

Global Pension Assets Study 2019

Thinking Ahead Institute research



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Overview

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Main 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

The study covers 22 pension markets in the world (P22). They have pension assets of USD 40,173 bn

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



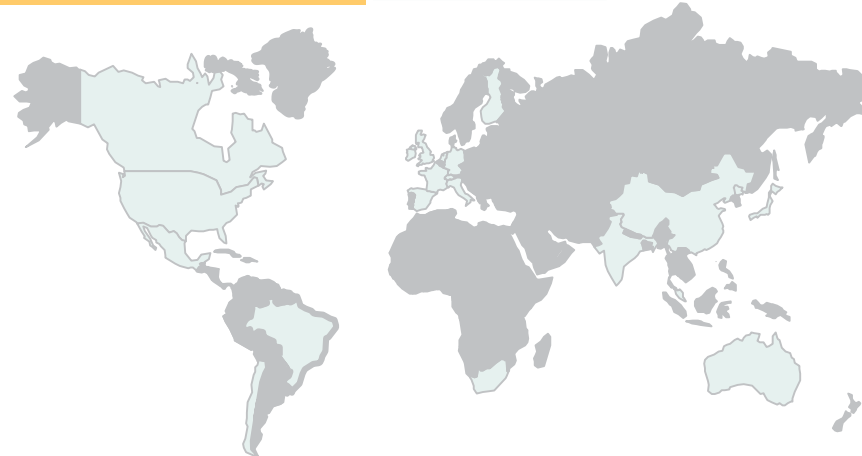
A deeper analysis is performed for the P7, with assets of USD 36,555 bn (91% of P22, 84% of P195)

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



Key 2018 findings – P22 markets

USD 40,173 bn

Total P22 assets estimated to year end 2018

62%

The US is the largest market, with a share of 61.5% of P22 assets, followed by Japan and the UK with 7.7% and 7.1% respectively

91%

of P22 assets are in seven largest markets



P22 assets decreased **3.3%** in 2018 from USD 41,561 bn the previous year

-5.7%

Return for a 60% global equities / 40% global bonds reference portfolio in 2018 (in USD)

60%

Ratio of pension assets to GDP of these economies

The P22 assets growth rate of US, UK and Japan were -2.6%, -6.3% and -0.5% respectively in 2018 (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

Key 2018 findings – P7 markets

Asset allocation

US and Australia have higher allocations to equities than the rest of P7 markets

Japan, Netherlands and Switzerland have higher allocation to bonds

Average global asset allocation of the seven, largest markets at the end of 2018



■ Equities ■ Bonds ■ Other ■ Cash

The asset allocation pattern has changed since 1998. Allocation to equities has decreased while investments in other assets grew during the same period.

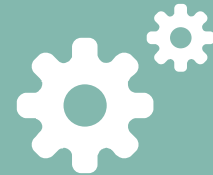
DB/DC split

50%

DC assets are estimated to represent slightly over 50% of total P7 pension assets

8.9%

Growth rate of DC assets in the last ten years



DC is dominant in Australia and the US. Japan and Canada, historically only DB, are now showing an increasing allocation towards DC

4.6%

Growth rate of DB assets in the last ten years

¹ 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 2018 talking points

1

DC assets overhaul DB but with attendant issues

- The growth of DC – reflecting increased member coverage and in some markets higher contributions – started 40 years ago and is continuing at a steady pace
- It has been pensions regulation and employer practice that has been behind this movement away from traditional DB pensions; this includes US 401k enactment in 1978, Australia Superannuation Guarantee in 1992; and UK auto-enrolment in 2008
- But with all this history, DC is still weakly designed, untidily executed and poorly appreciated; it will take better design and engagement models to create meaningful contributions to retirement security

2

Bad growth year for pension assets eased by private market diversification

- 2018 was the third worst year for P7 in the last 20, but the 5 year 2.9% pa and 10 year 6.5% pa are more revealing of the longer term pattern
- The outcome would have been quite a lot worse without the contribution from private markets; given their 20% or so allocation and with their positive returns they produced important risk diversification
- The governance of private markets and alternative assets remains difficult with funds striving to better manage the agency, measurement, integration and complexity challenges

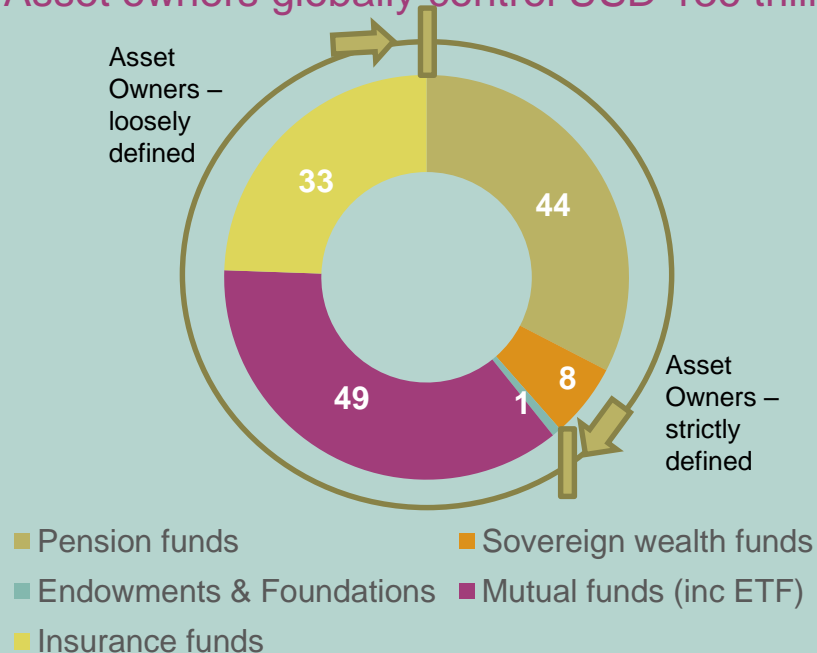
3

Australian super industry reflecting on a system with fault lines

- The criticisms of Australian super that surfaced in banking and productivity reviews were far-ranging - unintended multiple accounts; entrenched underperforming funds; boards conflicted or ineffective; inappropriate interpretation of best interests
- Criticisms of the retail and self managed sectors were drawn from challenges on their alignment of interests; this has allowed industry funds to strengthen their market position
- There is a developing super fund 'zeitgeist' focused on radically increasing member value; the model to do this will involve considerably more engagement and more scale and efficiency in the system

Key 2018 findings - global asset owner landscape

Asset owners globally control USD 136 trillion



Source: The asset owner of tomorrow: Thinking Ahead Institute. Various original sources. Projections used to derive end 2018 estimates

What is an asset owner?

An asset owner has five qualifying characteristics:

1. Works directly for a defined group of beneficiaries/savers/investors as the manager of their assets in a fiduciary capacity (upholding loyalty and prudence) under delegated responsibility
2. Works with a sponsoring entity, usually a government, part of government, a company or a not-for-profit
3. Works within explicit law and possesses an implicit societal license to operate because of its societal trust and legitimacy
4. Delivers mission-specific outcomes to beneficiaries and stakeholders in the form of various payments or benefits into the future
5. Employs a business model that combines a governance budget (essentially resources and processes) and a risk budget (reflecting the mix of financial assets that delivers on the mission).

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 the last 20 years of global pension assets growth

#1 market – Australia

- The 20-year growth in pension assets in Australia has been 10.2% per annum. The critical features in this success have been government-mandated pension contributions, a competitive institutional model and the dominance of DC

#1 pension design – defined contribution

- The 20-year growth of DC in the P7 has been 7.6% per annum relative to 3.2% per annum for DB. DC has worked better for employers who have had declining appetite for taking pension risk during this 20-year period

#1 asset class – private assets

- The asset allocation to real estate, private equity and infrastructure in the 20-year period has moved from about 4% to above 20%. Alternatives have been attractive for return reasons, offsetting their governance difficulties

#1 meme – governance

- 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; Royal Commission and Productivity Commission in Australia. Pension governance is a lot stronger than 20 years ago

#1 missed opportunity – stewardship

- 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

#1 no-show – technology

- 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

Key issues for pension funds to consider in the next 5-10 years

Pension design, continually towards a DC model

• DC becomes the dominant global model. DC models are in a state of flux: platforms continue to emerge; scale matters; providing lifetime income replaces asset accumulation as the core focus

Bigger impact from evolved regulations

• Pension funds will be subject to heavier saver / investor protection regulations. What they invest in will also be over-regulated

Governance issues are challenging

• There is a big governance challenge to build the resources and support effective collective decision-making required to manage a complex organisation, with multiple stakeholders, and varied views on what constitutes progress and success

Culture makes a difference

• Investment organisations increasingly differentiate themselves by referencing their values and culture. New measurement models and methods continue to emerge to move the needle on culture

Sustainability and long-horizon investing

• 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

Technology rising

• Technology will challenge business models and human capital, requiring adaptation. The people plus technology model should ultimately emerge as dominant. Technology enhanced engagement can play an important role in a DC-dominant world

Expected shifts by pension funds in the next 5-10 years

Shift	Shift from	Shift to
Business model Institutionalising professionalism	<ul style="list-style-type: none"> License to operate is more of a legal construct Focused over <u>short-</u> and long-term but problems with control 	<ul style="list-style-type: none"> License to operate is both legal and a social construct Focused over <u>long-</u> and short-term; with better control
People model Leveraging culture and diversity more	<ul style="list-style-type: none"> Male, ethno-centric, economics educated with limited culture 	<ul style="list-style-type: none"> Multi-disciplinary, diverse spectrum of backgrounds with stronger culture
Operating model Streamlining decisions	<ul style="list-style-type: none"> IT infrastructure weak Decision biases significant Collective intelligence weakly harnessed 	<ul style="list-style-type: none"> IT infrastructure stronger Decision biases reduced Collective intelligence strongly harnessed
Investment model Repositioning to more systematic and sustainable	<ul style="list-style-type: none"> Alternatives moderately sized but infrastructure finance small Alpha broad, factors small Small-scale responsible investing model Silent and disengaged owners 	<ul style="list-style-type: none"> Alternatives large-sized with infrastructure finance larger Alpha selective, factors larger Mainstreamed sustainability model Engaged owners with some activism

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

Asset size

Market	Total Assets 2018 (USD billion)	Assets/GDP ratio (%) ⁷
Australia	1,866	130.7%
Brazil ¹	243	12.7%
Canada	1,630	94.0%
Chile	196	65.5%
China ²	198	1.5%
Finland	233	84.2%
France	155	5.5%
Germany ³	557	13.8%
Hong Kong	156	43.2%
India	129	4.8%
Ireland	166	45.4%
Italy	187	9.0%
Japan ⁴	3,081	60.8%
Malaysia	227	65.4%
Mexico	185	15.4%
Netherlands	1,517	166.7%
South Africa	213	56.4%
South Korea	733	44.3%
Spain	41	2.8%
Switzerland ⁵	893	126.0%
UK	2,856	101.7%
US ⁶	24,711	120.5%
Total	40,173	60.4%⁸

Source: Thinking Ahead Institute 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

Period to end December 2018	Total assets growth in USD – All countries annualised	Total assets growth in USD – P7 countries annualised	Reference portfolio return 60% Global Equity / 40% Global Debt annualised
1-year	-3.3%	-3.3%	-5.7%
5-year	2.9%	2.9%	3.2%
10-year	6.8%	6.5%	6.9%
20-year	5.3%	4.9%	4.7%

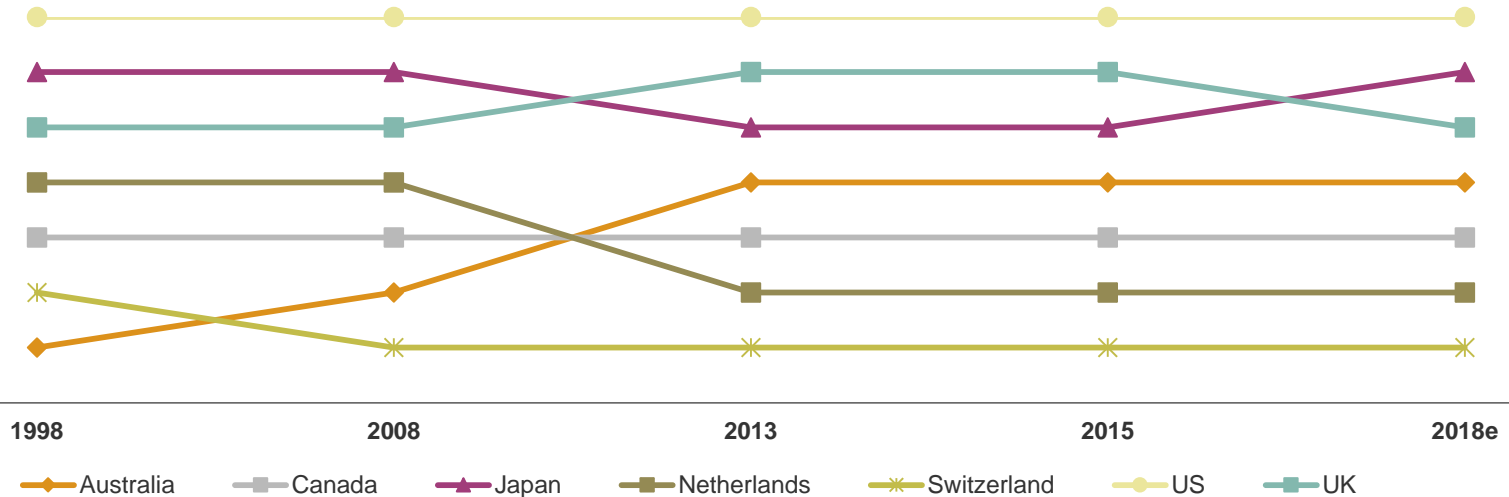
- Total pension asset growth has been quite closely matched to global public market equity and bond returns over the last 20 years
- The reference portfolio returns are a simple proxy for market returns used by some funds – in practice funds seek to outperform this return by adopting different mixes 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: Thinking Ahead Institute 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

1998		2008		2013		2015		2018e	
US	9,027	US	11,762	US	20,285	US	21,395	US	24,711
Japan	2,285	Japan	3,318	UK	3,129	UK	2,831	Japan	3,081
UK	1,159	UK	1,433	Japan	2,895	Japan	2,672	UK	2,856
Netherlands	470	Netherlands	852	Australia	1,746	Australia	1,565	Australia	1,866
Canada	445	Canada	847	Canada	1,471	Canada	1,451	Canada	1,630
Switzerland	350	Australia	710	Netherlands	1,354	Netherlands	1,285	Netherlands	1,517
Australia	205	Switzerland	509	Switzerland	809	Switzerland	794	Switzerland	893



Source: Thinking Ahead Institute and secondary sources

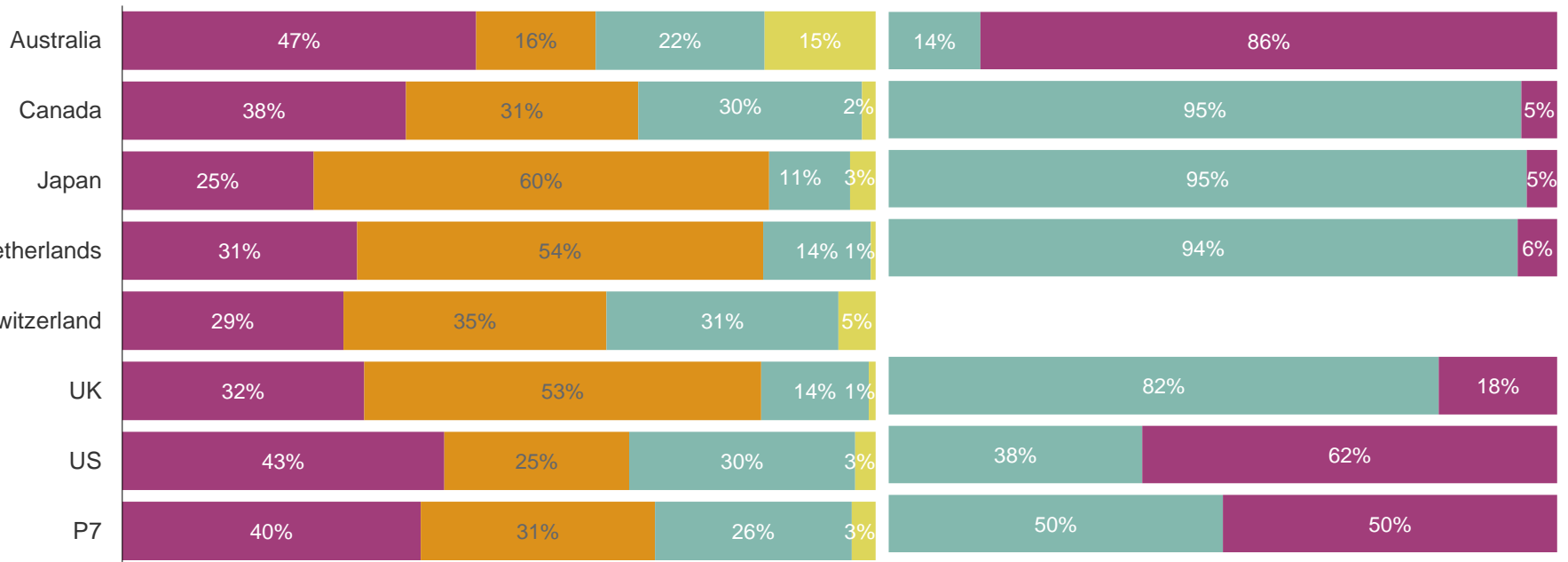
Asset allocation and DB/DC split

Asset allocation 2018

DB/DC split 2018^{1,2}

■ Equity ■ Bonds ■ Other ■ Cash

■ DB ■ DC

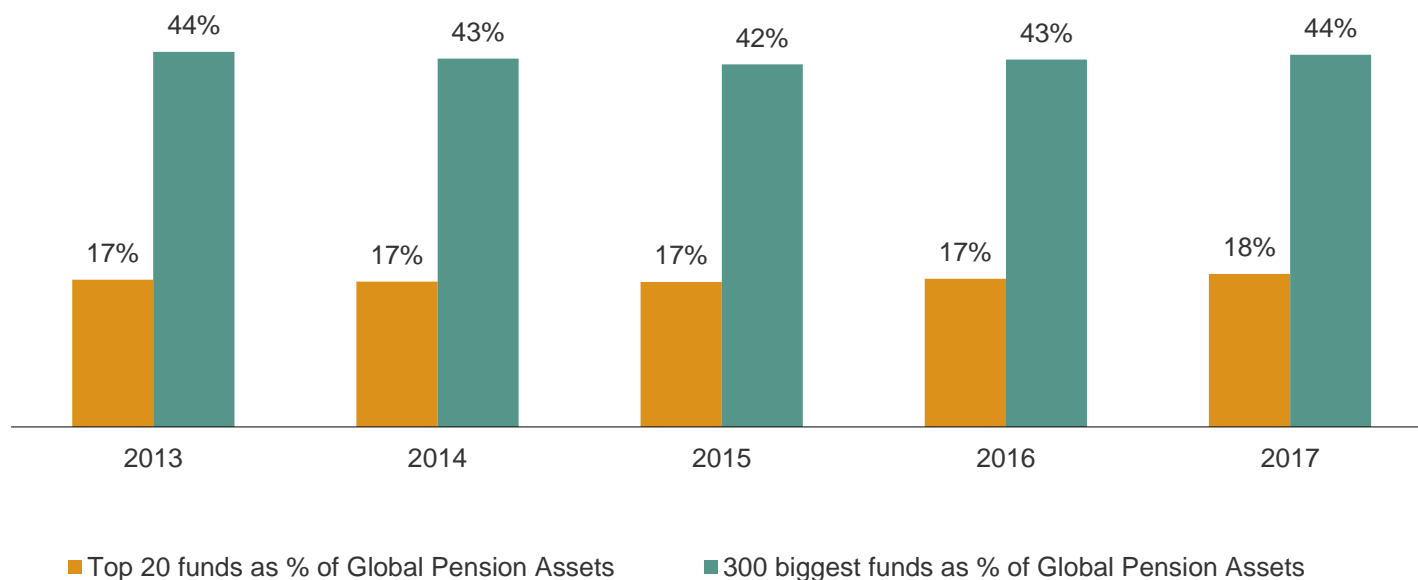


Source: Thinking Ahead Institute and secondary sources

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.

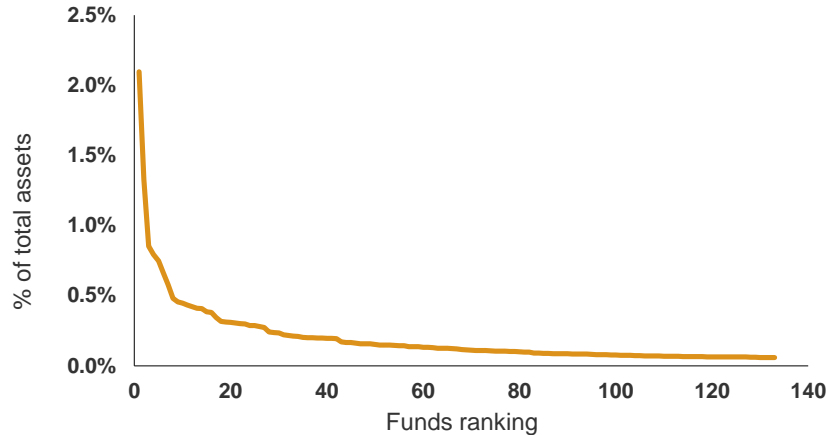
Concentration of assets in top 300 pension funds



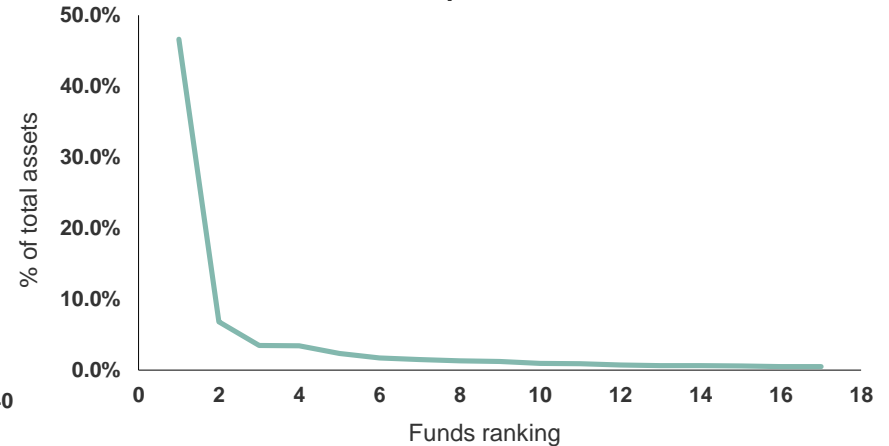
- The annual [Pension & Investments / Thinking Ahead Institute world 300 Analysis](#) ranks the world's largest 300 pension funds by assets
- The assets of the top 300 pension funds represent 44.0% of the total global pension assets
- The top 20 pension funds account for 18% of total global pension assets

Relative size of top pension funds by market

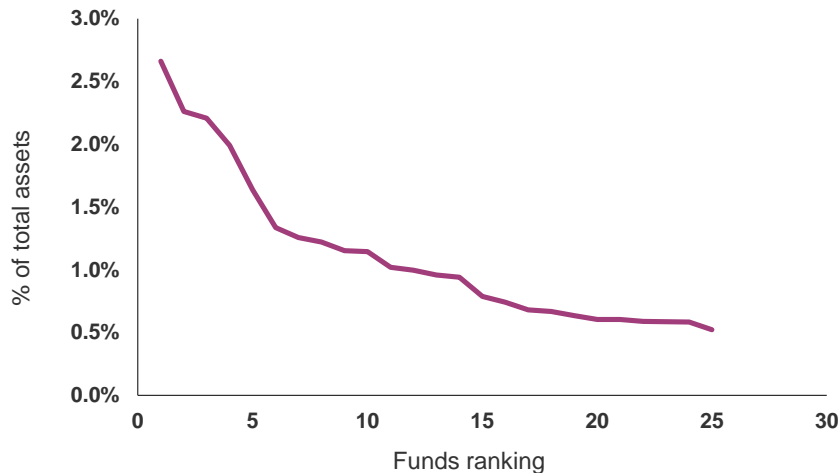
US



Japan



UK



- While the top ten US pension funds represent 8.4% of total assets, the top ten Japanese pension funds account for 69.1% of total assets. This is largely explained by the Government Pension Investment fund that represents 46.6% of Japan's pension assets
- In the UK, the top ten pension funds represent 16.9% of the total UK pension assets. Among them, 11.3% are private pension funds and the 3.9% are state-sponsored pension funds

Source: Thinking Ahead Institute and secondary sources

Asset size

Asset size and growth statistics

Comparison of asset size with GDP

A decade of growth

- In 2018 global pension assets are estimated to have reached USD 40,173 billion, a decrease of 3.3% in a year
- The US is the largest pension market followed, at significant distance, by Japan and the UK. Together they account for over 76% of all pensions assets

Market	Total assets 2008 (USD billion)	Total assets 2018e (USD billion)	10-year CAGR (USD) ¹
US	11,762	24,711	7.7%
Japan	3,318	3,081	-0.7%
UK	1,433	2,856	7.1%
Australia	710	1,866	10.2%
Canada	847	1,630	6.8%
Netherlands	852	1,517	5.9%
Switzerland	509	893	5.8%
South Korea	—	733	—
Germany	379	557	3.9%
Brazil	188	243	2.6%
Finland	150	233	4.5%
Malaysia	—	227	—
South Africa	141	213	4.2%
China	—	198	—
Chile	74	196	10.2%
Italy	—	187	—
Mexico	92	185	7.2%
Ireland	90	166	6.4%
Hong Kong	69	156	8.5%
France	154	155	0.1%
India	—	129	—
Spain	40	41	0.2%
Total	20,806	40,173	6.4%¹

Source: Thinking Ahead Institute and secondary sources

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

Growth rates in USD

- During the last ten years, the fastest growing pension markets have been Australia (10.2%), Chile (10.2%) and Hong Kong (8.5%) in USD terms
- France and Japan have had the slowest rates of growth in USD terms since 2008 (0.1% and -0.7% respectively)

Growth rates to 2018e (USD)

Market	1-year CAGR ²	5-year CAGR	10-year CAGR
Australia ³	-6.7%	1.3%	10.2%
Brazil	11.0%	-5.3%	2.6%
Canada ¹	-6.8%	2.1%	6.8%
Chile	-6.7%	3.9%	10.2%
China ⁴	0.3%	15.0%	-
Finland	-3.9%	0.8%	4.5%
France ¹	-5.8%	-0.9%	0.1%
Germany	-3.3%	2.4%	3.9%
Hong Kong	-5.0%	6.3%	8.5%
India	-1.8%	8.3%	-
Ireland	-5.8%	5.7%	6.4%
Italy ⁴	-3.9%	3.1%	-
Japan	-0.5%	1.3%	-0.7%
Malaysia ⁴	-2.1%	1.5%	-
Mexico	-0.9%	-1.1%	7.2%
Netherlands	-6.9%	2.3%	5.9%
South Africa	-14.7%	-1.4%	4.2%
South Korea ⁴	-4.6%	7.6%	-
Spain	-5.0%	-2.5%	0.2%
Switzerland	-2.3%	2.0%	5.8%
UK ¹	-6.3%	-1.8%	7.1%
US	-2.6%	4.0%	7.7%
Average	-3.8%	2.5%	5.3%

Source: Thinking Ahead Institute 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 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 Australia, Chile, Hong Kong, Mexico, UK and US have increased relative to other markets in the study while the weight of Canada and Ireland remained unchanged.

Market	Relative weights of each market		
	2008	2018e	
Australia	3.4%	4.6%	▲
Brazil	0.9%	0.6%	▼
Canada ¹	4.1%	4.1%	
Chile	0.4%	0.5%	▲
China ²	—	0.5%	
Finland	0.7%	0.6%	▼
France ¹	0.7%	0.4%	▼
Germany	1.8%	1.4%	▼
Hong Kong	0.3%	0.4%	▲
India ²	—	0.3%	
Ireland	0.4%	0.4%	
Italy ²	—	0.5%	
Japan	15.9%	7.7%	▼
Malaysia ²	—	0.6%	
Mexico	0.4%	0.5%	▲
Netherlands	4.1%	3.8%	▼
South Africa	0.7%	0.5%	▼
South Korea ²	—	1.8%	
Spain	0.2%	0.1%	▼
Switzerland	2.4%	2.2%	▼
UK ¹	6.9%	7.1%	▲
US	56.5%	61.5%	▲
Total	100.0%	100.0%	

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.

Source: Thinking Ahead Institute and secondary sources

Growth rates in local currency

- Estimated five-year growth rates range from 1.2% pa in Spain to 17.7% pa in China
- During the past ten years Chile's pension assets have grown the fastest, followed by those of Mexico, Australia, South Africa, Hong Kong and UK, when calculated in local currency.

Market	1-year CAGR ²	5 -year CAGR	10-year CAGR
Australia	-2.2%	7.4%	9.9%
Brazil	11.4%	6.7%	7.9%
Canada ¹	1.2%	7.2%	7.9%
Chile	5.3%	9.8%	11.3%
China ³	5.9%	17.7%	-
Finland	0.5%	4.6%	6.7%
France ¹	-1.4%	2.8%	2.1%
Germany	1.2%	6.2%	6.0%
Hong Kong	-4.8%	6.5%	8.6%
India ³	7.1%	10.9%	-
Ireland	-1.5%	9.7%	8.5%
Italy ³	0.6%	7.0%	-
Japan	-2.7%	2.2%	1.3%
Malaysia ³	0.1%	6.3%	-
Mexico	-1.1%	7.4%	11.2%
Netherlands	-2.6%	6.2%	8.1%
South Africa	-0.5%	5.1%	8.7%
South Korea ³	-0.1%	8.8%	-
Spain	-0.6%	1.2%	2.2%
Switzerland	-1.6%	4.1%	5.0%
UK ¹	-0.4%	3.5%	8.6%
US	-2.6%	4.0%	7.7%
Average	0.5%	6.6%	7.2%

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

Source: Thinking Ahead Institute and secondary sources

Currency impact

- In 2018, the Japanese Yen and the Mexican Peso rose against the US Dollar, all the other currencies in the study depreciated against the US Dollar
- Currencies that depreciated the most against the USD were the South African Rand (-14.3%), Chilean Peso (-11.4%), Indian Rupee (-8.3%) and Canadian Dollar (-7.9%)
- Over longer periods, there has been a trend of strengthening USD relative to other major currencies. During the last ten years, the only currencies that have appreciated against the USD were the Swiss Franc (0.7% pa) and the Australian Dollar (0.2% pa), while in the last five years, none of the currencies of the markets in this study appreciated against the USD.

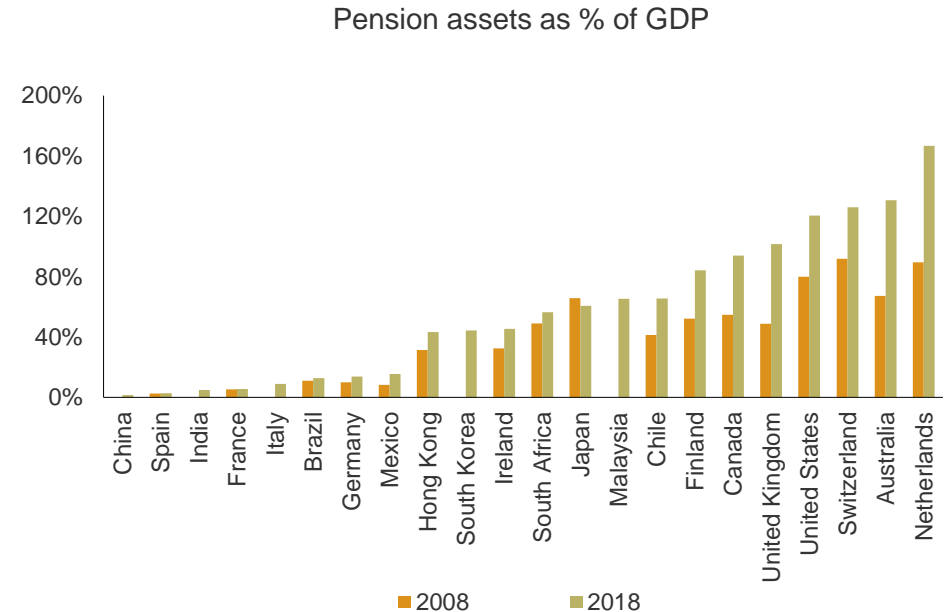
Market	Variation in FX rates against USD		
	1-year	5-year CAGR	10-year CAGR
Australia	-4.6%	-5.6%	0.2%
Brazil	-0.4%	-11.2%	-4.9%
Canada	-7.9%	-4.7%	-1.1%
Chile	-11.4%	-5.4%	-1.0%
China ¹	-5.3%	-2.3%	-
Finland	-4.4%	-3.6%	-2.1%
France	-4.4%	-3.6%	-2.0%
Germany	-4.4%	-3.6%	-2.0%
Hong Kong	-0.2%	-0.2%	-0.1%
India ¹	-8.3%	-2.3%	-
Ireland	-4.4%	-3.6%	-2.0%
Italy ¹	-4.4%	-3.6%	-
Japan	2.2%	-0.9%	-2.0%
Malaysia ¹	-2.3%	-4.5%	-
Mexico	0.2%	-7.8%	-3.6%
Netherlands	-4.4%	-3.6%	-2.0%
South Africa	-14.3%	-6.2%	-4.1%
South Korea ¹	-4.4%	-1.2%	-
Spain	-4.4%	-3.6%	-2.0%
Switzerland	-0.7%	-2.0%	0.7%
UK	-5.8%	-5.1%	-1.3%

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

Source: Thinking Ahead Institute and secondary sources

Pension assets vs GDP in local currency

Market	Pension assets as a % of GDP		
	2008	2018e	Change ¹
Australia	67%	131%	64%
Brazil	11%	13%	2%
Canada	55%	94%	39%
Chile	41%	65%	24%
China ²	—	1%	—
Finland	52%	84%	32%
France	5%	6%	1%
Germany	10%	14%	4%
Hong Kong	31%	43%	12%
India ²	—	5%	—
Ireland	32%	45%	13%
Italy ²	—	9%	—
Japan	66%	61%	-5%
Malaysia ²	—	65%	—
Mexico	8%	15%	7%
Netherlands	89%	167%	78%
South Africa	49%	56%	7%
South Korea ²	—	44%	—
Spain	2%	3%	1%
Switzerland	92%	126%	34%
UK	49%	102%	53%
US	80%	120%	40%



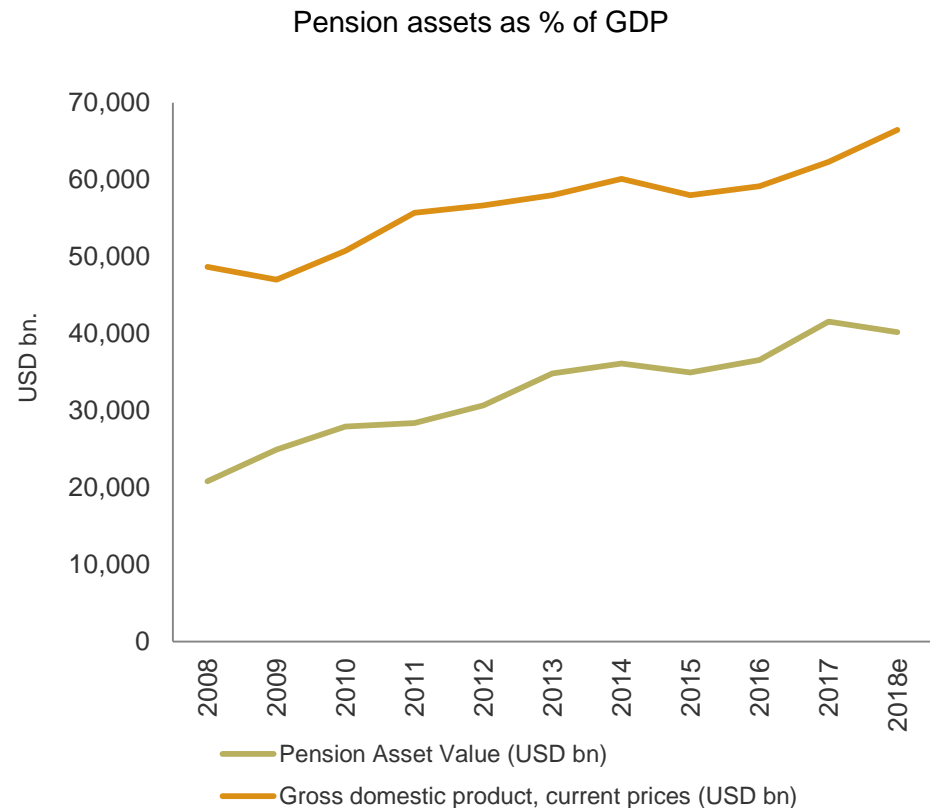
¹ In percentage points, figures are rounded.

² 2008 figures are not available for China, India, Italy, Malaysia and South Korea.

Source: Thinking Ahead Institute and secondary sources

Pension assets vs GDP in USD

- The total pension assets to GDP ratio reached 60.4% at the end of 2018
- The Netherlands has the highest ratio of pension assets to GDP (167%) followed by Australia (131%), Switzerland (126%), the US (121%) and the UK (102%)
- During the last ten years, the pension assets to GDP ratio increased the most in Netherlands, Australia, United Kingdom and the US (78, 64, 53 and 40 percentage points respectively). It declined in only one market, Japan by 5%.

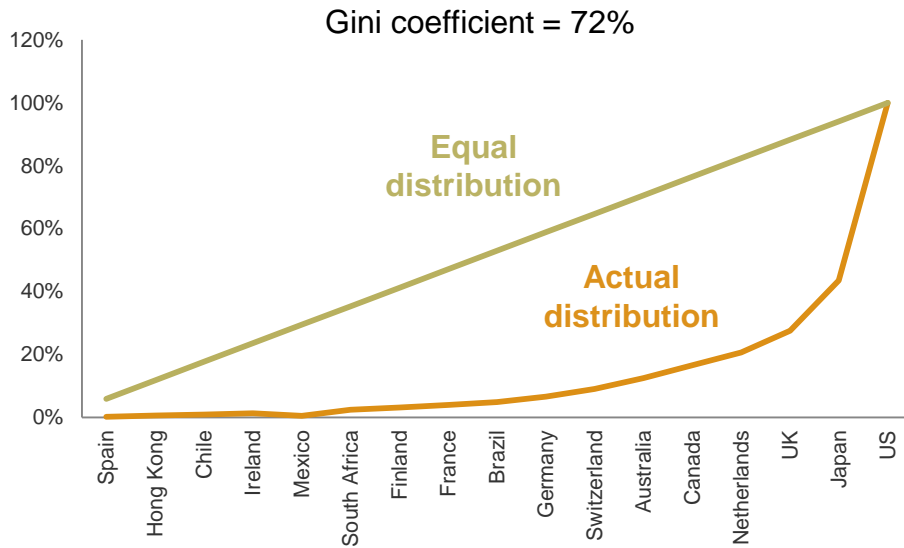


Source: Thinking Ahead Institute and secondary sources

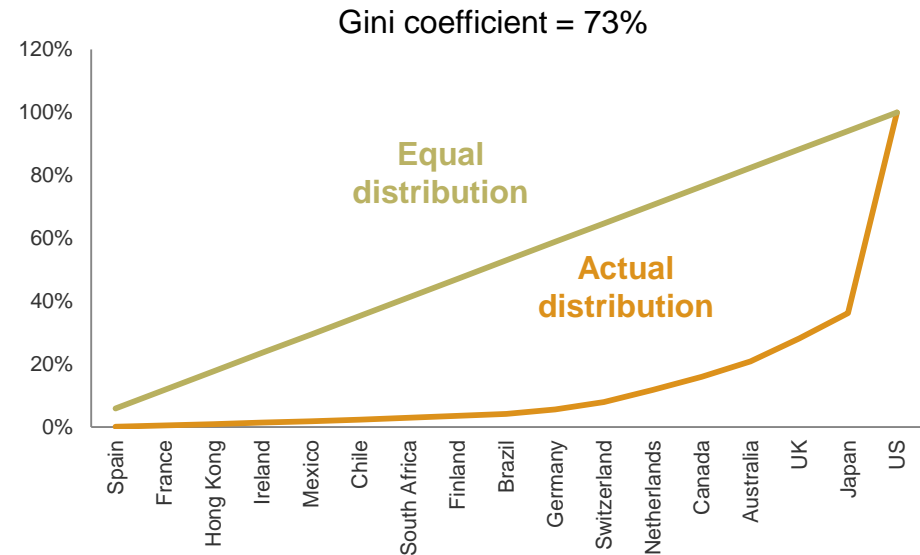
Note: World GDP measured in USD and market GDP in Local Currency

Pension market concentration

Lorenz curve for pension assets in 2008



Lorenz curve for pension assets in 2018



Source: Thinking Ahead Institute and secondary sources

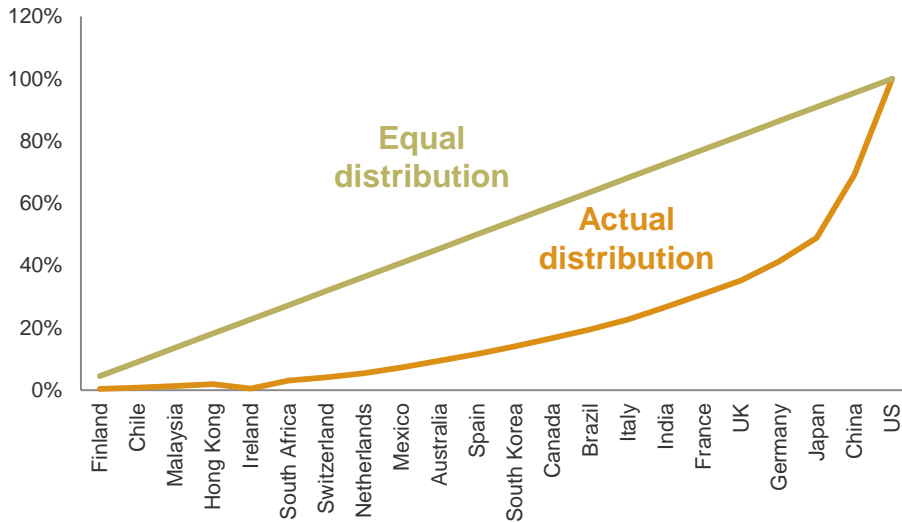
- The Gini coefficient of global pension assets in 2018 was 72.9% which indicates the pension assets are still concentrated in relatively few markets
- The global pension market has remained largely unchanged over the last 10 years. The Gini coefficient was 71.6% in 2008

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

Compared with GDP

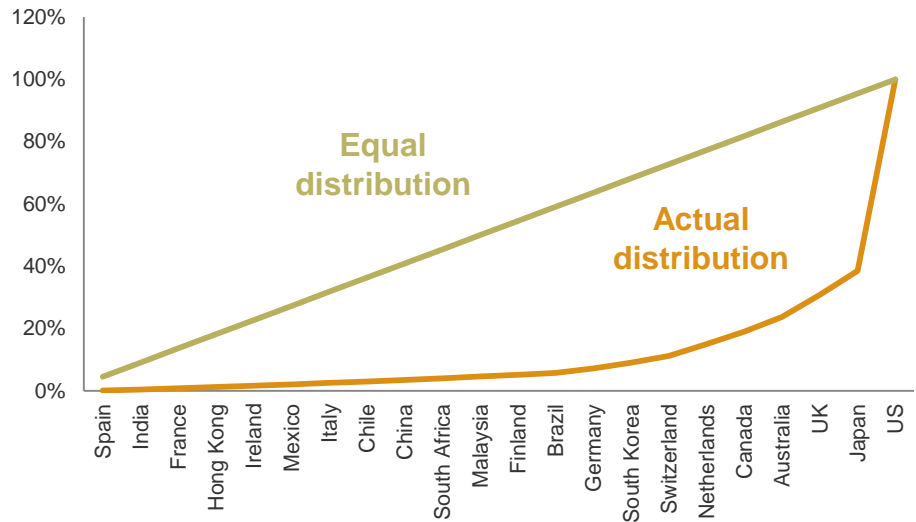
Lorenz curve for GDP in 2018

Gini coefficient = 59%



Lorenz curve for pension assets in 2018

Gini coefficient = 75%

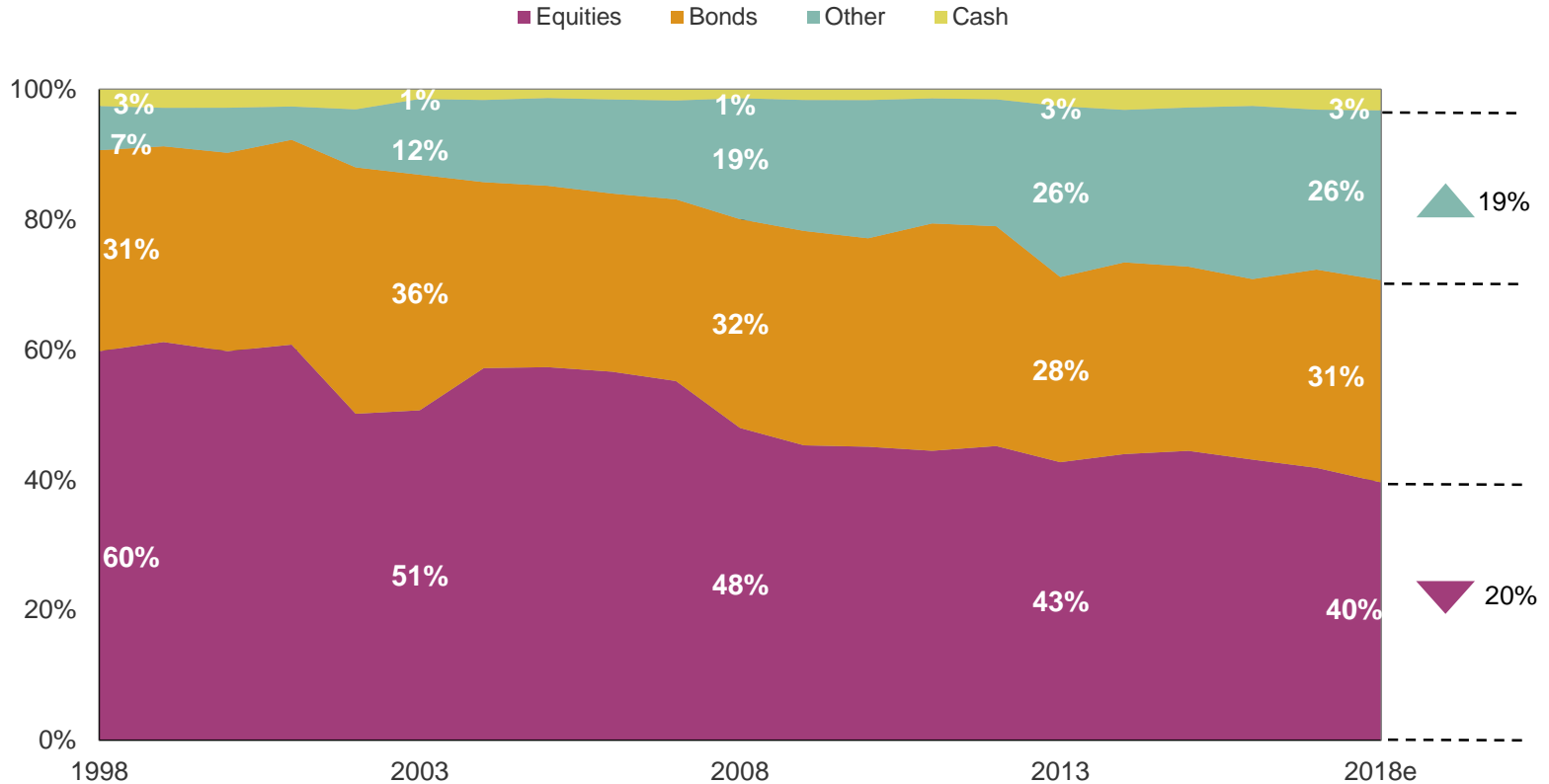


Source: Thinking Ahead Institute and secondary sources

- The lower Gini coefficient for GDP (58.8%) relative to pension market size (74.8%) 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 54.8% in 2008 to 58.8% in 2018

Asset allocation (P7)

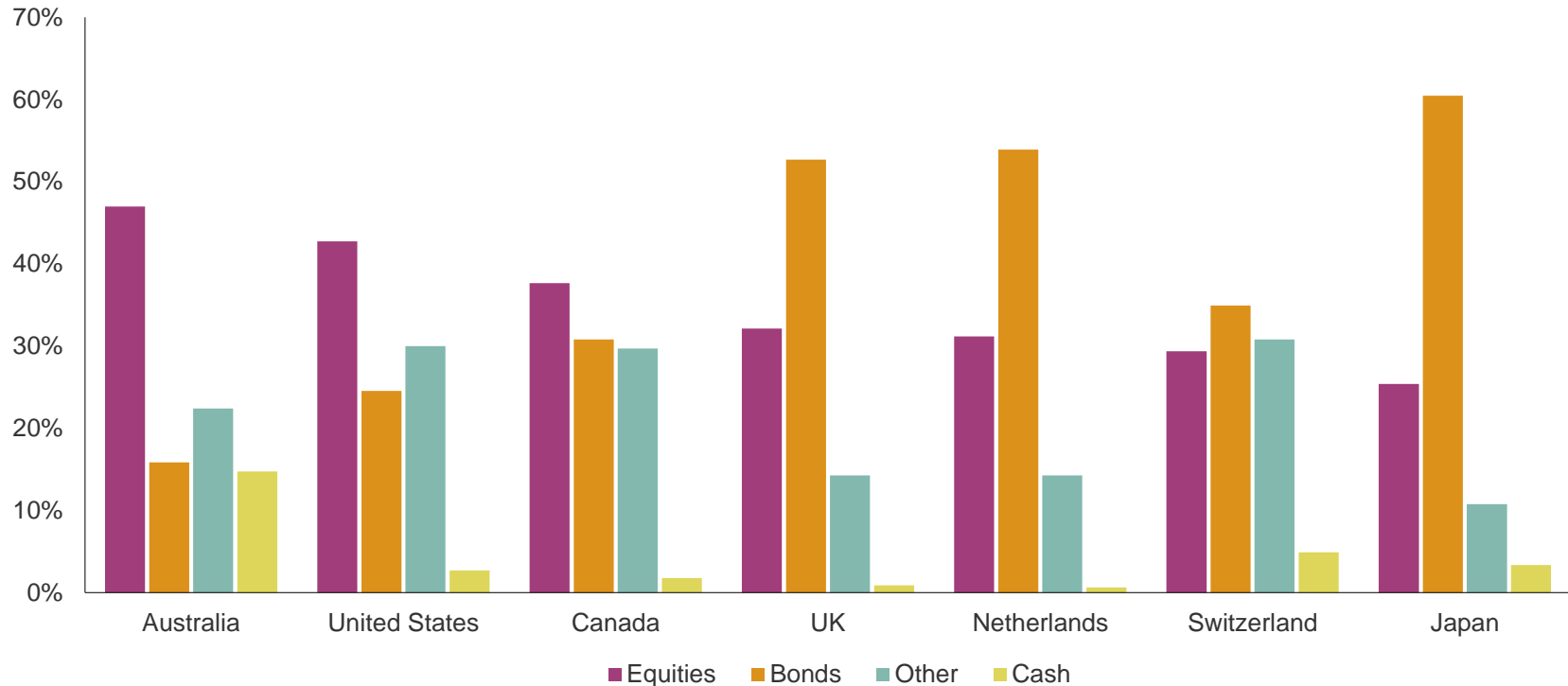
Aggregate P7 asset allocation from 1998 to 2018



Source: Thinking Ahead Institute and secondary sources

- Since 1998 equity allocations have reduced from 60% to 40% while allocations to other assets (real estate and other alternatives) have increased from 7% to 26%. Allocation to cash and bonds remains the same as in 1998 for P7 markets.

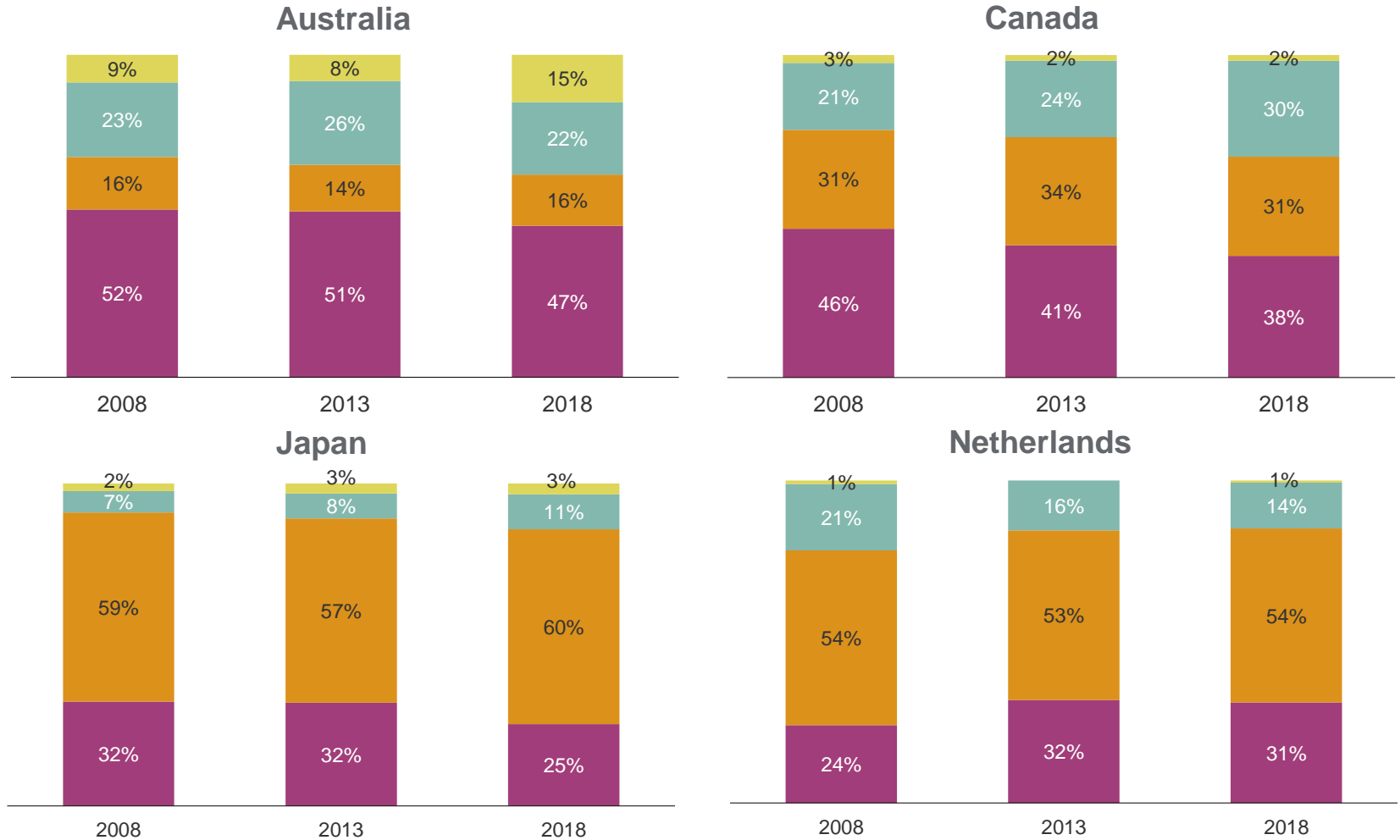
P7 asset allocation in 2018



Source: Thinking Ahead Institute and secondary sources

- In 2018, Australia and the US continued to have above average equity allocations
- The Netherlands, UK and Japan have above average exposure to bonds, while Switzerland has the most even allocations across equities, bonds and other assets

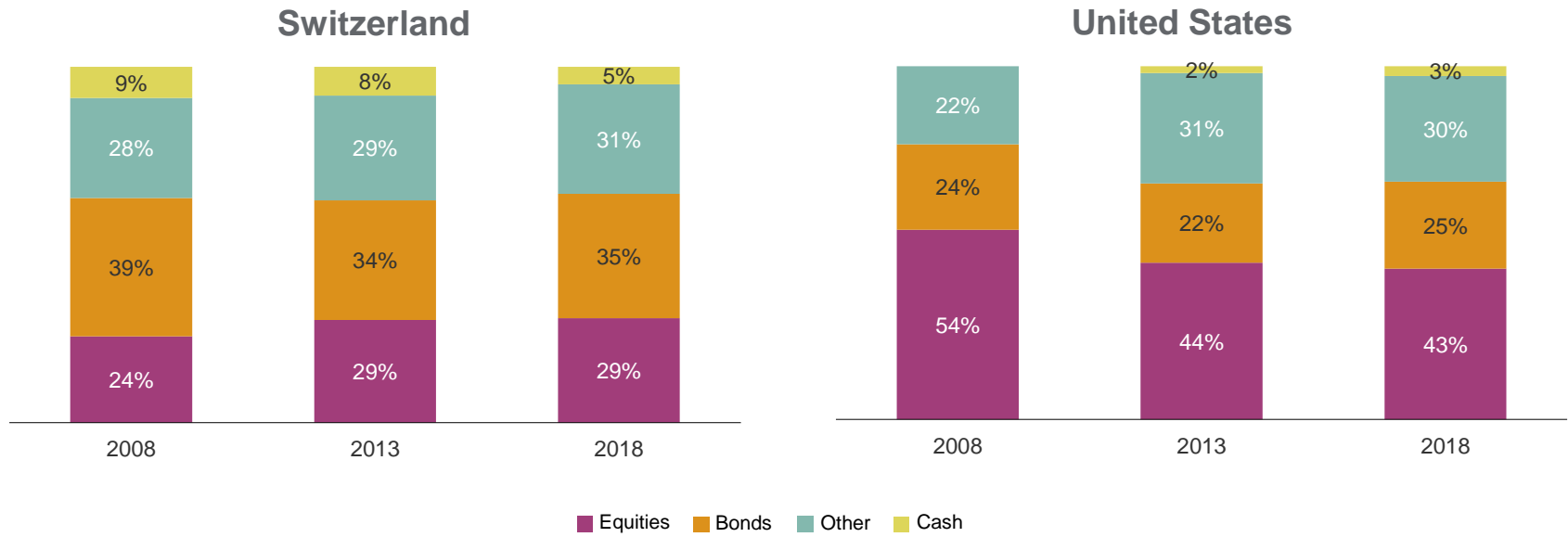
P7 asset allocation over the last ten years (1)



Source: Thinking Ahead Institute and secondary sources

Equities Bonds Other Cash

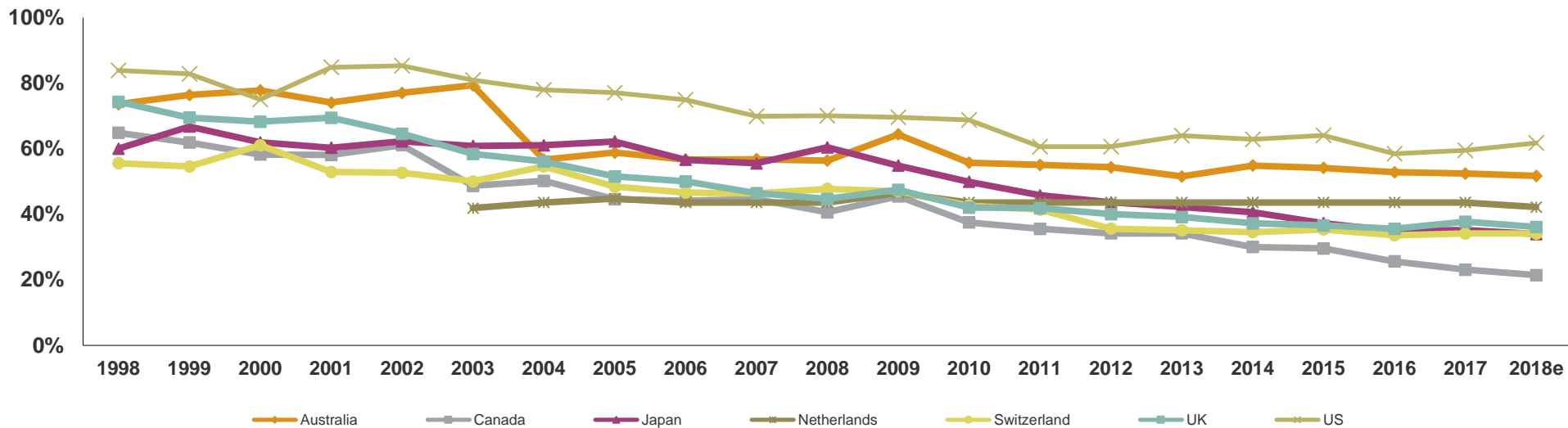
P7 asset allocation over the last ten years (2)



Source: Thinking Ahead Institute and secondary sources

Domestic equity exposure

Domestic equity over total equity exposure

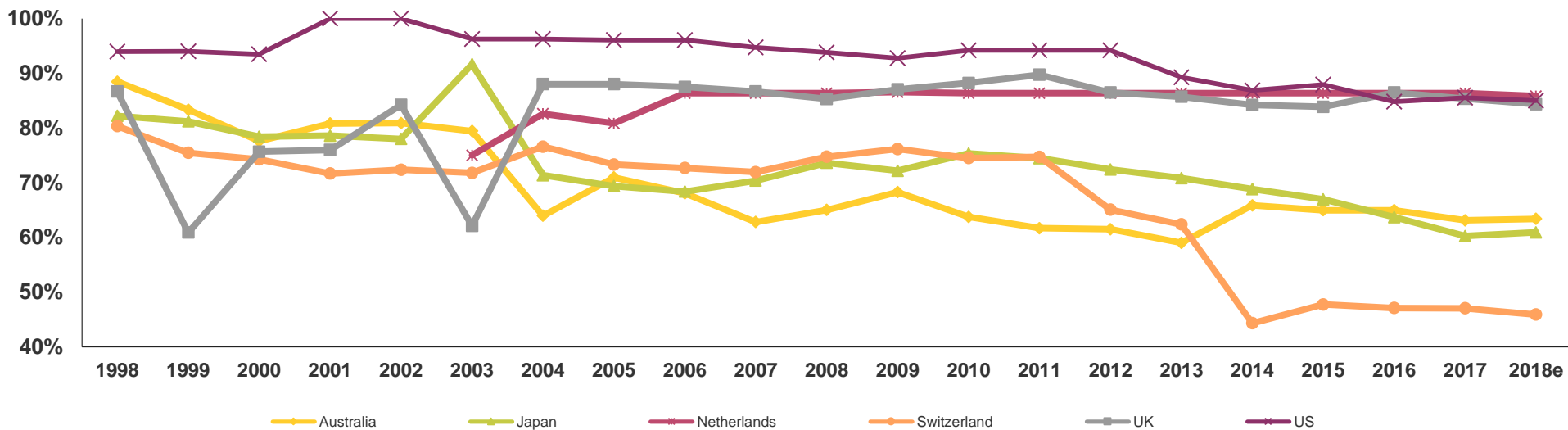


Source: Thinking Ahead Institute and secondary sources

- 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 40.2% in 2018
- 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

Domestic bonds exposure

Domestic bonds over total bond exposure

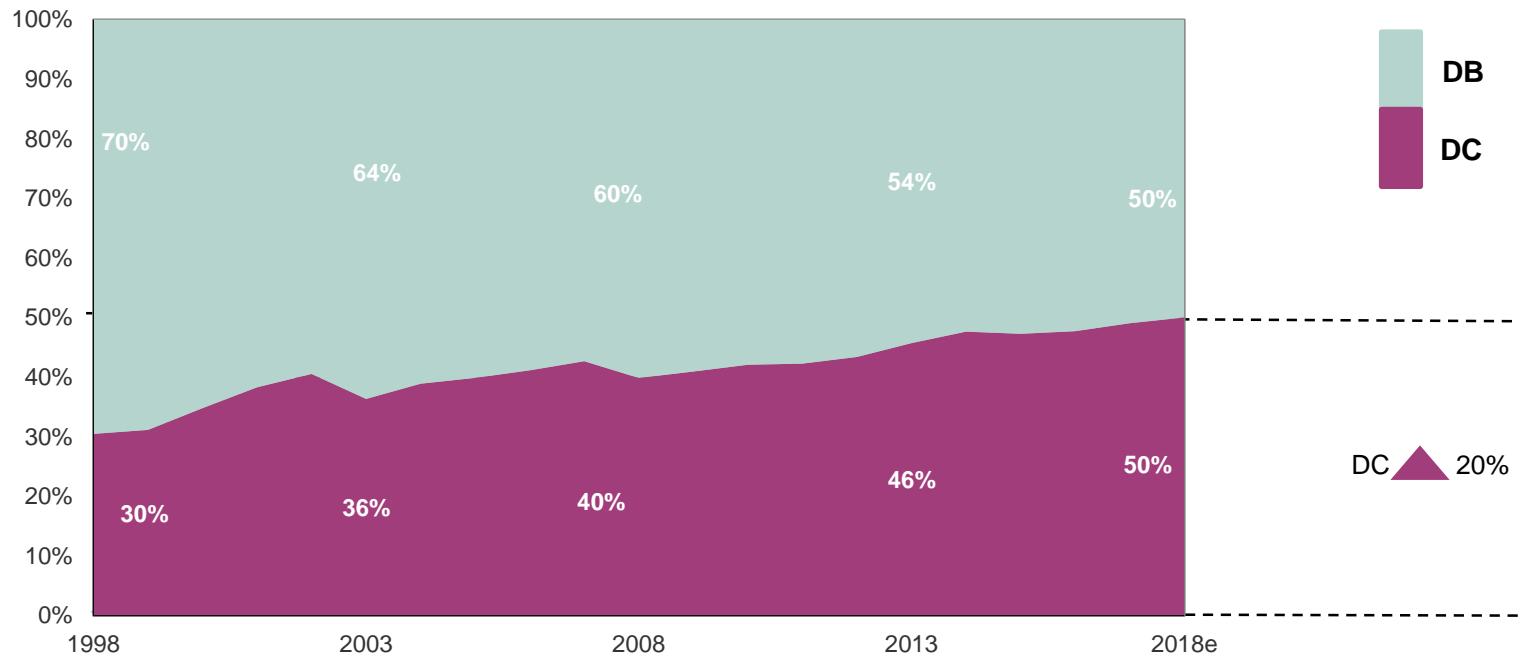


Source: Thinking Ahead Institute and secondary sources

- The allocation to domestic bonds has remained high. On average, the allocation to domestic bonds as a percentage of total bonds was 86.3% in 1998 and 70.9% in 2018
- 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

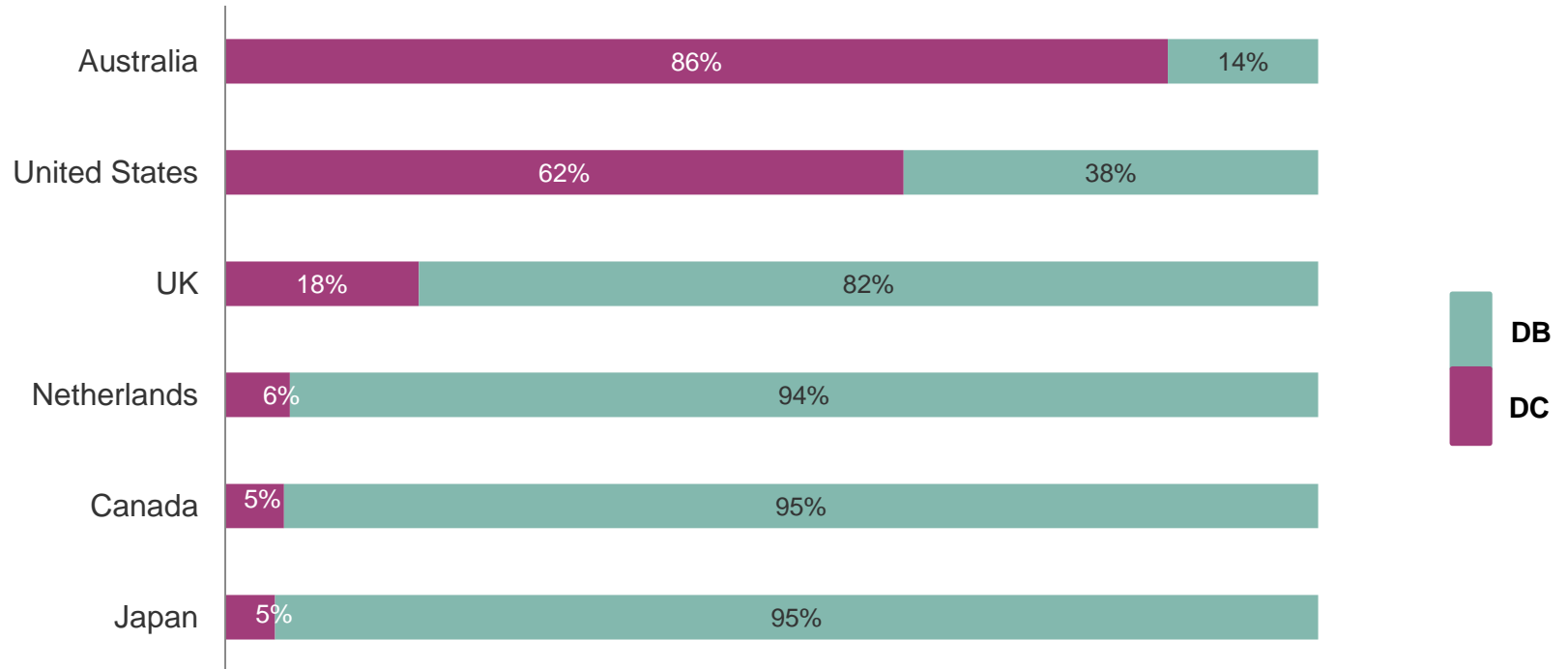


Source: Thinking Ahead Institute and secondary sources

- During the last ten years, DC assets have grown by 8.9% pa while DB assets have grown at a slower pace by 4.6 % pa.
- The growth rate of DC assets for the last 20 years is 7.6% pa and 3.2% 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.

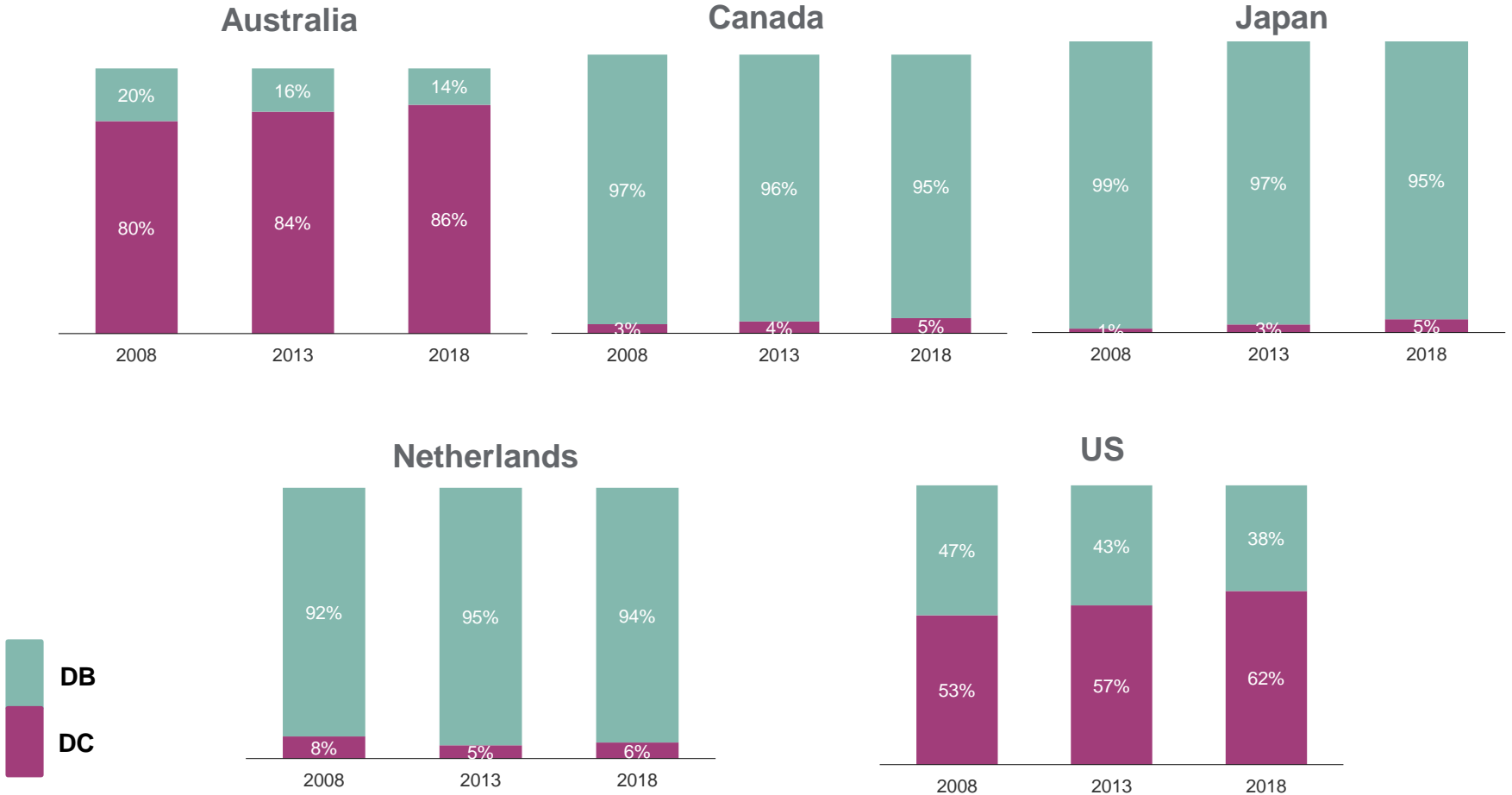
DB/DC split in 2018



Source: Thinking Ahead Institute and secondary sources

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



Source: Thinking Ahead Institute 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, TAI Team and limitations of reliance

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 2017 (except for Australia and Brazil which is from June 2018) collected by Willis Towers Watson and from various secondary sources
 - Estimates as at year-end 2018 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 in the 2017 edition of the study, 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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The Thinking Ahead Institute is a global not-for-profit group whose aim is to influence change in the investment world for the benefit of the end saver. The Institute's members comprise asset owners, investment managers and other groups that are motivated to influence the industry for the good of savers worldwide. It is an outgrowth of Willis Towers Watson Investments' Thinking Ahead Group and more research is available on its [website](#).

Limitations of reliance

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