infrastructure, especially rail infrastructure, in these countries is likely to remain less developed than in Western Europe for a considerable time to come.

Infrastructure needs

Preliminary estimates point to investment needs of between €1.5 trillion and €2 trillion. From now until 2020, €500 billion is estimated to be needed for the implementation of the Trans- European Transport Network (TEN-T) programme. In the energy sector, public and private entities in the Member States will need to spend around €400 billion on distribution networks and smart grids, another €200 billion on transmission networks and storage as well as €500 billion to upgrade and build new generation capacity between now and 2020. Last, but not least, between €38-58 billion and €181-268 billion capital investment are required to achieve the Commission's broadband targets.

7.2.1 Development of PPPs

Europe is considered a mature market for PPPs.[136] However, the experience varies greatly between sectors and from one country to another.

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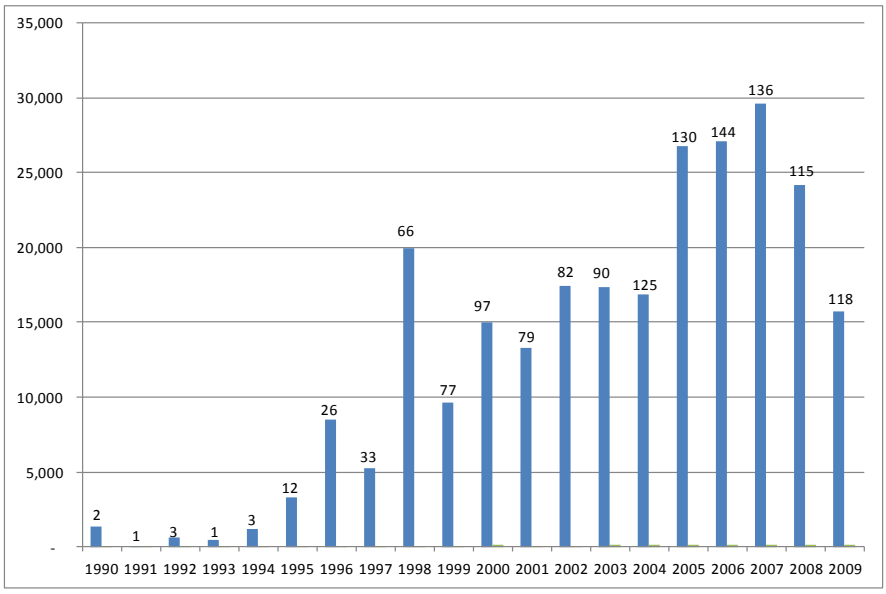
135 Over the period 2006-2009 in the OMS the public sector accounts on average for about one third of infrastructure finance. In the NMS slightly more than half of all infrastructure investment is financed by the public sector. Source Infrastructure finance in Europe: composition, evolution and crisis impact EIB Papers Volume 5 n1 2010.

136 According to the EIB between 1990 and 2009 more than 1 300 PPP contracts were signed in the EU, representing a capital value of more than US$343 billion (€250 billion). This includes roughly 350 new projects with a value of almost €70 billion having reached financial close since the beginning of

Many EU member states only have a limited experience of PPPs or none at all. PPPs have developed in the transport sector (road, rail),[137] in the area of public buildings and equipment (schools, hospitals, prisons)[138] and the environment (water/waste treatment, waste management).[139]

During the period 1990-2009, the UK accounted for more than half the value of all European PPP projects. Spain and Portugal, with respectively 11.4% and 7% of the total value of projects, have become more important in recent years.[140] France, Germany and Greece together represent about 15% of the value of PPPs in Europe.

Figure 7.1. **Evolution of European PPPs per annum – Value of Projects in Euro million**



Source: EIB.

2007. In terms of overall management of public services or the construction and operation of public infrastructure at global EU level, PPPs represent a small part of total public investment.

137 Greece, Ireland, Netherlands, Spain, the United Kingdom: Guidebook on Promoting Good Governance in Public-Private Partnerships, UNECE 2007, p. 20.

138 France, United Kingdom idem.

139 The prevailing model for private sector involvement in the environmental sector has been that of public service concessions.

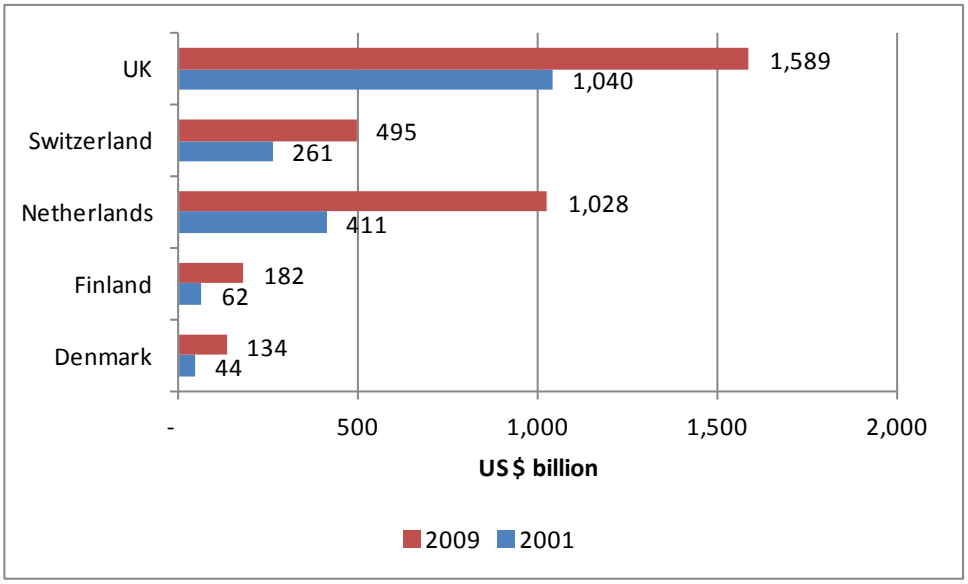
140 This reflects mainly the completion of some large road projects such as in Portugal the Douro Litoral Toll Road or the Transmontana Highway.

7.3 Pension Market

In Europe countries such as UK, the Netherlands, Sweden, Denmark and Finland have a well developed pension market. Over the past decade pension assets in these countries have grown considerably, in line with a general trend observed in the United States, Canada and Australia. Pension assets in the United Kingdom for example have grown to a market value of US$1 589 billion equivalent to 73% of GDP in 2009. Netherlands' pension assets in 2009 were US$1 028 billion representing 130% of GDP.

Other European countries have a short history of private pensions resulting in a less developed pension market or are relying on insurances for retirement services. In addition, the state-run public pension tier in countries like Greece, Italy, Spain and Turkey still plays a major role in the old-age retirement system, limiting the growth of and need for private pensions.

Figure 7.2. **Evolution of European pension assets for selected countries 2001-2009**[141]



Source: OECD Database.

7.3.1 Key developments affecting infrastructure investment

Demographic profile

The gradual maturing of European plans' demographic profiles is having an impact on investment strategies and ultimately infrastructure allocation.

University Superannuation Scheme ("USS") however, contrary to many pension funds in Europe, is a relative immature scheme due to its ongoing flow of new entrants ensuring strong positive cash flow. As the scheme does not need to realise investments to meet liabilities it can tolerate some short term volatility of returns. This is reflected in USS exposure to equity investment that at December 2009 represented 68% to the total portfolio.

[141] Switzerland is not a EU member, but is included in the analysis given the significance of its pension fund market.

Diversification

European pension funds' exposure to alternative assets in countries such as the Netherlands and Switzerland continues to grow, extending a long-established trend and reflecting pension fund's growing appetite for diversification.

For example, Dutch fund manager APG started looking at infrastructure in 2004 to diversify the portfolio and protect its clients against inflation risk. APG's new strategy shifted its overall portfolio away from fixed income investments towards equities and alternative investments, transitioning its portfolio from public to private markets.

USS is building up its alternative allocation (current target 20%), with a corresponding reduction in the allocation to quoted equities. Infrastructure is part of USS allocation to alternative assets.

The Danish pension fund ATPs investment approach is different. ATP invests based on a risk budget and has five investment classes: Rates, Equity, Credit, Inflation and Commodity. ATP therefore focuses on the characteristic of the individual asset it invests in, in order to ensure that its risk allocation is allocated correctly to the five classes.

Figure 7.3. **European pension Assets Allocation for selected countries**
Aggregate end 1999 versus end 2004 versus end 2009

Source: Towers Watson 2010 Global Pension Asset Study.

Solvency regulation

Solvency regulation in Denmark forces pension funds to be fully funded at any moment. ATP current funding is 118%. If it gets above 120% there is an increase in pension payments.

This has an implication on the diversification strategy which needs to cover the fund in any type of "weather". What is important is not the type of asset but the characteristics of the asset.

Varma is subject to Finnish solvency regulation (different from the Swedish and Danish) which drives its investment strategy. For example the fact of having a surplus over the required capital, allows Varma to invest in more illiquid/high returns assets.

Dutch pension funds cover ratio should be 105%. Funds have had problems complying with this at certain periods, notably when the impact of the financial crisis was most felt.

Responsible Investment

For the infrastructure mandate issued by Dutch pension fund PFZW, asset manager PGGM hired three ethical advisers to consult on its investment portfolio, on climate change, human rights and the arms industry.

ATP's Environmental Social and Governance ("ESG") team is an independent but integrated team of ATP Investments. It is actively involved in infrastructure asset review and investment decisions. The team refers to a committee with the CEO as chairman.

7.4 Infrastructure Investment of European Pension Funds

Despite the maturity of the infrastructure market, especially in countries such as the UK, France, Spain, European investors have recently started building up their allocation to infrastructure, treating it as a separate allocation, only in the last five years.

European investors such as APG, PGGM, USS, Varma and ATP are among the largest investors in infrastructure. Equity allocations to the asset are still limited (e.g. 1 to 3% of total portfolio) even if targets have been slowly increasing in recent years.

In Europe pension funds utilise the indirect market route to benefit from the experience and expertise offered by infrastructure fund managers. Only APG and PGGM, as asset managers, have the right resources in place to invest directly in infrastructure although ATP and USS both occasionally invest directly or co-invest.

Investors' exposure to infrastructure projects is predominantly located in Europe and North America. Some investors have a global mandate, while others are more focused on the European market.

APG in March 2007 opened an office in Hong Kong in order to expand its Asian infrastructure and real estate portfolios in the emerging markets of South Korea, China and the south-east Asian region. To increase the geographic diversity within the portfolio PGGM has invested in an India specific infrastructure fund and is monitoring opportunities in China.

7.5 A closer look at a few selected investors

Findings of this section draw in part on interviews with industry professionals, in part on information obtained from a literature review, selected pension fund annual reports and an analysis of the available data sources. Interviews were conducted with representatives of selected investors in infrastructure, consultants and infrastructure funds.

7.5.1 Appetite for infrastructure

PGGM

PGGM administers some €100 billion of pension assets for five Dutch pension funds, including Stichting Pensioenfonds Zorg en Welzijn ("PFZW"), the second largest pension fund in the Netherlands.

Three of the five clients have decided to invest in infrastructure and more are expected to take the infrastructure investment decision in the future. These investments are channelled through the PGGM Infrastructure Fund 2010-2011 (€1.25bn in commitments).

As of February 2011, PFZW's investment in infrastructure was 1.5% of total Assets under Management (€99 billion) with a future target allocation of 3.5%.

The new funds that recently decided to invest in infrastructure have a target up to 5%.

The first investment in infrastructure was made in 2005. Focus in the early years was on fund investments up to €100 million in size, with a few co-investments. In 2009 a change in strategy has been implemented, focussing more on direct investments.

APG

As of December 2010, APG Group managed assets totalling some €272 billion, including those of the pension fund ABP (€237 billion at December 2010) the Dutch civil service pension fund, the largest pension fund in the Netherlands.

APG has been investing in the infrastructure sector since 2004. Initial investment was through an infrastructure fund as part of the real estate allocation. In 2006 APG started to classify infrastructure as a distinct asset class separate from private equity and real estate.

In 2008, the target allocation to infrastructure within APG has been increased from 1 to 2% and in 2009 a further increase in allocation has taken place.

As of December 2010 APG has invested nearly €3 billion in infrastructure.

Arbejdmarkedets Tillaegs Pension ("ATP")

ATP is Denmark's largest pension fund with total assets of more than DKK 399 billion in December 2010. ATP's infrastructure portfolio – still under construction – equated to 2.3% of the total portfolio with just below 3% committed. ATP does not have a target for its infrastructure investments but has an overall target of 25-30% of its risk budget targeted to the inflation class of assets.

ATP has been actively investing in infrastructure since the end of 2005. The pension fund currently has a separate allocation to infrastructure.

University Superannuation Scheme ("USS")

USS is the second largest pension fund in the UK with assets at 31 March 2010 of over GBP 30 billion. It was established in 1974 to administer the principal pension scheme for academic and senior administrative staff in UK universities and other higher education and research institutions.

The pension fund is an opportunistic investor in the infrastructure asset class via its private capital allocation. USS started investing in infrastructure in 2005. USS had GBP 797 million invested in infrastructure at March 2010, an increase compared to the 2009 allocation of GBP 600 million. Target allocation to infrastructure is between 4 and 5% of the total portfolio.

Varma Mutual Pension Insurance Company ("Varma")

Varma, with EUR 33.2 billion (December 2010) in investment assets, is the largest private investor in Finland.

As of June 2010 Varma's investments in infrastructure funds were below 1% of total assets. There is no target infrastructure allocation and investment is made on an opportunistic basis.

Varma has been investing in infrastructure investments since 1996, but only began investing in infrastructure funds in 2004. Varma's investments decisions have always been made internally without the use of an infrastructure advisor.

Organisation model/Investment Style

ATP in 2006 entered the infrastructure fund market through investment in a fund and has a dedicated team that invests in infrastructure. ATP has a limited amount of funds and through these try to increase its exposure to individual assets with the right risk/reward and inflation linkage. In this way ATP both co-invest with and through the funds.

Varma's route to market has always been through commitments to unlisted funds, and it has no plans to invest in listed infrastructure funds, fund of funds structures or direct investments outside Finland.

USS invests through unlisted infrastructure funds but is considering co-investments and direct investment in infrastructure.

APG initially made its allocation in the asset class via unlisted infrastructure funds, and in 2006 started investing directly. In the future it will look to make more direct investments in infrastructure projects. The current team of ten people is set to increase with direct involvement of APG in infrastructure.

PGGM preference is for direct investment, with investment through funds for niche sectors such as renewable or emerging countries. It will not invest through infrastructure fund of funds, infrastructure debt funds or listed infrastructure vehicles. Currently nine persons are dedicated to infrastructure and the team is forecast to reach 15/16 people in the future.

7.5.2 Infrastructure Investment Strategy

Definition of Infrastructure

Pension funds own infrastructure in order to obtain the characteristics these investments offer. Controlling the assets is important to ensure these characteristics. Investors want to invest in infrastructure assets that already generate cash flow, hence the preference for Brownfield stage infrastructure projects that feature lower economic risk.

There is limited exposure to social infrastructure and PFI projects, the main reason being the low returns that these kinds of assets can offer. Unlevered, these assets present much less attractive returns hence they are often based on a leverage play.

For APG it is important to maintain in its portfolio a balanced mix of "core infrastructure" (stable but low returns) and "growth infrastructure" (higher returns but more exposed to volatility in demand).

PGGM portfolio of investments already features exposure to a range of assets in the transport, energy utilities and social infrastructure sectors.

Returns

Depending on legal framework conditions, infrastructure sector and political risk etc., in general, infrastructure investments have expected absolute returns of 8-11%, net of fees. Brownfield investments are expected to deliver a 5-10% (unlevered return).

Renewables

ATP Pension Fund has invested in renewable energy infrastructure and technology, such as solar wind and hydro, as well as emerging technologies, such as biofuels and biomass for a long time.

ATP invested DKK 600 million in renewable and has committed 2.2 million to concrete assets and over DKK 2bn of equity in companies that are related to the renewable and clean energy sector.

PGGM is especially interested in renewable energy opportunities and has already invested in wind farms. In December 2010 PGGM committed capital to the BNP Paribas Clean Energy Fund.

Geographic allocation

Investors' exposure to infrastructure projects is predominantly located in Europe and North America. Some investors have a global mandate, while other are more focused on the European market.

APG invests in infrastructure on a global basis but historically has invested predominantly in European focused funds. However in March 2007, the pension fund opened an office in Hong Kong in order to expand its Asian infrastructure and real estate portfolios.

To increase the geographic diversity within the portfolio PGGM has invested in an India specific infrastructure fund and is monitoring opportunities in China.

PGGM's infrastructure geographic exposure is:

- Current allocation: 55% Europe, 40% United States, 5% Emerging Markets (i.e. China, Latin America, India)

- Target allocation: 45% Europe, 35% United States, 20% Emerging Markets

ATP's infrastructure geographic exposure is:

- North America 33% Europe 43% and Australia 24% of invested capital. ATPs portfolio is OECD focused and does not need to be diversified within the portfolio as ATP views geographical diversification on the overall ATP portfolio.

Varma's primary focus is on European infrastructure in conjunction with moderate exposure to North American assets, but because of the extra costs incurred by currency exchange rates it is not seeking a global portfolio.

7.5.3 Drivers for investment in infrastructure

Why invest in infrastructure?

Pension funds are buy-and-hold investors and their main focus is on inflation protected cash yield, rather than capital gains. Infrastructure investment, providing the cash yield, matches pension liabilities given the low correlation with other assets and long term horizon.

Main characteristics investors want from the infrastructure investment:

- assets linked to inflation (e.g. water utilities, waste projects, toll roads);
- long term cash flows;
- stability of revenue (i.e. availability shadow toll roads or low commercial risk, for example ring roads, inner city harbours);
- low GDP correlation.

Where does it fit in the portfolio allocation?

ATP's investment portfolio is invested in five risk classes with very different return profiles. Infrastructure is included in the inflation class with index-linked bonds, alternative energy real estate and timberland.

Varma places the infrastructure allocation between a Private Equity and a Real Estate investment.

USS infrastructure allocation is part of the alternative allocation and invests in infrastructure through its private equity allocation.

For PGGM Infrastructure is part of the illiquid assets with Private Equity and Real Estate.

7.6 Main barriers to Investment in Infrastructure

The Investment Opportunities

Europe is considered a well developed and mature market for infrastructure. However, barriers to investment remain:

- Regulatory instability[142]
- Fragmentation of the market among different countries
- Lack of transparency about project pipeline and investment opportunities
- High bidding costs involved in the procurement process of infrastructure projects for certain countries
- Eurostat treatment of PPPs could hinder the development of the market in the future

The Investors' Capabilities

- Immature pension market in many European countries
- Problem of scale of pension funds
- Lack of resources and expertise in the sector
  - At the level of trustees and consultants
  - At management level
- The demise of monolines has frozen capital markets for infrastructure in Europe, depriving investors also the necessary expertise to access the sector.

142 "The Spanish government announced plans to retroactively cut pre-agreed "trade-in tariffs" for the country's solar-photovoltaic energy producers by 30%, or EUR 3bn ($3.9bn), over the next three years, as part of its plans to reduce the budget deficit". Source: Financial Times, 10 January 2010. Besides being a breach of investor confidence, this will likely increase the perceived regulatory risk for Spanish utilities, regulated industries and banks, as well as for Spanish sovereign risk.

7.7 Steps taken to date

Trans-European Transport Network Executive Agency (TEN-T EA)

Given the scale of the investment required, the necessity was recognised to prioritise projects, in close collaboration with national governments, and to ensure effective European coordination. In this context, the Trans-European Transport Network Executive Agency (TEN-T EA) was created in 2006 to implement and manage the TEN-T programme on behalf of the European Commission.

The long term nature of the projects involved, the considerable delays in the completion of a number of projects as well as the scale of the investments have slowed the implementation of the TEN-T programme. The Green Paper TEN-T: A Policy review – Towards a Better integrated Trans European Transport Network recognised a series of problems in relation to the TEN-T programme.[143]

EU Focus on PPPs

In November 2009, the European Commission issued the following communication: "Mobilising private and public investment for recovery and long term structural change: developing Public Private Partnerships" recognising that: "Investment in infrastructure projects is an important means to maintain economic activity during the crisis and support a rapid return to sustained economic growth. Public Private Partnerships (PPPs) can provide effective ways to deliver infrastructure projects, to provide public services and to innovate more widely in the context of these recovery efforts. At the same time, PPPs are interesting vehicles for the long term structural development of infrastructures and services, bringing together distinct advantages of the private sector and the public sector, respectively".

The EIB, the EU's long term lending institution, has actively sought to support efficient PPP schemes across Europe, and in particular in transport infrastructure. The Bank has made nearly EUR 30 bn available in loans for PPPs since the late 1980s. The EIB is also the leading financier of the TEN-T networks. It is expected to contribute 14% of total TEN-T investment between 2007 and 2013.[144]

Furthermore, the EIB has established together with the Commission and Member States the European PPP Expertise Centre (EPEC), which aims to strengthen the organisational capacity of the public sector to engage in PPPs through network activities and policy support to its members.

The European Commission is working closely with the EIB and the private sector in order to increase the overall leverage effect of EIB funding, for instance through the blending of grants from the EU budget and EIB loans.

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143 According to the EU, progress in implementation has been substantial and about one third of the necessary investments (EUR 400 billion) in the TEN-T has been made. Among the projects completed are the Øresund link, Malpensa airport and the Betuwe rail freight line. Other projects will be completed soon, like the PBKAL project (HST Paris-Brussels-Cologne, Amsterdam, London). Large sections of projects have also been put into operation like the Madrid-Barcelona HST link or the first phase of TGV Est in France.

144 European Commission communication: "Mobilising private and public investment for recovery and long term structural change: developing Public Private Partnerships", November 2009.

The Project Bond initiative

The principal idea behind the Europe2020 Project Bond Initiative is to provide EU support to project companies issuing bonds to finance large-scale infrastructure projects.

The aim is to access new pools of capital like institutional investors.

The initiative will create a mechanism for enhancing the credit rating of bonds issued by project companies themselves. There are various ways this could be achieved: one possibility is for the EIB to provide the higher-risk subordinated debt finance to credit enhance the bonds issued by a project company. This could be done under a risk sharing agreement with the EU budget similar to that which is already used to guarantee certain risks associated with transport projects.

Irrespective of the means of credit enhancement, the final objective is the same in all cases: creating a class of high quality bonds that institutional investors would feel comfortable to buy.

Project bonds would not be issued by a sovereign or EU entity as were the Euro bonds proposed by Delors in 1993 and recently debated, but by project companies themselves.[145]

A first example of a project bond was the successful SunPower's Montalto di Castro solar PV park in Italy in December of 2010 which relied heavily on the support of the EIB and Italian export credit agency SACE. Half of the bond issuance in fact was placed to institutional investors suggesting this could be a new form of financing for renewables projects in Europe.[146]

145 Eurobonds are bonds backed by the EU budget, and would reduce the refinancing costs of Euro zone countries with financial problems. This would establish a sort of European public debt which would have a revolutionary impact on EU finances. Eurobonds were recently backed by Euro zone President Jean Claude-Junker and Italian Finance Minister Giulio Tremonti. See "E-Bonds would end the crisis", Financial Times, 5 December 2010.

146 See Case Study of "Role of Pension Funds in financing Green Growth", OECD 2011 (forthcoming).

Box 7.1. **EU financial instruments for TEN-T implementation**

Grants from the Cohesion and Structural Funds

EU grant funding may be available for projects located in areas which benefit from the Cohesion or Structural Funds.

TEN-T funding instruments

In addition to funding available through the TEN-T Annual and Multi-Annual Programmes' Calls for proposals, there are other financing instruments and initiatives that have been designed to facilitate the procurement and implementation of TEN-T projects using PPP arrangements:

- construction cost-based grants equivalent to up to 30 per cent of the total construction cost to support payment obligations after project completion in availability-based PPPs;
- provision of loan guarantees: up to EUR 500 million is available to support a loan and guarantee instrument (see LGTT below); and
- provision of risk capital: up to 1% of EUR 80 billion of the TEN-T budget can be invested as equity or quasi-equity through a dedicated infrastructure fund (see Marguerite fund, below).

The Community's financial envelope for the implementation of the TEN-T Programme for the period 2007-2013 is approximately EUR 8 billion.

EIB finance

The European Investment Bank is also an important source of loans and guarantees for TEN-T projects.

Loan Guarantee for TEN-Transport (LGTT)

The LGTT was set up and developed jointly by the EIB and the European Commission with the aim to attract a larger private sector participation in the financing of revenue-risk TEN-T projects. The instrument enables the transfer of demand risk inherent in a concession-based PPP project during the early years of operation thereby significantly improving the financial viability of the project and making the capital structure more robust. By providing the guarantee the EIB is taking over this risk by potentially becoming a mezzanine lender to the project. The flexibility of the LGTT structure permits a tailoring of the product to fit the needs of the project. The product fits optimally with state-guaranteed senior debt and is an excellent element in mini-perm structures.

The EIB and the EC have committed capital of EUR 500 million each to enable LGTT of around EUR 5 billion to be issued until 2013. The EC contribution is made from the current TEN-T Budget while the EIB part is under the Structured Finance Facility (SFF) capital allocation.

The instrument was launched in 2008 and during its first full year of operation in 2009 it was used in three PPP road projects that reached financial close with a total guarantee amount of EUR 70 million.

A recent example of a TEN-T PPP project which used the LGTT instrument is A5 (Malsch-Offenburg) motorway in Germany.

Marguerite Fund

The Marguerite Fund, established by the EIB and a number of partners, is designed to support equity investments in new (greenfield) infrastructure projects in the areas of transport (TEN-T), energy (TEN-E) and renewables.

The target volume of the Fund is EUR 1.5 billion, of which over EUR 700m has already been committed during the initial closing in March 2010.

In subsequent fund-raising rounds, other institutional investors, both private and public may join the Fund. In parallel to the equity commitment, the Core Sponsors and other institutions have also established a EUR 5 billion debt financing initiative. The Fund is expected to be a model in the future for other similar public and private funds in the EU in view of the approach taken to combining market principles while still supporting public policy objectives.

7.8 Conclusions

Despite the maturity of the infrastructure market, especially in countries such as the United Kingdom, France, Spain, European investors have only recently started building up their allocation to infrastructure, treating it as a separate allocation, only in the last five years. Allocations to the asset are still limited (e.g. one to three per cent of total portfolio) even if targets have been slowly increasing in recent years.

In Europe pension funds utilise the indirect market route to benefit from the experience and expertise offered by infrastructure fund managers. Only the largest pension funds have the right resources in place to invest directly in infrastructure.

Europe is considered a mature market for PPPs. However, the experience varies greatly between sectors and from one country to another. For example countries such as the United Kingdom, France and Spain have a well developed market, while other countries are just starting to tender PPP projects. In some countries such as in Germany infrastructure projects are mainly financed through the municipal market.

The largest European investors in infrastructure are in countries such as United Kingdom, the Netherlands, Sweden, Denmark and Finland with a well-developed pension market. The state-run public pension tier in countries like Greece, Italy, Spain and Turkey still plays a major role in the old-age retirement system, limiting the growth of private pensions and the potential investment in infrastructure.

The European Commission is working closely with the EIB and the private sector in order to increase the overall leverage effect of EIB funding, for instance through the blending of grants from the EU budget and EIB loans. In February 2011, the EU launched a consultation paper on the Europe 2020 Project Bond Initiative to provide EU support to project companies issuing bonds to finance large-scale infrastructure projects.

The EIB, the EU's long term lending institution, has actively sought to support efficient PPP schemes across Europe, and in particular in transport infrastructure. Furthermore, the EIB has established together with the Commission and Member States the European PPP Expertise Centre (EPEC), which aims to strengthen the organisational capacity of the public sector to engage in PPPs through network activities and policy support to its members.

7.9 Additional Information – United Kingdom[147]

7.9.1 The Infrastructure Market

The UK has developed mature and extensive infrastructure networks. These are some of the largest and most intensely used in Europe. There has been a strong history of investment but the levels of investment have fluctuated markedly over time.

The move of the water, energy and communications sectors to regulated private ownership during the 1980s provided the basis for renewal of major parts of those networks. For example, £85bn has been invested in water infrastructure alone since privatisation.[148]

However, according to *The World Economic Forum*, in 2010 the United Kingdom is ranked just 33rd for the quality of its infrastructure and 12th for overall competitiveness, compared to ninth in 2005.[149] In fact all infrastructure projects have a limited life span and parts of the UK's infrastructure are ageing and are becoming outdated. Much of the UK's existing infrastructure was built during the 19th century. For example, 40% of London's water mains are over 100 years old, and 12% are more than 150 years old. The average age of sewers in England and Wales is 63 years.[150]

The Government plans that over the next five years, some £200 billion will be invested in UK economic infrastructure. The majority of the investment will be in transport and energy, with investment in the latter almost doubling between 2010 and 2015.

7.9.2 Development of PPPs

Since the mid-1990s, the United Kingdom has had extensive experience with the use of Private Finance Initiative (PFI) as a form of procurement for the delivery of a broad range of public services. Approximately 800 PFI/PPP projects are currently operational with a capital value of GBP 64 billion. Despite rapid growth PFI/PPP projects still accounted for only 10-15% of local authority capital investment over the last five years. In some sectors however, PFI's share of investment is clearly higher: for example 70% of hospital schemes have been delivered by PFI and 60% of new schools have been delivered through the PFI Group.

Some PFIs have run into trouble. The largest ever to upgrade maintain and operate the London Underground was covered by three contracts for a total of GBP 16.2 billion, signed in 2002/2003. However all the tube lines reverted to state control by end of June 2010, following re-nationalisation in two stages, in 2007 and 2010.

The new United Kingdom government elected in May 2010 has first indicated the intention to reconsider the use of PPP/PFI and to explore other avenues to attract private investment in the infrastructure market. Subsequently the government decided to cancel the PFI programme "Building School for the Future", brought forward by the previous Labour party. In the National Infrastructure

147 Main sources of information: National Infrastructure Plan 2010, Private Finance Projects and off-balance sheet debt, House of Lords, United Kingdom, 17 March 2010.

148 Meeting Future Challenges – a blueprint for policy action, Water UK, June 2010.

149 The Global Competitiveness Report 2010-2011, World Economic Forum, September 2010.

150 Victorian mains replacement: Why we are replacing pipes, Thames Water, www.thameswater.co.uk

Plan published in October 2010, it is suggested one option to reduce the cost of capital in infrastructure may be to extend the regulatory asset base concept (as in the water sector) to those assets or sectors which are not currently the subject of economic regulation.

7.9.3 Pension Fund Investment in Infrastructure

The United Kingdom pension fund market is considered a mature and well developed market. However the small scale of pension funds in the UK is a barrier to investment in infrastructure. There are in fact approximately 2500 pension funds of which approx 1000 are managing funds of less the GBP 5 million; only 190 are managing funds of more than GBP 1 billion.

Pension funds in the UK have been actively investing in bonds to finance PPPs which were usually guaranteed by monoline insurers. Bond financing was the dominant financing solution for large projects (>£200 million in capital value) for the last decade.

Prior to the onset of the financial crisis, the UK PPP bond market was supported by a core group of institutional investors comprising pension funds and fund managers. These investors bought approximately £15 billion of bonds issued by PPP project companies in the UK between 1997 and 2008. Since January 2008, no bonds have been issued to fund PPPs.[151]

Among the UK Pension funds most active in infrastructure are:

- The London Pensions Fund Authority (LPFA)

The London Pensions Fund Authority (LPFA) is one of the largest Local Government Pension Schemes (LGPS) in the UK with assets under management in excess of £4.0 billion as at July 2010. LPFA's infrastructure investments feature in its 15% allocation to alternatives. The pension fund as no defined route to market for its infrastructure investments and considers unlisted and listed funds.

Infrastructure represents 5% of the active fund portfolio allocation as of July 2010. It includes investments in solar in Spain and emerging markets e.g. China and PFI assets. LPFA is not considering increasing its exposure to infrastructure in the short term.

- University Superannuation Scheme ("USS")

USS is the second largest pension fund in the United Kingdom with total assets of GBP 21.4 billion as of 31 March 2009. The pension fund is an opportunistic investor in the infrastructure asset class via its private equity allocation.

USS started investing in infrastructure in 2005. USS has currently around 2.5% of its total portfolio committed to infrastructure, compared with a long term target of 3%.

The main transports deals in which infrastructure funds and pension funds are involved are located in the United Kingdom. One of the most important transactions has been High Speed Rail 1 which was recently awarded to two Canadian pension funds Borealis and Ontario Teachers' Pension Plan. The project attracted a lot of interest from institutional investors.[152]

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151 Capital Markets in PPP financing, EIB-EPEC, 2010.

152 Aside from the Canadian pension funds other bidders were:

7.9.3 Steps Taken to Date

The National Infrastructure Plan

In October 2010, the UK Government published the National Infrastructure Plan 2010, identifying the scale of the infrastructure needs in the UK in the next five years as GBP 200 billion. In the subsequent Spending Review the Government has committed over GBP 40 billion to infrastructure projects. To support the plan the government stated its intention to unlock private sector investment.

In launching the Plan, Lord Sassoon, Commercial Secretary to the Treasury, said: "We recognise the scale of the challenge and the need to encourage new sources of private sector capital. We are targeting Government's own investment at a series of bold and critical projects that go to the heart of this vision and support a private sector led recovery".

The plan includes:

- *Investing in a new low carbon economy* – including a Green Investment Bank, up to £1 billion for one of the world's first commercial scale carbon capture and storage demonstration projects, and the provision of grants to increase the uptake of electric vehicles.

- *Providing the best superfast broadband in Europe by 2015* – a total of £530 million of investment over the Spending Review period.

- *Investing £30 billion in transport* – including a high speed rail network, Crossrail, over £10 billion for maintenance and investment in key road and local transport schemes across the country and £14 billion of funding to Network Rail to support maintenance and investment.

- *Ensuring that the UK remains a world leader in science and research* by continuing support for the highest value scientific research by maintaining a science budget of £4.6 billion, and £220 million of capital investment in the UK Centre for Medical Research and Innovation and £69 million in the Diamond Synchrotron.

Infrastructure UK

The National Infrastructure Plan has been developed by Infrastructure UK, the agency which was created in December 2009 as a division of HM Treasury, to act as the focal point for the UK's infrastructure strategy, financing, development and delivery.

Infrastructure UK is focused on enabling greater private sector investment in infrastructure, and the improvement of the Government's long-term planning, prioritisation and delivery of infrastructure.

- Borealis (the infrastructure investment arm of Ontario Municipal Employees Retirement System) and Ontario Teachers' Pension Plan

- Cheung Kong Infrastructure (CKI) and Barclays Capital

- Groupe Eurotunnel, Goldman Sachs Infrastructure Partners, M&G's Infracapital, Universities Superannuation Scheme (USS) and CDC Infrastructure (Caisse de Dépôts et Consignations)

- Morgan Stanley Infrastructure, 3i Infrastructure and Abu Dhabi Investment Authority (ADIA) – Macquarie acting as financial adviser.

The Spending Review in October 2010 confirmed that Infrastructure UK would prioritise economic infrastructure that supports growth, the transition to a low carbon economy and encourage private sector investment in infrastructure.

The UK Government committed in the 2011 budget to fund a Green Investment Bank (GIB) with GBP 3 billion over the period to 2105. The Bank should start operation in April 2012 and has as its mission to accelerate private sector investment in the UK's transition to a green economy. To leverage the initial capital the GIB will try to attract institutional investors through new financial instruments.

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8 KOREA

8.1 Country Profile[153]

Korea is a presidential republic consisting of sixteen administrative divisions. Korea is a unitary country with a short history of local autonomy. Despite the decentralisation process started in the late 1980s, local governments still have a limited role compared to the strong control exercised by the central government.

Infrastructure has played a key role in the rapid industrialisation and economic growth of the country that led Korea to become one of the largest economies in Asia. The growth in fact has been based largely on Korean export oriented industries such as automotive, consumer electronics and information technology and shipbuilding industries.[154]

The government has ambitious plans to turn the country into a business, transport and tourism hub for North East Asia. As part of the plan much investment has been made in improving its infrastructure. Korea is also strongly committed to promoting green growth with the stated objective to build a green transport infrastructure.[155]

Although the public debt stock remains low by OECD standards, the government has committed to a medium-term fiscal target of reducing the consolidated central budget deficit.[156] Maintaining a low public debt burden is an important priority for Korea, given its rapid population ageing. Fiscal reforms are expected to make it more effective controlling spending, affecting also infrastructure expenditure.

In Korea the traditional view of infrastructure was as an investment of strategic importance, a major public good where there may have been difficulties in raising funds. Investment in infrastructure

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153 OECD (2010), OECD Economic Surveys: South Korea, OECD Publishing, Paris.

154 In 2009 Korea became the ninth largest exporter in the world from 12th in 2008, and its current account surplus rose to 5% of GDP.

For example, the Korean shipbuilding industry is one of the world's largest; with seven of the world's ten-largest shipbuilding firms. Also South Korea has the highest broadband penetration rate in the world.

155 On the 60th anniversary of the founding of the Republic of Korea in August 2008, the President proclaimed "Low Carbon/Green Growth" as the nation's vision to guide development during the next 50 years.

In order to develop a green transport infrastructure it is expected that the share of passenger travel by rail will rise from 18% in 2009 to 26% in 2020, and metropolitan mass transit from 50% to 65% over the same period.

156 The target implies limiting spending growth from the 7% average annual pace recorded between 2004 and 2008 to around 4%.Gross government debt reached a record high of 34% of GDP in 2009 in Korea, although still one of the lowest in the OECD area. However the debt of Korea's 24 public corporations – which is not included in government debt – more than doubled from 84 trillion won in 2004 to 177 trillion won in 2008, in part due to new infrastructure development.

was therefore considered a government responsibility. With the involvement of private capital since the end of the 1990s, new investment opportunities in the infrastructure sector were offered to investors in Korea. More recently Korean public pension funds have been aggressively investing in infrastructure in foreign countries.

8.2 The Infrastructure Market

Infrastructure development in Korea can be divided into two periods. The first period spans the 1960s to the mid-1990s when infrastructure was considered as supportive or auxiliary investment forming part of the grand picture of a series of "Five-Year Economic Development Plans". The second period began in the mid-1990s when infrastructure started to be considered as a separate strategic investment asset to increase national competitiveness and wealth.

- Period 1960s to early 1990s

  Infrastructure investment was planned and executed by central government to support activities in achieving the targeted growth rates set by a series of "Five-Year Economic Development Plans" from 1962 to 1996.

  For example, in the Third Five-Year Economic Development Plan (1972-1976), the development of heavy and chemical industries was emphasised. The government intensively invested in development of airports, seaports, highways, railways, and telecommunication systems in order to support those industries.

- Period from the mid-1990s

  With the East Asian financial crisis of 1997, the Korean government faced tight budget restraints and began to have difficulties financing infrastructure projects. As a consequence, the Korean government turned towards the private market for financing. In addition, the government felt that involving the private sector would also improve efficiency in infrastructure projects through private management techniques and innovation.

  Separate regulations and plans for infrastructure investments were developed by the government in the mid-1990s.

  These regulations included:

  – roadmaps for SOC[157] investment policies;

  – guidelines to coordinate/ optimise the allocation of investment in different types of SOC projects;

  – a system to finance infrastructure projects, etc.

[157] In Korea, the term Social Overhead Capital (SOC) is more commonly used to refer to infrastructure. In a broad sense, SOC denotes capital assets that are not physically used to produce goods, but are used instead to support the economic activities of production, for instance: roads, telecommunications, electrical grids and power plants.

Infrastructure Needs

There are two main views in evaluating Korean SOC stock. The first view is that Korean SOC stock is not sufficient as compared to other developed countries. A second view is that it is sufficient but not balanced between different infrastructure assets. Infrastructure in Korea is narrowly focused on transport-related facilities, such as roads, railways, subways, airports, and seaports. Among the transport-related assets, investments were heavily made on roads (Table 8.1). Some therefore feel that it may be necessary to re-allocate investment amongst infrastructure assets.

Table 8.1. **The trend of the Korean government's allocation of investments by asset in the transportation category – in %**

	1994	1996	1998	2000	2002	2004
Roads	56.3	55.6	54.4	59.2	56.4	57.2
Railways	15.8	18.5	17.5	17.6	26.2	22.4
Subways	12.9	11.4	9.0	9.5	5.9	6.1
Airports	6.3	6.1	9.5	6.0	2.2	2.5
Seaports	8.6	8.4	9.6	7.8	9.3	11.8

Source: Re-quoted from *How to improve the productivity of the government expenditure* (Research Report 2004-07).

Meeting the objectives National Strategy for Green Growth set by the Korean government in 2009 will require substantial infrastructure investments.

The government launched the Five-Year Plan for Green Growth for the period 2009-13, which calls for spending US$83.6 billion or 2% of GDP per year. The large amount reflects the inclusion of major infrastructure projects, such as the "Four Major Rivers Restoration Project" and the expansion of the high-speed train network. It also includes US$22.3 billion for securing new growth engines. Part of this amount will be used for "green finance", which will involve government lending and credit guarantees.

8.2.1 Development of PPPs

Before 1994, infrastructure projects were carried out under individual laws, such as The Toll Road Act and The Harbour Act. In August 1994 the Korean government introduced the Private-Public Participation (PPP) legal framework through the enactment of "The Act on Promotion of Private Capital into SOC investment". The PPP programme aimed to promote private participation in infrastructure in order to reduce the burden on the public budget as well as to introduce the capital, technology, and efficiency of the private sector.

The East Asian financial crisis of the late 1990s significantly reduced the Korean national budget and severely constrained the Korean government's budget allocation to infrastructure projects. In order to overcome the situation, the Government revised the PPP Act in January 1999 through the enactment of "The Act on Private Participation in Infrastructure". This act broadened the eligible sectors and investors under the PPP projects and introduced a risk-sharing mechanism. It also established the

Private Investment Centre of Korea (PIKCO), a dedicated unit with a remit of promoting private participation.

Thanks to the amendment of the PPP Act in 1998, 130 projects were implemented and contracts involving USD 13 billion of domestic and foreign capital had been awarded by 2003.

In order to facilitate further development of the PPP market in Korea, the Government amended the PPP Act again in 2005. The amendment introduced the "Build-Transfer-Lease (BTL)" scheme, expanded PPP project facilities types, and diversified investor profiles to include vehicles such as infrastructure funds. It also transferred the function of PIKCO to the Public and Private Infrastructure Investment Management Centre (PIMAC) at the Korea Development Institute (KDI).

Private investments in infrastructure have been continuously increasing since the introduction of the PPP Act.

Table 8.2. **The Private Participation in Infrastructure Trend**

(*Unit*: KRW 100 000 000)	2001	2002	2003	2004	2005	2006	2007	2008	2009
BTO Projects	41 391	23 696	45 589	50 116	60 679	37 956	42 701	60 934	31 380
BTL Projects	-	-	-	-	2 820	28 251	53 926	28 470	51 566
Total	**41 391**	**23 696**	**45 589**	**50 116**	**63 499**	**66 207**	**96 627**	**89 404**	**82 946**
(*Unit*: US$ million)	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
BTO Projects	3 207.6	1 894.1	3 827.9	4 376.2	5 924.4	3 987.7	4 594.2	5 535.1	2 461.3
BTL Projects					275.3	2 968.1	5 801.8	2 586.2	4 044.6
Total	**3 207.6**	**1 894.1**	**3 827.9**	**4 376.2**	**6 199.7**	**6 955.9**	**10 396.0**	**8 121.3**	**6 505.8**

Note: The annual OECD exchange rate was used to convert Korean Won to US dollars.

Source: National Indicators, Ministry of Strategy and Finance.

The two procurement schemes under the PPP Act are Build-Transfer-Operate (BTO) and Build-Transfer-Lease (BTL). The BTO scheme is for both solicited and unsolicited projects of economic infrastructure such as roads, seaports, and railways. The main revenue stream of BTO projects are user fees collected by operating the facilities, and the government minimum revenue (MRG) is applicable for solicited projects. The BTL is only applicable to solicited projects of social infrastructure such as schools, dormitories, and military housing. Due to the difficulty in collecting its investment from user fees, the concessionaires receive government payments based on their operational performance for a specified period of time.

8.3 Pension Funds Market

While the South Korean insurance market is the largest in Asia outside Japan,[158] its pension market, especially the private pension portion of it, is still sizeable. However, the private pension market is continuously growing and as of December 2010 the total market value of private pensions was KRW 203 trillion.[159]

The four main public pension programmes in Korea are the National Pension Service for Korean residents aged 18-60 (NPS); the Government Employees Pension Service (GEPS) for public employees; the Korea Teachers Pension (KTP) for private school teachers and professors; and the Military Personnel Pension Service for military personnel.

Along with the public pension programmes and life insurance companies, various types of private financial institutions, for instance, banks, or non-life insurance companies, offer private pension programmes.

8.3.1 Key developments affecting infrastructure investment

Diversification

Korean institutional pension funds look for investments that are stable with long-term profit yields and that allow for diversification in asset allocation. They are beginning to look at investments in infrastructure as a subset of their growing interest in "alternative" investments more generally.

The current asset allocation of Korean pension funds is heavily weighted towards bonds. The pension funds are always looking for opportunities to diversify their investments. Infrastructure assets have a low risk exposure as compared to stocks, and have higher return rates as compared to bonds.

For instance, the Korea National Pension Service (NPS) has increased its investments in alternative asset classes. NPS's exposure to alternative asset classes is 5.8% (18.9 trillion won) as of December 2010. Out of this, SOC takes up 6.2 trillion won (4.7 domestic and 1.5 overseas).

Investment regulations

Investment restrictions affect Korean corporate pension funds' investment into infrastructure in several ways. There are limits on equity exposure for equity investment (up to 30% for DB, not permitted for DC); limits on investment in foreign assets (global investment limit of 30% for DC plans and 30% for foreign equity assets); complete exclusion of investment in private funds for both DB and DC plans.[160]

Korean regulators are now considering plans to deregulate rules on corporate pensions to allow them to invest in more kinds of assets as pension funds in other Asian countries increase overseas investments.

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158 Total assets of South Korean life insurance companies in 2009 were W352.79 trillion, with the largest three – Samsung Life, Korea Life and Kyobo Life dominating the market with 67% of all life insurance assets at the end of September 2009. Source: Economist Intelligence.

159 Source: Financial Supervisory Service.

160 Source*: Survey of Investment Regulations of Pension Funds, OECD, February 2010* http://www.oecd.org/dataoecd/53/43/44679793.pdf.

See Annex A.

8.4 Infrastructure Investment of Korean Pension funds

The appetite for infrastructure of Korean pension funds differs between domestic and overseas.

Domestically, Korean pension funds generally participated indirectly but with the introduction of Public Private Participation in Infrastructure Act (PPI Act) in 1994, the funds gained the option to invest directly as shareholders in infrastructure projects (Annex B).

Most domestic investments are made in core infrastructure, for instance, bridges, highways, airports, and social infrastructure projects, such as public libraries, hospitals, or as a part of public-private participation in infrastructure programmes.

In recent years Korean Pension Funds have become active investors in infrastructure also abroad. For instance, the Korean National Pension Service (NPS) bought a 12% stake in London's Gatwick Airport through the company Global Infrastructure Partners. They also closed a deal to acquire a 23.44% stake in Colonial Pipeline, the biggest oil pipeline operator in the United States, from Chevron Corp in partnership with private equity fund Kohlberg Kravis Robert & Co.

Table 8.3. **Infrastructure Investment – Overseas**

(Unit: USD million)

Pension Fund	Country of Investment	Year	Investment USD Million	Description
The Korea National Pension Service	United Kingdom	2010	156.44	12% stake in London's Gatwick Airport, through the Global Infrastructure Partners
The Korea National Pension Service	USA	2010	895	23.44% stake in U.S pipeline operator Colonial Pipeline Co. from Chevron Corp.,
The Korea National Pension Service	United Kingdom	2009	1,268.40	HSBC global headquarters, London
The Korea National Pension Service	Australia	2010	637.41	Aurora Place, a landmark in Sydney
The Korea National Pension Service	France	2010	291	51% of the O'Parinor shopping centre in Aulnay-sous-Bois
The Korea National Pension Service	Germany	2010	736.38	Sony Centre, Berlin
The Military Personnel Pension Service	United Kingdom	2007	255.794	6.88% of Thames Water Shares
The Korea Teachers Credit Union	Australia	2010	1,834	Desalination project, Victoria

8.5 A closer look at a few selected investors

Findings of this section draw in part on interviews with industry professionals, in part on information obtained from a literature review, selected pension fund annual reports and an analysis of the available data sources. Interviews were conducted with representatives of selected investors in infrastructure, consultants and infrastructure funds.

8.5.1 Appetite for Infrastructure

Korean institutional investors are new to infrastructure investment. They therefore do not directly invest in overseas infrastructure because they recognise that they do not have enough knowledge internally. Although using infrastructure funds of external financial institutions incur a management fee of 1-2%, they choose to engage them in order to make their international investments.

The fundamental rules for pension fund management are to generate stable and long-term revenues for pension contributors. This matches with the characteristics of infrastructure assets, which yield stable and long-term revenues. For Korean domestic projects in particular, the MRG programme mitigates the *J*-curve effect during the construction and early operating periods.

The Korean National Pension Service (NPS)[161]

The size of NPF, which is the reserve fund managed by NPS, is 324 trillion won as of December 2010. According to Tower Watson 300 Analysis (September 2010), NPS ranks No. 4 in terms of assets under management as of year-end 2009.

The NPS launched an in-house fund-management unit, with a group of professional managers hired from the private sector, in 1999. The fund management centre executes portfolio-investment strategies set forth by an independent committee of public- and private-sector representatives. In January 2007 the Fund Investments Office was reorganised to implement plans to diversify assets, which were predominantly invested in government bonds.

Plans to entrust management of the fund to a committee of private-sector experts were announced in May 2008. A seven-member three-year term committee was to be set up and its policy implemented by a public corporation with autonomy in budget planning and personnel management.[162]

These moves came in the context of a perceived need to increase the annual return on the funds, from about 6.1% during 2005-08, to over 8%. However, in light of the severe turbulence on world capital markets, these plans have been put on hold as of early 2010. In October 2008 there was harsh criticism in the National Assembly about losses incurred in asset values during 2008.

Some 77% of the fund is currently in fixed income holdings almost all of them Korean. The NPS plans to redistribute the portfolio by diversifying away from fixed-income investments. By 2014, it plans to decrease its portfolio allocation to domestic fixed income from 77.8% to 60%.

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161 Main source: The Economist Country Finance Report.

162 The draft bill to introduce a seven-member three year term committee is still under consultative procedure

Only 10% of the total, US$24 billion, is invested abroad. The Foreign stake in the portfolio is set to rise to US$100 billion of a US$400 billion portfolio in 2014.[163]

NPS needs to expand alternative investments for diversification of the portfolio away from stocks and bonds and is looking at investment in infrastructure in the more developed countries such as Europe, US, Canada and Australia. They are interested in infrastructure that is linked to inflation and has stable cash flows.

NPS is proceeding with plans to buy real estate in major cities worldwide to take advantage of low prices. The NPS has also signed strategic partnerships with numerous external asset managers, including several foreign ones, to advise on and manage various asset classes.

For example, it uses 12 foreign companies for its overseas equity portfolio, including Morgan Stanley (US) and AIG (US); four advisors for its overseas fixed-income investments, including Goldman Sachs (US); and 12 companies for its alternative overseas investments, including JP Morgan (US), Bain Capital (US) and Blackstone (US).

[163] Financial times *Korea Pension fund widens its horizon*, 1 February, 2010.

8.6 Main Barriers to Investment in Infrastructure

The Investment Opportunities

- Changes in government policy

  Foreign investors sometimes find that the Korean government's policy implementation is somewhat inconsistent and that the guidelines frequently change.

- Government bureaucracy

  The interviewees expressed the view that insufficient coherence among government policies and a lack of joining up between different government departments is a hindrance to investment in infrastructure.

The Investors Capability

- Lack of capacity in infrastructure

  There is a recognised lack of know-how and expertise in infrastructure investments within Korean pension funds. This also extends to a lack of expertise in Greenfield and Brownfield development as well. The funds tend to buy-in capability through partnerships with financial institutions; global partners such as Fidelity, Goldman Sachs. Their overseas investments to date have been primarily via infrastructure funds rather than directly.

- Regulatory barriers – portfolio limits for corporate pension plans

The Conditions for Investment

- Difficult business environment in Korea, especially for foreign investors, owing to formal barriers, market regulations, cultural barriers, etc.[164]

- Competition of established construction conglomerates

- Exchange rate risk

  There are difficulties in hedging against exchange rate risk:

  1. mid-and long-term investment (more than 10 years of investment);

  2. unstable cash flow; and

  3. difficulty in evaluating market value

The high volatility of the Korean Won means that dividend and interest revenues through infrastructure investments are often less than expected revenue when agent fees and expenses are taken into account and converted into local currency.

[164] The stock of inward foreign direct investment (FDI) as a share of GDP in Korea is among the lowest in the OECD area, as is the share of services in Korea's inward FDI.

8.7 Steps Taken to date

The Government offers various types of support to promote take up of PPP projects in Korea. This support comes in various forms: support for land acquisition, financial support, risk-sharing, technical assistance, credit guarantees and tax and financial benefits.

Table 8.4. **The Different Types of Government Support**

	Construction Period	Operating Period
Subsidy	Construction Subsidy	Minimum Revenue Guarantee (MRG)
Guarantee Programme	Infrastructure Credit Guarantee Fund	
Tax Incentives	Preferential rates for corporate and local taxes, exemption for value-added tax	

Source: Korea Development Institute.

Support for Land Acquisition

First, it provides support for land acquisition to concessionaires. They are granted land acquisition rights as well as the right to use national and state public lands free of charge. Concessionaires may also entrust the competent authority with the execution of land purchase, compensation of loss, resettlement of local residents, and other related administrative tasks.

Financial supports and tax incentives

The government will also provide concessionaires with financial support in the form of subsidising land acquisition costs or construction costs in order that they can maintain appropriate user fee levels. There are various tax incentives offered to increase investment interest. These include exemptions from acquisition and registration taxes on real estate for BOT projects, along with 0% VAT on construction services. There is also a reduced tax on infrastructure bonds.

Termination

The government plays a risk-sharing role as well. When PPP projects are terminated for unavoidable reasons during construction or operations, the government takes over the management and operation rights of the facility, as well as offering a certain amount of termination payment to the concessionaire. The concessionaire may also request a government buy-out of the project in the case of termination of construction or operation of a facility due to force majeure. The government may also pay for a shortfall when the actual operational revenue is less than the share of investment risk by the government. If the actual operation revenue exceeds the share of investment risk, however, it will be redeemed within the limit of the amount previously paid (and this applies only to solicited projects with significant public benefit).

Technical Assistance

Technical assistance and policy development support from the Government are provided through the Public and Private Infrastructure Investment Management Centre (PIMAC). PIMAC provides policy suggestions for the PPI scheme, conducts research on the infrastructure market, reviews solicited and unsolicited project proposals, helps negotiate concession contracts and mediate disputes, and offers educational workshops for investors to promote private investment in infrastructure financing.

Credit Guarantees

The Korea Infrastructure Credit Guarantee Fund (KICGF) was established by the PPP Act. The Fund comes from central government through revenue guarantee fees, and independent financial institutions. The government contribution is subject to annual budgetary approval. The Fund provides credit guarantees to concessionaires when obtaining bank loans from financial institutions or issuing infrastructure bonds for PPI projects, to help ensure timely debt payments.

The Government Minimum Revenue Guarantee Programme

Along with the credit guarantee, the Korean government provides partial coverage for yearly operating revenues that fall below a specified limit of estimated revenue in the concession agreement.

Some of the early projects had longer-term revenue guarantees without any conditions. However, after the amendments of the PPI Act, the government abolished unconditional support and also gradually reduced overall support as well.

In the case of the "Incheon Int'l Airport Highway", the government's guarantee level was more than 95% of the investment and covered subordinate debts as well as equity investments which were higher risk. It was thought that this distorted the fundamentals of infrastructure investment which should involve calculating estimated cash flow of projects and decision-making based on long-term risk and revenue analysis.

Table 8.5. **The Government Minimum Revenue Guarantee Provision**

	January 1999		May 2003	January 2006	
	Solicited	Unsolicited		Solicited	Unsolicited
Period	Whole operating period		15 Years	10 Years	Abolished
Guarantee Level (Max)	90%	80%	First 5 Years 90% Next 5 Years 80% Last 5 Years 70%	Next 5 Years 75% Next 5 Years 65%	
Condition	None		No MRG applied if actual revenue is less than 50% of forecasted revenue	Same as left	

Source: Korea Development Institute.

8.8 Conclusions

After a first attempt to bring private sector capital into infrastructure through the Private Capital Inducement Act of 1994, Korea started the process in 1999 with the Private Participation in Infrastructure Act, which provides the basis for its current PPP programme.

The overall scale of the PPP programme in Korea is comparable to the British PFI programme but the average project size is larger due to higher presence of transport projects. While the transportation concessions remain a major part of the PPP programme following the 2005 PPI Act the Korean governments started a PFI model for social infrastructure projects.

In Korea, private participation in infrastructure was initiated and nurtured by the government's need, and was not primarily driven by demand from the private sector. PPI projects and the Minimum Revenue Guarantee Programme were introduced in Korea as a part of the policy of budget reductions in public expenditure in the early 2000s. As a result, the private sector invested in the infrastructure market without necessarily completing thorough business feasibility analyses, as they relied heavily on the government minimum revenue guarantees (MRG) provision.

While the South Korean insurance market is the largest in Asia outside Japan, its pension market, especially the private pension portion of it, despite growing rapidly is still relatively small. Among public pension funds on the other hand, the desire to diversify away from fixed income has in recent years pushed Korean funds to invest aggressively in infrastructure in foreign assets.

Since the PPI Act of 1994 infrastructure funds have been regarded as one of the main investment vehicles. The first infrastructure fund was set up in 1999 but failed due to lack of bankable available projects. However, now there are 20 such funds active in Korea.

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ANNEX A
ADDITIONAL INFORMATION TO KOREA – PORTFOLIO LIMITS

Table A.1. Portfolio limits on the Korean pension fund investment in selected asset categories

	Equity	Real Estate	Bonds	Retail Investment Funds	Private Investment Funds	Loans	Bank Deposits
Personal Pension Funds	10% (non-listed)	15%	No limit	No limit	No limit	No limit	No limit
Corporate Pension	DB: 30% (listed). DC: Not permitted	DB and DC both not permitted	DB and DC: Both no limit (Investment grade above BBB-)	Equity fund:[165] DB: 30% DC: Not permitted Balanced fund: DB: 40% DC: Not permitted Bond fund: DB and DC: Both no limit.	DB and DC: Both not permitted	DB and DC: Both not permitted	DB and DC: Both no limit

Source: Survey of Investment Regulations of Pension Funds, OECD, July 2008.

Table A.2. Portfolio limits on the Korean pension fund investment in foreign asset categories

	Global investment limit in Foreign assets	Specific investment limits in foreign asset categories						
		Equity	Real Estate	Bonds	Retail Investment Funds	Private Investment Funds	Loans	Bank Deposits
Personal Pension Funds	20% (It applied only to personal insurance. The other types of personal pension including trusts and investment funds have no restriction on these limits)							
Corporate Pension (Retirement Pension)	DB: No limit DC: Total 30%	DB: 30% (listed).[166] DC: Not permitted	DB and DC both not permitted	DB: No limit DC: Permitted	DB: 30% DC: Permitted only for bond funds	DB and DC: Both not permitted	DB and DC: Both not permitted	DB: Not permitted DC: 30%

Source: Survey of Investment Regulations of Pension Funds, OECD, July 2008.

165 Equity funds: Funds investing in equities more than 60% of its net assets. Balanced funds: Funds investing in equities between 40-60% of its assets. Bond funds: Funds investing in bonds more than 60% of its assets.

166 Only for listed equities traded in designated markets, including NASDAQ; New York, America, Tokyo, London, Euronext Paris, Deutsch, Hong Kong and Singapore stock exchange.

ANNEX B
ADDITIONAL INFORMATION TO KOREA – INFRASTRUCTURE INVESTMENT

Table B.1. Infrastructure Investment – Domestic

Management Company	Fund Name	Annual Total Net Asset (Unit: KRW billion)					No. of Asset	Major Assets	Pension funds or pension fund-related Institutional Investors
		2005	2006	2007	2008	2009			
Macquarie-Shinhan Infrastructure Management	Macquarie Korea Infrastructure Funds	1 312.2	1 763.3	1 702.7	1 740.8	1 690.4	14	Choenan-Nonsan Highway, Yongin-Seoul Highway, etc.	Military Mutual Aid Association Korea Government Employees Pension Service
Korea Infrastructure Asset Management Company	KIF I	64.2	78.7	71.1	72.1	75.6	4	Incheon Airport Highway, etc.	
	KIF II	10.0	49.4	486.9	558.1	363.0	7	Yongin-Seoul Highway, Kangnam Ringroad, etc.	Korea Teachers Pension (KTP) Korea Public Officials Benefit Association
	Korea BTL I	-	10.0	46.4	246.5	417.6	27	Daegu city Museum, Seoul Mokwoon Elementary School, etc.	
	Korea Education Fund	-	9.9	10.6	85.2	148.4	12	Daejeon National Universities Dormitories, Inchoen city library, etc.	
	Korea Railway Fund	-	9.9	10.6	31.8	147.0	4	Incheon airport railway, Kyeong-Jeon BTL	
	Total	74.2	157.9	625.6	993.7	1 151.6	54		
KB Asset Management	Balhae Infrastructure Fund	na	358.0	680.0	835.8	880.3	6	Daegu-Busan highway, etc.	National Pension Service Korea Government Employees Pension Service Korea Teachers Pension Service Korea Firemen's Mutual Aid Association
Darby-Hana Infrastructure Fund Management	Darby-Hana Emerging Infrastructure Asset Management	na	131.1	182.4	228.8	346.7	7	Seoul ring roads, Kyeonggi highway, etc	National Pension Service Government Employees Pension Service
Woori Asset Management	Korea BTL Infrastructure Fund	-	-	124.0	217.1	280.0	na	Na	
Shinhan – BNP Asset Management	Shinhan Infrastructure Portfolio Fund	-	89	122.1	224.0	241.0	33	Mokpo new seaport, Busan University dormitory, etc.	
Total		13 864	24 192	3 436.8	4 240.2	4 590.0			