Thinking Ahead Institute
Global pension assets study 2018

February 2018
Overview

Sections:
• Asset size, including growth statistics and comparison of asset size with GDP (P22)
• Asset allocation (P7)
• DB and DC share of pension assets (P7)

P22 markets

- Australia
- Brazil
- Canada
- Chile
- China
- Finland
- France
- Germany
- Hong Kong
- India
- Ireland
- Italy
- Japan
- Malaysia
- Mexico
- Netherlands
- South Africa
- South Korea
- Spain
- Switzerland
- UK
- US

P7 markets

- Australia
- Canada
- Japan
- Netherlands
- Switzerland
- UK
- US

P195
Outside the P22 we estimate there is an additional USD 3,000 bn to 4,000 bn of pension assets

A deeper analysis is performed for the P7, with assets of USD 37,770 bn (91% of P22, 84% of P195)

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Key 2017 findings – P22 markets

USD 41,355 bn
Total P22 assets estimated to year end 2017

61% The US is the largest market, with a share of 61.4% of P22 assets, followed by the UK and Japan with 7.5% and 7.4% respectively

91% of P22 assets are in seven largest markets

16.4% P22 assets increased 13.1% in 2017 from USD 36,571 bn the previous year

67% Ratio of pension assets to GDP of these economies

The P22 assets growth rate of US, UK and Japan were 12.7%, 16.9% and 9.7% respectively in 2017 (in USD)

It is important to note the impact of currency exchange rates when measuring the growth of pension assets in USD as, in many cases, the results vary significantly with growth rates in local currency terms.

Return for a 60% global equities / 40% global bonds reference portfolio in 2017 (in USD)
The majority of pension fund assets in Switzerland are DC and take the form of cash balance plans, whereby the plan sponsor shares the investment risk and the assets are pooled. Pure DC assets have only recently been introduced in Switzerland and, although they have seen strong growth, they are not yet large enough to justify inclusion in this analysis.

US, Australia and the UK have higher allocations to equities than the rest of P7 markets. Japan, Netherlands and Switzerland have more conservative investment strategies: higher allocation to bonds.

The asset allocation pattern has changed since 1997. Allocation to assets other than equities and bonds have increased while allocation to equities and bonds have decreased.

<table>
<thead>
<tr>
<th>Equities</th>
<th>Bonds</th>
<th>Other</th>
<th>Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>46%</td>
<td>27%</td>
<td>25%</td>
<td>2%</td>
</tr>
</tbody>
</table>

DC assets represent 48.6% of total P7 pension assets.

DC is dominant in Australia and the US. Japan and Canada, historically only DB, are now showing signs of a shift to DC.

3.1% Growth rate of DB assets in the last ten years.

Growth rate of DC assets in the last ten years - 5.6%.

The majority of pension fund assets in Switzerland are DC and take the form of cash balance plans, whereby the plan sponsor shares the investment risk and the assets are pooled. Pure DC assets have only recently been introduced in Switzerland and, although they have seen strong growth, they are not yet large enough to justify inclusion in this analysis.
Key 2017 findings - global asset owner landscape

Asset owners globally control USD 131 trillion

- Pension funds 33%
- Sovereign wealth funds 45%
- Endowments & Foundations 45%
- Mutual funds (inc ETF) 7%
- Insurance funds 1%

Source: The asset owner of tomorrow: Thinking Ahead Institute. Various original sources. Projections used to derive end 2017 estimates

What is an asset owner?

An asset owner has three qualifying characteristics:

1. Works directly for a defined group of beneficiaries / savers / investors as the investment manager of their assets in a **fiduciary capacity** under delegated responsibility

2. Works with a **sponsor**, usually a government, part of government, a company or a not-for-profit within explicit law and under an implicit societal license to operate

3. Has the **purpose** of delivering mission-specific outcomes to beneficiaries and stakeholders in the form of various payments or benefits into the future

Pension funds, sovereign wealth funds and endowments and foundations clearly qualify as asset owners, while mutual funds and insurance funds partly qualify
# Key findings from 20 years of global pension assets growth

<table>
<thead>
<tr>
<th>#1 market – Australia</th>
<th>• The 20-year growth in pension assets in Australia has been 12.1% per annum. The critical features in this success have been government-mandated pension contributions, a competitive institutional model and the dominance of DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 pension design – defined contribution</td>
<td>• The 20-year growth of DC in the P7 has been 7.5% per annum relative to 4.9% per annum for DB. DC has worked better for employers who have had declining appetite for taking pension risk during this 20-year period</td>
</tr>
<tr>
<td>#1 asset class – private assets</td>
<td>• The asset allocation to real estate, private equity and infrastructure in the 20-year period has moved from about 4% to around 20%. Alternatives have been attractive for return reasons, offsetting their governance difficulties</td>
</tr>
<tr>
<td>#1 meme – governance</td>
<td>• The governance of pension funds has been a growing source of attention fanned by successive industry reviews – ERISA in the US; Myners in the UK; Cooper in Australia. Pension governance is a lot stronger than 20 years ago</td>
</tr>
<tr>
<td>#1 missed opportunity – stewardship</td>
<td>• The 20-year story is one of missing the opportunity to influence and mitigate corporate misalignments – like executive pay, and other poor leadership and boardroom practices</td>
</tr>
<tr>
<td>#1 no-show – technology</td>
<td>• The technology impacts on pension funds have been surprisingly light as evidenced by legacy systems that rely heavily on spreadsheets. The prioritisation of technological innovation hasn't changed much over the 20 years</td>
</tr>
</tbody>
</table>
Key issues for pension funds to consider in the next 5-10 years

<table>
<thead>
<tr>
<th>Pension design, towards a DC model</th>
<th>• DC becomes the dominant global model. Individuals own the risk but have little control. The significant governance issues gradually get sorted out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigger impact from evolved regulations</td>
<td>• Pension funds will be subject to heavier saver/investor protection regulations. What they invest in will also be over-regulated</td>
</tr>
<tr>
<td>Governance issues are challenging</td>
<td>• There is a big governance challenge to build the resources required to manage a complex organisation, with multiple stakeholders, and varied views on what constitutes progress and success</td>
</tr>
<tr>
<td>Culture makes a difference</td>
<td>• Investment organisations increasingly differentiate themselves by referencing their values and culture. New measurement models and methods are needed to move the needle on culture</td>
</tr>
<tr>
<td>Sustainability and long-horizon investing</td>
<td>• Opportunities are being missed in the overlapping areas of sustainability, ESG, stewardship and long-horizon investing. Investors need to combine both investment beliefs and wider sustainability motives in their strategy</td>
</tr>
<tr>
<td>Technology rising</td>
<td>• Technology will challenge business models and human capital, requiring adaptation. The people plus technology model should ultimately emerge as dominant</td>
</tr>
</tbody>
</table>
## Expected shifts by pension funds in the next 5-10 years

<table>
<thead>
<tr>
<th>Shift</th>
<th>Shift from</th>
<th>Shift to</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business model</strong> Refocusing</td>
<td>License to operate is more of a legal construct</td>
<td>License to operate is both legal and a social construct</td>
</tr>
<tr>
<td></td>
<td>Focused over short- and long-term but problems with control</td>
<td>Focused over long- and short-term; with better control</td>
</tr>
<tr>
<td><strong>People model</strong> Adapting to better culture and diversity</td>
<td>Male, ethno-centric, economics educated with limited culture</td>
<td>Multi-disciplinary, diverse spectrum of backgrounds with stronger culture</td>
</tr>
<tr>
<td><strong>Operating model</strong> Streamlining decisions</td>
<td>IT infrastructure weak</td>
<td>IT infrastructure stronger</td>
</tr>
<tr>
<td></td>
<td>Decision biases significant</td>
<td>Decision biases reduced</td>
</tr>
<tr>
<td><strong>Investment model</strong> Repositioning to more systematic and sustainable</td>
<td>Alternatives moderately sized but infrastructure finance small</td>
<td>Alternatives large-sized with infrastructure finance larger</td>
</tr>
<tr>
<td></td>
<td>Alpha broad, factors small</td>
<td>Alpha selective, factors larger</td>
</tr>
<tr>
<td></td>
<td>Small-scale responsible investing model</td>
<td>Mainstreamed sustainability model</td>
</tr>
<tr>
<td></td>
<td>Silent and disengaged owners</td>
<td>Engaged owners with some activism</td>
</tr>
</tbody>
</table>

Source: The asset owner of tomorrow, Thinking Ahead Institute, 2017
## Asset size

<table>
<thead>
<tr>
<th>Market</th>
<th>Total Assets 2017 (USD billion)</th>
<th>Assets/GDP ratio (%)(^7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1,924</td>
<td>138.4%</td>
</tr>
<tr>
<td>Brazil(^1)</td>
<td>269</td>
<td>12.9%</td>
</tr>
<tr>
<td>Canada</td>
<td>1,769</td>
<td>107.8%</td>
</tr>
<tr>
<td>Chile</td>
<td>205</td>
<td>77.8%</td>
</tr>
<tr>
<td>China(^2)</td>
<td>177</td>
<td>1.5%</td>
</tr>
<tr>
<td>Finland</td>
<td>233</td>
<td>92.8%</td>
</tr>
<tr>
<td>France</td>
<td>167</td>
<td>6.5%</td>
</tr>
<tr>
<td>Germany(^3)</td>
<td>472</td>
<td>12.9%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>164</td>
<td>49.1%</td>
</tr>
<tr>
<td>India</td>
<td>120</td>
<td>4.9%</td>
</tr>
<tr>
<td>Ireland</td>
<td>157</td>
<td>48.2%</td>
</tr>
<tr>
<td>Italy</td>
<td>184</td>
<td>9.6%</td>
</tr>
<tr>
<td>Japan(^4)</td>
<td>3,054</td>
<td>62.5%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>227</td>
<td>73.4%</td>
</tr>
<tr>
<td>Mexico</td>
<td>177</td>
<td>15.5%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1,598</td>
<td>193.8%</td>
</tr>
<tr>
<td>South Africa</td>
<td>258</td>
<td>75.1%</td>
</tr>
<tr>
<td>South Korea</td>
<td>725</td>
<td>47.4%</td>
</tr>
<tr>
<td>Spain</td>
<td>44</td>
<td>3.3%</td>
</tr>
<tr>
<td>Switzerland(^5)</td>
<td>906</td>
<td>133.1%</td>
</tr>
<tr>
<td>UK</td>
<td>3,111</td>
<td>121.3%</td>
</tr>
<tr>
<td>US(^6)</td>
<td>25,411</td>
<td>131.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41,355</strong></td>
<td><strong>67.0%(^8)</strong></td>
</tr>
</tbody>
</table>

Source: Willis Towers Watson and secondary sources

\(^1\) Only includes pension assets from closed entities.
\(^2\) Only includes Enterprise Annuity assets.
\(^3\) Only includes pension assets for company pension schemes.
\(^4\) Does not include the unfunded benefit obligation of corporate pension plans (account receivables).
\(^5\) Only includes autonomous pension funds. Does not consider insurance companies assets.
\(^6\) Includes IRAs.
\(^7\) The Assets/GDP ratio for individual markets are calculated in local currency terms, and the total Assets/GDP ratio is calculated in USD.
\(^8\) The ratio of Total Pension Assets to GDP declined from 2016 with the addition of China. China’s pension assets represent 1.5% of total GDP.
Pension asset growth versus market returns

<table>
<thead>
<tr>
<th>Period to end December 2017</th>
<th>Total assets growth in USD – All countries annualised</th>
<th>Total assets growth in USD – P7 countries annualised</th>
<th>Reference Portfolio return 60% Global Equity / 40% Global Debt annualised</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year</td>
<td>13.1%</td>
<td>12.8%</td>
<td>16.4%</td>
</tr>
<tr>
<td>5-year</td>
<td>6.2%</td>
<td>6.3%</td>
<td>7.4%</td>
</tr>
<tr>
<td>10-year</td>
<td>4.5%</td>
<td>4.3%</td>
<td>4.9%</td>
</tr>
<tr>
<td>20-year</td>
<td>6.2%</td>
<td>5.8%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

- Total pension asset growth has been quite closely matched to global public market equity and bond returns over the last 20 years
- The reference portfolio returns are a simple proxy for market returns used by some funds – in practice funds seek to outperform this return by adopting different mixes of asset to the 60/40 split in the reference portfolio. In particular, funds have large alternative assets exposures
- Pension asset growth includes net cash flows – contributions in and benefits out. Most calculations suggest that this amount has been quite small relative to the size of assets and market growth

Source: Willis Towers Watson and secondary sources
Growth in all countries not adjusted for the change in using P11 to P22 over the period
Figures for P7 are like-for-like in the 7 countries selected

Reference Portfolio used by some pension funds as performance comparator for an averagely sized risk appetite
The Reference Portfolio is rebalanced annually
Source: MSCI ACWI Index; Bloomberg Barclays Global Aggregate Bond Index
All calculations in US dollars
Evolution of P7 ranking – assets in billions of USD

<table>
<thead>
<tr>
<th>Year</th>
<th>US</th>
<th>Japan</th>
<th>UK</th>
<th>Canada</th>
<th>Australia</th>
<th>Netherlands</th>
<th>Switzerland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>7,893</td>
<td>1,901</td>
<td>1,050</td>
<td>436</td>
<td>365</td>
<td>294</td>
<td>193</td>
</tr>
<tr>
<td>2007</td>
<td>15,330</td>
<td>3,002</td>
<td>2,686</td>
<td>1,209</td>
<td>1,086</td>
<td>1,058</td>
<td>539</td>
</tr>
<tr>
<td>2012</td>
<td>16,848</td>
<td>3,166</td>
<td>2,879</td>
<td>1,476</td>
<td>1,421</td>
<td>1,252</td>
<td>736</td>
</tr>
<tr>
<td>2014</td>
<td>21,708</td>
<td>3,272</td>
<td>2,693</td>
<td>1,611</td>
<td>1,548</td>
<td>1,415</td>
<td>788</td>
</tr>
<tr>
<td>2017e</td>
<td>25,411</td>
<td>3,111</td>
<td>3,054</td>
<td>1,924</td>
<td>1,769</td>
<td>1,598</td>
<td>906</td>
</tr>
</tbody>
</table>

Source: Willis Towers Watson and secondary sources
Asset allocation and DB/DC split

Asset allocation 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>Equity</th>
<th>Bonds</th>
<th>Other</th>
<th>Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>49%</td>
<td>14%</td>
<td>22%</td>
<td>15%</td>
</tr>
<tr>
<td>Canada</td>
<td>45%</td>
<td>31%</td>
<td>22%</td>
<td>2%</td>
</tr>
<tr>
<td>Japan</td>
<td>30%</td>
<td>56%</td>
<td>10%</td>
<td>4%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>33%</td>
<td>50%</td>
<td>17%</td>
<td>0%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>33%</td>
<td>34%</td>
<td>28%</td>
<td>4%</td>
</tr>
<tr>
<td>UK</td>
<td>47%</td>
<td>35%</td>
<td>16%</td>
<td>2%</td>
</tr>
<tr>
<td>US</td>
<td>50%</td>
<td>21%</td>
<td>28%</td>
<td>1%</td>
</tr>
<tr>
<td>P7</td>
<td>46%</td>
<td>27%</td>
<td>25%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Willis Towers Watson and secondary sources

DB/DC split 20171,2

<table>
<thead>
<tr>
<th>Country</th>
<th>DB</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>13%</td>
<td>87%</td>
</tr>
<tr>
<td>Canada</td>
<td>95%</td>
<td>5%</td>
</tr>
<tr>
<td>Japan</td>
<td>96%</td>
<td>4%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>94%</td>
<td>6%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>13%</td>
<td>87%</td>
</tr>
<tr>
<td>UK</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>US</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>P7</td>
<td>51%</td>
<td>49%</td>
</tr>
</tbody>
</table>

1 DC assets in Switzerland are cash balance plans where the plan sponsor shares the investment risk and all assets are pooled. There are no pure DC assets where members make an investment choice and receive market returns on their funds. Therefore, Switzerland is excluded from this analysis.

2 In January 2017, the UK’s Office for National Statistics stated that the figures previously disclosed for DC entitlements were significantly overestimated. As a result there is a significant decrease in UK DC pension assets when compared to the previous editions of this study. This change has a very limited impact on the P7 DC assets; in the order of a one percent reduction.
Concentration of assets in top 300 pension funds

The annual Pension & Investments/Willis Towers Watson 300 Analysis ranks the world's largest 300 pension funds by assets.

- The assets of the top 300 pension funds represent 43.0% of the total global pension assets.
- The top 20 pension funds account for 17.4% of total global pension assets.
Relative size of top pension funds by market

- While the top ten US pension funds represent 8.6% of total assets, the top ten Japanese pension funds account for 67.0% of total assets. This is largely explained by the Government Pension Investment fund that represents 44.4% of Japan’s pension assets.
- In the UK, the top ten pension funds represent 16.8% of the total UK pension assets. Among them, 13.3% are private pension funds and the remaining 3.5% are state-sponsored pension funds.

Source: Willis Towers Watson and secondary sources
Asset size
Asset size and growth statistics
Comparison of asset size with GDP
A decade of growth

- In 2017 global pension assets are estimated to have reached USD 41,355 billion, an increase of over 13% in a year
- The US is the largest pensions market followed, at significant distance, by the UK and Japan. Together they account for over 76% of all pensions assets
- P22 assets are around 50% larger than a decade ago

<table>
<thead>
<tr>
<th>Market</th>
<th>Total assets 2007 (USD billion)</th>
<th>Total assets 2017e (USD billion)</th>
<th>10-year CAGR (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>15330</td>
<td>25411</td>
<td>5.2%</td>
</tr>
<tr>
<td>UK</td>
<td>2686</td>
<td>3111</td>
<td>1.5%</td>
</tr>
<tr>
<td>Japan</td>
<td>3002</td>
<td>3054</td>
<td>0.2%</td>
</tr>
<tr>
<td>Australia</td>
<td>1086</td>
<td>1924</td>
<td>5.9%</td>
</tr>
<tr>
<td>Canada</td>
<td>1209</td>
<td>1769</td>
<td>3.9%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1058</td>
<td>1598</td>
<td>4.2%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>539</td>
<td>906</td>
<td>5.3%</td>
</tr>
<tr>
<td>South Korea1</td>
<td>—</td>
<td>725</td>
<td>—</td>
</tr>
<tr>
<td>Germany</td>
<td>391</td>
<td>472</td>
<td>1.9%</td>
</tr>
<tr>
<td>Brazil</td>
<td>259</td>
<td>269</td>
<td>0.4%</td>
</tr>
<tr>
<td>South Africa</td>
<td>195</td>
<td>258</td>
<td>2.8%</td>
</tr>
<tr>
<td>Finland</td>
<td>183</td>
<td>233</td>
<td>2.4%</td>
</tr>
<tr>
<td>Malaysia1</td>
<td>—</td>
<td>227</td>
<td>—</td>
</tr>
<tr>
<td>Chile</td>
<td>111</td>
<td>205</td>
<td>6.3%</td>
</tr>
<tr>
<td>Italy1</td>
<td>—</td>
<td>184</td>
<td>—</td>
</tr>
<tr>
<td>Mexico</td>
<td>108</td>
<td>177</td>
<td>5.1%</td>
</tr>
<tr>
<td>China1</td>
<td>—</td>
<td>177</td>
<td>—</td>
</tr>
<tr>
<td>France</td>
<td>170</td>
<td>167</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>75</td>
<td>164</td>
<td>8.1%</td>
</tr>
<tr>
<td>Ireland</td>
<td>128</td>
<td>157</td>
<td>2.1%</td>
</tr>
<tr>
<td>India1</td>
<td>—</td>
<td>120</td>
<td>—</td>
</tr>
<tr>
<td>Spain</td>
<td>46</td>
<td>44</td>
<td>-0.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,577</strong></td>
<td><strong>41,355</strong></td>
<td><strong>4.2%</strong></td>
</tr>
</tbody>
</table>

1 10 year growth rates are not available for China, India, Italy, Malaysia and South Korea.

Source: Willis Towers Watson and secondary sources
Growth rates in USD

- During the last ten years, the fastest growing pension markets have been Hong Kong (8.1%), Chile (6.3%) and Australia (5.9%) in USD terms.
- France and Spain have had the slowest rates of growth in USD terms since 2007 (-0.2% and -0.5% respectively).

<table>
<thead>
<tr>
<th>Market</th>
<th>1-year CAGR</th>
<th>5-year CAGR</th>
<th>10-year CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia³</td>
<td>8.0%</td>
<td>5.4%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Brazil</td>
<td>9.9%</td>
<td>-4.1%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Canada¹</td>
<td>14.0%</td>
<td>4.5%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Chile</td>
<td>17.7%</td>
<td>4.8%</td>
<td>6.3%</td>
</tr>
<tr>
<td>China⁴</td>
<td>11.2%</td>
<td>18.4%</td>
<td>—</td>
</tr>
<tr>
<td>Finland</td>
<td>16.4%</td>
<td>3.4%</td>
<td>2.4%</td>
</tr>
<tr>
<td>France¹</td>
<td>18.7%</td>
<td>1.7%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Germany</td>
<td>16.0%</td>
<td>0.2%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>20.3%</td>
<td>10.0%</td>
<td>8.1%</td>
</tr>
<tr>
<td>India</td>
<td>7.8%</td>
<td>8.8%</td>
<td>—</td>
</tr>
<tr>
<td>Ireland</td>
<td>18.7%</td>
<td>8.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Italy⁴</td>
<td>15.3%</td>
<td>5.9%</td>
<td>—</td>
</tr>
<tr>
<td>Japan</td>
<td>9.7%</td>
<td>-0.7%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Malaysia⁴</td>
<td>17.9%</td>
<td>2.5%</td>
<td>—</td>
</tr>
<tr>
<td>Mexico</td>
<td>13.2%</td>
<td>-0.4%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>17.5%</td>
<td>5.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>South Africa</td>
<td>26.8%</td>
<td>0.4%</td>
<td>2.8%</td>
</tr>
<tr>
<td>South Korea⁴</td>
<td>18.1%</td>
<td>13.2%</td>
<td>—</td>
</tr>
<tr>
<td>Spain</td>
<td>16.5%</td>
<td>0.0%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>12.2%</td>
<td>4.2%</td>
<td>5.3%</td>
</tr>
<tr>
<td>UK¹</td>
<td>16.9%</td>
<td>1.6%</td>
<td>1.5%</td>
</tr>
<tr>
<td>US</td>
<td>12.7%</td>
<td>8.6%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

Average: 15.2% 4.6% 3.2%

¹ There was a methodology change for France and Canada in 2008/2009 and a methodology change for UK in 2012 and 2016.
² 1-year growth rate does not capture net contributions in markets.
³ Existing contribution rates as well as the fact that retirees can cash in all their benefits (i.e. no compulsion to lock in or annuities), can have a significant impact on expected asset growth in Australia.
⁴ 10 year growth rates are not available for China, India, Italy, Malaysia and South Korea.

Relative weights of each market

- In the past decade, the weights of Brazil, Canada, Finland, France, Germany, Ireland, Japan, Netherlands, South Africa, Spain and UK have declined relative to the other markets in the study.

<table>
<thead>
<tr>
<th>Market</th>
<th>2007</th>
<th>2017e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>4.1%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Brazil</td>
<td>1.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Canada¹</td>
<td>4.5%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Chile</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>China²</td>
<td>—</td>
<td>0.4%</td>
</tr>
<tr>
<td>Finland</td>
<td>0.7%</td>
<td>0.6%</td>
</tr>
<tr>
<td>France¹</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Germany</td>
<td>1.5%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0.3%</td>
<td>0.4%</td>
</tr>
<tr>
<td>India²</td>
<td>—</td>
<td>0.3%</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.5%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Italy²</td>
<td>—</td>
<td>0.4%</td>
</tr>
<tr>
<td>Japan</td>
<td>11.3%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Malaysia²</td>
<td>—</td>
<td>0.6%</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>4.0%</td>
<td>3.9%</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.7%</td>
<td>0.6%</td>
</tr>
<tr>
<td>South Korea²</td>
<td>—</td>
<td>1.8%</td>
</tr>
<tr>
<td>Spain</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2.0%</td>
<td>2.2%</td>
</tr>
<tr>
<td>UK¹</td>
<td>10.1%</td>
<td>7.5%</td>
</tr>
<tr>
<td>US</td>
<td>57.7%</td>
<td>61.4%</td>
</tr>
</tbody>
</table>

Source: Willis Towers Watson and secondary sources

1 There was a methodology change for France and Canada in 2008/2009 and a methodology change for UK in 2012 and 2016.

2 2007 figures for China, India, Italy, Malaysia and South Korea are not available.
Growth rates in local currency

- Estimated five-year growth rates range from 2.0% pa in Spain to 19.1% pa in China
- During the past ten years Mexico’s pension assets have grown the fastest, followed by those of South Africa, Chile, Hong Kong and Australia

<table>
<thead>
<tr>
<th>Market</th>
<th>1-year CAGR</th>
<th>5-year CAGR</th>
<th>10-year CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>6.0%</td>
<td>8.8%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Brazil</td>
<td>11.8%</td>
<td>5.6%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Canada</td>
<td>6.3%</td>
<td>9.4%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Chile</td>
<td>8.7%</td>
<td>10.2%</td>
<td>8.6%</td>
</tr>
<tr>
<td>China</td>
<td>4.2%</td>
<td>19.1%</td>
<td>—</td>
</tr>
<tr>
<td>Finland</td>
<td>2.4%</td>
<td>5.4%</td>
<td>4.6%</td>
</tr>
<tr>
<td>France</td>
<td>4.4%</td>
<td>3.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Germany</td>
<td>2.0%</td>
<td>2.2%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>21.2%</td>
<td>10.2%</td>
<td>8.1%</td>
</tr>
<tr>
<td>India</td>
<td>1.2%</td>
<td>12.2%</td>
<td>—</td>
</tr>
<tr>
<td>Ireland</td>
<td>4.4%</td>
<td>10.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Italy</td>
<td>1.4%</td>
<td>8.0%</td>
<td>—</td>
</tr>
<tr>
<td>Japan</td>
<td>5.8%</td>
<td>4.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>6.7%</td>
<td>8.1%</td>
<td>—</td>
</tr>
<tr>
<td>Mexico</td>
<td>7.7%</td>
<td>8.2%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3.3%</td>
<td>7.1%</td>
<td>6.3%</td>
</tr>
<tr>
<td>South Africa</td>
<td>14.8%</td>
<td>8.3%</td>
<td>9.2%</td>
</tr>
<tr>
<td>South Korea</td>
<td>4.6%</td>
<td>13.2%</td>
<td>—</td>
</tr>
<tr>
<td>Spain</td>
<td>2.5%</td>
<td>2.0%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>7.5%</td>
<td>5.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>UK</td>
<td>6.6%</td>
<td>5.3%</td>
<td>5.5%</td>
</tr>
<tr>
<td>US</td>
<td>12.7%</td>
<td>8.6%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Average</td>
<td>6.6%</td>
<td>8.0%</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

1 There was a methodology change for France and Canada in 2008/2009 and a methodology change for UK in 2012 and 2016.
2 1-year growth rate does not capture net contributions in markets.
3 10 year growth rates are not available for China, India, Italy, Malaysia and South Korea.

Source: Willis Towers Watson and secondary sources
Currency impact

- In 2017, the Brazilian real and the Hong Kong Dollar depreciated against the US Dollar, all the other currencies in the study rose against the US Dollar.
- Currencies that appreciated the most against the USD were the Euro (13.7%), Korean Won (12.9%), Malaysian Ringgit and South African Rand (both with 10.5%).
- Over longer periods, there has been a trend of strengthening USD relative to other major currencies. During the last ten years, the only currency that has appreciated against the USD was the Swiss Franc (1.4% pa), while in the last five years, none of the currencies of the markets in this study appreciated against the USD.

<table>
<thead>
<tr>
<th>Market</th>
<th>1-year</th>
<th>5-year CAGR</th>
<th>10-year CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1.9%</td>
<td>-3.1%</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Brazil</td>
<td>-1.7%</td>
<td>-9.2%</td>
<td>-6.1%</td>
</tr>
<tr>
<td>Canada</td>
<td>7.3%</td>
<td>-4.5%</td>
<td>-2.4%</td>
</tr>
<tr>
<td>Chile</td>
<td>8.3%</td>
<td>-4.9%</td>
<td>-2.1%</td>
</tr>
<tr>
<td>China¹</td>
<td>6.7%</td>
<td>-0.6%</td>
<td>—</td>
</tr>
<tr>
<td>Finland</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>-2.0%</td>
</tr>
<tr>
<td>France</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Germany</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>-0.8%</td>
<td>-0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>India¹</td>
<td>6.5%</td>
<td>-3.0%</td>
<td>—</td>
</tr>
<tr>
<td>Ireland</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Italy¹</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>—</td>
</tr>
<tr>
<td>Japan</td>
<td>3.6%</td>
<td>-5.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Malaysia¹</td>
<td>10.5%</td>
<td>-5.2%</td>
<td>—</td>
</tr>
<tr>
<td>Mexico</td>
<td>5.1%</td>
<td>-7.9%</td>
<td>-5.8%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>South Africa</td>
<td>10.5%</td>
<td>-7.3%</td>
<td>-5.9%</td>
</tr>
<tr>
<td>South Korea¹</td>
<td>12.9%</td>
<td>0.0%</td>
<td>—</td>
</tr>
<tr>
<td>Spain</td>
<td>13.7%</td>
<td>-1.9%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>4.4%</td>
<td>-1.3%</td>
<td>1.4%</td>
</tr>
<tr>
<td>UK</td>
<td>9.7%</td>
<td>-3.6%</td>
<td>-3.8%</td>
</tr>
</tbody>
</table>

¹ 10 year growth rates are not available for China, India, Italy, Malaysia and South Korea.

Source: Willis Towers Watson and secondary sources
## Pension assets vs GDP in local currency

<table>
<thead>
<tr>
<th>Market</th>
<th>2007</th>
<th>2017e</th>
<th>Change¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>114%</td>
<td>138%</td>
<td>24%</td>
</tr>
<tr>
<td>Brazil</td>
<td>19%</td>
<td>13%</td>
<td>-6%</td>
</tr>
<tr>
<td>Canada</td>
<td>83%</td>
<td>108%</td>
<td>25%</td>
</tr>
<tr>
<td>Chile</td>
<td>64%</td>
<td>78%</td>
<td>14%</td>
</tr>
<tr>
<td>China²</td>
<td>—</td>
<td>1%</td>
<td>—</td>
</tr>
<tr>
<td>Finland</td>
<td>71%</td>
<td>93%</td>
<td>22%</td>
</tr>
<tr>
<td>France</td>
<td>6%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Germany</td>
<td>11%</td>
<td>13%</td>
<td>2%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>35%</td>
<td>49%</td>
<td>14%</td>
</tr>
<tr>
<td>India²</td>
<td>—</td>
<td>5%</td>
<td>—</td>
</tr>
<tr>
<td>Ireland</td>
<td>47%</td>
<td>48%</td>
<td>1%</td>
</tr>
<tr>
<td>Italy²</td>
<td>—</td>
<td>10%</td>
<td>—</td>
</tr>
<tr>
<td>Japan</td>
<td>66%</td>
<td>63%</td>
<td>-3%</td>
</tr>
<tr>
<td>Malaysia²</td>
<td>—</td>
<td>73%</td>
<td>—</td>
</tr>
<tr>
<td>Mexico</td>
<td>10%</td>
<td>16%</td>
<td>6%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>126%</td>
<td>194%</td>
<td>68%</td>
</tr>
<tr>
<td>South Africa</td>
<td>65%</td>
<td>75%</td>
<td>10%</td>
</tr>
<tr>
<td>South Korea²</td>
<td>—</td>
<td>47%</td>
<td>—</td>
</tr>
<tr>
<td>Spain</td>
<td>3%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>112%</td>
<td>133%</td>
<td>21%</td>
</tr>
<tr>
<td>UK</td>
<td>88%</td>
<td>121%</td>
<td>33%</td>
</tr>
<tr>
<td>US</td>
<td>106%</td>
<td>131%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: Willis Towers Watson and secondary sources

¹ In percentage points, figures are rounded.
² 2007 figures are not available for China, India, Italy, Malaysia and South Korea.
Pension assets VS GDP in USD

- The total pension assets to GDP ratio reached 67% at the end of 2017.
- The Netherlands has the highest ratio of pension assets to GDP (194%) followed by Australia (138%), Switzerland (133%), the US (131%) and the UK (121%).
- During the last ten years, the pension assets to GDP ratio increased the most in Netherlands, United Kingdom, Canada and the US (68, 34, 25 and 25 percentage points respectively). It declined in only one market, Brazil by 6%.

Note: World GDP measured in USD and market GDP in Local Currency

Source: Willis Towers Watson and secondary sources
Pension market concentration

The Gini coefficient of global pension assets in 2017 was 72.9% which indicates the pension assets are still concentrated in relatively few markets.

The global pension market has remained largely unchanged over the last 10 years. The Gini coefficient was 71.5% in 2007.

Note: China, India, Italy, Malaysia and South Korea are not included in the analysis.
Compared with GDP

The lower Gini coefficient for GDP (58.7%) relative to pension market size (75.0%) suggests that the global pension asset pool is more concentrated than what would be suggested by their GDP levels. This could be explained by a number of factors including but not limited to a more developed capital market and a more mature pension system within the larger markets.

As a comparison, the Gini coefficient for GDP has increased over the last 10 years, from 55.0% in 2007 to 58.7% in 2017.
Asset allocation (P7)
Since 1997, bonds, equities and cash allocations have reduced to varying degrees while allocations to other assets (real estate and other alternatives) have increased from 4% to 25%

Pension fund assets managed by the top 100 alternative asset managers rose to USD 1,612 billion in 2017 according to Willis Towers Watson’s Global Alternatives Survey
In 2017, Australia, Canada, the UK and the US continued to have above average equity allocations.

The Netherlands and Japan have above average exposure to bonds, while Switzerland has the most even allocations across equities, bonds and other assets.
P7 asset allocation over the last ten years (1)

<table>
<thead>
<tr>
<th>Year</th>
<th>Australia</th>
<th>Canada</th>
<th>Japan</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>8%</td>
<td>55%</td>
<td>50%</td>
<td>43%</td>
</tr>
<tr>
<td>2012</td>
<td>9%</td>
<td>22%</td>
<td>57%</td>
<td>32%</td>
</tr>
<tr>
<td>2017</td>
<td>15%</td>
<td>14%</td>
<td>10%</td>
<td>18%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Australia</th>
<th>Canada</th>
<th>Japan</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>8%</td>
<td>55%</td>
<td>50%</td>
<td>43%</td>
</tr>
<tr>
<td>2012</td>
<td>9%</td>
<td>22%</td>
<td>57%</td>
<td>32%</td>
</tr>
<tr>
<td>2017</td>
<td>15%</td>
<td>14%</td>
<td>10%</td>
<td>18%</td>
</tr>
</tbody>
</table>
P7 asset allocation over the last ten years (2)

**Switzerland**
- 2007: 8% Cash, 25% Other, 37% Bonds, 30% Equities
- 2012: 8% Cash, 30% Other, 35% Bonds, 28% Equities
- 2017: 4% Cash, 28% Other, 34% Bonds, 33% Equities

**United Kingdom**
- 2007: 7% Cash, 15% Other, 37% Bonds, 30% Equities
- 2012: 7% Cash, 30% Other, 37% Bonds, 30% Equities
- 2017: 3% Cash, 16% Other, 35% Bonds, 35% Equities

**United States**
- 2007: 18% Cash, 23% Other, 60% Bonds, 22% Equities
- 2012: 22% Cash, 29% Other, 50% Bonds, 21% Equities
- 2017: 1% Cash, 28% Other, 50% Bonds, 50% Equities

Source: Willis Towers Watson and secondary sources
Domestic equity exposure

- There is a clear sign of a reduced home bias in equities, as the weight of domestic equities has fallen, on average, from 68.7% in 1998 to 41.1% in 2017.
- During the past ten years, the US has had the highest allocation to domestic equities, while Canada, Switzerland, and the UK have had the lowest allocation.

The allocation to domestic bonds has remained high. On average, the allocation to domestic bonds as a percentage of total bonds was 88.2% in 1998 and 76.6% in 2017.

Canada, Netherlands, the UK and the US have the highest allocation to domestic bonds, while Switzerland has the highest foreign bond exposure.
DB/DC split (P7)
DC on the rise

- During the last ten years, DC assets have grown by 5.6% pa while DB assets have grown at a slower pace of 3.1% pa.
- The growth rate of DC assets for the last 20 years is 7.9% pa and 4.5% pa for DB assets

Note: DC assets in Switzerland are cash balance plans where the plan sponsor shares the investment risk and all assets are pooled. There are no pure DC assets where members make an investment choice and receive market returns on their funds. Therefore, Switzerland is excluded from this analysis.
Note: The majority of pension fund assets in Switzerland are DC and take the form of cash balance plans, whereby the plan sponsor shares the investment risk and the assets are pooled. Pure DC assets have only recently been introduced in Switzerland and, although they have seen strong growth, they are not yet large enough to justify inclusion in this analysis.
DB/DC split over the last ten years

Australia

<table>
<thead>
<tr>
<th>Year</th>
<th>DB</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>15%</td>
<td>85%</td>
</tr>
<tr>
<td>2012</td>
<td>17%</td>
<td>83%</td>
</tr>
<tr>
<td>2017</td>
<td>13%</td>
<td>87%</td>
</tr>
</tbody>
</table>

Canada

<table>
<thead>
<tr>
<th>Year</th>
<th>DB</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>3%</td>
<td>97%</td>
</tr>
<tr>
<td>2012</td>
<td>4%</td>
<td>96%</td>
</tr>
<tr>
<td>2017</td>
<td>5%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Japan

<table>
<thead>
<tr>
<th>Year</th>
<th>DB</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>97%</td>
<td>3%</td>
</tr>
<tr>
<td>2012</td>
<td>97%</td>
<td>3%</td>
</tr>
<tr>
<td>2017</td>
<td>96%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Netherlands

<table>
<thead>
<tr>
<th>Year</th>
<th>DB</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>9%</td>
<td>91%</td>
</tr>
<tr>
<td>2012</td>
<td>5%</td>
<td>95%</td>
</tr>
<tr>
<td>2017</td>
<td>6%</td>
<td>94%</td>
</tr>
</tbody>
</table>

US

<table>
<thead>
<tr>
<th>Year</th>
<th>DB</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>46%</td>
<td>54%</td>
</tr>
<tr>
<td>2012</td>
<td>43%</td>
<td>57%</td>
</tr>
<tr>
<td>2017</td>
<td>40%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Source: Willis Towers Watson and secondary sources

Notes: The majority of pension fund assets in Switzerland are DC and take the form of cash balance plans, whereby the plan sponsor shares the investment risk and the assets are pooled. Pure DC assets have only recently been introduced in Switzerland and, although they have seen strong growth, they are not yet large enough to justify inclusion in this analysis. In January 2017, the UK’s Office for National Statistics stated that the figures previously disclosed for DC entitlements were significantly overestimated. As a result, we do not have confidence in making comparisons with prior years and so have omitted this chart.
Methodology

Asset estimation

- In this analysis we seek to provide estimates of pension fund assets (i.e. assets whose official primary purpose is to provide pension income). This data comprises:
  - Hard data typically as of year-end 2016 (except for Australia and Brazil which is from June 2017) collected by Willis Towers Watson and from various secondary sources
  - Estimates as at year-end 2017 based on index movements
- Before 2006, we focused only on ‘institutional pension fund assets’, primarily 2nd pillar assets (occupational pensions). Since 2006, the analysis has been slightly widened, incorporating DC assets (IRAs) within US’s total pension assets. The objective was to better capture retirement assets around the globe and expand the analysis into the 3rd pillar (individual savings) universe, which is primarily being used for pensions purposes in many markets. Furthermore, this innovation enables us to estimate the global split between DB and DC assets
- In the 2016 edition of the GPAS Australian assets started to include Self-Managed Super Fund (SMSF) assets. SMSF represent almost a third of Australia’s pension assets
- The source for UK pension data was changed this year from the Official National Statistics (ONS) to a variety of publicly available sources. This change was prompted by methodological changes announced by the ONS in January 2017
- Due to unavailability of pensions data in China, the study collects information on Enterprise Annuity (Pillar II) assets only. Data relating to Pillar I assets - social pooling (DB) and individual accounts (DC) - is very limited and therefore not included. The National Social Security Fund pension assets (c. US$349 billion at December 31, 2016) are also not included as it is considered as a reserve fund and separate from the pension system

Comparison with GDP

- This section compares total pension fund assets within each market to GDP sourced from the IMF
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