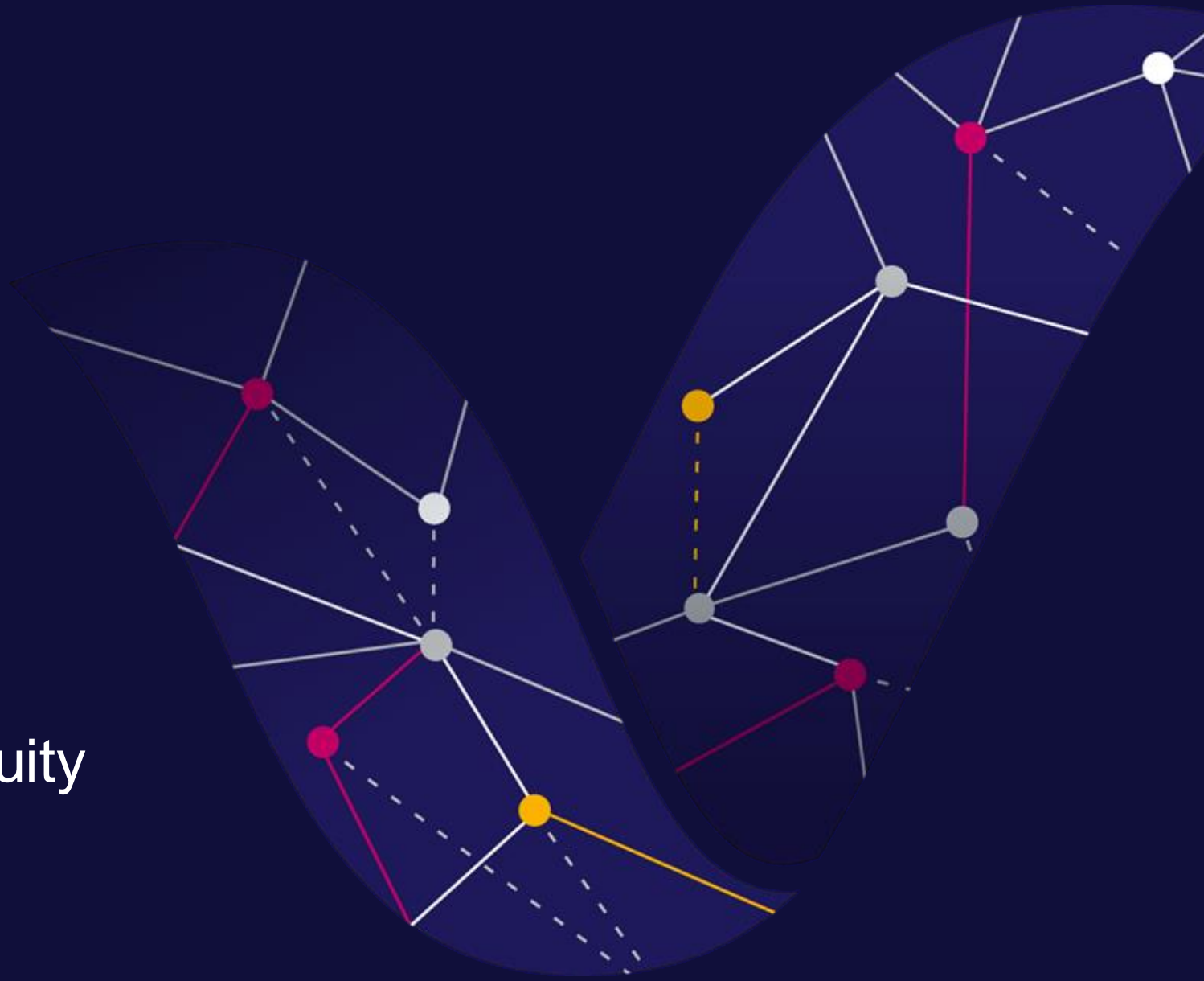
VALLORII

Stock markets
Valuation and the Cost of Equity

Roundtable, 16th September 2026

CONFIDENTIAL



Our outlook for 2026:
We build the VAPRI risk catalogue and discuss immediate impacts

January

Affordability

How to balance infrastructure investments with affordability envelopes?

March

Depreciation

What does it mean to depreciate infrastructure assets?

May

Financial resilience

How do we ensure financially resilient infrastructure assets?

July

Geopolitics

What impact does geopolitics have on infrastructure and the Cost of Equity?

September

Vallorii Leaders Forum

Invitation-only gathering of senior leaders to explore how to deliver infrastructure

September

Stock markets

What does the stock (& public fund) market tell us about the Cost of Equity?

November

Liquidity

What is liquidity and how does it impact the Cost of Equity?

2027

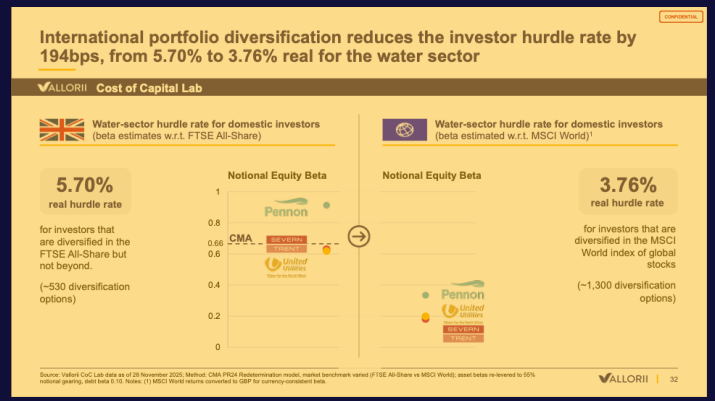
New plan

Discussion with Members on Roundtable topics for 2027

Vallorii's inaugural Forum gathered >40 senior leaders across the infrastructure sector

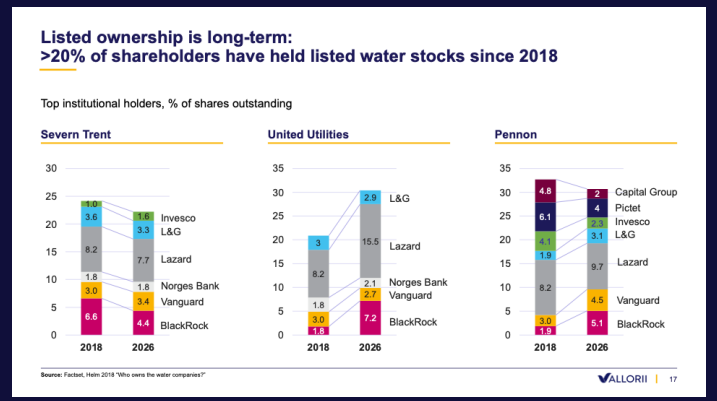
In July, we discussed how CAPM gives lower CoEs to international investors
Today, we discuss why and if companies should list to lower their CoE

July Roundtable



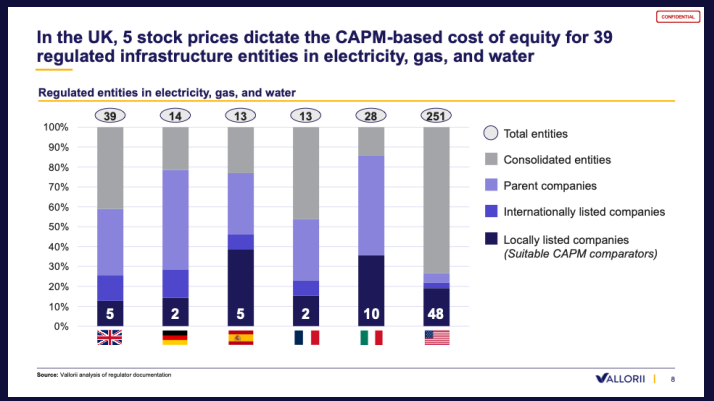
Based on CAPM, international investors Cost of Equity is **~200bps** below that of domestic investors.

1 How do stock prices impact regulatory Cost of Equity?



CAPM measures short-term investment risks. Long-term investors are exposed to different risks.

2 Should utilities list on stock markets again?



Since privatisation, the number of listed UK utilities has fallen from **>30 to 5**.

Source: Vallorii Roundtables

Regulators rely on stock market data to set the Cost of Equity in price reviews

Stock-market based **CAPM as 'principal model'** to set allowances (confirmed in August 2026 consultation).

Return on over £100bn capital resting on CAPM with five comparator companies and regulatory judgement

Newly added European comparators to the Cost of Equity estimate in RIIO-T3.

DESNZ relies on stock-market based CAPM to estimate **generation technology hurdle rates.**

Redeterminations **re-test the same market evidence**; ongoing debate on total market return vs equity risk premium.

Source: Ofcom Security Report (published Mar 2026); NSIA Annual Report 2024-25 and March 2026 reforms; HM Treasury & NISTA, UK Infrastructure: A 10 Year Strategy, June 2025 (gov.uk); Ofgem RIIO-T3 FD; National Gas RIIO-GT3 BP; BBC News, "Thames Water rescue plan attacked by excluded bidders; Industrial Strategy - Clean Energy Industries Sector Plan (DESNZ, 2025); Independent Water Commission Final Report (Jul 2025); ORR Annual Assessment of Network Rail 2024-25; CAA H8 initial proposals and Heathrow ANPS consultation (Jun 2026); press reporting

Agenda

1 ***How do stock prices impact regulatory Cost of Equity?***
CAPM prices risks for listed companies based on short-term stock market volatility

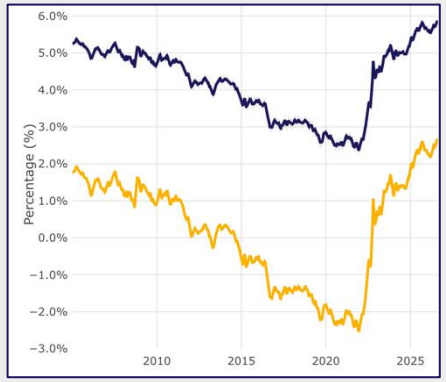
- *Theory recap:* CAPM beta measures investor risks on daily stock volatility, not long-term uncertainty.
- *Short-term price volatility cancels out:* Stock prices vary with the market in the short-term. Short-term volatility cancels out over time. Long-term trends don't cancel out and lead to large differences between companies.
- *Short- vs. long-term investors:* >20% of UK have been held since 2018. Private companies are held exclusively by long-term investors (excluding distressed debt).

2 ***Should utilities list on stock markets again?***
Stock market listing impact borrowing strategies but little else

- *Few companies are listed:* From >30 listed utilities in the UK, only 5 remain due to privatisation and consolidation
- *No clear performance differences:* Listed companies outperform unlisted companies in investor returns and operational outcomes for the water sector. The same is not true in other sectors.
- *Balance sheets differ:* On average, listed companies show lower gearing and lower CoD than unlisted (63% vs. 73%, 60bps CoD difference). Taken together, listing has limited impacts on equity returns; between-company differences dominate.

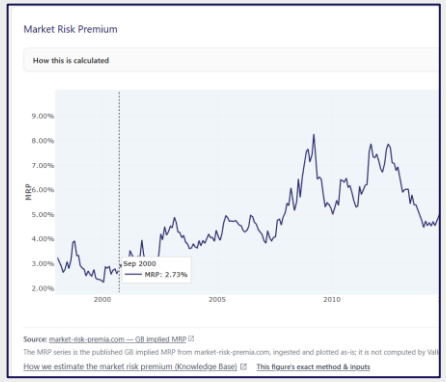
Theory recap: CAPM quantifies Cost of Equity based on beta. Beta is estimated from historical stock returns

Risk-free rate (RFR)



Regulators estimate the hypothetical risk-free rate from **government bond yields**.

Total market return (TMR)



Regulators estimate the market-wide return expectation **ex-ante and ex-post from market returns**.

Risk: CAPM Beta

Regulators estimate beta for a **group of listed comparator companies**

Focus today

Beta → Correlation between daily stock return and market return

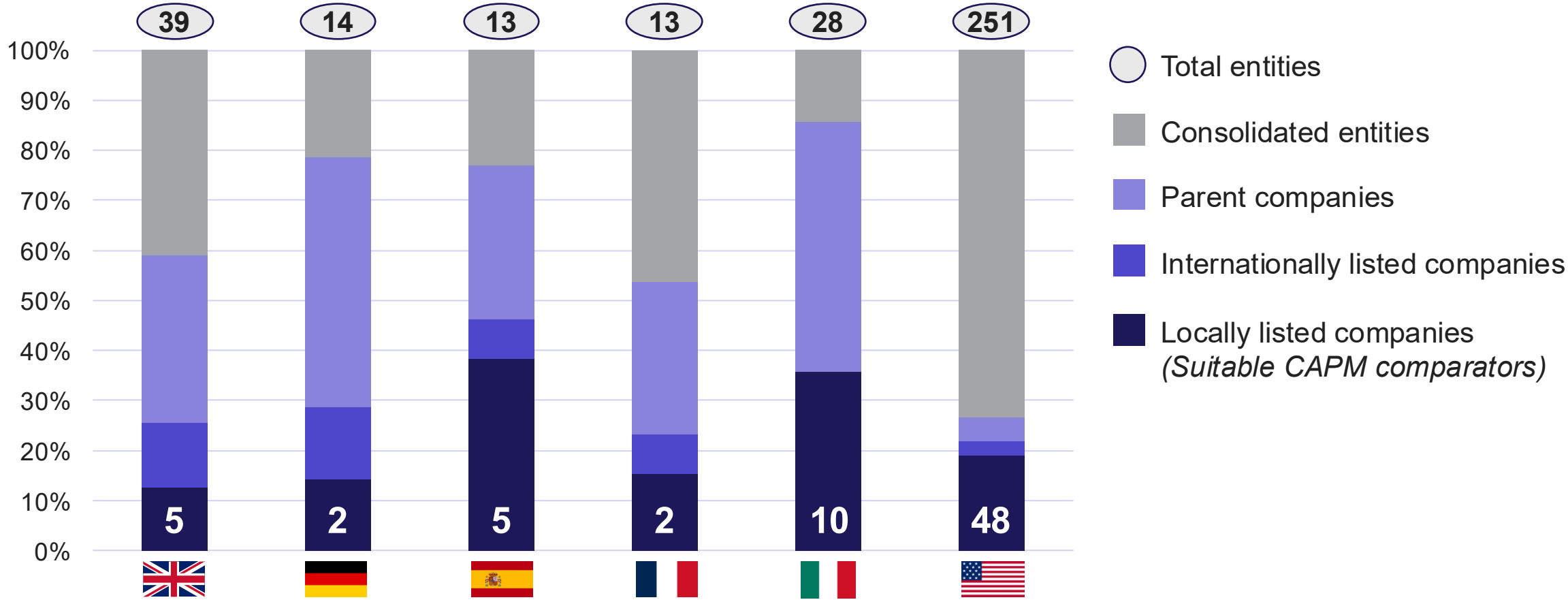
Beta is estimated from historical daily stock returns.

- Beta is high for stocks where daily returns are **highly correlated with the market index**
- **Price volatility and correlation** drive the CoE in CAPM

Source: Vallorii Cost of Capital Lab, Market-Risk-Premia.com

In the UK, 5 of 39 regulated infrastructure are locally listed (and used in CAPM). The picture is similar in other countries.

Regulated entities in electricity, gas, and water



Source: Vallorii analysis of regulator documentation; **Note**: UK entities relate to Ofwat and Ofgem regulated entities across ED, ET, GD&T and Water & Wastewater

Poll #1: What methodology should investors be using to define their return requirements?

Stock return – using CAPM beta

Stock return – alternative top-down models, e.g., multi-factor

Ratios – e.g. Market-to-Asset / Price-Earnings / Price-Book

Fundamental bottom-up – VAPRI or similar

Other – Prepare for a follow-up!

Utility stocks have substantial volatility. Over the past 10 years, 90-day utility returns have varied by ~15% on average

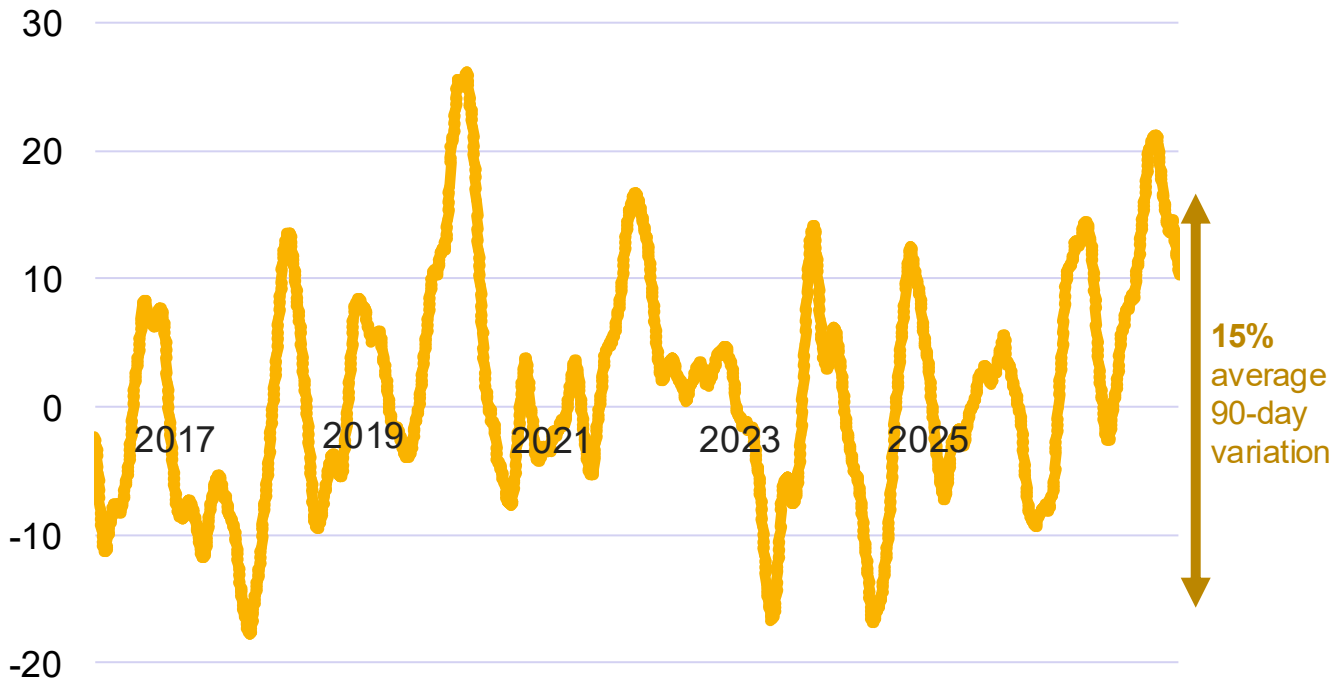
Drivers of short-term utility price volatility

A **Utility stocks react to gilt yield changes**

B **Utilities provide little protection against short-term market volatility**

C **Index-linked fund ownership has increased volatility and CAPM betas**

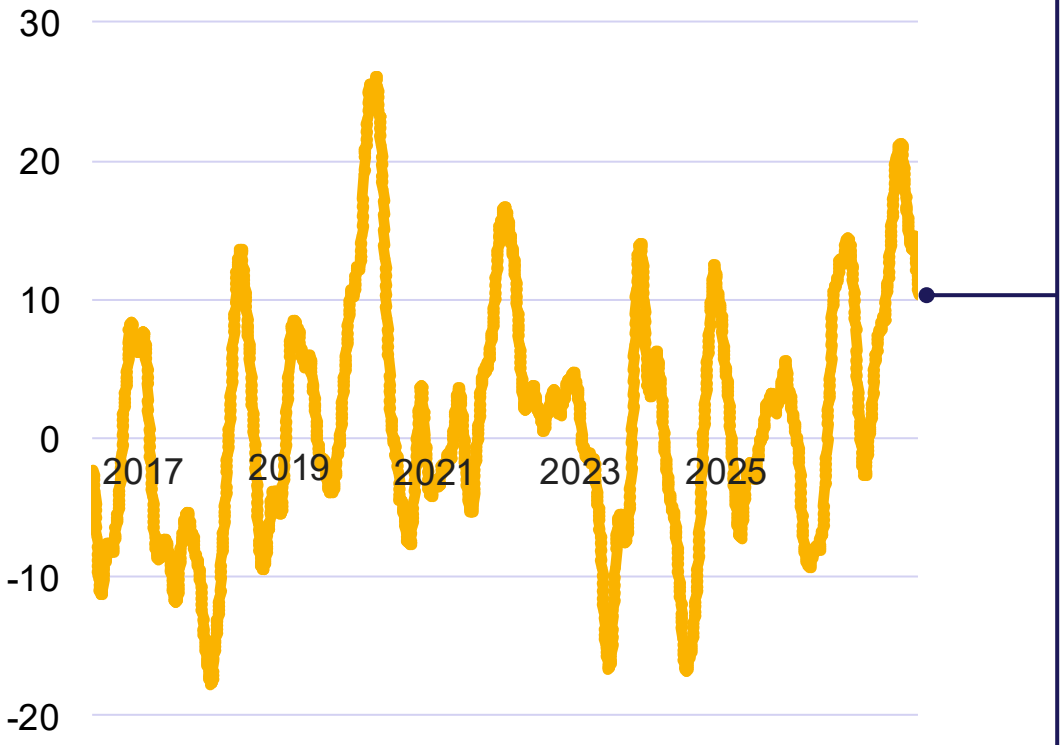
UK utility index returns (90-day, smoothed)



Source: Equal-weighted index of NG, PNN, SSE, SVT, UU from FactSet

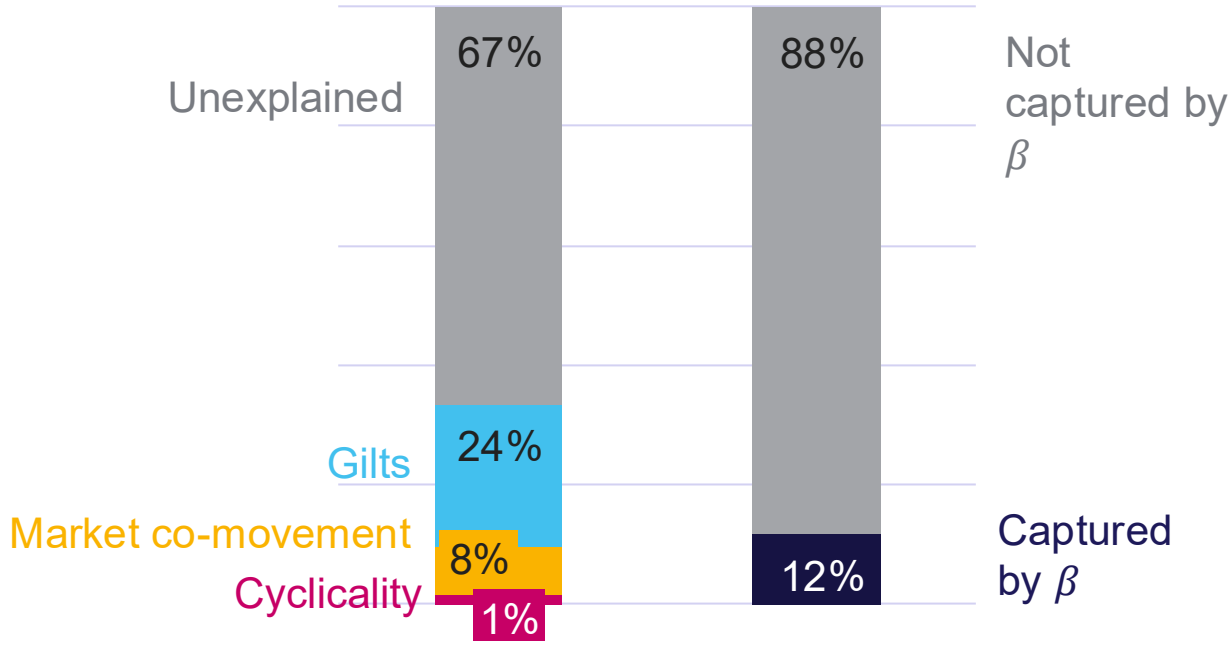
A Gilt yield changes explain ~24% of 90-day utility return volatility. CAPM prices ~12% of 90-day volatility

UK utility index returns (90-day, smoothed)



What drives monthly utility stock volatility?

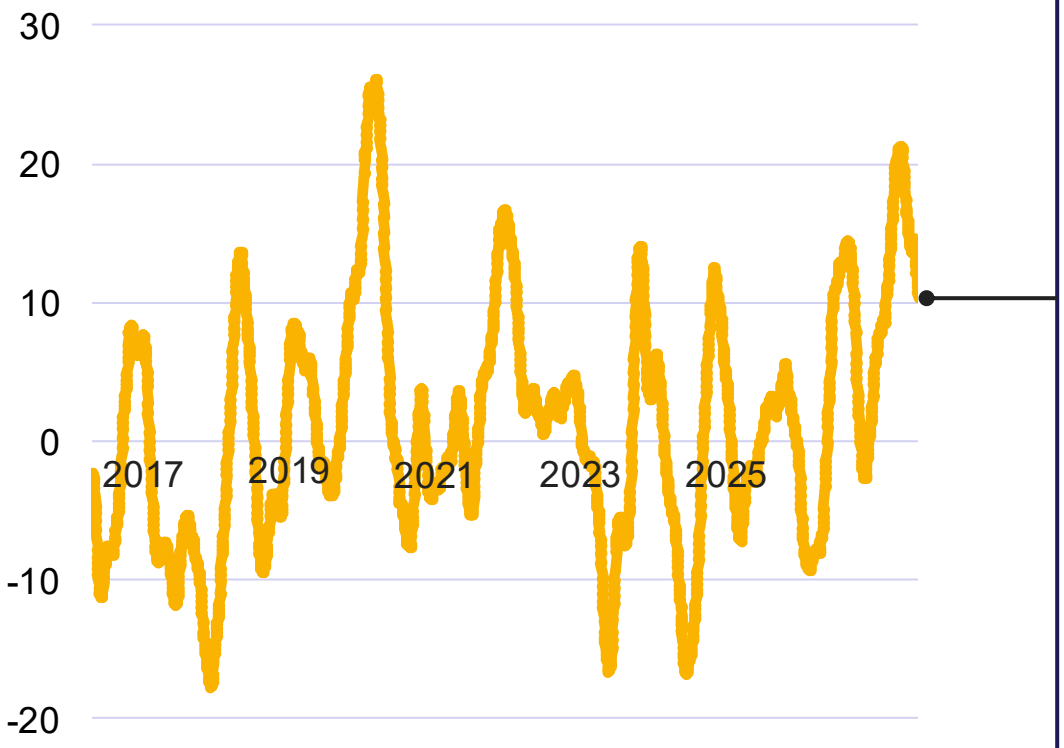
Share of monthly return variance (Jan 2020–May 2025) , %



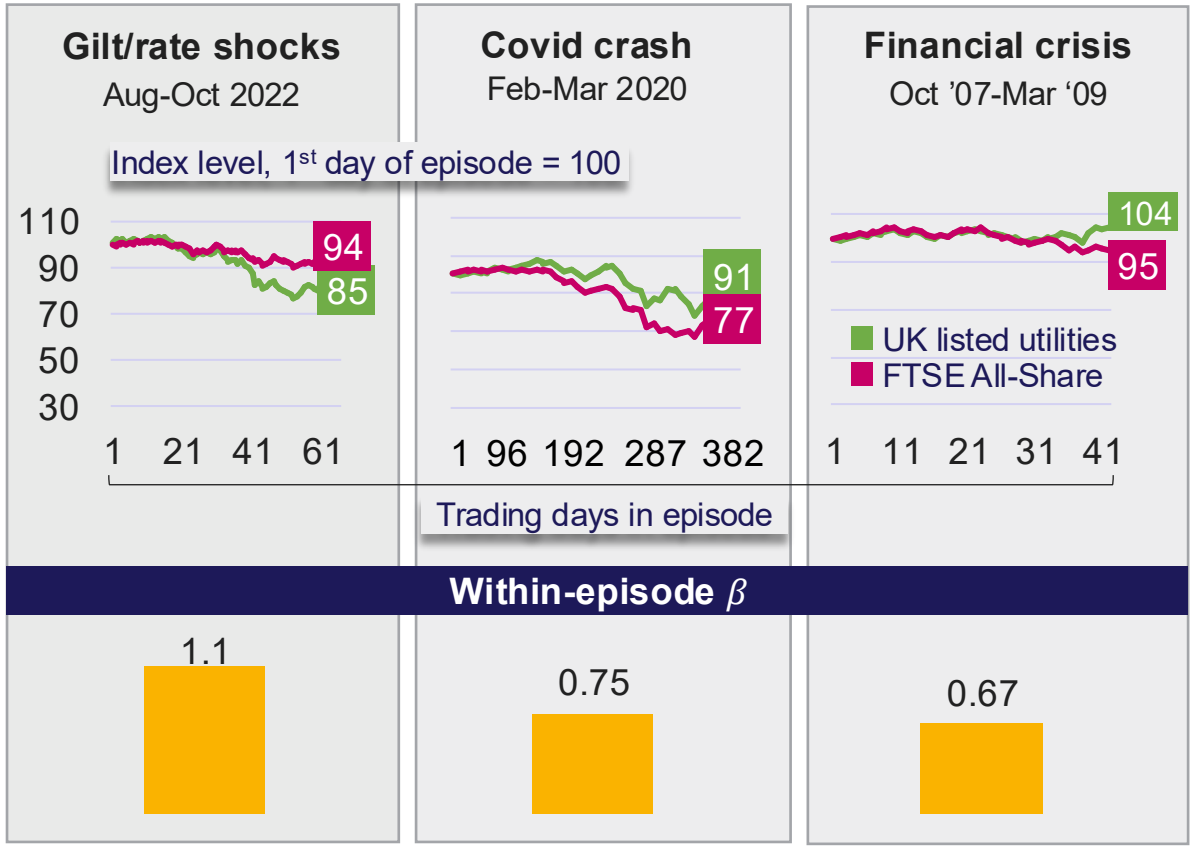
Source: Vallorii Cost of Capital Lab. Equal-weighted index of NG, PNN, SSE, SVT, UU from FactSet. Monthly excess returns for NG, PNN, SSE, SVT, UU (Jan 2020 – May 2025, 65 obs) regressed on the FTSE All-Share, the m/m change in the 10yr real gilt yield and GVA growth; R^2 apportioned by Shapley value, averaged across the five. Bar 2 is the R^2 of the market factor alone; the bars are not additive, and the residual is unexplained by these three factors, not proven company-specific.

B Utility stocks provide only limited protection against market shocks

UK utility index returns (90-day, smoothed)



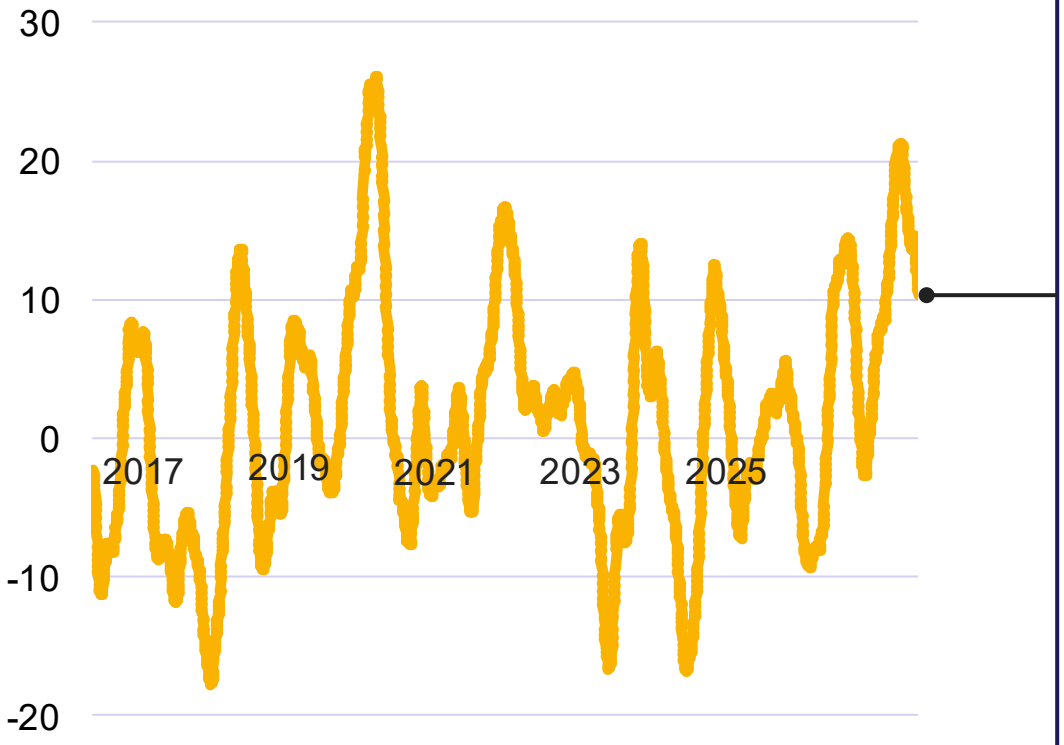
What happens during market shocks?



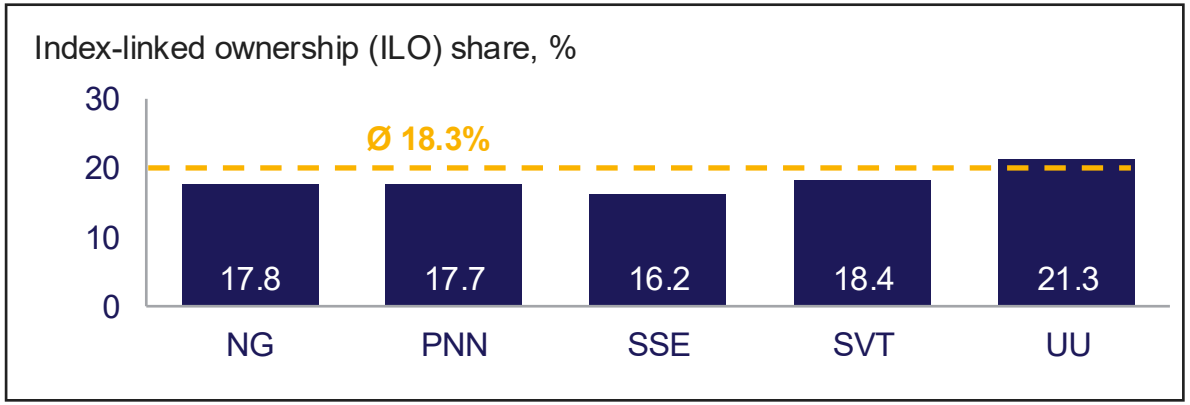
Source: Vallorii Cost of Capital Lab. Equal-weighted index of NG, PNN, SSE, SVT, UU from FactSet; price return, not total return. Episode panels rebased to the first day of each episode.

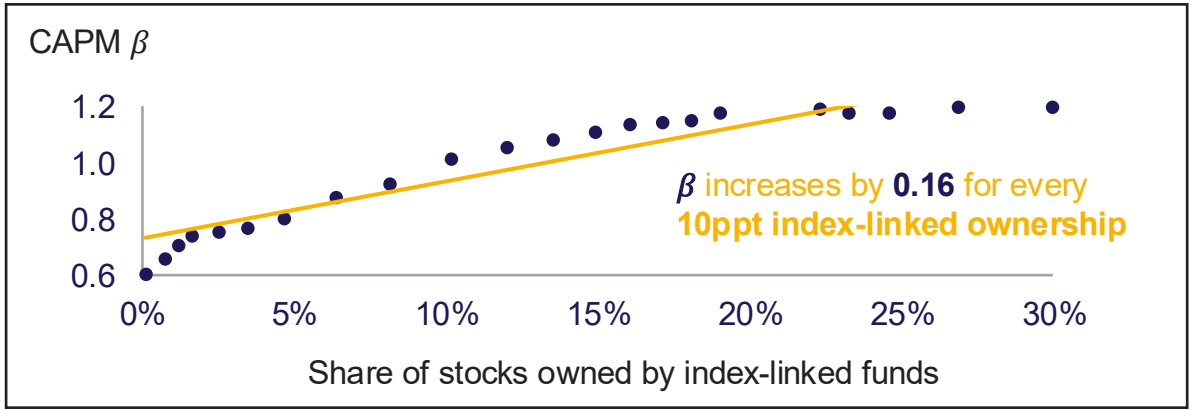
C 20% of UK utilities are owned by index-linked investors. This increases volatility and CAPM beta by ~200bps

UK utility index returns (90-day, smoothed)



Index-linked ownership increases beta



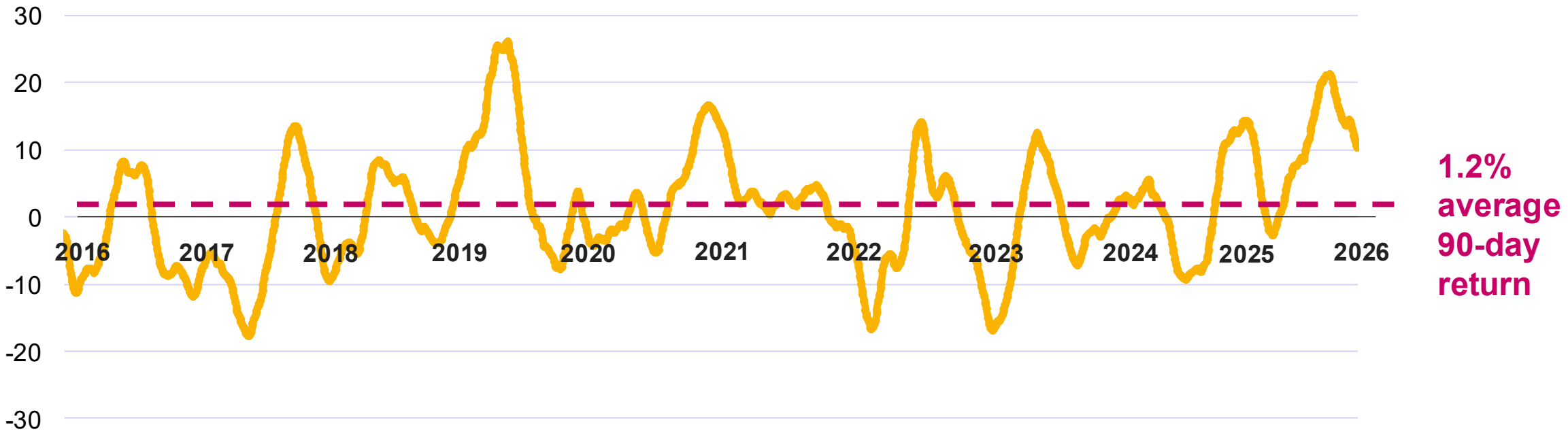


Source: Vallorii Cost of Capital Lab. Equal-weighted index of NG, PNN, SSE, SVT, UU from FactSet. Kontz et al. 2026

However, utility return volatility cancels out over time! (Mean-reversion)

The average long-term 90-day utility return is 1.2%, while the CAGR over the decade is ~5%

UK utility index returns (90-day, smoothed), %

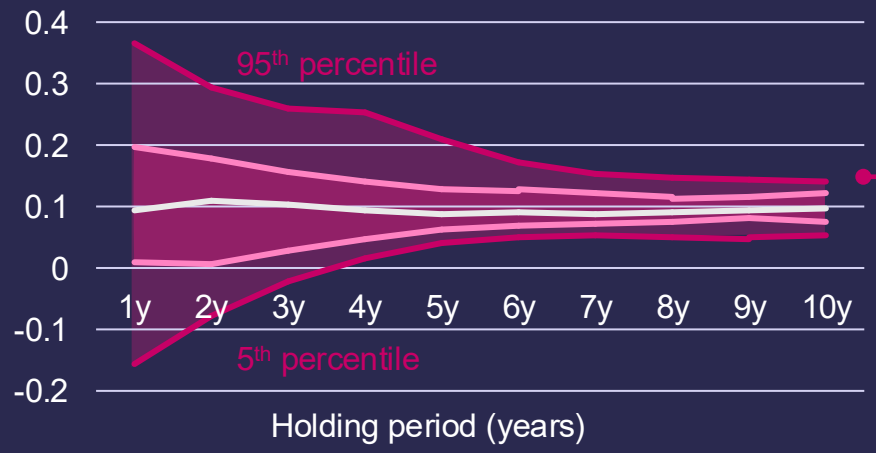


Source: UK utility index includes NG, UU, SVT, PNN, SSE (equal weights)

Over long holding periods, short-term (monthly) volatility cancels out. Compounded equity returns are de-risked over time (time diversification).

SHORT-TERM market movements

Compound equity returns, % annualised



Over time, compound returns become less risky.

Short-term stock market volatility cancels out / mean-reverts

Relevant traders

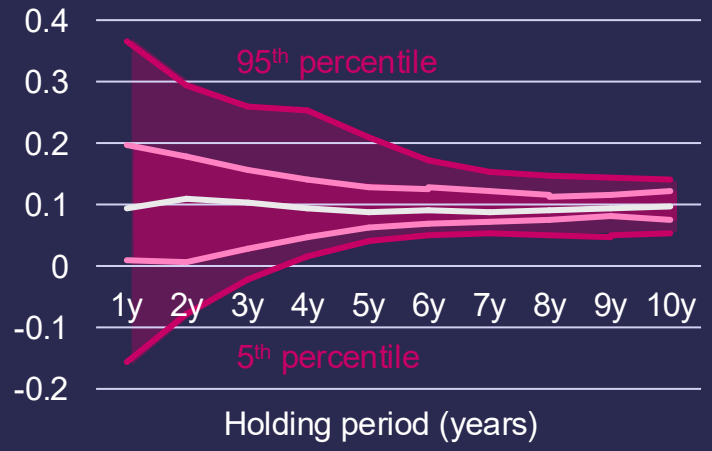
- Quantitative and qualitative Hedge funds
- Short-term retail investors

Source: (1) Vallorii IFM factor run (rolling CAPM vs FTSE All-Share, 2020-2025, mean of five comparators); (2) FactSet weekly prices, price only, equal-weighted basket, all overlapping start dates 2001-2026. Track 2 percentiles are descriptive of one historical sample, not confidence intervals. Blanchett & Stempen 2024

However, compound wealth becomes more uncertain over time. Long-term traders need to worry about long-term risks.

SHORT-TERM market

Compound equity returns, % annualised

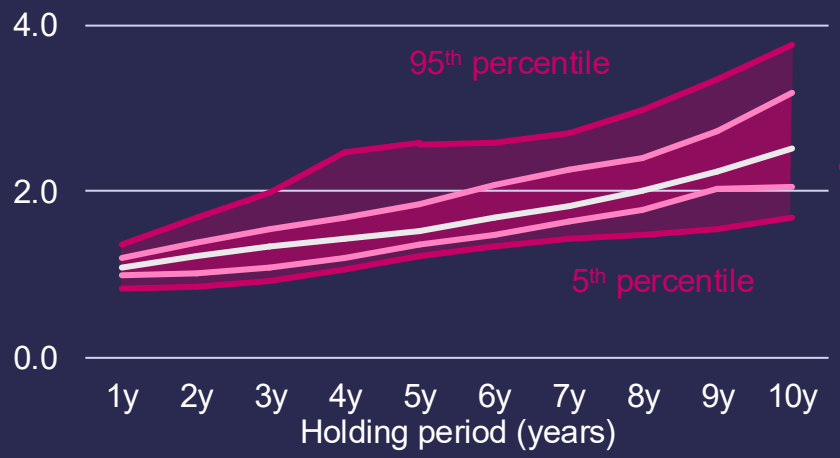


Relevant traders

- Quantitative and qualitative Hedge funds
- Short-term retail investors

LONG-TERM market

Compound equity wealth, nominal index



Relevant traders

- Institutional investors
- Long-term investment funds
- Long-term passive investments

Over time, compound wealth becomes more risky.

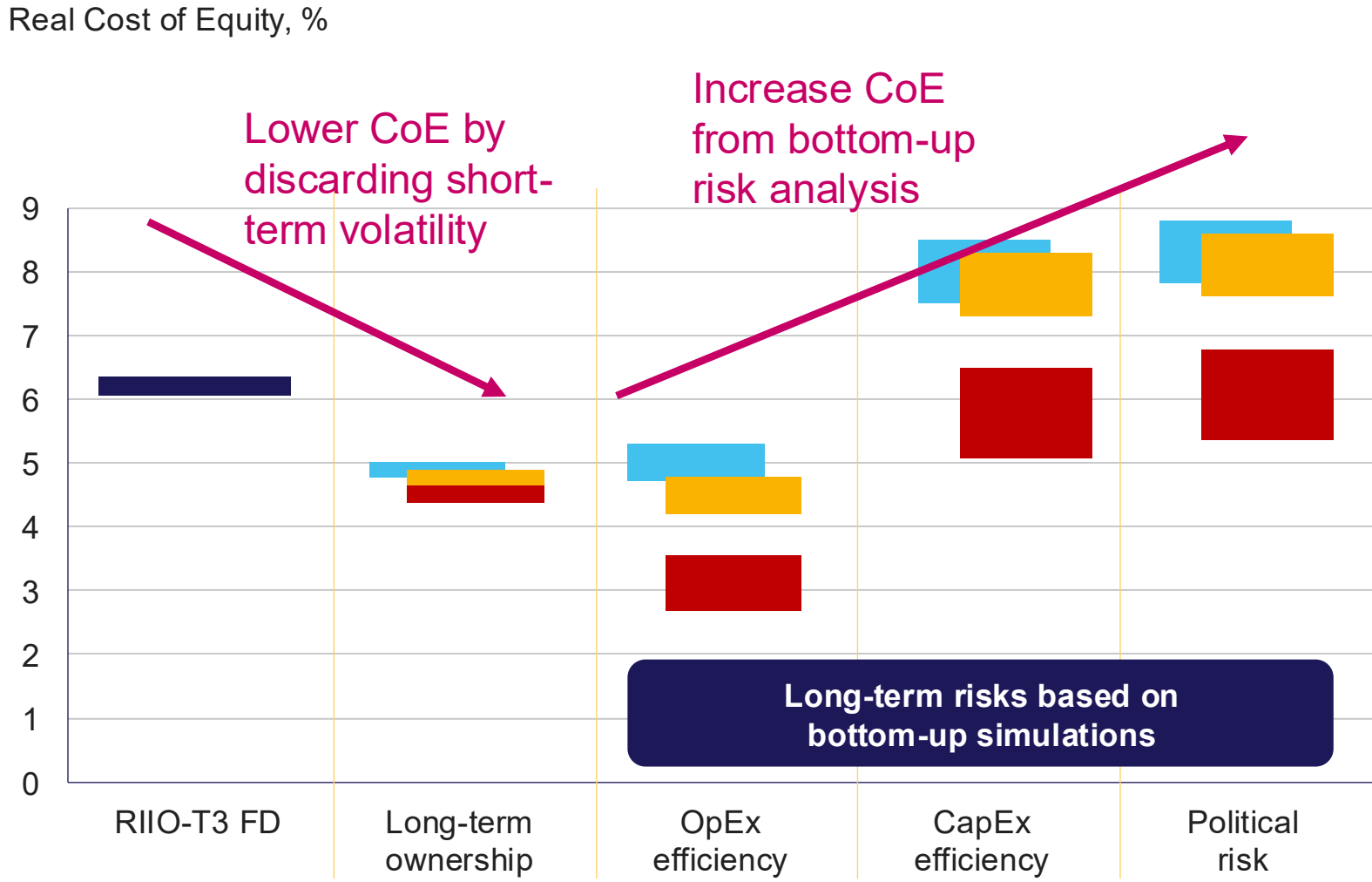
Long-term trend and value uncertainty compounds. Uncertain growth turns to uncertain wealth.

Source: (1) Vallorii IFM factor run (rolling CAPM vs FTSE All-Share, 2020-2025, mean of five comparators); (2) FactSet weekly prices, price only, equal-weighted basket, all overlapping start dates 2001-2026. Track 2 percentiles are descriptive of one historical sample, not confidence intervals. Blanchett & Stempen 2024

Price of risk model (VAPRI)

- Lowers CoE by reducing the impact of short-term volatility
- Increases CoE by considering long-term outcomes from fundamentals

Sector	Asset	CAPM, real (notional company)	VAPRI CoE (actual company)
Electricity Transmission	National Grid	5.7% (Ofgem T3 FD)	5.4 – 6.8%
	SSE		7.8 – 8.7%
	SP Energy Networks		7.7 – 8.5%



Listed ownership is concentrated: Top 11 shareholders hold on average ~31% of outstanding listed shares

Top institutional holders, % of shares outstanding

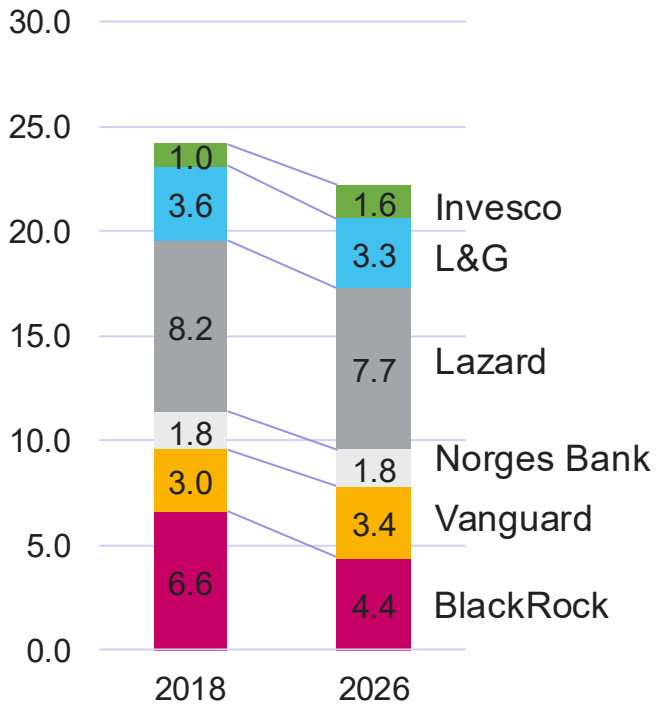
	BlackRock	Vanguard	Norges Bank	Lazard	L&G	Invesco	Pictet	Capital Group	Atlas	JP Morgan	Clear Bridge	Total
NG	6.9	2.6	1.7	1.9	1.6	1.1	-	3.4	-	-	1.2	20%
PNN	5.1	4.5	2	9.7	3.1	2.3	4	2	-	3.6	-	36%
SSE	5.1	2.6	3	-	-	3.7	-	3.8	-	-	4.7	23%
SVT	4.4	3.4	1.8	7.7	3.3	1.6	5.4	-	5.4	3.3	-	36%
UU	7.2	2.7	2.1	15.5	2.9	-	1.8	-	8.2	-	-	40%

Source: Factset

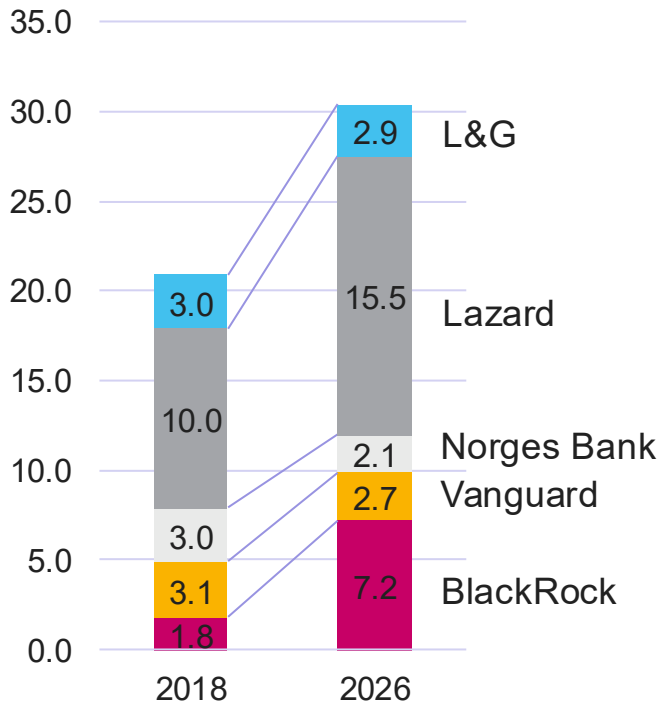
Listed ownership is sticky:
>20% of shareholders have held listed water stocks since 2018

Top institutional holders, % of shares outstanding

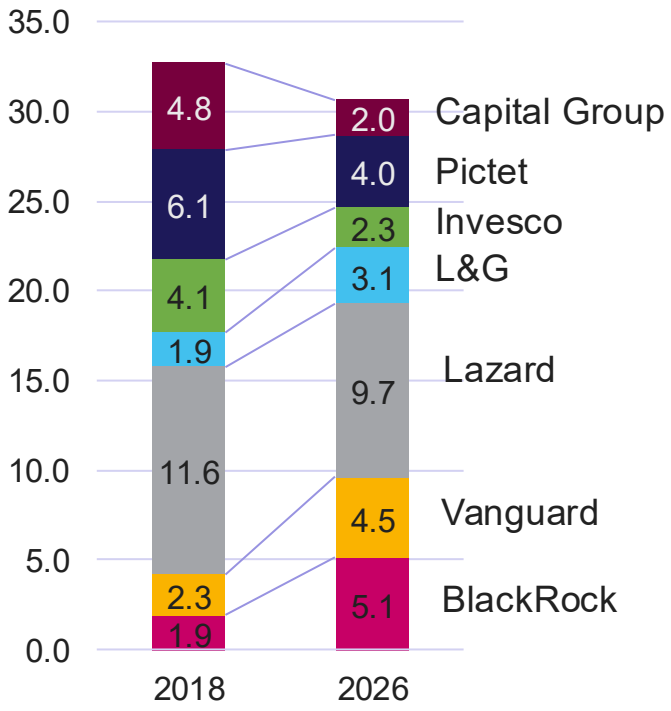
Severn Trent



United Utilities



Pennon



Source: Factset, Helm 2018 "Who owns the water companies?"

Poll #2: Should regulators care more about long- or short-term volatility in stock prices?

Short term – using CAPM is fine

Mid-term – some sensitivity to short-term volatility

Long-term – we really care about cumulative returns

All the same – no difference between holding periods

Other – Prepare for a follow-up!

Agenda

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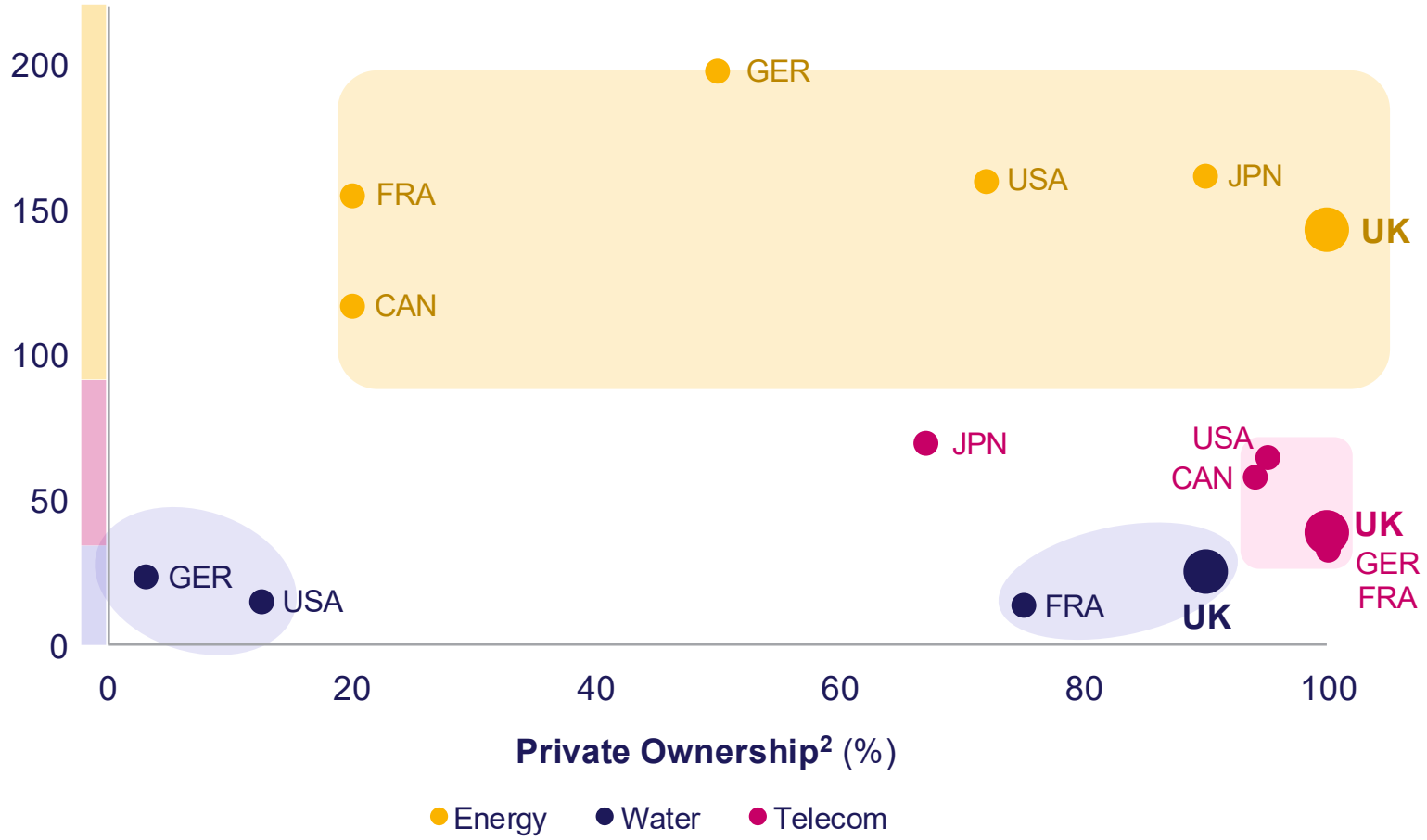
Should utilities list on stock markets again?
Stock market listing impact borrowing strategies but little else

- *Few companies are listed:* From >30 listed utilities in the UK, only 5 remain due to privatisation and consolidation
- *No clear performance differences:* Listed companies outperform unlisted companies in investor returns and operational outcomes for the water sector. The same is not true in other sectors.
- *Balance sheets differ:* On average, listed companies show lower gearing and lower CoD than unlisted (63% vs. 73%, 60bps CoD difference). Taken together, listing has limited impacts on equity returns; between-company differences dominate.

Private vs nationalised ownership does not imply higher or lower costs to consumers

Monthly consumer cost[1] (GBP)

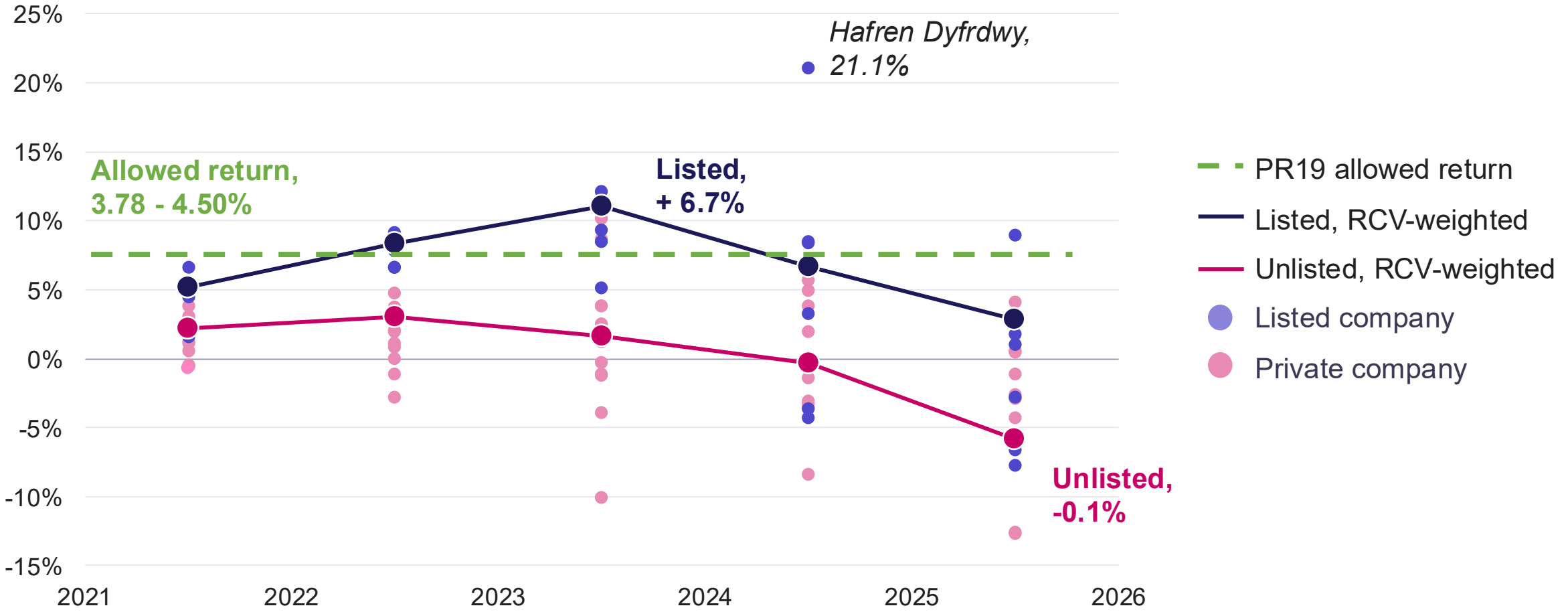


Source: Vallorii Analysis, government and regulator reports for each country. (1). Water: UN Water Statistics, EurEau Europe's Water in Figures 2021; Rail: National Transport Agencies annual filings; Broadband: OECD Broadband; Energy: IEA Energy Prices (2). Private ownership % reflects the proportion of infrastructure assets held by investor-owned companies, based on data from official sector reports and regulatory agencies. Public ownership includes state-owned enterprises, municipal utilities, and cooperatives. If private company partially publicly held without control is assumed to be fully private (as public ownership has no control rights)

Does listed vs. unlisted ownership provide better outcomes for consumers? investors?

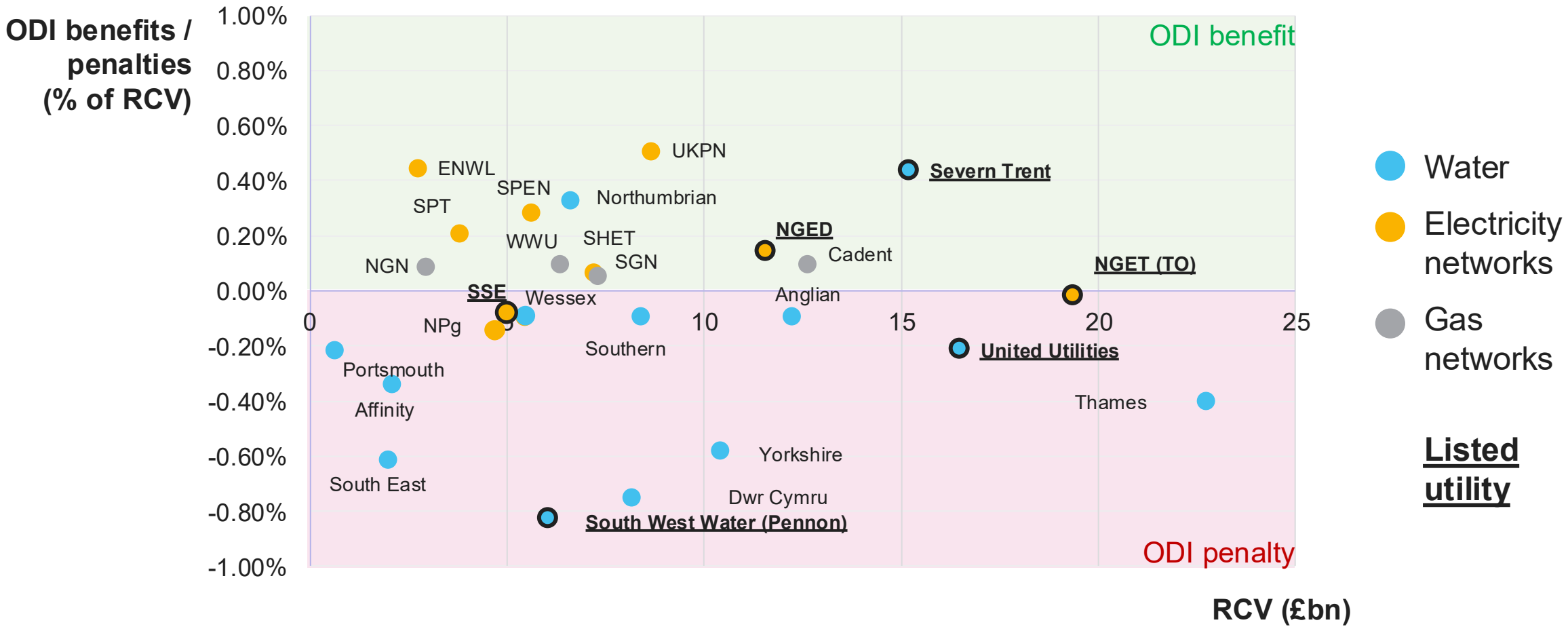
The three listed water companies out-earned unlisted ones in every year of AMP7, with a RoRE of 6.7% vs -0.1% (real)

RoRE, %real of notional regulatory equity



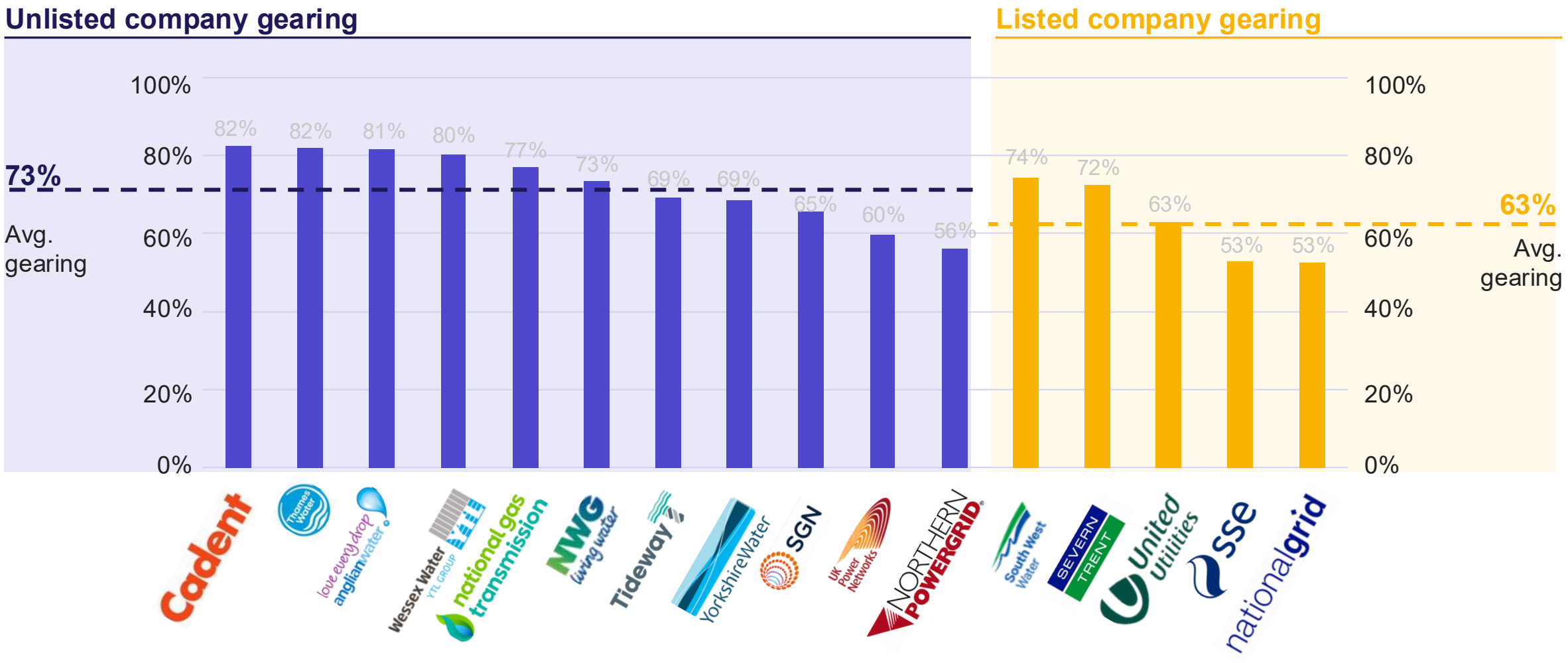
Source: Ofwat Monitoring Financial Resilience Reports, FY2021 to FY2025 (return on regulated equity, notional capital structure).
Method: Group means weighted by closing RCV (Ofwat PR19 RCV workbook 2025). Allowed return: Ofwat PR19 base return on regulatory equity, 3.73% to 4.50% by company, 4.10% AMP7 average. Listed = LSE-listed parent (Severn Trent, United Utilities, Pennon). Ofwat material under OGL v3.0.

Most listed companies have delivered solid outcomes to customers (ODIs)



Source: Ofwat APRs 2025-26 (Tables 4H, 3A); Ofgem RIIO-2 regulatory performance data 2024-25.
Notes: (1) Water FY2025-26, energy FY2024-25 (2025-26 RFPRs due 30 Sep 2026). RCV = net debt + regulatory equity, nominal. RAV = NPV-neutral equity RAV ÷ (1 − notional gearing), rebased to 2024-25 nominal. ODI = in-year financial ODIs only. Energy at group level. Water covers 12 of 17 appointees; (2) Thames going through restructuring and discussing payment plan with Ofwat.

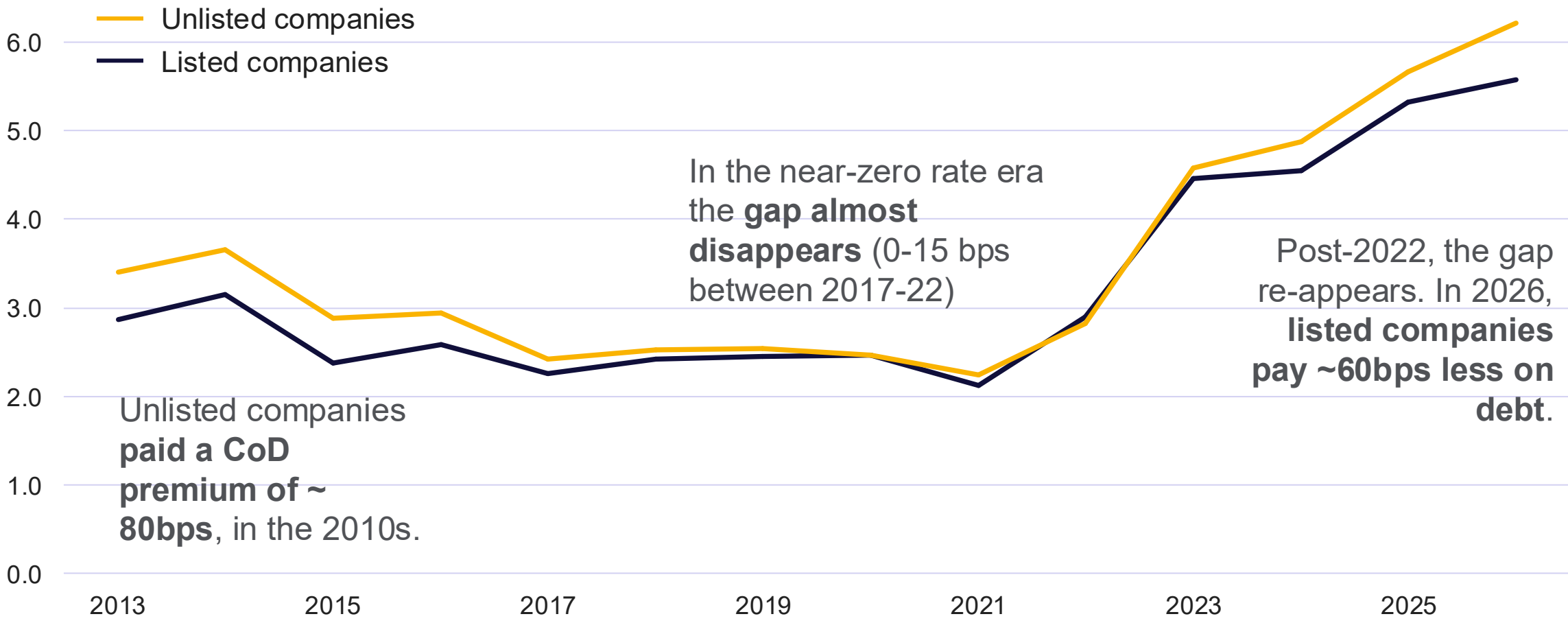
On average, private utilities are more highly geared (73%) than listed companies (63%), albeit with large differences across individual companies



Source: Vallorii analysis based on Companies House financial reports;
Notes: Gearing = net debt· RAV/RCV, FY2025, at regulated-entity (OpCo) level; Anglian, Northumbrian and Wessex use 2026 RAV and implied net debt to reflect recent equity raises. Exceptions: Northern Powergrid Dec-2024; Thames Water Mar-2023 (accounting period extension).

Since 2023, listed companies have paid ~60bps lower CoD than unlisted peers

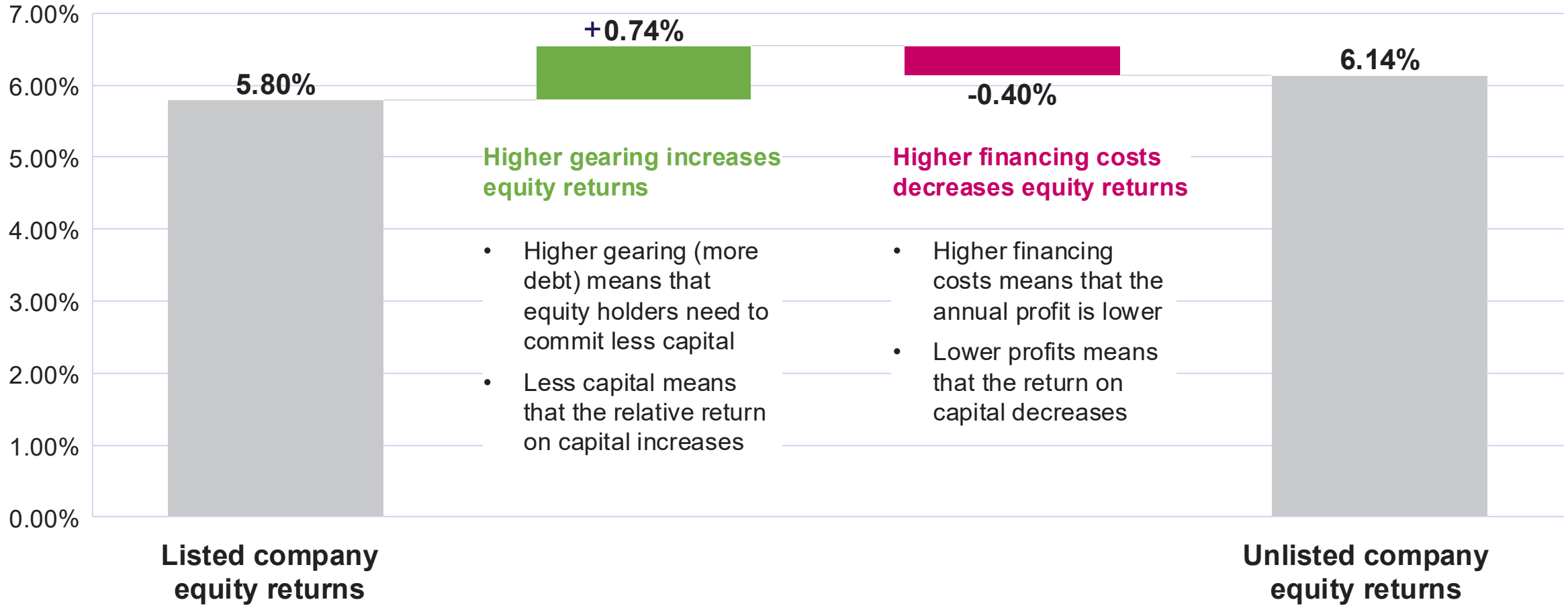
Cost of debt (in %, nominal)



Source: FactSet Debt Capital Structure (DCS_WAVG_COST_DEBT, YTM basis), FY2010–FY2026; 23 Ofwat/Ofgem licensees, 5 listed and 18 private. Rates outside 0.5%–12% excluded; one row per FactSet entity ID; Scottish Power and Glas Cymru excluded. Vallorii analysis.

Taken together, lower gearing and lower financing costs offset each other: listed company's equity returns trail private ones only by ~30bps

Equity returns, % real



Note: Assumptions. Water appointees; allowed return 4.19% CPIH-real vanilla WACC (CMA PR24 FD, Vol 4 ch 7, Table 7.31); gearing 63% listed / 72% private; cost of debt 3.25% / 3.44% CPIH-real (FactSet DCS, YTM basis; CPIH 2.40%); Thames excluded, outside the 0.5–8% screen. Ke = (WACC − g × CoD) / (1 − g). Result. Listed 5.80% vs private 6.14%, private ahead 34bps: gearing adds 74bps, 19bps of extra debt cost takes back 40bps.

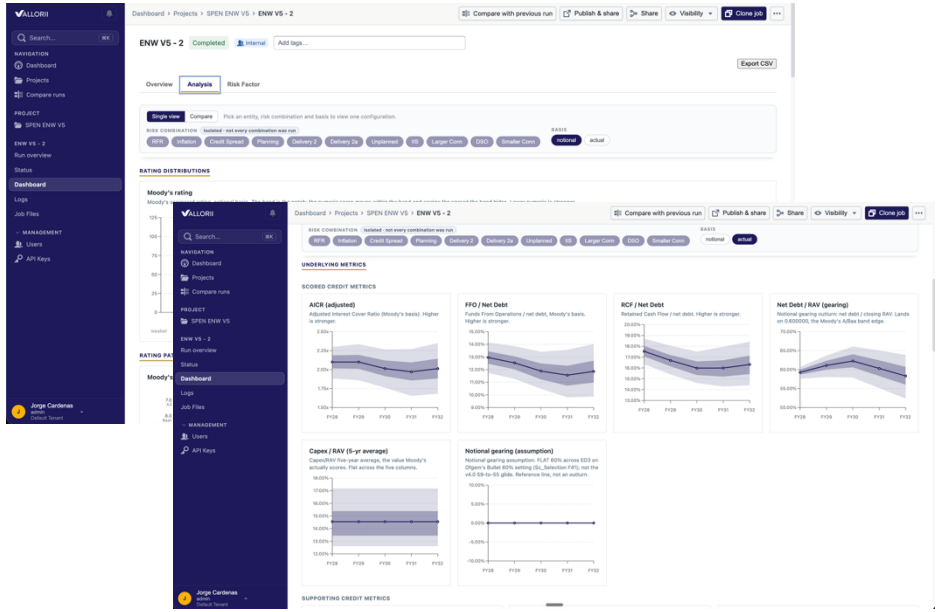
Poll #3: Who should own privatised infrastructure assets?

- **Listed** – Mid-term listed investors are the ideal owner
- **Listed** – Short-term listed investors are the ideal owner
- **Unlisted** – Long-term unlisted investors are the ideal owner
- **Irrelevant** – No preference for listed / unlisted investors
- **It depends** – on the asset or company

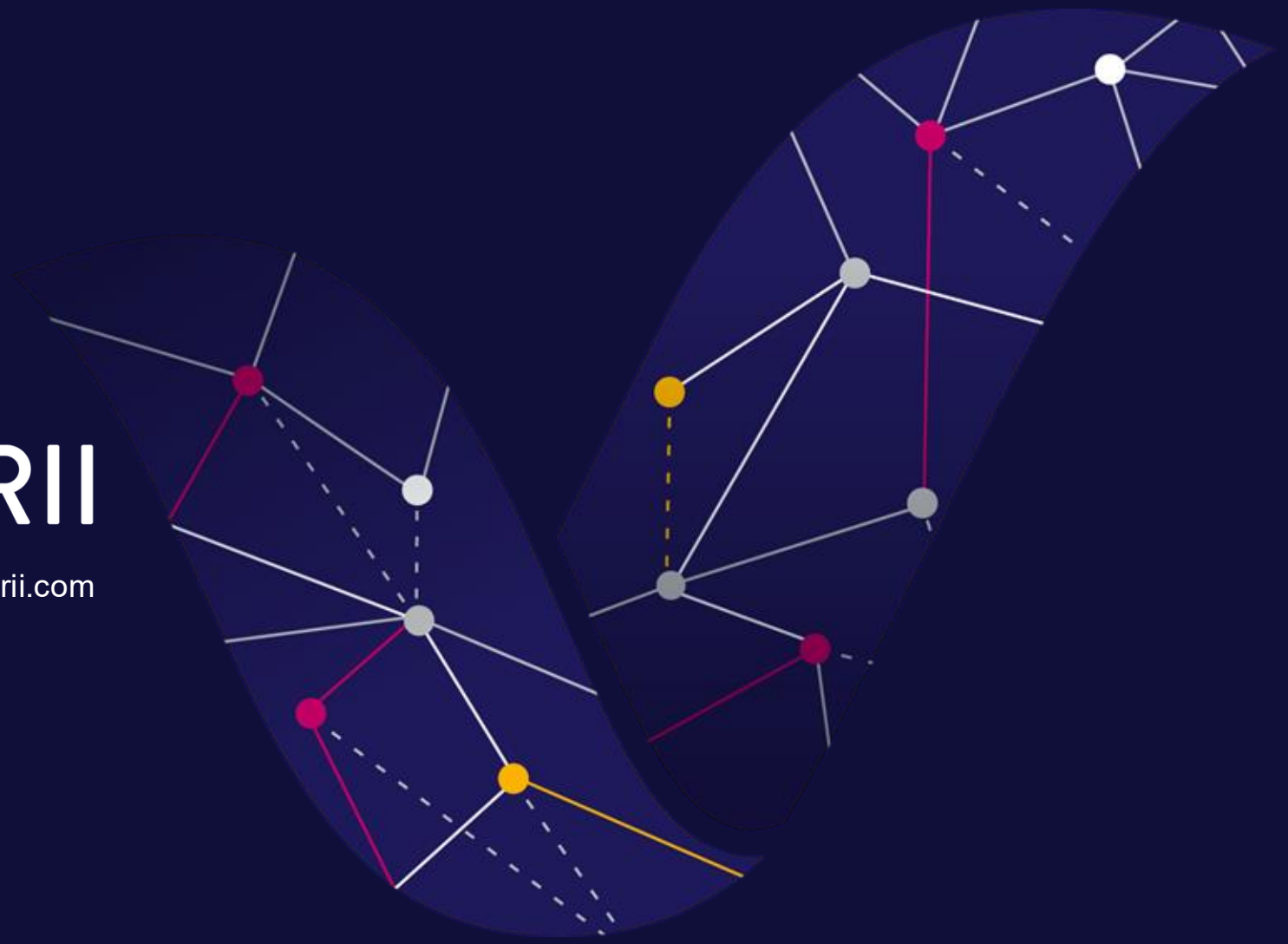
VAPRI September update: First publication available and financeability assessments dashboards live

Published VAPRI academic paper

New financeability dashboard with VAPRI implementation for ED3



(1) VAPRI published academic paper: https://www.jbs.cam.ac.uk/wp-content/uploads/2026/08/eprg-wp2620.pdf



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