
HARVARD | BUSINESS | SCHOOL

# LOOKING FOR ALTERNATIVES

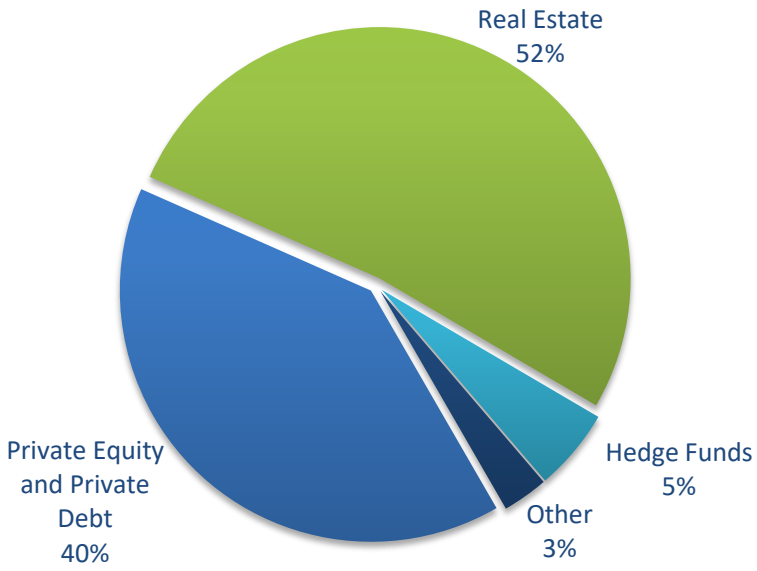
## PENSION INVESTMENTS AROUND THE WORLD, 2008 TO 2017

Victoria Ivashina and Josh Lerner

Federal Reserve Bank of Boston, 2018 Economic Conference

# What is an "Alternative Investment"?

- "Traditional investments": publically traded equity and debt (domestic or international)
- "Alts" include:
  - Private Equity
  - Real Estate
  - Private Debt (new and increasing)
  - Hedge Funds
  - Infrastructure
  - Natural Resources




2008, sample of 392 U.S. DB pension funds

# What is an "Alternative Investment"? (2)

Common denominators:

- fund structure
- investing
  - long-term, but finite investment horizon
    - » Although—with the abundance of capital & pressures on the pensions, life insurers, i.e., very-long liability structure—there is a lot of talk about different/ever-green fund structure, and we'll have an opportunity to discuss it
  - Illiquidity!
  - "Active" component
- a promise of higher returns (e.g., 20-25% in PE, net of fees)

# 2008-2017: A Unique Environment for Pensions

European Insurance and Occupational Pension Authority (EIOPA), *Financial Stability Report*:

*Spring, 2009 – "The defined benefit (DB) occupational pension fund sector is coming under increased pressure, also because of low interest rates and prevailing longevity risk."*

*Spring, 2010 – "A sustained period of low interest rate environment is especially challenging for life insurers and pension funds. Persistently low risk-free rates will cause insurers and pension funds to suffer losses on products that guarantee higher interest rates than they can fund in such market conditions. It also increases risks as undertakings might be searching for higher yields as well as the present value of liabilities, leading to deterioration in the capital position."*

*Spring, 2011 – "While funding levels have improved, there still exists a great deal of uncertainty in the financial markets and the current low interest rate environment also creates differing problems in the Defined Benefit (DB) and Defined Contribution (DC) sector."*

*Spring, 2012 – "[R]ecent months have again seen the 10Y [Euro] benchmark rate decline to levels well below 2%. Clearly, long-term rates are of critical importance to life insurers and pension funds, as these institutions typically have long-run obligations to policyholders and pensioners that become more expensive in today's terms when rates are low."*

*…*

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# Data

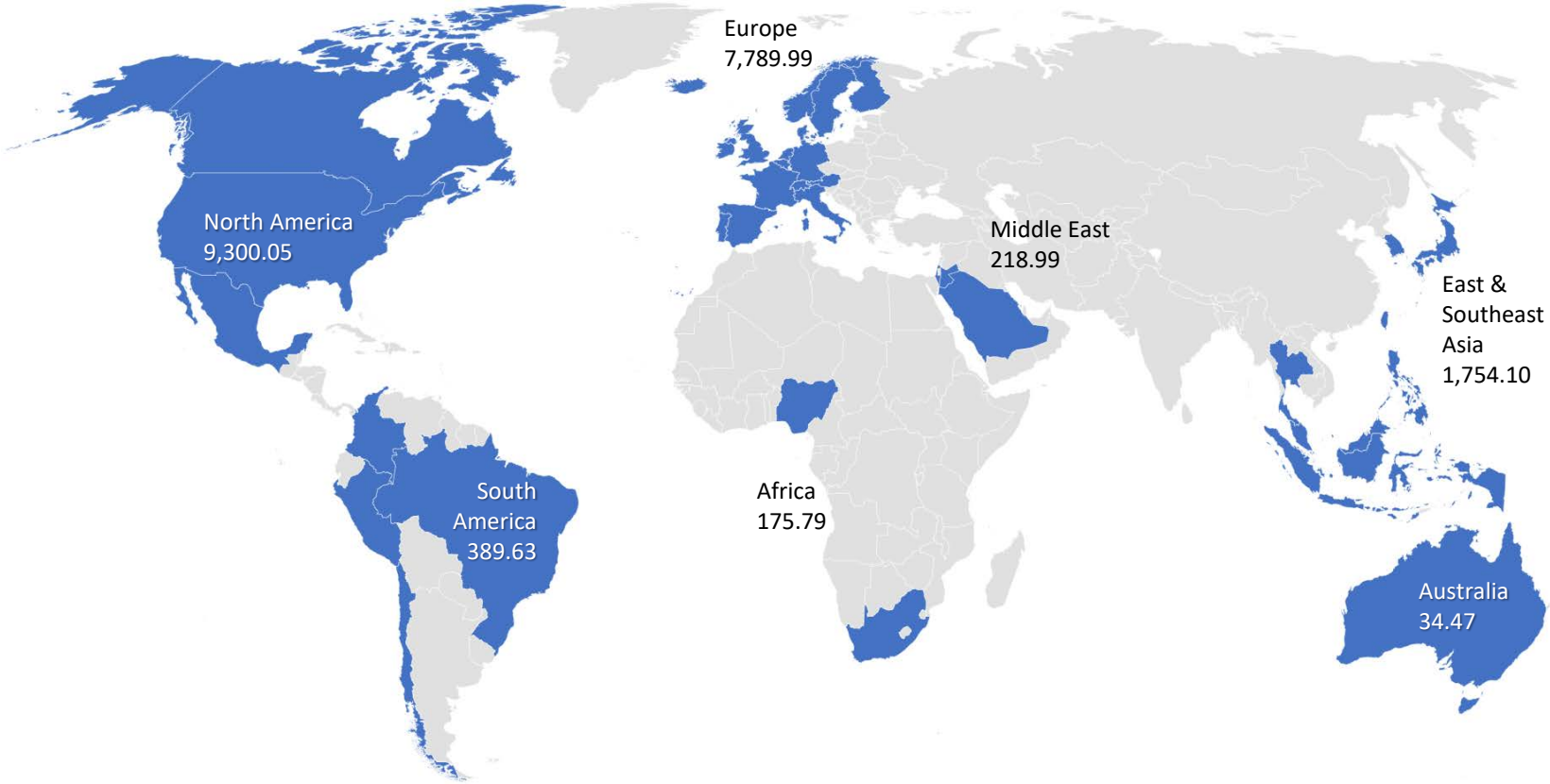
The challenge is to get the international data:

- Key data source: New data pooled by Preqin
- 2008-2017
- Nearly 2,000 pension funds (with Alts allocation at any point over the sample period)
- We see all Alts allocations

- Caveats:
  - starts in 2008
  - not a balanced panel
    - We'll look at (i) funds with 10 years of data, (ii) funds with at least 5 years of data
  - we don't see the overall portfolio (Preqin only focuses on Alts)

- Some fixes: Additional data (to understand the portfolio): P&I (1,000 U.S. pension funds)

# Data: Pensions AUM Covered in the Sample ($ billions)




23 developed economies
16 emerging markets
2017: $19.7 T aggregate AUM & $2.8 T in Alts

# Data: Coverage (Preqin vs. OECD)

| Country | Region | Total Assets | | |
|---|---|---|---|---|
| | | Our sample | OECD | % of OEC coverage |
| Developed markets: | | | | |
| United States of | Americas | 7,169.21 | 25,126.5 | 28.53% |
| Canada | Americas | 1,402.25 | 2,403.87 | 58.33% |
| Japan | Asia & Pacific | 348.37 | 1,598.10 | 21.80% |
| Australia | Asia & Pacific | 31.91 | 1,523.30 | 2.09% |
| Hong Kong, | Asia & Pacific | 7.30 | 123.10 | 5.93% |
| United Kingdom | Europe | 1,425.29 | 2,273.71 | 62.69% |
| Netherlands | Europe | 1,343.01 | 1,335.23 | 100.58% |
| Switzerland | Europe | 600.22 | 904.38 | 66.37% |
| Denmark | Europe | 399.30 | 611.90 | 65.26% |
| Germany | Europe | 371.40 | 223.91 | 165.87% |
| Sweden | Europe | 349.89 | 389.26 | 89.88% |
| France | Europe | 127.63 | 230.18 | 55.45% |
| Finland | Europe | 78.83 | 134.87 | 58.45% |
| Italy | Europe | 63.25 | 165.24 | 38.28% |
| Spain | Europe | 36.94 | 164.24 | 22.49% |
| Iceland | Europe | 25.82 | 32.36 | 79.79% |
| Portugal | Europe | 24.00 | 21.09 | 113.76% |
| Norway | Europe | 22.73 | 37.38 | 60.81% |
| Belgium | Europe | 18.21 | 27.56 | 66.08% |
| Austria | Europe | 15.47 | 25.99 | 59.53% |
| Ireland | Europe | 14.86 | 118.32 | 12.56% |
| Liechtenstein | Europe | 3.62 | 5.21 | 69.54% |
| Israel | Middle East & Africa | 133.00 | 177.29 | 75.02% |
| Emerging markets: | | | | |
| Brazil | Americas | 155.31 | 439.51 | 35.34% |
| Mexico | Americas | 153.43 | 156.50 | 98.04% |
| Colombia | Americas | 84.50 | 64.58 | 130.85% |
| Chile | Americas | 80.74 | 174.48 | 46.27% |
| Peru | Americas | 40.00 | 41.18 | 97.14% |
| Korea (South) | Asia & Pacific | 566.25 | 364.63 | 155.29% |
| Thailand | Asia & Pacific | 60.30 | 27.33 | 220.60% |
| Indonesia | Asia & Pacific | 20.14 | 17.03 | 118.21% |
| Nigeria | Middle East & Africa | 27.20 | 20.21 | 134.58% |

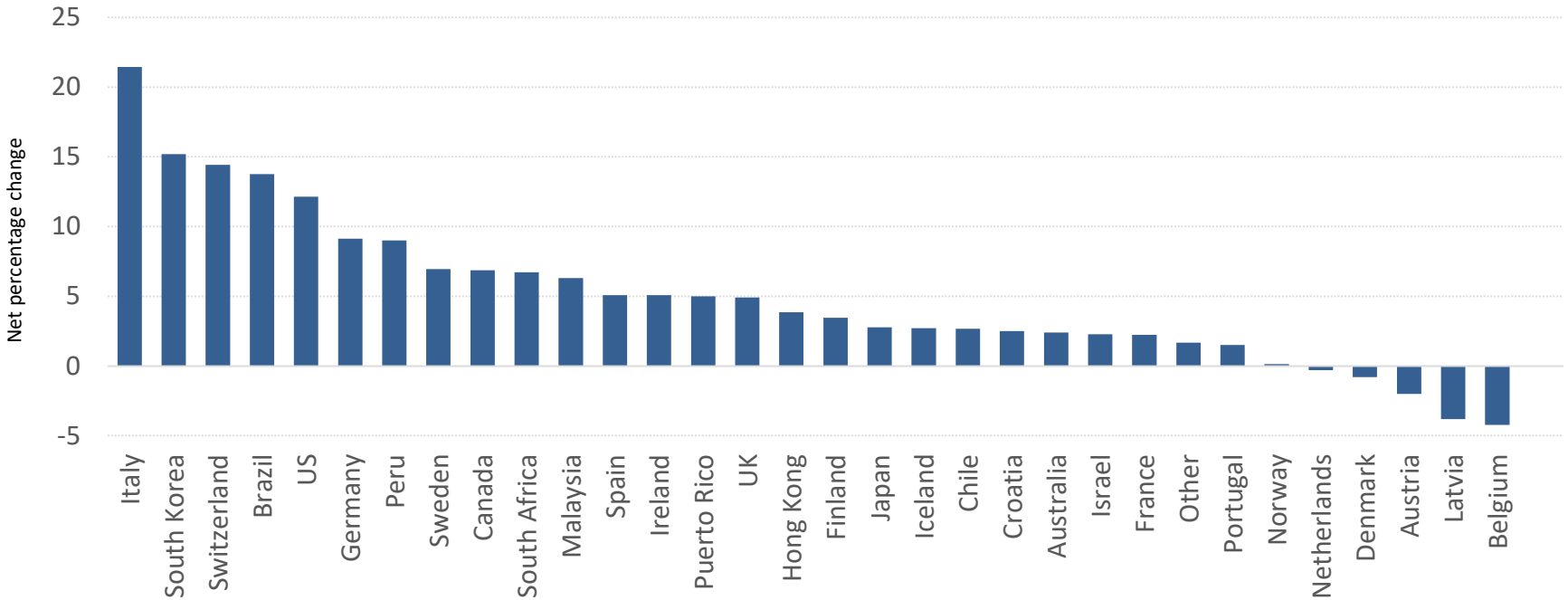
# Variable of Interest:

- Our central metric is Alts allocation in percent of contemporaneous AUM (i.e., share of the portfolio). That is, for a fund *i* in year *t*:

$$\frac{Total\ NAV_{it}^{Alts}}{AUM_{it}}$$

# Change in Allocation to Alts (% of AUM), 2008-2017

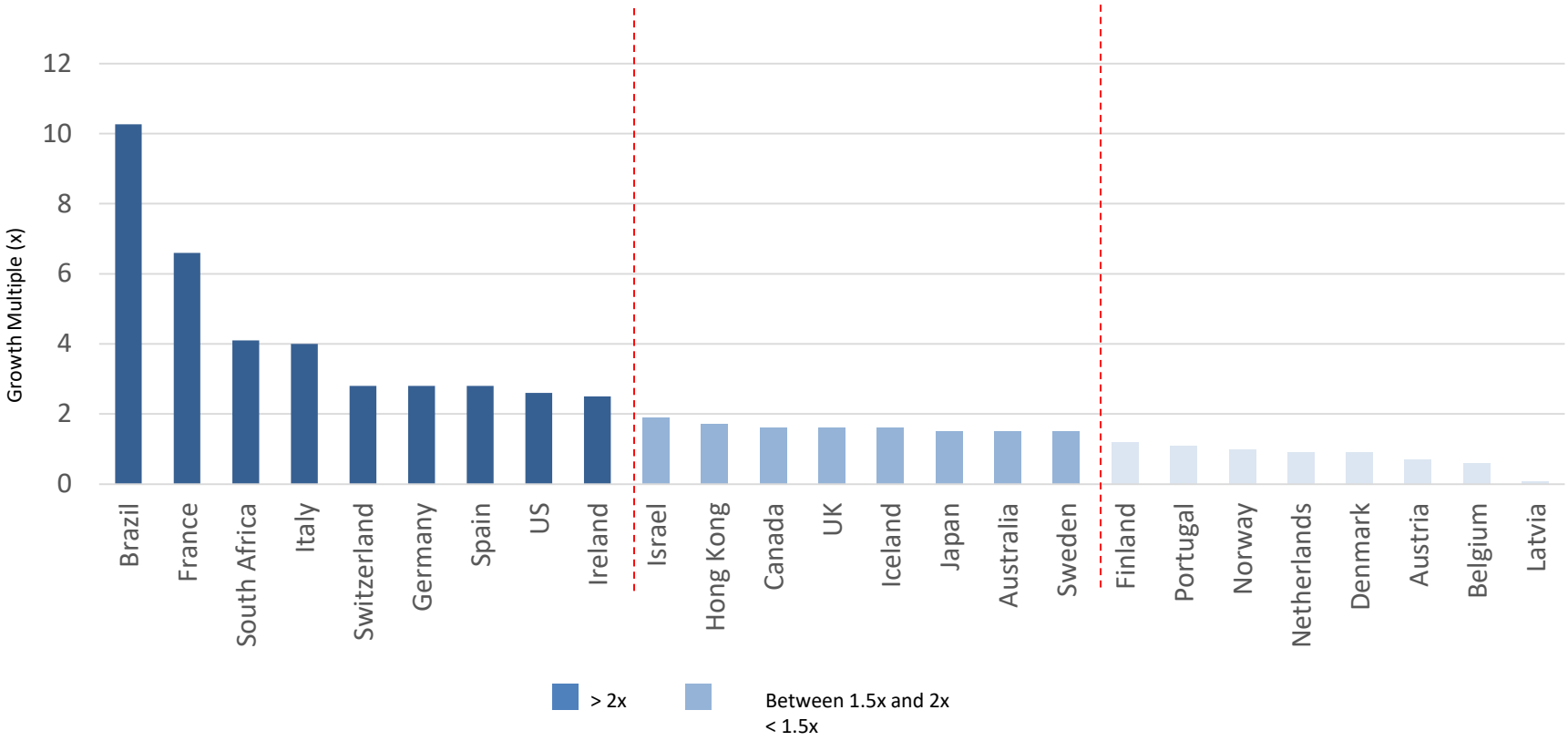
Equally-weighted (within country) averages
(funds with 10 years of data)




Note: The figure excludes countries with only one fund reported.

# Allocation to Alts 2017 as a multiple of 2008 level

Equally-weighted (within country) averages
(funds with 10 years of data)

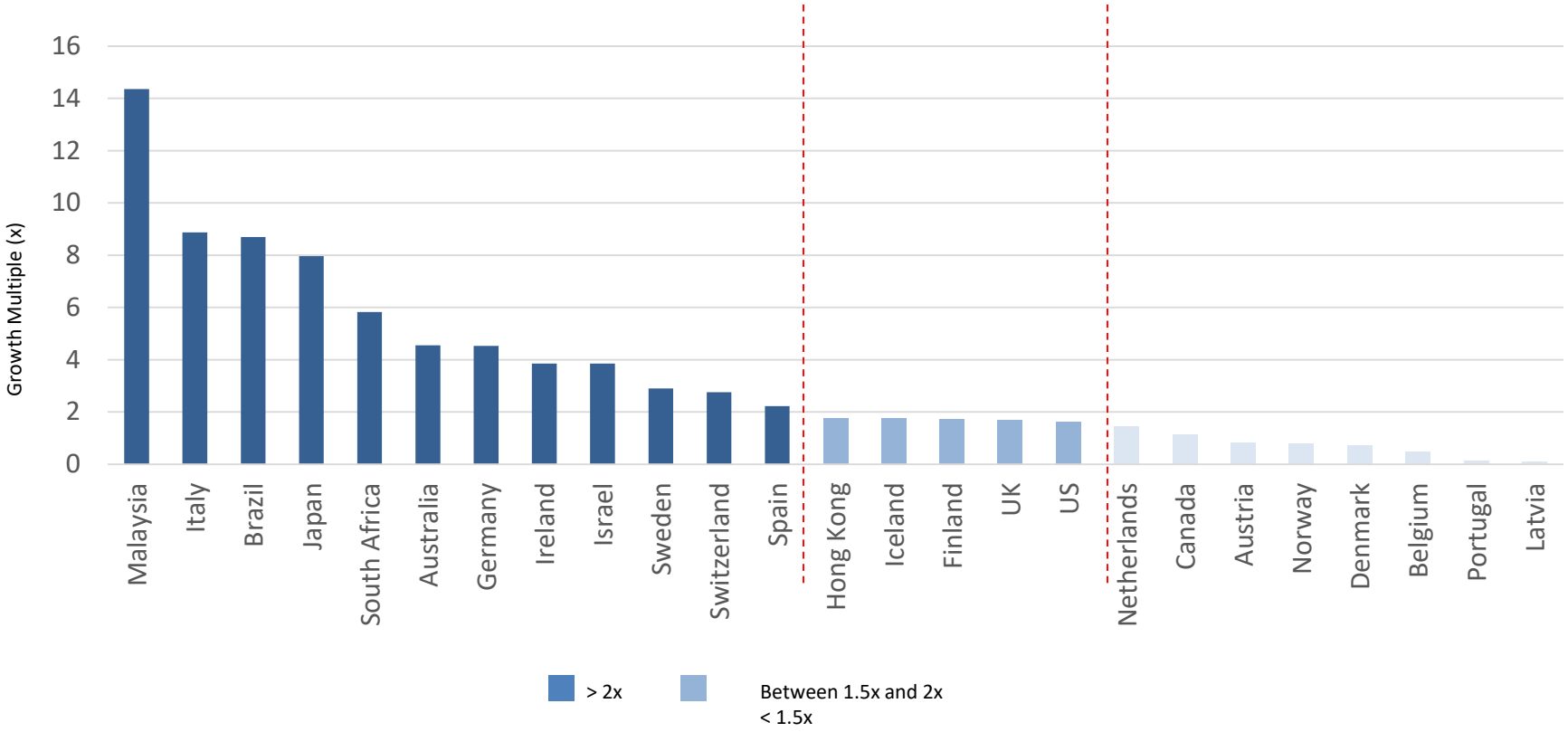



*Excludes South Korea and Malaysia with growth multiples of 114.93x and 32.50x, respectively.

Note: The figure excludes countries with only one fund reported.

# Allocation to Alts 2017 as a multiple of 2008 level

Value-weighted (within country) averages
(funds with 10 years of data)

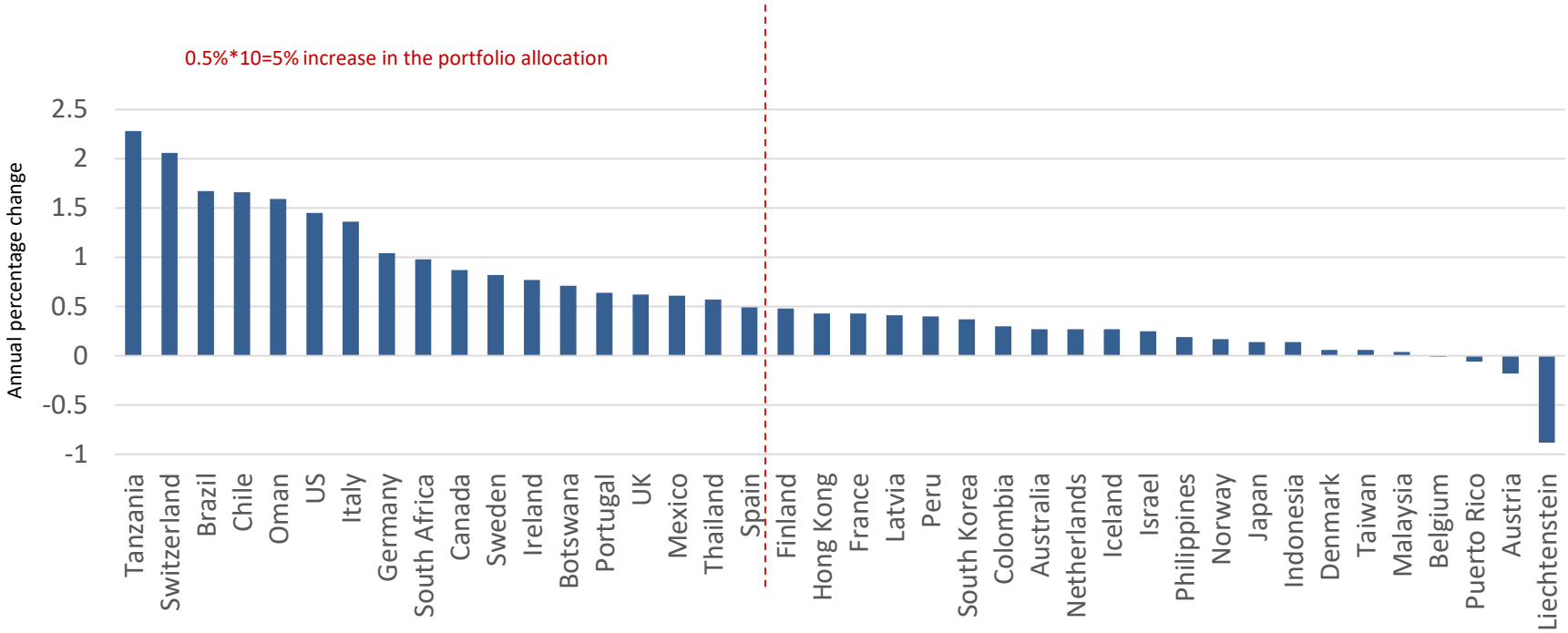



*Excludes France and South Korea with growth multiples of 60.34x and 24.31x, respectively.

Note: The figure excludes countries with only one fund reported.

# Annual change in pp (% AUM), 2008-2017

Equally-weighted (within country) averages
(funds with 5 years of data)




Note: The figure excludes countries with only one fund reported.

# Alts Allocations by Fund Size

| Size percentile | Mean 2008 AUM ($ billion) | Alts holdings (% of AUM) 2008 | | 2017 | | Diff. (2017-2008) | |
|---|---|---|---|---|---|---|---|
| 1 | 0.049 | 2.76 | | 9.27 | | 6.50 | *** |
| 2 | 0.153 | 3.04 | | 11.95 | | 8.91 | *** |
| 3 | 0.328 | 5.57 | | 9.93 | | 4.36 | *** |
| 4 | 0.576 | 7.10 | | 10.92 | | 3.81 | *** |
| 5 | 0.913 | 5.16 | | 11.77 | | 6.61 | *** |
| 6 | 1.400 | 7.49 | | 12.28 | | 4.79 | *** |
| 7 | 2.136 | 8.21 | | 12.58 | | 4.37 | *** |
| 8 | 3.613 | 6.41 | | 12.97 | | 6.56 | *** |
| 9 | 7.463 | 7.21 | | 13.11 | | 5.90 | *** |
| 10 | 56.365 | 9.57 | | 13.16 | | 3.59 | *** |
| Diff. | (10) - (1) | 6.81 | *** | 3.90 | *** | | |

- This phenomenon affects small and large funds; most pronounced for the small funds

# Alts Allocations by Fund Size (2)

| Dependent variable: | Average annual change in Alts holdings, 2017-2008 | | | |
|---|---|---|---|---|
| | Funds with at least 5 years of data | | Funds with 10 years of data | |
| | (1) | (2) | (3) | (4) |
| 2008 AUM ($billion) | -0.0049** | -0.0041* | -0.0040** | -0.0050** |
| | [0.002] | [0.002] | [0.002] | [0.002] |
| Constant | 1.11*** | 1.11*** | 1.03*** | 1.03*** |
| | [0.046] | [0.044] | [0.047] | [0.044] |
| Fixed effects: Country | -- | Yes | -- | Yes |
| Observations | 1,940 | 1,940 | 1,025 | 1,025 |
| *R*-sq. | 0.002 | 0.1152 | 0.004 | 0.139 |

*cross-section*

- This phenomenon affects small and large funds; most pronounced for the small funds even within the same country

# Allocation to Alts by Fund Type, 2008-2017

## Equally-weighted (within country) averages
## (funds with 10 years of data)

| Country | Region | Equally-weighted | | | | | |
|---|---|---|---|---|---|---|---|
| | | Public funds | | | Private funds | | |
| | | # of funds | Δ 2008-17 (pp) | Growth | # of funds | Δ 2008-17 (pp) | Growth |
| Developed markets: | | | | | | | |
| US | Americas | 300 | 12.27 | 2.27 x | 210 | 11.96 | 3.88 x |
| Canada | Americas | 18 | 5.82 | 1.31 x | 20 | 7.80 | 3.44 x |
| Australia | Asia & Pacific | 2 | 8.07 | -- | 5 | 0.14 | 1.02 x |
| UK | Europe | 91 | 4.87 | 1.50 x | 116 | 4.95 | 1.85 x |
| Switzerland | Europe | 18 | 16.04 | 3.05 x | 42 | 13.72 | 2.80 x |
| Denmark | Europe | 12 | 0.93 | 1.13 x | 5 | -4.92 | 0.57 x |
| Iceland | Europe | 10 | 1.83 | 1.40 x | 1 | 11.50 | 4.29 x |
| Sweden | Europe | 8 | 0.56 | 1.03 x | 15 | 10.34 | 2.03 x |
| Netherlands | Europe | 6 | -7.53 | 0.56 x | 29 | 1.19 | 1.16 x |
| Finland | Europe | 4 | 3.99 | 1.24 x | 11 | 3.27 | 1.21 x |
| Germany | Europe | 4 | 14.09 | 2.37 x | 15 | 7.81 | 3.32 x |
| Norway | Europe | 3 | 2.89 | 1.22 x | 6 | -1.23 | 0.88 x |
| France | Europe | 2 | 6.60 | -- | 3 | -0.67 | -- |
| Israel | Middle East & Africa | 1 | 5.00 | 6.00 x | 1 | -0.46 | 0.87 x |
| Emerging markets: | | | | | | | |
| Brazil | Americas | 2 | 18.55 | 4.57 x | 5 | 11.86 | -- |

- This phenomenon affects both public and private funds

# Private Funds are “Runnable”

*“The management of savings is a competitive market, the client can take the money and walk away. […] Note that if we transfer a client, we basically transfer client’s cash. The largest client has around 2.5% of the assets. But the reason why the largest client would leave us is maybe the same reason why the second largest, the third largest, etc. would leave us, and that’s because there would be better investment performance elsewhere.”*

PFA CEO, interview quoted in HBS Case 218-025

# A Mechanical Explanation?

## (vs. strategic change)

- Central metric is:

(3) Is it plausible that the expected return on Alts had gone up sufficiently to justify the raise?
Jenkinson et al. (2016): NAVs are an accurate estimate of future cash flows

(2) Global "dry powder" has been rising from $1 trillion to $1.7 trillion in the five years leading to 2017 (undrawn funds (e.g., Bain & Co., 2018)

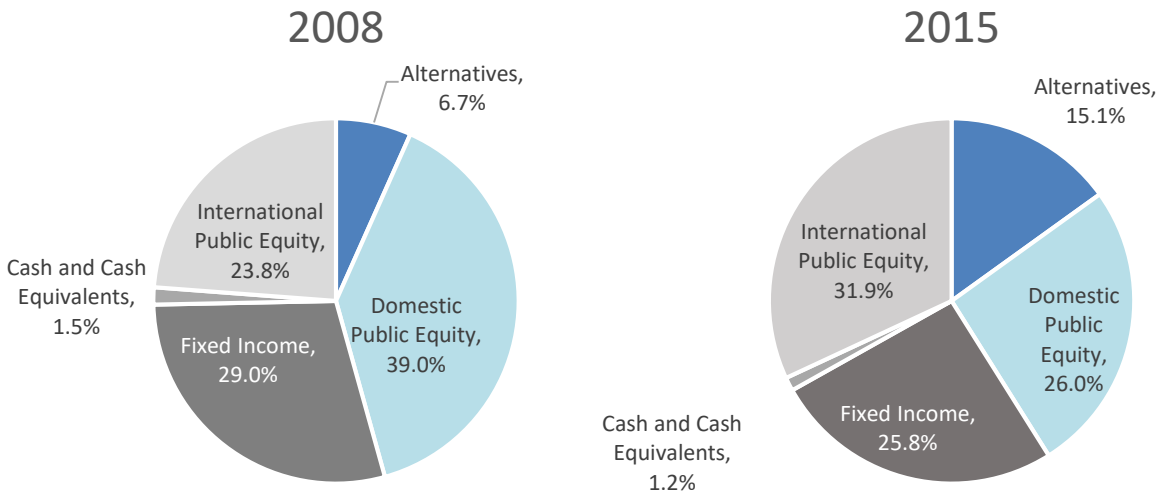
$$\frac{Total\ NAV_{it}^{Alts}}{AUM_{it}} = \frac{\sum_J Drawn\ capital_{ijt} * (1 + E_t(R_j))}{AUM_{it}}$$

(1) According to OECD, 2000-2008 annual growth rate of global pension funds AUM was 5%
It is 5.8% in our sample

# Change in AUM Composition over Time

## Median allocation to asset classes, 2008 vs. 2015

- P&I data: U.S. DB funds




Median net percentage point change in allocations*

| | **Alternatives** | **Domestic Public Equity** |
|---|---|---|
| Δ 2015-2006 | 10.7 ↑ | -19.6 ↓ |
| Δ 2015-2008 | 8.4 ↑ | -13 ↓ |

*Statistically significant at 1%

# Expected Returns
# (back-of-the-envelop calculation)

- 2008-2017:
  - S&P 500:  15.3% annualized total rate
  - MSCI World Index: 12.6% annualized total rate
- Assuming:
  - 2% return on fixed income (25% of AUM) and 0% on cash equivalents
  - 60% in equity, 15% annualized return on equity
- For Alts to shift from 7.4% to 19.6%  of AUM, expected return on Alts—net of fees—has to be 25.9% per year (~32% gross of fees)

As compared to:

- Preqin: S&500 PME for 2007-2017 vintages (the bulk of the portfolio in 2017)
  - For PE: 1.03 (SD 0.06)
  - For RE: 0.85 (SD 0.17)
  - For all private asset classes: 0.94 (0.04)

# Tying Rise in Alts Allocations to Interest Rate Environment

- Rise in Alts allocations is slow-moving:
  - the nature of these investments is opportunistic
  - diversification further slows it down
  - pensions need to build an in house capacity for screening if not sourcing
  - anecdotally, these are strategic shifts (and pensions are not exactly agile institutions)
  - Alts are highly illiquid: once invested, the position is not easy to undo

- Focus on long-term interest movement instead

- Challenge: this is international context

  Use Holston, Laubach and Williams (2017): USD, CAD, Euro, GBP

  Extend to JPY (doesn't affect the results)

  Implicit assumption: Home-currency bias (Maggiori, Neiman, and Schreger, 2018)

# Tying Rise in Alts Allocations to Interest Rate Environment

| Dependent variable | Average annual change in Alts share (% AUM), 2008-2017 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Natural rate | -0.4602** | -0.3574* | -0.4938** | -0.5301** |
| | [0.179] | [0.190] | [0.202] | [0.232] |
| GDP growth | 0.3058 | 0.3001 | 0.4140 | 0.4140 |
| | [0.215] | [0.215] | [0.258] | [0.254] |
| Inflation | -- | -0.2691 | -- | 0.1237 |
| | | [0.265] | | [0.357] |
| AUM | -0.0048* | -0.0050* | -0.0049 | -0.0047 |
| | [0.003] | [0.002] | [0.004] | [0.004] |
| Constant | 0.8075 | 1.2191*** | 0.6658 | 0.4759 |
| | [0.469] | [0.402] | [0.523] | [0.522] |
| Observations | 867 | 867 | 1,595 | 1,595 |
| *R*-sq. | 0.048 | 0.050 | 0.037 | 0.037 |

*cross-section*

# In Sum

- Following the 2008 Global Financial Crisis there has been a large, pro-active increase in pensions allocations to Alts:
  - This is an international phenomenon
  - It affects both Public (proxy for DB) and Private (proxy for DC) funds
  - It affects funds of all sizes
  - It is hard to reconcile with expectations for the Alts performance or with mechanical changes in Alts' NAV
  - It is positively associated with the variation in the natural rates

# Final Thoughts

- These findings point out to substantial exposure ($1.8 trillion increase just in our sample, and that is despite the slow down in capital calls) of wider range of households to private asset class

- They also point out to mounting pressure on Alts future performance (sensitivity of returns to inflows is an enduring patter for PE, e.g., Kaplan and Stein, 1993; Gompers and Lerner, 2000; Kaplan and Schoar, 2005)

- This is particularly concerning given the governance issues and/or lack of sophistication of many of the pension funds