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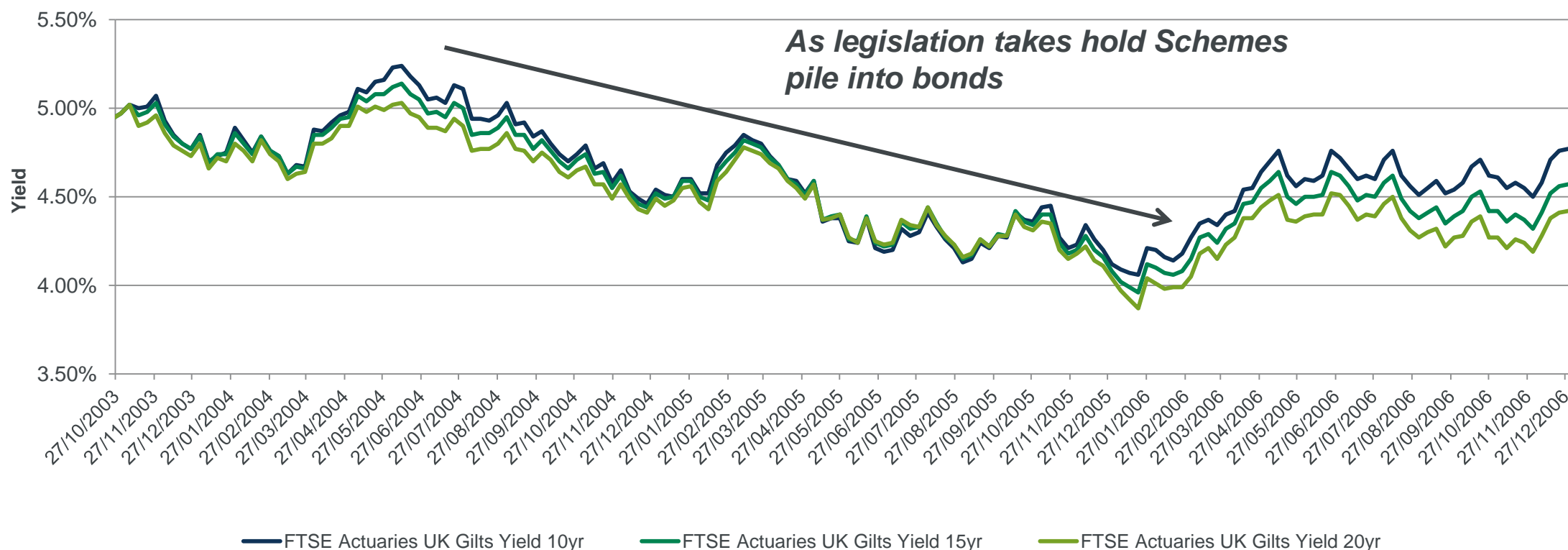
Is Solvency II Optimisation Dangerous?

Daniel Banks, P-Solve Investments

Shadrack Kwasa, P-Solve Investments

Unintended Regulatory Consequences - Pensions

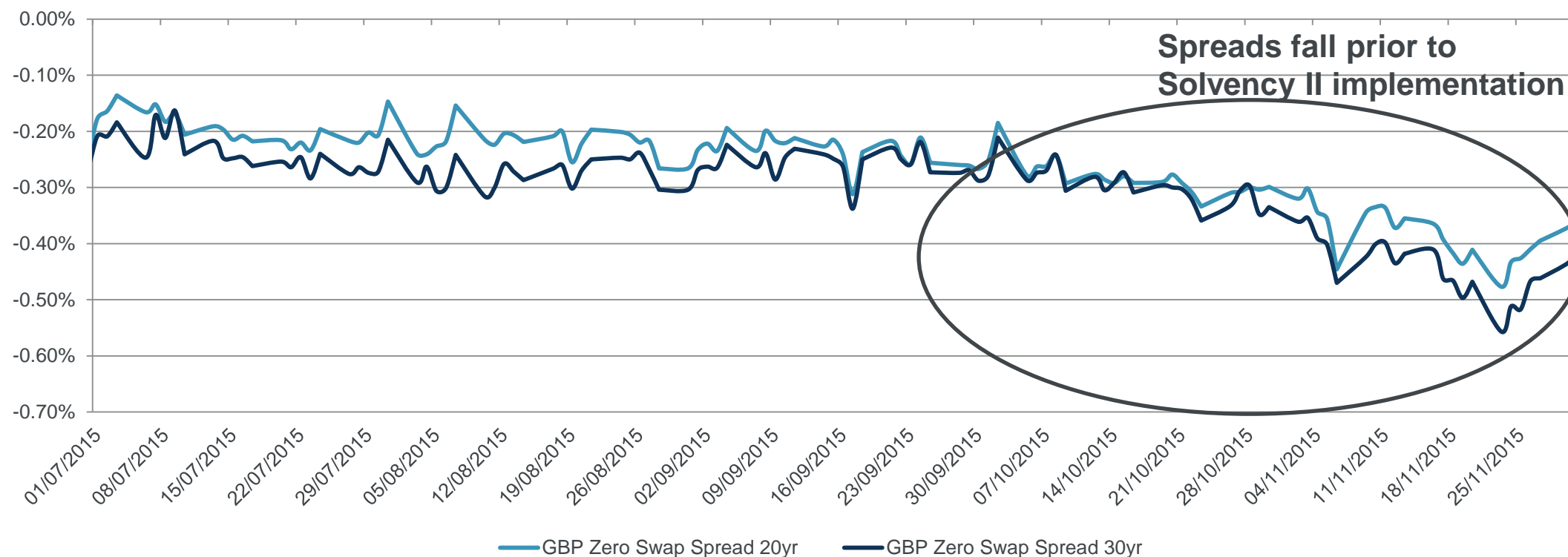
Impact of Pension Scheme Funding Legislation 2005



Source: P-Solve, Bloomberg

Unintended Regulatory Consequences – Life Insurance

Impact of Solvency II Legislation – Life Insurance



Source: P-Solve, Bloomberg

Is unseen investment risk accumulating in the market?



Hypothesis

SII investment portfolio optimisation may expose the GI market to unintended consequences.

TRUE

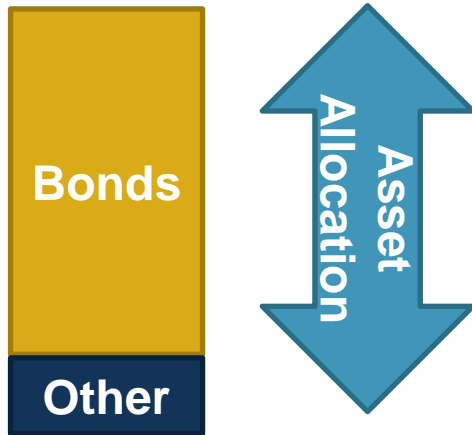
**Regulations drive positioning –
positioning is sub-optimal**

FALSE

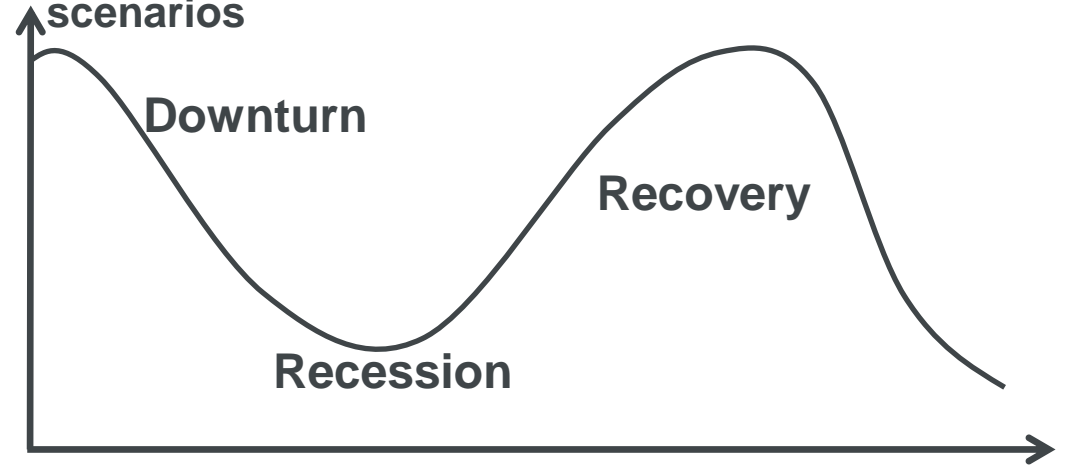
**SII portfolios exhibit consistent SII
and Economic risks**

Testing our hypothesis: Background

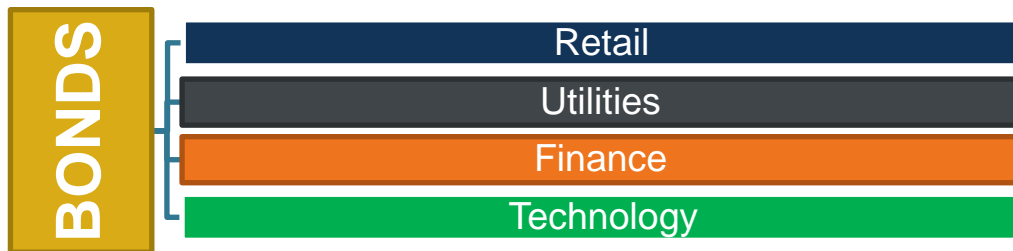
1. Most General Insurers invest predominantly in bonds



2. Analysis performed over a range of economic scenarios



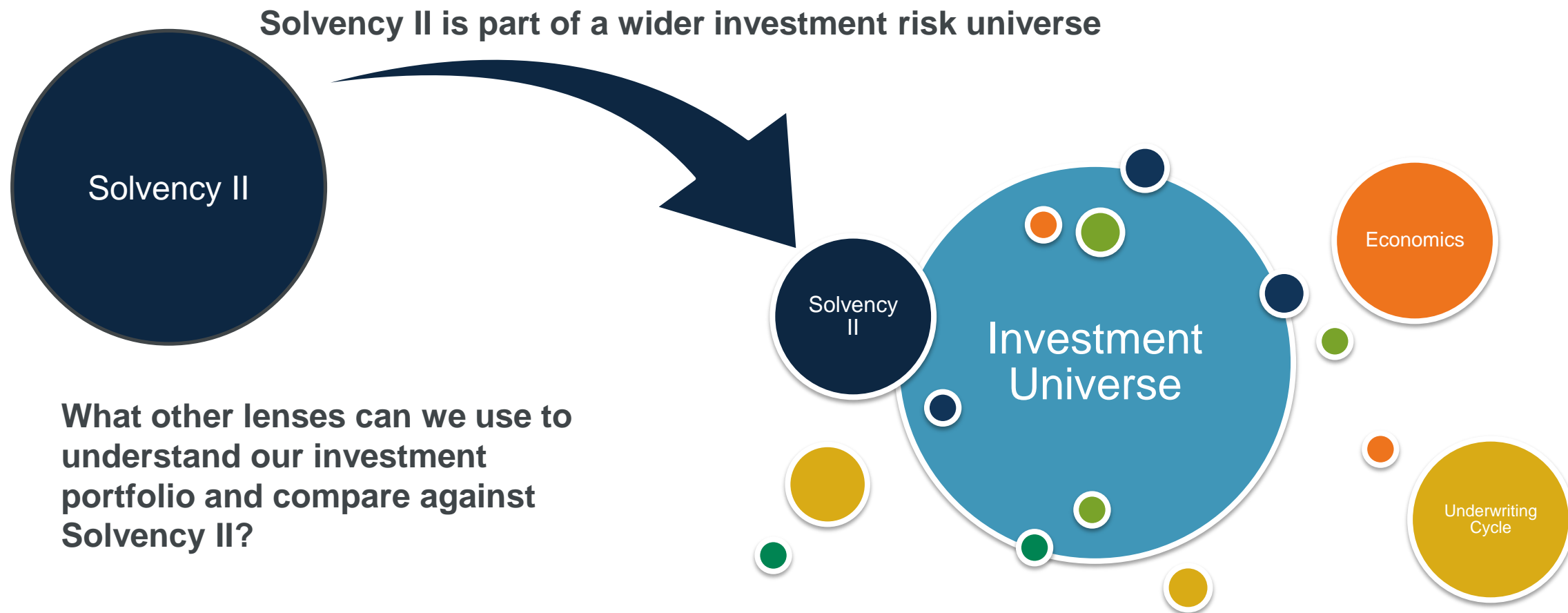
3. Bonds categorised by industry sector





4. Analysis restricted to standard formula



Lenses through which you can view risk





3 lenses to test our hypothesis

Risk Lens	Risk Measure	Optimisation Objective	Lens in common use?
Lens 1 = Volatility	Standard deviation of returns		

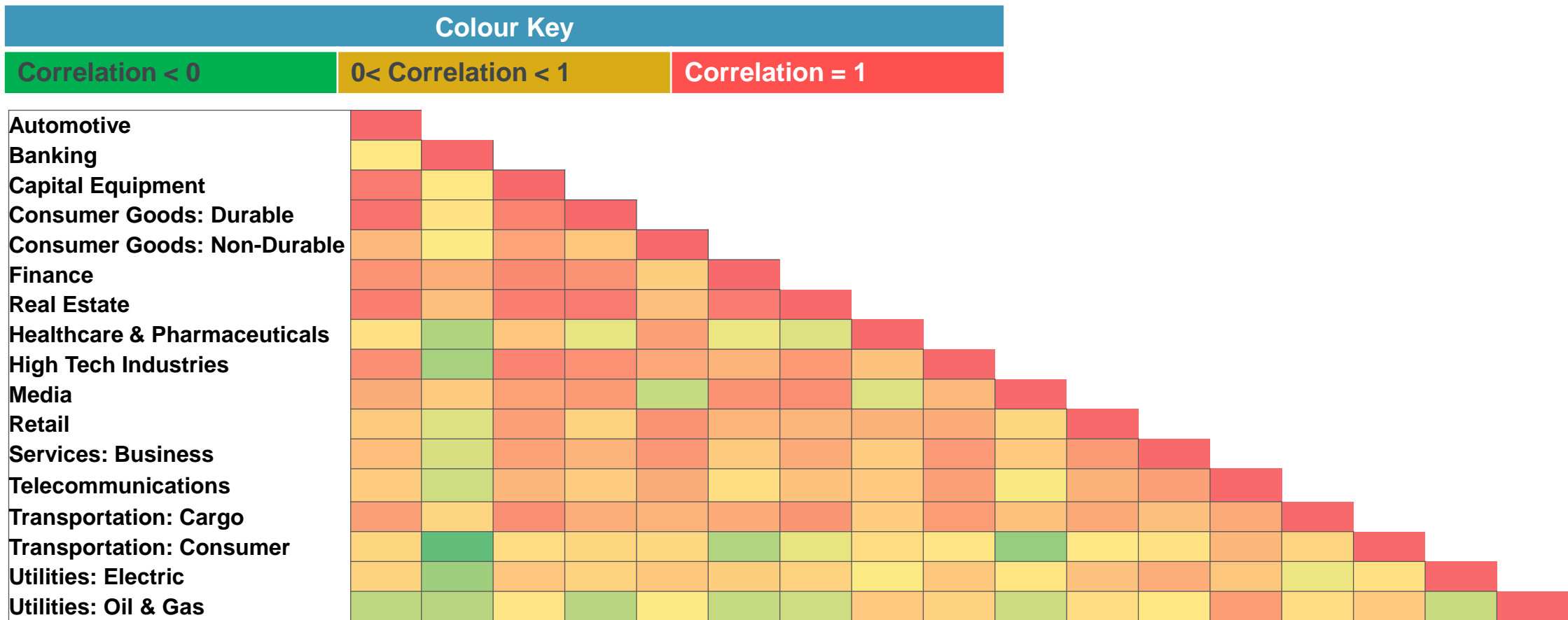
First Test of the hypothesis: Correlations

- Asset movements relative to each other are important.

Correlations	Asset Movements	Investment Risk
+ve	 	Amplified

Default lens view on correlations

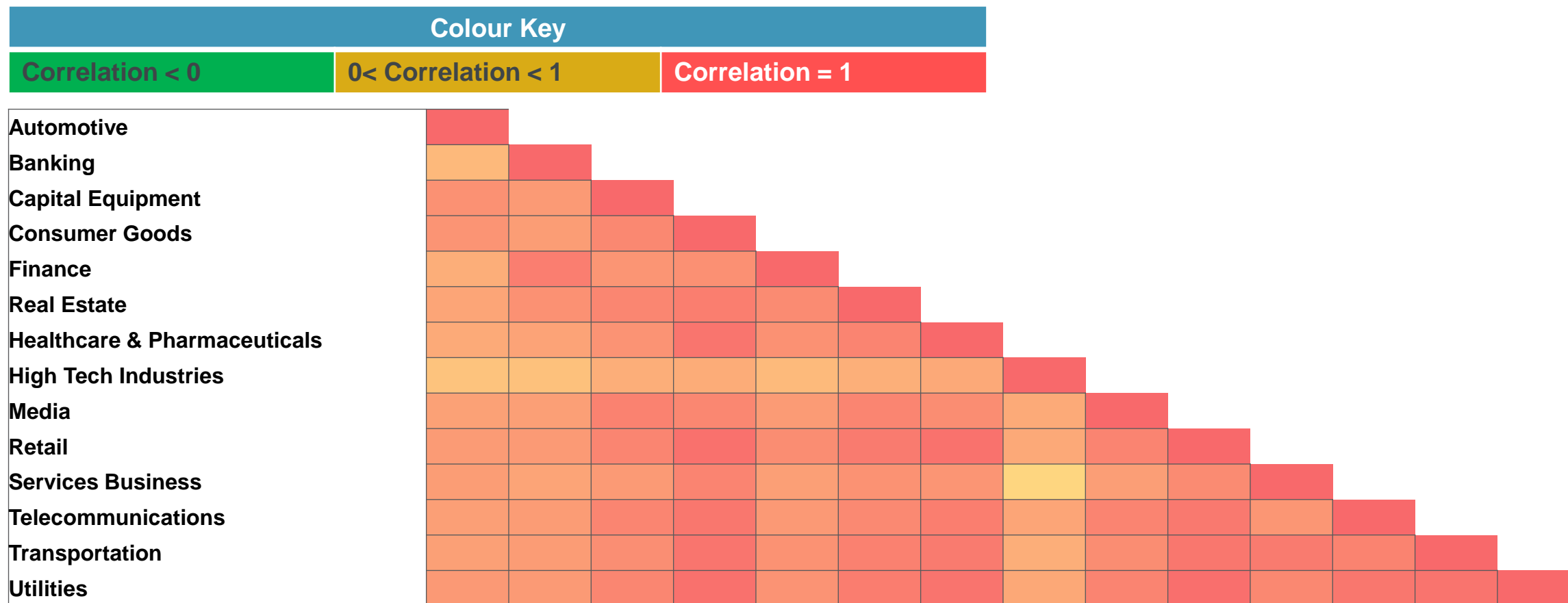
- Default correlation matrix covering the period from 2000 to 2017.



Source: P-Solve, Moody's

Volatility lens view on correlations

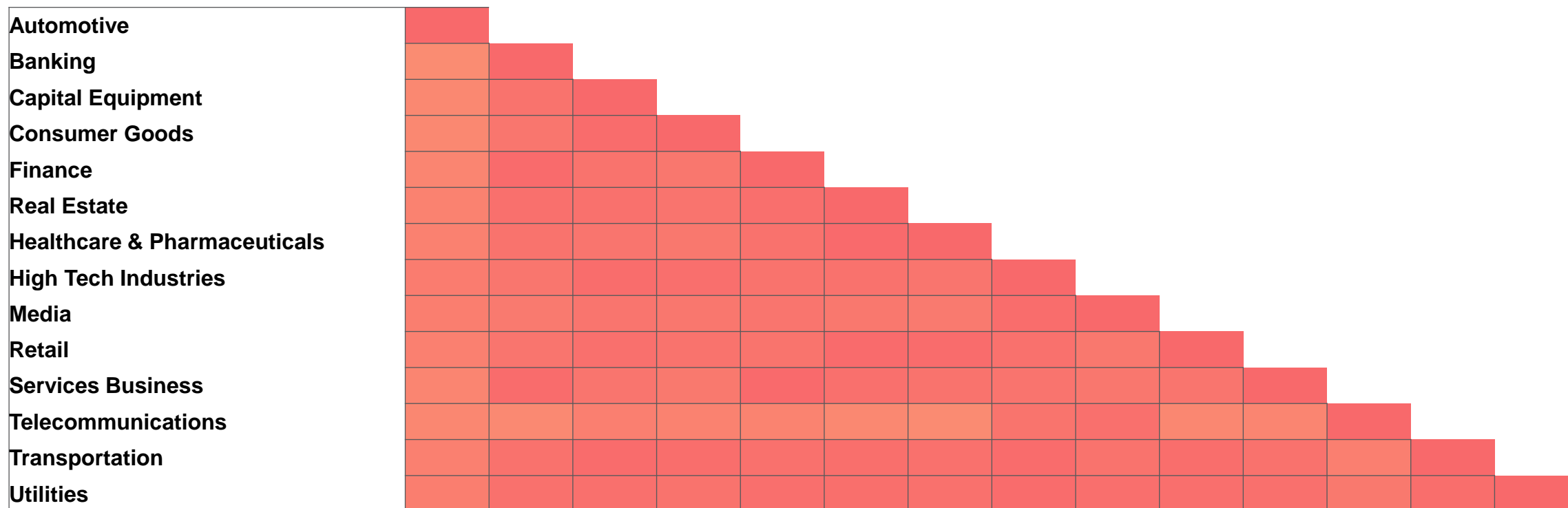
- Volatility correlation matrix covering the period from 2000 to 2017.



Source: P-Solve, Bloomberg

Solvency II View on Correlation – Bond spreads

- Taking spread data over the period assumed when calibrating the standard formula for spread SCR.
- “EMU Corporates for different maturity buckets and rating classes between 1999 and February 2010.”



Source: P-Solve, Moody's, EIOPA-14-322

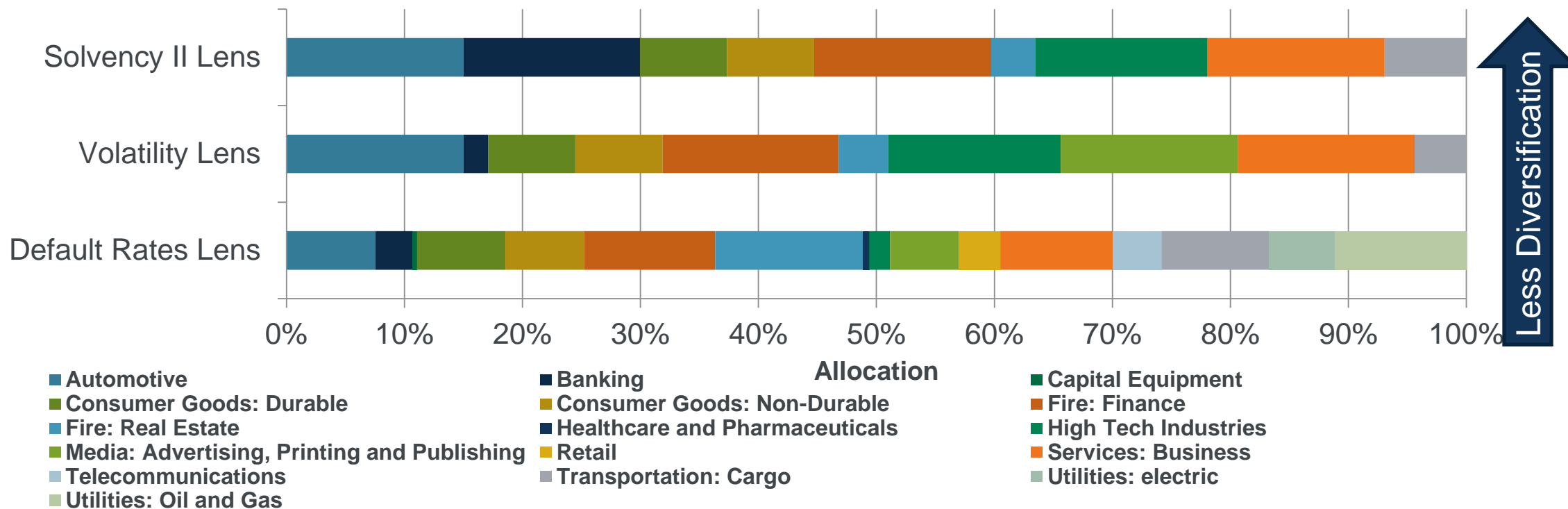
What does the correlation picture tell us?

Lens	Bond universe correlations	Does diversifying across sectors reduce risk?
Default	Both +ve and -ve correlations appear	✓
Volatility	Mid to high +ve correlation between sectors	●
Solvency II	High +ve correlation across sectors	✗

- In a Solvency II world investing across sectors does not reduce correlation risk.
- Consistent with spread SCR that assigns the same SCR to similar bonds regardless of sector.

Second Test of the Hypothesis: Portfolio Optimisation

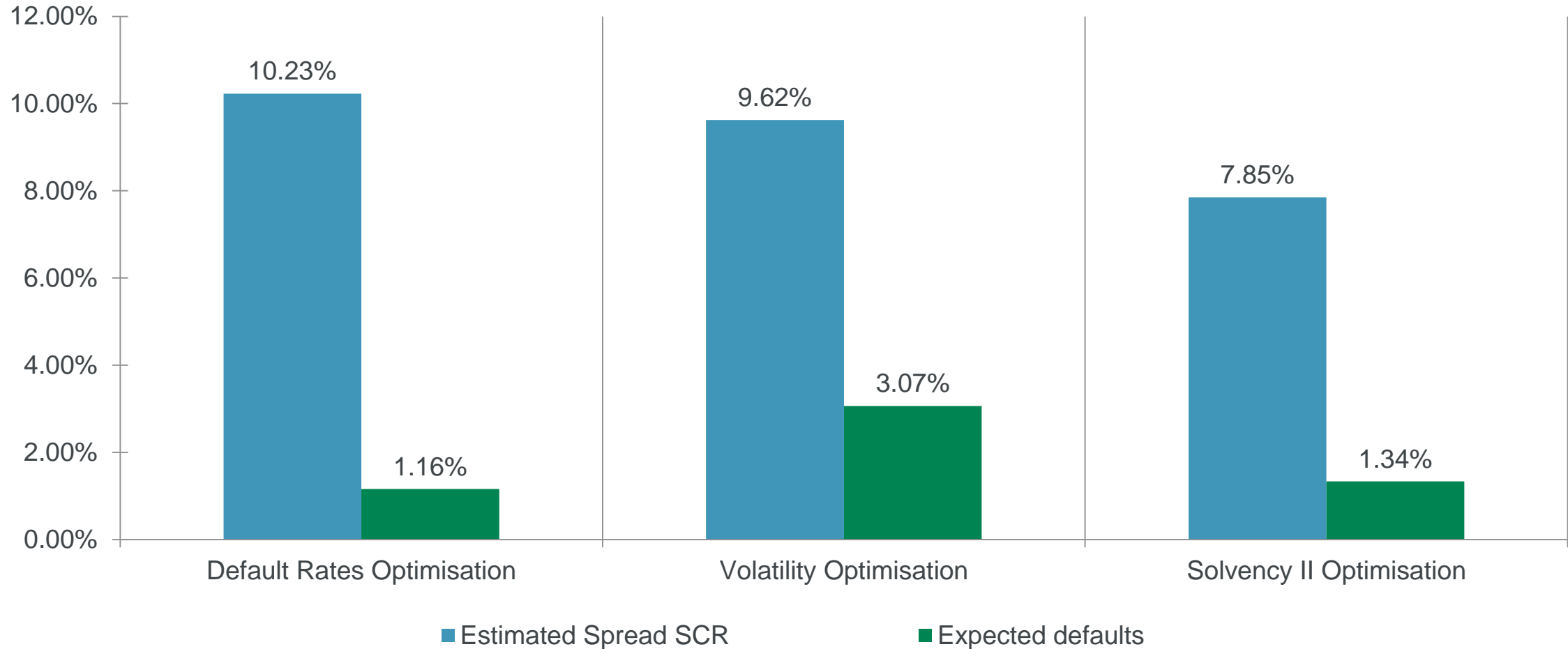
- Long term portfolios optimised across economic cycles



- The Solvency II lens picks bonds across sectors due to the relationship between spread SCR and return.
- In most cases the lower the spread SCR the lower the return and vice-versa.

Source: P-Solve, Moody's, Bloomberg

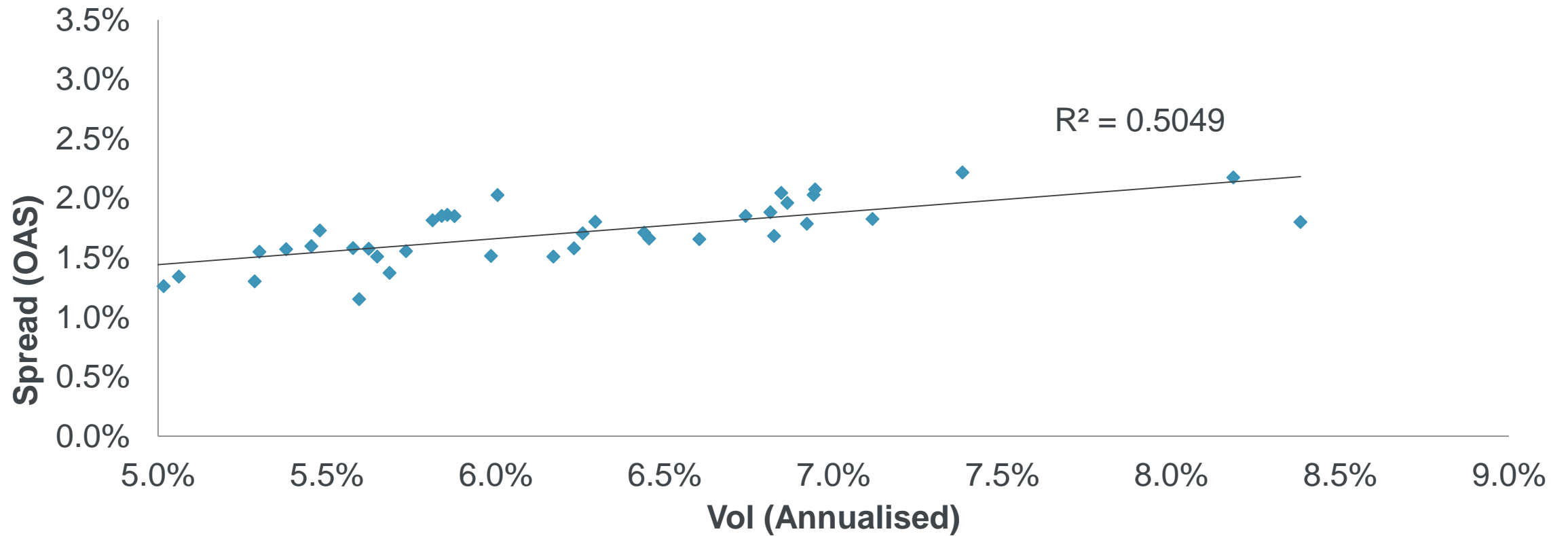
How do the portfolios compare?



Source: P-Solve, Moody's, Bloomberg

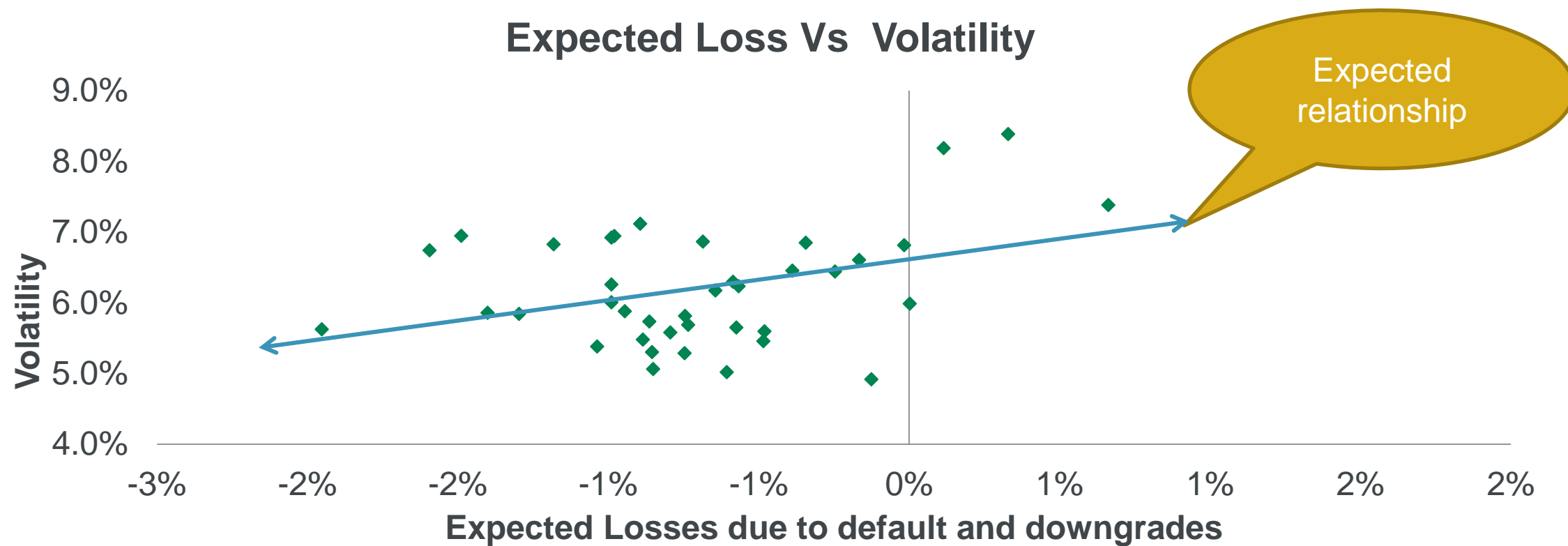
Volatility vs Spread

Volatility vs Average Spread



Source: Moody's

Comparing volatility to expected loss



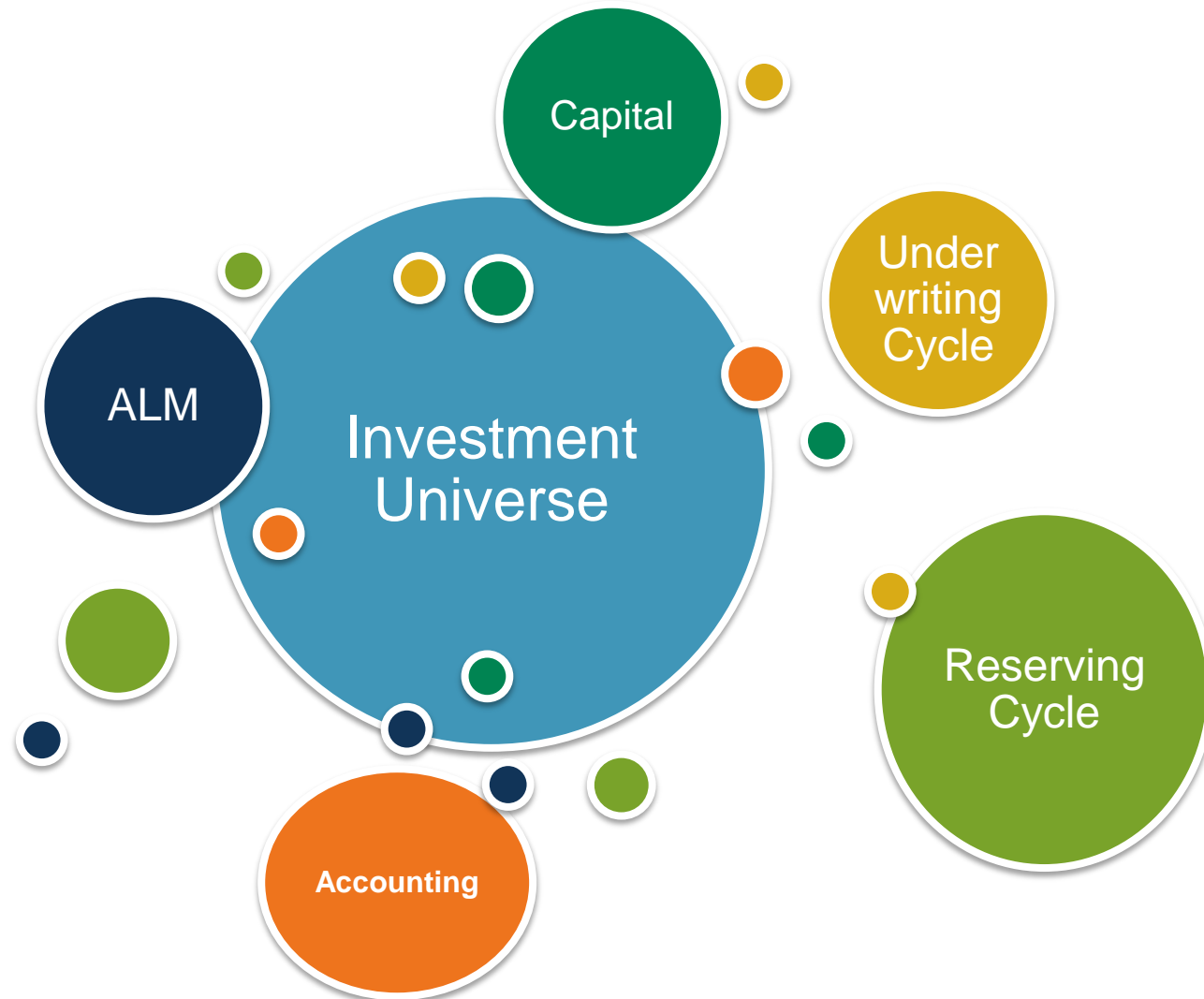
- Plotting expected losses against volatility shows no correlation between the two.

Source: Moody's

Are the results what we would expect?

Lens	Any unexpected results?
Default	<ul style="list-style-type: none">• Relatively high spread SCR
Volatility	<ul style="list-style-type: none">• Relatively high defaults• No correlation between expected loss and volatility
Solvency II	None – nil benefit for sector diversification is in line with standard formula

What might influence the choice of lens?



What does this mean for insurers

Challenge

- Why do we use this lens?
- What is the impact of our choice?

Apply different lenses

- Do we understand all the risks we are exposed to?

Act

- Use lens to adapt portfolio to match the type of risks we want.

Finally...is Solvency II Optimisation Dangerous?

- The Solvency II lens, in this case, is ***not dangerous***; although it may result in less sector diversification in a bond portfolio
- The volatility lens produces more surprising results; **this is more of a concern** considering it is a widely used alternative to Solvency II
- The choice of lens **materially** impacts the result

Questions

Comments

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