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Beyond their Borders

Evolution of foreign investments by pension funds 2020 Edition

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alfi association of the luxembourg fund industry

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The Association of the Luxembourg Fund Industry (ALFI) is the representative body of the Luxembourg investment fund community. Created in 1988, the Association today represents over 1,300 Luxembourg domiciled investment funds, asset management companies and a wide range of service providers such as depositary banks, fund administrators, transfer agents, distributors, legal firms, consultants, tax experts, auditors and accountants, specialist IT providers and communication companies. The Luxembourg Fund industry is the largest fund domicile in Europe and a worldwide leader in cross-border distribution of funds.

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Foreword ALFI

Corinne Lamesch,
ALFI Chairperson

In 2015, ALFI commissioned a report on foreign investment of pension funds and we feel it is now time to update this document.

Since the first edition of this study, we have witnessed a growth in the share of alternatives strategies across pension markets. Luxembourg Alternative Investment Funds (AIF) are vehicles of choice to structure alternative investments and can be the ideal channel for accessing investment opportunities in many different asset classes worldwide for pension funds.

UCITS remains a key vehicle for many pension funds seeing exposure to worldwide markets. Thirty years ago, few would have foreseen the phenomenal success that Europe's UCITS has become. 'Undertakings for Collective Investment in Transferable Securities' was an unlikely candidate to be a brand in its own right, however today it is the EU's most recognised financial export. As the premier global investment fund, nearly two out of three UCITS distributed on a cross-border basis are from Luxembourg. We expect this trend to continue given the sound regulatory framework the high level of investor protection and the depth of global capability embedded in the structure.

Another key development since the previous edition is the growing focus on sustainability of the investments made by pension funds. Luxembourg has been a pioneer in this field and is today the leading domicile of sustainable funds in Europe.

However, pension funds regulations still differ from one country to the other. In particular, some countries restrict the amount pension funds can allocate to investment funds or foreign investments. Consequently, navigating the terrain of complex local requirements can be difficult for asset managers. ALFI, therefore, believes that a study providing more clarity on the global investments of pension funds will be beneficial to the asset management community.

Committed to its key objective to help connect investors with worldwide market opportunities, we trust that this updated report, commissioned by our association, will be valuable.

Corinne Lamesch

Foreword PwC

Dariush Yazdani, Partner
PwC Market Research Centre

Alfi has commissioned PwC to update our previous report, *Beyond their Borders: Evolution of foreign investment by pension funds*. In the last report, I noted that the new millennium had changed the playing field for pension funds. This remains much the same – an increasing number of people are retiring and they're living longer. The strain on pension systems across the globe is growing.

The low interest rate environment that we find ourselves in, exacerbated by central bank policies, continues – in some developed nations, we have even seen negative rates. Given the increasing volatility of public markets, many pension funds have reduced their equity allocation and are searching for alternatives. This has called pension funds' investment strategies into question. How can they, in the most sustainable way, meet their long-term mandates and help individuals save?

In light of these factors and the current global investment environment, pension funds, with their ability to weather periods of market instability, are also upping their allocations to alternatives, including notably illiquid assets such as real estate and infrastructure. In search for diversification, pension funds are not only looking in terms of asset class, but also geography. They are going beyond their borders in their search for growth – either through direct investments or, increasingly, using funds such as AIFs or UCITS.

In the coming pages we provide a detailed analysis of the current global pension market, highlighting the trends that are propelling the industry forward. We also examine the benefits that pension funds can reap when investing through funds such as UCITS and AIFs. The years ahead might be tough for the pension industry given the rising pressure placed on systems globally, but there are opportunities to be found – if one knows where to look.

Dariush Yazdani

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Introduction

The world is ageing. This is placing considerable strain on already stretched pension fund assets. Already, the old-age dependency ratio[1] in Europe has already pushed past 40 and the US is not far behind. We have seen global pension funds already push a considerable change agenda to the asset and wealth management industry as they look to place the above US$42 trillion in assets they control.

This strain has led many pension funds to examine their foreign investment limits. In recent years, as many pension funds have sought to spread their risk and increase yield by increasing their foreign investment limits. As of 2018, foreign investments account for roughly a third of pension funds' total assets under management (AuM).

Alongside pension funds increasingly looking beyond their borders, the imbalance between employed contributors and retired beneficiaries is shifting the market towards defined contribution. In 2018, assets in DC plans overtook those is DB for the first time. This is as DB plans become less able to address the risks that arise from ongoing demographic shifts across the globe. DC schemes, on the other hand, are better equipped to do so due to automatic adjustments.

As many pension funds search for value for money, they are turning away from costly active funds towards low-cost index trackers. This is compounded by the underperformance of many active funds in the last few years, especially against passive funds whose returns were bolstered by an equity bull market. Concerns surrounding costs have also led many pension funds to reconsider their fee structures. Led by the largest pension fund in the world, Japan's GPIF, institutional investors are considering adopting a performance-based fee structure.

Climate change is also shifting the preferences of pension fund contributors. As a new generation of investors enters the pension fund market, there has been an uptick in demand for sustainable financial assets. The underlying purpose of the investment, to guarantee a safe retirement, remains the same. However, the mind-set shift means the new generation are not just concerned about the financial performance of the fund, but also ensuring that their assets are contributing to the world in same way.

From a geographical perspective, as regulations in Latin America allow pension funds to increasingly invest overseas, we've seen an uptick in the appeal of UCITS products in the region. Provided that the products continue to attract demand from local investors and that change in the regulatory landscape continues, Latin America could appear to be a great opportunity for UCITS. The vehicle's "regulated" status makes UCITS an attractive vehicle for retirement saving. Furthermore, the European Commission and EIOPA have been pushing for the formation of the pan-European personal pension product. The PEPP, which offers investors a new pan-European option to save for retirement, could provide the market with more competitive products.

Asian pension funds tend to be more conservative than those in developed markets, but this is changing as investors in the region struggle to meet the expected performance targets and are looking for ways to gain higher returns. Some pension funds in the region are increasing the allocation of their assets in alternatives with the hopes of diversifying out of the highly volatile and, sometimes, poorly performing public market. By turning towards less liquid assets such as private equity, infrastructure and real estate, they are starting to take the measures that they hope will better fit the pensions' prospects of long-term growth.

Finally, as we are witnessing a growth in the share of alternatives across pension markets, AIFs appear to be the vehicle of choice to structure alternative investments. With relatively few regulatory constraints but rigorous reporting obligations, AIFs provide pension funds with the freedom and safety needed to invest in less conservative asset classes. In fact, holding more than one quarter of the total alternative assets by the end of 2018, pension funds are by far the vehicle's main investors.

1. According to the World Bank, old age dependency ratio is the ratio of older dependents --people older than 64--to the working-age population--those ages 15-64.

2

Asset allocation of pension funds

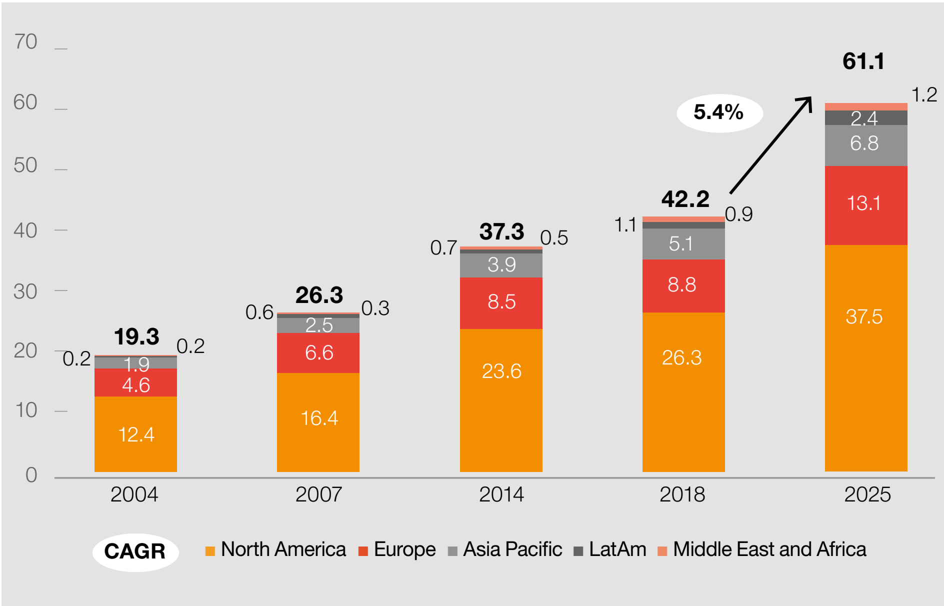
Asset Allocation of pension funds

Retirement assets saw steady growth between 2014 and 2018, rising at 3.2% compound annual growth rate (CAGR) to reach US$ 42.2tn. Pension fund assets also saw healthy growth in recent years, rising by US$ 4.9tn in the four years between 2014 and 2018. Pension funds continue to hold the bulk of assets among institutional investors, accounting for approximately 52% of the market in 2018.

Growth, however, stalled at the end of 2018, likely as a result of the downturn and volatility seen in the equity markets in the last quarter of the year. This short-term volatility saw the majority of pension funds experiencing negative real rates of return across the globe. Notably though, pension funds, by their very nature, also take a much longer term view, so short-term volatility is less of a concern. With growth expected to continue in the coming years, we believe that pension assets will see a 5.4% CAGR between end 2018 and 2025 to reach just above 61.1tn.

Looking regionally, North America remains the main domicile for pension assets, accounting for 61% of the global market at the end of 2018. Over the same period, Latin American funds witnessed the strongest AuM growth, with assets rising at an 18% CAGR. Alternatives were a large driver of asset growth across the globe, but doubly so in Latin America where private equity investing played a major role in the double digit growth.

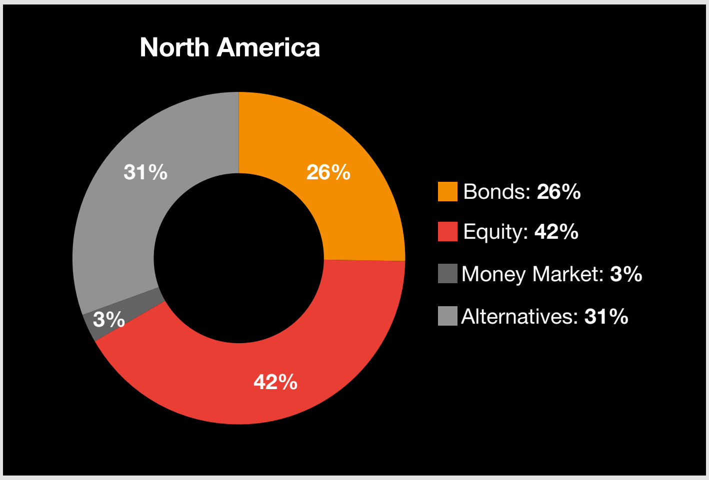
Exhibit 1: Pension asset growth by region, 2004-2025e (US$tn)

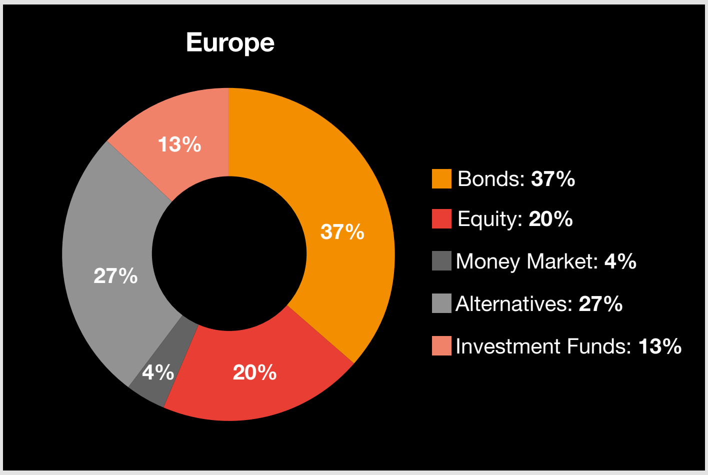


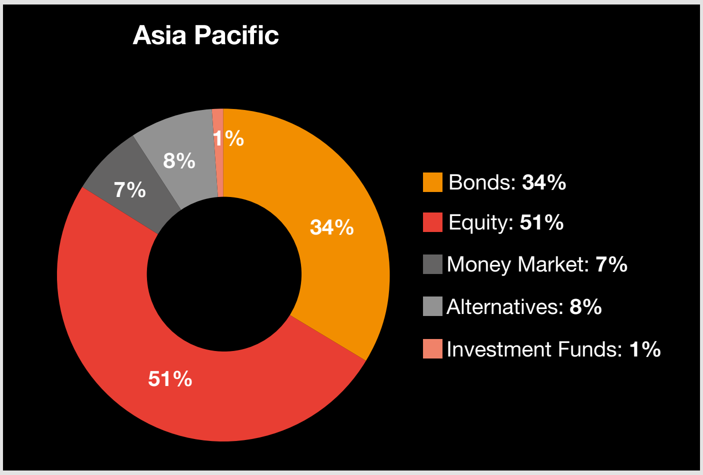
Sources: PwC Market Research Centre, past data based on OECD

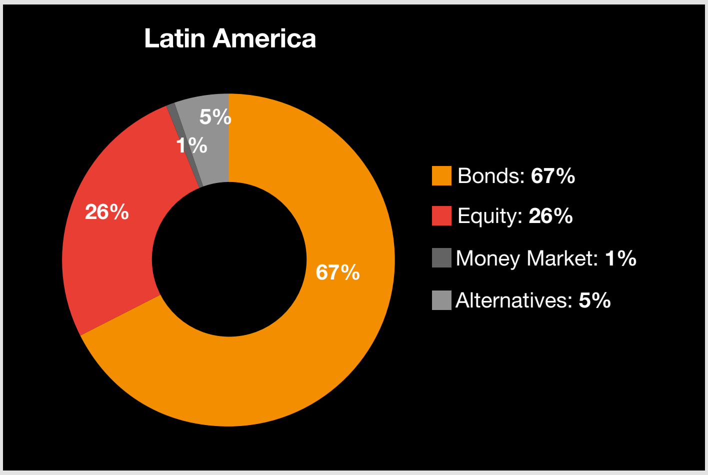
2. OECD, Pension funds in figures 2019

Exhibit 2: Pension fund asset allocation by region in 2018

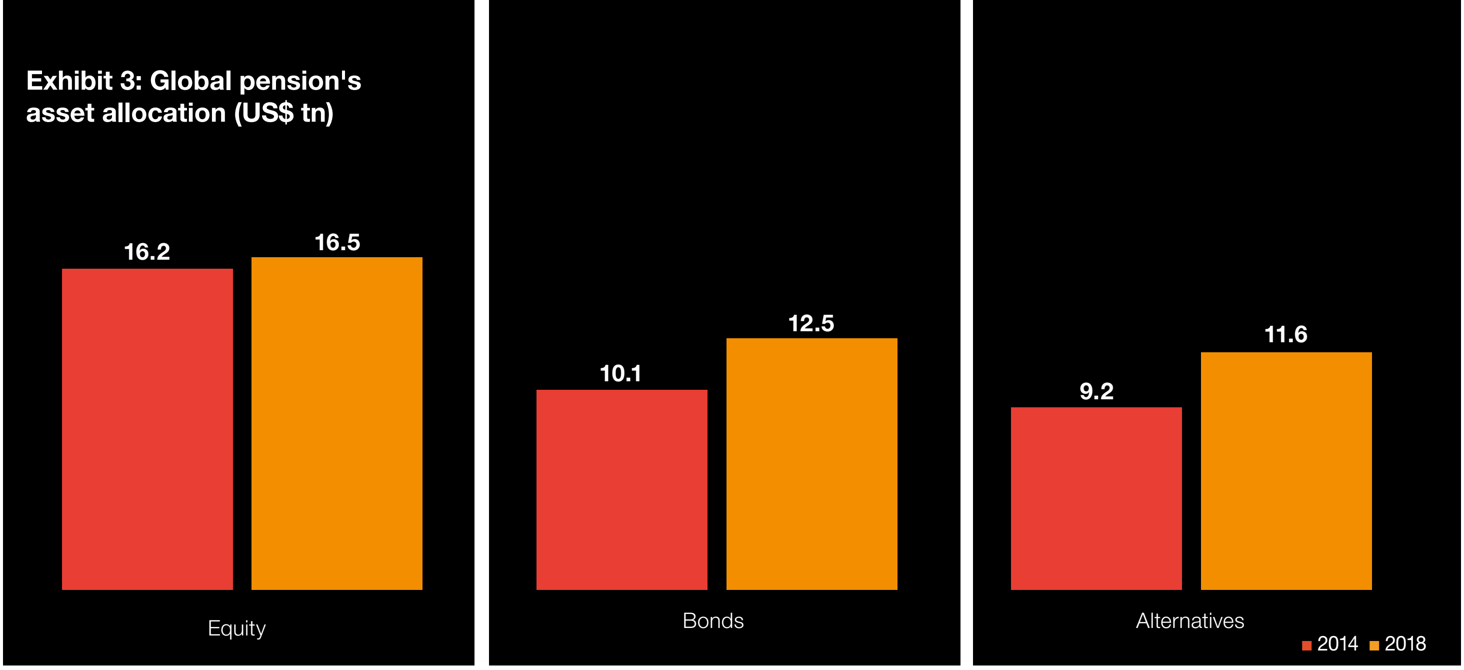








Source: PwC Market Research Centre based on OECD, World Bank, Towers Watson, national pension associations and national regulators



Source: PwC Market Research Centre based on OECD, World Bank, Towers Watson, national pension associations and national regulators.

Equity

Equity continues to hold the crown in terms of asset allocation, accounting for 38% of total assets in 2018. Over the last two decades, however, we have observed a downwards trend in terms of relative allocation, with equity falling from 60% in 1998. This is as pension funds diversify their portfolios and turn towards assets that increase their alpha, such as alternatives.

Countries	Largest Equity investments (US$ bn)
US	**10,625.7**
Canada	**723.3**
Japan	**691.0**
Australia	**626.4**

Countries	Largest proportion of equity investments (%)
Singapore	**96.2**
Poland	**85.6**
Hong Kong	**57.5**
Denmark	**51.4**

Bonds

Despite low interest rates, bonds remain a core of pension fund portfolios. Bonds accounted for 29% of global pension fund assets, up from 28% in 2014. Unlike equity assets, bonds have remained a stable portion of pension portfolios, almost always hovering around the 30% mark.

Countries	Largest Bond investments (US$ bn)
US	**6,177.8**
UK	**848.2**
Canada	**800.6**
Netherlands	**710.1**

Countries	Largest proportion of bond investments (%)
Mexico	**80.5**
Czech Republic	**76.5**
Brazil	**72.0**
Portugal	**70.7**

Alternatives

Unlike equity, alternatives are playing an increasingly important role in pension funds' portfolios. Globally, alternatives made up 27% of pension fund assets in 2018, rising from 26% in 2014. In absolute terms, alternatives AuM has risen from US$9.2tn to US$11.6tn.

Countries	Largest Alt investments (US$ bn)
US	**7,413.3**
Canada	**899.7**
UK	**896.9**
Switzerland	**352.9**

Countries	Largest proportion of alternative investments* (%)
Germany	**40.6**
Canada	**35.6**
Switzerland	**35.3**
UK	**31.9**

Source: PwC Market Research Centre based on OECD, World Bank, Towers Watson, national pension associations and national regulators

*Including Real Estate

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Foreign investments of pension funds

Motivations for investing abroad

In light of rising old age dependency ratios in many countries, pension funds are facing a crisis of unprecedented proportions. They must increase their yield in order to meet the growing number of individuals reliant on them. To generate higher returns and meet their mandates, pension funds are increasingly diversifying their portfolio both in terms of asset class and geography.

In the continued low interest rate environment in developed nations, many pension funds are increasing their foreign investments to tap into thriving foreign markets to increase returns and reduce volatility. Increasing foreign exposure also helps to mitigate local company and sector risks.

Moreover, different components like local market conditions, exchange and inflation rates, and regulatory constraints could affect the degree of a pension fund's foreign exposure. In countries with a highly volatile currency, for example, investing abroad can help reduce exposure to exchange-rate risks by hedging against currency rate changes. Similarly, high local inflation could also be a source of motivation for investing abroad.

Last but not least, another source of motivation for investing abroad is the accessibility to attractive foreign equity products. For example, UCITS are becoming increasingly popular across the globe. Due to its tax efficiency, the product attracts significant demand from local investors and its strict regulatory framework makes the vehicle a safe investment.

Regulations on foreign investments for selected countries

Countries	Global investment limit in foreign assets
Australia	• No limit
Belgium	• No limit
Brazil	• 10%; • Real estate and loans are not allowed; • Bonds, retail investment funds, private investment funds, and bank deposits are allowed only through local retail investments in foreign assets; • Direct equity investments are limited to Brazilian Depositary Receipts (BDR) and to stocks listed in the MERCOSUR capital markets;
Canada	• No limit
Chile	• Joint limit for all funds: 80%; • 100%; 90%; 75%; 45%; and 35% for funds A, B, C, D and E, respectively
Colombia	• No specific limit for each type of investment; • Maximum limit: 40% (Fund A and D), 60% (Fund B), 70% (Fund C); • Additional requirements apply in equity and private investment funds.
Czech Republic	• No limit for OECD countries
Denmark	• No limit for OECD countries
Finland	• No limit. • Limit for countries outside the OECD/EEA = 10% Voluntary pension plans.
France	• No limit
Germany	• No limit; where certain legal risks can arise, must be kept at prudent level
Hong Kong	• At least 30% in HKD denominated investment
Ireland	• No limit
Italy	• No limit
Japan	• No limit
Luxembourg	• No limit
Mexico	• Max 20% regardless of asset classes, additional requirements apply
Netherlands	• No limit
New Zealand	• No limit
Norway	• No limit for OECD countries
Peru	• 46%
Poland	• 30%
Portugal	• 15% limit in assets not traded in an EU or OCED regulated market. For PPR pension funds, the limit is 10%.
Singapore	• N/A
South Africa	• 25%, additional asset classes requirement applies
South Korea	• 30-70%
Spain	• No limit for OECD countries
Sweden	• No limit
Switzerland	• Max 10% in foreign real estate, max 30% unhedged exposure in foreign currencies
UK	• No limit
US	• No limit

Source: PwC Market Research Centre, national associations and OECD

Easing of regulation for foreign investments

The majority of countries analysed do not set any limits regarding foreign investments. Nonetheless, some countries have issued maximum percentages that can be invested in non-OECD or non-EEA countries (e.g. Czech Republic, Denmark, and Finland). Moreover, some countries have issued different limits for specific asset classes (e.g. Chile and Colombia). Although the regulatory landscape of the pension markets has generally remained unchanged since 2014, we have witnessed some changes.

In Italy for instance, new regulation regarding portfolio ceilings, foreign investments and other additional restrictions was issued in 2014. This regulation relaxed certain quantitative restrictions and put a greater emphasis on the reporting of pension funds' organisational structure, portfolio strategy, and risk monitoring systems. Apart for restrictions regarding real estate and loans, no more limits apply.

In 2017, Finland removed regional sorting. There is, however, still a 10% limit on foreign investments in countries outside the EEA for voluntary plans.

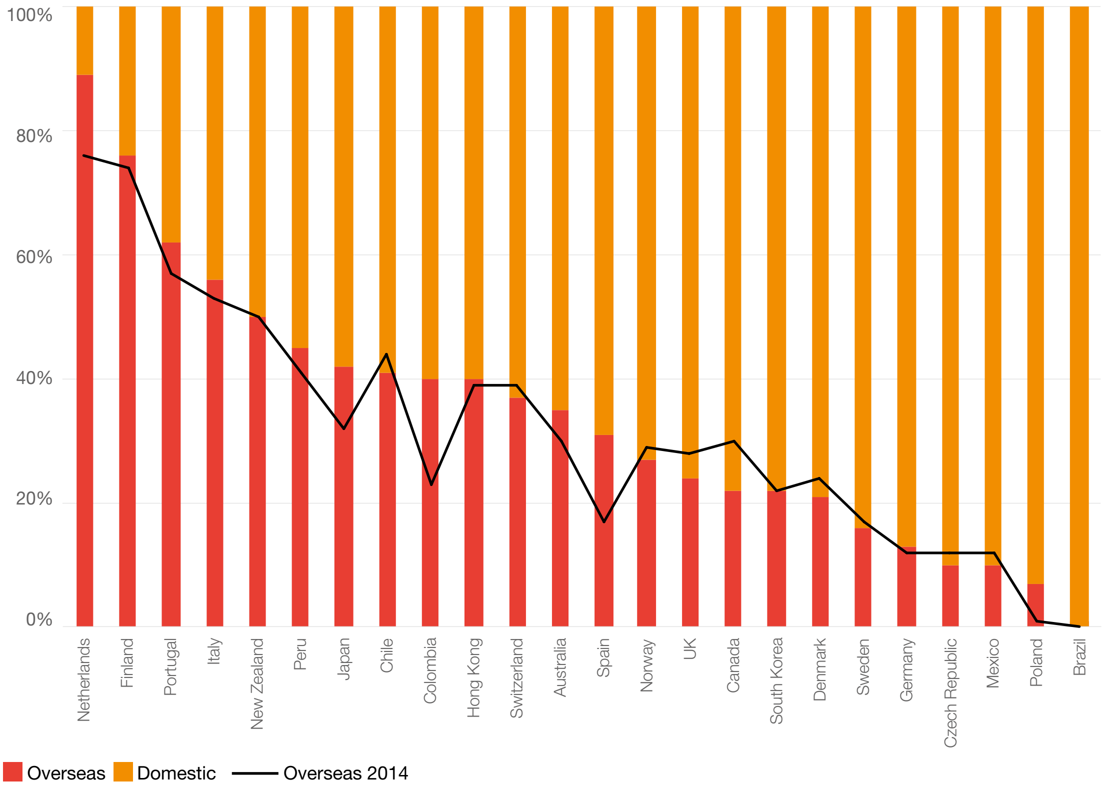
Although foreign investments are limited in Mexico, pension funds have been allowed to invest in foreign REITs through indexes since 2013. Since 2017, Malaysia, New Zealand, South Africa, Thailand and Taiwan became eligible countries in which pension funds can invest. Furthermore, Mexican pension funds can now shift part of their assets into foreign mutual funds from 51 countries under certain conditions since 2019, however many AFORES have yet to do so.

In Poland, since 2014, pension funds are no longer allowed to invest in treasury bonds or any state-backed assets and the minimum limit for which pension funds can invest in equities is now down to 15% (from 75%). As a result of these new measures, the limit for foreign investments has increased from 5% to 30%.

From the few changes noted above, countries are seemingly modifying their local legal framework towards regulatory easing for foreign investments. This softening of barriers for pension funds to invest beyond their borders is an indication that foreign exposure will most likely continue to increase in the global pension market.

In 2018, the average foreign investments of pension funds for the selected countries accounted for about 34% of their total pension investments, compared to 31% in 2014. Europe has the most developed market in terms of foreign exposure. In the region, the average percentage pension fund portfolios allocated to foreign markets remained quite stable, rising from 34% in 2014 to 35% in 2018. The United States does not set any quantitative limit on overall foreign investments for pension funds and many of the biggest pension funds across the country are investing extensively in Chinese tech. Asia Pacific's pension funds invested, on average, 38% in foreign markets in 2018, compared to 31% in 2014. Latin American countries have, on average, invested just 27% of their pension fund portfolios in foreign assets. However, foreign exposure varies considerably depending on the country. Brazilian pension funds, for example, only have around 1% foreign exposure, even though the regulator allows for up to 10%.

Exhibit 4: Overseas investments of pension funds for selected countries in 2018



Source: PwC Market Research Centre, national associations and OECD

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Key trends

Growth of DC over DB schemes

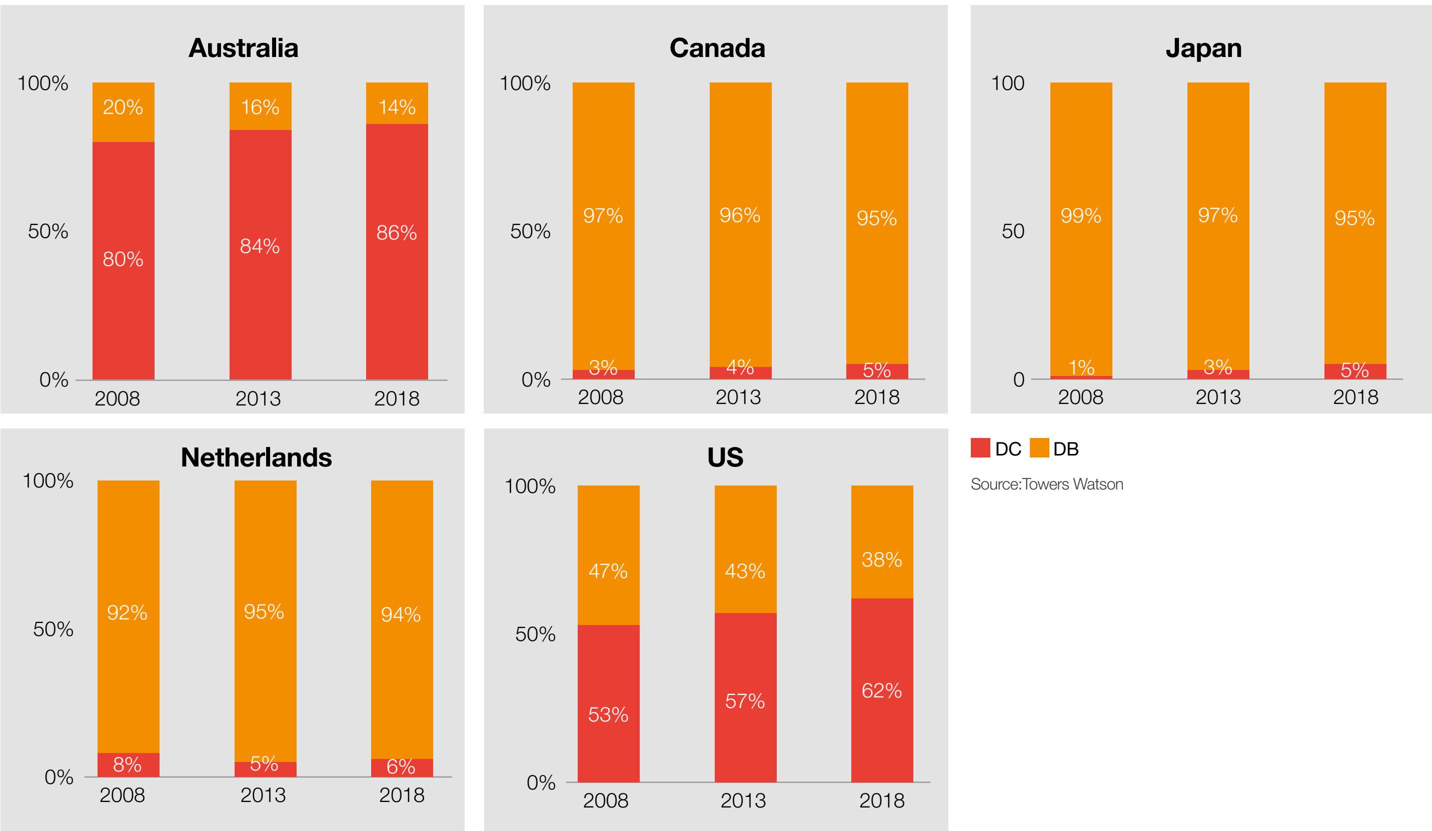
For the first time since its introduction 40 years ago, DC has overtaken DB as the most popular pension arrangement. DC pensions hold more than 50% of the seven largest pension markets' total assets, compared to 30% back in 1998.

The ongoing demographic shift, causing the old age dependency ratio to increase in many countries, poses a threat to traditional DB plans. Although DB schemes are designed to anticipate longevity risk and provide financial security to retired individuals, they do not possess the automatic adjustments needed to keep up with the ongoing demographic changes. In fact, DB dominated countries like the Netherlands, Japan, and Canada have already been exposed to an imbalance between the amount of contributors and beneficiaries as a direct consequence of their ageing populations.

In response to these fiscal pressures, countries are reforming their pension systems thereby attesting to a shifting global retirement landscape. Sweden, for instance, has changed its public PAYG system, replacing the old DB arrangement to a combination of notional DC and funded DC and in the Netherlands, a reformed system is shifting the pension system to DC plans. DC schemes offer a straightforward relationship between contribution and retirement, which offers a greater incentive to contribute than DB arrangements. They help smooth consumption as individuals become more concerned about their retirement savings and can choose to either contribute more, work longer, or spend less in order to not run out during retirement. DC can provide the automatic adjustments that DB cannot, minimising the risk of demographic shocks and budget deficit.

Over the past ten years, the ratio of DC over DB schemes has been increasing rapidly. DC assets have grown at an 8.9% growth rate compared to 4.6% for DB assets between 2008 and 2018. As countries across the globe struggle to meet pension demands, DC popularity is expected to rise at a rapid rate. Their share is increasing in Australia and the US, with 86% and 62% of pension assets being in DC schemes and many countries that have historically been DB slowly making moves in this direction (see Exhibit 5).

Exhibit 5: The rise of DC



Source:Towers Watson

3. Seven largest markets refers to pension markets of Australia, Canada, Japan, Netherlands, Switzerland, UK and US.
4. OECD, Pensions Outlook 2018

Shift from active to passive

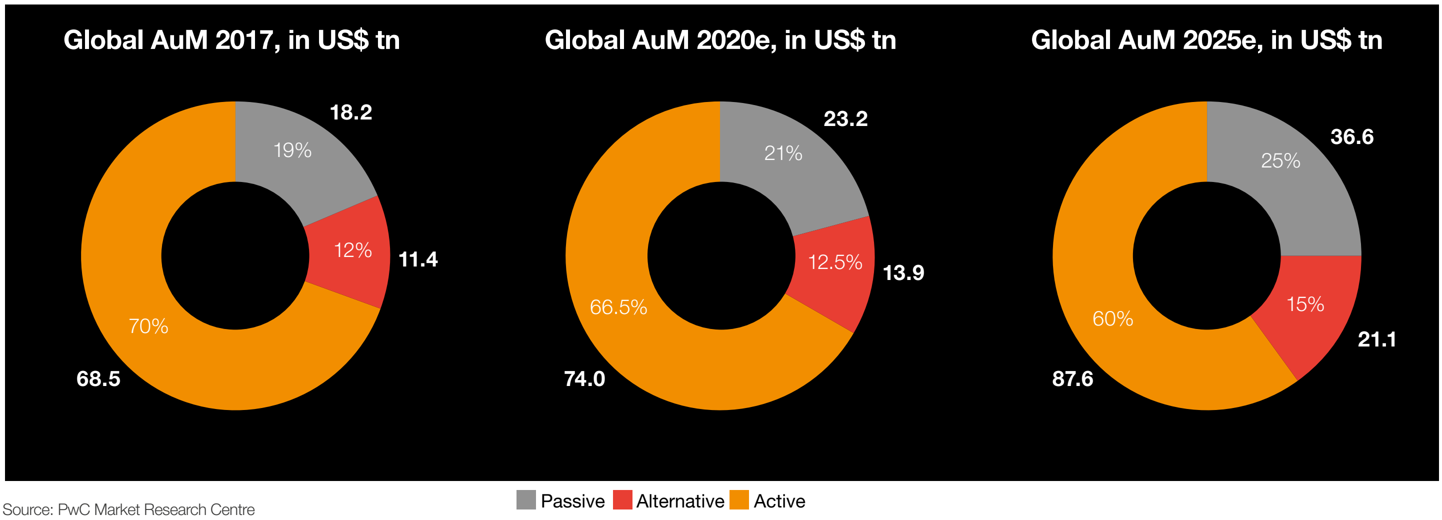
While demand for passive and alternative strategies will continue to grow, active will still remain the largest part of the industry (see Exhibit 6). In fact, as passives continue growing, pension funds will need active managers to deal with some of the inefficiencies[5] that may result from a passive driven market. Passive rise is a foundational change in the way pension plans now manage their portfolios as both active and passive are needed.

According to a DWS survey, approximately 78% of surveyed global pension funds expect positive growth in their allocation to passives over the next three years. As these funds grow in popularity among institutional investors, we expect their AuM to rise to US$ 36.6tn by 2025, up from US$ 23.2tn in 2017. With investors searching for increased value for money, many have begun slowly shifting towards low-cost passives, which, buoyed by the equity bull market, have seen high returns.

When it comes to exchange-traded funds, 26% of pension funds identified ETFs as their preferred investment vehicle. Additionally, the percentage of respondents claiming to hold traditional index funds grew from 48% to 53%. Another strategy that has experienced similar growth is smart beta with 26% of participants having invested in it as an increasing amount of pension funds are looking to combine the best of active and passive investing.[6]

Looking forward, a shift from market capitalisation-weighted indices towards smart beta, factor-based, ESG (environmental, social and governance) and other thematic strategies is to be expected as a result of passives becoming increasingly popular.

Exhibit 6: The rise of alternatives and passives



Source: PwC Market Research Centre

5. More money being invested into passives results in a rise of premiums and hence a distorted valuation.
6. DWS

Exhibit 7: ESG integration efforts by five largest pension funds

2017	2018	2019
• GPIF aim to raise its allocation of ESG investments to 10%. • The World Bank Group and GPIF have formalised a partnership that aims to expand markets for sustainable investing.	• GPIF announced that it will join Climate Action 100+. • Norway's Government Pension Fund requires Norges Bank Investment Management who manage the fund, to invest between 30 and 60 billion kroner in dedicated environment-related mandates. • South Korea's National Pension Service plans to begin investing in shares of overseas-listed socially responsible companies through external managers. • ABP has reduced the carbon footprint of its equity portfolio by 28%.	• GPIF and European Investment Banklaunch new initiative to promote Green, Social and Sustainability Bonds. • South Korea's National Pension Service announced its plans of publishing an annual report on its ESG practices as of Janauary 2020. • ABP has declared itself on track to invest EUR 58bn of assets in products linked to the UN's Sustainable Development Goals by the end of 2020.

Source: PwC Global AWM Research Centre

Alignment with SDG and ESG

Global sustainable investment assets saw a 34% increase in two years and stood at US$ 30.7tn as at end 2018.[7] Institutional investors hold the largest share of SRI investments in 2018 standing at 75%. Asia-Pacific witnessed a sudden rise in sustainable investing assets with Japan's GPIF set to raise its allocation of ESG investments to 10%. As a global player, GPIF's impact was significant and has set an example for other institutional investors and asset managers to adopt ESG integration (see Exhibit 7).

A new environmentally conscious generation of investors while looking for strong returns, are also looking for their investments to have an impact. A lack of environmental, social and governance (ESG) products has resulted in a surge of investor demand, retail and institutional alike. In fact, ESG mutual fund assets which totalled US$1,08tn in 2017 is expected to see an 8.5% growth to reach US$2.08tn by 2025. With European managers taking the lead in applying ESG criteria to investments, they will observe a 9.3% growth during the 8-year period. UK is expected to have a 10.5% growth during the same period reflects the increasing importance of ESG amongst asset managers.

As investors are becoming ever more concerned with sustainability, they are increasingly pressuring pension funds to provide evidence of effective ESG investments. As a result, the use of "stewardship track record" as an instrument for selecting sustainable securities will increase. Thus, as sustainable finance progresses throughout pension markets around the world, stewardship will form a major component of ESG investing. According to the same DWS survey, 83% of pension funds consider stewardship to be about seeking good long-term investment returns, while 57% believe it is about meeting social responsibilities.

Among the future drivers of sustainable finance in pension funds is the ETF market growth. The transparency that characterises ETFs makes these types of funds ideal vehicles for ESG investing. As companies with a clear sustainability agenda tend to perform better, ETFs could prove to be profitable long-term investment vehicles. In fact, more than 80% of surveyed pension funds consider that if stewardship were to be properly carried out in their index portfolio, it could provide positive returns on the long run.

Managers of pension funds, only being passively responsible for the investments, need to stay in close contact with the investee companies in charge of strategy. They need to act like active managers and make sure that the fund's assets are properly allocated in sustainable securities. They should also point out any major issues and opportunities that may arise in this regard in order to preserve future success.[8]

A recent study noted that 'nearly two-thirds of institutional investors believe ESG will become an industry standard within the next five years'[9], with the expectation for ESG to compliment both risk and return. Investors hold the belief that companies willing to integrate ESG have higher values and are capable of outperforming the others.

Since 2017, the IORP II Directive requires European pension funds to assess climate-related risks. Pension providers are now required to carry out their own risk assessment, including climate change-related risks, as well as risks caused by the use of resources and regulatory changes. Climate-related risk assessment is now more relevant than ever, as almost 17% of pension funds are now considering the investment risks of climate change in 2018 (compared to only 5% in 2017).

Moreover, various EU member states are developing initiatives that encourage ESG integration. In the UK in 2018, the Department of Work and Pensions (DWP) issued a new investment regulation by implementing environmental social and governance (ESG) and ethical elements during investment decisions. In 2015, France's government issued a new regulation called "law on energy transition for green growth" which creates mandatory ESG and climate policy reporting to all asset owners. In Norway, Ethical Guidelines are in force for the Government Pension Fund Global (GPFG).

7. GSIA 2018
8. DWS
9. Schroders, Institutional Investors Study 2018

Introduction of new fee model (GPIF)

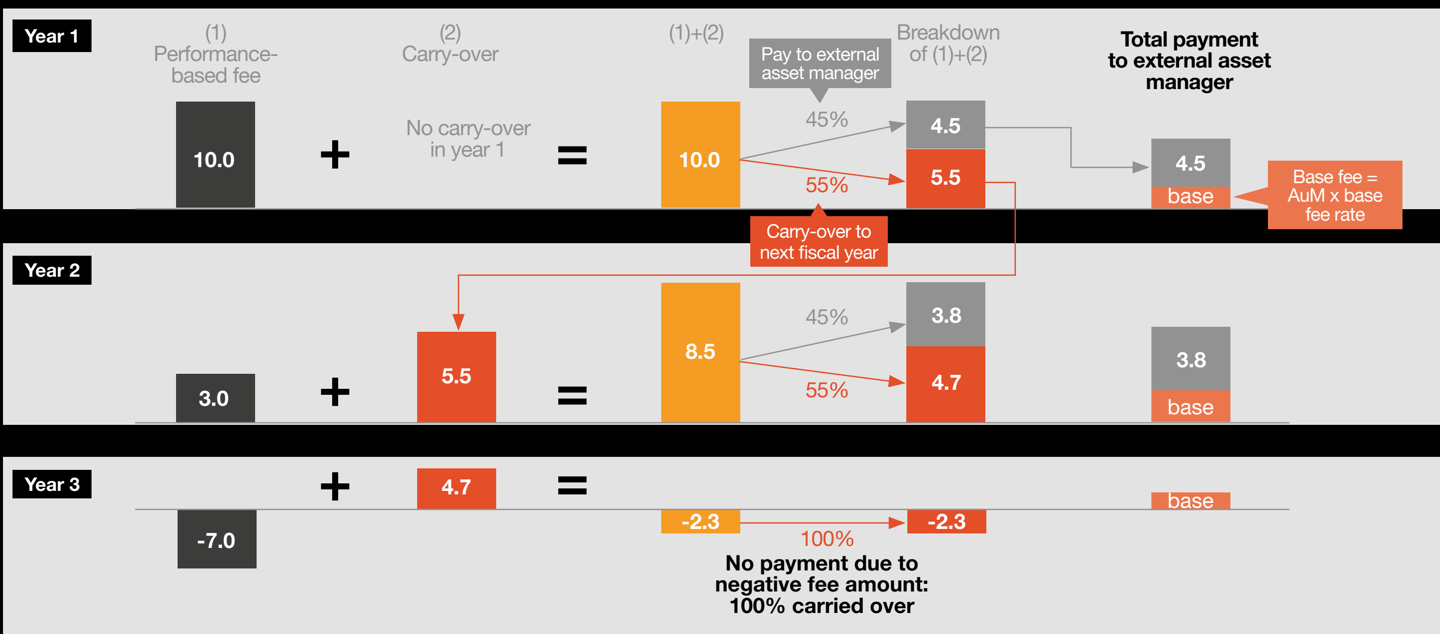
In 2018, the largest pension fund in the world, Japan's GPIF, introduced a new performance-based fee structure, with the aim of promoting long-term sustainable investment growth. This newly introduced system will lower the base fee rate to the rate of passive fund and the maximum fee is removed. A carry-over which partially accumulates payment of annual performance-based fees is also introduced so as to link with mid- to long-term investment results (see Exhibit 8). This new structure was designed to align the asset managers' interests to the pension fund by incentivising them to reach their medium and long-term targets. This new fee model directly assesses the problem of GPIF's underperforming actively managed assets and increasing fees.

The world's largest pension fund has recently pitched its fee model as a potential industry standard; taking into consideration that total fees paid the pension fund to asset managers have decreased by 40% last year. This may well convince pension funds in Asia to adopt the fee model as a way to increase fee savings. Similarly, US pension funds whose portfolios are actively managed should closely monitor GPIF's newly adopted model. A few of the largest pension funds in the US had already adopted a similar model.

Minnesota State Board of Investment and the Massachusetts Pension Reserve, for instance, introduced performance-based fees back in 1986 and 1987 and still use them to this day, however, few pension funds followed.

GPIF intends to be a guide and actively promotes its new model with hopes to bring performance-based fees into the mainstream throughout pension markets. Executive managing director and chief investor officer at GPIF, Hiromichi Mizuno, regularly invites asset owners to follow GPIF's footsteps in order to turn the new model into a widely used industry practice.

Exhibit 8: GPIF's Carryover Mechanism



Source: GPIF

UCITS opportunities: Latin America

With around US$1tn in total assets, the Latin American pension market has significant growth potential. Pension funds in the region are investing an increasing amount of their assets to international products, with almost 14% of total assets allocated to cross-border funds or ETFs. Provided that the products continue to attract demand from local investors and that change in the regulatory landscape continues, Latin America could appear to be a great opportunity for UCITS.

The number of Latin America investors using UCITS has been steadily increasing. A recent survey of Latin American institutional investors by Greenwich associates noted that 52% of respondents used UCITS in 2018, compared to 47% in 2017 and just 24% in 2016. For these institutional investors, UCITS are attractive investment vehicles due to their expanded options and cost efficiency. The main reason for why UCITS are popular is for the tax advantages they offer, as 54% of respondents claimed that this was the number one reason why they are investing in such products.

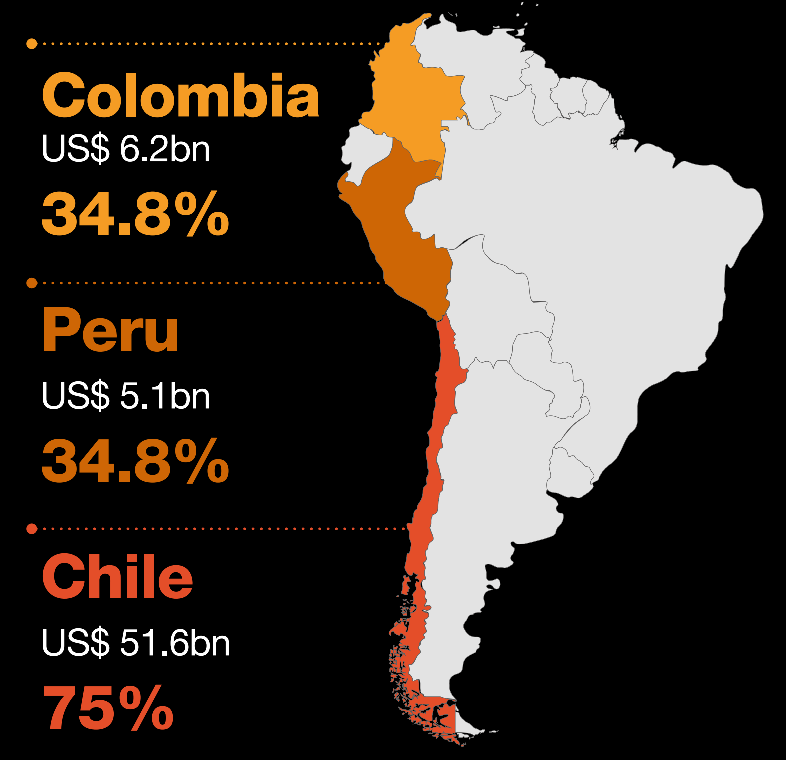
Chile is the most developed country in terms of UCITS usage, with 75% of foreign investments of Chilean pension funds, accounting for US$51.6bn, being in UCITS. In Peru and Colombia, US$5.1bn and US$6.2bn in the foreign investment portfolio of pension funds are invested into UCITS funds respectively. A majority of Peru's foreign investment share in mutual funds is directed towards the US (65%), followed by Luxembourg (28.5%). A third of Colombian foreign investments are comprised of investment funds with a significant share (62.6%) based in the US.[10]

Although Latin America hosts some of the most strictly regulated pension markets, some countries are opening up to foreign investments. This would allow further investments into UCITS should regulators ease regulations. In Mexico, pension funds can invest up to 20% of their portfolios in foreign assets, however the majority of AFORES have yet to take full advantage of this option. Since 2019, AFORES can shift part of their assets into foreign mutual funds from 51 countries under certain conditions. Since then, the Mexican Pension Association authorised 42 international mutual funds operated by 11 asset managers for AFORES to choose from.

In Brazil, the share of cross-border investments is extremely low, with less than 1% of total pension funds' assets allocated to foreign investments. As mentioned earlier, the Brazilian Monetary Council (CMN) imposes strict regulations on pension funds, limiting foreign investments to 10%. However, Brazilian regulators recently amended a resolution aimed to free up the Brazilian pension funds' allocation to foreign investments.

Latin America appears to have potential for UCITS. Due to its tax efficiency, the product attracts significant demand from local investors and regulations seem to be easing across the region. As a matter of fact, cross-border allocations by pension funds are expected to more than double 2017 levels by 2022 on the continent, as the Latin American pension market is expected to grow 9% in the upcoming years.

Amount and share of UCITS funds in foreign investment portfolio of pension funds, 2017



Source: FIAP data presented at ALFI conference, 2017

10. FIAP data presented at ALFI conference, 2017

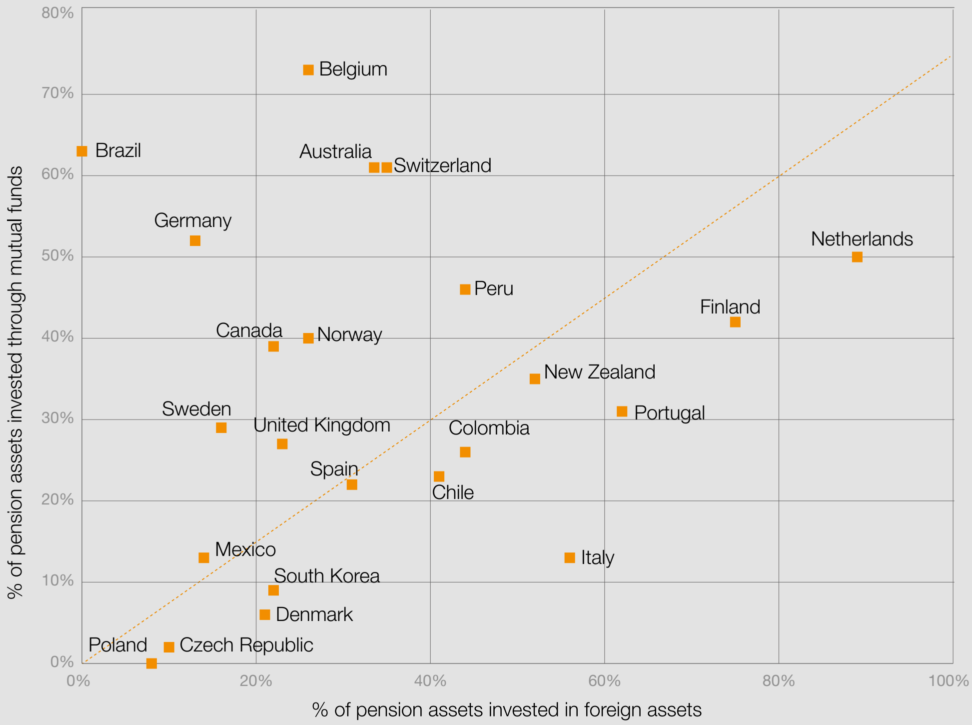
UCITS as a vehicle for retirement saving

Investment funds are known to be highly regulated and liquid, and are capable of providing broad global representation while spreading risk across hundreds of companies, sectors and countries across the world. UCITS have enjoyed a significant amount of success due to these reasons. Pension funds usually do not face any restrictions regarding the allocation amount due to UCITS 'regulated' status.

Furthermore, the European Commission and EIOPA have been pushing for the formation of the pan-European personal pension product (PEPP), which would give EU citizens access to personal retirement plans that can be used to save into a single retirement savings vehicle on a cross-border basis. The PEPP which would be modelled after the UCITS, should encounter strong demand and would surely provide asset managers in the pension market with a large boost.

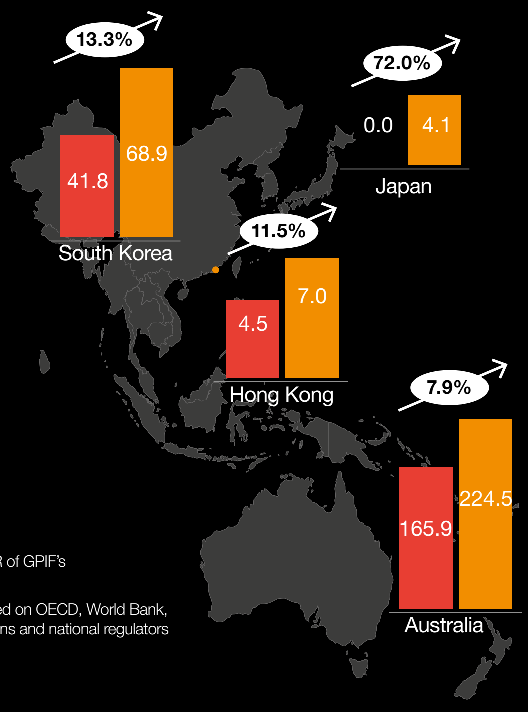
We have observed a correlation (0.75) between indirect investments through investment funds and foreign investments. This correlation, which remained unchanged from the previous report published in 2014, shows the critical role investment funds play in investing abroad. Investing in foreign funds is one of the most effective and convenient ways for gaining exposure to international assets. Almost every mature pension fund tends to use investment funds when investing a large percentage of its assets abroad. Being highly regulated, they provide the investor with further protection. These funds tend to be more liquid than most other investment vehicles and offer the investor access to extensive global assets that are not always available in a domestic market.

Exhibit 9: % of pension assets invested through investment funds



Source: PwC Market Research Centre based on OECD

Share of alternative investments from 2014 to 2018 (US$ bn)



Note: Japan's growth rate is a 3-year CAGR of GPIF's alternative investments from 2015 to 2018

Source: PwC Market Research Centre based on OECD, World Bank, Towers Watson, national pension associations and national regulators

Rising investments in alternative assets: Asia Pacific

In light of an increasing old-age dependency ratio, Asian pension funds are starting to take appropriate measures to diversify their investment portfolios by turning towards alternative investments. Asian pension funds tend to be more conservative than those in developed markets, but this is changing as investors in the region struggle to meet the expected performance targets and are looking for ways to yield higher returns. Pension funds in the region are looking for ways to improve their long-term investments by increasing their asset allocation in illiquid assets such as private equity, real estate, and infrastructure.

In South Korea for instance, the National Pension Service (NPS), which makes up for more than 90% of the Korean pension market, allocated 12% of its assets to alternatives in 2018. The fund's share of alternative investments has increased in recent years from 4% in 2008. Moreover, the other smaller Korean pension funds are said to be allocating more than 30% to this asset class.

In Japan, the Government Pension Investment Fund (GPIF), the largest pension fund in the world, regularly awards mandates to boost its alternative investments and has recently hired consultants to manage foreign alternatives. Although the share of alternatives is low, the GPIF have increased their alternative investments in recent years from a minimal amount to JPY432.7bn (US$4bn) in 2018. Over 50% of Japanese pension funds now allocate some of their assets in alternatives, compared to only 12.8% in 2014. According to a JP Morgan survey, 39.7% of respondents plan to allocate more to alternatives in the coming years.

In Australia, superannuation funds invested 18% of their assets into alternatives in 2018, compared to 16% in 2014. Australia's pension market has paved the way for infrastructure investments and has been very successful in the asset class over the last two decades. In fact, superannuation funds invest in infrastructure and real estate at much higher rates than the global average and, as the Australian market continues to grow, many of the smaller funds will invest more into this asset class.

Southeast Asian countries are also expected to follow this trend, with promising investment prospects in alternative asset classes such as local infrastructure. The two largest state-owned Malaysian pension funds have increased their alternative investments from 3 to 6% over the last five years and in Taiwan, pension funds have increased their share of alternative investment from 2% to 8.6% over the same period.

Pension funds are increasingly turning to more illiquid assets, such as infrastructure and real estate, in order to increase their yields, especially in regions with persistently low interest rates. Pension funds also invest in private equity in order to diversify their portfolios, especially with public markets seeing higher levels of volatility in recent years. With the increasing interest in alternative asset class, it is likely that new challenges will arise for Asian pension funds. Unlike public securities traded on the secondary market, alternatives are complex tailor-made investment vehicles which require a high degree of know-how and vigilance. This could call for stricter regulations globally in the near future, especially with investments concerning retirement assets.

AIFs as a vehicle to structure alternative investments

As pension funds increasingly turn to alternatives they also need to adopt measures to ensure that their investments remain secure and provide value for money. To do so, they are looking for vehicles that provide them with measurable risk management policies, comprehensive, regular and transparent fee documentation, investment safeguards, correct asset valuation, and independent audit. As the same time, the asset manager must be approved by regulators and usually have a strong track record in managing alternative assets.

An option that has emerged meeting all these criteria is the AIF. Created under the Alternative Investment Fund Managers Directive of 2009, these funds are subject to stringent reporting and regulatory requirements. While having less regulatory constraints than UCITS, the AIFMD provides investor protection, stability and a supervisory framework for AIFMs. Pension funds are already the main investors in AIFs, accounting for 26% of total assets at the end of 2017. Given the increased protection, on a vehicle and asset manager level, we expect more pension funds will turn to AIFs, be they hedge funds, fund of funds, private equity, real estate or other funds, in the coming years.

Factsheets by country

Summary of the countries' main pension fund indicators

Country	Pension assets/ GDP	Defined Benefit schemes	Old-age dependency ratio	Foreign investments	Regulatory limit on foreign investments	Alternative investment	Investment funds
Australia	82%	10%	24%	34%	No limit	18%	61%
Belgium	11%	71%	29%	20%	No limit	4%	72%
Brazil	11%	42%	13%	<1%	10%	9%	63%
Canada	149%	60%	26%	20%	No limit	36%	38%
Chile	65%	0%	17%	41%	Up to 80%	<1%	38%
Colombia	24%	0%	12%	33%	40% to 70%	9%	21%
Czech Republic	9%	0%	30%	10%	No limit for OECD	1%	2%
Denmark	85%	1%	31%	21%	No limit for OECD	11%	6%
Finland	81%	89%	35%	75%	10% non OECD	30%	42%
Germany	7%	100%	33%	13%	No limit	41%	49%
Hong Kong	41%	10%	24%	40%	30% in HKD assets	5%	n.a.
Italy	9%	5%	37%	56%	No limit	31%	12%
Japan	29%	95%	46%	42%	No limit	<1%	n.a
Luxembourg	3%	70%	21%	n.a.	No limit	13%	39%
Mexico	14%	12%	11%	11%	20%	3%	12%
Netherlands	169%	94%	30%	87%	No limit	21%	50%
New Zealand	27%	20%	24%	50%	No limit	1%	35%
Norway	9%	100%	26%	28%	No limit for OECD	6%	40%
Peru	21%	0%	11%	44%	46%	10%	40%
Poland	7%	0%	26%	8%	30%	2%	<1%
Portugal	19%	75%	34%	34%	No limit for Euro zone	9%	29%
South Korea	35%	24%	20%	22%	30% to 70%	12%	9%
Spain	9%	39%	30%	31%	No limit for OECD	9%	22%
Sweden	87%	100%	26%	16%	No limit	5%	29%
Switzerland	141%	90%	28%	36%	30% of foreign currency	35%	60%
United Kingdom	99%	82%	29%	23%	No limit	32%	27%
United States	121%	33%	24%	n.a.	No limit	30%	25%

* Investment funds + mandates

Australia

Overview of Australia's pension funds

Australian pension assets were equivalent to 82% of the country's AUD 2tn GDP at year-end 2018. The ratio of pension assets to GDP has increased dramatically during the last four years as pension assets have grown much faster than GDP, achieving a growth rate of 7.6% annual growth rate from Mar-2018 to Mar-2019.

Total assets and asset allocation

The pension market in Australia is well developed with AuM of almost AUD 1.7tn (US$ 1.1tn) in Dec-2018. The market is comprised of 209 pension funds, with the largest ten pension funds holding 46.8% of total pension assets at year-end 2018. Australian pension funds are diversified, with 51% of AuM invested in equities, 21% in bonds, 10% in money market products and 18% in alternative investments, as of Mar-2019.

AustralianSuper, the second largest superannuation, is on the 2019's Leaders List of the 25 World's most responsible asset allocators.

Australia's pension market has paved the way for infrastructure investments and has been very successful in the asset class over the last two decades. In fact, superannuation funds invest in infrastructure and real estate at much higher rates than the global average. The assets of Australian pension funds allocated to equities are the equivalent of 46% of the total market capitalisation of listed domestic companies.

Foreign investments

Australia does not set any quantitative limit on overall foreign investments or any specific asset classes for pension funds. Currently, Australian pension funds allocate 34% of their portfolios to foreign assets, compared to 25% in March 2014.

Allocation to investment funds

Pension funds in Australia invested approximately 39% of their assets directly and 61% through investment funds in Mar-2019.

Future trends

AustralianSuper has announced in August 2019 a plan to invest US$ 1bn in Indian infrastructure.

First State Super and VicSuper signed a binding deal to merge (22 July 2019), creating Australia's second-largest pension fund, as regulatory pressure is driving consolidation.

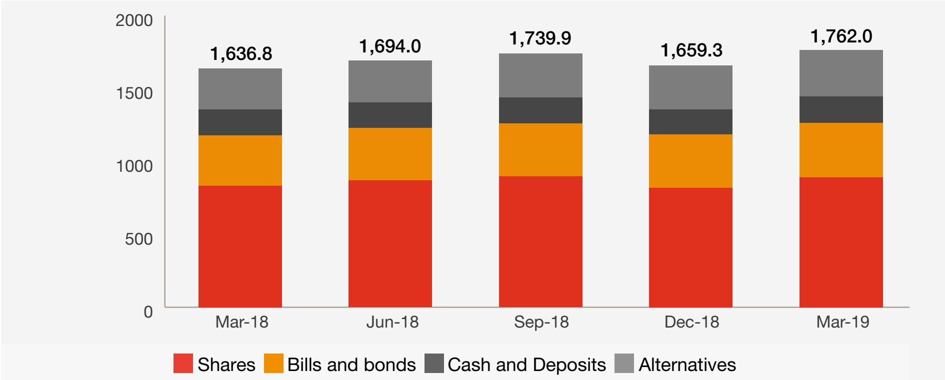
Australia's pension funds finds themselves in a destabilizing field, given that regulation becomes tighter, hence having consequences on the investment of the industry. The prevalent challenge will be the amount of commission that pension funds will have to pay to financial advisers.

Sources: APRA, OECD, IPE, World Bank, Ignites Asia, Reuters and PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
82%	10%	24%	34%	No limit	18%	61%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 82%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 46%**			●

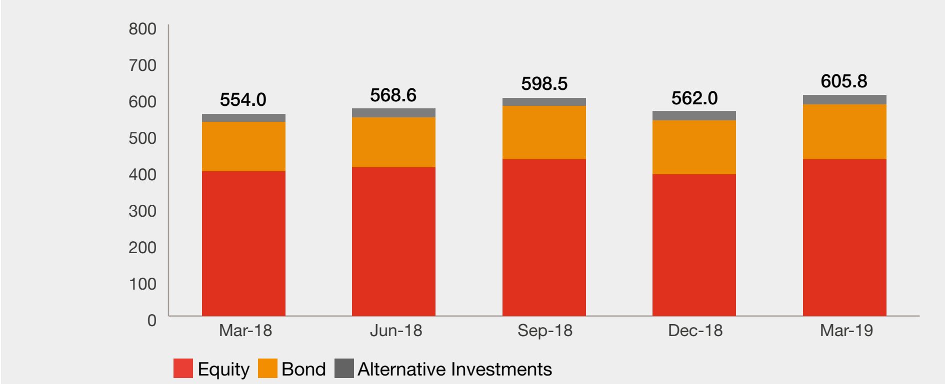
Evolution of Total Assets of Pension Funds by Asset Class (AUD bn)



	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19
% of indirect investments	62%	62%	62%	62%	61%

Sources: APRA, New America, and PwC Market Research Centre

Evolution of Foreign Investments by Asset Class (AUD bn)



	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19
% of foreign investments	34%	34%	34%	34%	34%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: APRA, New America, and PwC Market Research Centre

Largest Pension Funds in Australia

#	Pension fund	AuM 2018 (AUD bn)	Market share 2018
1	Future Funds	147.2	8.9%
2	AustralianSuper	142.0	8.6%
3	First State Super	89.6	5.4%
4	QSuper	81.8	4.9%
5	UniSuper	69.3	4.2%
6	Sunsuper	57.4	3.5%
7	REST	51.5	3.1%
8	HESTA	46.8	2.8%
9	Cbus	46.6	2.8%
10	CSC	44.3	2.7%
	TOTAL	**776.5**	**46.8%**

Source: Towers Watson

Belgium

Overview of Belgium's pension funds

Belgium's pension assets were equivalent to 11% of the country's EUR 463.1bn GDP at year-end 2018.

The ratio of pension assets to GDP recently increased as pension assets grew faster than GDP with a 21.2% CAGR from 2014 to 2018 compared to a lower GDP CAGR (0.1%) in the same period.

Total assets and asset allocation

The pension market in Belgium is largely dominated by DB schemes, which accounted for 71% of assets in 2018. The market is partially concentrated, with the ten largest pension funds holding more than 43% of total pension assets in the same year.

In 2018, pension fund AuM reached EUR 49.0bn (US$ 56.0bn). The asset allocation of Belgian pension funds is somewhat diversified with 49% in shares, 41% in bonds, 6% in money market products and 4% in alternative investments.

The assets of Belgian pension funds allocated to equities are equivalent to 9% of the total market capitalisation of listed domestic companies.

Foreign investments

Belgium does not set any quantitative limit on overall foreign investments or any specific asset classes in pension funds. As of 2018, Belgian pension funds allocate an estimated 20% of their portfolios to foreign assets.

Allocation to investment funds

Pension funds in Belgium invest heavily through investment funds and have consistently done so during the past four years. In 2018, an estimated 72% of Belgian pension funds' assets were invested through investment funds.

Future trends

Due to a high and increasing old-age dependency ratio (29% in 2018), and a high DB ratio, we expect Belgian pension funds to pursue diversification both domestically and internationally.

The Belgium's workplace pension fund association expects the total pension funds' assets of the country to reach EUR 100bn by 2025 – more than twice as much as today. Belgium has emerged as the primary domicile of choice for pan-European schemes.

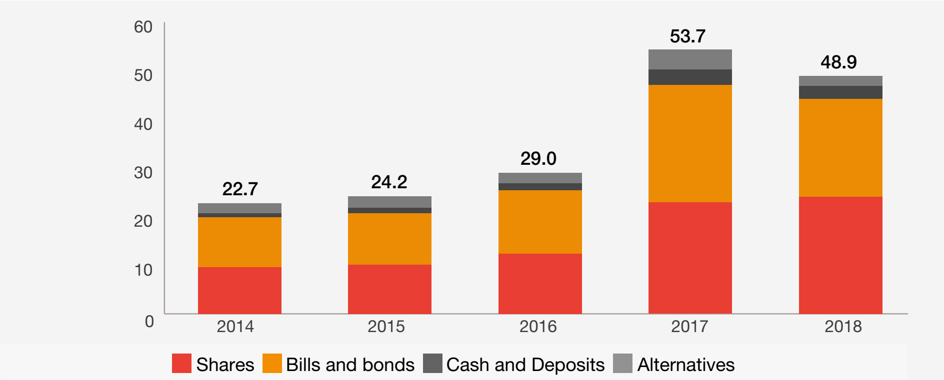
Since 2018, large funds are shifting their investments to riskier assets in order to increase their returns, with a focus on low-volatility equities and ESG investing. At the same time, DC funds are now required to disclose fees and investment strategy.

Sources: FSMA, OECD, IPE, World Bank, IPE, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
11%	71%	29%	20%	No limit	4%	72%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 11%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 9%**	●		

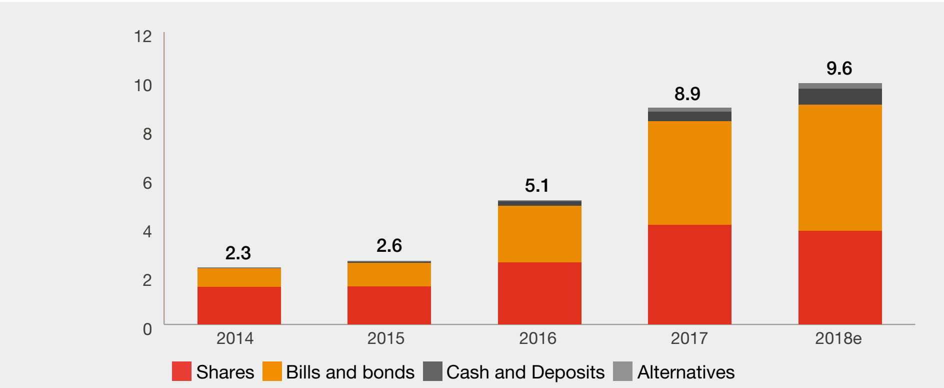
Evolution of total assets of pension funds by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of indirect investments	73%	71%	72%	73%	72%

Sources: FSMA, Pensions Europe, OECD, World Bank and PwC Market Research Centre

Evolution of foreign investments by asset class (EUR bn)



	2014	2015	2016	2017	2018e
% of foreign investments	10%	11%	18%	17%	20%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: FSMA, Pensions Europe, OECD, World Bank and PwC Market Research Centre

Largest Pension Funds in Belgium

#	Pension fund	AuM 2018 (EUR bn)	Market share in 2018
1	Anheuser-Buscher InBev NV	4.4	9.0%
2	ExxonMobil OFP	3.0	6.1%
3	KBC Group NV	1.9	4.7%
4	Amonis	2.1	4.3%
5	J&J Pension Fund OFP	1.9	3.8%
6	BP Pensioenfonds OFP	1.6	3.3%
7	Elgabel OFP	1.6	3.3%
8	EUROCONTROL	1.5	3.2%
9	Pensioenfonds Metaal OFP	1.3	2.6%
10	Groupe Bruxelles Lambert SA	1.2	2.4%
	TOTAL	**20.9**	**42.7%**

Note: Zilverfonds, the 'pay-as-you-go' pension scheme was abolished by the government in 2016

Sources: IPE and PwC Market Research Centre

Brazil

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
11%	42%	13%	<1%	10%	9%	63%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 11%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 4%**	●		

Overview of Brazil's pension funds

Brazilian pension assets were equivalent to 11% of the country's BRL 7.2tn GDP at year-end 2018. This ratio of pension assets to GDP is increasing as pension assets grew at 5.1% CAGR from 2014 – Jul 2018, while the domestic GDP had a growth rate of 2.7% CAGR over the period 2014-2018.

Total assets and asset allocation

Brazil's pension fund AuM reached BRL 821bn (US$ 211bn) in July 2018. The market is concentrated with the largest 10 pension funds owning more than 56% of total pension assets.

The Brazilian pension fund market has a proportion of Defined Benefits (DB) schemes of 42%.

Brazilian pension funds are not well diversified; 17% of assets are invested in equities, 72% in bonds, 2% in money markets and 9% in alternative investments.

Foreign investments

The Brazilian Monetary Council (CMN) imposes strict regulations on pension funds, limiting foreign investments to 10%. Brazilian pension funds currently invest less than 1% in foreign assets.

Allocation to investment funds

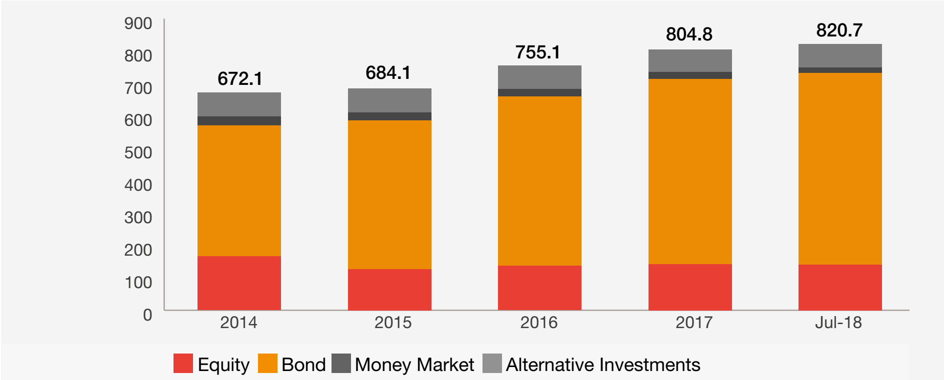
Brazilian pension funds can only invest in most asset classes through local investment funds. Pension funds in Brazil invest approximately 63% of their assets through local investment funds. Bond funds remain the largest asset class within investment funds, accounting for 85%.

Future trends

As Brazilian pension funds currently invest less than the regulatory limit of foreign investments is of 10%, we expect a rise in foreign assets. The limited investment in foreign assets is largely as interest rates are currently high in the region, meaning government securities will provide a strong rate of return. However, as we see interest rates fall in the region, we believe many pension funds will increase their allocation in search of yield.

Sources: Abrapp, OECD, World Bank, Routers, Bloomberg, PwC Market Research Centre

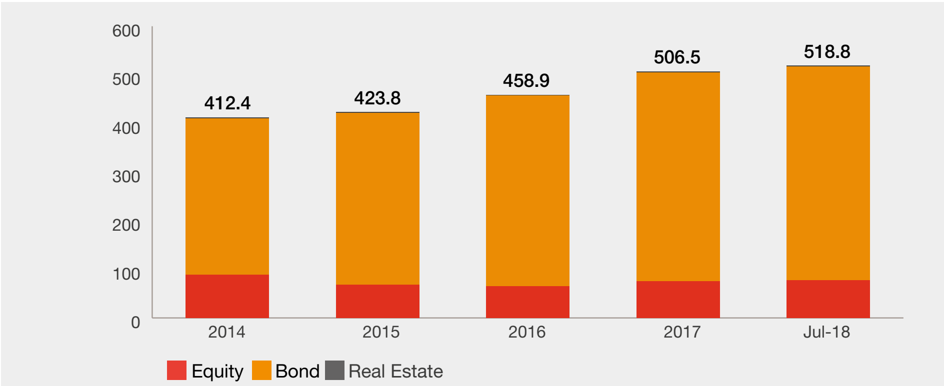
Evolution of total assets of pension funds by asset class (BRL bn)



% of indirect investments	61%	62%	61%	63%	63%

Sources: Abrapp, World Bank, OECD and PwC Market Research Centre

Investment Funds held by Pension Funds by asset class (BRL bn)



% of foreign investments	Less than 1%	Less than 1%	Less than 1%	Less than 1%	Less than 1%
Regulatory limit of foreign inv.	10%	10%	10%	10%	10%

Sources: Abrapp, World Bank, OECD and PwC Market Research Centre

Largest pension funds in Brazil

#	Pension fund	AuM 2018 (BRL bn)	Market share in 2018
1	Previ	181.0	22.1%
2	Petros	72.1	8.8%
3	Funcef	64.1	7.8%
4	Funcesp	28.4	3.5%
5	Fund. Itaú Unibanco	26.5	3.2%
6	Valia	22.4	2.7%
7	Sistel	18.3	2.2%
8	Banesprev	17.0	2.1%
9	Forluz	15.6	1.9%
10	Real Grandeza	15.1	1.8%
	TOTAL	**460.5**	**56.1%**

Source: Abrapp

Canada

Overview of Canada's pension funds

Canadian pension assets were equivalent to 149% of the country's CAD 2.3tn GDP at year end 2018 – among the highest ratio in the world. This ratio of pension assets to GDP is expected to increase gradually. Pension assets grew at a CAGR of 5%, faster than GDP growth (CAGR of 3.9%) between 2014 and 2018.

Total assets and asset allocation

The pension market in Canada is well developed with CAD 3.4tn (US$ 2.5tn), one of the highest globally in 2018. The market is quite fragmented as well, with the largest ten pension funds holding 33% of the total pension assets.

Canada Pension, BC Municipal and Quebec Pension are all on the 2019's Leaders List of the 25 World's most responsible asset allocators. In 2018, 60% of Canadian pensions were Defined Benefit (DB) schemes.

Canada is one of the few countries in the world with such a significant share of assets in DB plans.

The asset allocation of Canadian pension funds is well diversified with 29% of total assets invested in equities, 32% in bonds and 36% in alternative investments in 2018.

The assets of Canadian pension funds allocated to equities are the equivalent of 38% of the total market capitalisation of listed domestic companies.

Foreign investments

According to the OECD, Canada does not set any quantitative limit on overall foreign investments or any specific asset classes for pension funds. They can invest 100% in foreign equities, bonds and investment funds. As of 2018, Canadian pension funds invest 20% of their assets abroad compared to 18% invested in 2014.

Allocation to investment funds

Pension funds in Canada invest an estimated 62% of their assets directly and 38% through investment funds.

Future trends

Canadian pension funds are increasing their share of alternative and foreign investments. Canada's second largest pension fund Ontario Teachers is looking to invest in India's infrastructure relating to green energy and airport.

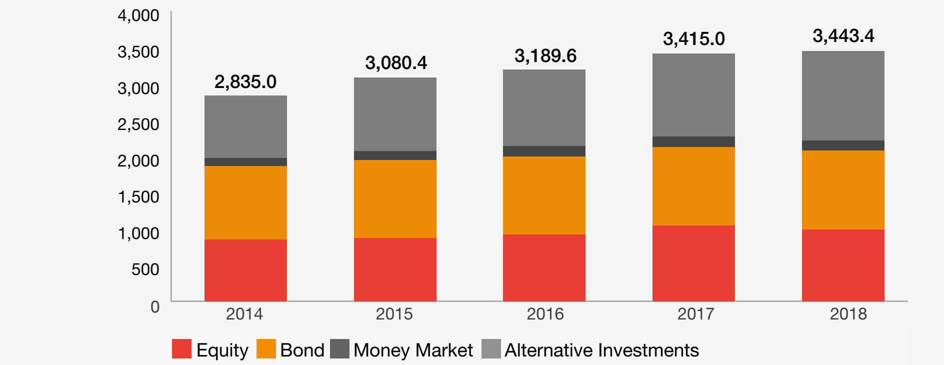
In fact, as of 2019, Canadian pension funds are willing to increase their investments in China so as to help ensure the long-term viability of various social programs. The rise of Asia's economies and the changing global economic environment have pushed other global economies such as Canada to diversify and invest in Asia.

Sources: OECD, World Bank, TNFE, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
149%	60%	26%	20%	No limit	36%	38%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 149%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 38%**			●

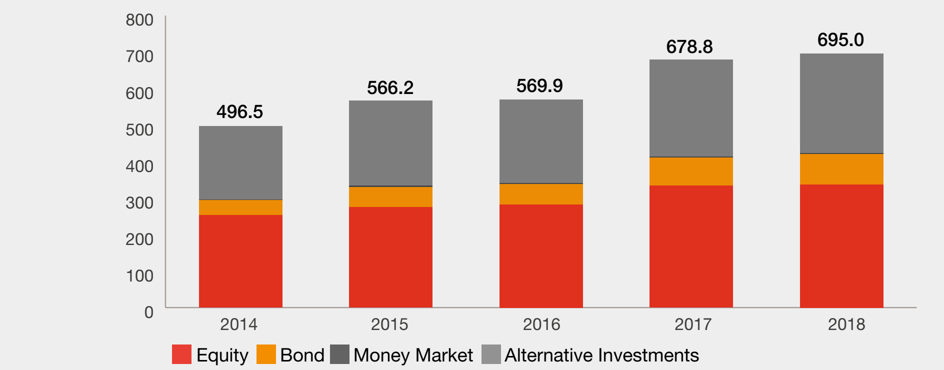
Evolution of total assets of pension funds by asset class (CAD bn)



% of indirect investments	36%	39%	38%	38%	38%

Sources: OECD, New America, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (CAD bn)



% of foreign investments	18%	18%	18%	20%	20%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

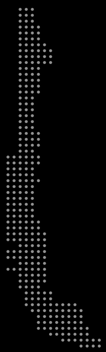
Sources: OECD, New America, World Bank, and PwC Market Research Centre

Largest pension funds in Canada

#	Pension fund	AuM 2018 (CAD bn)	Market share in 2018
1	Canada Pension	389.9	11.2%
2	Ontario Teachers	190.1	5.4%
3	Public Service Pension Plan	110.5	3.2%
4	Ontario Municipal Employees	96.9	2.8%
5	Healthcare of Ontario	78.6	2.2%
6	Quebec Pension	72.5	2.1%
7	Quebec Government & Public	70.3	2.0%
8	B.C. Municipal	52.5	1.5%
9	Alberta Local Authorities	44.2	1.3%
10	B.C. Public Service	31.4	0.9%
	TOTAL	**1,136.9**	**32.5%**

Source: Towers Watson

Chile



Overview of Chile's pension funds

Chilean pension assets were equivalent to 65% of the country's CLP 206.6tn GDP at year end 2018. The ratio of pension assets to GDP has been increasing in recent years as pension assets are growing faster than GDP with a 7.6% CAGR from 2014 to 2018 compared to a GDP CAGR of 7.0% in the same period.

Total assets and asset allocation

The pension market in Chile is relatively well developed with AuM of about CLP 134tn (US$ 193bn) in 2018. However, the market is fully concentrated with only six pension funds operating in the country.

In 2017, all pension schemes (100%) in Chile were Defined Contribution (DC) schemes. In 2018, the asset allocation of Chilean pension funds was not very diversified with 39% of total assets allocated to equities, 61% to bonds and less than 1% to alternative investments.

Although the share of alternatives is low, this might change as pension funds have only been allowed to invest in alternatives (i.e. real estate, private equity, private debt, infrastructure and other assets) since 2014. The maximum limits were established between 5% and 15%, depending of the type of pension funds.

Chilean pension fund assets allocated to equities are the equivalent of 30% of the total market capitalisation of listed domestic companies.

Foreign investments

Currently, Chilean pension funds invest a large part, 41%, of their portfolios in foreign assets but still far from the limit permitted by the regulator.

Allocation to investment funds

Pension funds invest 38% of their AuM through investment funds, hence indirectly, as of 2018.

Future trends

Chile is among the most promising countries worldwide in terms of penetration of UCITS funds. Chilean pension funds hold 75% of their foreign investments in UCITS funds.

In 2019, Chile's AFP Habitat, has entered into the Colombian market after acquiring Colombia's US$ 11.5bn Colfondos pension fund.

Foreign investments in 2018 reached 41% out of the potential 80% regulatory limit.

Sources: OECD, Reuters, World Bank, FIAP and PwC Market Research Centre

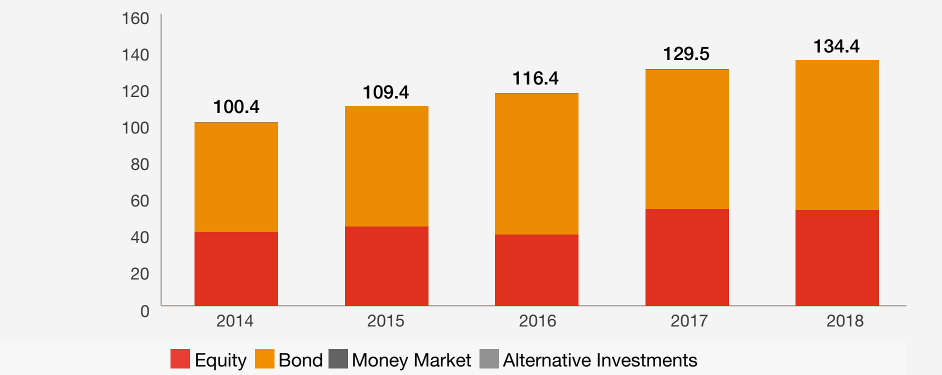
Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
65%	0%	17%	41%	Up to 80%	<1%	38%

Low Medium High

Maturity of Pensions industry
Pension assets/GDP: 65%

Size of domestic equity market
Pension allocation to equities/domestic market cap ratio: 30%

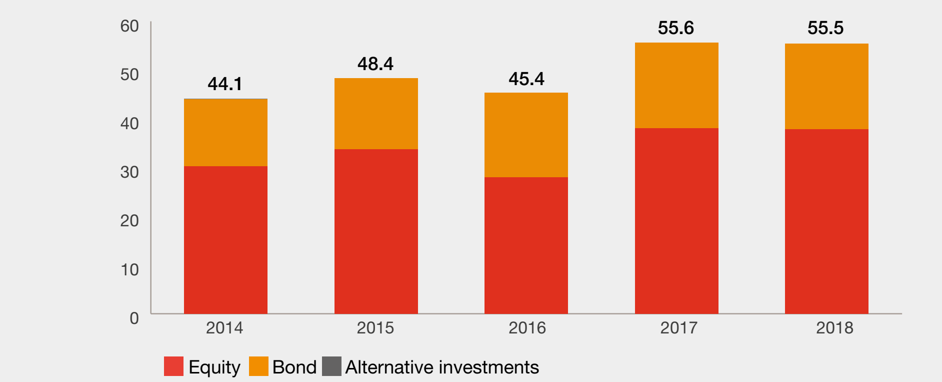
Evolution of total assets of pension funds by asset class (CLP tn)



% of indirect investments	45%	44%	38%	43%	38%

Sources: OECD, World Bank, Superintendencia de Pensiones and PwC Market Research Centre

Evolution of Foreign Investments by asset class (CLP tn)



% of foreign investments	44%	44%	39%	43%	41%
Regulatory limit of foreign inv.	Up to 80%	Up to 80%	Up to 80%	Up to 80%	Up to 80%

Sources: OECD, World Bank, Superintendencia de Pensiones and PwC Market Research Centre

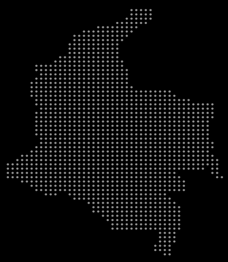
Largest pension funds in Chile

#	Pension fund	AuM 2018 (CLP tn)	Market share in 2018
1	AFP Habitat	37.2	27.7%
2	AFP Provida	33.1	24.6%
3	AFP Capital	25.5	18.9%
4	AFP Cuprum	25.2	18.8%
5	MODELO	7.4	5.5%
6	PLANVITAL	4.5	3.4%
	TOTAL	**132.8**	**98.8%**

Total doesn't add up to 100% due to rounding, Chile's Pension fund market comprises of the six pension funds mentioned above.

Source: Superintendencia de Pensiones

Colombia



Overview of Colombia's pension funds

The Colombian pension fund system is composed of 4 fund types (Conservative, Moderate, Great Risk and Programmed Retirement).

Colombian pension assets were equivalent to 24% of the country's COP 1,072tn GDP at year end 2018. The ratio of pension assets to GDP has been increasing in recent years as pension assets are growing faster than GDP with a 11.6% CAGR from 2014 to 2018 compared to a GDP CAGR of 8.9% in the same period.

Total assets and asset allocation

The pension market in Colombia is very concentrated with only four pension funds accounting for about COP 236.5tn (US$ 72.2bn) of AuM in 2018.

The asset allocation of Colombian pension funds is fairly diversified with 34% of total assets invested in equities, 53% in bonds, 3% in money market products and 9% in alternative investments in 2018.

Colombian pension funds have been investing in private equity for the past decade. The limits of asset allocations in alternative vehicles were updated in 2016 by the government. Out of the four fund types only the Conservative funds could not invest in alternatives.

The assets of Colombian pension funds allocated to equities are the equivalent of 24% of the total market capitalisation of listed domestic companies.

Foreign investments

Colombia sets a quantitative limit on overall foreign investments, depending on the type of pension fund. Currently, Colombian pension funds' foreign exposure is increasing, from 23% in 2014 to reaching an estimated 33% in 2018.

Allocation to investment funds

Pension funds in Colombia invest an estimated 79% of their assets directly and the remaining through investment funds. Currently, 35% of Colombian pension funds' foreign investments are sourced through UCITS funds.

Future trends

With a relatively low old-age dependency ratio (12% in 2018), Colombian pension funds have yet to diversify their investments. While they have been increasing their foreign exposure, there is still room for improvement.

Given the rise in assets and the limited opportunities in their local equity market, AFPs are diversifying outside of their borders in order to find better returns. Most of this growth has gone through ETFs, even though active allocations have also risen.

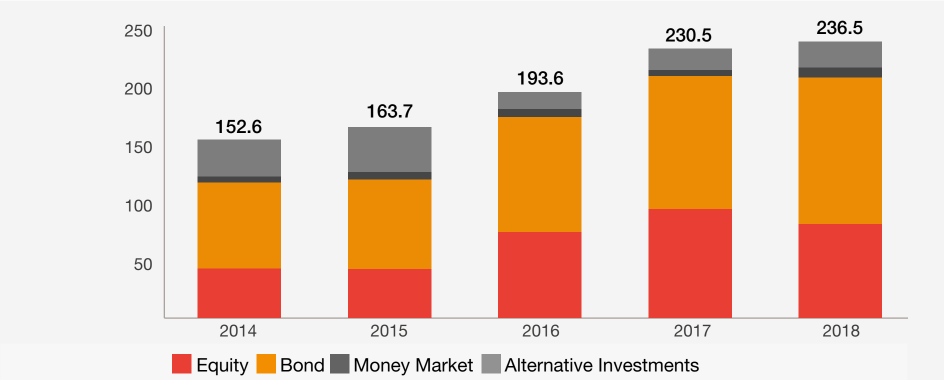
Colombia's AFP Colfondos was recently acquired by Chile's AFP Habitat for US$ 11.5bn.

Sources: OECD, World Bank, FIAP, Superintendencia Financiera de Colombia and PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
24%	0%	12%	33%	40% to 70%	9%	21%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 24%**		●	
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 24%**		●	

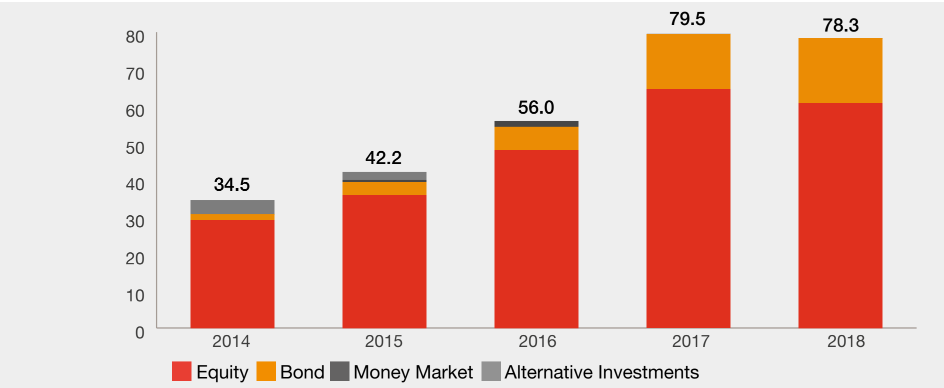
Evolution of total assets of pension funds by asset class (COP tn)



	2014	2015	2016	2017	2018
% of indirect investments	21%	26%	22%	25%	21%

Sources: OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (COP tn)



	2014	2015	2016	2017	2018
% of foreign investments	23%	26%	29%	34%	33%
Regulatory limit of foreign inv.	40% to 70%	40% to 70%	40% to 70%	40% to 70%	40% to 70%

Sources: OECD, World Bank, and PwC Market Research Centre

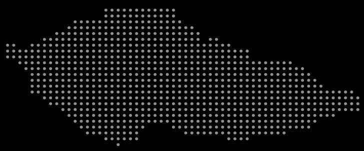
Largest pension funds in Colombia

#	Pension fund	AuM 2018 (COP tn)	Market share in 2018
1	Porvenir	100.8	42.6%
2	Proteccion	81.1	34.3%
3	Colfondos	31.6	13.4%
4	Old Mutual	14.6	6.2%
	TOTAL	**228.1**	**96.4%**

Total doesn't add up to 100% due to rounding, Colombia's Pension fund market comprises of the four pension funds mentioned above.

Source: Superintendencia Financiera de Colombia

Czech Republic



Overview of Czech pension funds

Czech pension assets were the equivalent of 9% of the country's CZK 5.5tn GDP at year end 2018. This ratio of pension assets to GDP is increasing as pension assets grow at a CAGR of 9.6%, faster than domestic GDP growth (CAGR of 3.5%).

Total assets and asset allocation

The pension market in Czech Republic is under developed with AuM of about CZK 489bn (US$ 21.7bn) in 2018. The market is quite concentrated as well, with the largest five pension funds holding 82% of the total pension assets.

Defined Contribution (DC) schemes dominate the Czech pension markets; almost all pension schemes in Czech Republic are DC schemes.

The asset allocation of Czech pension funds is very conservative. Czech pension funds invested 98% of their assets directly in 2018; of which 76% of total assets invested in bonds; 20% in money market products, less than 1% in equities and 1% in alternative investments.

The assets of Czech pension funds allocated to equities are equivalent to less than 1% of the total market capitalisation of listed domestic companies, which is far below the average level. This highlights the need for Czech pension funds to diversify their assets towards more aggressive asset classes.

Foreign investments

Czech Republic does not set any quantitative limit on overall foreign investments or any specific asset classes within pension funds. In 2018, an estimated 10% of their assets were directed to foreign investments.

Allocation to investment funds

Although the number did slightly increase since 2014, pension funds in Czech Republic invested only 2% of their assets through investment funds in 2018 as a result of conservative asset allocation.

Future trends

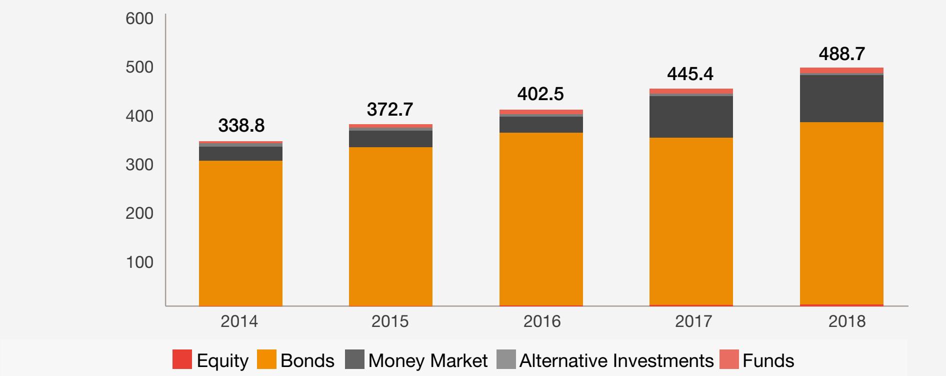
Czech Republic has first and third pillar pensions, still not providing access to occupational pensions. OECD proposed that the Czech Republic introduce an opt out instead of opt in system, as to increase the amount of money individuals put in pensions. This move would help the country move towards a long-term sustainability position and would increase the amount of AuM of pension funds in the country.

Sources: OECD, EFAMA, World Bank and PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
9%	0%	30%	10%	No limit for OECD	1%	2%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 9%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: <1%**	●		

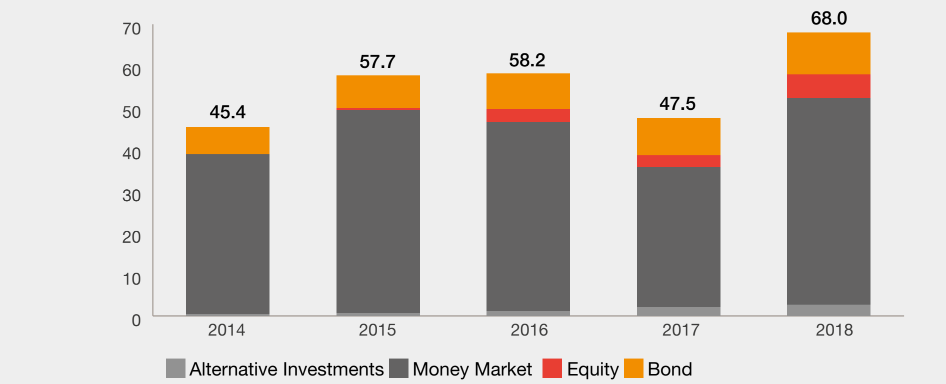
Evolution of total assets of pension funds by asset class (CZK bn)



% of indirect investments	2%	2%	2%	2%	2%

Sources: OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (CZK bn)



% of foreign investments	13%	15%	14%	11%	10%
Regulatory limit of foreign inv.	No limit for OECD	No limit for OECD	No limit for OECD	No limit for OECD	No limit for OECD

Sources: OECD, World Bank, and PwC Market Research Centre

Largest pension funds in Czech Republic

#	Pension fund	AuM Mar-18 (CZK bn)	Market share in Mar-2018
1	Penzijní společnost České pojišťovny	125.0	28.1%
2	Česká spořitelna PS	85.4	19.2%
3	KB PS	55.5	12.5%
4	ČSOB PS	52.3	11.8%
5	AXA PS	48.3	10.8%
	TOTAL	**366.5**	**82.3%**

Sources: IPE and PwC Market Research Centre

Denmark

Overview of Denmark's pension funds

Danish pension assets were equivalent to 85% of the country's DKK 2.3tn GDP at year end 2018. The ratio of pension assets to GDP has been increasing during the last few years as pension assets grew faster than GDP with a 1.1% CAGR from 2014 to 2018 compared to a -0.1% GDP growth in the same period.

Total assets and asset allocation

The pension market in Denmark is well developed with AuM of about DKK 1,940.6bn (US$ 298.1bn) in 2018. However, the market is highly concentrated, with the largest 7 pension funds holding 78.8% of total pension assets (excluding the ATP).

In 2017, 1% of Danish pension schemes were Defined Benefits (DB) schemes. The asset allocation of Danish pension funds is well diversified. Danish pension funds invest 51% of their assets in equities, 32% in bonds,11% in alternative investments and 6% in investment funds, as of 2018.

PensionDanmark is on the 2019's Leaders List of the 25 World's most responsible asset allocators.

The assets of Danish pension funds allocated to equities are to equivalent to 41% of the total market capitalisation of listed domestic companies.

Foreign investments

Foreign investments remained stable in the period, decreasing slightly, even though total assets increased. This is due to a large decrease in investment funds and bonds, which were invested in foreign countries with a higher ratio with respect to equity, which on the other hand increased.

Allocation to investment funds

Pension funds in Denmark invest most of their assets directly, with just 6% of their AuM allocated through investment funds.

Future trends

The two largest pension funds in the country, ATP and PFA, have performed extraordinarily well in the first half of 2019, with record returns. With more money to invest, ATP and PFA are expected to re-balance their asset allocation in order to maintain these returns. PFA, for instance, is set to increase its investments in real estate.

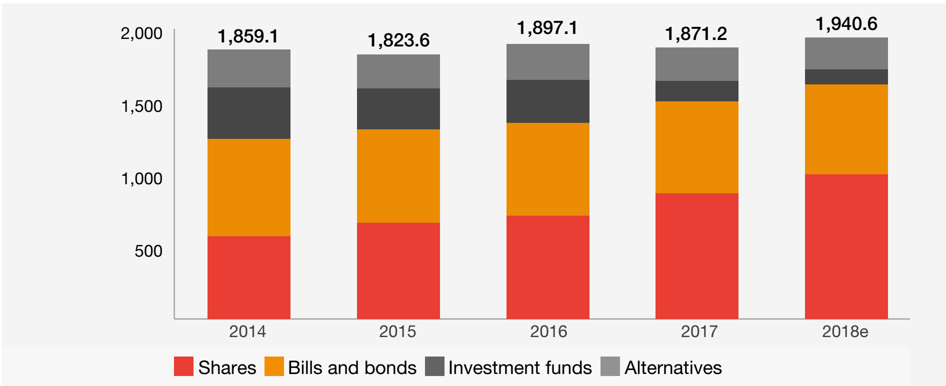
Cost and return are major issues as well as increasing requirements from the authorities and as a consequence smaller players are either merging together or with larger ones. Some of them also work together in administrative cooperation to reduce cost.

Sources: Forsikringopension, OECD, World Bank, Reuters, Bloomberg, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
85%	1%	31%	21%	No limit for OECD	11%	6%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 85%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 41%**			●

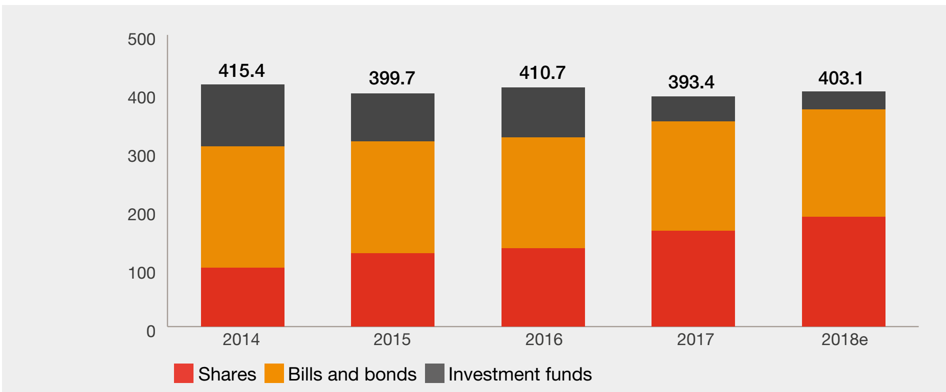
Evolution of total assets of pension funds by asset class (DKK bn)



% of indirect investments	19%	16%	16%	8%	6%e

Sources: Forsikringopension, OECD, the World Bank, New America and PwC Market Research Centre

Evolution of Foreign Investments by asset class (DKK bn)



% of foreign investments	22%	22%	22%e	22%e	21%e
Regulatory limit of foreign inv.	No limit for OECD countries	No limit for OECD countries	No limit for OECD countries	No limit for OECD countries	No limit for OECD countries

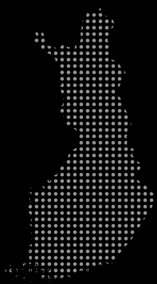
Sources: Forsikringopension, OECD, the World Bank, New America and PwC Market Research Centre

Largest pension funds in Denmark

#	Pension fund	AuM 2018 (DKK bn)	Market share in 2018
1	ATP	785.5	Danish labour market supplementary pension fund
2	PFA Pension	492.2	25.4%
3	Sampension	265.9	13.7%
4	PensionDanmark	227.9	11.7%
5	Industriens Pension	169.4	8.7%
6	PKA	126.1	6.5%
7	Laegemes Pensionskasse	126.0	6.5%
8	Magistrenes Pensionskasse	121.6	6.3%
	TOTAL	**1,529.1**	**78.8%**

Sources: Towers Watson and PwC Market Research Centre

Finland



Overview of Finland's pension funds

Finnish pension assets were equivalent to 81% of the country's EUR 233.5bn GDP at year end 2018. Moreover, the ratio of pension assets to GDP is decreasing as pension assets grew at a CAGR of 2.9%, slower than GDP growth (CAGR of 4%) between 2014 and 2018.

Total assets and asset allocation

The pension market in Finland is well developed with AuM of about EUR 193.4bn (US$ 222.1bn) in 2018. The 9 largest pension funds account for almost 98% of total pension assets, with Keva having the largest share.

In 2017, 89% of Finnish pension schemes were Defined Benefit (DB) schemes. The asset allocation of Finnish pension funds is well diversified with 35% invested in equities, 29% in bonds, 6% in money market products and 30% in alternative investments.

Absolute maximum limits were removed in 2017, meaning that pension funds can now invest as much as they want in any asset class.

As of 2018, the assets of Finnish pension funds allocated to equities are the equivalent of 28% of the total market capitalisation of listed domestic companies.

Foreign investments

Currently, Finnish pension funds invest heavily in foreign assets: 75% of their assets are directed to foreign investments. However, Finland sets quantitative limits on overall foreign investments: voluntary pension plans are allowed to invest 10% of their total assets in non-OECD countries.

Future trends

In light of a critically high and increasing old-age dependency ratio (35% in 2018), Finnish pension funds are increasing alternative investments and geographical exposure.

According to Ilmarinen, domestic employment and contribution rates are expected to evolve favorably, relieving the Finnish pension market of some of the pressure related to aging population.

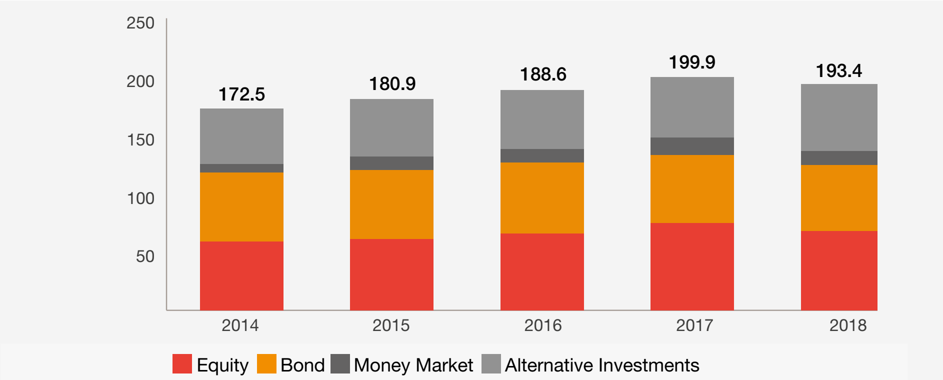
In 2019, Keva welcomed the government plan to merge the country's municipal and private pension systems.

Sources: OECD, TELA, IPE, World Bank, Illmariner, IPE, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
81%	89%	35%	75%	10% non OECD	30%	42%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 81%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 28%**		●	

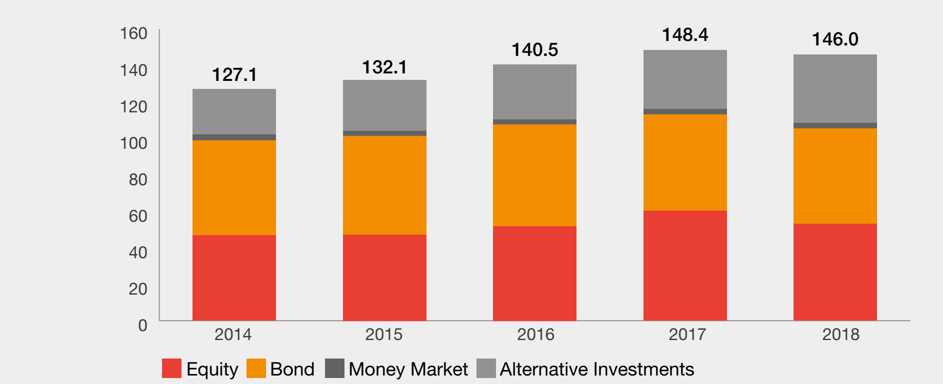
Evolution of total assets of pension funds by asset class (EUR bn)



% of indirect investments	34%	34%	41%	43%	42%

Sources: OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (EUR bn)



% of foreign investments	74%	73%	74%	74%	75%
Regulatory limit of foreign inv.	10% non OECD	10% non OECD	10% non OECD	10% non OECD	10% non OECD

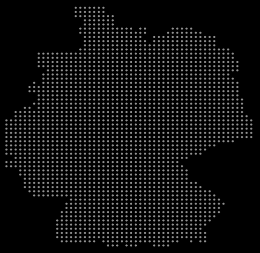
Sources: OECD, World Bank,, TELA, and PwC Market Research Centre

Largest pension funds in Finland

#	Pension fund	AuM 2018 (EUR bn)	Market share in 2018
1	Keva	50.1	25.9%
2	Ilmarinen	46.5	24.0%
3	Varma Mutual Pension Insurance Co.	44.6	23.1%
4	Elo	23.4	12.1%
5	Valtion Eläkerahasto (VER)	19.7	10.2%
6	Veritas Pensionforsakring	3.2	1.7%
7	Valion ek	0.8	0.4%
8	ABB es	0.7	0.4%
9	Apteekkien ek	0.6	0.3%
10	Yleisradion es	0.6	0.3%
	TOTAL	**190.2**	**98.3%**

Sources: IPE and PwC Market Research Centre

Germany



Overview of Germany's pension funds

Germany's pension assets were equivalent to only 7% of the country's EUR 3.4tn GDP at year end 2018. However, this ratio has been increasing over time. This was due to pension assets growing at a CAGR of 4.7%, faster than domestic GDP (CAGR of 2%%), between 2014 and 2018.

Total assets and asset allocation

The pension market in Germany is underdeveloped with AuM of about EUR 233.7bn (US$ 267.7bn).

The asset allocation of German pension funds is rather conservative, with with 50% invested in bonds, 41% in alternative investments, 5% in equities and 4% in money market products.

German pension funds have continued to diversify their asset allocation through alternatives. As of February 2019, 96% of German-based pension funds actively invested in real estate.

The assets of German pension funds allocated to equities are the equivalent of only less than 1% of the total market capitalisation of listed domestic companies.

Foreign investments

Germany does not set any detailed quantitative limit on overall foreign investments or specific asset classes for pension funds. However, foreign investments of pension funds have to be kept at prudential level. German pension funds' allocation to foreign assets has shrank from 2014 (16%) to 2018 (13%).

Allocation to investment funds

Pension funds in Germany invested an estimated 51% of their assets directly and the remaining through investment funds in 2018.

Future trends

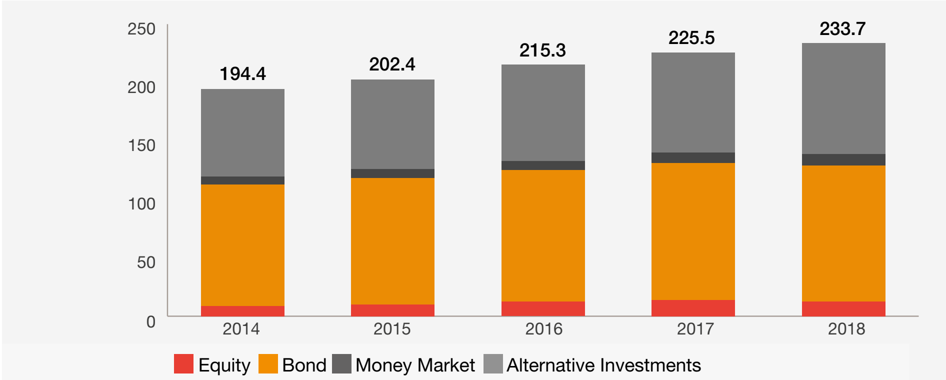
German pension funds have continued to diversify their asset allocation through alternatives, especially real estate, with 96% of German-based pension funds actively investing in the asset class as of February 2019.

Sources: OECD, Bafin, WTW, IPE, World Bank and PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
7%	100%	33%	13%	No limit	41%	49%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 7%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: <1%**	●		

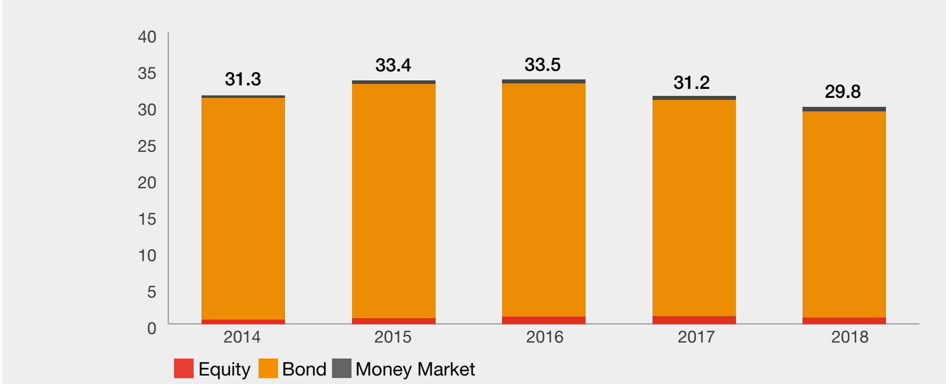
Evolution of total assets of pension funds by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of indirect investments	43%	44%	47%	49%	49%

Sources: OECD, World Bank, Bafin, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of foreign investments	16%	17%	16%	14%	13%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: OECD, World Bank, Bafin, and PwC Market Research Centre

Largest pension funds in Germany

#	Pension fund	AuM 2018 (EUR bn)	Market share in 2018
1	Bayerische Versorgungskammer (BVK)	84.5	36.2%
2	VBL	38.5	16.5%
3	Deutsche Rentenversicherung Bund	38.0	16.2%
4	Daimler AG	33.4	14.3%
5	BVV	29.3	12.5%
	TOTAL	**223.7**	**95.7%**

Sources: IPE and PwC Market Research Centre

Hong Kong

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
41%	10%	24%	40%	30% in HKD assets	5%	N/A

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 41%**		●	
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 2%**	●		

Overview of Hong Kong's pension funds

Hong Kong pension assets accounted for 41% of the region's HKD 2.8tn GDP at year end 2018. This ratio of pension assets to GDP is increasing rapidly as pension assets grew at a CAGR of 8.0% from 2014 to 2018, much faster than GDP growth (CAGR of 5.9%).

Total assets and asset allocation

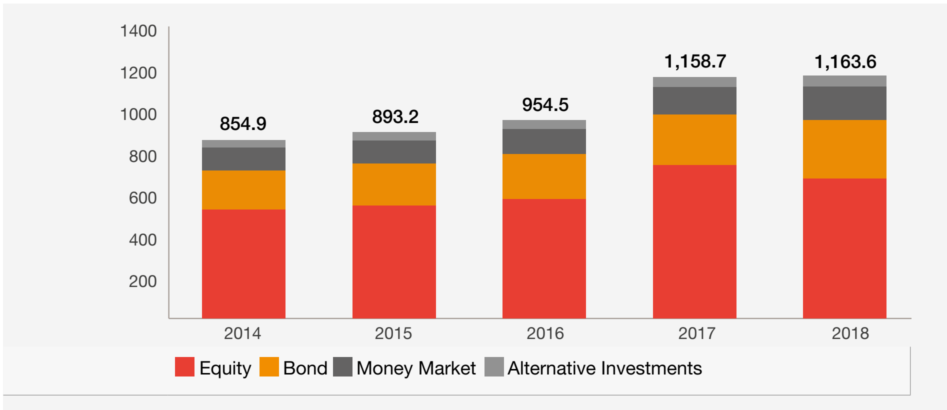
The pension market in Hong Kong is fairly developed with AuM of about HKD 1,163.6bn (US$ 148.5bn) in 2018.

In 2018, Hong Kong pension funds allocated 58% of their assets to equities, 24% to bonds, 14% to cash and deposits, and 5% to alternatives.

As of 2018, the assets of pension funds allocated to equities are the equivalent to 2% of the total market capitalisation of listed domestic companies, which is far below the average level.

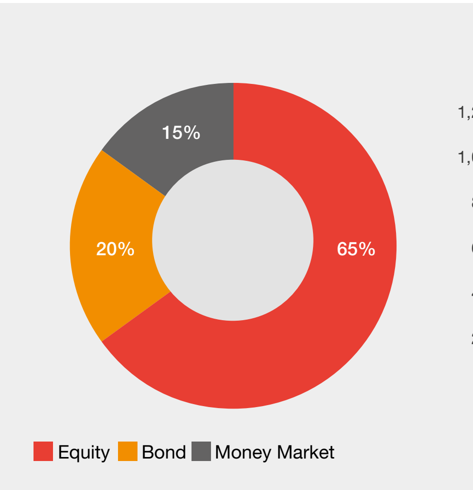
Employees and self-employed people in Hong Kong are required to join a Mandatory Provident Fund (MPF) scheme or Occupational Retirement Schemes under the Occupational Retirement Schemes Ordinance (ORSO). Under the MPF System, each trustee offers one or more MPF schemes, and each scheme has different constituent funds for scheme members to choose from. The assets under the MPF system increased from HKD 565.1 bn to HKD 813.0 bn (CAGR of 10%) between 2014 and 2018, much faster than those in the ORSO schemes (CAGR of 5%). The MPF market is fairly concentrated with top ten trustees accounting for 72% of the total market.

Evolution of total assets of pension funds by asset class (HKD bn)



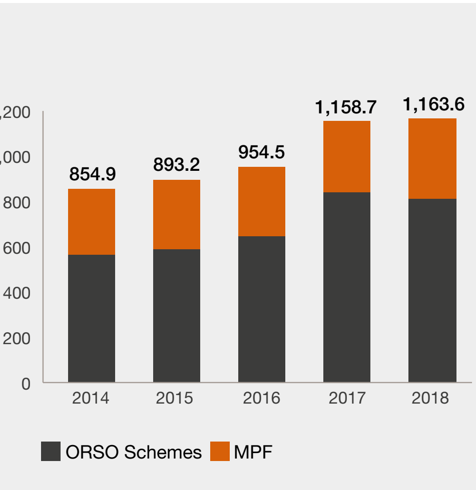
Sources: OECD, World Bank, MPFA, and PwC Market Research Centre

Asset Allocation of MPF Constituent Funds (2018)



Source: MPFA

Evolution of assets of pension funds (HKD bn)



Source: MPFA

Sources: IPE and PwC Market Research Centre

Hong Kong

Foreign investments

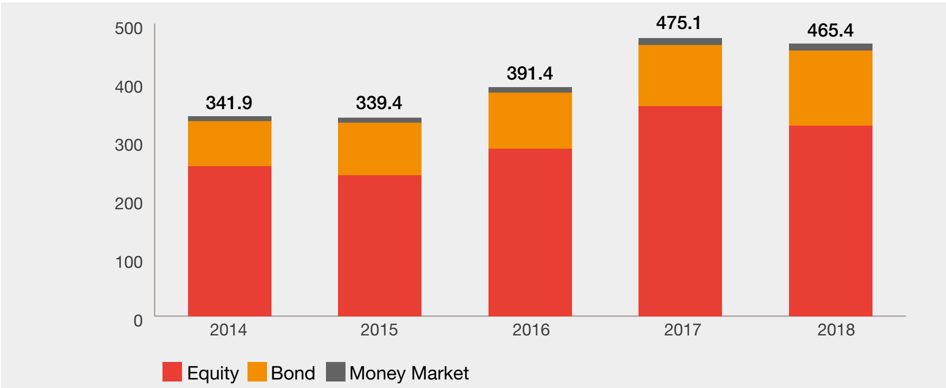
MPF schemes must invest at least 30% of its assets in Hong Kong dollar currency investments. Pension funds in Hong Kong can invest in securities listed in the stock exchange approved by the Hong Kong regulator. Currently, 40% of their assets are directed to foreign investments.

Allocation to investment funds

MPF and ORSO schemes can invest in the investment funds authorised by the Securities and Futures Commission (SFC).

Sources: OECD, MPFA, World Bank, SCMP, AIGCC and PwC Market Research Centre

Evolution of MPF Foreign Investments by asset class (HKD bn)



	2014	2015	2016	2017	2018
% of foreign investments	**40%**	**38%**	**41%**	**41%**	**40%**
Regulatory limit of foreign inv.	**> 30% in HKD assets**	**> 30% in HKD assets**	**> 30% in HKD assets**	**> 30% in HKD assets**	**> 30% in HKD assets**

Sources: OECD, World Bank, MPFA, and PwC Market Research Centre

Top MPF Approved Trustees in Hong Kong

#	Pension fund	AuM 2018 (HKD bn)	Market share in 2018*
1	Manulife Asset Mgmt (HK) Ltd	206.0	17.7%
2	HSBC Investment Funds (HK) Ltd	176.1	15.1%
3	AIA MPF Services	82.9	7.1%
4	Sun Life Hong Kong Limited	74.9	6.4%
5	BOCI Prudential Asset Mgmt MPF	66.8	5.7%
6	Hang Seng Investment Mgmt Ltd	58.2	5.0%
7	Principal Asst Mgt Co(Asia)Ltd	53.7	4.6%
8	Bank Consortium Trust Co Ltd	53.4	4.6%
9	Fidelity (FIL Inv Mgt HK Ltd)	41.0	3.5%
10	Bk of East Asia (Trustees) Ltd	26.1	2.2%
	TOTAL	**839.1**	**72.1%**

*The market share includes both MPF and ORSO schemes

Source:Trustnet

Italy

Overview of Italy's pension funds

Italian pension assets were equivalent to 9% of the country's EUR 1.8tn GDP at year end 2018. The ratio of pension assets to GDP has increased in recent years with pension assets growing significantly faster than GDP with a 6.3% CAGR from 2014 to 2018 compared to a 0.4% GDP growth in the same period.

Total assets and asset allocation

The pension market in Italy is not well developed with an AuM of about EUR 167.1bn (US$ 191.9bn) in 2018. Moreover, the market is fairly concentrated, with the largest nine pension funds holding 53% of total pension assets.

In 2017, 5% of Italian pension schemes were Defined Benefits (DB) schemes.

The asset allocation of Italian pension funds is diversified with 19% invested in equities, 45% in bonds, 6% in money market products and almost 31% in alternative investments in 2018.

The assets of Italian pension funds allocated to equities are the equivalent of 8% of the total market capitalisation of listed domestic companies as of 2018.

Foreign investments

Italy has not set limits on overall foreign investments for OECD countries. Currently, Italian pension funds allocate 56% of their assets to foreign investments.

Allocation to investment funds

Pension funds in Italy invested most of their assets directly in 2018, with an estimated 12% allocated through investment funds.

Future trends

As the pension market in Italy is maturing, we expect funds to continue diversifying their asset allocation. In fact, we are witnessing a shift towards more specialist active mandates for equity and fixed-income assets.

Due to low expected returns from traditional asset classes, we are expecting Italian pension funds to increase their asset allocation in alternative investments. An example is Solidarietà Veneto, which is now broaden its asset allocation to include infrastructure and real estates.

At the beginning of 2019, a consortium of 5 pension funds (for a total of EUR 6bn) announced an investment policy focused on private equity, representing a blueprint for future partnerships.

Sources: OECD, COVIP, IPE, and PwC Market Research Centre

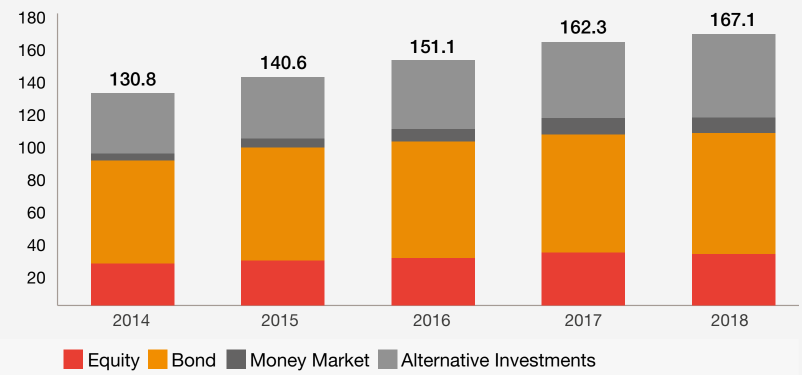
Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
9%	5%	37%	56%	No limit	31%	12%

Low Medium High

Maturity of Pensions industry
Pension assets/GDP: 9%

Size of domestic equity market
Pension allocation to equities/domestic market cap ratio: 8%

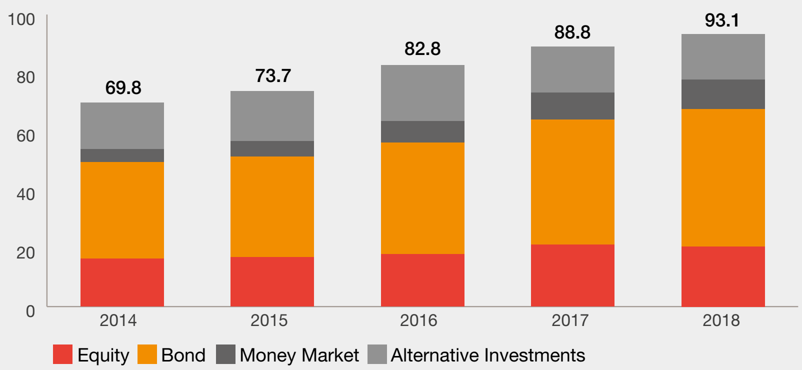
Evolution of total assets of pension funds by asset class (EUR bn)



% of indirect investments	10%	11%	11%	12%	12%e

Sources: COVIP, OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (EUR bn)



% of foreign investments	53%	53%	55%	55%	56%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: COVIP, OECD, World Bank, and PwC Market Research Centre

Largest pension funds in Italy

#	Pension fund	AuM 2018 (EUR bn)	Market share in 2018
1	Fondazione ENPAM	22.4	13.4%
2	Cassa Nazionale di Prev. e Assist. Forense	11.9	7.1%
3	Previndai-Fondo Pensione	11.3	6.7%
4	Fondo Pensione COMETA	11.0	6.6%
5	Inarcassa	10.6	6.4%
6	CNPADC	8.0	4.8%
7	Fondazione Enasarco	7.5	4.5%
8	Intesa Sanpaolo SpA	6.4	3.8%
8	FONCHIM	6.2	3.7%
9	Fondo Pensione Fon Te	3.8	2.3%
	TOTAL	**99.1**	**59.3%**

Sources: IPE and PwC Market Research Centre

Japan

Overview of Japan's pension funds

Japanese pension assets, based on our estimations, were equivalent to 29% of the country's JPY 545.11tn GDP at year end 2018. This ratio of pension assets to GDP has recently been decreasing. From 2014 to 2018, pension assets have had a CAGR of -1.1%, while the GDP has had -1.6% CAGR for the same period.

Total assets and asset allocation

Japan has one of the largest pension fund markets in the world, with assets amounting to JPY 158.2tn (US$ 1.4tn) at year end 2018. The pension market in Japan is quite concentrated with the largest three pension funds, including the largest pension fund in the world (Government Pension Investment Fund), accounting for almost 96% of the market.

The GPIF allocates 48% invested in equities, 46% in bonds, 6% in money market, and less then 1% alternatives. Although the share of alternatives is low, the GPIF have increased their alternative investments in recent years from almost 0 in 2014 to JPY 393.5bn (US$ 3.5bn) in 2018. GPIF is on the 2019's Leaders List of the 25 World's most responsible asset allocators.

Pension fund's allocation to equity is about 13% of the total market capitalisation of listed domestic companies.

Foreign investments

Currently, GPIF allocates 42% of its assets to foreign investments, compared to 34% in 2014. Considering GPIF's market share, this proportion is probably representative of Japan's total pension funds' foreign investments.

Allocation to investment funds

Pension funds in Japan prefer to give mandates to the external asset manager. For example, GPIF hired three transition managers to help it shift the money from domestic bonds into stocks and foreign investments.

Future trends

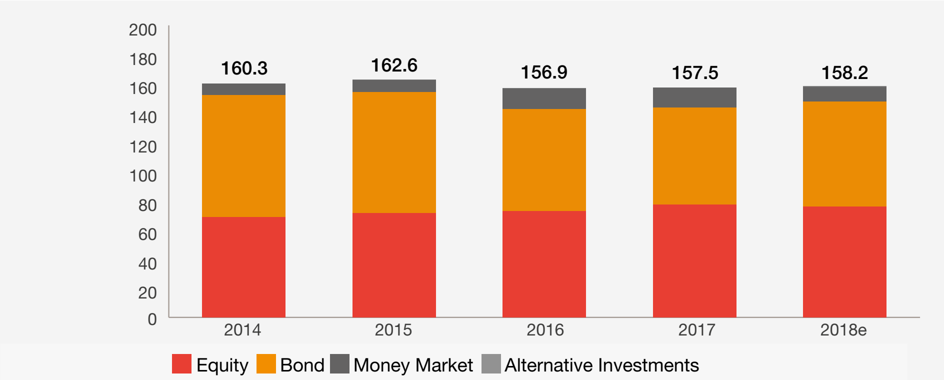
We expect Japanese pension funds to invest more in alternatives, including infrastructure, real estate and private equity and to shift from bonds into Japanese and foreign stocks.

Sources: OECD, GPIF, IPE World Bank, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
29%	95%	46%	42%	No limit	<1%	N/A

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 29%**		●	
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 13%**	●		

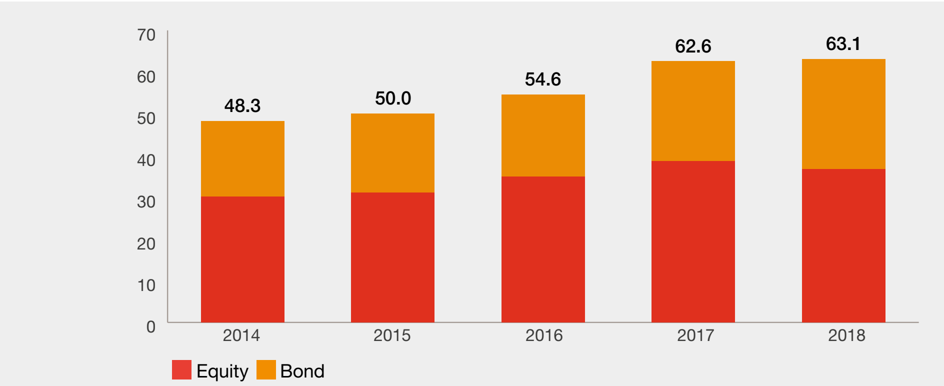
Evolution of total assets of pension funds by asset class (JPY tn)*



	2014	2015	2016	2017	2018e
% of indirect investments	N/A	N/A	N/A	N/A	N/A

*For means of analysis, we used AuM and asset allocation of GPIF, as this fund holds almost 82% of the assets of Japanese pension funds.
Source: OECD, World Bank, Ignites Asia, New America, GPIF and PwC Market Research Centre

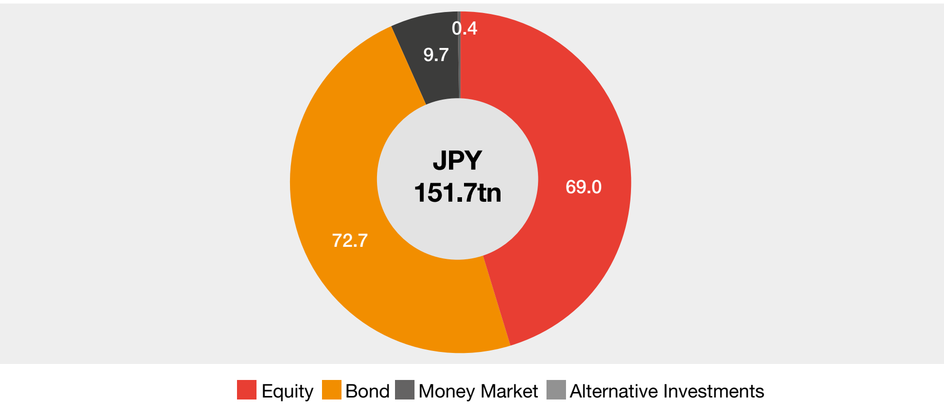
Evolution of Foreign Investments by asset class (JPY tn)*



	2014	2015	2016	2017	2018
% of foreign investments	34%	36%	36%	39%	42%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

*For means of analysis we only looked at the largest pension fund in the market: GPIF, as this fund holds more than 99% of the assets of Japanese pension funds.
Note:* % of foreign investments applied only to GPIF total asset
Source: OECD, World Bank, Ignites Asia, New America, GPIF and PwC Market Research Centre

Asset allocation of the largest pension fund in Japan – GPIF, 2018 (JPY tn)



Source : GPIF

Luxembourg

Overview of Luxembourg's pension funds

Luxembourgish pension assets were equivalent to 3% of the country's EUR 60.5bn GDP at year end 2018. The ratio of pension assets to GDP has not increased from 2014 to 2018. Pension assets have been growing at a CAGR of 3.3%, faster than domestic GDP (CAGR of 2.6%).

Total assets and asset allocation

The pension market in Luxembourg is not well developed, with AuM of about EUR 1.6bn (US$1.8bn) in 2018. DB, which accounted for 80% of assets in 2014, has dropped slightly, reaching 70% in 2018.

Luxembourg's pension funds are not well diversified. As of 2018, 21% of assets were invested in equity, 58% in bonds, 8% in money market instruments and 13% in alternative investments.

The assets of Luxembourgish pension funds allocated to equities are equivalent to 1% of the total market capitalisation of listed domestic companies

Foreign investments

Although data about foreign investments of Luxembourg's pension funds are not readily available from the regulator (CSSF), Luxembourgish pension funds do invest in foreign assets.

Allocation to investment funds

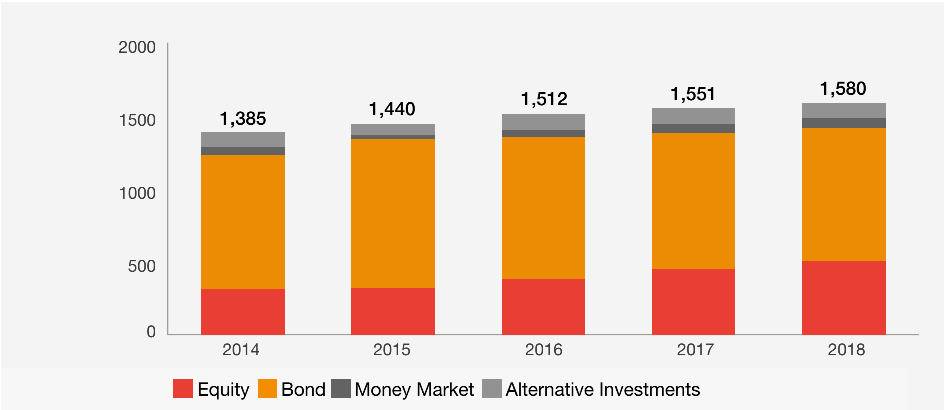
Although, Luxembourgish pension funds have increased their investments through investment funds in the past four years, the ratio of investments through investment funds to total pension assets was 42% in 2014 and fell to 39% in 2018.

Sources: OECD, World Bank, Pensions&Investments, ALFI and PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
3%	70%	21%	N/A	No limit	13%	39%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 3%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 1%**	●		

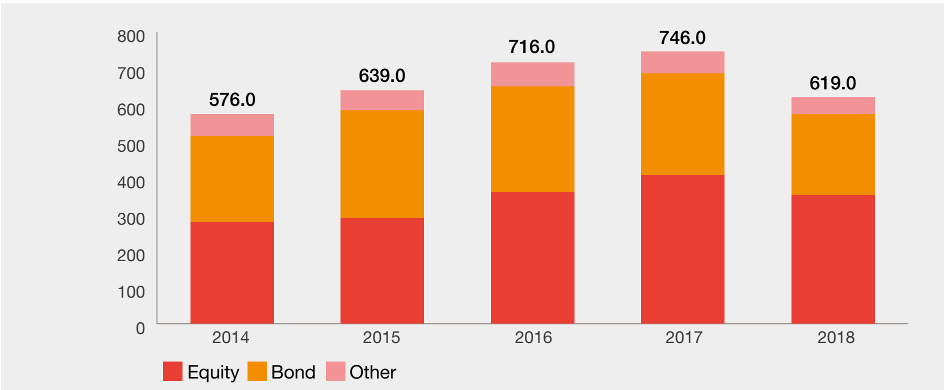
Evolution of total assets of pension funds by asset class (EUR mn)



	2014	2015	2016	2017	2018
% of indirect investments	42%	44%	47%	48%	39%

Sources: CSSF, OECD, World Bank, and PwC Market Research Centre

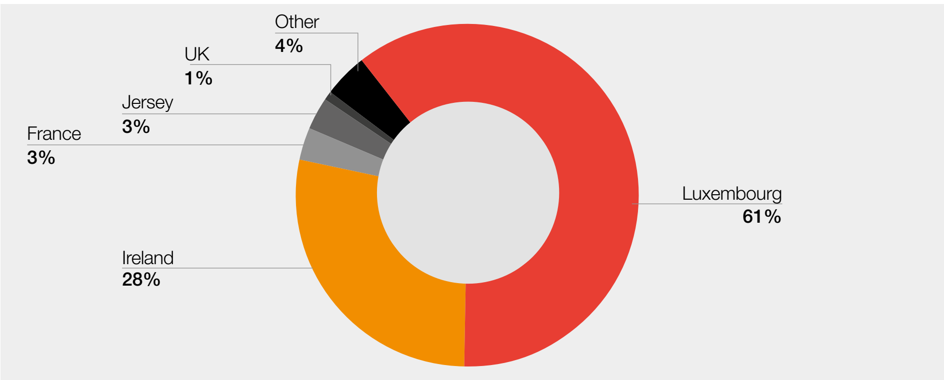
Investment Funds held by Pension Funds by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of foreign investments	N/A	N/A	N/A	N/A	N/A
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Source: CSSF, OECD, World Bank, and PwC Market Research Centre

Domicile share of authorisations for cross-border distribution



Source: PwC Market Research Centre

Mexico

Overview of Mexico's pension funds

Mexican pension assets were equivalent to 14% of the country's MXN 23.5tn GDP at year end 2018. Moreover, both pension assets and GDP have increased rapidly, with pension assets growing at a CAGR of 8.7% between 2014 and 2018, and GDP growing at a CAGR of 7.7%.

Total assets and asset allocation

The pension market in Mexico is not well developed with AuM about MXN 3.3tn (US$ 168.6bn) in 2018. Moreover, the market is highly concentrated, with the largest four pension funds holding more than 70% of total pension assets. In 2018, Mexican pension schemes were mainly Defined Contribution (DC) schemes. The asset allocation of Mexican pension funds is very conservative with 81% of total assets invested in bonds, 16% in equities, and only 3% is allocated to alternative investments.

While the share of total investments allocated to equity investments decreased from 23% in 2014 to 16% in 2018, the share of bonds increased from 76% in 2014 to 81% in 2018. Alternative investments increased over the last three years, from 0.1% in 2015 to 3% in 2018, even though still remaining low compared to other countries.

In 2018, the assets of Mexican pension funds allocated to equities were the equivalent of 7% of the total market capitalisation of listed domestic companies.

Foreign investments

The portion of foreign investment has fallen by around 14% since 2014. As of 2018, 90% of foreign assets were invested in equities.

Allocation to investment funds

In 2018, pension funds in Mexico invested approximately 88% of their assets directly and 12% through investment funds. In 2014, only 2% of assets were invested through investments funds, with a big change happening in 2016, when they went from 2% to 12%.

Future trends

Major investment opportunities for AFORES in the financing of long term projects are determined by the structural reforms that the country is implementing in telecommunication, energy, financial sector, and so on. In this regard, we have to point out that pension funds have to invest through public offering (legal restriction).

Since 2019, AFORES can shift part of their assets into foreign mutual funds from 51 countries under certain conditions. Since then, the Mexican Pension Association authorised 42 international mutual funds operated by 11 asset managers for AFORES to choose from.

Sources: OECD, CONSAR, World Bank and PwC Market Research Centre

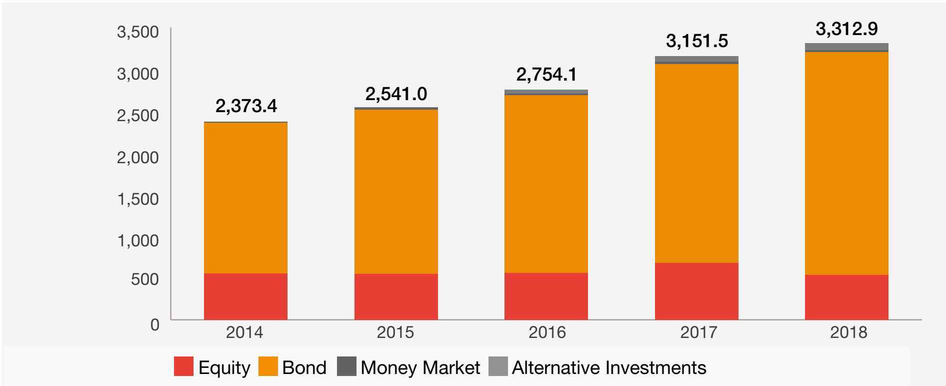
Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
14%	12%	11%	11%	20%	3%	12%

Low Medium High

Maturity of Pensions industry
Pension assets/GDP: 14%

Size of domestic equity market
Pension allocation to equities/domestic market cap ratio: 7%

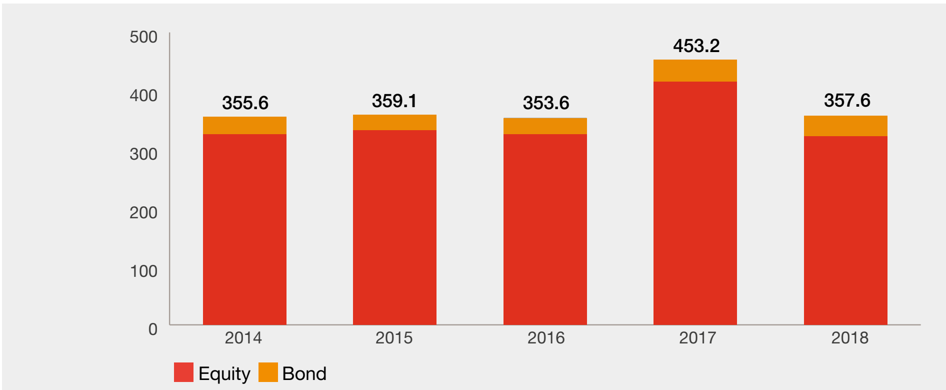
Evolution of total assets of pension funds by asset class (MXN bn)



% of indirect investments	2%	2%	12%	13%	12%

Sources: OECD, Consar, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (MXN bn)



% of foreign investments	15%	14%	13%	14%	11%
Regulatory limit of foreign inv.	20%	20%	20%	20%	20%

Sources: OECD, Consar, World Bank, and PwC Market Research Centre

Largest pension funds in Mexico

#	Pension fund	AuM Jun-2019 (MXN bn)	Market share Jun-2019
1	XXI Banorte	827.5	22.4%
2	Citibanamex	668.9	18.1%
3	Profuturo	548.2	14.8%
4	SURA	545.2	14.8%
5	Principal	242.4	6.6%
6	PensionISSSTE	232.8	6.3%
7	Coppel	229.9	6.2%
8	Invercap	178.5	4.8%
9	Inbusa	125.5	3.4%
10	Azteca	93.7	2.5%
	TOTAL	**3,692.7**	**100.0%**

Sources: Consar and PwC Market Research Centre

The Netherlands

Overview of Dutch pension funds

Dutch pension assets were equivalent to an estimated 169% of the country's EUR 795.0bn GDP at year end 2018.

The ratio of pension assets to GDP has been increasing during the last few years as pension assets grew much faster than GDP with a 6.2% CAGR from 2014 to 2018 compared to a 1.9% GDP growth in the same period.

Total assets and asset allocation

The pension market in the Netherlands is well developed and is one of the most mature with an estimated AuM of about EUR 1,341.7 in 2018. Moreover, the market is fairly concentrated, with the largest 10 pension funds holding 74.5% of total pension assets. ABP, the largest pension fund, is on the 2019's Leaders List of the 25 World's most responsible asset allocators.

In 2018, 94% of Dutch pension schemes were Defined Benefits (DB) schemes. The asset allocation of Dutch pension funds is diversified with an estimated 29% invested in equities, 46% in bonds, 3% in money market and 21% in alternative investments.

The assets of Dutch pension funds allocated to equities are the equivalent of 44% of the total market capitalisation of listed domestic companies.

Foreign investments

According to the OECD, the Netherlands have not set limits on overall foreign investments for OECD countries. Currently, Dutch pension funds allocate an estimated 87% of their assets to foreign investments.

Allocation to investment funds

Pension funds in the Netherlands invest around half of their assets directly, with an estimated 50% allocated through investment funds.

Future trends

Around 250 pension funds accounting for more than EUR 1,300 bn. The industry is strongly consolidating as the number of pension funds has been divided by 3 over the past 10 years and we expect this trend to continue.

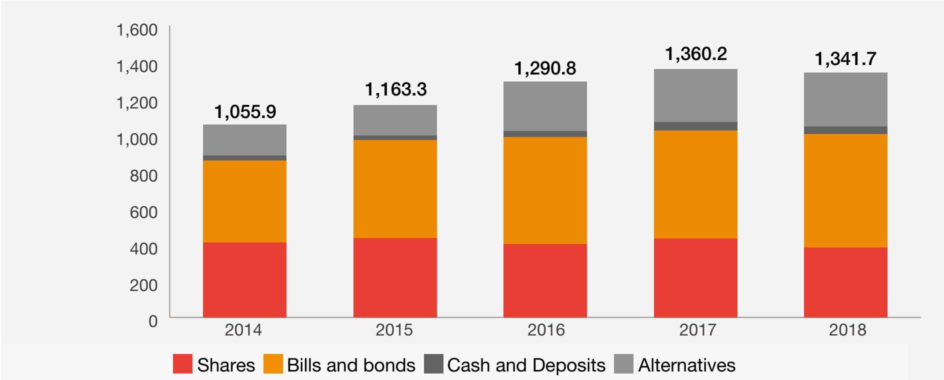
The largest Dutch pension funds have committed to a climate accord to reduce emission reduction in July 2019. The total amount of AuM of these pension funds amount to EUR 800bn. Therefore, we expect "green" investments to increase in the coming years.

Sources: DNB, OECD, IPE, World Bank, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
169%	94%	30%	87%	No limit	21%	50%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 169%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 44%**			●

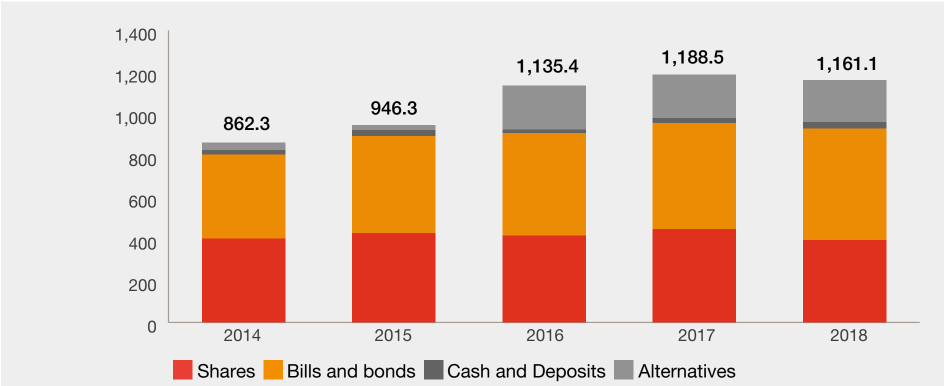
Evolution of total assets of pension funds by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of indirect investments	56%	51%	53%	51%e	50%

Sources: DNB, OECD, Towers Watson, World Bank, New America, and PwC Market Research Centre

Evolution of foreign investments by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of foreign investments	82%	81%	88%	87%	87%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

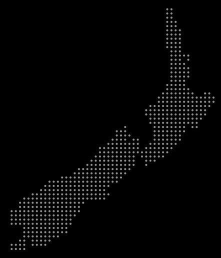
Sources: DNB, OECD, Towers Watson, World Bank, New America, and PwC Market Research Centre

Largest pension funds in the Netherlands

#	Pension fund	AuM 2018 (EUR bn)	Market share in 2018
1	ABP	442.0	32.9%
2	PFZW	225.2	16.8%
3	PMT	78.4	5.8%
4	bpfBOUW	61.8	4.6%
5	PME	50.3	3.7%
6	ABN AMRO	28.9	2.2%
7	Shell	28.5	2.1%
8	ING	28.2	2.1%
9	Beroepsvervoer over de Weg	28.0	2.1%
10	Stichting Pensioenfonds PGB	27.8	2.1%
	TOTAL	**999.0**	**74.5%**

Sources: IPE and PwC Market Research Centre

New Zealand



Overview of New Zealand's pension funds

New Zealand's pension assets were equivalent to 27% of the country's NZD 305.0bn GDP at year end 2018. This ratio has been increasing over the years given that, between 2014 and 2018, pension assets grew at a CAGR of 11.9%, while domestic GDP grew at CAGR of 4.3%.

Total assets and asset allocation

The pension market in New Zealand is fairly developed with AuM of about NZD 81.2bn (US$ 54.5bn) in 2018.

New Zealand pension funds invest 65% of their assets directly. The asset allocation as of 2018 was 32% equities, 24% bonds, 8% money market products and 1% alternative investments.

The New Zealand Superannuation, the largest pension fund in New Zealand, makes up for more than 46% of the total market share, with NZD 37.9bn in June 2018. The fund is on the 2019's Leaders List of the 25 World's most responsible asset allocators.

The assets of New Zealand pension funds allocated to equities are the equivalent of 20% of the total market capitalisation of listed domestic companies.

Foreign investments

New Zealand does not set any detailed quantitative limit on overall foreign investments or specific asset classes for pension funds. New Zealand pension funds' allocation to foreign assets is of 50% in 2018, high compared to the other countries.

Allocation to investment funds

Pension funds in New Zealand invested approximately 65% of their assets directly and the remaining through investment funds in 2018.

Future trends

New Zealand pension funds have started to take appropriate measures to diversify their investment portfolios in terms of geographical exposure (50% of foreign investments).

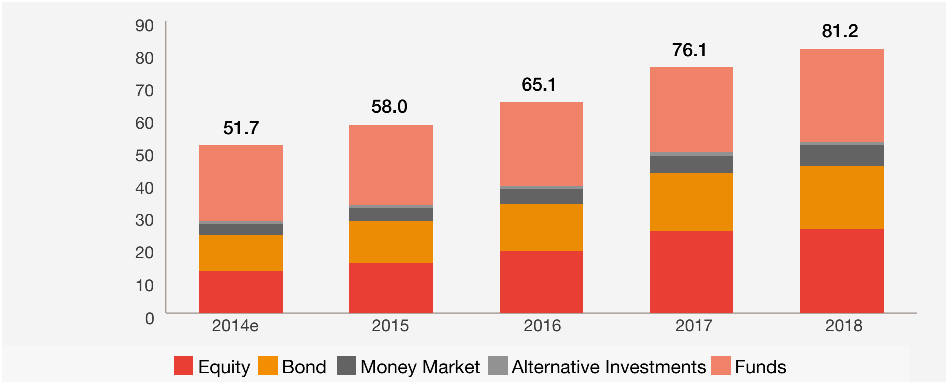
We expect New Zealand's pension funds to increase their asset allocation in alternative and foreign investments. The NZ Superannuation CEO highlighted recently the importance of having to invest in infrastructure to keep up with the growing demand in the country.

Sources: OECD, World Bank, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
27%	20%	24%	50%	No limit	1%	35%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 27%**		●	
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 20%**		●	

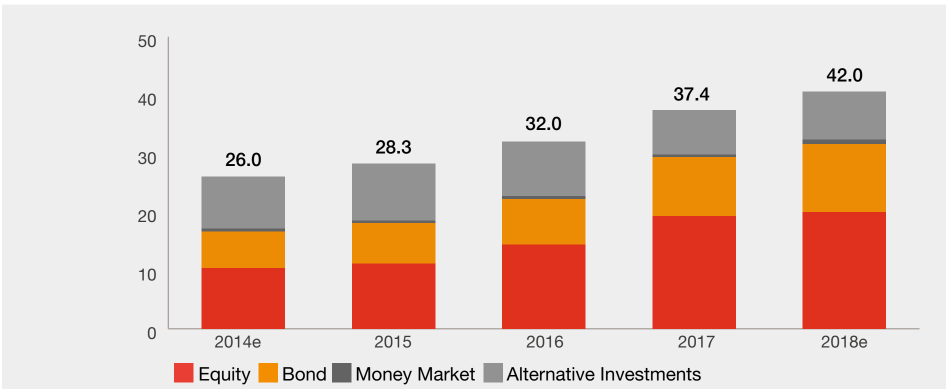
Evolution of total assets of pension funds by asset class (NZD bn)



	2014e	2015	2016	2017	2018
% of indirect investments	45%e	43%	40%	35%	35%

Sources: OECD, World Bank, New America and PwC Market Research Centre

Evolution of Foreign Investments by asset class (NZD bn)



	2014e	2015	2016	2017	2018e
% of foreign investments	50%e	49%	49%	49%	50%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: OECD, World Bank, New America and PwC Market Research Centre

Largest pension funds in New Zealand

#	Pension fund	AuM Jun-2018 (NZD bn)	Market share Jun-2018
1	New Zealand Superannuation	37.9	46.7%
	TOTAL	**37.9**	**46.7%**

Source: Towers Watson

Norway

Overview of Norway's pension funds

The ratio of pension assets to GDP is increasing rapidly as pension assets grew at a CAGR of 5.8%, faster than GDP growth (CAGR of 4.6%), from 2014 to 2018.

Up to now, many pension providers in Norway are incorporated as insurers (e.g. OPF, KLP) but Norway has decided to adopt Solvency II-like requirement for pension funds. Norway is also likely to adopt "pension account" which introduce the possibility for all employees to gather all pension balances (regarding active and terminated DC schemes from current and former employers) into one single account.

Contribution of the employer for DB pension plan is fully deductible, with total benefit limited to 100% of salary. From 2018, National DC pension plans have been introduced in order to face longevity.

Total assets and asset allocation

However, Norway held one of the biggest pension funds (Sovereign Wealth Fund) in the world, which is not included in the sector's total assets. The fund is on the 2019's Leaders List of the 25 World's most responsible asset allocators.

Norwegian pension funds invested 36% invested in equities, 56% in bonds, 2% in the money market, and 6% in alternative investments in 2018.

Foreign investments

According to the OECD, Norway has no regulatory limits in terms of foreign investments for pension funds. In 2018, Norwegian pension funds allocated 28% of their portfolios to foreign assets.

Allocation to investment funds

In 2018, pension funds in Norway invested most of their assets directly and 40% through investment funds. The share of indirect has increased at a 8-year CAGR of 4.9% (from 26% in 2009 to 40% in 2018).

Future trends

Special provisions in new rules have been included to make it easier for pension funds to invest in infrastructure. Ethical guidelines are already in force for the GPFG.

As of 2018, Norway's sovereign wealth fund was denied permission to invest in private equity. However, allocation to green energy infrastructure was allowed.

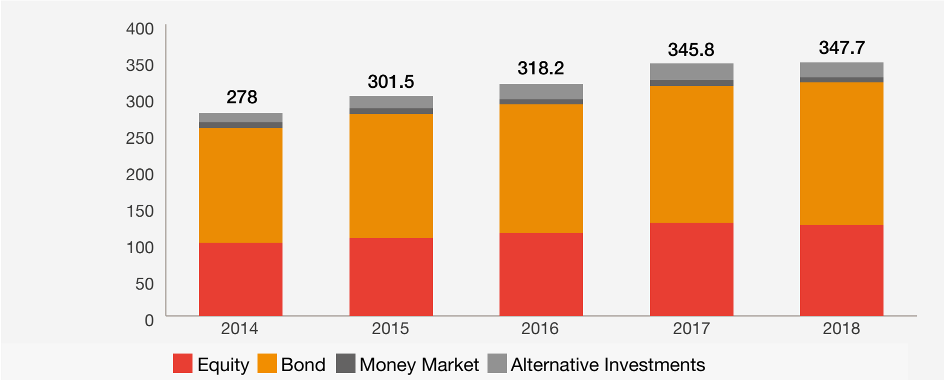
In 2019, Norway's ministry of finance proposed that Norway's sovereign wealth fund be allowed to invest in unlisted renewable. At the same time, Norway's sovereign wealth fund doubled the permitted amount of allocation to renewable energy infrastructure. Moreover, it seeks to allocate EUR 6.3 bn to private equity.

Sources: OECD, World Bank, Pension&Investments, IPE, Infrastructure Investor, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
9%	100%	26%	28%	No limit for OECD	6%	40%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 9%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 5%**	●		

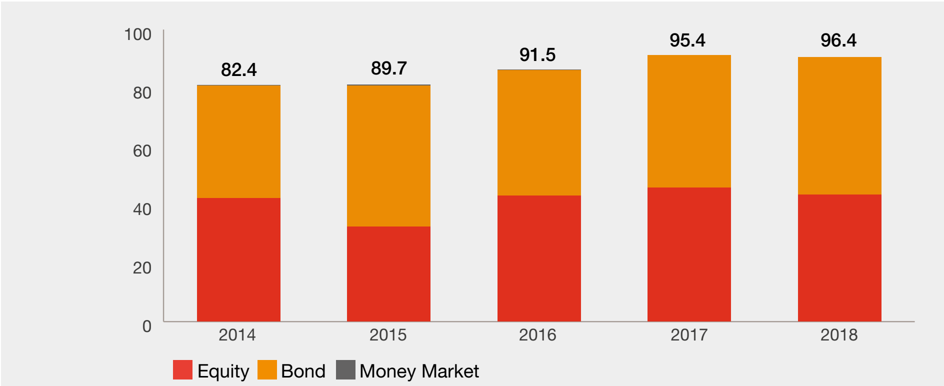
Evolution of total assets of pension funds by asset class (NOK bn)



	2014	2015	2016	2017	2018
% of indirect investments	32%	34%	36%	38%	40%

Sources: OECD, World Bank, New America, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (NOK bn)



	2014	2015	2016	2017	2018
% of foreign investments	30%	30%	29%	28%	28%
Regulatory limit of foreign inv.	No limit for OECD	No limit for OECD	No limit for OECD	No limit for OECD	No limit for OECD

Sources: OECD, World Bank, New America, and PwC Market Research Centre

Largest pension funds in Norway

#	Pension fund	AuM 2018 (NOK bn)	Market share in 2018
1	Norway Government PF Global	9,386.80	Wealth Fund
2	Kommunal Landspensjonskasse (KLP)	672.5	Insurance & Pension
3	Folketrygdfondet	258.6	Wealth Fund
4	Oslo Pensjonsforsikring	94.7	27.2%
5	Equinor	45.0	12.9%
6	PKH	26.0	7.5%
7	Norsk Hydro ASA	17.8	5.1%
8	Tine SA	16.3	4.7%
9	NSB AS	8.0	2.3%
10	Telenor ASA	6.8	1.9%
	TOTAL	**214.5**	**61.7%**

Sources: IPE and PwC Market Research Centre

Peru

Overview of Peru's pension funds

There are only 4 private pension funds (AFPs) in Peru, AFP Habitat, AFP Integra, AFP Prima and AFP ProFuturo.

The ratio of pension assets to GDP increased given that pension assets grew at an estimated CAGR of 8.1% between 2014 and 2018, while domestic GDP grew at a CAGR of 5.8%.

Total assets and asset allocation

The pension market in Peru is not well developed and is growing slowly with the four pension fund administrators (AFPs) operating in the country managing assets of an estimated PEN 1562bn (US$ 463bn) in 2018.

All Peruvian pension funds are Defined Contribution (DC) schemes. The asset allocation of Peruvian pension funds is well diversified with 42% invested in equities, 46% in bonds, 3% in money market products and 10% in alternatives, as of 2018.

The assets of Peruvian pension funds allocated to equities are the equivalent of 21% of the total market capitalisation of listed domestic companies.

Foreign investments

Peruvian pension funds increasingly invest in foreign assets. In 2018, 44% of their assets were directed to foreign investments. Peru is among the few countries that changed their regulatory limit over the last year.

Allocation to investment funds

Pension funds in Peru invest approximately 60% of their assets directly and the remaining through investment funds.

Future trends

Peru is one of the most aggressive countries in terms of foreign investments, even sometimes going beyond the maximum threshold.

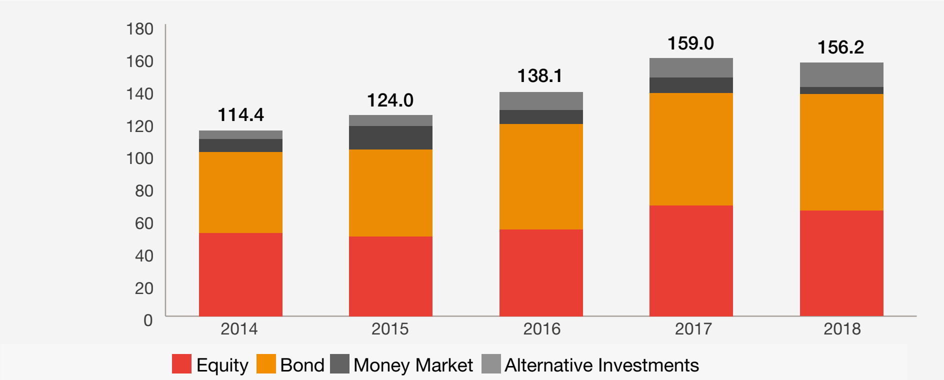
In December 2017, Peru's banking, insurance and pensions regulator proposed to decrease regulatory requirements mutual funds must meet in order for AFPs to invest in them. This change gave more autonomy to AFPs on their investment decision, and, at the same time, made it easier to invest in mutual funds.

Sources: OECD, World Bank, CityWire, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
21%	0%	11%	44%	46%	10%	40%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 21%**		●	
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 21%**		●	

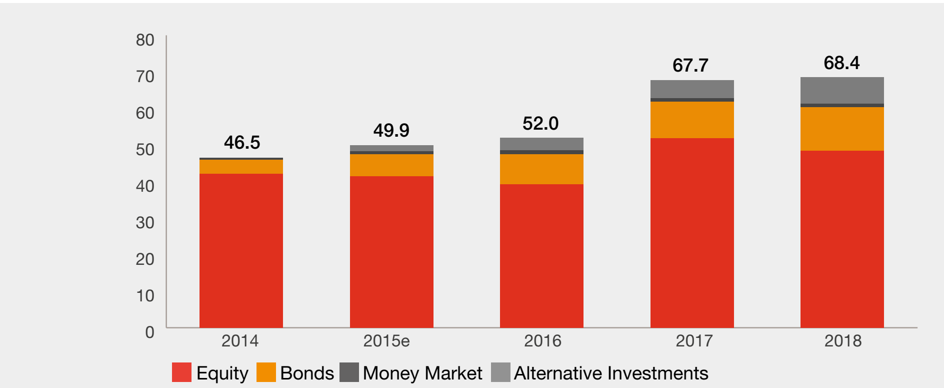
Evolution of total assets of pension funds by asset class (PEN bn)



	2014	2015	2016	2017	2018
% of indirect investments	38%	40%	36%	40%	40%

Sources: Superintendencia de Banca, OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (PEN bn)



	2014	2015e	2016	2017	2018
% of foreign investments	41%	40%	38%	43%	44%
Regulatory limit of foreign inv.	40%	42%	42%	46%	46%

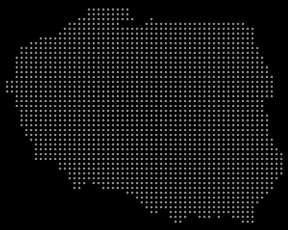
Sources: Superintendencia de Banca, OECD, World Bank, and PwC Market Research Centre

Largest pension funds in Peru

#	Pension fund	AuM 2019 (PEN bn)	Market share in 2019
1	Integra	68.2	44.2%
2	Prima	46.8	30.3%
3	Profuturo	38.5	24.9%
4	Habitat	0.9	0.6%
	TOTAL	**154.4**	**100.0%**

Sources: Superintendencia de Banca

Poland



Overview of Poland's pension funds

Polish pension assets were equivalent to 7% of the country's PLN 2.2tn GDP at year end 2018. The ratio of pension assets to GDP has been decreasing between 2014 and 2018 as pension assets grew at a CAGR of -1.3% while GDP has been growing at a CAGR of 6.3%.

Total assets and asset allocation

The pension market in Poland is not well developed with AuM of about PLN 156.6bn (US$ 39.6bn) in 2018. The market is extremely concentrated, with the three largest pension funds holding more than 56.6% of total pension assets. All Polish pension schemes are Defined Contribution (DC).

Polish pension funds allocated 86% of their investments to equities, 7% to bonds and 6% to money market products. Alternative investments accounted for just 2% of total pension fund assets in 2018, even though they accounted for 6.8% in 2017.

As of Dec-2013, the polish government required open pension funds (OPFs) to transfer 51.5% of their assets, primarily in treasury bonds and treasury bills, to the state's Social Security Institution (ZUS), thus drastically changing the total AuM of the pension funds' industry.

The assets of pension funds allocated to equities are equivalent to 22% of total market capitalisation.

Foreign investments

Poland sets a 30% quantitative limit on overall foreign investments. In 2017, the foreign investment of pension funds accounted for 6% of total pension assets. According to the OECD, limits for foreign investments have increased from 5% to 30% in 2014 (with 3 years adjustment period).

Allocation to investment funds

Pension funds in Poland invested less than 1% of their assets via investment funds in 2017.

Future trends

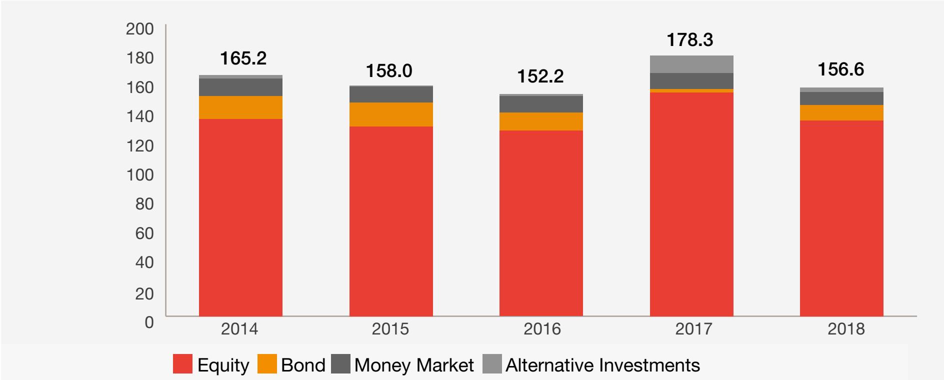
In 2019, the government proposed to transfer all of the PLN 162bn assets in the privately managed part of the pension system (OFE) to individual pension accounts. The aim is to privatise the funds' assets. This measure will start affecting the industry from 2020.

Sources: KNF, OECD, World Bank, Pensions & Investments, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
7%	0%	26%	8%	30%	2%	<1%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 7%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 22%**		●	

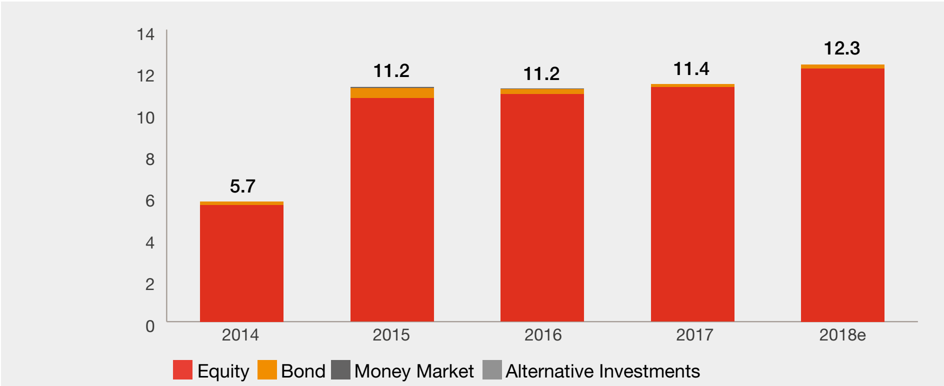
Evolution of total assets of pension funds by asset class (PLN bn)



	2014	2015	2016	2017	2018
% of indirect investments	Less than 1%	Less than 1%	Less than 1%	Less than 1%	Less than 1%

Sources: KNF, OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (PLN bn)



	2014	2015	2016	2017	2018e
% of foreign investments	4%	7%	7%	6%	8%e
Regulatory limit of foreign inv.	10%	20%	30%	30%	30%

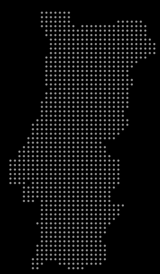
Sources: KNF, OECD, World Bank, and PwC Market Research Centre

Largest pension funds in Poland

#	Pension fund	AuM March 2018 (PLN bn)	Market share in 2018
1	Nationale-Nederlanden PTE SA	42.3	23.3%
2	Aviva PTE Aviva BZ WBK SA	37.2	20.5%
3	ZUS-Social Insurance Institution	23.3	12.8%
4	PTE PZU SA	21.9	12.0%
5	Aegon PTE SA	14.5	8.0%
6	MetLife PTE SA	13.5	7.4%
7	AXA PTE SA	10.9	6.0%
8	Generali PTE SA	8.3	4.6%
9	PTE Allianz Polska SA	7.7	4.2%
	TOTAL	**176.5**	**99.0%**

Sources: IPE and PwC Market Research Centre

Portugal



Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
19%	75%	34%	34%	No limit for Euro zone	9%	29%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 19%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 9%**	●		

Overview of Portugal's pension funds

Portuguese pension assets were equivalent to 19% of the country's EUR 207bn GDP at year end 2018. The ratio of pension assets to GDP has been increasing in recent years as pension assets increased faster than GDP from 2014 to 2018 with a 20.4% CAGR compared to a 2.2% GDP growth in the same period. The high growth in pension assets can be attributed to the fact that since 2017 personal plans are being offered by life insurance companies as well.

Total assets and asset allocation

The pension market in Portugal is not well developed with an AuM of about EUR 38.9bn (US$ 44.5bn) in 2018. The market is extremely concentrated. The largest pension fund, FEFSS, held more than 46% of the market share in 2018. In 2018, 69% of Portuguese pension schemes were Defined Benefits (DB) schemes. The share of DB schemes has regularly decreased the past decade.

The asset allocation of Portuguese pension funds showed a sound degree of diversification with 12% of total assets allocated to equities, 71% to bonds, 8% to money market products and 9% to alternative investments. The share of alternative investments has decreased from 2014 (20%).

The assets of Portuguese pension funds allocated to equities are equivalent to 9% of the total market capitalisation of listed domestic companies.

Foreign investments

Portugal does not set limits on overall foreign investments for pension funds in the Euro zone. Portuguese pension funds invested an estimated 34% of their assets in foreign investments as of 2018.

Allocation to investment funds

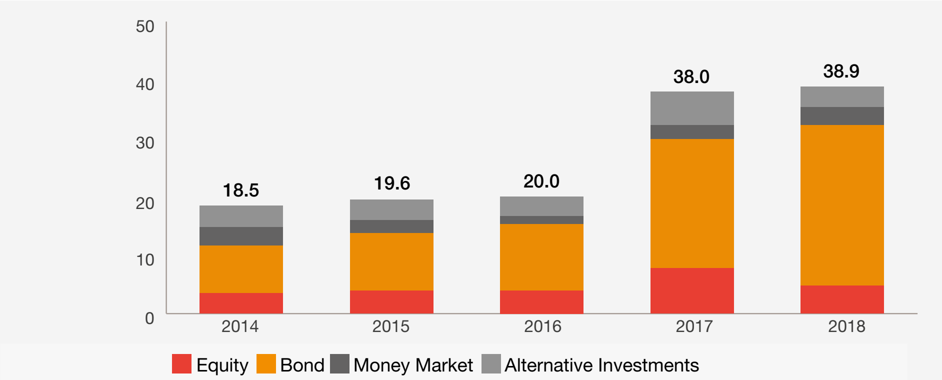
Pension funds in Portugal invest most of their assets directly and 29% through investment funds. Indirect investments grew over time and we expect them to continue this trend.

Future trends

In recent years, Portuguese government bonds have been increasing, offering pension funds both diversification and stability in a conservative and once fragile market. Now, in light of an increasing old-age dependency ratio and a fairly high DB/DC ratio, Portuguese pension funds will have to take appropriate measures to diversify their investment portfolios in terms of assets class and geographical exposure.

Sources: OECD, World Bank, IPE, and PwC Market Research Centre

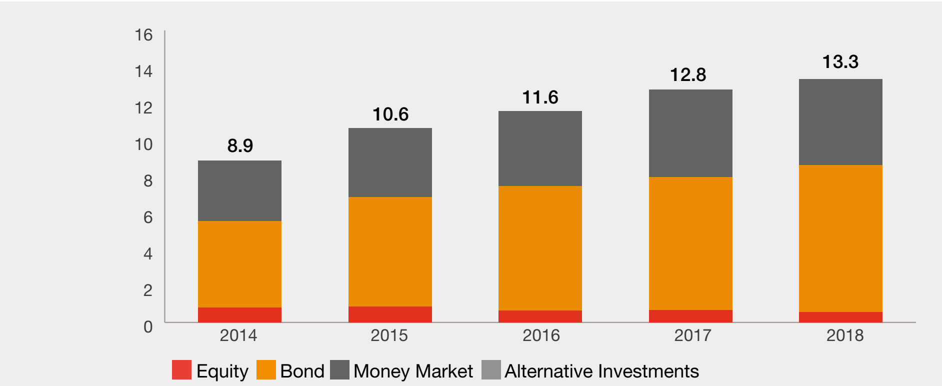
Evolution of total assets of pension funds by asset class (EUR bn)



% of indirect investments	24%	25%	28%	29%	29%

Sources: OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (EUR bn)



% of foreign investments	48%	54%	58%	34%	34%
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: OECD, World Bank, and PwC Market Research Centre

Largest pension funds in Portugal

#	Pension fund	AuM 2018 (EUR bn)	Market share 2018
1	FEFSS	18.0	46.3%
2	Grupo BCP	3.3	8.5%
3	Passoal da CGD	2.6	6.7%
4	Banco de Portugal - DB	1.9	4.9%
5	Novo Banco	1.6	4.1%
6	Banco BPI	1.5	3.9%
7	Grupo EDP	1.1	2.8%
8	Banco Santander Totta	1.0	2.6%
9	Montepio Geral	0.7	1.8%
10	Petrogal	0.2	0.5%
	TOTAL	**32**	**82%**

Sources: IPE and PwC Market Research Centre

South Korea

Overview of South Korea's pension funds

The assets of South Korea's National Pension Service (NPS)* were equivalent to 35% of the country's KRW 1,800.35 GDP at year end 2018. Moreover, this ratio of pension assets to GDP continues to increase rapidly. Assets grew at a CAGR of 8.0%, much faster than GDP growth (CAGR of 4%), between 2014 and 2018.

Total assets and asset allocation

The pension market in South Korea is fairly developed and very concentrated, with one pension fund holding more than 90% (US$ 582.9bn) of the total pension fund AuM in 2017. In 2017, 24% of South Korean pensions were Defined Benefit (DB) schemes.

The asset allocation of the NPS is fairly diversified with 35% of total assets invested in equities and 53% in bonds in 2018. The fund's share of alternative investments has increased in recent years from 4% in 2008 to 12% in 2018, with a 10-year CAGR of 17.4%. Moreover, the other smaller Korean pension funds are said to be allocating more than 30% to this asset class.

The NPS assets allocated to equities are the equivalent of 14% of the total market capitalisation of listed domestic companies in 2018.

Foreign investments

South Korean pension funds are allowed to invest between 30%-70% of their assets in foreign investments. Currently, the NPS invests 22% of its assets abroad.

Allocation to investment funds

The NPS invests most of its assets directly and 9% through investment funds as of 2018.

Future trends

South Korean state pension fund had an investment return of about 7% in the first four months of 2019, hence surpassing the KRW 700 trillion AuM threshold.

South Korea is at an all time low level of fertility rate (0.96), going for the first time under 1. In order to counter this problem, South Korea decided to reform the pension system, increasing the ratio of risky assets (stocks and real estates) from 50% to 60%, and raising the ratio of overseas investment from 30% to 45%. This is a move which will help the pension system to boost returns.

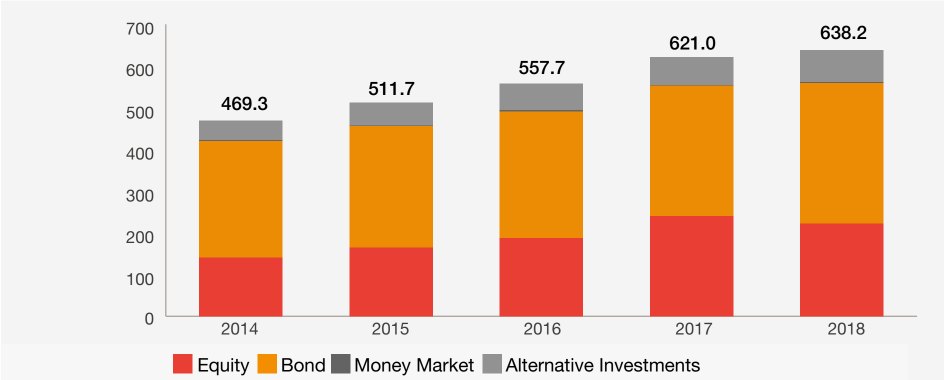
*For means of analysis we only looked at the largest pension fund in the market: National Pension Service (NPS), as this fund holds more than 90% of the assets of South Korean pension funds

Sources: OECD, NPS, World Bank, NIKKEI Asian Review and PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
35%	24%	20%	22%	30%to 70%	12%	9%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 35%**		●	
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 14%**	●		

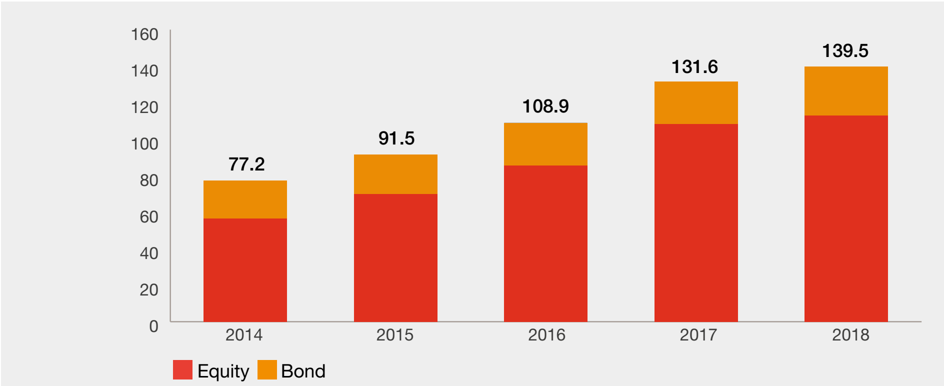
Evolution of total assets of pension funds by asset class (KRW tn)



% of indirect investments	6%	7%	7%	8%	9%

Sources: OECD, World Bank, NPS, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (KRW tn)



% of foreign investments	16%	18%	20%	21%	22%
Regulatory limit of foreign inv.	30% to 70%	30% to 70%	30% to 70%	30% to 70%	30% to 70%

Sources: OECD, World Bank, NPS, and PwC Market Research Centre

Largest pension funds in South Korea

#	Pension fund	AuM 2018 (KRW tn)
1	National Pension	637.3
2	Teachers' Pension	19.2
3	Government Employees Pension	18.2
	TOTAL	**674.7**

Source: Towers Watson

Spain

Overview of Spain's pension funds

Spanish pension assets were equivalent to 9% of the country's EUR 1.2tn GDP in 2018. The ratio of pension assets to GDP has been decreasing in recent years as pension assets grew slower than GDP with a 1.6% CAGR from 2014 to 2018 compared to a GDP growth of 2.2% CAGR in the same period. Spanish pension funds experienced a EUR 4,091mn loss in 2018 (3.7% less than in 2017).

Total assets and asset allocation

The pension market in Spain is not well developed with AuM of about EUR 107.0bn (US$123.0bn) in 2018. The second largest pension fund, Fondo de Reserva de la Seguridad Social, accounted for 63.6% of total pension assets with EUR 546bn in 2014 Since then, the government has regularly tapped the fund to compensate for social security deficit. In 2018, its total assets fell to EUR 5bn.

In 2017, 39% of Spanish pension schemes were Defined Benefit (DB) schemes. Spanish pension funds invest 78% of their assets directly; of which 13% in equities, 45% in bonds, 10% in money market products and 9% in alternative investments as of 2018.

In 2018, the assets of Spanish pension funds allocated to equities are the equivalent of 2% of the total market capitalisation of listed domestic companies.

Foreign investments

Spain does not set any quantitative limit on overall foreign investments or any specific asset classes for pension funds. Currently, they invest 31% in foreign assets. The share of foreign investments grew at 15.3% CAGR for the period 2014 to 2018.

Allocation to investment funds

Pension funds in Spain invest most of their assets directly and 22% through investment funds.

Future trends

Investments in European equity and fixed income have recently been making low returns while alternatives have been boosting returns in the first half of 2019. We thus expect Spanish pension funds to seek diversification and increase their allocation in alternatives.

Pension funds have broadened out their regional exposure from a European to a more global framework, focusing on equity and fixed income instruments. This is a result of changes to the pension funds' market in the last years and of the Greek debt crisis.

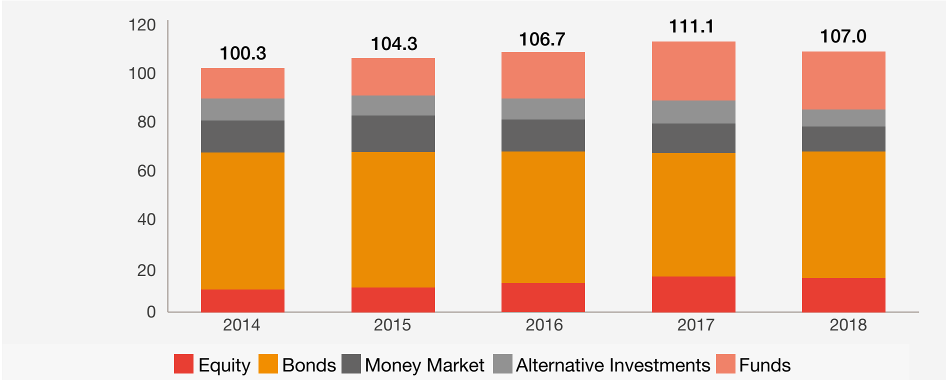
Some pension funds are trying to shield against rate rises through shortening in duration and use of alternatives.

Sources: OECD, Inverco, IPE, World Bank, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
9%	39%	30%	31%	No limit for OECD	9%	22%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 9%**	●		
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 2%**	●		

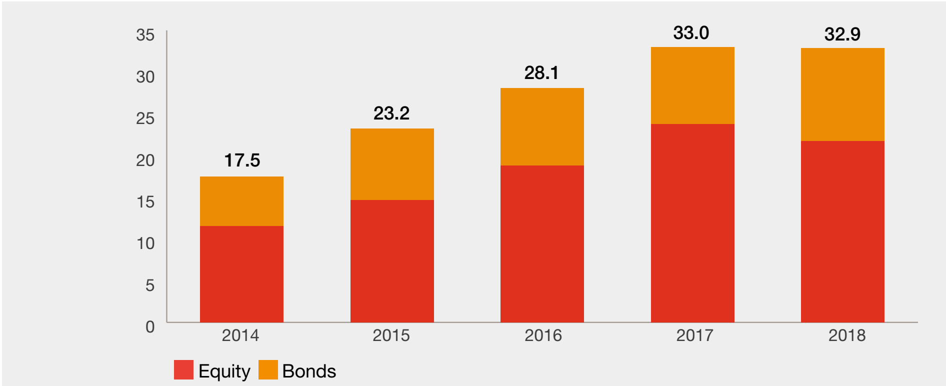
Evolution of total assets of pension funds by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of indirect investments	13%	15%	18%	22%	22%

Source: OECD, INVERCO, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (EUR bn)



	2014	2015	2016	2017	2018
% of foreign investments	17%	22%	26%	30%	31%
Regulatory limit of foreign inv.	No limit for OECD	No limit for OECD	No limit for OECD	No limit for OECD	No limit for OECD

Source: OECD, INVERCO, World Bank, and PwC Market Research Centre

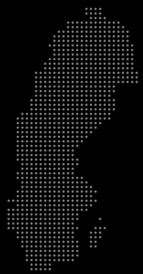
Largest pension funds in Spain

#	Pension fund	AuM 2018 (EUR bn)	Market share in 2018
1	Pension Caixa 30	5.6	5.2%
2	Fondo de Reserva de la Seguridad Social	5.0	4.7%*
3	Pse Grupo Endesa	2.8	2.6%
4	BBVA Empleo Veintitrés (Fondo 23)	2.8	2.6%
5	Empleados Telefonica de España	2.7	2.5%
6	Geroa Pentsioak EPSV	1.9	1.8%
7	Empleados Grupo Bankia	1.8	1.7%
8	Elkarkidetza EPSV De Empleo	1.1	1.0%
9	Empleados Iberdrola	1.0	0.9%
10	Europopular Integral	0.9	0.8%
	TOTAL	**25.7**	**24.0%**

*in 2014, Fondo de Reserva de la Seguridad Social accounted for 36.6% of the market share.

Source: IPE

Sweden



Overview of Sweden's pension funds

Swedish pension assets were equivalent to 87% of the country's SEK 4.9tn GDP in 2018. The ratio of pension assets to GDP has been increasing between 2014 and 2018 as pension assets grew at a 9.4% CAGR while GDP increased at a 2.1% CAGR.

Total assets and asset allocation

The pension market in Sweden is well developed with an estimated AuM of about SEK 4.2tn (US$ 470.5bn) in 2018. Moreover, the largest three pension funds already account for almost 54% of total pension assets, which indicates a high concentration within the pension market. Sweden's AP funds are on the 2019's Leaders List of the 25 World's most responsible asset allocators.

In 2018, Swedish pension funds invested 71% of their assets directly; of which 21% in equities, 43% in bonds, 1% in money market products and 5% in alternative investments.

The assets of Swedish pension funds allocated to equities are the equivalent of 24% of the total market capitalisation of listed domestic companies.

Foreign investments

Sweden does not set any quantitative limit on overall foreign investments or any specific asset classes for pension funds.

In 2018, they invested an estimated 16% in foreign assets.

Allocation to investment funds

In 2018, pension funds in Sweden invested 29% of their assets through investment funds, the remaining part was invested directly.

Future trends

Parliament has voted to change investment rules for AP funds 1-4. These new rules, among other things, set a new 40% ceiling on illiquid investments. The AP fund are thinking about investing directly in infrastructure companies.

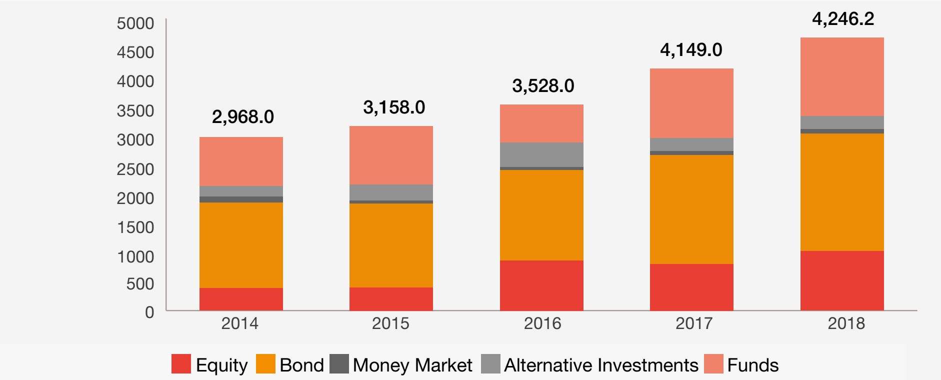
Given the recent development in Amazon, a trend towards sustainability is rising in Norway among institutional investors, which are requesting companies not to contribute to the environmental damage. Their ambition is to exit companies contributing to deforestation by 2025.

Sources: OECD, World Bank, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
87%	100%	26%	16%	No limit	5%	29%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 87%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 24%**	●		

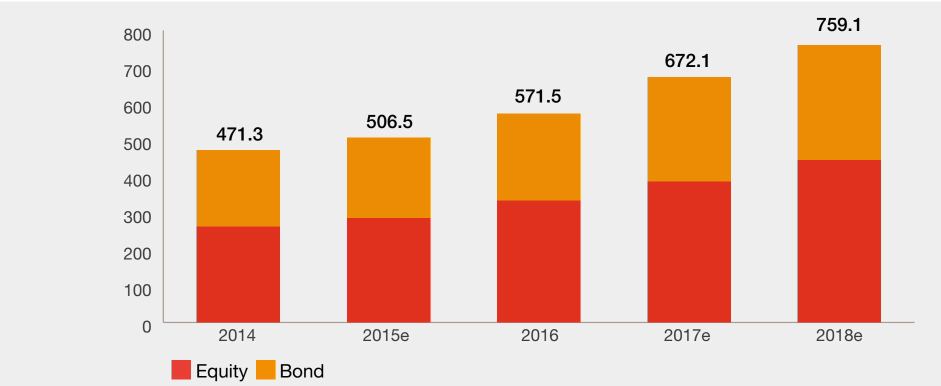
Evolution of total assets of pension funds by asset class (SEK bn)



	2014	2015	2016	2017	2018
% of indirect investments	28%	32%	19%	29%	29%

Sources: OECD, World Bank, New America, Pensions Europe, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (SEK bn)*



	2014	2015e	2016	2017e	2018e
% of foreign investments	16%	16%e	16%	16%e	16%e
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

*The asset breakdown of foreign investments correspond to the average breakdown of pension funds that make up 59% of the market share.

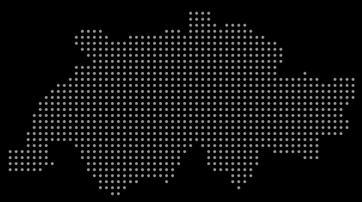
Sources: OECD, World Bank, New America, Pensions Europe, and PwC Market Research Centre

Largest pension funds in Sweden

#	Pension fund	AuM 2017 (SEK bn)	Market share in 2018
1	Alecta Pensionsförsäkring	866.4	20.0%
2	Sjunde AP-fonden (AP7)	816.9	19.0%
3	AMF	617.3	15.0%
4	Fjärde AP-fonden (AP4)	346.3	8.0%
5	Tredje AP-fonden (AP3)	337.8	8.0%
6	Andra AP-fonden (AP2)	332.0	8.0%
7	Första AP-fonden (AP1)	323.4	8.0%
8	KPA Pensionsförsäkring AB	171.1	4.0%
9	Nordea Life & Pensions	134.2	3.0%
10	Länsförsäkringar Liv	109.7	3.0%
	TOTAL	**4,055.1**	**95.0%**

Source: IPE and PwC Market Research Centre

Switzerland



Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
141%	90%	28%	36%	30% of foreign currency	35%	60%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 141%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 19%**		●	

Overview of Switzerland's pension funds

Swiss pension assets were equivalent to 141% of the country's CHF 694.2bn GDP at year end 2018. Moreover, this ratio of pension assets to GDP is increasing as pension assets have grown at a CAGR of 3.0% from 2014 to 2018, faster than domestic GDP (CAGR of 1.5%).

Total assets and asset allocation

The pension market in Switzerland is well developed with AuM of about CHF 982.2bn (US$ 997.4bn) in 2018. Moreover, the market is well fragmented with the top ten pension funds only holding 25% of total pension assets.

The asset allocation of Swiss pension funds is well diversified: 28% of AuM is invested in equities, 31% in bonds, 5% in money market products, and 35% in alternative investments in 2018. The share of alternatives has increased during this period (from 29% in 2014).

Swiss pension funds allocate to equities the equivalent of 19% of the total market capitalisation of listed domestic companies.

Foreign investments

Switzerland sets foreign investment limits only on foreign currency, but there is no limit on overall foreign investments. Pension funds in Switzerland can invest up to 30% in foreign currency. In 2018, an estimated 36% of their assets were directed to foreign investments.

Allocation to investment funds

Pension funds in Switzerland invest an estimated 40% of their assets directly with the remaining (60%) invested through investment funds.

Future trends

The Swiss Government proposed, in December 2018, to incentivise pension funds to invest in venture capital for domestic start-ups.

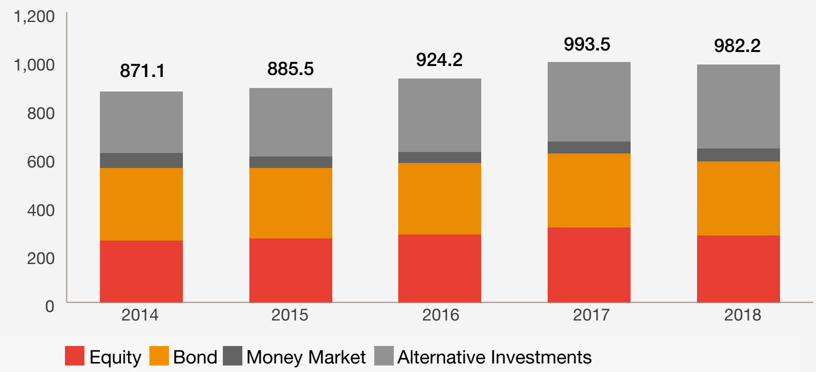
Such investments will be capped at 5% of AuM and will be detracted from the amount that pension funds can invest in alternatives.

According to a PwC study, individual pension plans for high earners are increasing in AuM in Switzerland. Over the next five years, their AuM should grow annually by 27%.

ESG is hitting Swiss pension plans investment decisions. An example is the public pension fund of Basel (EUR 8bn AuM), which is orienting towards sustainability strategies.

Sources: OECD, World Bank, IPE and PwC Market Research Centre

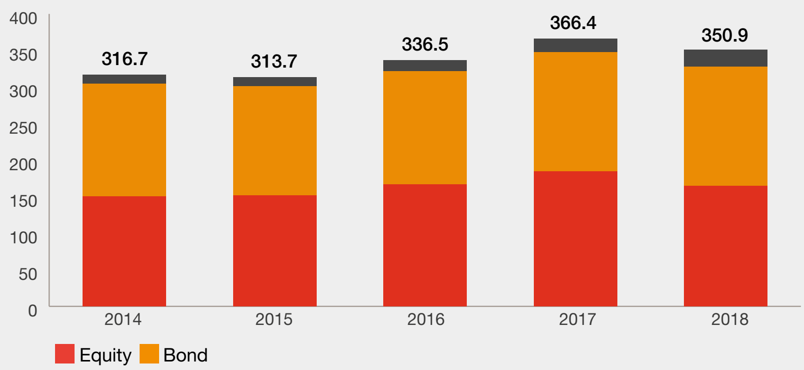
Evolution of total assets of pension funds by asset class (CHF bn)



	2014	2015	2016	2017	2018
% of indirect investments	51%	54%	57%	58%	60%

Sources: OECD, World Bank, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (CHF bn)



	2014	2015	2016	2017	2018
% of foreign investments	36%	35%	36%	37%	36%
Regulatory limit of foreign inv.	30% of foreign currency	30% of foreign currency	30% of foreign currency	30% of foreign currency	30% of foreign currency

Sources: OECD, World Bank, and PwC Market Research Centre

Largest pension funds in Switzerland

#	Pension fund	AuM 2018 (CHF bn)	Market share in 2018
1	PUBLICA	40.7	4.1%
2	Swiss Federal Social Security Funds	37.8	3.8%
3	Kanton Zürich (BVK)	33.4	3.4%
4	UBS AG	25.5	2.6%
5	Migros (PMK)	25.3	2.6%
6	Schweizerische Bundesbahnen (PKSBB)	18.3	1.9%
7	ASGA Pensionkasse	17.0	1.7%
8	Stadt Zürich (PKZH)	16.7	1.7%
9	Swiss Post (PKPost)	16.2	1.7%
10	Stiftung Auffangeinrichtung BVG	15.5	1.6%
	TOTAL	**246.5**	**25.1%**

Source: IPE and PwC Market Research Centre

United Kingdom

Overview of the UK's pension funds

British pension assets were equivalent to 99% of the country's GBP 2.2tn GDP at year end 2018 – one of the highest in the world. Moreover, this ratio of pension assets to GDP is still increasing as pension assets grew at a CAGR of 5.5% between 2014 and 2018, faster than GDP growth (CAGR of 4.7%).

Total assets and asset allocation

The pension market in the UK is well developed and fragmented. Moreover, it is one of the most mature worldwide with AuM of more than GBP 2.2tn (US$2.8tn) in 2018.

The market is also well fragmented, with the largest ten pension funds holding 18% of total pension assets. In 2018, 82% of British pension funds were Defined Benefit (DB) schemes. British pension funds invest 73% of their assets directly; of which 9% in equities, 30% in bonds, 2% in money market products and 32% in alternative investments. The share of equity investments has been decreasing in recent years while fixed income investments have increased.

The assets of British pension funds allocated to equities are the equivalent of 14% of the total market capitalisation of listed domestic companies as of 2018. With GBP 6,493bn of AuM, the UK is the leading European market for ESG related investments. Occupational pension scheme trustees are now required to state policy on financially material considerations stemming from ESG matters following new regulation.

Foreign investments

The United Kingdom does not set any quantitative limit on overall foreign investments or any specific asset classes for pension funds. In 2018, British pension funds invested an estimated 23% of their assets in foreign investments.

Allocation to investment funds

Pension funds in the UK invest 73% of their assets directly and the remaining 27% through investment funds. Overseas investment funds accounted for an estimated 40% of indirect investments in 2018.

Future trends

The UK industry (across all sectors) continues to face a period of significant change and unpredictability with Brexit, political unrest and the continued challenging economic environment.

Additionally, the UK pension industry is under ever increasing pressure with significant scheme deficits, the pressure to consolidate, a growing concern that DC schemes will not deliver a sustainable retirement income, ever increasing policies and regulations and growing demands for better transparency and governance from the policy makers and the regulator.

Sources: OECD, ONS, World Bank, PwC Market Research Centre

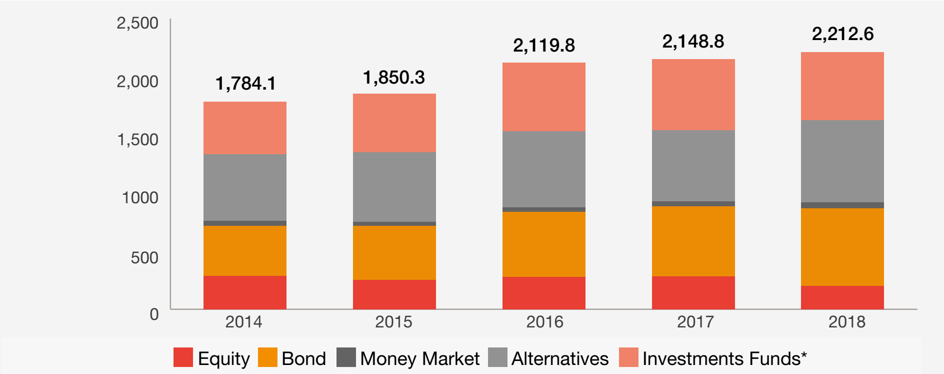
Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
99%	82%	29%	23%	No limit	32%	27%

Low Medium High

Maturity of Pensions industry
Pension assets/GDP: 99%

Size of domestic equity market
Pension allocation to equities/domestic market cap ratio: 14%

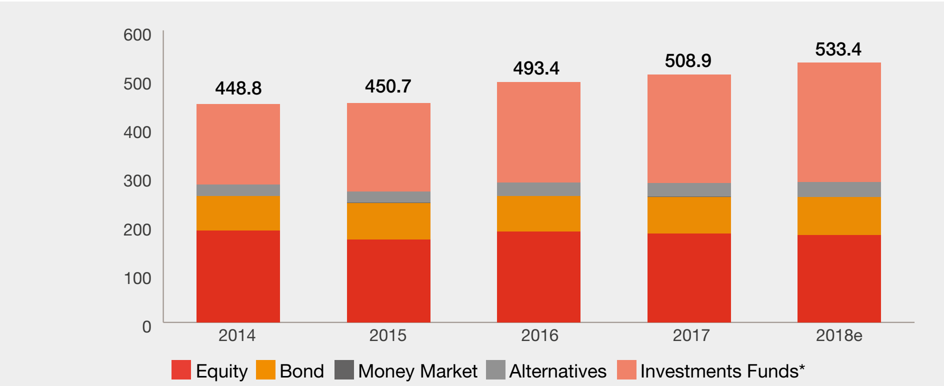
Evolution of total assets of pension funds by asset class (GBP bn)



% of indirect investments	25%	27%	28%	29%	27%

*Note: Asset allocation only includes direct investments (investment funds asset breakdown unavailable).
Sources: OECD, World Bank, ONS, and PwC Market Research Centre

Evolution of Foreign Investments by asset class (GBP bn)



% of foreign investments	24%	24%	23%	24%	23%e
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

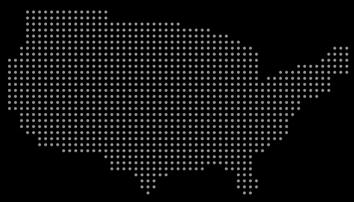
*Note: Asset allocation only includes direct investments (investment funds asset breakdown unavailable).
Sources: OECD, World Bank, ONS, and PwC Market Research Centre

Largest pension funds in the UK

#	Pension fund	AuM 2018 (GBP bn)	Market share in 2018
1	Universities Superannuation Scheme Ltd.	70.5	3.2%
2	BT Group plc	55.9	2.5%
3	Royal Bank of Scotland Group (RBS)	47.7	2.2%
4	Lloyds Banking Group	44.7	2.0%
5	Rothesay Life	38.0	1.7%
6	Pension Protection Fund (PPF)	32.1	1.5%
7	Pension Insurance Corporation	31.5	1.4%
8	Railways Pension Trustee Company Ltd.	30.8	1.4%
9	Barclays Bank plc	29.2	1.3%
10	HSBC Bank (UK) Ltd.	27.3	1.2%
	TOTAL	**407.7**	**18%**

* Data as of March 2018
Sources: IPE and PwC Market Research Centre

United States



Overview of the US's pension funds

US pension assets were equivalent to 121% of the country's US$ 20.5tn GDP at year end 2018, one of the highest ratios of pension assets to GDP in the world. Pension assets grew at a CAGR of 5.3% while GDP grew at a CAGR of 4.0%, between 2014 and 2018.

Total assets and asset allocation

The pension market in the US is well developed and is the largest in the world with AuM of US$ 24.7tn in 2018. The market is highly fragmented, with the largest ten pension funds holding less than 10% of total pension assets.

Pension funds invest their assets 43% in equities, 25% in bonds, 3% in money market products and 30% in alternative investments, as of 2018. Asset allocation in equities and alternatives have been increasing at a steady pace in recent years.

California Public Employees and California State Teachers funds are both on the 2019's Leaders List of the 25 World's most responsible asset allocators.

The assets of US pension funds allocated to equities are the equivalent of 33% of the total market capitalisation of listed domestic companies.

Foreign investments

The US does not set any quantitative limit on overall foreign investments or any specific asset classes for pension funds.

Allocation to investment funds

Currently, pension funds in the US invest 25% of their assets through investment funds. In 2018, domestic equity funds remained the largest asset class within investment funds, accounting for 46%. World equity funds accounted for 17% of total investment fund assets and have increased from 13% in 2014.

Future trends

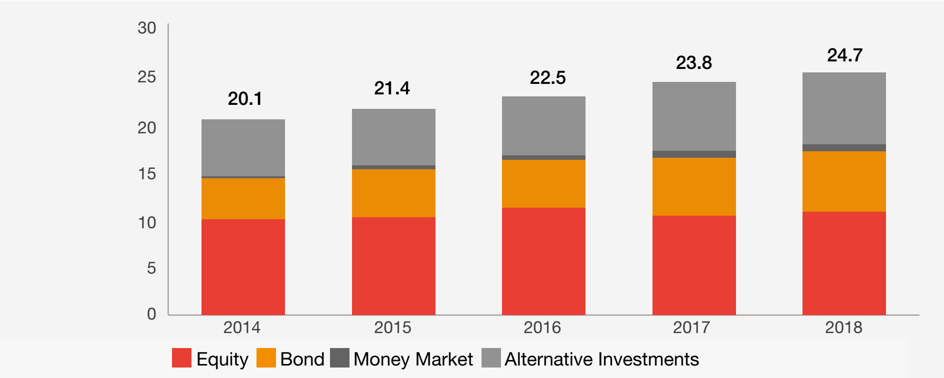
In 2018, US pension funds shifted away from the traditional 60% equities / 40% bonds, allocating more and more assets to alternatives, specifically real estates, infrastructures and natural resources.

Sources: OECD, Federal Reserve, Financial Times, World Bank, PwC Market Research Centre

Pension assets/GDP	% Defined Benefit schemes	Old-age dependency ratio	% Foreign investments	Regulatory limit foreign investments	% Alternative investments	% Investments funds
121%	33%	24%	N/A	No limit	30%	25%

	Low	Medium	High
Maturity of Pensions industry **Pension assets/GDP: 121%**			●
Size of domestic equity market **Pension allocation to equities/domestic market cap ratio: 33%**		●	

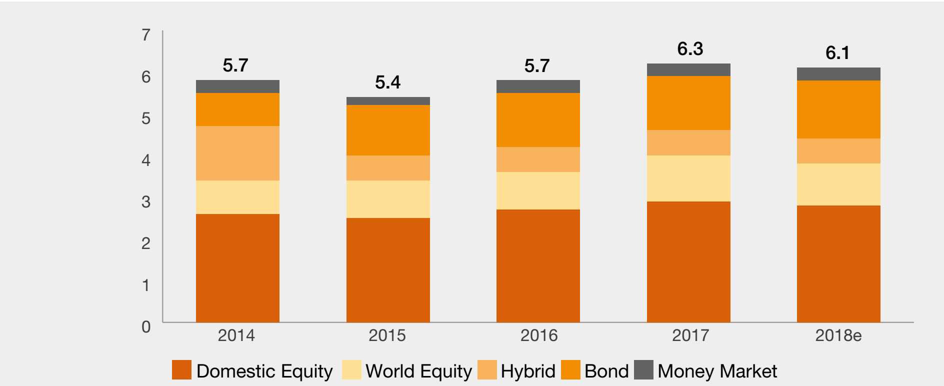
Evolution of total assets of pension funds by asset class (US$ tn)



	2014	2015	2016	2017	2018
% of indirect investments	29%	25%	25%	26%	25%

Note: Asset allocation only includes direct investments (Asset breakdown of mutual funds used in pension funds unavailable)
Sources: OECD, World Bank, New America, ICI, Federal Reserve, WTW and PwC Market Research Centre

Investments funds held by pension funds by asset class (US$ tn)



	2014	2015	2016	2017	2018e
% of foreign investments	N/A	N/A	N/A	N/A	N/A
Regulatory limit of foreign inv.	No limit	No limit	No limit	No limit	No limit

Sources: OECD, World Bank, New America, ICI, Federal Reserve, WTW and PwC Market Research Centre

Largest pension funds in the US

#	Pension fund	AuM 2018 (US$ bn)	Market share in 2018
1	Federal Retirement Thrift	578.8	2.3%
2	California Public Employees	376.9	1.5%
3	California State Teachers	230.2	0.9%
4	New York State Common	213.2	0.9%
5	New York City Retirement	200.8	0.8%
6	Florida State Board	174.7	0.7%
7	Texas Teachers	153.1	0.6%
8	AT&T	124.1	0.5%
9	Boeing	123.7	0.5%
10	New York State Teachers	120.1	0.5%
	TOTAL	**2,295.6**	**9.3%**

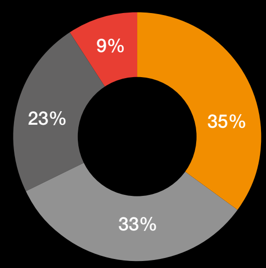
Source: Willis Towers Watsone

Other countries*

France

French pension assets were equivalent to an estimated 11% of the country's EUR 2.4tn GDP at year end 2018 (US$ 2.8tn). The Pension Reserve Fund (FRR), which ensures the financial stability of the state pension system (PAYG), has EUR 35bn AuM. France does not set any quantitative limit on overall foreign investments. Currently, the FRR allocates 73% of its portfolio to foreign assets. The French government is currently transforming the pension landscape, in a country traditionally free of pension funds. Among many measures, the new reform will implement the EU's IORP II directive which will expand the market for new pension vehicles. In 2016, France's Sapin II law had paved the way for a new type of complementary pension fund subject to the EU directive.

Asset allocation of pension Funds by asset class in 2018



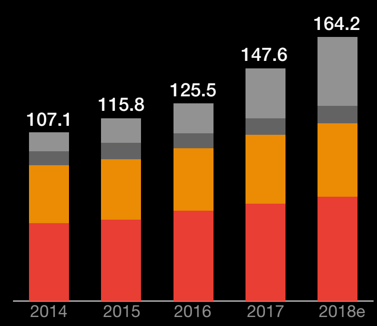
Source: Mercer EU Asset Allocation Survey 2019

Equity Bond Money Market Alternative Investments Funds

Ireland

Irish pension assets were equivalent to an estimated 52% of the country's EUR 318.5bn GDP at year end 2018. The pension market in Ireland is well developed with AuM of EUR 164.2bn (US$ 188.5 bn) and is growing fast with a 4-year CAGR of 11.3% since 2014. The Irish pension market is comprised of 62% of DB schemes and 38% of DC schemes. The asset allocation of Irish pension funds is well diversified with an estimated 40% invested in equities, 28% in bonds, 7% in money market products and 27% in alternative investments. The share of alternatives grew from 11% in 2014 at a CAGR of 38%. In 2018, the Irish government planned to reform the structure and regulation of the pension system. Some of the measures included stronger protection of DB funds and the introduction of auto-enrolment into DC schemes. However, the measures seem to have come to a halt, as the government is set to postpone the reform for 2022.

Evolution of total assets of pension funds by asset class (EUR bn)



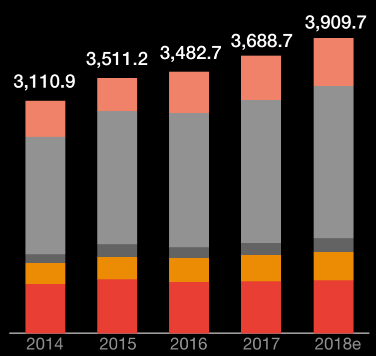
Source: IAPF

Equity Bond Money Market Alternative Investments Funds

South Africa

South Africa's pension market is fairly well developed, with an estimated AuM of about ZAR 3.9tn (US$ 322.5bn) in 2018. South African pension funds invested an 84% of their assets directly; of which 18% in equities, 10% in bonds, 5% in money market products and 52% in alternative investments. South African pension funds are allowed to invest 25% of their assets in foreign investments and, as of end 2018, invested an estimated 13% overseas. There have been many recent discussions in South Africa to use pension funds to finance development and infrastructure projects. The ruling African National Congress (ANC) has mentioned investigating the proposal, as the country's development needs are rising while debt is increasing.

Evolution of total assets of pension funds by asset class (ZAR bn)



Source: OECD

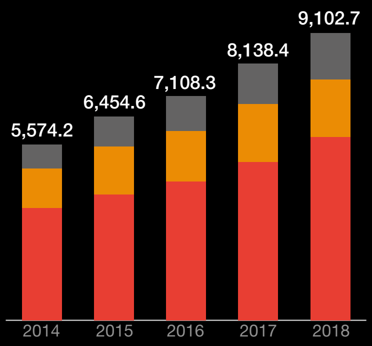
Equity Bond Money Market Alternative Investments Funds

* Limited data available

China

China's pension assets accounted for about 10% of the country's RMB 93.6tn GDP at year end 2018. This ratio of pension assets to GDP is increasing as pension assets grew at a CAGR of 13% from 2014 to 2018, much faster than GDP growth. In terms of asset allocation to equities, directly and indirectly, basic pension scheme and enterprise annuities are limited to 30% of total assets, and NSSF is limited to 40%. As of 2018, the assets of NSSF allocated to equities are the equivalent to 0.3% of the total market capitalisation of listed domestic companies, which is far below the average level. Foreign investment restrictions vary from different types of pension funds. Basic pension scheme and enterprise annuities cannot allocate to foreign investments, while NSSF can allocate no more than 20% of its total assets to foreign investments.

Evolution of total assets of pension funds by asset class (SGD bn)



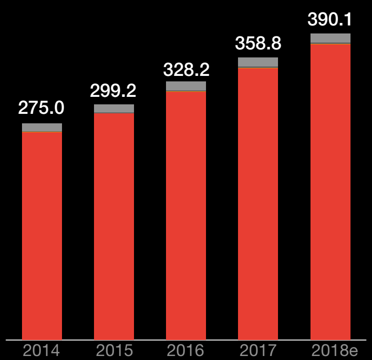
Sources: OECD, CPF

Basic pension scheme NSSF Enterprise Annuities

Singapore

In Singapore, the public pension fund market is regulated by a government authority called the Central Pension Fund (CPF). Its total assets were equivalent to 79% of the country's SGD 491.2bn GDP at year end 2018. The ratio of pension assets to GDP has increased in recent years as pension assets increased faster than GDP from 2014 to 2018 with a 9.1% CAGR compared to a 5.4% GDP growth in the same period. In 2018, the CPF held SGD 390.1bn (US$ 286.2 bn) in AuM and invested around 96% of its total assets in government bonds –which are issued by the government and only available for purchase by the CPF. The remainder of the CPF's investments were directed to advance deposits (around 4%), Statutory Board bonds, corporate bonds and Singaporean equities (less than 1%).

Evolution of total assets of pension funds by asset class (SGD bn)



Sources: OECD, CPF

Equity Bond Money Market Alternative Investments Funds

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