ANNUAL SURVEY OF LARGE PENSION FUNDS AND PUBLIC PENSION RESERVE FUNDS

REPORT ON PENSION FUNDS' LONG-TERM INVESTMENTS

OECD

2016

Please cite this publication as:

OECD (2018), Survey of Large Pension Funds and Public Pension Reserve Funds, 2016
www.oecd.org/finance/survey-large-pension-funds.htm

FOREWORD

G20 leaders have identified the facilitation of long-term financing from institutional investors as a priority for helping to achieve targets for future growth and employment. This survey sheds light on the role that large institutional investors can play in providing a source of stable long-term capital.

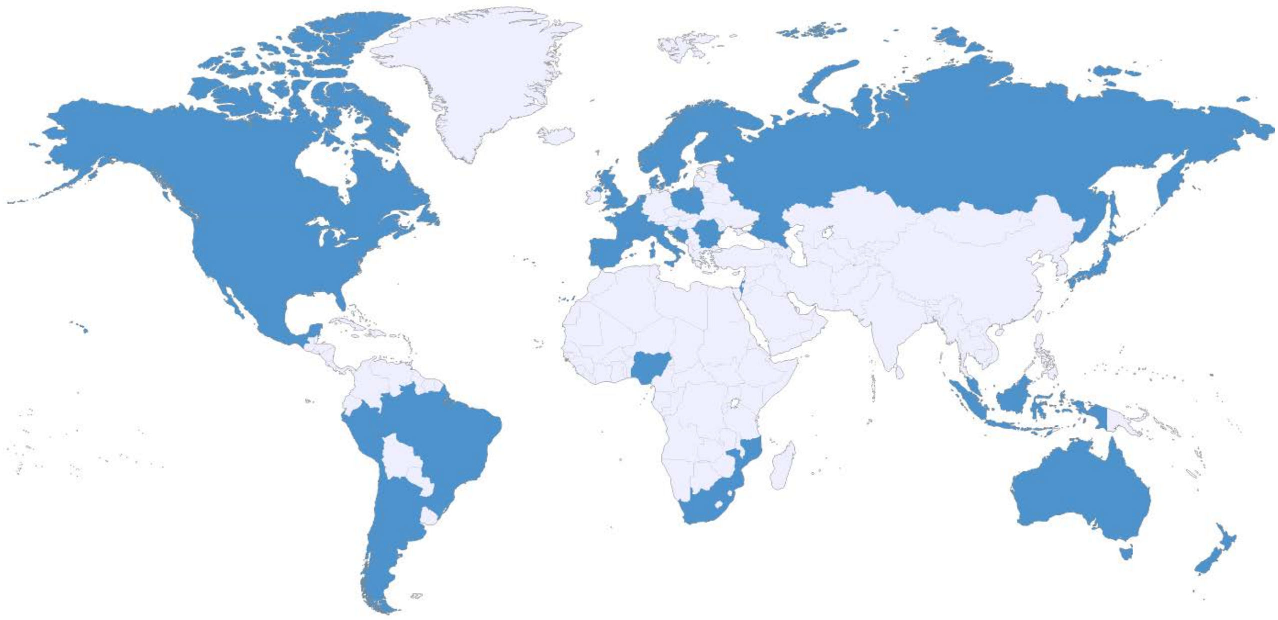
This survey is the fifth since the data collection exercise was first established in 2011. In line with the G20 mandate, the scope of this report covers 43 countries, including selected OECD countries, selected IOPS members, G20 members and, for the first time, APEC countries based on data gathered in 2015 and 2016. Brazil, India, Indonesia, Malaysia, Nigeria, the Russian Federation, and South Africa are amongst the non-OECD countries included in the survey.

This survey is based on a qualitative and quantitative questionnaire sent directly to Large Pension Funds (LPFs) and Public Pension Reserve Funds (PPRFs). It helps to provide detailed investment information and insights which complement the administrative data gathered by the OECD at a national level through the Global Pension Statistics and Global Insurance Statistics projects. The 2016 edition includes:

- a summary of key trends observed in the investment portfolios of LPFs and PPRFs
- an in-depth analysis of LPFs and PPRFs
- an analysis of infrastructure investment by LPFs and PPRFs
- an analysis of green investment and social impact investment by LPFs and PPRFs

This survey is part of the OECD Project on Institutional Investors and Long-term Investment and the work of the G20/OECD Task Force on Long-term Investment Financing by Institutional Investors. It has been prepared by Joel Paula and Raffaele Della Croce with contributions from Gary Mills, Abderrahim Assab and Christoph Weigl, all of the OECD Directorate for Financial and Enterprise Affairs. This report was made possible by the contributions of pension funds and public pension reserve funds. The OECD gratefully acknowledges the efforts of the participants in providing extensive data.

Global survey coverage representing USD 8.3 trillion in assets under management



Representative listing of fund responses

North America

British Columbia Investment Management Company - Canada
Canada Pension Plan Investment Board (CPPIB) - Canada
Ontario Teachers' Pension Plan (OTPP) - Canada
Quebec Pension Plan - Canada
Los Angeles County Employees Retirement Association - USA
Massachusetts PRIM - USA
New York City Combined Retirement System - USA
State Universities Retirement System of Illinois - USA

Central and South America

Sustainability Guarantee Fund - Argentina
FUNCEF - Brazil
Previ - Brazil
Pension Reserve Fund - Chile
AFP Cuprum - Chile
AFP Provida - Chile
AFP Integra - Peru
Afore XXI Banorte - Mexico
IMMS Reserve Fund - Mexico

Australia and NZ

CBUS - Australia
Future Fund- Australia
Unisuper - Australia
Superannuation Fund - New Zealand

Europe

Allianz - Croatia
PensionDanmark - Denmark
ERAFP - France
Keva - Finland
Cometa - Italy
Government Pension Fund Global - Norway
ABP - Netherlands
Demographic Reserve Fund - Poland
Lukoil-Garant - Russian Federation
Fonditel - Spain
Alecta - Sweden
AP1-AP4, AP7 - Sweden
Pensionskasse Post - Switzerland
USS - United Kingdom

Asia

MPFA - Hong Kong, China
GPIF - Japan
Pension Fund Association - Japan
BPJS Ketenagakerjaan - Indonesia
Employees' Provident Fund - Malaysia

Africa

Barclays Bank - Mozambique
RSA Fund - Nigeria
GEPF - South Africa
Sentinel Retirement Fund - South Africa

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BACKGROUND INFORMATION

About the survey

Traditionally, institutional investors have been seen as sources of long-term capital with investment portfolios built around two main asset classes (bonds and equities) and an investment horizon tied to the often long-term nature of their liabilities. Institutional investors have progressively diversified portfolios by adding allocations to alternative investments such as private equity, real estate, infrastructure and hedge funds.[1] However despite the increasing interest in alternative investments, official data on pension fund investment in alternatives – and in particular infrastructure – is scarce. National statistical agencies do not currently collect separate data on these investments and the different forms available to investors to gain exposure to these asset classes means that information is often buried under different headings.[2]

In order to identify the flows and to better capture the underlying trends in asset allocation and investment strategies of institutional investors, the OECD first launched surveys in 2011 of individual pension funds both within and outside of the OECD that are amongst the largest in their respective country, and comparatively, amongst the largest in the world.[3] Data gathered complements insights and detailed administrative data gathered at the national level.[4] 2016 now marks the sixth year of the survey and following the G20 mandate, the scope of this report will cover selected OECD countries, IOPS[5] countries, and member countries of the G20, expanding also to APEC countries, based on data gathered in 2015 and 2016.

The purpose of this exercise is to monitor and compare the investment behaviours and performance of the largest institutional investors in each region or country, analysing in greater depth the general trends observed at a national level. Results will highlight the depth and breadth of institutional investors, elucidating the importance of long-term capital and the role that pension savings can play in an economy, consistent with the objectives and directions as set forth by the Task Force. While the report covers the general state of long-term investment, which will be of prime value to the ultimate investors, it can also be used to inform regulators and other policymakers in order to help them better understand the operation of institutional investors in different countries. By analysing pools of long-term savings in domestic markets, and also in foreign markets where funds may invest a large portion of assets outside of their home country, policymakers can gain insights into the drivers behind asset allocation decisions and the conditions needed to attract long-term savings.

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

2 For example, infrastructure investment may not occupy a separate allocation, appearing instead as 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 infrastructure lending is reported as fixed income, while direct investment or participation in private equity vehicles is sometimes reported within the category "other".

3 The survey does not utilise a strict definition of a large pension fund, but seeks to capture trends by looking at the largest investors in the world, compared on an absolute basis, followed by the largest investors within specific countries.

4 See OECD Global Pension Statistics, www.oecd.org/ pensions/globalpensionstatistics.htm.

5 IOPS: International Organisation of Pension Supervisors, www.iopsweb.org/.

The survey reviews the trends in assets and asset allocation of 120 Large Pension Funds (LPFs) and Public Pension Reserve Funds (PPRFs),[6] which in total managed USD 10.7 trillion in assets in 2015, approximately one third of the total worldwide assets held by this class of institutional investor. Information was provided through the survey for 95 out of the 120 investors. Data for the 25 remaining funds came from publicly available sources.

Eighty-eight retirement schemes comprise the section on LPFs, consisting of a mix of defined benefit (DB) and defined contribution (DC) pension plans (mainly public sector funds, but also corporate funds) that together total USD 4.2 trillion in assets under management. Data for 72 schemes were provided by the large pension funds directly, the other 16 coming from publicly available sources. This information is presented in combination with the PPRF survey carried out at the same time. 23 PPRFs or Sovereign Wealth Funds (SWFs) with a pension focus completed the survey, 9 were added from publicly available sources, for a total of 32 PPRFs. Total amounts of PPRF assets were equivalent to USD 6.5 trillion at the end of 2015 for the countries in which we received or looked for data.

Altogether, data was compiled from funds representing 43 countries around the world including some non-OECD countries such as Brazil, India, Indonesia, Malaysia, Nigeria, the Russian Federation, and South Africa.

The survey report is divided into four sections. The Executive Summary summarises key trends observed in the investment portfolios of LPFs and PPRFs; Part A – Portfolio Analysis focuses on institutional investors' size and growth, asset allocation, international exposure, and investment performance, and is divided into two sets of investors: Large Pension Funds and Public Pension Reserve Funds. Part B – Infrastructure Investment focuses on capital flows in infrastructure, investment structures, sector and geographies. This part of the report – the infrastructure investment survey – includes data from 49 funds7 out of the total 95 funds that returned completed questionnaires. Part C – Sustainable Investment focuses on green investment and social impact investment.

The G20 context

G20 Leaders, acting through the Australian presidency in 2014, the Turkish presidency in 2015, and more recently under the Chinese presidency in 2016, the German presidency in 2017 and the Argentinian presidency in 2018, have made the issue of long-term financing for sustainable and durable growth a priority in charting the economic future of G20 and OECD countries. Promoting long-term financing, fostering institutional investors' involvement, and supporting the development of alternative capital market instruments for the financing of infrastructure are all key parts of implanting this agenda. Most recently under the German presidency, and also amongst APEC countries, sustainability in infrastructure investment became an important policy objective and will also be a priority under the upcoming Japanese presidency in 2019. In this way, investment in quality and sustainable infrastructure is a key part of achieving the G20's long-term growth targets, job creation, and goals for inclusive economic prosperity, helping to also meet the United Nations Sustainable Development Goals and country contributions to the Paris Agreement.

The OECD continues to play an important role in this agenda through the G20/OECD Task Force on Long-term Investment Financing by Institutional Investors (the Task Force). Through the Task Force, the OECD

[6] PPRFs are reserves/buffers to support otherwise PAYG financed public pension systems as opposed to pension funds which support funded pension plans in both public and private sectors. See Annex for definitions of the types of sovereign and public pension reserve funds. The survey included some SWFs such as Norway's Government Pension Fund – Global that have at least a partial pension objective.

[7] Forty-nine funds reported their exposure to infrastructure investments. The remaining 46 funds did not report their infrastructure investments or did not have infrastructure investments to report.

has submitted several reports to the G20. At the Hangzhou Summit on 4-5 September 2016, G20 leaders endorsed the *G20/OECD Guidance Note on Diversification of Financial Instruments for Infrastructure and SMEs,*[8] which presents a set of pragmatic and voluntary recommendations on the financial conditions and instruments that could help to mobilise further long-term investment in infrastructure, particularly from institutional investors. The Guidance Note encapsulates several years of work and contributions to the G20, stemming from the OECD Institutional Investors and Long-term Investment Project,[9] and presents a framework for policymakers to consider how institutions can play a larger role in long-term investment. OECD research on infrastructure as an asset class, and equity investment in infrastructure finance, presented to the G20/OECD Task Force since 2016 and 2017, includes also a forthcoming report on *Effective Approaches to Support the Implementation of the Guidance Note*.

In 2017, the OECD Long-term Investment Project contributed a chapter on *Mobilising Financing for the Transition*, in the publication Investing in Climate, Investing in Growth,[10] which was completed in the context of Germany's G20 presidency. The chapter highlights the growing role, and need, for the mobilisation of investment for sustainable and low-carbon infrastructure. In preparation for the Argentinian presidency of the G20, the OECD published a report titled *Breaking Silos: Actions to develop infrastructure as an asset class and address the information gap*[11], which presents policy recommendations on advancing the establishment of infrastructure as an asset class through data collection, lays out the benefits for gathering data on infrastructure investment as well as describes the necessary inputs for analysing infrastructure as an asset class and summarises existing initiatives on infrastructure data collection.

This survey report complements ongoing research efforts and provides valuable microeconomic data on institutional investor portfolios, which supports policy-level research and further recommendations on the subject of long-term investment.

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[8] See G20/OECD Guidance Note on Diversification of Financial Instruments for Infrastructure and SMEs, www.oecd.org/g20/topics/financing-for-investment/G20-OECD-Guidance-Note-Diversification-Financial-Instruments.pdf.

[9] See the project website for past contributions to the G20, events, and research, www.oecd.org/finance/lti.

[10] See OECD(2017) Investing in Climate, Investing in Growth, www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm.

[11] See OECD (2017) Breaking Silos: Actions to develop infrastructure as an asset class and address the information gap, www.oecd.org/daf/fin/private-pensions/Breaking-Silos -Actions-to Develop-Infrastructure-as-an-Asset-Class-and-Address-the-Information-Gap.pdf.

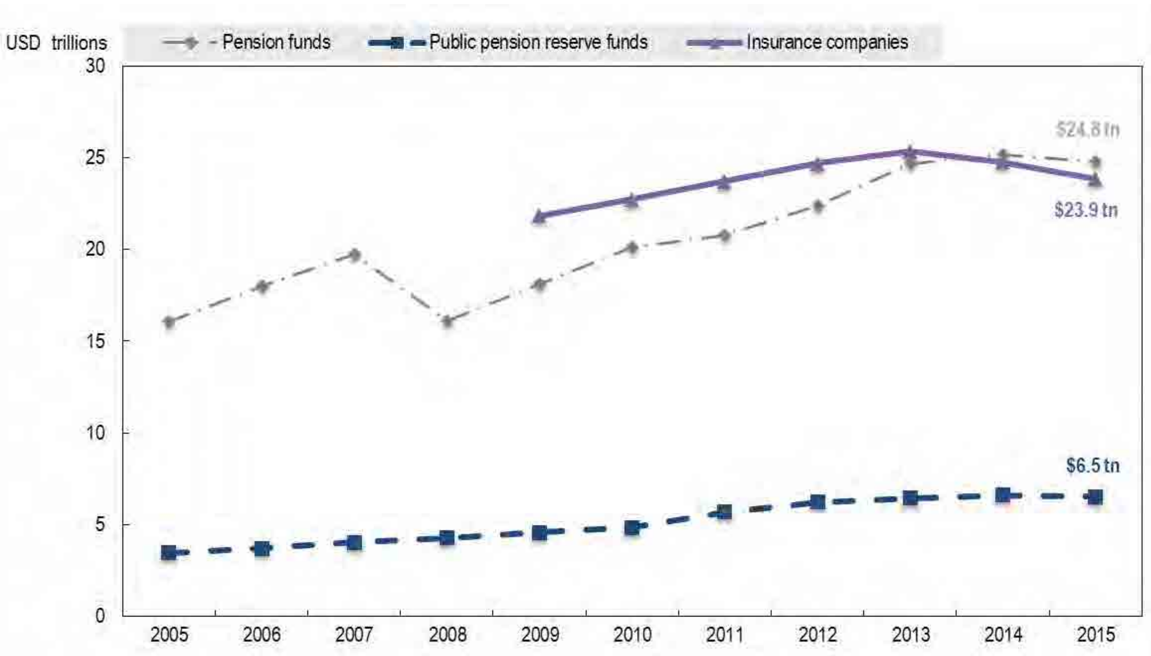
INTRODUCTION

Asset levels are growing in key institutional investor segments

In 2015, major asset owners in the OECD area, comprising pension funds, insurance companies, and public pension reserve funds, who together represent key segments of the institutional investment market, held USD 55.2 trillion in assets (Figure 1), a number now well above pre-crisis levels.[12] In that same year, the combined GDP of OECD countries was USD 52.4 trillion – asset owners together totalled 105% of the OECD region's GDP.

Figure 1. Assets in pension funds, insurance companies, and PPRFs in the OECD area, 2005-2015

In USD trillions



Note: Book reserves are not included in this chart. Total investments by pension funds are used as a proxy for total assets and may be a low estimate. Assets of insurance companies include assets of direct insurers and reinsurers.

For public pension reserve funds, data include Argentina's Sustainability Guarantee Fund (2011-2015), Australia's Future Fund, Belgium's Zilverfonds (2008-2015), Canada Pension Plan Investment Board, Quebec Pension Plan, Canada (2011-2015), Chile's Pension Reserve Fund (2010-2015), China's National Social Security Fund (2011-2015), Valtion Eläkerahasto, Finland (2013-2015), France's Pension Reserve Fund (2003-2012), Sustainability Fund, Germany (2015), Employees' Provident Fund Organisation, India (2012-2015), Ireland's National Pensions Reserve Fund (2005-2013), Japan's Government Pension Investment Fund, Korea's National Pension Service, Fonds de Compensation Commun au Régime Générale de Pension, Luxembourg (2015), New Zealand Superannuation Fund, Government Pension Fund - Norway, Government Pension Fund - Global - Norway (2011-2015), Poland's Demographic Reserve Fund, Portugal's Social Security Financial Stabilisation Fund, National Wealth Fund, Russian Federation (2011-2015), Spain's Social Security Reserve Fund, Sweden's AP1-AP4 and AP6, Unites States' Social Security Trust Fund.

Source: OECD calculations based on OECD Global Pension Statistics, Institutional Investors' Assets databases, and OECD estimates.

[12] It may seem in Figure 1 that assets are flat or declining in the past two years. This is mainly due to a strong dollar against many currencies. Actual underlying growth rates have been positive.

The total amount of assets under management for the Large Pension Funds (LPFs) for which data was received or obtained was USD 4.2 trillion at the end of 2015. The assets put aside by the largest pension funds for which we received data increased by 5.1% on average between 2014 and 2015 (through asset appreciation and/or fund flows). Trailing five-year real annualised returns were positive for the majority of funds, where history was available, with some funds reporting exceptionally strong returns over the past five years.

Sovereign Wealth Funds (SWFs) and Public Pension Reserve Funds (PPRFs) are becoming major players in international financial markets. Total amounts of PPRF assets were equivalent to USD 6.5 trillion by the end of 2015 for the countries in which data was received or obtained. PPRF assets increased 3.4% on average between 2014 and 2015 (due to asset appreciation and/or fund flows). Trailing five-year real annualised returns were positive for all funds, where history was available. Funds in New Zealand and Canada reported exceptionally strong returns over the past five years.

This growth in assets is likely to continue in OECD countries, especially in countries where mandatory retirement systems or where private pensions and insurance markets are still small in relation to the size of their economies. For example in France, where retirement is mostly funded through public spending, pension fund assets grew from just USD 388 million in 2005 to USD 13.3 billion in 2015.[13] Developing economies generally face an even greater opportunity to develop their institutional investor sectors as, with few exceptions, their financial systems are largely bank-based. Turkey's pension market grew from USD 3.2 billion in 2005 to USD 37.2 billion in 2015; China's from USD 8.4 billion to USD 146.7 billion over the same time period. Whether such growth continues across all countries 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, and becoming more common in non-OECD countries.[14]

Emerging economies are also home to some of the largest LPFs and PPRFs in the world. For example the survey included large selected pension funds in six major non-OECD countries: Brazil, Indonesia, Malaysia, Nigeria, the Russian Federation, and South Africa. South Africa's GEPF at USD 109.2 billion and Brazil's Previ at USD 39.4 billion stood out as the largest funds in their respective continents. Malaysia's Employees' Provident Fund, with assets under management of USD 159.5 billion is amongst the largest investors in the world.

The nature of long-term savings is changing

As described in the most recent OECD Pensions Outlook,[15] the pensions landscape has changed over the past decades in OECD countries. Governments, through pension reforms, have begun to emphasize contributory pension schemes to build assets in order to finance future retirement income, as opposed to retirement benefits provided through fiscal expenditures. This has enabled much of the growth observed in pension fund assets under management. In developing countries, governments are establishing mandatory and/or contributory retirement systems.

In this report, the long-term investment profiles of two major sectors, funded pension schemes [defined benefit (DB) and defined contribution (DC)] and reserve funds linked to public pay-as-you-go (PAYG)

[13] For country-level statistics, see Pension Markets in Focus 2016, www.oecd.org/pensions/Pension-Markets-in-Focus-2016.pdf.

[14] However, owing to rising public debt, some OECD countries such as Hungary and Poland have partially rolled back reforms that had established mandatory funded pension systems.

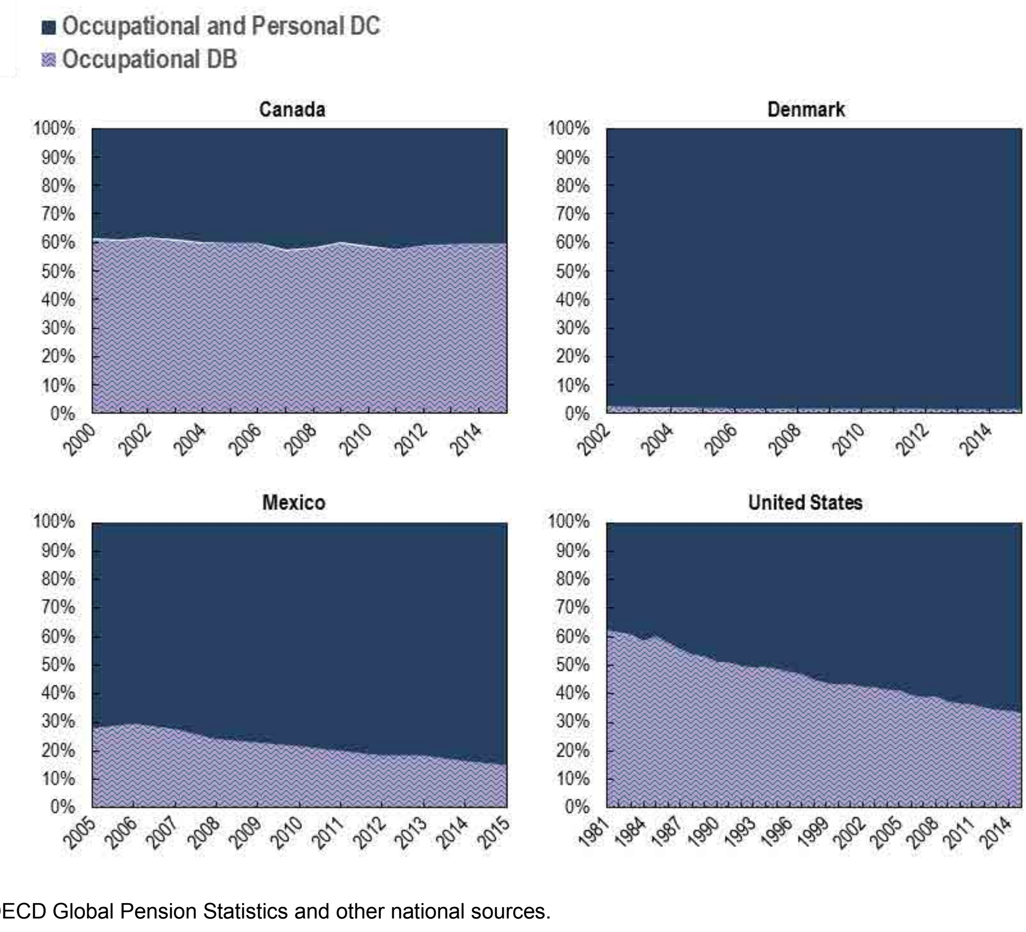
[15] OECD (2016) OECD Pensions Outlook, www.oecd.org/pensions/oecd-pensions-outlook-23137649.htm.

systems are analysed. This provides a picture, using microeconomic data, of two distinct pools of long-term savings.

The shift towards DC arrangements, where individuals bear the risks of retirement, compared to DB arrangements, is an important trend to be highlighted, and has been observed across OECD and non-OECD countries. As an example, in the early 1980s, the assets set aside to finance retirement income resided mostly in DB arrangements in the United States, at around 60% of total retirement assets (Figure 2). This share has steadily declined to 33% of total retirement assets in 2015, and is likely to continue to decline. This trend is also observable in other countries, such as Mexico. Denmark's retirement system, also shown in Figure 2, is dominated by savings in DC arrangements. Canada, by contrast, is still mostly dominated by large public DB plans, though DC arrangements constitute a sizeable portion of total assets. Across OECD countries, only Canada, Finland, Ireland, Israel, Portugal, and Turkey reported DB assets greater than 50% of total assets for funded pension plans in 2015. In emerging countries where in the past few decades new legislation has established mandatory or voluntary pension arrangements, it is more likely that these systems were created as DC or hybrid arrangements.

Figure 2. Percentage of assets in DB and DC pension arrangements in selected OECD countries

Percentage of total assets



Source: OECD Global Pension Statistics and other national sources.

It is important to point out this distinction as asset allocation, for example, of a defined benefit fund may not always compare to that of a defined contribution plan, even if members of both plans have similar investment horizons, as the management of investment decisions resides with different individuals (DB plans are professionally managed, DC plan investment choices reside with individual members).

Additionally, sponsor type (corporate, multiemployer, public), who may be subject to different regulatory environments, may influence the operating environment and characteristics of funds. Risk-sharing and pooling of investments in illiquid assets can be challenging in DC plans, as investors enter and leave employer-sponsored plans, or switch plan managers. Differing regulations for DB plans compared to DC plans will also influence the operating environment and investment profiles of funds. For example, some countries have liquidity requirements in place for DC plans which may limit a plan's ability to invest in illiquid assets. For policy makers looking to attract long-term financing, for example in infrastructure, the composition of local pension markets, regulations, and openness to foreign investment can influence how capital is invested.

EXECUTIVE SUMMARY

A challenging investment environment

Despite the good investment returns observed amongst LPFs and PPRFs and continued growth in assets, investors are facing a challenging investment environment. Perhaps most notably, it has become increasingly difficult for funds based in OECD countries to design investment policies that meet financial objectives using traditional methods (e.g. a traditional 60% equity 40% fixed income allocation). Adapting to higher volatility in global financial markets has led, for instance, to funds establishing opportunistic investment mandates and tactical allocation strategies that attempt to take advantage of short-term dislocations in financial markets. Such strategies essentially outsource a portion of a fund's long-term strategic allocation to specialist managers, giving them broader flexibility. Diversification across geographies and asset classes has also been increasing, along with the complexity of investment portfolios, for instance through the use of derivatives, which some funds may employ for hedging purposes or for replicating certain market exposures. Reporting methods that collect data using traditional asset classes may not always capture such information, especially figures that are aggregated at the national level.

The prolonged low-yield environment has also contributed to funding pressures in some markets. Even with the extended rally in equity markets, the funded status of some plans may not have improved significantly as interest rates (and discount rates) remain low.[16] Indeed, low interest rates affect both sides of the defined benefit balance sheet, by making it more difficult to earn a return to meet future obligations, and by also increasing pension liabilities. For defined contribution schemes, the effect on returns is similar, while low interest rates can increase annuity prices for retirees.[17]

LPFs and PPRFs are increasing alternative investments

Perhaps the most salient trend in response to economic and financial market conditions, observed since the survey was first launched in 2011, has been the gradual increase in alternative investments amongst both LPFs and PPRFs. Historical asset allocation for a group of 29 LPFs over the past six years shows that allocations to alternatives (including infrastructure) increased from 12.7% of total assets in 2010 to 13.8% in 2015 (Figure 3).[18] Over this same time period, funds on average increased allocations to fixed income and cash by 1.7 percentage points, and reduced equity by 2.9 percentage points. Shifting market values factor into changing asset allocation; however, given that equity markets have advanced through most of this time period, it appears that on average, funds have been reducing equity exposure in favour of larger alternative investment allocations, while balancing risky asset exposures against less risky fixed income and cash. The shifting composition of riskier assets in portfolios was strongest in funds based in Australia, Canada, Europe, Japan, and the United States. USS, based in the United Kingdom, reduced equity exposure by 22.3 percentage points, increased fixed income and cash by 20.0 percentage points, and increased alternatives and other by 2.4 percentage points, from 2010 to 2015. Total allocation to alternatives for Japan's PFA increased from 4.6% in 2010 to 8.1% in 2015.

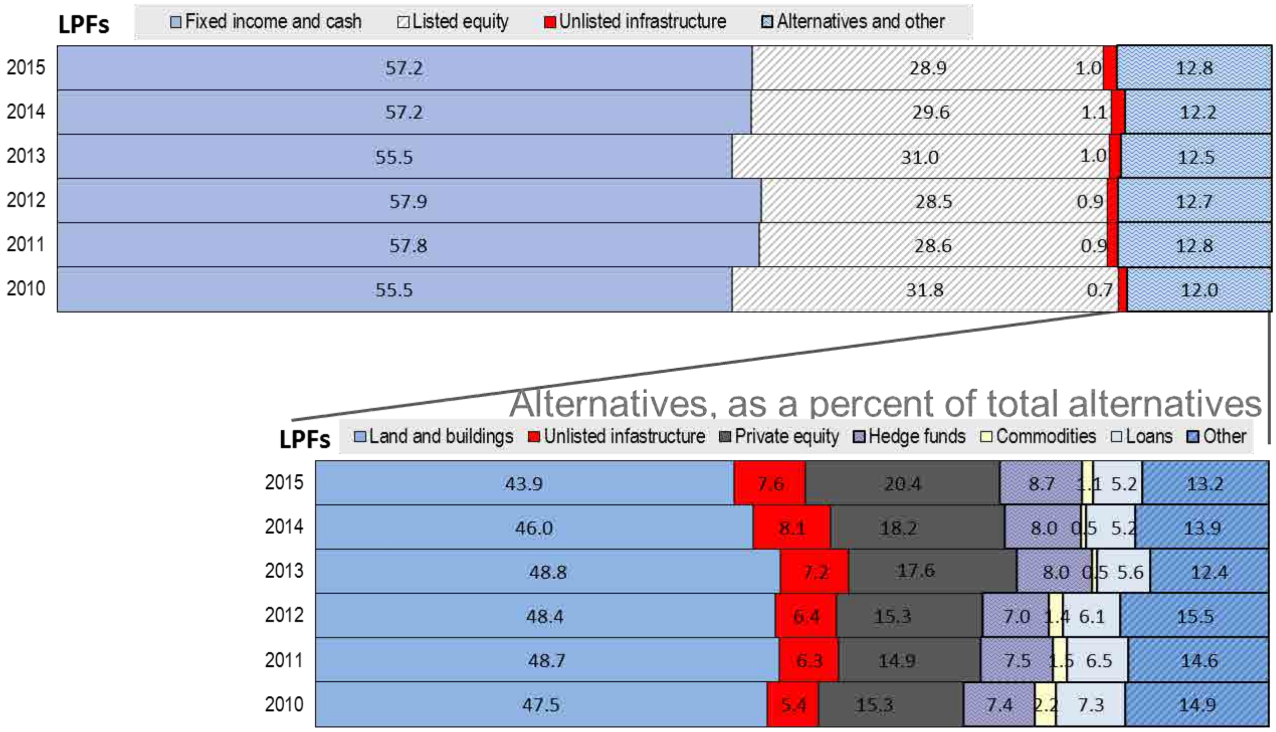
[16] For example, the aggregate funded status of pension plans sponsored by companies in the S&P 1500 index has not materially improved to pre-2008 levels; at December 31, 2015, Mercer estimated the aggregate funding level at 82% of liabilities, while in 2007 it hovered at around 100%.

[17] For an overview of financial issues facing global retirement schemes, see Pension Markets in Focus 2015, www.oecd.org/pensions/Pension-Markets-in-Focus-2015.pdf.

[18] Twenty-nine LPFs reported asset allocation over the past six years for this historical analysis, which is a subset of the 2015 total survey population.

Figure 3. Historical average asset allocation of selected LPFs and alternative asset breakout, 2010-2015

Asset allocation as a percentage of total assets



Note: Values are a simple average invested in each asset category for all LPFs, from which actual asset allocation was available in the periods 2010-2015, independently of their size in terms of assets. A total of 29 LPFs submitted asset allocations over the six-year period ending in 2015, a subset of the total survey population. Asset allocation totals may not add to 100% due to rounding.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

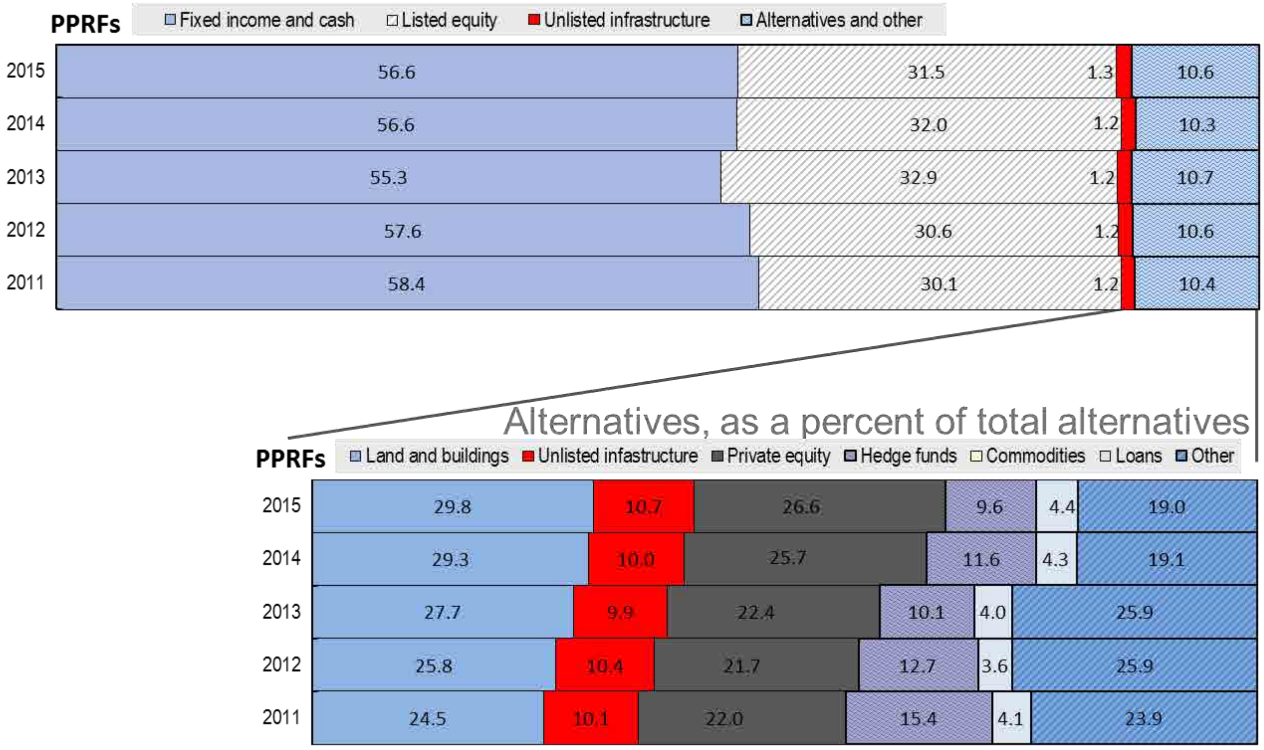
Looking at underlying trends within alternatives, LPFs have on average decreased allocations to land and buildings and increased allocations to infrastructure and private equity, with the latter seeing the strongest growth amongst the funds taken into consideration. Allocations to hedge funds over the past six years have increased slightly, while commodities have declined.

While the increasing trends in alternatives have been observed in most regions, it is not uniform across OECD and G20 countries. Pension funds in Brazil, for instance, reduced exposure to equities in favour of fixed income as domestic yields increased, while growth in alternative investment portfolios remained flat. Previ (Brazil) reduced its target to alternative investments from 14% in 2013 to 10% of total assets in 2015. FUNCEF, also in Brazil, increased its target fixed income allocation and reduced its allocation to land and buildings, and private equity. The Netherland's ABP's allocation to private equity decreased 2.9 percentage points from 2010 to 2015 while total allocations to alternatives and other increased 3.1 percentage points. Funds in other countries cited regulatory barriers to investing in alternative asset classes.

Amongst PPRFs, those funds that are limited to invest only in fixed income have not changed asset allocation (funds based in the United States, Belgium, and Spain), and some funds (Portugal) have reduced risk due to fiscal pressures. Those funds that are able to maintain a long-term investment horizon, and that do not have short-term liquidity requirements or investment restrictions, have set long-term investment policy targets that include return-seeking assets such as equities and alternatives.

Figure 4. Historical average asset allocation of selected PPRFs and alternative asset breakout, 2011-2015

Asset allocation as a percentage of total assets



Note: Values are a simple average invested in each asset category for all PPRFs, from which actual asset allocation was available in the periods 2011-2015, independently of their size in terms of assets. A total of 18 PPRFs submitted asset allocations over the five-year period ending in 2015, a subset of the total survey population. Asset allocation totals may not add to 100% due to rounding.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

On average, allocations to alternatives (including infrastructure) increased from 11.6% of the total portfolio in 2011 to 11.9% in 2015; a slower pace than what was observed amongst LPFs (Figure 4).[19] Funds also on average increased allocations to equities by 1.4 percentage points, and decreased fixed income and cash by 1.8 percentage points, contrary to trends observed amongst LPFs. Trends within alternatives show that funds have on average increased allocations to private equity, infrastructure, and land and buildings, with the latter showing the greatest increase amongst funds. Hedge fund allocations declined sharply compared to 2011.

A few funds within the PPRF group are just beginning to ramp up new allocations, which is partly driving the trends observed in Figure 4. The GPIF in Japan is migrating its portfolio to a new policy allocation of 50% equity and 50% fixed income, with up to 5% of the total portfolio invested in alternatives. In 2010 the fund had allocated 22.1% of the total portfolio to equities, with the rest, 77.9% in fixed income and cash. By the end of 2015, the fund had shifted to 43.0% in equities and 57.0% in fixed income and cash. The GPIF has been investing in internal resources to ramp up its alternative investment capabilities, which

[19] Eighteen PPRFs reported asset allocation over the past five years for this historical analysis, which is a subset of the 2015 total survey population.

included the establishment of a Private Market Investment Department in March 2016. The fund is currently making some of its first investments in private equity and other alternatives.

Sweden's AP3 increased allocations to alternatives from 13.6% of the total portfolio in 2010 to 20.5% in 2015. The New Zealand Superannuation Fund, which does not maintain a target allocation, reduced allocations to alternatives from 30.4% of the total portfolio in 2010 to 19.2% in 2015, while equities increased over the same time period.

For most funds, diversification of investment portfolios includes foreign allocations

Funds have mostly invested across borders by diversifying equity and fixed income portfolios, but some also invest in foreign alternatives such as real estate, private equity and infrastructure. Emerging market investments are part of the foreign allocations of both LPFs and PPRFs, with emerging markets equities the most common.

The average LPF based in OECD countries included in this publication invested 49.0% of total assets in foreign markets, while absolute levels of foreign investment varied amongst LPFs between 89.6% at the highest to 7.0% at the lowest. Funds based in Europe and Canada generally had high amounts invested overseas, while funds based in the United States had lower amounts. Foreign diversification is mostly the result of regulation and investment policy; large funds based in countries with small domestic markets may be more inclined to invest abroad to diversify and increase the opportunity set. Funds based in non-OECD countries invested much lower amounts in foreign markets, just 12.4% on average. Eight LPFs based in non-OECD countries reported zero foreign exposure, three of which were based in Brazil, two in Mozambique, one in Indonesia, one in the Russian Federation, and one in Nigeria.

Some PPRFs have diversified investments into foreign markets. With some major exceptions that reported zero foreign exposure (eight funds in total, based in Argentina, Belgium, Bosnia & Herzegovina, Bulgaria, Mexico, Poland, Spain and the United States), the other PPRFs had large exposures to foreign markets. Chile invested 100% of its portfolio abroad. Norway's Government Pension Fund Global also invested 100% of assets in foreign markets. Canada's CPPIB invested 80.4% in foreign markets, with over 35% of total assets invested in foreign alternative investments.

Infrastructure investment has been 'low and slow'

Similar to last year's survey, this year's results show that overall investment levels are low compared to total investment capital in institutional investor portfolios, and growth in investment levels has been slow. When total assets under management are considered for the funds that returned questionnaires (i.e. 95 funds, USD 8.4 trillion), infrastructure investment in the form of unlisted equity and debt was USD 91.7 billion in 2015, representing 1.1% of the total assets under management.[20]

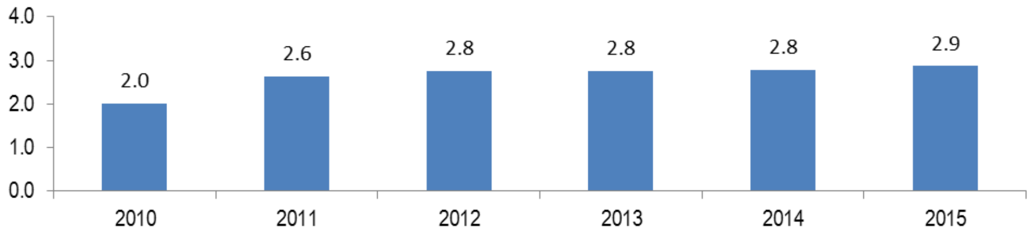
18 funds reported their infrastructure allocation in the survey over the period 2010-2015 (Figure 5). The average of these funds increased from 2.0% of total assets in 2010 to 2.9% in 2015. The pace of this increase has been slow over the past four years, indicating that infrastructure allocations, on average, have not been growing compared to the rest of the portfolio.

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

Changes in infrastructure allocations were not uniform across the survey population – despite the slow increase on average, some funds have made dramatic changes to their infrastructure portfolios. Four of the 18 funds in Figure 5 had established new allocations to infrastructure in the past six years. PFZW, based in the Netherlands, reported 1.5% of the total portfolio was invested in infrastructure in 2010, compared to 3.4% in 2015. The allocation for USS, based in the United Kingdom, increased from 3.1% to 4.5% over the same time period. For the Québec Pension Plan, allocations to infrastructure increased from 2.1% to 4.9%. Sweden's AP3 reported a decrease in infrastructure investment from 2.1% to 1.6%.

Figure 5. Historical unlisted infrastructure equity allocation of selected LPFs and PPRFs, 2010-2015

As a percentage of total assets



Note: Values are a simple average invested in unlisted infrastructure equity for those LPFs and PPRFs that reported unlisted infrastructure equity exposure in Part B of this survey, independently of their size in terms of assets. The data tracks a total of 18 LPFs and PPRFs over the period 2010-2015.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Some funds have reported challenges to increasing their infrastructure allocation. For instance, two funds based in Chile cited regulatory constraints as a barrier to establishing an infrastructure investment allocation. A fund based in Sweden cited legal restrictions on unlisted investments. Other funds cite a lack of suitably structured assets or availability of quality investments as limiting their ability to grow their allocation. This seems to confirm the importance of barriers and disincentives which limit such investments and the relevance and need for policymakers to address them, and also the need for interventions in the form of risk mitigation and efficient risk allocation. High valuations of infrastructure assets may also constrain investment. While a number of funds are expressing greater interest in investing in greenfield assets, few funds reported exposures to such assets, indicating that policies targeted at attracting investment in new projects is needed, along with improving business and financing models to cope with construction risk.

Potential unmet demand for infrastructure assets

Target allocations amongst the funds with dedicated exposure ranged on the low end from under 1% to as much as 20% of total assets. 13 of 16 funds that reported a separate allocation to unlisted infrastructure were below reported targets at the end of 2015. Four LPFs indicated that they planned to increase target allocations to infrastructure in the next one to two years.

A number of funds indicated that they planned to add a new allocation to infrastructure within the next two years, including three funds in Romania, one fund in Italy, one fund in Mozambique, one fund in Nigeria, and one fund in Bosnia-Herzegovina. Five funds including Russia's VTB, Chile's AFP Provida, ERAFP in France, Spain's Endesa, and Indonesia's BPJS Ketenagakerjaan, planned to add new allocations to infrastructure in the near future. Another fund, based in Spain, does not currently invest in infrastructure, but is considering adding an allocation, citing historically low interest rates in Europe as contributing to the attractiveness of infrastructure investment.

With a few exceptions, funds are not investing in infrastructure in emerging markets

Twelve funds reported domestic and foreign allocations in their unlisted infrastructure equity portfolio – this group consists mostly of large funds based in OECD countries that have an established track record and institutional knowledge regarding infrastructure investment. Most funds in the survey did not report this level of detail, but the results from this group of investors, which is fairly representative of large and sophisticated investors, shows low or no investment in emerging markets by most funds, which indicates that further policy work may be necessary in order to facilitate north-south investment.

Most of these twelve funds invested a significant portion of their infrastructure portfolio outside of their domestic market, with the exception of funds based in Australia, which were biased towards Australian assets, and one fund in Peru which invested all assets in the domestic market. For those funds that reported large foreign exposures, it was mostly in other OECD countries, particularly in the European Union and North America.

No funds reported exposure to infrastructure investments in Africa or in the Middle East. Very little investment was reported in Asia (excluding Japan and Korea), and Latin America. Eastern Europe also saw little investment by this group of funds. An exception amongst survey respondents was the Canada Pension Plan Investment Board. CPPIB opened offices in New York and São Paulo, putting investment professionals closer to key markets, and expanded its activities in Latin America, India and other selected Asian markets over 2014. The fund has five offices across four continents, and its foreign allocations are relatively balanced amongst developed and emerging markets.

It is also noteworthy that the majority of funds based in non-OECD countries do not invest in unlisted infrastructure equity. Of the 24 funds in non-OECD countries that reported their asset allocations, only three reported an allocation to unlisted infrastructure equity.

Sustainability is a major theme amongst investors

In Part C of this report, 29 funds reported allocations to "green" investments, broadly defined as investments that meet certain environmental criteria. The results reveal that investors are taking different approaches to sustainability in their investment process and portfolio allocations, with some reporting equities, fixed income (green bonds), and alternative assets as meeting environmental criteria. A noteworthy trend amongst the funds that reported green investments was a general increase in the amount of pension funds that invest in green bonds, and also in the relative size of their allocations. CalSTRS reported USD 25.0 million invested in green bonds in 2013, by 2016 this allocation had increased to USD 296.9 million.

Institutional investors are developing sophisticated processes and tools to incorporate into their decision making the financial impacts of environmental factors as well as expected policy and business responses to risks and opportunities. Underlying these developments is a number of trends in investment practices. For some time, Environment, Social and Governance (ESG) frameworks have been utilised by some investors to evaluate risks and opportunities, taking into account financial and non-financial information on investments. Broadly, ESG frameworks could be defined as investment policies or principles recognising that ESG factors may impact portfolio performance and so affect the investor's ability to meet investment goals or obligations.

An increasing number of funds are going beyond ESG and building investment strategy around other goals, such as evaluating climate change risk in investment portfolios and improving portfolio climate resiliency. Some funds have moved to align their investment activities with broader environmental or development objectives such as the United Nations Sustainable Development Goals (SDGs).

Fifteen funds reported social impact investments, which ranged from microfinance and venture capital/private equity with a targeted social development outcome to social/affordable housing and social impact bonds. Social impact investments, broadly, are investments with a desired development or positive social impact that could represent human rights, health, safety, education, or general wellbeing.

SURVEY OF LARGE PENSION FUNDS AND PUBLIC PENSION RESERVE FUNDS

PART A1 – LARGE PENSION FUND INVESTMENT PORTFOLIOS

Large pension fund size

The total amount of assets under management for the Large Pension Funds (LPFs) covered by the survey was approximately USD 4.2 trillion at the end of 2015 (Table 1). Within the OECD countries for which we received data, the Netherlands has two of the largest funds, ABP at USD 429.9 billion and PFZW at USD 178.1 billion. Amongst the largest are three funds based in the United States: CalPERS at USD 301.9 billion, CalSTRS at USD 191.4 billion, and the New York City Combined Retirement System at USD 158.2 billion. South Africa's GEPF at USD 109.2 billion and Singapore's Central Provident Fund at USD 213.6 billion also ranked high in the list. This year's survey includes responses from 72 funds, the largest survey population since the first annual survey completed in 2011, representing approximately 28 countries in the OECD and outside the OECD, complemented by additional information collected in publicly available reports for 16 additional funds.

Table 1 also shows large selected pension funds in six major non-OECD countries: Brazil, Indonesia, Malaysia, Nigeria, Russia, and South Africa. South Africa's GEPF at USD 109.2 billion and Brazil's Previ at USD 39.4 billion stood out as the largest funds in their respective continents. The Employees' Provident Fund of Malaysia is the largest pool of retirement savings in the country, at USD 159.5 billion, and amongst the largest institutional investors in Asia.

The assets put aside by the largest pension funds for which we received data increased by 5.1% (nominal) on average between 2014 and 2015 (through asset appreciation and/or fund flows). It should be noted that asset levels in some base currencies translated into USD are lower in 2015 compared to 2014 due to a stronger dollar. Funds based in the United States had slightly positive to slightly negative growth rates. Funds in Australia grew strongly in 2015: QSuper grew by 23.8%, HESTA by 12.1%, and Hostplus by 13.7%. Some Funds in Europe also increased by sizeable amounts. PFA Pension in Denmark increased 37.0% on the heels of strong net inflows; ERAFP in France increased 11.4%. In all, 17 funds showed an increase in assets greater than 15%. Eight funds showed a decrease in assets since 2014. Funds in most regions were buoyed by good investment returns in 2015.

In terms of total assets relative to the national economy, Singapore's Central Provident Fund had the highest ratio at 74.0% of GDP, followed by Malaysia's Employees' Provident Fund at 59.2%, ABP at 58.4% of GDP (which with PFZW represented 82.6% of the Dutch GDP), South Africa's GEPF at 40.9%, and Denmark's ATP at 34.8%. The weighted average of LPF assets accounted for 18.1% of the national GDP in the countries covered in this publication.

Table 1. Total assets of selected LPFs in 2015

Country head office	Name of the fund or institution	Total investments or assets (1)		
		USD bn.	% of GDP	% increase (compared to the previous year)
Netherlands	Stichting Pensioenfonds ABP	429.9	58.4	1.2
United States	CalPERS (2,3)	301.9	1.7	2.1
Singapore	Central Provident Fund (2)	213.6	74.0	8.7
United States	CalSTRS (2,3)	191.4	1.1	0.5
United States	New York State and Local Retirement System (2,4)	178.6	1.0	1.0
Netherlands	PFZW	178.1	24.2	1.2
Malaysia	Employees' Provident Fund	159.5	59.2	7.5
United States	New York City Combined Retirement System (2)	158.2	0.9	-0.6
United States	Florida Retirement System Pension Plan (2,3)	151.2	0.8	1.4
Canada	OTPP	121.6	8.4	10.4
South Africa	GEPF	109.2	40.9	9.8
Denmark	ATP (2)	103.2	34.8	0.1
Japan	Pension Fund Association	102.0	2.3	-3.0
Sweden	Alecta	86.7	17.5	7.0
United States	State of Wisconsin Investment Board (2)	85.4	0.5	-3.8
Hong Kong, China	MPFA - Mandatory Pension Fund Schemes (5)	76.3	n.d.	4.6
Canada	British Columbia Investment Management Corporation	74.1	5.1	-1.5
United Kingdom	USS	70.6	2.5	18.1
Australia	AustralianSuper (2,3)	70.5	5.7	16.9
Germany	Bayerische Versorgungskammer (2)	68.3	2.1	6.9
United Kingdom	BT Pension Scheme (2,3)	67.7	2.3	6.8
Netherlands	PMT	65.9	9.0	3.4
Canada	Alberta Investment Management Company (AIMCO) (2)	65.1	4.5	20.7
United States	Massachusetts PRIM Board (3)	61.0	0.3	0.4
Denmark	PFA Pension	56.6	19.1	37.0
Canada	OMERS (2)	56.4	3.9	7.1
	United Nations Joint Staff Pension Fund (3)	53.6	n.d.	1.4
Finland	KEVA	48.1	21.1	6.4
United States	Los Angeles County Employees Retirement Association	46.6	0.3	-1.3
Australia	QSuper	45.9	3.8	23.8
Finland	Varma Mutual Pension Insurance Company	44.7	19.6	3.1
Chile	AFP Provida (6)	42.6	18.8	5.2
Brazil	Previ	39.4	2.6	-7.7
Finland	Ilmarinen	39.0	17.1	4.8
Mexico	Afore XXI Banorte (7)	36.6	3.4	2.3
Australia	UniSuper Management Pty Ltd	36.5	3.1	17.1
Sweden	AP7	33.5	6.8	11.8
Chile	AFP Cuprum	33.3	14.9	10.7
United Kingdom	Railways Pension Scheme (2)	33.3	1.2	3.6
Denmark	PensionDanmark	25.7	8.7	7.0
France	ERAFP	25.6	1.1	11.4
Australia	Health Employees Superannuation Trust Australia	24.7	2.1	12.1
Australia	CBUS	23.7	2.0	11.1
Israel	Menora-Mivtachim	19.6	6.6	14.3
United States	State Universities Retirement System of Illinois (8)	17.4	0.1	-0.1
Australia	Sunsuper (7,9)	16.7	1.4	6.3
Switzerland	Pensionskasse Post	15.8	2.4	-1.8
Indonesia	BPJS Ketenagakerjaan (3)	14.6	1.7	4.2
Australia	Hostplus Superannuation fund	13.9	1.2	13.7
Brazil	FUNCEF	13.9	0.9	0.3

Country head office	Name of the fund or institution	Total investments or assets (1)		
		USD bn.	% of GDP	% increase (compared to the previous year)
Australia	Telstra Superannuation Scheme (3)	13.3	1.1	8.2
Israel	Makefet	12.4	4.2	11.2
Italy	Cometa	10.6	0.6	4.4
Peru	AFP Integra	10.3	5.7	8.4
Germany	Bayer-Pensionskasse (2)	9.2	0.3	3.4
Nigeria	RSA Fund (10)	8.1	1.7	16.0
Turkey	OYAK (2)	7.7	1.0	3.7
Italy	FONCHIM	5.7	0.3	7.6
Croatia	Allianz ZB obligatory pension fund	4.1	8.5	10.1
Spain	Fonditel (11)	3.7	0.3	4.7
Russian Federation	Sberbank	3.4	0.3	233.8
Italy	Fonte	3.3	0.2	9.9
Chile	AFP Modelo	3.3	1.5	38.7
Croatia	Raiffeisen Mandatory Pension Funds	3.2	6.8	11.9
Russian Federation	Lukoil - Garant	3.0	0.3	46.3
South Africa	Sentinel Retirement Fund (12)	2.9	1.1	6.8
Brazil	FAPES - BNDES (3)	2.8	0.1	3.7
Portugal	Pension funds managed by CGD (13)	2.7	1.4	7.3
Russian Federation	Future ("Buduschee")	2.2	0.2	41.6
Romania	ING Mandatory pension fund (14)	2.0	1.2	17.2
Nigeria	CPFA Fund (6)	1.8	0.4	11.3
Spain	Endesa	1.8	0.2	3.5
Croatia	PBZ CO	1.7	3.5	13.4
Russian Federation	VTB (3)	1.4	0.1	49.2
Portugal	Banco BPI Pension Fund	1.4	0.7	16.3
Croatia	Erste Plavi	1.4	2.9	13.3
Romania	Azt Viitorul Tau (15)	1.3	0.8	27.5
Nigeria	AES Fund (6)	0.7	0.1	21.8
Spain	Santander	0.2	0.0	8.2
Romania	ING ACTIV and ING OPTIM Voluntary Pension Funds (14)	0.1	0.1	15.0
Mozambique	Barclays Bank - Mozambique	0.1	n.d.	2.4
Romania	Raiffeisen Acumulare	0.0	0.0	15.8
Spain	CCOO	0.0	0.0	3.5
Mozambique	Mozal	0.0	n.d.	40.0
Total		**4,174.0**	**18.1**	**5.3**

“..” means not available

(1) Data correspond to all forms of investment with a value associated with a pension fund/plan. (2) Data for 2015 has been gathered from publicly available sources. (3) Data is as of June 30, 2015. (4) Data is as of March 31, 2016. (5) Assets reported by the Mandatory Pension Fund Authority are aggregated from 36 member schemes. (6) Data is as of September 30, 2015. (7) Data is as of August 31, 2015. (8) Data refer only to DB pension plans. (9) Data refer to the balanced option only. (10) In Nigeria, there are three types of pension schemes, namely, the Retirement Savings Account (RSA), which is contributory; the Closed Pension Funds; and the Approved Existing Schemes (AES). The largest pension fund from each of these three schemes has been selected. (11) Data refer to Fonditel's biggest pension plan: Empleados de Telefónica de España. (12) Data refer only to the Pensioner Portfolio. (13) Data cover the CGD Staff's Pension Fund, and the pension funds of Fidelidade, Galp Energia, Império-Bonança, and Mundial Confiança. (14) Data is as of July 31, 2015. (15) Data refer to the largest pension plan managed by Azt Viitorul Tau.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs and publicly available reports.

LPF asset allocation

Figures 6 and 7 show LPF asset allocation grouped by OECD and non-OECD countries. The simple average portfolio for the LPFs based in the OECD shows that 46.0% of total assets were invested in fixed income and cash, 35.4% in equity, and 18.6% in alternative/other investments in 2015. For LPFs in non-

OECD countries, the simple average portfolio held 69.2% in fixed income and cash, 24.0 in equities, and 6.8% in alternatives/other investments.

The survey shows the asset allocation of both defined benefit and defined contribution pension funds. In OECD and non-OECD countries, a spectrum of fund profiles existed, from portfolios invested in predominately safe assets such as fixed income and cash, to portfolios with higher amounts of equities and investments in alternative asset classes.

Within the OECD, funds based in France, Italy, Spain, and Mexico had higher allocations to fixed income and cash. Italy's Cometa fund invested 89.5% of assets in fixed income and cash, while other conservative portfolios PFA Pension (Denmark) and ERAFP (France) invested 69.1% and 65.7%, respectively, in fixed income and cash. Afore XXI Banorte, Mexico's largest pension fund, invested 74.1% of assets in fixed income and cash. AP7, based in Sweden, had the highest allocation to equity at 88.4%, followed by the United Nations Joint Staff Pension Fund at 64.7%.

Figure 6. Asset allocation of selected LPFs based in OECD countries, 2015

As a percentage of total investment

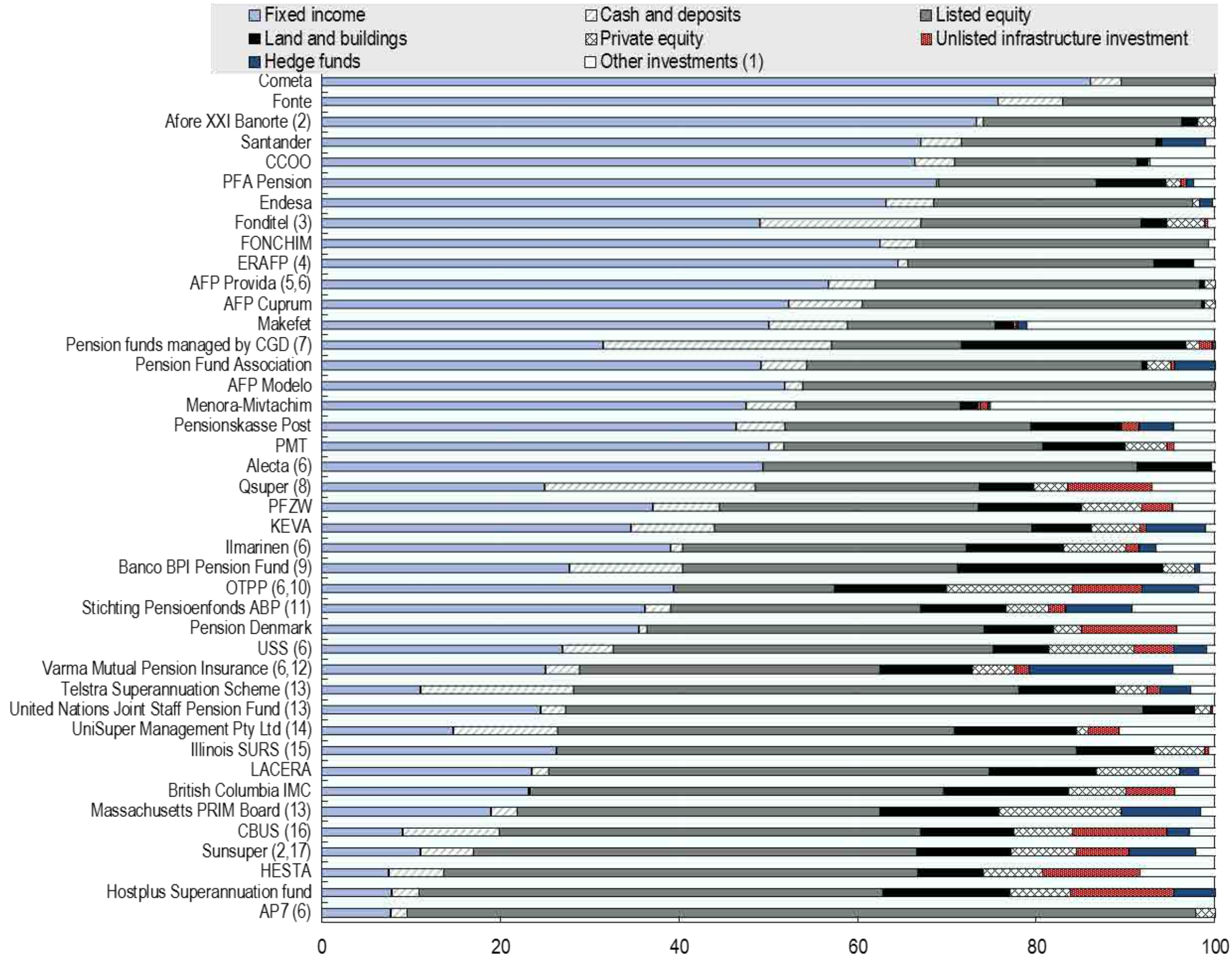
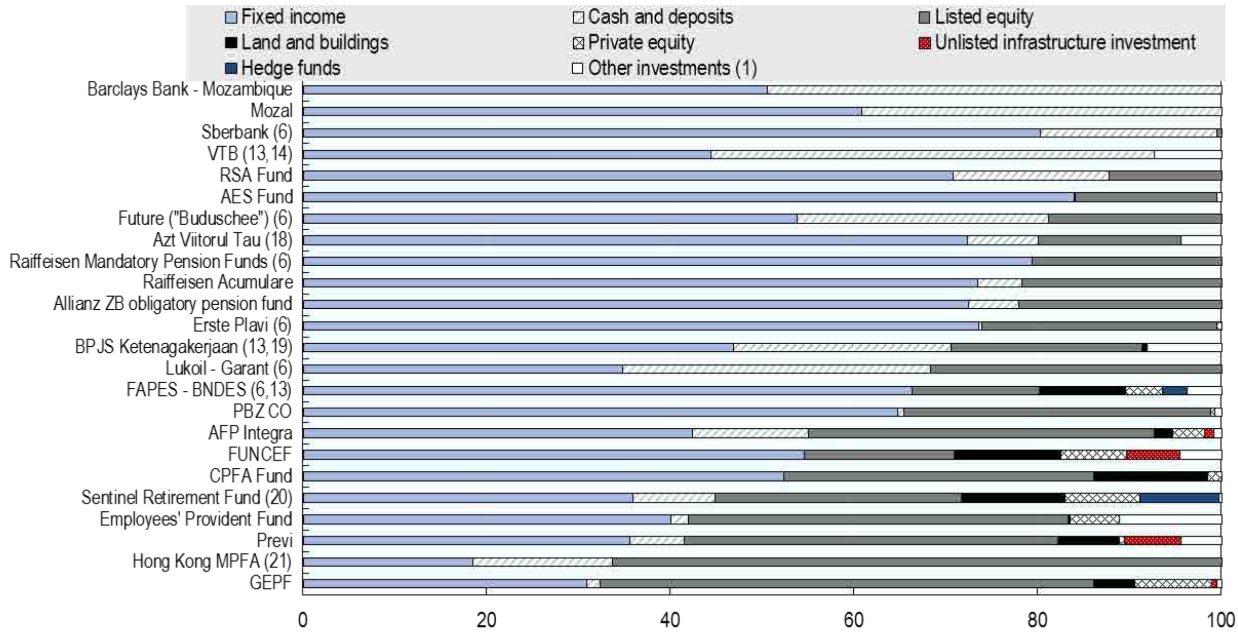


Figure 7. Asset allocation of selected LPFs based in non-OECD countries, 2015

As a percentage of total investment



(1) The "other" category includes loans, commodities and other investments. (2) Data is as of August 31, 2015. (3) Data refer to Fonditel's biggest pension plan: Empleados de Telefónica de España. (4) Other investments include multi-asset fund-of-funds. (5) Data is as of September 30, 2015. (6) Other investments and/or cash investments have been excluded from asset allocation calculations because they were negative in 2014. (7) Data cover the CGD Staff's Pension Fund, and the pension funds of Fidelidade, Galp Energia, Império-Bonança, and Mundial Confiança. (8) Other investments include the net of receivables and payables, including dividends receivable and asset purchase/sales still to settle at year end. (9) Other investments include equity funds, fixed income funds, and absolute return funds. (10) Other investments include real estate debt, timberlands, and derivatives. (11) Other investments include derivatives. (12) Other investments include unlisted equities. (13) Data is as of June 30, 2015. (14) Other investments include listed infrastructure. (15) Data only refer to DB pension plans. (16) Other investments include opportunistic growth investments. (17) Data refer to balanced plan only. (18) Data refer to the biggest pension plan managed by Azt Viitorul Tau. Other investments include UCITS. (19) Other investments include mutual funds. (20) Data refer to the Pensioner Portfolio. (21) Asset allocation reported by the Mandatory Pension Fund Authority is aggregated from 36 member schemes.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

In non-OECD countries, portfolios were tilted towards safer assets. Two funds based in Mozambique, Barclays Bank – Mozambique and Mozal, invested 100% of assets in fixed income and cash. Funds in Russia, Nigeria, and Romania also had high allocations to fixed income and cash. BPJS Ketenagakerjaan, based in Indonesia, reported 70.6% of assets were invested in fixed income and cash; the Employees' Provident Fund Malaysia invested 42.0% in fixed income and cash, and 41.4% in equities.

Alternative investments for LPFs include hedge funds, real estate, unlisted infrastructure, private equity, and other categories such as natural resources, loans, or commodities. The survey reveals that LPFs across regions have adopted alternative investments in varying degrees, but that alternatives' share of portfolios has been increasing (see executive summary for historical analysis of portfolio trends). Canada's OTPP invested 42.6% of total assets in alternative/other investments, the highest in the survey population. The fund also had the highest allocation to private equity at 14.1%. Four funds reported over 35% of total assets were allocated to alternatives/other investments: the USA's Massachusetts PRIM Board at 37.5%, Finland's Varma Mutual at 37.5%, Australia's Hostplus at 37.2%, and Spain's Santander at 35.9%.

Amongst non-OECD countries, FUNCEF and FAPES-BNDES, both based in Brazil, had sizeable allocations to alternatives/other investments: 28.9% and 19.7%, respectively. Sentinel Retirement Fund, based in South Africa, had the highest allocation to alternatives/other investments amongst funds based in non-OECD countries at 28.2% of total assets. The Employees' Provident Fund, Malaysia, invested 5.4% of total assets in private equity at the end of 2015, along with 11.0% in loans. Ten funds out of the total 64 in this section reported zero exposure to alternative investments.

Two Portuguese funds had high allocations to real estate: pension funds managed by CGD at 25.1% and Banco BPI at 23.0%. Massachusetts PRIM, USS, Los Angeles County Employees' Retirement System, and GEPF had sizeable allocations to private equity at 13.7%, 9.5%, 9.4%, and 8.4%, respectively. Varma Mutual Pension Insurance Company, Massachusetts PRIM, Sentinel Retirement Fund, and Australia's Sunsuper led the survey population in terms of hedge fund allocation with 16.1%, 8.9%, 8.8%, and 7.5%, respectively. As part of the alternative asset allocation, some funds also invested in infrastructure (see Part B – Infrastructure Investment).

LPF foreign investment

To some extent, pension fund investment in foreign markets can be an indicator as to how well domestic capital markets are integrated with foreign markets (Figures 8 and 9). All large pension funds based in the OECD invested at least part of their portfolios in foreign markets, although absolute levels of foreign investment varied widely, between 89.6% at the highest to 7.0% at the lowest (Figure 8). The most common asset classes invested abroad were fixed income and equities. Funds based in Europe tended to have large overseas allocations to both traditional and alternative investments. Sweden's AP7 invested a substantial amount of equities in foreign markets, 87.4% at the end of 2015. Dutch pension funds ABP, PMT, and PFZW all invested large amounts of their portfolios in foreign markets, which included allocations to alternatives. This may be related to the size of domestic markets (comparatively large funds based in countries with small domestic markets may be more inclined to invest in foreign financial markets). But in most instances, especially in less mature pension systems, foreign investment is first decided by regulatory policy (quantitative limits on foreign allocation), and then by individual fund policy.

Massachusetts PRIM Board, Los Angeles County Employees' Retirement System, and State Universities Retirement System of Illinois, all based in the United States, reported moderate allocations to foreign investments at 29.5%, 27.0%, and 17.6%, respectively. Funds in the United States do not have regulatory constraints on foreign investments, yet their overseas allocations are much lower compared to European funds, perhaps as a result of domestic investment opportunities compared to foreign, the absolute size of domestic capital markets compared to foreign markets, or home-market bias. Out of funds based in OECD countries, the average fund allocated 48.9% abroad.

A number of funds invested in alternatives in foreign markets. Varma Mutual Insurance, based in Finland, invested 16.1% of the total portfolio in foreign hedge funds. Canada's OTPP invested 13.0% in foreign private equity. Superannuation funds in Australia invested in foreign unlisted infrastructure, with reported allocations of 6.1% for HESTA, 4.2% for CBUS, 3.7% for Hostplus, 2.8% for QSuper. See Part B for an analysis of geographical dispersion of infrastructure portfolios.

Figure 8. Foreign investment by asset class, selected LPFs based in OECD countries, 2015

As a percentage of total (i.e. domestic and foreign) investment

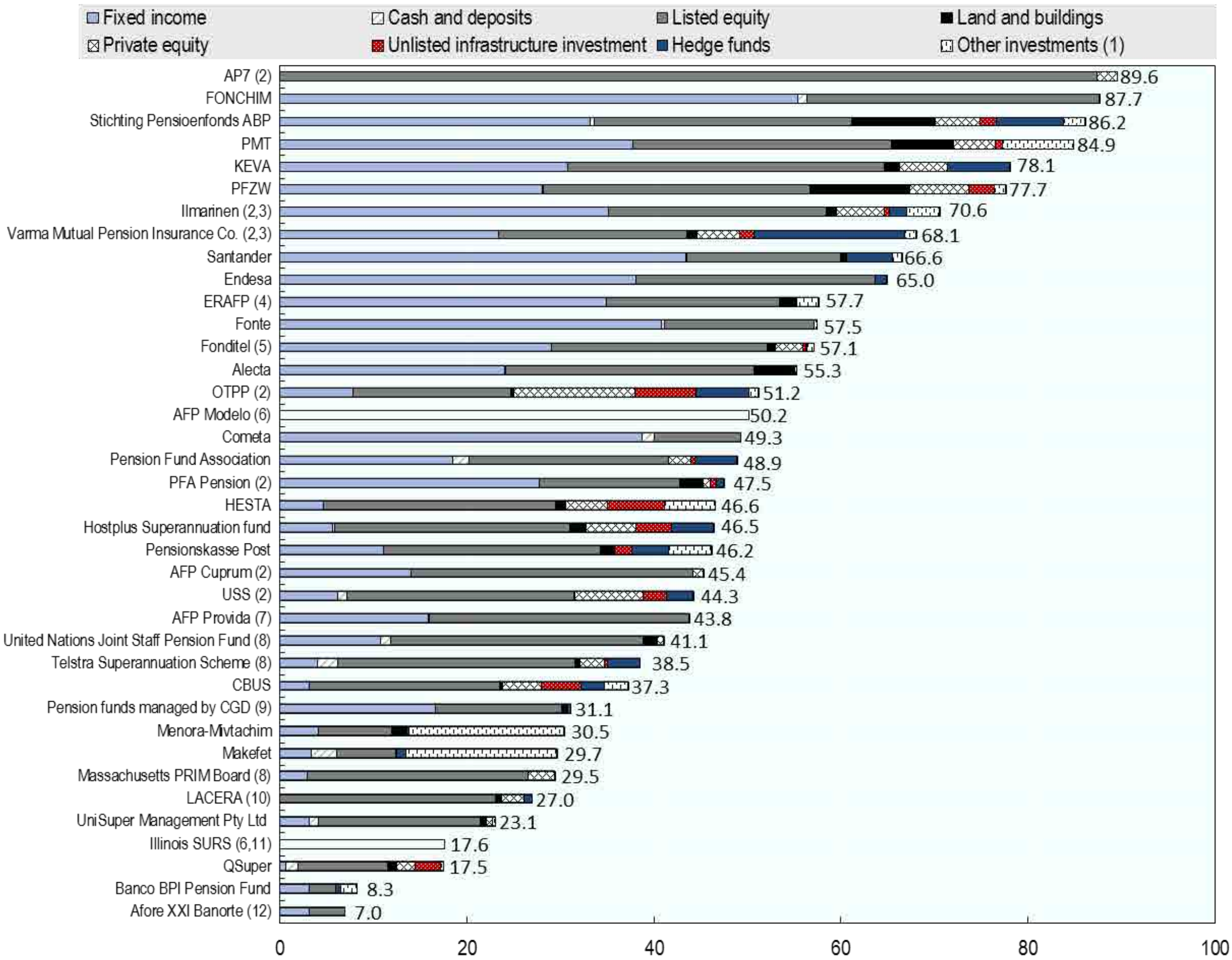
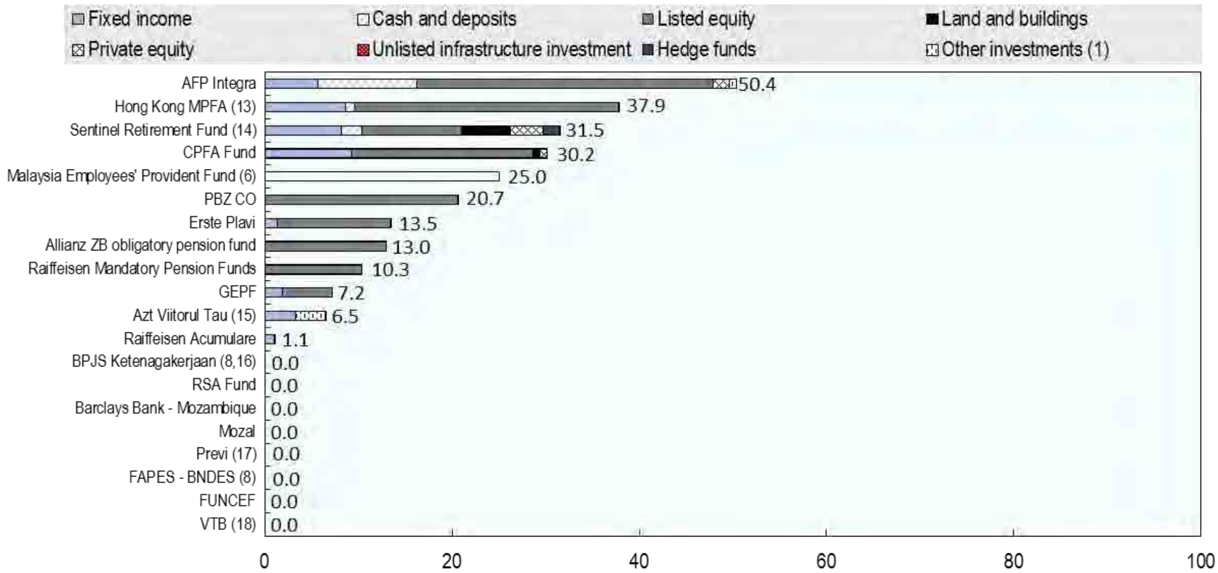


Figure 9. Foreign investment by asset class, LPFs based in non-OECD countries, 2015

As a percentage of total (i.e. domestic and foreign) investment



(1) The "other category includes loans, commodities, and other investments. (2) Cash and deposits and/or other investments have been excluded because they were negative in foreign markets in 2015. (3) Investments in commodities have been excluded from calculations of other investments because they were negative in 2015. (4) Cash and deposits are not all domestic. Some deposits are in money market funds governed by French law in the European Union. (5) Data refer to Fonditel's biggest pension plan: Empleados de Telefónica de España. (6) Breakdown of foreign investment by asset class was not available. (7) Data is as of September 30, 2015. (8) Data is as of June 30, 2015. (9) Data cover the CGD Staff's Pension Fund, and the pension funds of Fidelidade, Galp Energia, Império-Bonança, and Mundial Confiança. (10) Foreign investments refer to investments outside Canada and the United States. (11) Data only refer to DB pension plans. (12) Data is as of August 31, 2015. (13) Foreign allocation reported by the Mandatory Provident Fund Schemes Authority is aggregated from 36 member schemes. (14) Data only refer to the Pensioner Portfolio. (15) Data refer to the biggest pension plan managed by Azt Viitorul Tau. Other investments include UCITS. (16) Foreign investments are prohibited. (17) Investments abroad occur through funds constituted in Brazil, hence they are considered as internally made. (18) VTB invests in bonds of international financial organisations, however these work by Russian legislation.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Some funds based in non-OECD countries invested assets abroad, although on average much less (the average fund invested 12.4% in foreign markets) compared to funds in OECD countries. Chile's AFP Integra had the highest amount in the survey at 50.4%. Aggregated provident schemes in Hong Kong (MPFA) invested 37.9% overseas, mostly through equity markets but also in fixed income. The Sentinel Retirement Fund, based in South Africa, allocated 3.5% to foreign private equity. Eight funds reported zero exposure to foreign markets including three funds in Brazil and two funds based in Mozambique. Malaysia's Employees' Provident Fund invested 25.0% in foreign markets.

LPF performance – Investment rates of return in local currency

2015 delivered positive returns to most LPFs – despite relatively unimpressive returns in major stock markets in the United States, Canada, and across Europe. Low global growth, low inflation and low interest rates all contributed to relatively muted performance compared to 2014 and 2013. Volatility was high in emerging markets, particularly in Brazil and South Africa. Currencies fluctuated considerably in 2015 with the U.S. dollar riding one of its strongest rallies in history – levels of foreign investment by pension funds, particularly in dollar denominated assets, compared to benchmarks, could strongly influence reported returns in local currency. Differences in pension fund returns show a wide variation owing to heterogeneity in size, local market performance, levels of foreign investment, investor base (DB or DC), asset allocation and other factors such as levels of liability hedging and/or currency hedging observed in the sample of retirement schemes.

The average fund surveyed returned 5.1% nominal in 2015. Riskier assets delivered mixed returns in 2015, thus funds with larger allocations to equities may not have outperformed more conservative portfolios. Four funds based in Australia reported nominal returns ranging between 6.2% and 7.5%, with a fifth fund, UniSuper reporting a stronger 12.1%. Funds based in Nigeria reported strong nominal returns. Funds based in Finland, Italy, the Netherlands (with the exception of PFZW), Spain, and the United States all reported low single digit positive nominal returns. Trailing five-year real returns were positive for all funds with the exception of FUNCEF and Previ, both based in Brazil.

Table 2. Nominal and real annual investment rates of return of selected LPFs, 2011-2015

In percentage

Country head office	Name of fund or institution	Nominal						Real					
		2011	2012	2013	2014	2015	*5-year annualised*	2011	2012	2013	2014	2015	*5-year annualised*
Australia	AustralianSuper (1)	-1.4	13.2	17.5	8.9	..	..	-4.2	10.7	14.4	7.0	..	..
Australia	CBUS	..	..	..	8.5	7.5	..	..	..	..	6.6	5.8	..
Australia	HESTA	..	..	17.4	7.8	6.5	..	..	..	14.3	6.0	4.7	..
Australia	Hostplus Superannuation fund	..	..	..	9.3	7.0	..	..	..	..	7.5	5.2	..
Australia	QSuper	..	..	..	12.5	6.2	..	..	..	..	10.6	4.5	..
Australia	Sunsuper (2)	-2.2	14.6	17.3	7.6	..	..	-5.0	12.1	14.1	5.8	..	..
Australia	Telstra Superannuation Scheme	..	..	16.3	7.9	..	..	..	..	13.2	6.1	..	..
Australia	UniSuper Management Pty Ltd	..	..	..	15.0	12.1	..	..	..	..	13.0	10.2	..
Brazil	FAPES - BNDES	8.6	24.7	-3.0	7.7	..	..	2.0	17.8	-8.4	1.3	..	..
Brazil	FUNCEF	10.7	9.3	6.9	4.4	2.8	*6.8*	3.9	3.3	0.9	-1.8	-7.1	*-0.2*
Brazil	Previ	7.6	12.6	7.1	2.6	-2.6	*5.3*	1.1	6.4	1.1	-3.6	-12.0	*-1.6*
Canada	British Columbia IMC (3)	..	..	..	14.2	-0.2	..	..	..	..	12.5	-1.8	..
Canada	OMERS	3.2	10.0	6.0	10.0	..	..	0.9	9.1	4.7	8.5	..	..
Canada	OTPP	11.2	13.0	10.9	11.8	13.0	*12.0*	8.7	12.1	9.5	10.2	11.2	*10.3*
Chile	AFP Cuprum (4,5)	0.0	6.8	7.6	15.6	6.6	*7.2*	-4.2	5.3	4.4	10.4	2.1	*3.5*
Chile	AFP Habitat (5)	..	..	7.8	..	..	..	..	..	4.6	..	..	..
Chile	AFP Modelo (5)	..	..	..	6.5	13.1	..	..	..	..	1.8	8.3	..
Chile	AFP Provida	-1.2	7.2	6.8	15.5	..	..	-5.4	5.6	3.7	10.3	..	..
Colombia	Porvenir (6)	..	..	0.0	..	..	..	..	..	-2.0	..	..	..
Croatia	Allianz ZB obligatory pension fund	..	..	..	11.4	5.6	..	..	..	..	11.9	6.2	..
Croatia	Erste Plavi	..	..	..	10.1	6.6	..	..	..	..	10.6	7.3	..
Croatia	PBZ CO	..	..	5.1	10.2	7.0	..	..	..	4.8	10.8	7.7	..
Croatia	Raiffeisen Mandatory Pension Funds	..	..	4.2	12.4	6.6	..	..	..	3.9	12.9	7.2	..
Denmark	Pension Denmark	..	..	..	4.9	4.3	..	..	..	..	4.5	3.9	..
Denmark	PFA Pension	11.1	10.5	-0.9	15.1	2.2	*7.4*	8.4	8.3	-1.6	14.6	1.8	*6.2*
Finland	Ilmarinen	-4.0	7.5	9.8	6.8	..	..	-6.7	5.0	8.1	6.3	..	..
Finland	KEVA	-1.7	12.9	7.5	8.7	4.8	*6.3*	-4.5	10.3	5.8	8.2	5.1	*4.8*
Finland	Varma Mutual Pension Insurance Company	..	..	..	7.1	4.2	..	..	..	..	6.6	4.4	..
France	ERAFP	-1.1	17.3	6.5	12.8	4.0	*7.7*	-3.5	15.8	5.8	12.7	3.8	*6.7*
Germany	BASF Pensionskasse	0.7	9.7	..	..	..	..	-1.3	7.5	..	..	..	..
Hong Kong, PRC	MPFA (7)	..	..	..	1.5	-3.6	..	..	..	..	-3.3	-5.8	..
Indonesia	BPJS Ketenagakerjaan (5)	..	..	10.1	10.8	..	..	..	..	1.8	2.3	..	..
Israel	Makefet (5)	..	..	11.5	5.6	2.4	..	..	..	9.5	5.8	3.4	..
Israel	Menora-Mivtachim (5)	-1.4	11.2	10.6	7.0	3.6	*6.1*	-3.5	9.5	8.6	7.2	4.6	*5.2*
Italy	Cometa	0.8	7.7	3.9	6.4	1.7	*4.1*	-2.4	5.3	3.2	6.4	1.6	*2.8*
Italy	FONCHIM	-1.3	8.3	6.7	6.5	3.0	*4.6*	-4.5	5.8	6.0	6.5	2.9	*3.3*
Italy	Fonte	..	..	4.3	5.7	2.2	..	..	..	3.6	5.7	2.1	..
Japan	Pension Fund Association (5)	-4.3	16.0	24.3	11.3	1.9	*9.4*	-4.1	16.2	22.3	8.7	1.8	*8.6*
Malaysia	Employees' Provident Fund (8)	..	..	..	6.8	6.4	..	..	..	..	3.6	4.3	..
Mexico	Afore XXI Banorte	6.6	14.0	2.2	7.6	..	..	2.7	10.1	-1.7	3.4	..	..
Mexico	Banamex	..	..	4.2	..	..	..	..	..	0.2	..	..	..
Netherlands	PFZW	8.4	13.4	3.7	15.5	-0.1	*8.0*	5.9	10.2	2.0	14.7	-0.8	*6.2*
Netherlands	PMT	7.0	12.6	1.1	20.6	2.3	*8.5*	4.4	9.4	-0.6	19.8	1.6	*6.7*
Netherlands	Stichting Pensioenfonds ABP	3.3	13.7	6.2	14.5	2.7	*8.0*	0.9	10.5	4.5	13.7	2.0	*6.2*
Nigeria	AES Fund	2.5	16.5	..	22.7	19.9	..	-7.1	4.1	..	13.7	9.4	..
Nigeria	CPFA Fund	7.7	18.7	18.5	4.4	13.0	*12.3*	-2.4	6.0	9.8	-3.3	3.1	*2.5*
Nigeria	RSA Fund (9)	4.3	15.3	15.3	6.0	8.5	*9.8*	-5.5	3.0	6.8	-1.8	-1.0	*0.2*
Peru	AFP Horizonte Peru	-8.2	12.1	..	..	..	..	-12.4	9.2	..	..	..	..
Peru	AFP Integra	..	..	..	8.9	5.4	..	..	..	..	5.5	0.9	..
Portugal	Banco BPI Pension Fund	-7.3	20.6	16.7	7.7	14.7	*10.0*	-10.5	18.3	16.5	8.1	14.2	*8.8*
Portugal	Pension funds managed by CGD (10)	1.0	6.5	5.5	5.3	5.0	*4.6*	-2.6	4.6	5.3	5.6	4.6	*3.5*
Romania	Azt Viitorul Tau (11)	..	..	10.3	6.1	2.4	..	..	..	8.6	5.3	3.4	..
Romania	ING ACTIV and ING OPTIM Voluntary Pension Funds	..	..	11.6	7.2	..	..	..	..	9.9	6.3	..	..
Romania	ING Mandatory pension fund	..	..	11.3	9.3	..	..	..	..	9.6	8.4	..	..
Romania	Raiffeisen Acumulare	..	..	14.2	9.1	2.8	..	..	..	12.4	8.2	3.8	..
Russia	Lukoil - Garant	1.8	7.5	..	..	..		-4.1	0.9	..	..	..	..
Russia	VTB	0.5	8.7	5.9	4.4	..	..	-5.3	2.0	-0.5	-6.2	..	..
South Africa	GEPF (5)	12.2	11.9	16.0	12.2	4.7	*11.3*	5.8	5.9	10.1	6.5	-0.5	*5.5*
South Africa	Sentinel Retirement Fund (12)	..	..	19.7	12.5	11.4	..	..	..	13.6	6.8	5.8	..

Country head office	Name of fund or institution	Nominal						Real					
		2011	2012	2013	2014	2015	*5-year annualised*	2011	2012	2013	2014	2015	*5-year annualised*
Spain	Bankia (13)	-2.0	6.3	7.7	..	..	..	-4.3	3.3	7.5	..	..	..
Spain	CCOO	2.0	7.3	9.0	6.0	2.5	*5.3*	-0.4	4.3	8.7	7.1	2.5	*4.4*
Spain	Endesa	1.1	7.7	9.4	7.1	3.5	*5.7*	-1.2	4.7	9.1	8.2	3.4	*4.8*
Spain	Fonditel (14)	-5.3	9.0	4.2	5.8	2.7	*3.2*	-7.5	5.9	3.9	7.0	2.6	*2.3*
Spain	Santander	-1.5	6.6	7.2	5.9	2.1	*4.0*	-3.8	3.6	6.9	7.0	2.1	*3.1*
Sweden	Alecta	-2.1	11.4	10.2	..	..	..	-4.3	11.5	10.0	..	..	..
Sweden	AP7	..	..	..	29.3	6.3	..	..	..	..	29.7	6.2	..
Switzerland	Pensionskasse Post	..	..	..	6.8	0.2	..	..	..	..	7.1	1.5	..
Turkey	OYAK	14.1	14.2	15.3	17.2	..	..	3.3	7.6	7.4	8.3	..	..
United Kingdom	BT Pension Scheme	1.7	7.5	..	..	..	..	-2.5	4.7	..	..	..	..
United Kingdom	USS (5)	0.4	11.4	12.8	15.1	3.6	*8.5*	-3.7	8.6	10.5	14.6	3.4	*6.5*
United States	CalPERS	1.1	13.3	..	..	..	..	-1.8	11.4	..	..	..	..
United States	LACERA	..	..	15.0	6.7	1.5	..	..	..	13.3	5.9	0.8	..
United States	Massachusetts PRIM Board (15)	-0.3	13.4	15.2	8.2	..	..	-3.2	11.5	13.5	7.4	..	..
United States	New York City Combined Retirement System (5)	1.3	13.2	16.1	7.5	..	..	-1.7	11.3	14.4	6.7	..	..
United States	Ohio Public Employees Retirement System	0.2	14.4	13.9	..	..	..	-2.7	12.4	12.2	..	..	..
United States	Illinois SURS (16)	..	..	17.0	6.5	2.6	..	..	..	15.3	5.7	1.8	..
	United Nations Joint Staff Pension Fund (5)	-3.9	12.7	15.5	3.2	..	..	-6.7	10.8	13.8	2.4	..	..

Note: Annual investment rates of return are net-of-fees, unless noted. Real annual investment returns have been calculated using the nominal interest rate and the variation of domestic consumer price index between the ends of each year.

“..” means not available
(1) Returns are for the balanced fund. (2) Data in 2013 and 2014 refer to the balanced pension option. (3) Reported returns are for years ending March 31, 2015 and March 31, 2016. (4) Returns are provided for the Fund C. (5) Returns are gross-of-fee investment rates of return. (6) Data refer only to the moderate plan of the mandatory pension fund. (7) Returns reported by the Mandatory Pension Fund Authority are aggregated from 36 member schemes. (8) Real returns for the Employees' Provident Fund, Malaysia were provided by Malaysia which were calculated in relation to their National Statistics data. (9) Before 2014, data refer to DC plans only. From 2014, data refer to DC and DB plans. (10) Returns have been calculated as a weighted average of the returns of CGD Staff's Pension Fund, and the pension funds of Fidelidade, Galp Energia, Império-Bonança, and Mundial Confiança. Total assets of each fund have been used as weights. (11) Data refer to the largest fund managed: Fond de Pensii Administrat Privat AZT Viitorul Tau. (12) Data only refer to the Pensioner Portfolio. (13) Data are given for the most representative plan of Bankia Pensiones. (14) Data from 2013 onwards refer to Fonditel's biggest pension plan (Empleados de Telefónica de España) while data for 2010 to 2012 are aggregates of several plans. (15) Returns for 2013 and 2014 have been gathered from publicly available sources. (16) Data refer only to DB schemes.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs and publicly available reports.

PART A2 –PUBLIC PENSION RESERVE FUND INVESTMENT PORTFOLIOS

Public pension reserve fund size

The total amount of Public Pension Reserve Fund (PPRFs) assets at the end of 2015 was equivalent to USD 5.6 trillion within the countries for which data was received or obtained (Table 3). The largest reserve is held by the US Social Security Trust Fund at USD 2.8 trillion, followed by Japan's Government Pension Investment Fund at USD 1.1 trillion. Korea, China, Canada and Sweden also have accumulated large reserves. Of the countries with public pension reserve funds surveyed, 13 had established their funds since 2000. The United States Social Security Trust Fund is the oldest, established over 75 years ago.

Table 3 also shows three major non-OECD countries that are G20 members: Argentina, China, and India. China's National Social Security Trust Fund reached USD 294.8 billion at the end of 2015. Argentina's fund, founded in 2007, reached USD 50.7 billion. Assets shown for India represent three distinct funds: the Employees' Provident Fund, the Employees' Pension Fund and the Employees' Deposit Linked Insurance Fund, all totalling USD 101.2 billion.

The reserves put aside by the PPRFs that submitted questionnaires increased by 3.4% (nominal) on average between 2014 and 2015 (based on local currency values). Argentina's Sustainability Guarantee Fund increased by 40.6% since last year, driven mostly by high domestic rates of inflation and positive net inflows. Three other funds showed high growth rates: China's National Social Security Fund at 24.6%, Chile's Pension Reserve Fund at 18.9%, and the Canada Pension Plan Investment Board at 18.4%, attributed to a combination of strong investment returns and positive net inflows. Spain showed a decline of 22.0%. During 2015, Spain drew on reserves to pay pension benefits and to meet fiscal objectives.

In terms of total assets relative to the national economy, Korea had the highest ratio at 32.8% of GDP, followed by Luxembourg at 30.2%, Sweden at 29.5% (aggregate AP funds), Jordan at 28.7%, and Japan at 25.8% (Table 3). The weighted average of PPRF assets accounted for 17.7% of GDP in the selected countries in 2015.

Large reserves are also accumulated in sovereign wealth funds that have a pension focus. The Government Pension Fund Global in Norway has two main goals: to facilitate government savings necessary to meet the rapid rise in public pension expenditures in coming years, and to support long-term management of petroleum revenues. At the end of 2015, the fund held USD 869.0 billion in assets, accounting for 245.6% of Norway's GDP. The fund is considered to be the largest sovereign wealth fund in the world. The Russia Federation's National Wealth Fund is dedicated to supporting the pension system to guarantee long-term sound functioning of the system (see Annex for a description). Both funds saw a strong increase in assets compared to the previous year.

Table 3. Total assets of selected PPRFs in 2015

Country head office	Name of the fund or institution	Year of establishment	Total investments or assets (1)		
			USD bn.	% of GDP	% increase (compared to the previous year)
United States	Social Security Trust Fund	1940	2,812.5	15.4	0.8
Japan	Government Pension Investment Fund	2006	1,137.2	25.8	0.0
Korea	National Pension Fund (2)	1988	437.0	32.8	9.0
China (People's Republic of)	National Social Security Fund (2)	2001	294.8	2.7	24.6
Canada	Canada Pension Plan Investment Board	1997	204.2	14.2	18.4
Sweden	National Pension Funds (AP1-AP4 and AP6) (3,4)	2000	147.9	29.5	4.1
India	Employees' Provident Fund Organisation (2,5)	1952	101.2	4.6	-14.3
Australia	Future Fund	2006	90.0	7.3	7.3
France	AGIRC - ARRCO (2)	n.d.	59.6	2.5	-5.2
Argentina	Sustainability Guarantee Fund	2007	50.7	10.3	40.6
Canada	Quebec Pension Plan	2006	45.0	2.8	7.4
Germany	Sustainability Fund (Nachhaltigkeitsrücklage) (2)	1972	37.1	1.1	-2.8
Spain	Social Security Reserve Fund	1966	35.4	3.0	-22.0
Norway	Government Pension Fund - Norway (GPFN)	2001	24.3	6.9	5.1
Belgium	Zilverfonds	2001	23.4	5.2	3.7
Finland	Valtion Eläkerahasto	1997	20.4	8.8	3.6
New Zealand	New Zealand Superannuation Fund	1989	20.0	11.8	6.3
Portugal	Social Security Financial Stabilisation Fund	1977	15.4	7.9	4.4
Luxembourg	Fonds de Compensation Commun au Régime Générale de Pension (2)	2004	14.5	30.2	5.9
Jordan	Social Security Investment Fund (2)	n.d.	10.8	28.7	n.d.
Chile	Pension Reserve Fund	2006	8.1	3.6	18.9
Poland	Demographic Reserve Fund	2002	5.0	1.1	9.5
Mexico	IMSS Reserve (6)	n.d.	1.5	0.1	8.0
Bulgaria	State Fund for Guaranteeing the Stability of the State Pension System	2007	1.4	2.9	3.6
Bosnia and Herzegovina	Pension Reserve Fund Of Republic of Srpska	2011	0.2	1.1	2.4
Total selected countries (7)			**5,597.5**	**17.7**	**3.4**
Memo item: Sovereign Wealth Funds with a pension focus (8)					
Norway	Government Pension Fund - Global (GPFG)	1990	869.0	245.6	18.1
Russian Federation	National Wealth Fund (2)	2008	71.7	6.3	19.1
Total memo items			**940.8**		
Total PPRFs and SWFs with a pension focus			**6,538.3**		

(1) Data correspond to all forms of investment with a value associated to a pension fund/plan. 2015 valuations are for year-end, unless otherwise noted. (2) Data have been gathered from publicly available sources. (3) Data for AP6 come from a publicly available report. Total investments are the sum of assets of AP1 and AP3 as of June 30, 2015, and AP2, AP4 and AP6 as of December 31, 2015. (4) Swedish gross domestic product is as of December 31, 2015. (5) Data refer to the end of March 2015, and include the Employees' Provident Fund, the Employees' Pension Fund and the Employees' Deposit Linked Insurance Fund. (6) Data only refer to reserves used to pay early retirement due to invalidity or work-related injuries. (7) Weighted average for assets as a % of GDP and % increase. (8) Norway's Government Pension Fund - Global and Russia's National Wealth Fund are sovereign wealth funds and not public pension reserve funds; their mandate goes beyond financing pension expenditures."n.d." means not available.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs and publicly available reports.

PPRF asset allocation

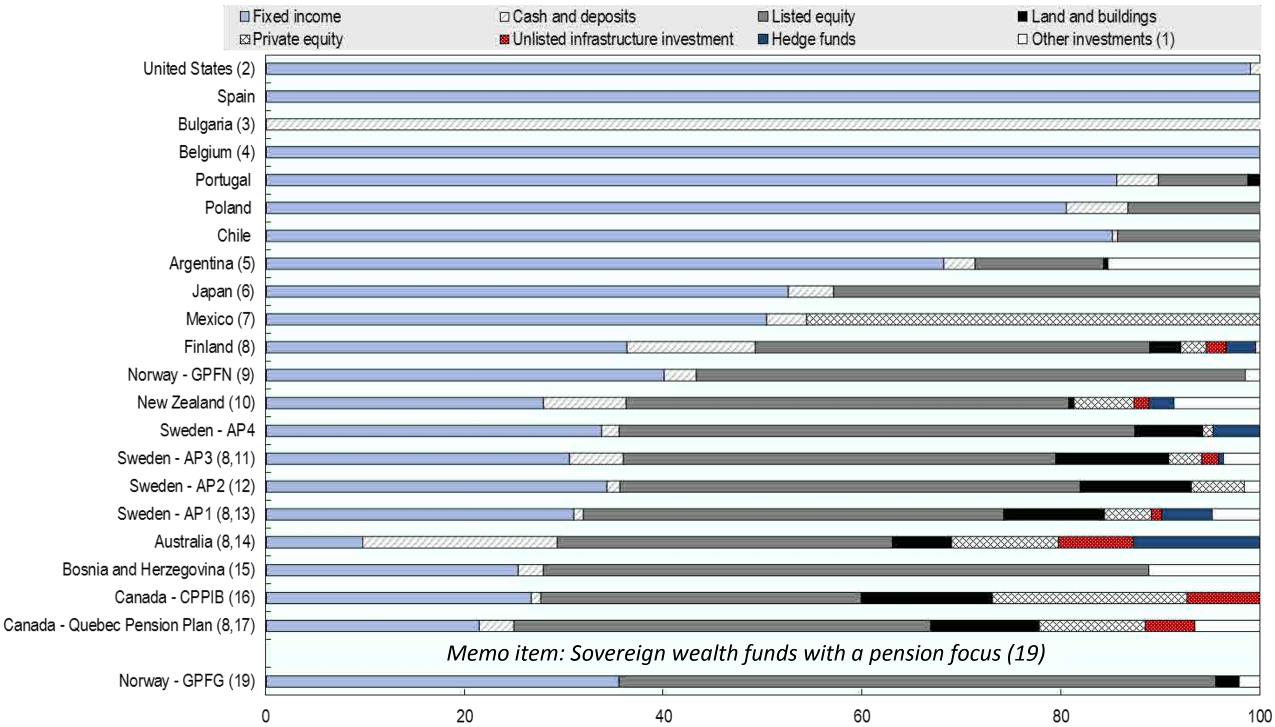
PPRFs together have varying mandates and constraints on investment portfolios. Some reserves were established as "buffer funds" to smooth benefit payments of first-pillar pay-as-you-go retirement systems. Finland's Valtion Eläkerahasto is such a fund: pension payments disbursed by the state are included in the government budget to which the fund transfers an amount equivalent to 40 per cent of the annual pension expenditure, and the fund has a funding ratio of 25% of the state's pension liability. Germany's Sustainability Fund (Nachhaltigkeitsrücklage) was designed to smooth short- to medium-term volatility of pension finances. The Australia Future Fund and Canada Pension Plan Investment Board, by contrast, have long-term investment mandates where expected pension payments occur far into the future.

A spectrum of mandates and also statutory limits on investments leads to varying investment profiles (Figure 10). Some funds, such as those in Belgium and the United States, have statutory limits requiring them to invest only in government bonds. In Australia, Canada and New Zealand, long-term mandates lead to a profile more similar to a funded pension scheme (defined benefit fund) and lower allocations to fixed income and higher allocations to return seeking assets (such as alternative investments and equity).

Over the past few years, several PPRFs had to increase liquidity and reduce risk due to fiscal pressures. Major changes in investment strategies took place in Spain and Portugal. Spain's Social Security Reserve Fund migrated nearly all assets to Spanish government bonds in 2014 and has increased cash and liquidity in 2015. Portugal de-risked the Social Security Financial Stabilization Fund by increasing fixed income allocations and decreasing listed equities and real estate related holdings. Since 2010, Portugal's fund increased fixed income and cash from 65.3% of assets to 89.8% by the end of 2015.

Figure 10. Asset allocation of selected PPRFs – actual 2015

As a percentage of total investment



(1) The "other" category includes loans, commodities and other investments. (2) Assets were invested in interest-bearing securities of the U.S. Government for purchase exclusively by the Social Security trust funds (special issues). (3) Assets of the State Fund for Guaranteeing the Stability of the State Pension System were held in weekly deposits at the Bulgarian National Bank. (4) Zilverfonds invested in Belgian Government bonds only. (5) Other instruments include listed infrastructure investments. (6) Data is gathered from a publicly available report. Alternative investments are classified as domestic bonds, domestic stocks, foreign bonds, or foreign stocks. At fiscal year end March 3, 2016 the fund reported 0.06% of the total portfolio was invested in alternatives. (7) Data only refer to reserves used to pay early retirement due to invalidity or work-related injuries. The asset allocation of IMSS changed between 2012 and 2013, mainly in private equity, as a result of the increase in the Afore investment. Since 1997, IMSS invested in Afore XXI, which in 2012 merged their operations with Afore Banorte and became Afore XXI Banorte. In March 2013, with the acquisition of Afore BBVA Bancomer, the institutional investment in Afore XXI Banorte increased as well. (8) Data is as of June 30, 2015. (9) Other investments include lending associated with repos, financial derivatives, unsettled trades, and receivables. (10) Other investments include timberlands, farmland, insurance-linked securities, and derivatives. (11) Other investments include long/short portfolios, opportunistic asset allocation, derivatives, convertibles, insurance-linked securities, volatility strategies, and risk premia strategies. (12) Derivatives are reported at fair value as "other investments". Any cash backing of these derivatives are included and reported as "Cash and deposits". Unsettled transactions, accrued interest and dividends are reported as "Other investments". (13) Other investments include risk premia strategies and risk parity portfolios. (14) The category "unlisted infrastructure investment" includes listed and unlisted infrastructure investments. (15) Other investments include investment in unregistered instruments and local companies. (16) ARS strategies and associated structured products have been included in "cash and deposits". (17) Other investments include asset allocation strategies and asset-backed commercial paper. (18) Norway's Government Pension Fund - Global is a Sovereign Wealth Fund and is not a Public Pension Reserve Fund, because its mandate goes beyond financing pension expenditures. (19) Other investments include financial derivatives, unsettled trade receivables, lending (repo).

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs and publicly available reports.

Other funds have moved in the opposite direction and have reduced fixed income and cash and increased exposures to return seeking assets. In fact, the general trends in asset allocation over the past five years confirm that PPRFs are on average shifting investment from fixed income to equities and alternatives (see executive summary). Japan's Government Pension Investment Fund invested 77.9% in fixed income and cash, and 22.1% in listed equities in 2010. By the end of 2015, the fund had invested 57.0% of assets and fixed income and cash and 43.0% in listed equities. The shift reflects a new policy asset mix effective in 2014 of 50% fixed income, and 50% listed equities. This new policy also includes the ability to invest up to 5% in alternative investments.

The simple average portfolio for the PPRFs included in the survey shows that 57.2% of the total assets were invested in fixed income and cash, 29.3% in listed equities, and 13.5% in alternative/other investments. Four funds invested exclusively in fixed income or cash. Bulgaria's reserve fund invested all assets in cash and deposits. Funds in Australia, Canada, Norway and Sweden all maintained lower allocations to fixed income in favour of larger allocations to equities and alternative investments. Bosnia and Herzegovina's fund had the highest allocation to listed equity at 61.0% of total assets.

Alternative investments in PPRF portfolios include hedge funds, real estate, unlisted infrastructure, private equity, and other categories such as natural resources. Finland's Valtion Eläkerahasto's allocation to private equity included private credit. At the end of 2014, Australia's Superannuation Scheme invested 36.9% of total assets in alternatives, including 12.7% of total assets in hedge funds. The Canada Pension Plan Investment Board allocated 19.6% of the total portfolio to private equity at the end of 2015. The Swedish funds AP2, AP3 and AP4 have all increased their allocations to alternatives over the past few years. From 2010 to 2014, AP3 increased from 13.6% to 20.5%, and AP4 increased from 5.9% to 12.5%. New Zealand's Superannuation Scheme invested 19.2% of total assets in alternatives, which included allocations to forestry and farmland. PPRFs also invest in infrastructure assets mainly though listed and unlisted equity (see section B), with funds in Canada and Australia having the largest allocations.

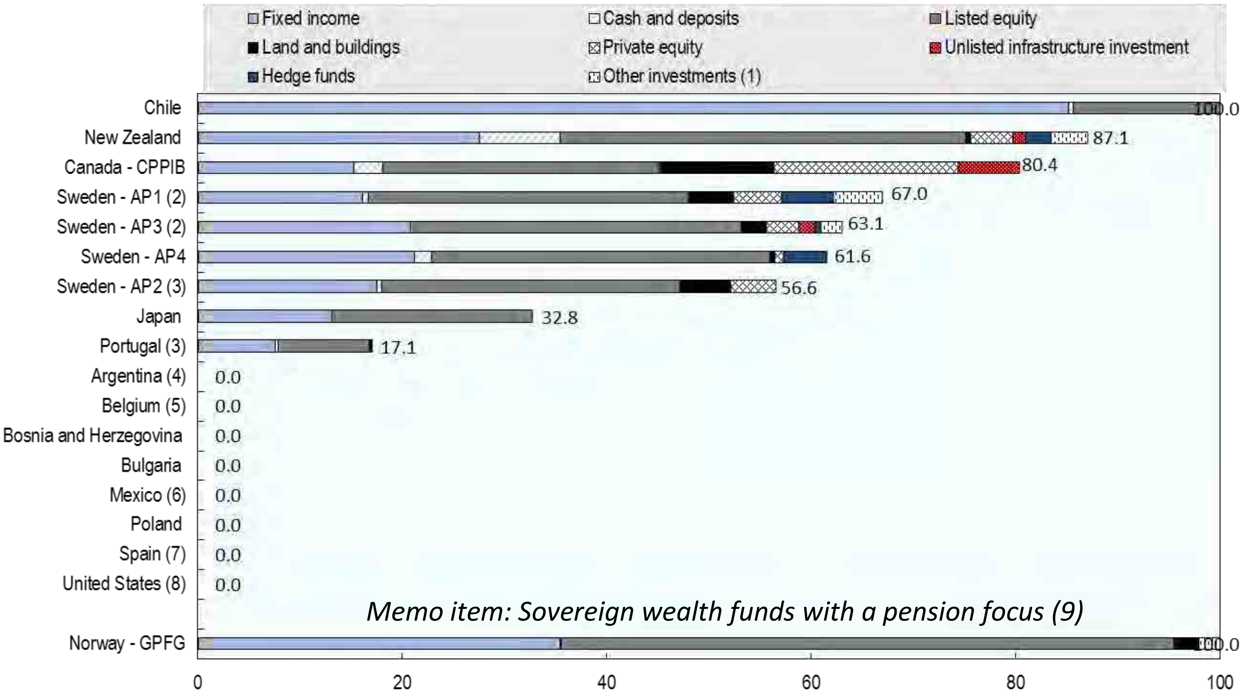
PPRF foreign investment

With some major exceptions, the majority of funds maintain exposure to foreign markets through both equity and fixed income instruments (Figure 11). Some funds also invest in foreign alternatives. Chile's entire portfolio was fully invested abroad, including equities in developed and emerging markets. Norway's Government Pension Fund – Global, which receives petroleum revenues (which are transacted in USD), invested all assets in foreign markets. Five additional funds invested over 60% of total assets in foreign markets.

CPPIB invested over 35% of the portfolio in overseas alternatives, and had a high allocation to private equity and real estate (11.2% and 18.0%, respectively). Sweden's AP1 also invested a significant amount in foreign alternatives, allocating 19.0%. Portugal's reserve fund invested smaller amounts in foreign markets – most of the foreign fixed income allocation was in the European Union, while the foreign equity portfolio was concentrated in North America. A total of eight funds reported zero exposure to foreign assets.

Figure 11. Foreign investment by asset class in selected PPRFs in 2015

As a percentage of total (i.e. domestic and foreign) investment



(1) The "other" category includes loans, commodities, and other investments. (2) Data is as of June 30, 2015. (3) Other investments have been excluded because they were negative in 2015. (4) Foreign investments prohibited. (5) Zilverfonds invested in Belgian government bonds only. (6) Data only refer to reserves used to pay early retirement due to invalidity or work-related injuries. (7) The Spanish Social Security Reserve Fund stopped investing in foreign assets (government bonds) in July 2014. (8) Assets were invested in interest-bearing securities of the U.S. Government for purchase exclusively by the Social Security trust funds (special issues). (9) Norway's Government Pension Fund - Global is a Sovereign Wealth Fund and is not a Public Pension Reserve Fund, because its mandate goes beyond financing pension expenditures.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Seven funds reported exposure to listed equities and fixed income in emerging markets. CPPIB allocated 9.9% of the total portfolio to emerging markets,[21] including private equity, real estate, and unlisted infrastructure investments. Sweden's AP1 invested 12.6% in emerging markets, with the majority of exposure in listed equities.

PPRF performance – Investment rates of return in local currency

2015 delivered positive returns to most PPRFs – on average PPRFs are invested more conservatively than LPFs, and with volatile financial markets through much of 2015, portfolios invested predominately in fixed income and cash fared well. Government bond yields (10 year benchmark issues) declined in 2015 in Germany, Japan, the United Kingdom, and the United States, driving positive returns in bond portfolios across major regions of the G20. For funds with wider investment mandates, owing to variation in

[21] Emerging markets are defined in the survey as countries in the following regions: Latin America and Caribbean, European countries (excluding the European Union) and Russia, Middle East, Africa, and Asian countries excluding Japan, Korea, Australia and New Zealand.

domestic equity market performance, diversification by funds across foreign markets and into alternative asset classes helped performance.

All PPRFs that returned questionnaires posted positive nominal and real returns in 2015, with the exception of Poland's Demographic Reserve Fund. A few reported exceptionally strong returns. Funds based in Canada continued several years of above-average returns, as well as in Chile. Sweden's AP6 stood out from the rest of Sweden's funds in 2015. Argentina's high nominal returns over the past few years are due to high levels of inflation. Slight deflation in Finland and Poland led to higher real returns for those funds. The simple average fund return was 5.6% nominal, 4.7% real in 2015 (excluding Argentina and Bosnia Herzegovina where real returns were not available).

Annualised five-year real returns, which capture results during the European sovereign debt crisis to the end of 2015, were positive for all funds that reported data. New Zealand returned 11.8% real annualised. Other funds that had diversified portfolios such as Sweden AP1-AP4, the Canadian reserve funds, and Australia's Future Fund all had strong five-year annualised real returns.[22]

Table 4. Nominal and real annual investment rates of return of selected PPRFs 2011-2015

In percentage

Country	Name of the fund or institution	Nominal						Real					
		2011	2012	2013	2014	2015	*5-year annualised*	2011	2012	2013	2014	2015	*5-year annualised*
Selected countries													
Argentina	Sustainability Guarantee Fund (1)	12.1	22.7	33.8	43.3	40.0	*29.9*	..	..	..	..		..
Australia	Future Fund	1.6	12.8	17.2	13.2	8.4	*10.5*	-1.4	10.4	14.1	11.3	6.6	*8.1*
Belgium	Zilverfonds	4.3	4.2	4.0	3.7	3.2	*3.9*	0.8	2.0	3.0	4.1	1.6	*2.3*
Bosnia and Herzegovina	Pension Reserve Fund Of Republic of Srpska (1)	-0.7	2.6	6.0	5.7	5.4	*3.8*	..	..	..	..	..	..
Canada	Canada Pension Plan Investment Board	5.3	9.7	13.5	15.6	16.0	*11.9*	2.9	8.8	12.1	13.9	14.1	*10.3*
Canada	Quebec Pension Plan (2,3)	2.6	10.3	15.3	12.3	10.5	*10.1*	0.3	9.4	13.9	10.7	8.8	*8.5*
Chile	Pension Reserve Fund	14.8	-3.4	10.5	17.7	12.8	*10.2*	9.9	-4.8	7.2	12.5	8.1	*6.4*
Finland	Valtion Eläkerahasto (3)	..	..	6.4	7.8	4.9	..	..	..	4.7	7.3	5.1	..
France	AGIRC (3,4)	-1.4	10.2	5.9	5.0	3.5	*4.6*	-3.8	8.7	5.2	5.0	3.4	*3.6*
France	ARCCO (3,4)	-2.4	11.6	6.7	6.4	3.5	*5.1*	-4.8	10.1	6.0	6.3	3.3	*4.1*
Japan	Government Pension Investment Fund (5)	-1.9	8.7	17.1	9.2	1.8	*6.8*	-1.7	8.8	15.2	6.7	1.7	*6.0*
Korea	National Pension Service (3)	2.3	7.0	4.2	5.3	4.6	*4.7*	-1.8	5.5	3.0	4.4	3.4	*2.9*
Luxembourg	FCCRGP (3,6)	0.8	8.1	5.6	11.0	3.5	*5.7*	-2.3	5.7	4.0	11.6	2.4	*4.2*
Mexico	IMSS Reserve (7)	5.0	4.3	4.6	4.7	4.2	*4.6*	1.1	0.7	0.6	0.6	2.0	*1.0*
New Zealand	New Zealand Superannuation Fund	1.2	19.2	26.1	13.9	6.5	*13.0*	-0.7	18.1	24.1	13.0	6.4	*11.8*
Norway	Government Pension Fund - Norway	-3.9	12.2	15.6	10.6	6.9	*8.1*	-4.1	10.6	13.3	8.4	4.5	*6.4*
Poland	Demographic Reserve Fund	1.8	10.2	3.0	4.0	-0.1	*3.7*	-2.7	7.7	2.3	5.0	0.5	*2.5*
Portugal	Social Security Financial Stabilisation Fund	-11.0	23.3	6.9	14.7	3.6	*6.9*	-14.1	21.0	6.7	15.2	3.1	*5.7*
Spain	Social Security Reserve Fund (5)	6.0	4.9	9.1	11.9	1.1	*6.5*	3.6	2.0	8.9	13.0	1.0	*5.6*
Sweden	AP1 (8)	-1.9	11.3	11.2	14.6	4.0	*7.7*	-4.1	11.4	11.0	15.0	3.9	*7.2*
Sweden	AP2	-2.1	13.3	12.7	13.1	4.0	*8.0*	-4.3	13.4	12.5	13.5	3.9	*7.6*
Sweden	AP3 (8)	-2.5	10.7	14.1	13.7	6.8	*8.4*	-4.7	10.8	13.9	14.1	6.7	*7.9*
Sweden	AP4	-0.7	11.2	16.4	15.7	6.8	*9.7*	-2.9	11.3	16.2	16.1	6.7	*9.2*
Sweden	AP6 (3)	-6.9	9.2	9.2	6.5	12.2	*5.8*	-9.0	9.3	9.1	6.8	12.1	*5.4*
United States	Social Security Trust Fund	4.4	4.1	3.8	3.6	3.4	*3.8*	1.4	2.3	2.3	2.8	2.6	*2.3*
Memo item: Sovereign Wealth Funds with a pension focus (9)													
Norway	Government Pension Fund - Global	-2.6	13.4	15.9	7.5	2.7	*7.1*	-2.8	11.8	13.6	5.3	0.3	*5.5*

Note: Real net investment returns have been calculated using the nominal interest rate and the variation of the end-of-period consumer price index between the ends of each year.

".." means not available.

(1) Real returns were not available. (2) Return for 2015 is gross-of-fees. (3) Data has been gathered from publically available sources. (4) AGIRC and ARRCO are unfunded mandatory supplementary plans for white-collar and blue-collar workers respectively, with reserves. (5) Returns are gross investment rates of return. (6) Fonds de Compensation Commun au Régime Générale de Pension. (7) Data only refer to reserves used to pay early retirement due to invalidity or work-related injuries. (8) Returns for 2015 were gathered from publicly available reports. (9) Norway's Government Pension Fund - Global is a Sovereign Wealth Fund and not a Public Pension Reserve Fund, because its mandate goes beyond financing pension expenditures.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs and publicly available reports.

[22] Many active funds target a 4.0% real return over long-term periods. An adequate real return provides funds with the ability to grow the corpus of the fund beyond the rate of inflation and wage growth.

PART B – INFRASTRUCTURE INVESTMENT

Table 5. Detailed infrastructure investment of selected LPFs and PPRFs, 2015

As a percentage of total assets

Country head office	Name of the fund or institution	Total investments in 2015 (in USD m.)	Infrastructure investment (as a % of total investments)		
			Unlisted equity	Listed equity	Debt
LPFs					
Australia	Construction & Building Unions Superannuation Fund	23,664	10.5	..	..
Australia	Health Employees Superannuation Trust Australia	24,683	10.9	..	0.5
Australia	Hostplus Superannuation fund	13,947	11.6	..	..
Australia	QSuper	45,891	9.5	..	..
Australia	Sunsuper (1,2)	16,732	5.8	..	0.3
Australia	Telstra Superannuation Scheme (3)	13,306	1.5	1.9	..
Australia	UniSuper Management Pty Ltd	36,538	3.4	..	..
Brazil	FAPES - BNDES (3)	2,799	0.0	3.6	4.2
Brazil	FUNCEF	13,909	5.9	1.0	1.9
Brazil	Previ	39,372	6.2	4.6	..
Canada	British Columbia Investment Management Corporation	74,111	5.4	..	..
Canada	OTPP	121,565	7.7	..	..
Chile	AFP Provida (4)	42,634	0.0	0.2	0.7
Croatia	Allianz ZB obligatory pension fund	4,070	0.0	4.6	..
Denmark	PensionDanmark	25,726	10.7	0.0	0.0
Denmark	PFA Pension	56,574	0.6	..	..
Finland	Ilmarinen	39,020	1.5	..	..
Finland	Keva	48,136	0.7	0.3	0.5
Finland	Varma Mutual Pension Insurance Company	44,655	1.6	..	..
Israel	Makefet	12,398	0.3	..	..
Israel	Menora-Mivtachim	19,620	0.8	..	..
Japan	Pension Fund Association	101,993	0.4	..	..
Malaysia	Employees Provident Fund	159,489	0.0	3.2	..
Mexico	Afore XXI Banorte (1)	36,645	0.0	2.2	0.9
Netherlands	PFZW	178,118	3.4	0.0	0.0
Netherlands	PMT	65,937	0.8	1.1	2.8
Netherlands	Stichting Pensioenfonds ABP	429,916	1.9	..	..
Peru	AFP Integra	10,272	1.1	..	1.1
Portugal	Banco BPI Pension Fund	1,441	0.0	16.8	17.3
Portugal	Pension funds managed by CGD (5)	2,724	1.5	1.5	..
Romania	Azt Viitorul Tau	1,305	0.0	9.7	0.0
Russia	VTB (3)	1,903	0.0	7.2	0.0
South Africa	GEPF	109,203	0.7	..	0.0
Spain	Endesa	1,784	0.0	6.4	6.6
Spain	Fonditel ()	3,731	0.3	..	..
Switzerland	Pensionskasse Post	15,788	2.0	..	..
United Kingdom	USS	70,602	4.5	0.4	0.9
United States	State Universities Retirement System of Illinois	17,351	0.4	..	..
	United Nations Joint Staff Pension Fund (3)	59,944	0.2	..	..
PPRFs					
Argentina	Sustainability Guarantee Fund	50,689	0.0	..	12.9
Australia	Future Fund (3)	90,026	7.5	..	..
Canada	Canada Pension Plan Investment Board	204,228	7.3	..	..
Canada	Quebec Pension Plan (3)	44,988	4.9	..	..
Chile	Pension Reserve Fund	8,112	0.0	2.9	5.3
Finland	Valtion Eläkerahasto (3)	20,416	2.0	..	..
New Zealand	New Zealand Superannuation Fund	19,974	1.5	1.8	..
Sweden	AP1 (3)	36,030	1.0	..	..
Sweden	AP3 (3)	36,970	1.6	0.6	..
Sweden	AP4	36,735	0.0	4.6	..

".." means not available.

(1) Data is as of August 31, 2015. (2) Data refer to the balanced option only. (3) Data s as of June 30, 2015. (4) Data is as of September 30, 2015. (5) Data cover the CGD Staff's Pension Fund, and the pension funds of Fidelidade, Galp Energia, Império-Bonança, and Mundial Confiança. (6) Data refer to Fonditel's biggest pension plan: Empleados de Telefónica de España.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Part B of this report presents an analysis of the quantitative and qualitative data on infrastructure investments gathered from large pension funds and public pension reserve funds. A total of 49 funds, accounting for USD 2.5 trillion in AUM, reported an allocation to infrastructure investments, either in the form of unlisted infrastructure equity, listed equity, or debt. Although the majority of funds surveyed stated they are actively investing in infrastructure as shown in Table 5, these total allocations are not comparable, as they relate to different forms of investment. Infrastructure investments can be classified along three primary dimensions based on types of financial instruments, capital market exposure, and vehicles, with survey questions designed to capture all of these elements:

- equity and debt investments (describes the type of economic exposure to infrastructure assets);
- direct exposure, mainly through private market (unlisted) equity (investment in project equity and infrastructure funds that invest in project equity) and debt (such as project bonds or loans); and,
- indirect investment through listed corporate shares or corporate bonds, or vehicles such as mutual funds and trust funds that invest in shares of infrastructure corporations or in projects.

Institutional investors are taking different approaches to infrastructure investing. Behind the separate investment allocation to infrastructure lies the investor decision to consider infrastructure as an asset class in its own right. Diversification, liquidity, capital requirements, pricing frequency, and amount of control over the investment can all vary through the different methods of investing in infrastructure, and can serve differing investment objectives in a fund's long-term strategic asset allocation.

Analysis of infrastructure allocations in the total portfolio

Of the 49 funds that indicated investment in infrastructure assets, 37 reported exposure to unlisted infrastructure assets,[23] and 18 had dedicated target allocations to the asset category (see Table 6). Most funds that reported a target allocation were underweight, indicating that there is capacity for investors to increase investment levels in unlisted infrastructure equity.

Pension funds with a dedicated allocation have a target allocation to the asset class as part of the total portfolio and access the investment largely through unlisted equity instruments (infrastructure funds or direct investment).

Four superannuation funds based in Australia, CBUS, HESTA, Hostplus, and QSuper all reported high allocations to unlisted infrastructure equity: 10.5%, 10.9%, 11.6%, and 9.5%, respectively. Australia has well established capital markets for infrastructure finance, and superannuation funds, which are defined contribution savings plans for retirement, have been active participants. PensionDanmark reported 10.7% of investments were allocated to infrastructure. Three Canadian funds also stand out as having sizeable allocations to unlisted infrastructure equity: OTPP at 7.7%, CPPIB at 7.3%, and British Columbia Investment Management Company at 5.4%.

PFZW in the Netherlands reported 3.4% allocated to unlisted infrastructure equity; USS in the United Kingdom reported 4.5%. Investment levels in other parts of Europe, North America, and Latin America are on average much lower. Previ, based in Brazil, is a notable exception, although the reported allocation of 6.2% at the end of 2015 to unlisted infrastructure equity was lower than last year's 6.8%.

[23] Due to rounding, it may appear that some funds reported a zero percent allocation in Table 5.

Table 6. Infrastructure investment in 2015 – portfolio allocation

As a percentage of total assets

Country head office	Name of fund	Infrastructure allocation	Where does it fit in the portfolio allocation	Invest in greenfield projects	Actual allocation to unlisted infrastructure (2015) (% of total assets)	Most recent reported target asset allocation to unlisted infrastructure (if separate) (% of total assets)
LPFs						
Australia	Health Employees Superannuation Trust Australia	Separate	Infastructure, unlisted debt	Yes	10.9	12.5
Australia	UniSuper Management Pty Ltd	Non-separate	..	Yes	3.4	..
Australia	Sunsuper (1)	Separate	Infastructure	..	5.8	7.0
Australia	Telstra Superannuation Scheme (2,3)	Separate	Infrastructure	No	1.5	3.0-5.0
Australia	Hostplus Superannuation Fund	Separate	Infrastructure	Yes	11.6	10.0
Australia	QSuper	Separate	Infrastructure	No	9.5	10.0
Australia	Construction & Building Unions Superannuation Func	Separate	Infrastructure	Considering	10.5	11.0
Brazil	FAPES - BNDES	Non-separate	..	No	0.0	..
Brazil	FUNCEF	Non-separate	Private equity, equity, fixed income	No	5.9	..
Brazil	Previ (2)	Non-separate	Equity	Yes	6.2	..
Canada	British Columbia Investment Management Corporatio	Non-separate	Infrastructure, infrastructure & renewables	No	5.4	..
Canada	OTPP (2)	Separate	Infrastructure	..	7.7	..
Croatia	Allianz ZB obligatory pension fund	Not separate	Equity	Considering	0.0	..
Denmark	PFA Pension (2,4)	Non-separate	Equity, private equity, fixed income	..	0.6	..
Denmark	PensionDanmark	Separate	..	Yes	10.7	..
Finland	Ilmarinen (2)	Non-separate	..	..	1.5	..
Finland	Keva	Non-separate	Private equity, equity, fixed income	No	0.7	..
France	ERAFP (2)	Separate	Infrastructure and private equity	To be defined	0.0	1.0
Israel	Makefet	Non-separate	..	..	0.3	..
Israel	Menora-Mivtachim	Non-separate	..	..	0.8	..
Mexico	Afore XXI Banorte (2)	Separate	Listed infrastructure equity, fixed income	Yes	0.0	..
Netherlands	PFZW	Separate	Infrastructure	Yes	3.4	5.0
Netherlands	PMT	Separate	Equities, fixed income	No	0.8	To be decided
Netherlands	Stichting Pensioenfonds ABP	Separate	Infrastructure	Yes	1.9	3.0
Peru	AFP Integra	Separate	Infrastructure	Yes	1.1	..
Portugal	Banco BPI Pension Fund	Non-separate	Equity and fixed income	..	0.0	..
Portugal	CGD PENSÕES	Separate	..	No	1.6	1.0
Portugal	Fidelidade	Non-separate	..	No	0.8	..
South Africa	GEPF (2)	Non-separate	Private equity, developmental investments	Yes	0.7	..
Spain	Endesa (2)	Non-separate	Equity and fixed income	..	0.0	..
Spain	Fonditel (2,5)	Non-separate	Private equity	Yes	0.3	4.0
Japan	Pension Fund Association	Non-separate	Fixed income	No	0.4	2.0
Romania	Azt Viitorul Tau	Non-separate	Equity	No	0.0	..
Switzerland	Pensionskasse Post	Separate	Infrastructure	Yes	2.0	2.0
United Kingdom	USS (2)	Separate	Infrastructure	Considering	4.5	5.0
United States	State Universities Retirement System of Illininois	Non-separate	Other (opportunity fund)	..	0.4	..
	United Nations Joint Staff Pension Fund	Non-separate	Real estate	..	0.2	..
PPRFs						
Argentina	Sustainability Guarantee Fund (6)	Separate	Infrastructure	Considering	..	5.0-20.0
Australia	Future Fund	..	Infrastructure and timberland holdings	..	7.5	..
Canada	Canada Pension Plan Investment Board (3,7)	..	Infrastructure	..	7.3	..
Canada	Quebec Pension Plan	Separate	Infrastructure	..	4.9	7.5
Chile	Pension Reserve Fund	Non-separate	Equity, fixed income	..	0.0	..
Finland	Valtion Eläkerahasto	Separate	..	Yes	2.0	..
Japan	Government Pension Investment Fund (2)	Non-separate	..	No	..	..
New Zealand	New Zealand Superannuation Fund	Non-separate	Infrastructure, private equity	..	1.5	..
Sweden	AP1	Separate	Infrastructure	..	1.0	5.0
Sweden	AP3	Separate	Real estate, other	..	1.6	..

".." means not available.

(1) Sunsuper target allocation is based on the balanced option. (2) Data partially based on previous year's questionnaire. (3) Target allocation is based on three pre-mixed options for plan participants. (4) PFA Pension is a defined contribution scheme, thus a target allocation does not exist at the fund level. (5) Data refer to Fonditel's largest pension plan: Empleados de Telefónica de España. Although Fonditel did not indicate a separate category for infrastructure, the fund reported in 2015 a 4% target and categorises infrastructure as private equity. (6) Argentina's Sustainability Guarantee Fund invests in infrastructure through private debt instruments. (7) CPPIB does not have a separate allocation to infrastructure because CPPIB has a "Total Portfolio Approach" and therefore no specific allocations to any asset class. The Total Portfolio Approach ensures that CPIB can maintain - or deliberately change - targeted risk exposures across the entire portfolio as individual investments enter, leave or change in value.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

For funds without a separate allocation to infrastructure, investment in such assets may be included in real estate or private markets categories, or in the event that the fund invests in listed instruments, infrastructure investments may be categorised in listed equities or fixed income as a result of passive investments in public securities, or part of active portfolios.[24] Depending on the composition of industries in local bond and equity markets, infrastructure-related issues may be a large component of overall market capitalisation, as is the case in some developing countries.

Box 1. Recent trends in infrastructure finance

Overall infrastructure financing levels remained stable between 2010 and 2016, supported by ample liquidity in financial markets and high demand from the private sector. This included project-based primary finance (i.e. financing associated with "greenfield projects" – new activity in new assets) and secondary market transactions. Out of total finance from 2010 to 2016 of about USD 2.6 trillion, the lion's share went to the energy sector and finance for renewables accounted for 50% (USD 1.3 trillion). A further 25% consisted of non-renewable power generation and support for transmission and distribution, while 23% went to the transport sector.

Despite the stable total volumes of financing for infrastructure, in recent years fewer new projects have secured primary financing. Primary financing for infrastructure declined for all regions from USD 226 billion in 2010 to USD 153 billion in 2016. For renewable energy projects, however, primary financing increased.

In contrast to the overall drop in primary financing, a large secondary market for infrastructure is developing, boosted by mergers and acquisitions (M&A) and refinancing activity. Global infrastructure M&A activity doubled from a low of USD 83 billion in 2012 to a record USD 179 billion in 2016, with the United States and China leading in terms of volumes. Meanwhile, low interest rates and the abundance of liquidity in financial markets encouraged refinancing, which more than doubled from USD 43 billion in 2010 to USD 92 billion in 2015, before declining in 2016 due to a slow-down in activity, particularly in Asia. While refinancing does not lead to additional investments, it can lower overall costs for users and governments, potentially freeing up fiscal space. Secondary markets also provide opportunities for investors, in particular for institutional investors, who represent a growing source of finance.

Source: Adapted from OECD (2017), *Investing in Climate, Investing in Growth*, Chapter 7.
http://dx.doi.org/10.1787/9789264273528-en

Institutional investors seem to prefer more stable investment profile of brownfield assets, although there is increasing evidence that funds are considering greenfield assets either as direct investors, or hiring investment managers that are skilled at investing in assets during the construction phase. A greater number of funds reported growing interest in greenfield investments[25] (17 "yes or considering" versus twelve "no"). Risk, and perspective returns, are higher in greenfield assets and may require more due diligence on the part of the investor.

Similar to real estate, infrastructure can have equity-like or bond-like characteristics, and institutional investors have positioned infrastructure in the holistic asset allocation with different objectives, keeping in mind the unique risk/return characteristics. GEPF, based in South Africa, categorises infrastructure as part of its private equity and developmental investments. The State Universities Retirement System of Illinois, which reported 0.4% of the total portfolio allocated to unlisted infrastructure, categorising this exposure as part of an opportunistic fund. The following are some examples of asset allocation and portfolio investments in infrastructure from specific investors:

[24] Several funds indicated that they would consider moving infrastructure investments to a dedicated allocation as investments mature, or as they see opportunities arise.

[25] Defined as those investments bearing construction and development risks.

- The Canada Pension Plan Investment Board has a unique investment mandate and approach: it does not have a target asset allocation and fixed target allocations to alternative investments, including infrastructure. The fund does invest with a long-term investment horizon and seeks to benefit from risk premia associated with illiquid investments, which includes its allocation to unlisted infrastructure equity.

- The British Columbia Investment Management Corporation, one of Canada's largest institutional investors, has built its infrastructure investment portfolio around what it calls "core infrastructure assets", which typically operate in stable regulatory environments and provide reliable cash flows. At December 31, 2015, the fund reported that 19.5% of its infrastructure portfolio was allocated to emerging markets.

- Argentina's Sustainability Guarantee Fund invested 12.9% in infrastructure debt and is required by statute to invest a minimum of 5%, while not to exceed 20%, of the portfolio in infrastructure. Financial trusts and structured financing transactions ('Fideicomisos Financieros') have been the main financing vehicles for the infrastructure investments.

Analysis of infrastructure investment levels

Overall investment in infrastructure in 2015 was still limited: if we consider total assets under management of funds from which data was received (i.e. 95 funds for USD 8.4 trillion) infrastructure investment in the form of unlisted equity and debt considered as direct, was USD 91.7 billion, representing 1.1% of the total assets under management of the entire survey population.

Looking more in detail at the 49 funds taken into consideration for this part of the survey, total investment in infrastructure at the end of 2015, considered as direct exposure (USD 91.7 billion), represented 3.6% of total assets of these 49 funds (Table 7).

Unlisted equity (i.e. infrastructure funds or direct investments in projects) is the largest category of infrastructure investment at USD 80.3 billion, and 3.2% of total assets in Part B. The average low investment is in line with what was reported in previous years: in 2014, 41 funds reported exposure to unlisted equity totalling USD 74.3 billion, or 3.0% of assets. Over this time period, the survey population has changed, mostly with the addition of new funds reporting their infrastructure allocation, although the general trend observed amongst those funds that reported their infrastructure allocation since 2010 is for a gradually increasing allocation to unlisted infrastructure equity (see executive summary for greater detail on these findings).

There is potential capacity to expand institutional investment in infrastructure. Target allocations amongst the funds with dedicated exposure ranged on the low end from 1% to 20% of total assets. Most funds that reported a separate target allocation to infrastructure were below targets at the end of 2015 (see Table 6). A majority of funds, nine in total, indicated no change in their infrastructure target allocation. Six funds indicated an increase in their target allocation to infrastructure in 2015, while one fund indicated a reduction. In 2014, ERAFP reported a target of 0.5% to infrastructure; this target increased to 1.0% in 2015. ERAFP has yet to fund this new allocation.

Table 7. Infrastructure investment in 2015

	Total assets, in USD millions	As a % of total assets of funds in Part B of the report (1)	As a % of total assets for all funds (2)
Unlisted Equity	80,275	3.2	1.0
Debt	11,408	0.4	0.1

(1) Infrastructure investment is calculated as a percentage of total assets of funds investing in infrastructure. (2) Infrastructure investment is calculated as a percentage of total assets of all funds in the survey, excluding the ones stemming from publicly available reports.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

A number of funds indicated that they planned to add a new allocation to infrastructure within the next two years, including three funds in Romania, one fund in Italy, one fund in Mozambique, one fund in Nigeria, and one fund in Bosnia-Herzegovina. A fund based in Spain does not currently invest in infrastructure, but is considering adding an allocation, citing historically low interest rates in Europe as contributing to the attractiveness of infrastructure investment. Sweden's AP1, a PPRF, established a new allocation to infrastructure in 2015 at 1.0% of total plan assets. Japan's GPIF may invest up to 5% of the total portfolio in alternative investments, including infrastructure, but has yet to fund this new allocation. A few other funds indicated possible interest, but cited regulatory constraints on investments as barriers. For example, the Mandatory Provident Fund System in Hong Kong, which is a defined contribution system of privately managed funds, only permits investment in listed markets such as shares and bonds. AFP Modelo and AFP Cuprum, both based in Chile, cited liquidity and regulatory constraints as barriers to investment. A fund in Romania also cited regulatory constraints as barriers to infrastructure investment.

Infrastructure debt

Despite the difficulties of measuring debt investment in infrastructure, often reported in other asset classes by investors, the survey clearly outlines high activity and some interesting new trends in this category which can include publicly traded debt instruments or direct project loans, senior and/or mezzanine loans, and bonds. Some funds also reported green bonds as part this allocation.

Debt exposure to infrastructure for the subsample for part B was USD 11.4 billion or 0.4% of total assets in 2015 (Table 7). Of the funds surveyed, 14 reported exposure to direct loans and bonds. The UK's USS reported 0.6% of the total portfolio was invested in infrastructure loans. PMT, based in the Netherlands, reported 2.8% of the total portfolio was invested in infrastructure bonds. Two funds based in Brazil, FAPES-BNDES and FUNCEF reported exposure to infrastructure debt; FAPES-BNDES reported that its exposure was through debentures of companies in the infrastructure sector, telecommunications, and energy.

Argentina's Sustainability Guarantee Fund, one of the only PPRFs to report exposure to direct infrastructure fixed income, reported 12.9% allocated to loans and bonds. Financial trusts and structured finance transactions were the main financing vehicles for Argentina's debt investments in infrastructure. The fund is required by statute to invest at least 5%, and up to 20%, of the total portfolio in domestic infrastructure projects.

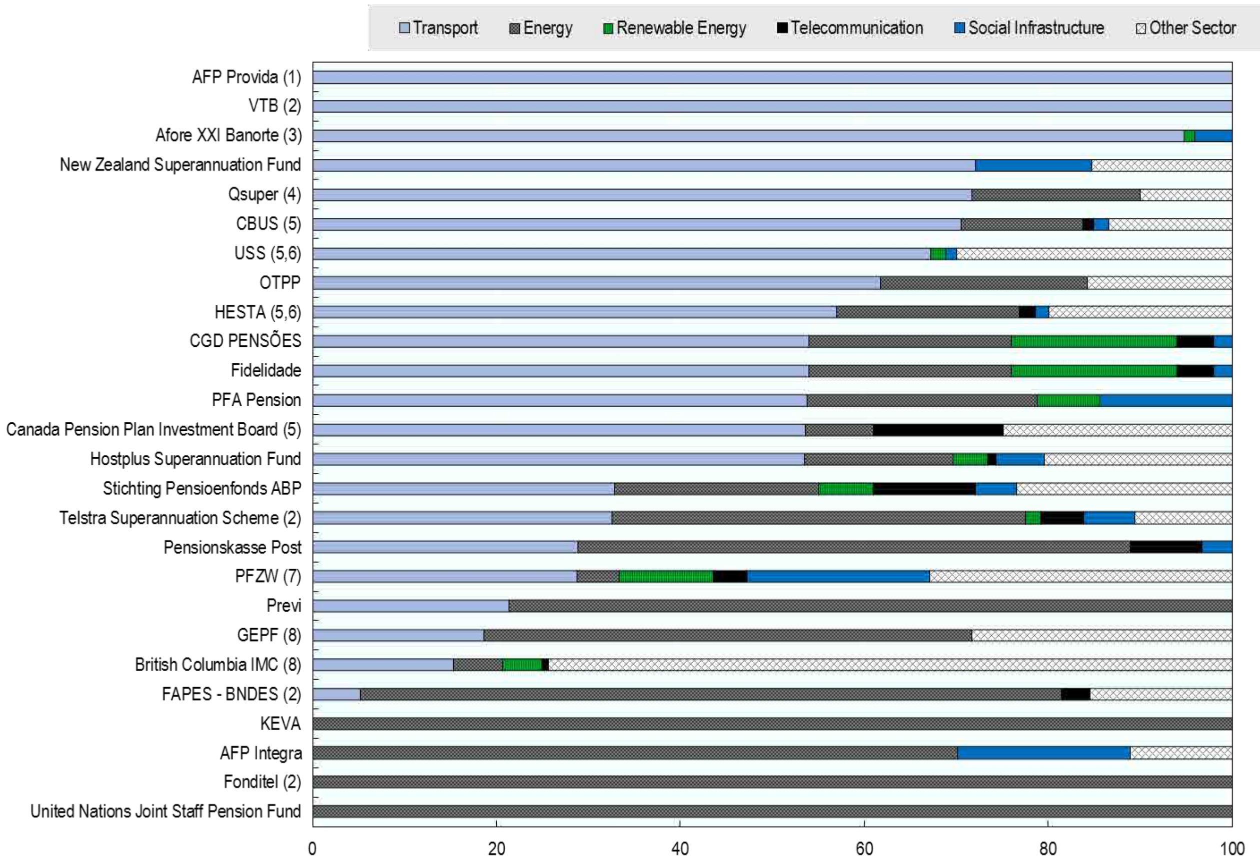
Some green bonds may also be included as infrastructure investment. Investment in green bonds increased in 2014 and 2015 due to expanded issuer volumes (see Part C on green investments). Some of these debt instruments back clean water and energy projects which could fall under the category of infrastructure.

Analysis of infrastructure portfolios

Amongst funds that reported the sector allocations of their unlisted infrastructure equity portfolios, transportation was the largest component, followed by conventional energy (Figure 12). Two funds, AFP Provida and VTB invested exclusively in transportation, while another two funds, Fonditel and the United Nations Joint Staff Pension Fund invested only in conventional energy.

Figure 12. Infrastructure sector allocations of selected LPFs and PPRFs in 2015

As a percentage of total unlisted infrastructure equity investment



(1) Data is as of September 30, 2015. (2) Data is as of June 30, 2015. (3) Data is as of August 31, 2015. (4) Other includes carparks, water, and uncategorised. (5) Other includes utilities. (6) Other includes timberlands. (7) Other includes transmission, distribution and storage of electricity, oil and gas, water, and infrastructure related services. (8) Other includes investments through multi-sector infrastructure funds.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Recent OECD research on investment flows in infrastructure uncovered significant levels of financing activity for renewable energy.[26] Yet survey results show widely varying investment levels by pension funds. Two funds based in Portugal reported 18% of their infrastructure portfolio was in renewables, the highest out of the group. PFZW, based in the Netherlands, reported 10.3% was invested in renewables. The

[26] Refer *Investing in Climate, Investing in Growth,* Chapter 7, OECD Publishing, Paris. www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm.

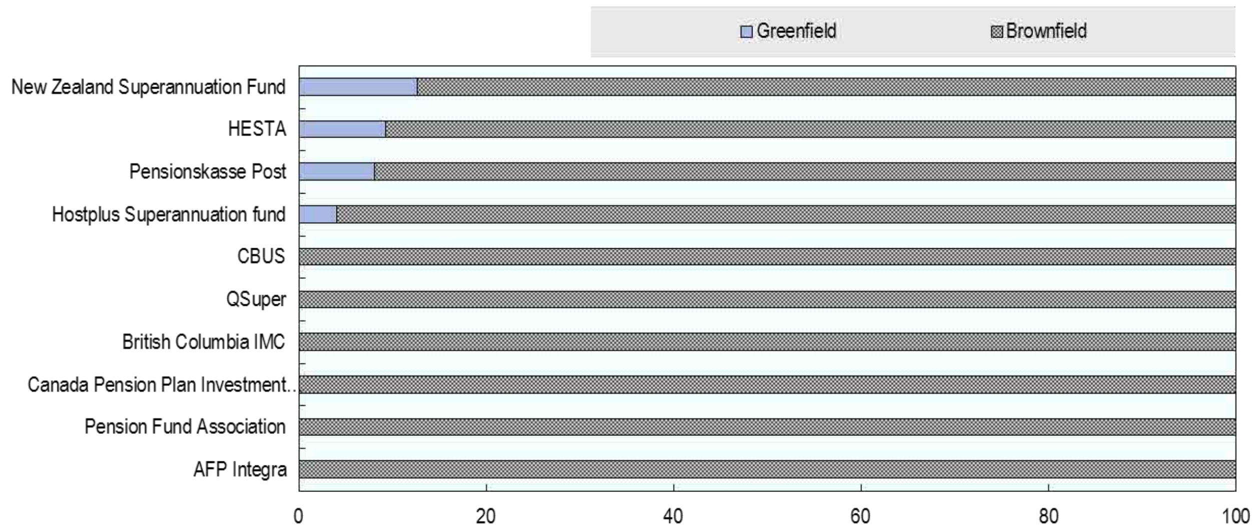
majority of funds – 16 in total – reported no exposure to renewable energy. As part of its new investment policy adopted at the end of 2015, ABP plans to invest an additional EUR 4 billion in renewable energy generation. Unlisted equity is one medium in which funds may invest in renewables: it is likely that actual allocations to renewables are higher through listed equity instruments and other channels.

AFP Integra, PFZW, and PFA Pension all had significant allocations to social infrastructure. Telecommunication investments were generally a small part of portfolios.

While a number of funds are expressing greater interest in investing in greenfield assets (see Table 6 where funds indicated whether they invest or plan to invest), few funds reported investment in greenfield assets. A separate question asked respondents to split their unlisted equity allocations between greenfield and brownfield investments (Figure 12). Four funds out of ten indicated exposure to greenfield assets, albeit at low levels compared to brownfield.

Figure 13. Infrastructure allocations, by development phase, for selected LPFs and PPRFs in 2015

As a percentage of total unlisted infrastructure equity investment



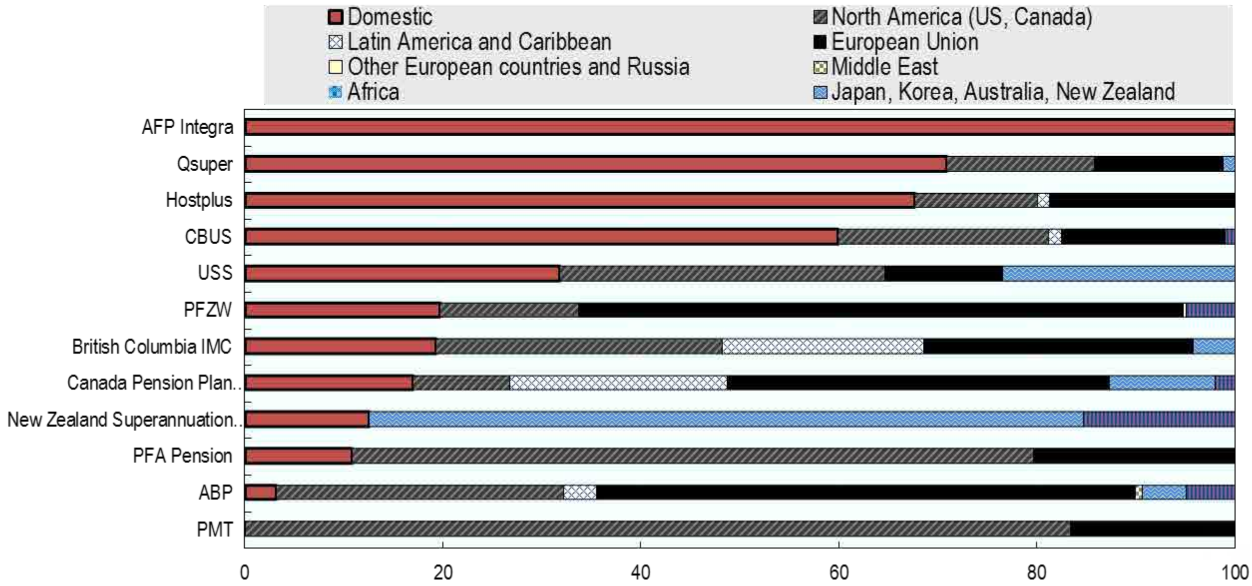
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Twelve funds reported the geographical distribution of their unlisted infrastructure equity portfolio (Figure 13). Based on this small sample, little investment is happening in emerging markets. No funds reported exposure in Africa, the Middle East, or in Eastern Europe. The New Zealand Superannuation Fund and two funds based in the Netherlands: ABP and PFZW reported exposure to infrastructure in emerging Asian countries. The two Canadian funds, CPPIB and BCIMC reported sizeable allocations in Latin America.

Some funds also had a strong home-market bias. AFP Integra, based in Peru, invested exclusively in its domestic infrastructure market. Three funds based in Australia had high allocations to the domestic market, with some diversifying foreign exposure in North America and the European Union. Denmark's PFA Pension invested a large portion of its portfolio in North America. PMT, based in the Netherlands, invested its entire unlisted infrastructure equity portfolio in foreign markets.

Figure 14. Infrastructure allocations, by geographic region, for selected LPFs and PPRFs in 2015

As a percentage of total unlisted infrastructure equity investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Analysis of infrastructure investment vehicles

This year, the majority of funds indicated that they invest in unlisted equity through funds, a shift from last year's survey where most funds reported exposure through direct and co-investment (Table 8). This change reflects the greater number of funds that responded to this question.

Of the funds that broke out their allocations in Table 8, unlisted infrastructure funds accounted for 57% of the total, direct and co-direct investments 43%, and other unlisted investments were 0% of the total, on average. Australian superannuation funds used a mix of investment funds and direct/co-direct investments, without a clear favoured vehicle amongst six funds included in Table 8. Funds based in Europe and the United States tended to use funds rather than direct investment. Canadian funds favoured direct and co-investments in unlisted equity.

A variety of fund structures to access infrastructure are available, including closed- and open-ended. Data on infrastructure funds shows high activity in 2015. According to Preqin, 46 unlisted infrastructure funds reached financial close in 2015, securing an aggregate USD 36 billion in capital commitments.[27] The average fund size has also been increasing, with some mega-funds coming to market. In 2017 Global Infrastructure Partners III reached a final close at USD 15.8 billion; Brookfield Infrastructure Fund III closed at USD 14.0 billion in 2016[28]. Investment platforms also continue to raise capital from institutional investors. An example is the Pension Investment Platform in the United Kingdom, owned directly by nine local pension funds.

[27] Preqin (2016), Global Infrastructure Report, Sample pages.

[28] Prequin Infrastructure Online.

Table 8. Detailed infrastructure investment vehicles of selected LPFs and PPRFs, 2015

As a percentage of total unlisted infrastructure equity investment

Country head office	Name of the fund or institution	Total unlisted infrastructure equity in 2015 (in USD m.)	Unlisted infrastructure investment breakdown (as a % of total unlisted infrastructure investments)		
			Unlisted infastructure funds	Direct and co-investment infrastructure equity	Other unlisted infrastructure equity
LPFs					
Australia	CBUS	2,494	84.5	10.5	5.0
Australia	HESTA	2,697	92.1	5.2	2.6
Australia	Hostplus Superannuation fund	1,614	89.8	10.2	0.0
Australia	QSuper	4,362	9.2	90.8	0.0
Australia	Sunsuper (2,3)	972	11.0	89.0	0.0
Australia	Telstra Superannuation Scheme (4)	199	61.4	38.6	0.0
Brazil	FUNCEF	827	100.0	0.0	0.0
Brazil	Previ	2,449	0.0	100.0	0.0
Canada	British Columbia IMC	4,003	23.0	77.0	0.0
Canada	OTPP	11,316	0.0	100.0	0.0
Denmark	PFA Pension	362	100.0	0.0	0.0
Finland	Keva	337	32.9	67.1	0.0
Finland	Varma Mutual Pension Insurance Company	707	100.0	0.0	0.0
Japan	Pension Fund Association	387	0.0	100.0	0.0
Netherlands	PFZW	6,025	32.0	68.0	0.0
Netherlands	PMT	499	100.0	0.0	0.0
Netherlands	Stichting Pensioenfonds ABP	8,147	66.0	34.0	0.0
Peru	AFP Integra	110	100.0	0.0	0.0
South Africa	GEPF	712	100.0	0.0	0.0
Spain	Fonditel (5)	11	100.0	0.0	0.0
Switzerland	Pensionskasse Post	310	100.0	0.0	0.0
United Kingdom	USS	3,153	23.1	76.9	0.0
United States	State Universities Retirement System of Illinois	78	100.0	0.0	0.0
	United Nations Joint Staff Pension Fund (4)	98	100.0	0.0	0.0
PPRFs					
Canada	Canada Pension Plan Investment Board	14,896	0.2	99.8	0.0
Finland	Valtion Eläkerahasto (4)	407	51.7	48.4	0.0
New Zealand	New Zealand Superannuation Fund	292	27.9	72.1	0.0
Sweden	AP1 (4)	373	0.0	100.0	0.0
Sweden	AP3 (4)	603	100.0	0.0	0.0

(1) Totals may not add up to 100 due to rounding. (2) Data is as of August 31, 2015. (3) Data refer to the balanced option only. (4) Data s as of June 30, 2015. (5) Data refer to Fonditel's largest pension plan: Empleados de Telefónica de España.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

PART C – SUSTAINABLE INVESTMENT

Green investment

A section of the survey included some questions on green investments by LPFs and PPRFs, which provides a source of quantitative data, and also provides insights as to how investors define more broadly sustainable investment and what may be categorised as "green".[29]

Some institutional investors are developing sophisticated processes and tools to incorporate into their decision making the financial impacts of environmental factors as well as expected policy and business responses to risks and opportunities. Underlying these developments is a number of trends in investment practices. For some time, Environment, Social and Governance (ESG) frameworks have been utilised by growing numbers of investors to evaluate risks and opportunities, taking into account financial and non-financial information. Broadly, ESG frameworks could be defined as investment policies or principles recognising that ESG factors may impact portfolio performance and so affect the investor's ability to meet investment goals or obligations. These impacts could further be used to inform asset allocation decisions or securities valuation models. Since there is not wide agreement on particular definitions of ESG, and there is a wide range of interpretation, individual investor circumstance and belief systems can be driving forces in the uptake and implementation of ESG practices.

In some cases, institutional investors are evolving their investment frameworks to align their investment activities with broader environmental or development objectives such as the United Nations Sustainable Development Goals (SDGs), or environmental issues more broadly as part of their investment framework and/or thematic investment strategy. Funds are also adjusting to new regulations in some markets that seek to clarify the role of ESG in a fund's investment process. France has introduced the most far-reaching requirements in terms of ESG reporting by institutional investors. Under Article 173-VI of the Energy Transition Act, asset managers, pension funds and insurance companies must provide information not only on how they integrate ESG factors in their investment and voting decisions but also on the climate risks they face and how their portfolio construction mitigates certain risks.[30]

DNB, the Dutch central bank, which is also the pension fund regulator, is launching in 2017 a "thematic examination into the impact of climate change on the financial sector". Findings will be presented in a publication on climate risks, which will also address the consequences for supervision. Eighteen Dutch financial institutions, including pension funds, insurance companies, and banks, came together as signatories to a Sustainable Development Goals Investment Agenda, inviting the Dutch government and central bank to work together. The signatories published a report *Building Highways to SDG Investing*[31] that puts forth a series of recommendations on how to advance an investment framework built around the SDGs.

[29] Green investments can be defined through many criteria, depending on investor standards. For the survey, examples of such investments included green equity indexes such as FTSE4Good, S&P Global Eco Index, S&P Global Water Index, green bonds such as European Investment Bank climate awareness bonds, SEB & Credit Suisse – World Bank/IFC Green Bonds, and alternative investments in real estate that are environmentally acceptable such as improving energy efficiency, recycling, or reducing CO2 emissions.

[30] For further reading on ESG reporting requirements, see OECD (2017), *Investment Governance and the Integration of Environmental, Social and Governance Factors*, www.oecd.org/finance/Investment-Governance-Integration-ESG-Factors.pdf

[31] Building Highways to SDG Investing, www.triodos.com/downloads/investment-management/articles/SDGI_Report_Building_Highways.pdf

CBUS, one of the largest Australian superannuation funds, is mapping its portfolio's contributions to the SDGs, trying to understand how investments can align, while also searching for opportunities. Sweden's AP4, a pension reserve fund, utilises a framework to map its portfolio contributions to the SDGs, and the fund lists several goals related specifically to climate change including measuring and disclosing the fund's carbon footprint on listed equities. Sweden's AP6 joined CDP (the Carbon Disclosure Project) declaring its support for the initiative and the recommendation that more companies should measure and disclose their carbon emissions. PensionDanmark uses the SDGs as part of its framework for sustainable investment.

Based on survey data, several funds reported large allocations to green equities: France's ERAFP reported 27.5% of the total portfolio, and the Netherlands' PMT reported 29.0% (Table 9). For PMT, the inclusion of their entire listed equity portfolio as "green" is the result of their approach to responsible investing, which is considered in all investment decisions, including new investment strategies, product mandates, and investment proposals. ERAFP applied an ESG best-in-class approach to all equity mandates. AP4, which reported 9.1% of their total portfolio in green equities, labelled this allocation as 'low-carbon' and 'ESG-strategies'. For BCIMC, green equity includes global equity securities with high environmental, social and governance (ESG) rating relative to their sector peers.

AP2 reported a sizable total allocation to green investments, at 12.1% of the total portfolio, part of which included private equity investment in renewable energy/climate solutions. AP7 reported a small allocation to "cleantech" which it defines as new environmentally improved business models and technical innovations, making it possible to use natural resources more efficiently and responsibly. The fund is looking to increase the allocation over the next couple of years. Many funds that reported green investments also stated that they had no set target for green investments.

A noteworthy trend amongst the funds that reported green investments was a general increase in the amount of pension funds that invest in green bonds, and also in the relative size of their allocations. Allocations to green bonds reported by ABP, Alecta, AP2, and AP4, all increased in 2015 from levels reported in the prior year. AP2 reported a 1% strategic allocation to green bonds. Alecta invested for the first time in green bonds in 2014; Santander in 2015. Strong issuance in the green bond market has helped funds increase their allocations.

Table 9. Detailed green investments of selected LPFs and PPRFs in 2015

As a percentage of total investment

Country head office	Name of the fund or institution	Total investments in 2015 (in USD m.)	Green investments (as a % of total investments)				
			Green equity	Green bonds	Alternative green asset classes (1)	Other green investments	Total Green Investments
Australia	Health Employees Superannuation Trust Australia (2)	24,683	2.2	..	3.4	..	5.6
Australia	UniSuper Management Pty Ltd	36,538	3.9	0.3	0.8	..	4.9
Australia	Hostplus Superannuation fund	13,947	..	0.5	0.4	..	0.9
Brazil	FUNCEF	13,909	0.6	..	..	..	0.6
Brazil	Previ (3)	39,372	..	..	..	0.0	0.0
Canada	British Columbia Investment Management Corporation	74,111	2.6	..	..	..	2.6
Canada	OTPP	121,565	..	..	0.5	..	0.5
Denmark	PFA Pension	56,574	0.2	..	0.3	..	0.5
Denmark	Pension Denmark (4)	25,726	..	..	..	12.2	12.2
Finland	Valtion Eläkerahasto (5)	20,416	..	..	0.3	..	0.3
France	ERAFP (6)	25,572	27.5	0.0	..	..	27.5
Netherlands	PMT (7)	65,937	29.0	..	0.0	..	29.0
Netherlands	Stichting Pensioenfonds ABP (8)	429,916	1.2	0.5	0.8	5.1	7.7
New Zealand	New Zealand Superannuation Fund (9)	19,974	..	..	0.0	7.2	7.2
Norway	Government Pension Fund - Global	869,034	..	..	..	0.7	0.7
Romania	Azt Viitorul Tau	1,305	..	..	..	0.1	0.1
Spain	Endesa	1,784	..	0.3	..	..	0.3
Spain	Fonditel (10)	3,731	1.2	..	0.1	..	1.3
Spain	Santander	238	..	1.0	..	..	1.0
Sweden	AP7	33,546	..	..	0.3	..	0.3
Sweden	Alecta	86,668	..	0.5	..	..	0.5
Sweden	AP2	35,387	1.6	1.5	6.1	3.0	12.1
Sweden	AP3 (5)	36,970	..	1.2	0.0	0.0	1.3
Sweden	AP4	36,367	9.1	1.2	..	..	10.3
United Kingdom	USS (11)	70,602	..	..	0.2	0.1	0.3
:h as stocks, exchange-trac	United Nations Joint Staff Pension Fund (5)	53,574	0.4	0.3	..	..	0.7

Note: Some funds have green investments (in "green" indices for instance) but cannot separate these investments from other portfolio investments, as is the case for Keva in Finland, and Illinois SURS in the United States (green private equity).

".." means not available.

(1) The alternative green asset classes include hedge funds, natural resources, private equity, infrastructure and inflation-linked bonds. (2) Includes investment in private equity clean technology. (3) Green investments are defined by Previ as assets (such as stocks, exchange-traded funds, and mutual funds) in which the underlying business(es) are somehow involved in operations aimed at improving the environment. (4) Other investments include renewable energy. (5) Reported values are as of June 30, 2015. (6) If investments based on the FTSE4Good or similar methodologies are considered as green investments, all the investments in equity by ERAFP could be seen as green, since ERAFP applied an ESG best-in-class approach to all equity mandates. (7) PMT reported its entire listed equity allocation as green investment, as their investment processes uses ESG criteria for its selection and monitoring of asset managers. (8) Other investments include green real estate, which are defined as properties with a GreenStar label in the GRESB Index, and that have an above average performance on sustainability. (9) Other investments include forestry. (10) Data refer to Fonditel's biggest pension plan: Empleados de Telefónica de España. (11) Other green investments include renewable energy and low-carbon infrastructure, cleantech private equity, and a listed environmental technology fund.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Social impact investment[32]

The OECD has gathered for the third year data on social impact investments by LPFs and PPRFs, provided in Table 10. The results show that some funds have committed capital to finance organisations or projects with the explicit expectation of a measurable social, as well as financial return; this also includes investment that contributes to the general public benefit. The survey grouped investments into two primary categories: social impact investments (for example social impact bonds) and venture capital/SME finance that is specifically targeted to have a demonstrable social benefit (such as local market development).

[32] See *Social Impact Investment: Building the Evidence Base*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264233430-en, for more information.

Mentioned in the previous section on green investment, as institutional investors consider the SDGs or development objectives as part of their investment process, social impact investments may be part of these portfolios. Development impact assessment may not always be straightforward, and investments with a clear contribution to the SDGs (or more specifically, to some of the SDGs) may not be labelled as such. Thus some funds reported policies related to social investments that integrate investment decisions across all asset classes under a unified investment process.

Broadly, investments with a desired development or positive social impact could represent human rights, working conditions, health, safety, or general wellbeing. Negative screens that eliminate unethical enterprises may be a part of a responsible investment ethos, along with positive screens that seek investments with a strong social impact track record, although implementation can vary across asset category.

Table 10. Detailed social investments of selected LPFs and PPRFs in 2015

As a percentage of total investment

Country head office	Name of the fund or institution	Total investments in 2015 (in USD m.)	Social investments (as a % of total investments)			
			Social impact investments	Social / development VC and SME finance	Other social investments	Total social investments
Argentina	Sustainability Guarantee Fund (1)	50,689	6.1	..	..	6.1
Australia	Health Employees Superannuation Trust Australia	24,683	..	..	0.1	0.1
Australia	Sunsuper (2)	16,732	0.3	..	..	0.3
Australia	Hostplus Superannuation fund	13,947	..	..	0.6	0.6
Denmark	PFA Pension	56,574	..	0.2	..	0.2
France	ERAFP	25,572	0.1	1.0	..	1.1
Netherlands	Stichting Pensioenfonds ABP	429,916	..	0.6	..	0.6
New Zealand	New Zealand Superannuation Fund	19,974	..	..	0.4	0.4
South Africa	GEPF	109,203	..	0.1	..	0.1
Spain	Fonditel (3)	3,731	..	..	0.9	0.9
Spain	Santander	238	..	0.7	..	0.7
Sweden	AP2	35,387	..	0.1	..	0.1
Switzerland	Pensionskasse Post	15,788	..	..	1.3	1.3
United Kingdom	USS	70,602	..	0.0	..	0.0
United States	Massachusetts PRIM Board (4)	60,965	0.0	0.0	0.0	0.0

Note: Some funds have social investments but cannot separate these investments from other portfolio investments, as is the case for Fonte in Italy.

".." means not available.

(1) Investments include social infrastructure. The Sustainability Guarantee Fund invests for both financial returns and social returns. (2) Reported values are as of August 30 2015. (3) Data refer to Fonditel's biggest pension plan: Empleados de Telefónica de España. (4) Reported values are as of June 30, 2015.

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

This specific part of the survey was seeking information on investments that funds have made in specific products, debt/equity instruments or through specific investment mandates designed for social impact investing.

Pensionskasse Post, based in Switzerland, reported a 1.3% allocation to microfinance, which it had labelled as an investment with a positive social impact. The GEPF, based in South Africa, has a developmental investment portfolio allocation, which comprises 5% of the overall portfolio and consists of investments in economic and social infrastructure, renewable energy, and agriculture. Argentina's Sustainability Guarantee Fund, a PPRF, invested 6.1% in social infrastructure with a dual goal of achieving both financial and positive social returns. Such investments included housing construction and potable water improvement, and are considered part of infrastructure investment.

Three superannuation funds based in Australia reported exposure to social investments. In September 2013, HESTA's board approved an annual allocation to "impact investments" of 0.20% of the total fund, the objectives of this impact investment strategy are to identify investments aligned with members' values which can achieve a suitable balance between financial net return and social impact. Hostplus reported a 0.6% allocation to other social investments, but did not report a specific policy regarding social investments. CBUS did not report an allocation, but did disclose an investment perspective which describes social investment as focused on social and affordable housing that is aligned with fund members in the building and construction industry. The fund is exploring options to invest in this space and the market in Australia is currently in development. CBUS has also made submissions to the Australian Treasury to encourage the government to facilitate affordable housing bonds.

Box 2. Social impact bonds and development impact bonds

Social impact bonds (SIBs) are a type of public-private partnership that embeds a pay-for-success scheme, commissioned by public authorities, foundations or corporations to provide social goods and services. SIB commissioners have clear priorities in terms of social goals that need to be achieved in a more efficient way, which allows them to set up predefined and measurable target social outcomes. Investors in SIBs are repaid based on the achieved outcomes, defined *a priori* by the SIB commissioner. Therefore, the investors will be repaid in tranches over time, only if the agreed upon outcomes are achieved. The payments and any positive returns on investment should reflect the innovation and more efficient social service provision provided by the social service delivery organisation.

Development impact bonds (DIBs) are based on the model of SIBs and finance development initiatives in lower income countries. Similar to SIBs, DIBs are performance-based instruments and pay based on the achievement of agreed development goals stipulated in the contract.

The SIB model, first used in the U.K., has been replicated in other regions such as the United States, Canada, Israel and Australia. SIBs issued to date have focused on a range of social issues such as criminal justice, child/family support, homelessness, employment, and health.

Source: Adapted from *Social Impact Investment: Building the Evidence Base,* OECD Publishing

Massachusetts PRIM Board reported small allocations in all three categories. The fund noted that it recognizes its obligations under Massachusetts law to seek investment opportunities that will benefit the economic climate of the Commonwealth of Massachusetts as a whole, provided that such investments are consistent with PRIM's obligations to the members and beneficiaries of its participating retirement systems. Accordingly, in cases where investment characteristics, including returns, risk, liquidity, compliance with allocation policy, and others, are equal, PRIM will favour those investments with a substantial, direct and measurable benefit to the economy of the Commonwealth.

ANNEX - TYPES OF SOVEREIGN AND PUBLIC PENSION RESERVE FUNDS

Although there is no single widely accepted definition, Sovereign and Public Pension Reserve Funds (SPFs) could be defined as funds set up by governments or social security institutions with the objective of contributing to finance the relevant pay-as-you-go pension plans. There are two types of SPFs. Although both have the same ultimate objective (i.e. meeting the potential financial liabilities relating to the social security system), they vary in terms of funding sources, investment strategies, and payout phases, among others.

- One is the fund that is part of the overall social security system, where the inflows are mainly surpluses of employee and/or employer contributions over current payouts, as well as top-up contributions from the government via fiscal transfers and other sources. Among others, Denmark's Social Security Fund, Japan's Government Pension Investment Fund, and USA's Social Security Trust Fund fall within this category. These funds may be managed by the social security institution itself or an independent -often public sector- fund management entity.

- The other type refers to those funds which are established directly by the government (completely separated from the social security system), and whose financial inflows are mainly from direct fiscal transfers from the government. Unlike the first type of SPFs, those within this category have been set up by governments to meet future deficits of the social security system. Some are not allowed to make any payouts for decades. All of these funds are under autonomous management entities. Examples include the Australia Future Fund, the New Zealand Superannuation Fund, the Norwegian Government Pension Fund, and the French "Fond de Réserve pour les Retraites". These funds are also sometimes classified as sovereign wealth funds (SWFs). Though they do not all have high foreign investment allocations.

Source: OECD Pension Markets in Focus.

www. oecd.org/finance/lti

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