Re-imagining the art of portfolio construction

Andrew van Biljon, Research Director

Henry Jolliffe, Research Director

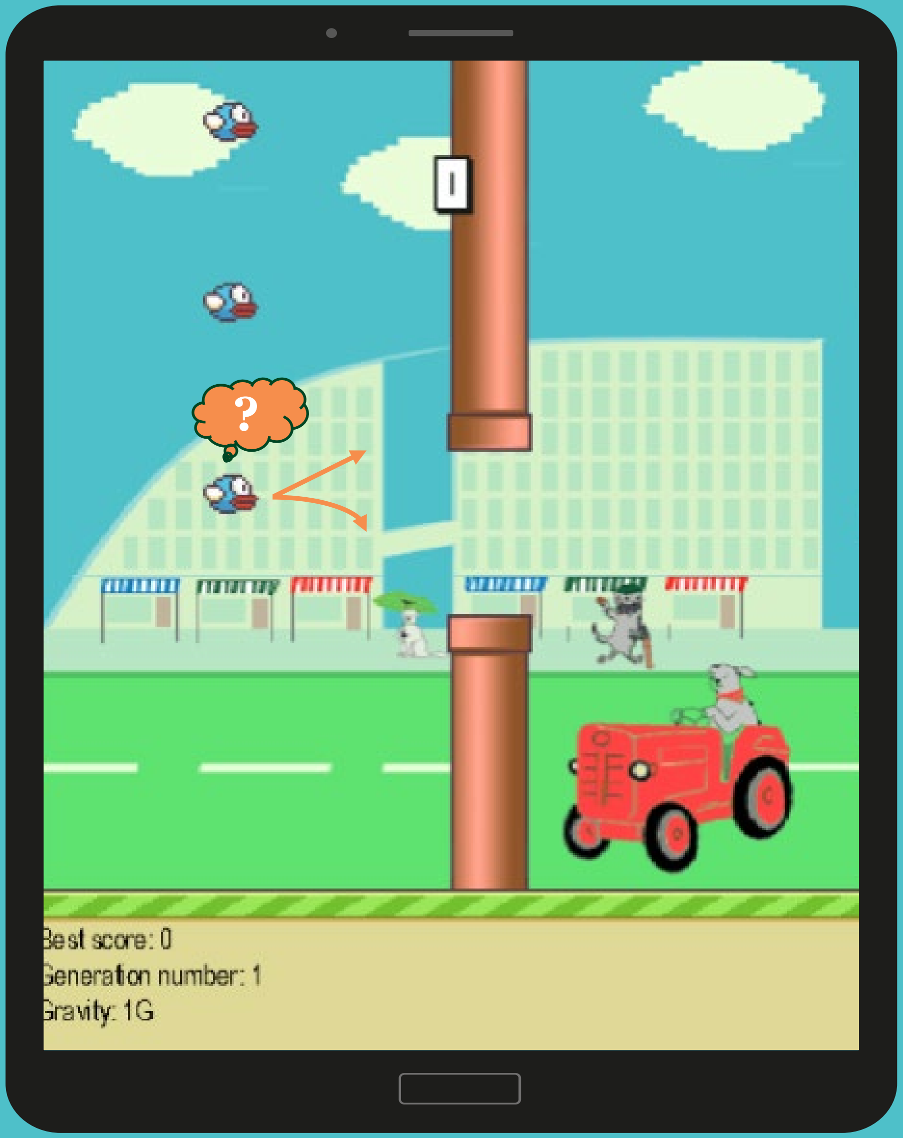
80 Victoria Street London SW1E 5JL +44 (0)20 7963 8100 ruffer.co.uk

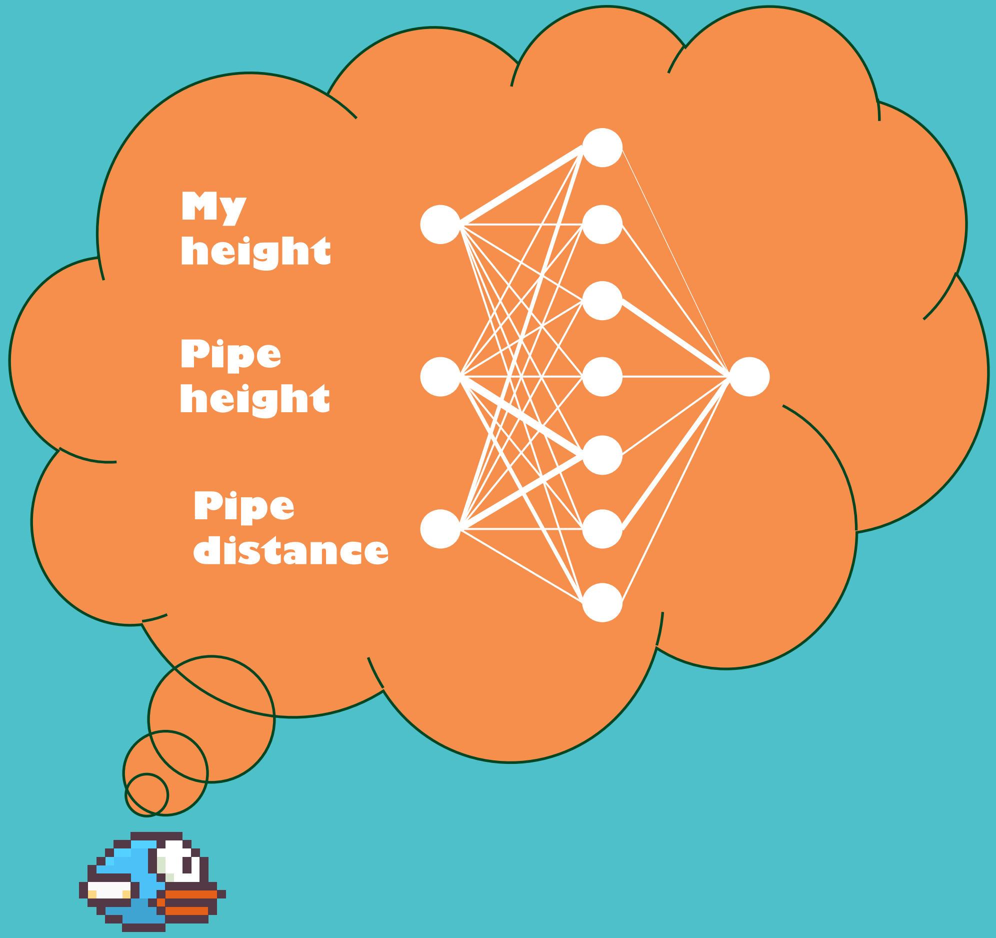
NOVEMBER 2021

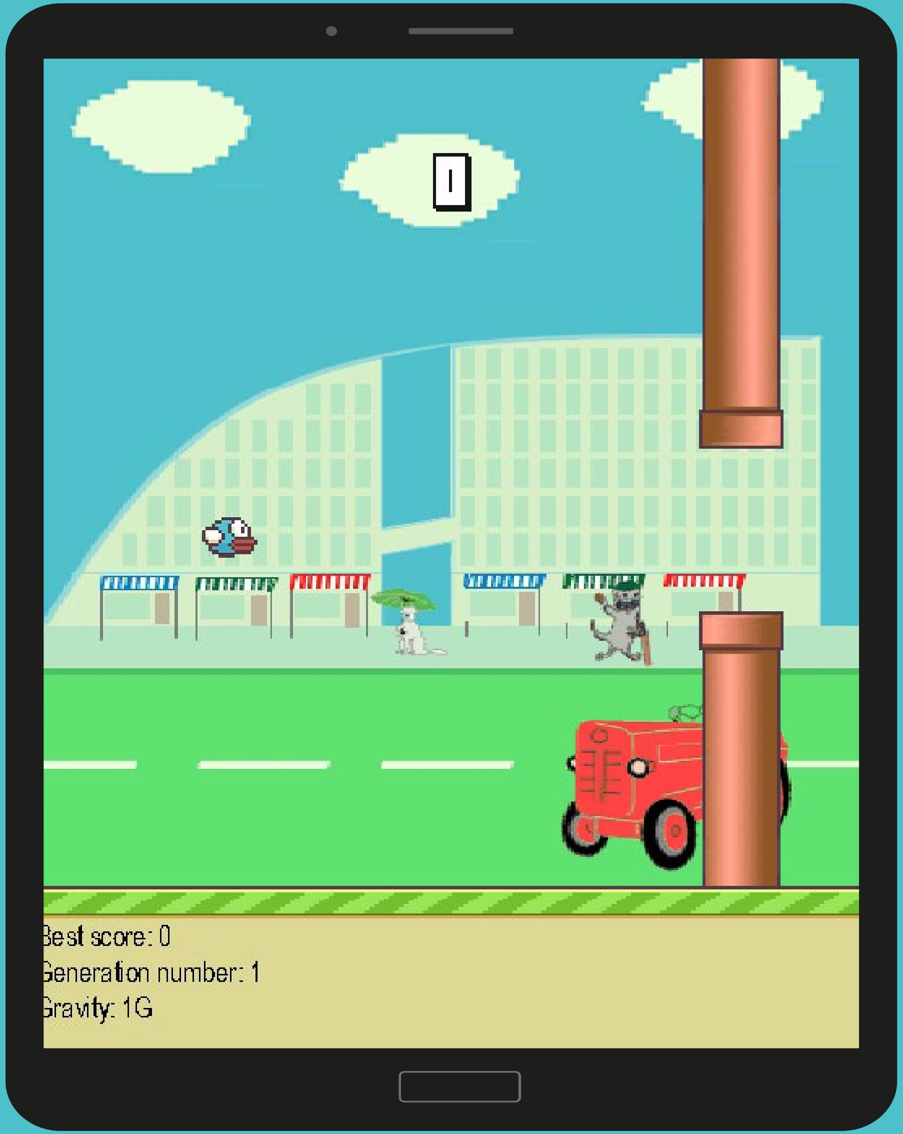
Summary

- Portfolio construction hasn’t evolved
- Current methods are vulnerable to a sea change
- The likelihood of this is increasing
- Portfolio construction may need a re-think

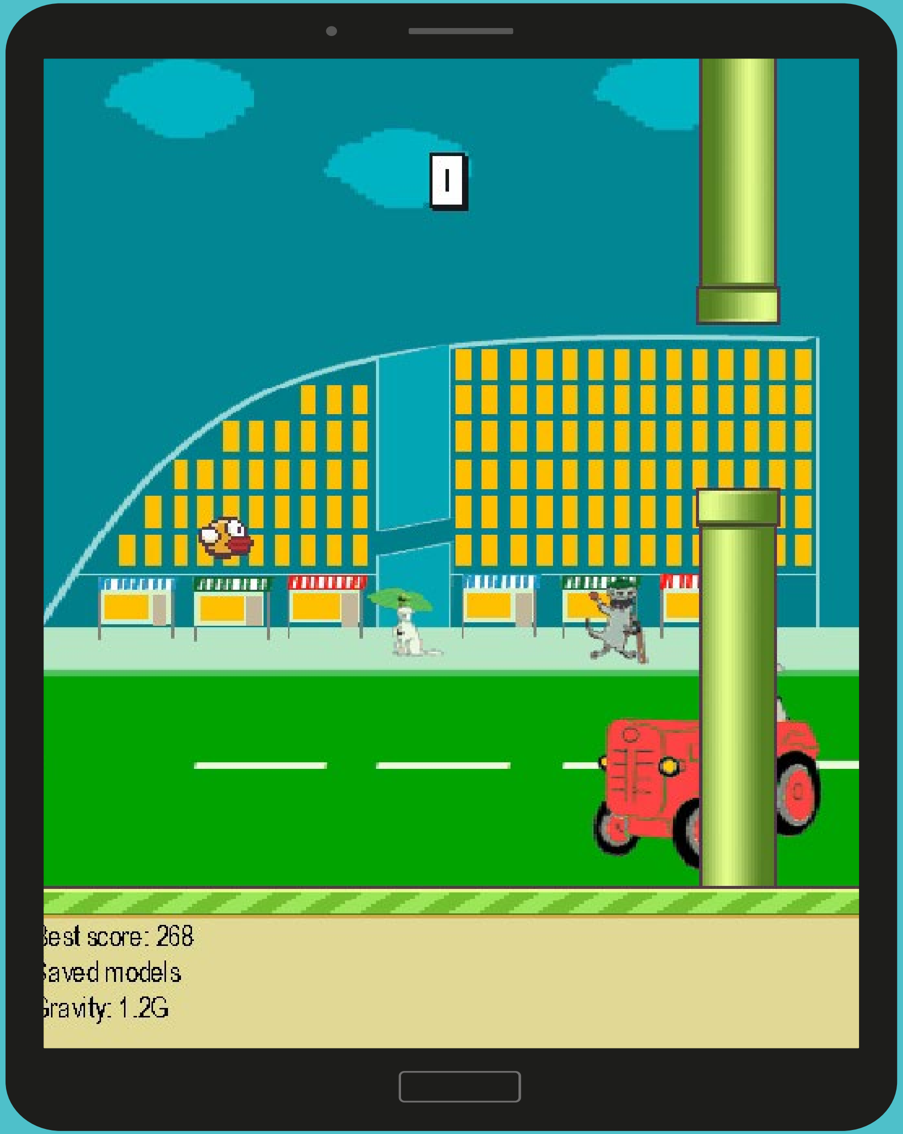
Flappy bird primer







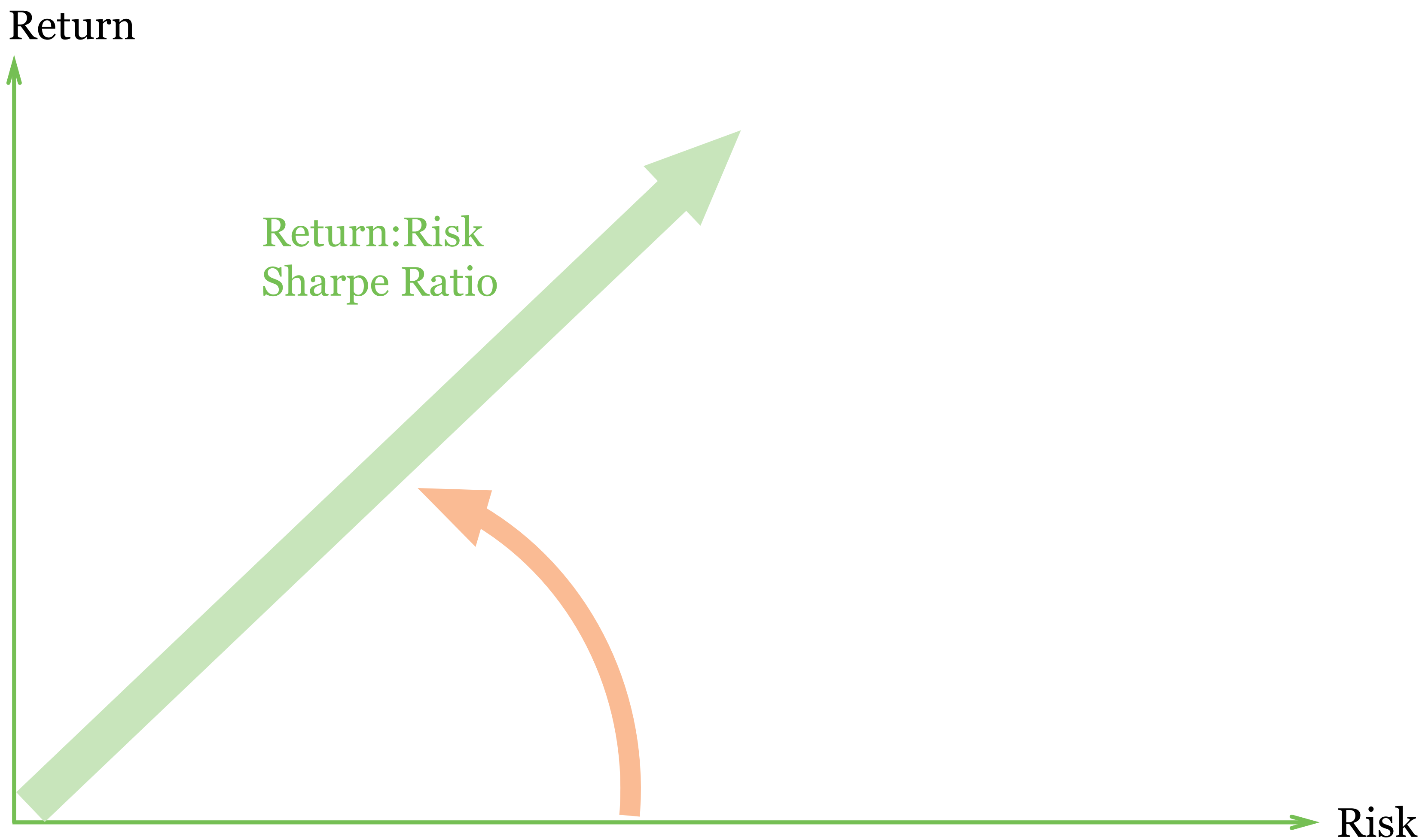
Stable environments = hyper-optimised agents...



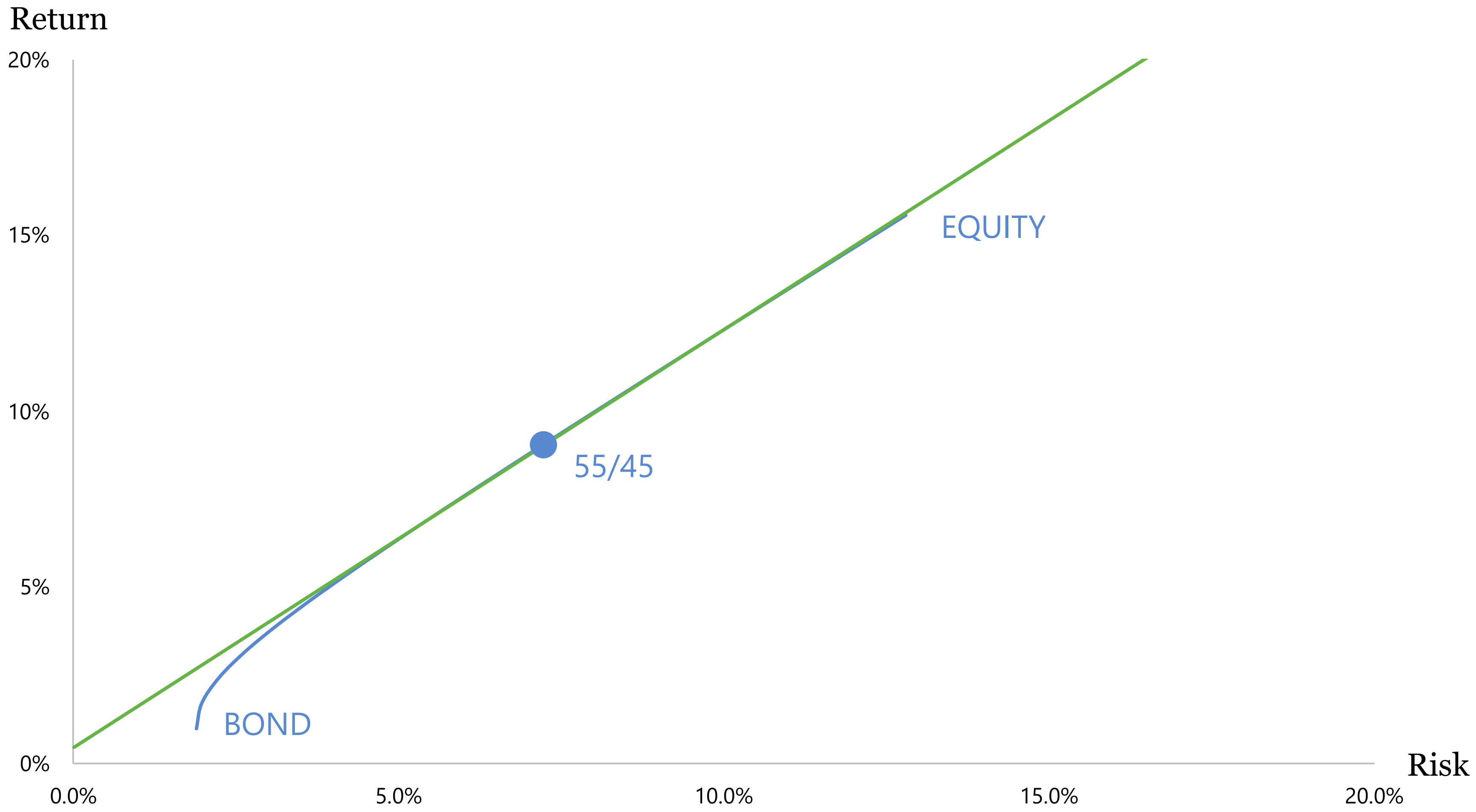
… vulnerable to small environmental change

What sort of market environment?

Markowitz in ’52 – the fundamental trade-off

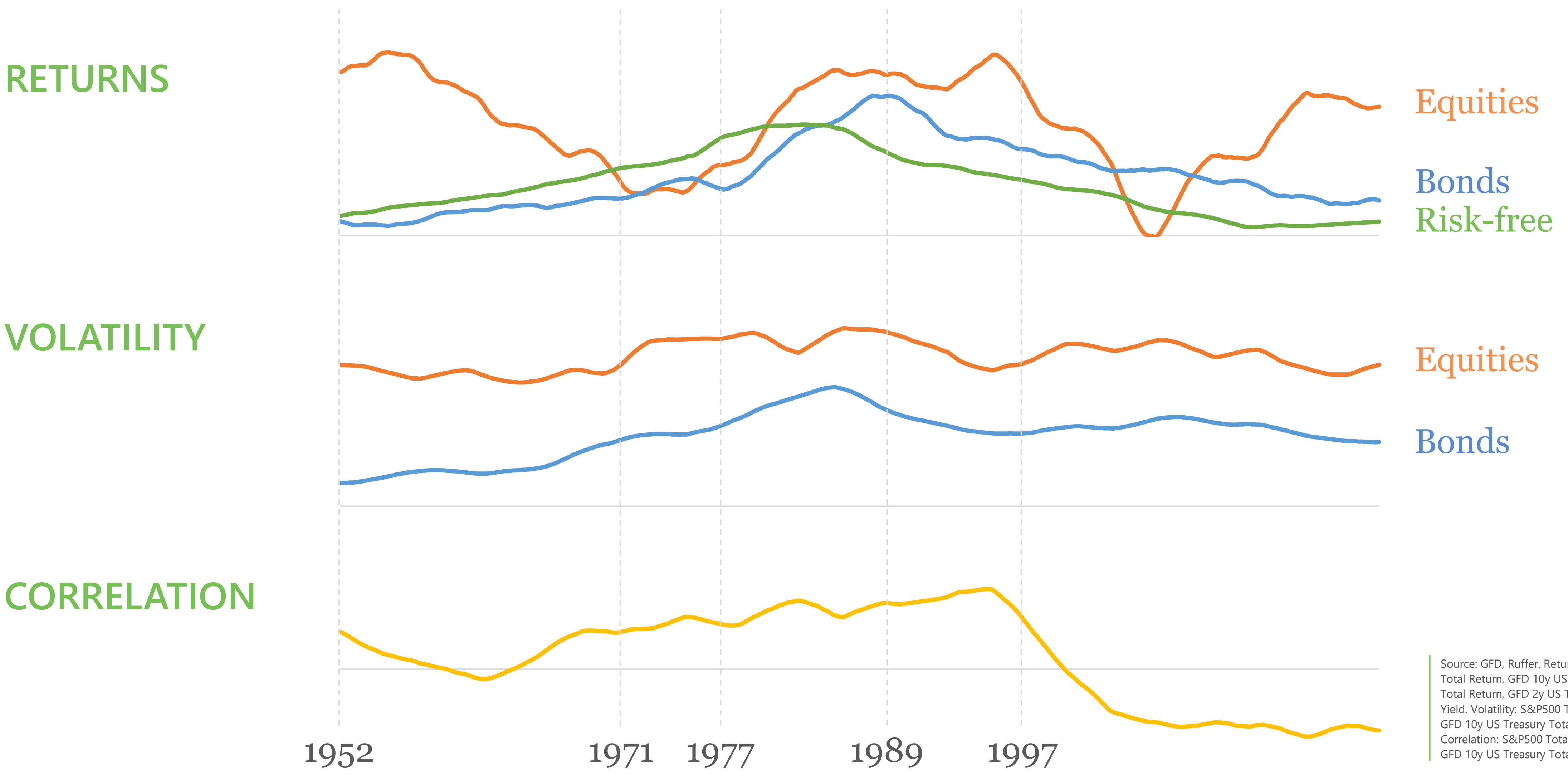


Allocating optimally



Source: Ruffer calcuations

Stylised conditions 1952 to today



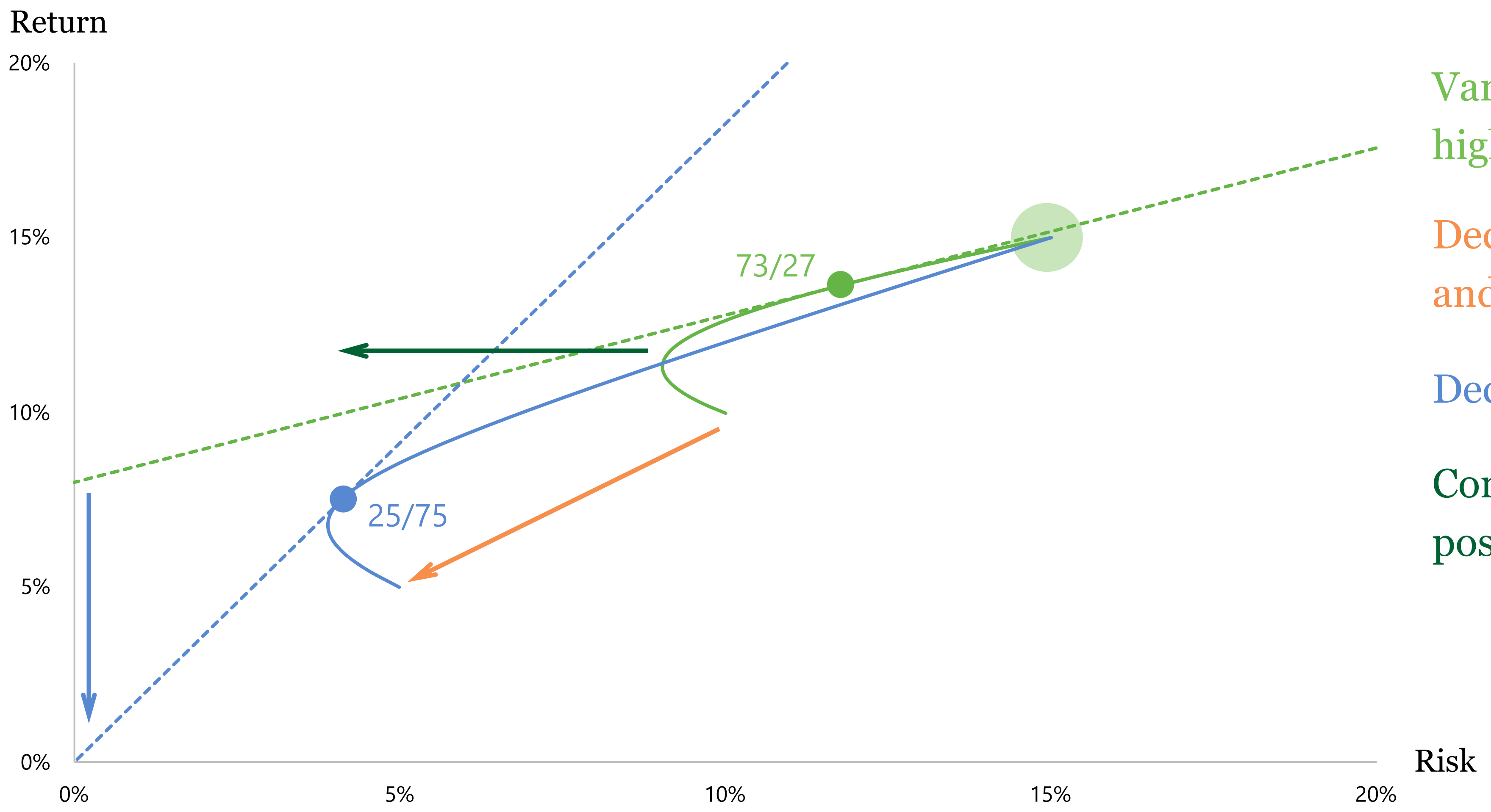
Source: GFD, Ruffer. Returns: S&P500 Total Return, GFD 10y US Treasury Total Return, GFD 2y US Treasury Yield. Volatility: S&P500 Total Return, GFD 10y US Treasury Total Return. Correlation: S&P500 Total Return and GFD 10y US Treasury Total Return

A Financial Renaissance

- Gold standard and Bretton Woods (1971)
- Federal Reserve Reform Act (1977)
- Apple II, TRS-80, Commodore PET (1977)
- China's Four Modernisations (1978)
- Commercial internet service providers (1989)
- Asia Crisis (1997)

Portfolio construction in its natural habitat

SHARPE RATIO INCREASES FROM 0.5 TO 1.8



Variable equity returns with high but steady volatility

Declining bond returns and volatility

Declining risk-free rate

Correlation flip from positive to negative

Source: Ruffer calculations

The Great Carcinisation

Portfolio construction

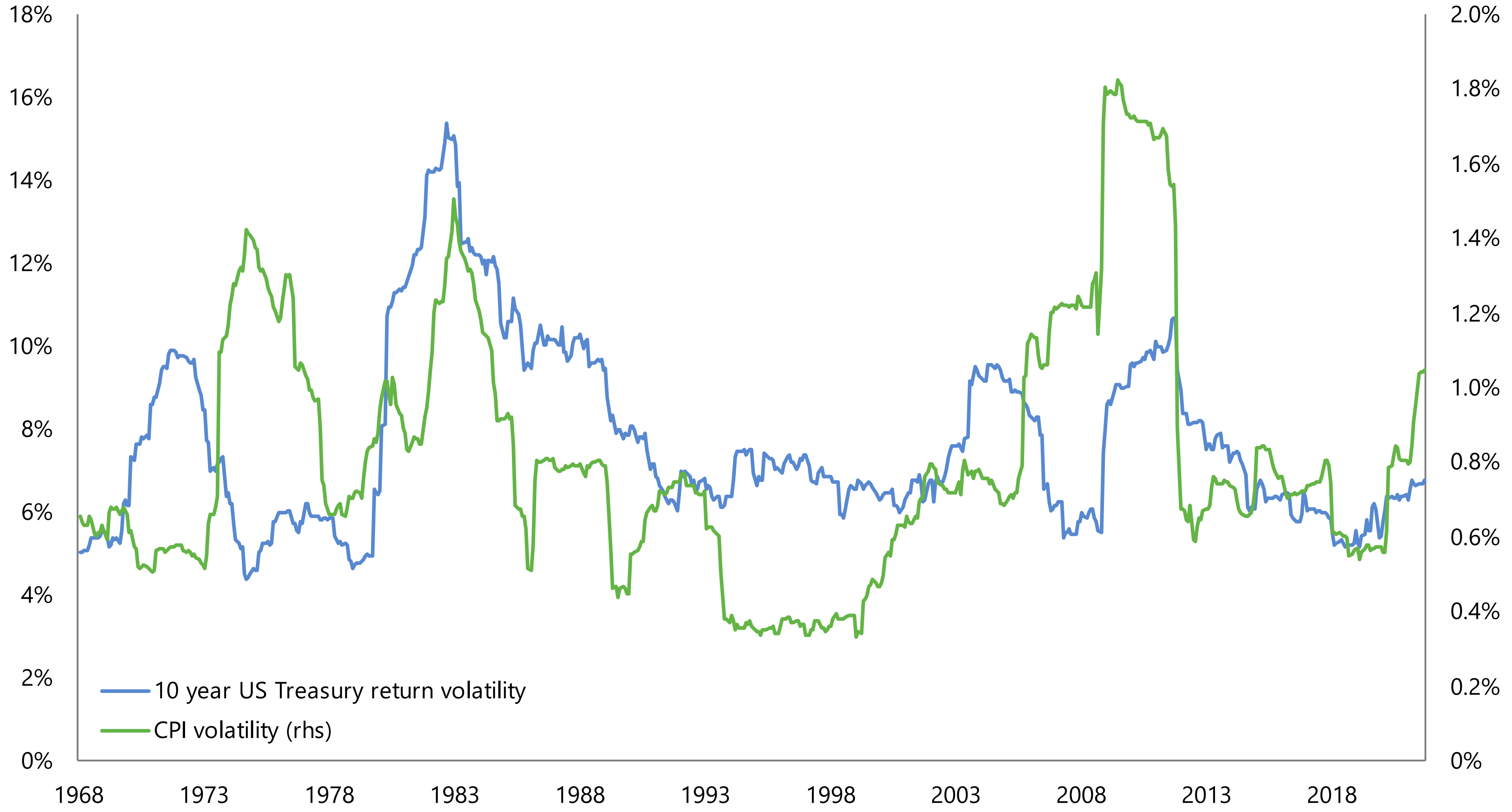
Risk metrics

Exposures

Risk premia

Why might the environment be changing?

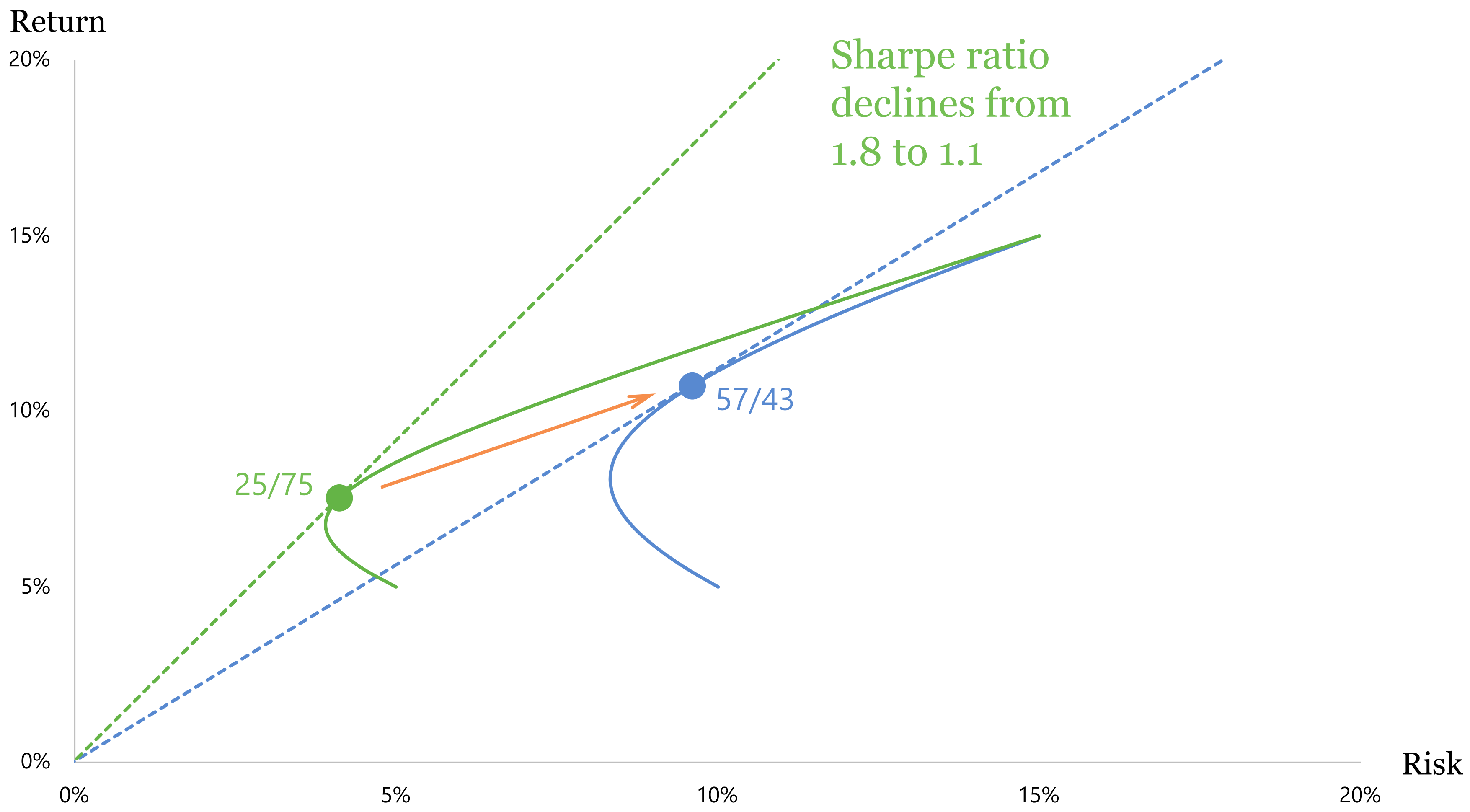
INTEREST RATE VOLATILITY COULD BE DUE A RETURN



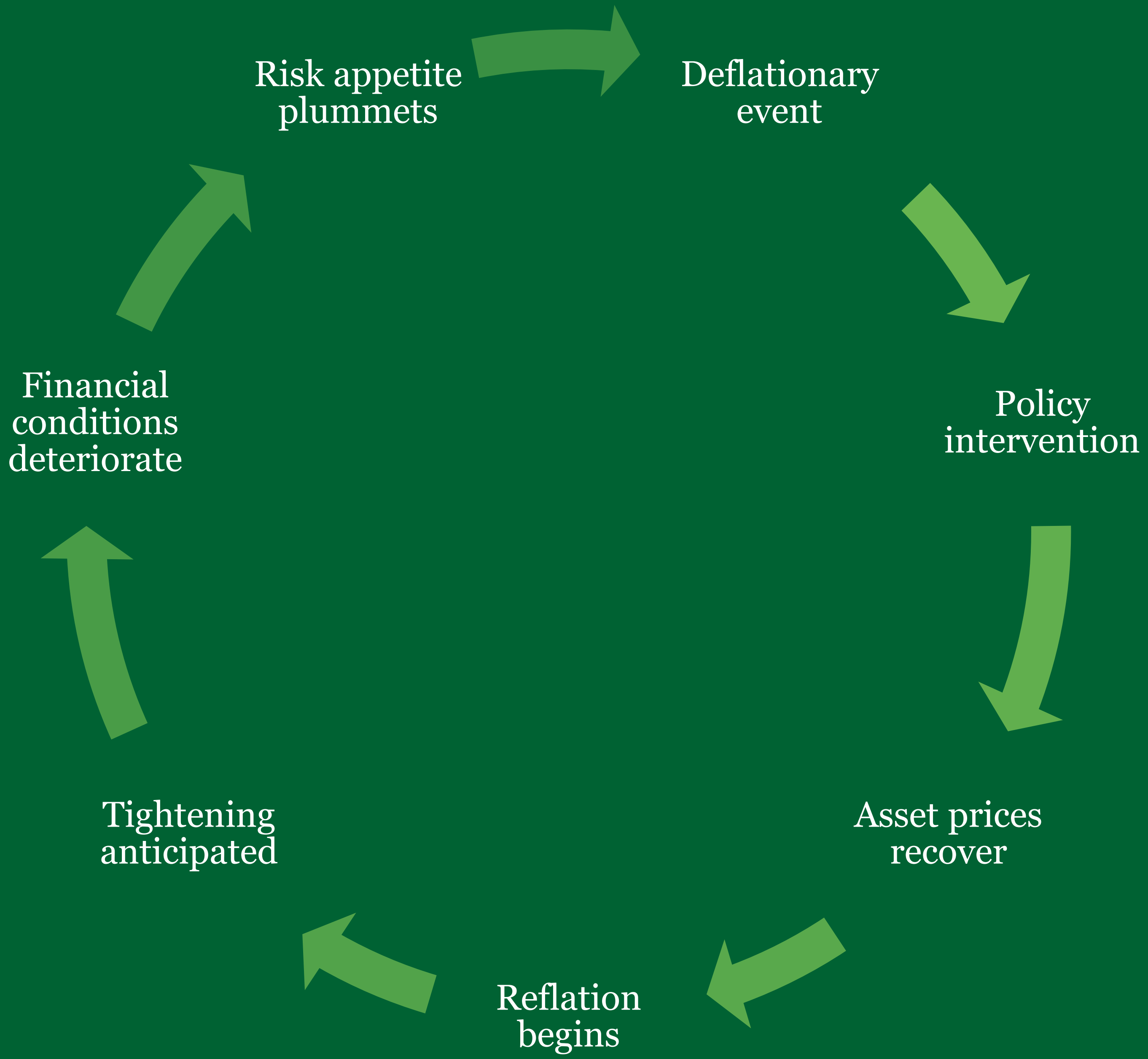
Source: Bloomberg, Ruffer

The framework starts to creak

A RISE IN BOND VOLATILITY LEADS TO WORSE OUTCOMES



Source: Ruffer calcuations

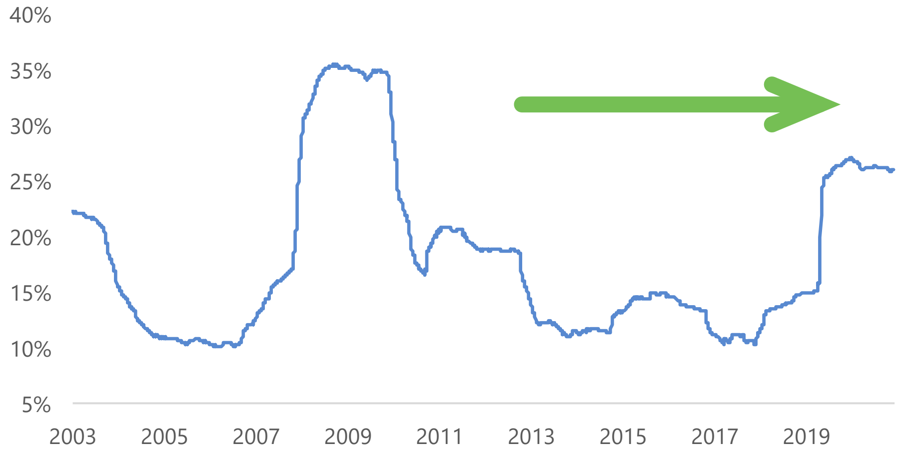


Rate volatility is just one product of the changing environment

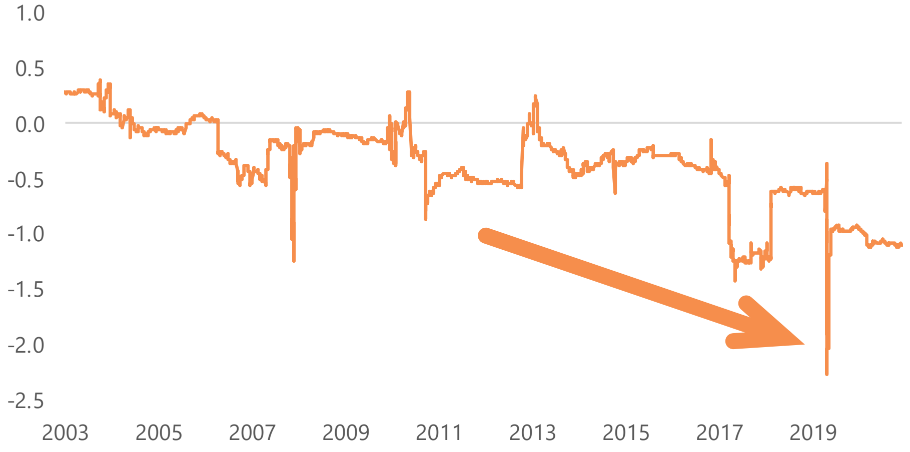
Danger lurks beneath the surface of equities

RETURN

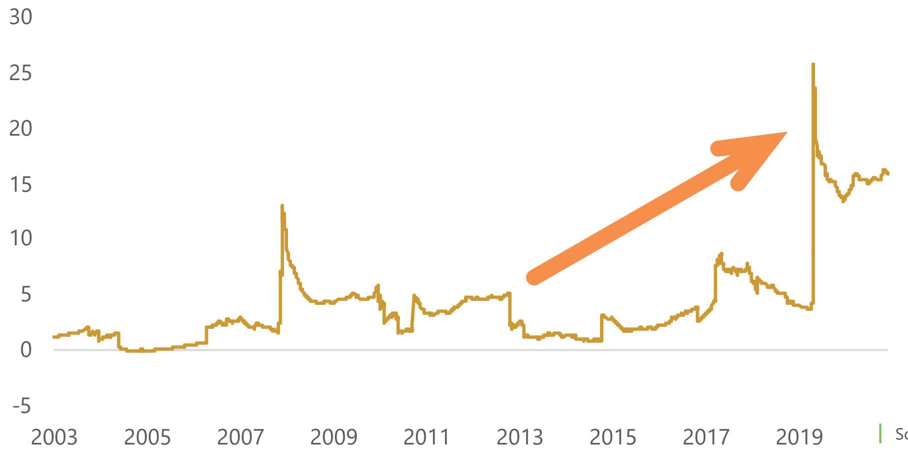
VOLATILITY



SKEWNESS



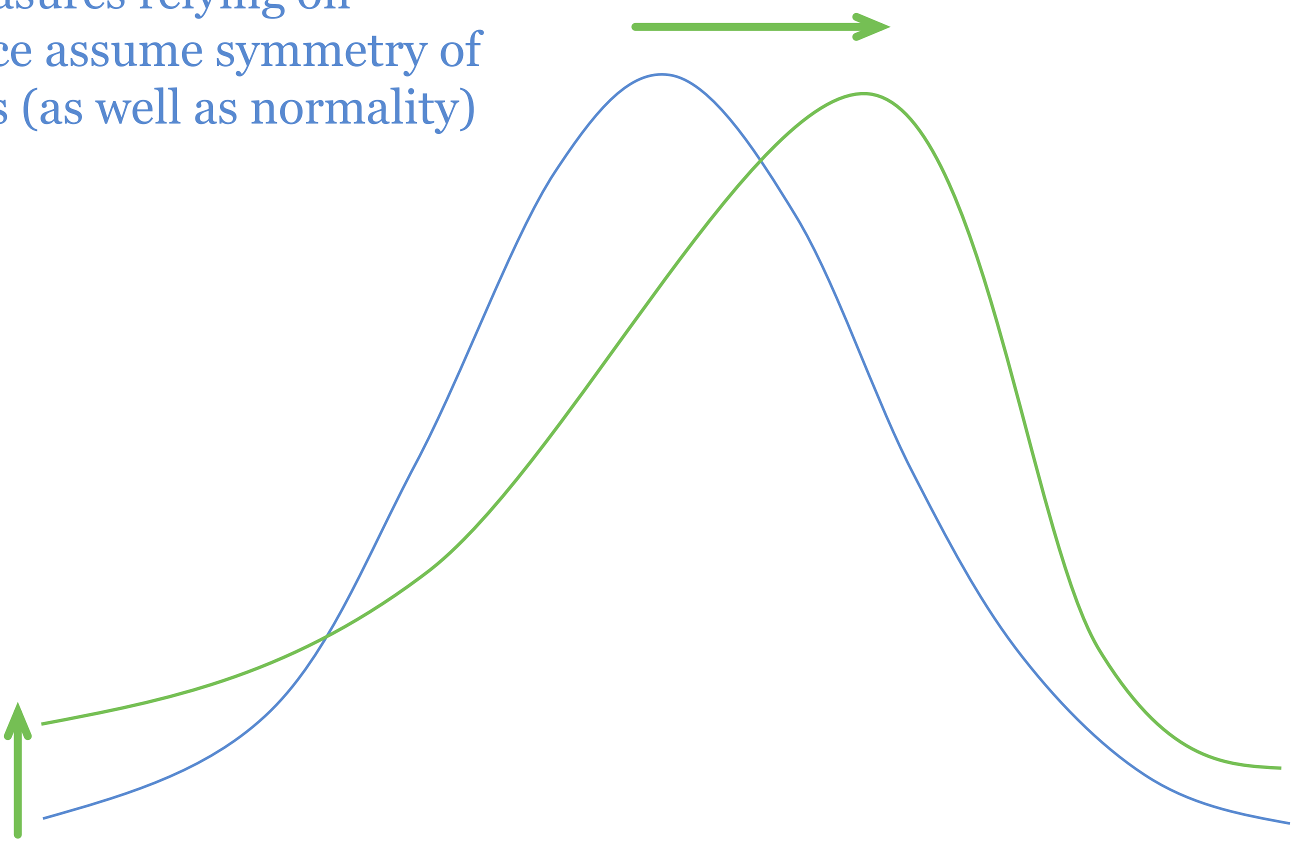
FAT-TAILEDNESS



Source: Bloomberg

The framework breaks

All measures relying on variance assume symmetry of returns (as well as normality)



The more symmetry is violated, the worse the allocation errors produced by the framework

Modernising Modern Portfolio Theory

- If we consider our wealth proportionally, rather than in absolute dollar amounts (defining a function *U(r)*)

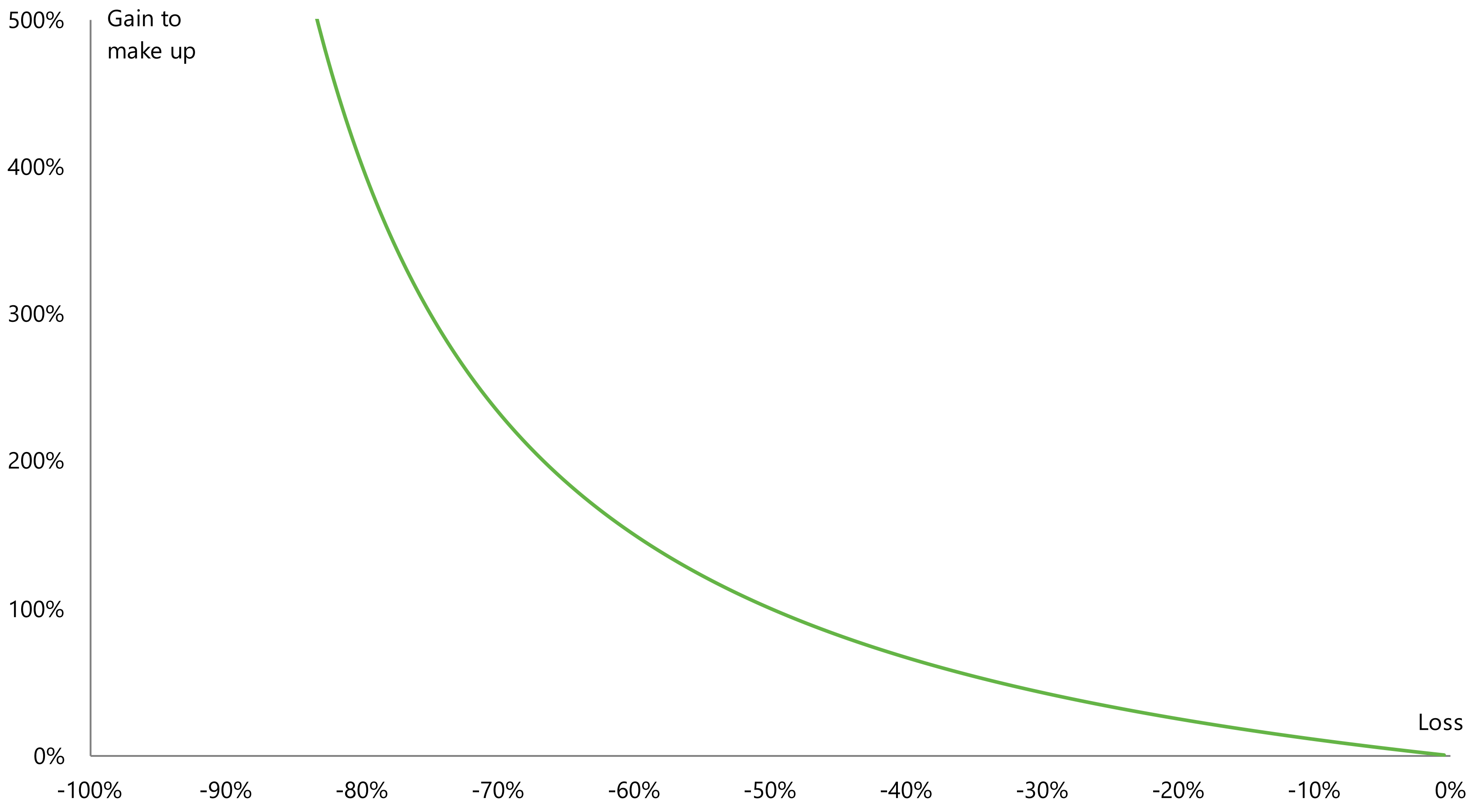
$$E[U(r)] = U(0) + U'(0).\underset{\text{Max}}{\overset{\text{Return}}{E[r]}} + \frac{1}{2!}U''(0).\underset{\text{Min}}{\overset{\text{Volatility}}{E[r^2]}} + \frac{1}{3!}U'''(0).\underset{\text{Max}}{\overset{\text{Skewness}}{E[r^3]}} + \frac{1}{4!}U''''(0).\underset{\text{Min}}{\overset{\text{Kurtosis}}{E[r^4]}} + \ \ldots$$

- Complicated
- Estimates of return and covariance still needed

What to do?

- Avoid large losses
- Find convexity
- Make sure you pay for it

Preservation of capital before all else



Source: Ruffer calcuations

No more free lunches

"It is pretty obvious that with interest rates near zero and being held stable by central banks, bonds can provide neither returns nor risk reduction."

Bob Prince, Co-CIO
Bridgewater Associates
July 2020

Source: Bloomberg, Ruffer calculations

Need convexity

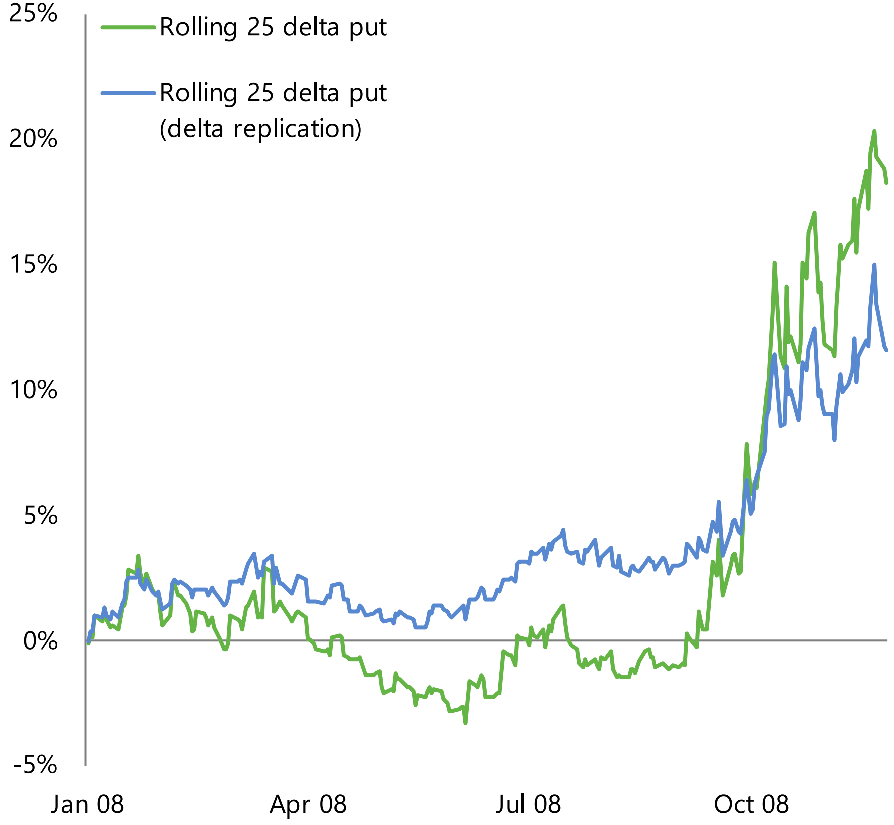
- Asset returns compensate for potential losses in bad times

$$Risk\ premium_t^i = -Covariance(Asset\ excess\ return_{t+1}^i, SDF_{t+1})$$

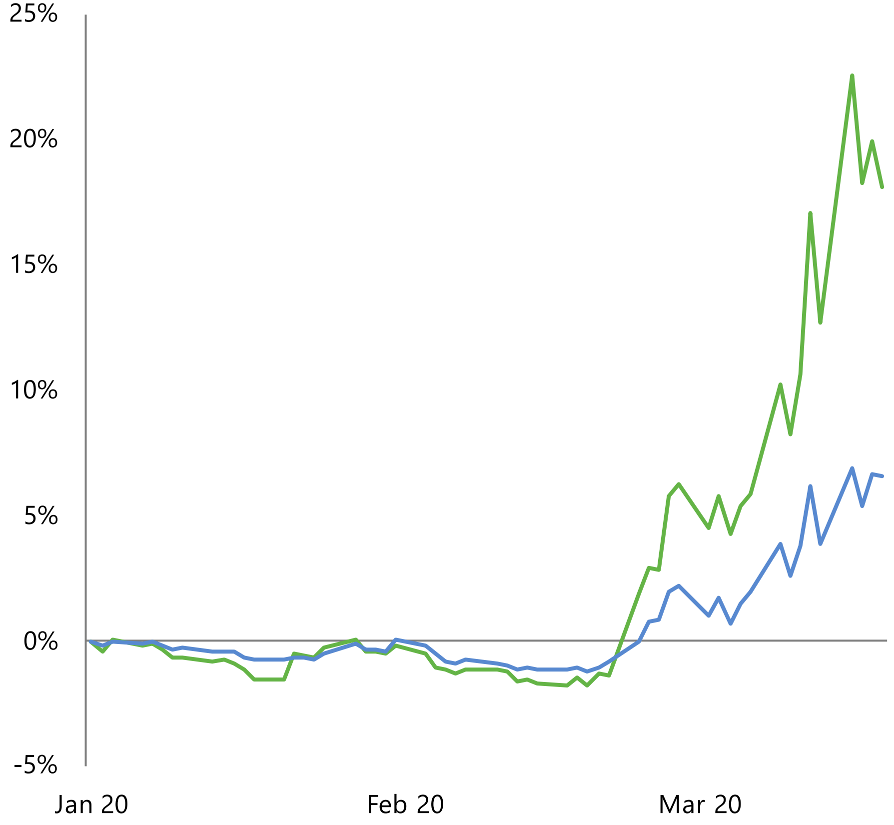
- Assets that benefit from bad times carry negative risk premium
- Convex payoffs come with a price

Got to pay to play

2008



2020



Source: Bloomberg, Ruffer calculations

Protection framework

VALUE

Look for protection we believe to be cheap

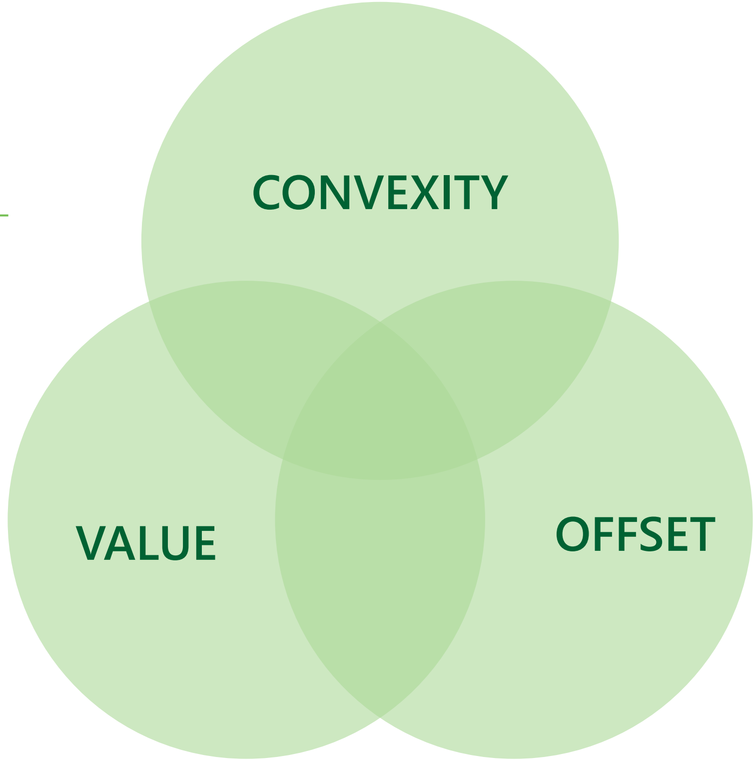
For instance, where there is a structural supply

OFFSET

Identify protection which can provide a meaningful payoff in adverse conditions

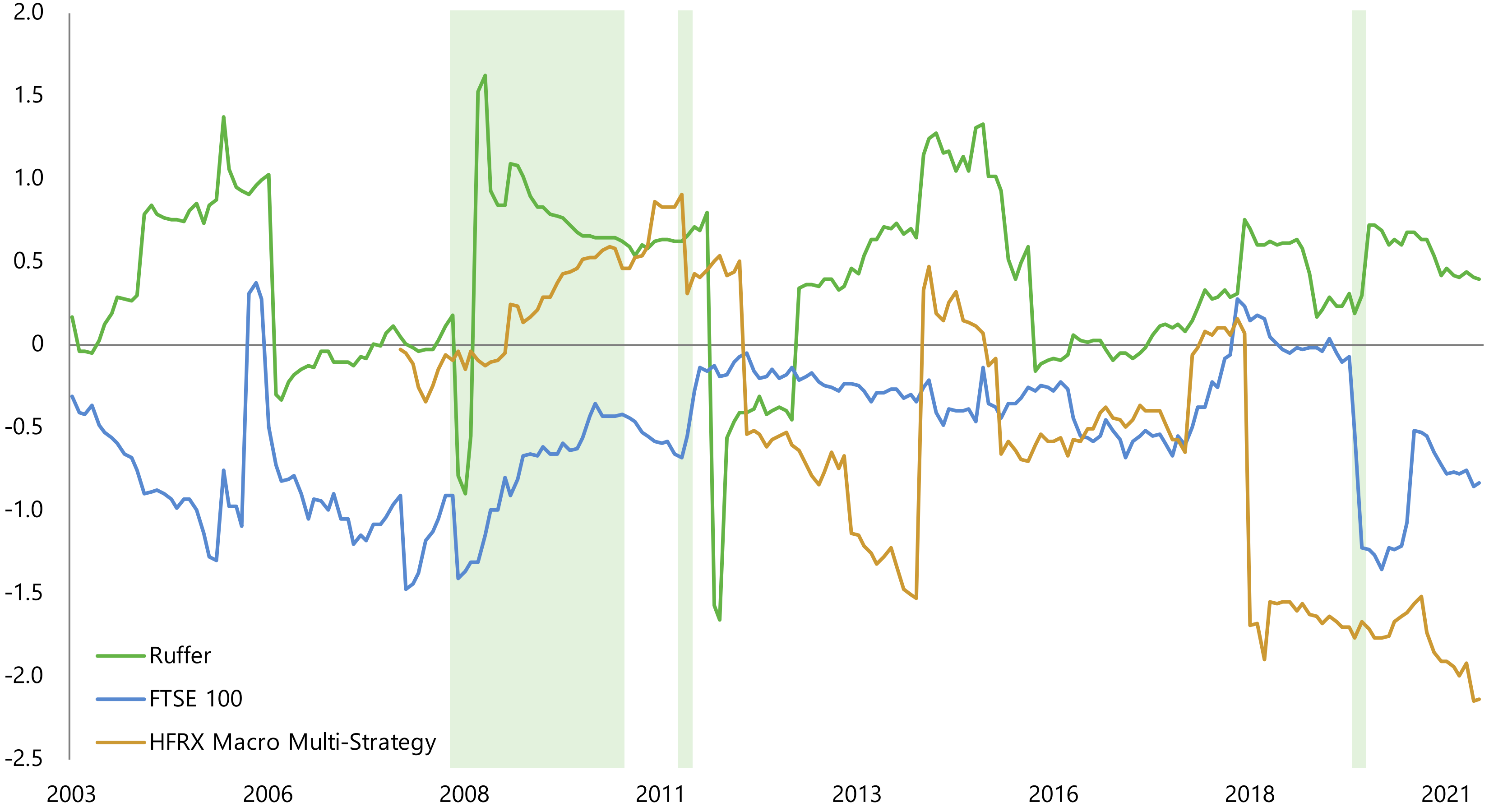
CONVEXITY

Target protection to match risks in the portfolio



The right sort of convexity

SKEWNESS OF RETURNS – RUFFER AND COMPARISONS



Source: Source: Bloomberg, Ruffer, data to 30 September 2021. Performance data is included in the appendix. Data is based on reinvested income. All references to Ruffer performance refer to the Ruffer Total Return Fund class 'O' shares

Ruffer LLP

80 Victoria Street London SW1E 5JL +44 (0)20 7963 8100

RUFFER.CO.UK

Regulatory performance data

PERCENTAGE GROWTH

To 30 Sep %	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
Ruffer	19.8	8.9	17.8	0.7	4.0	4.6	27.3	10.1	4.0	2.0	11.1	2.6	2.3	12.9	0.3	1.6	1.7	7.3	12.6
FTSE 100	9.9	11.7	19.8	8.8	8.5	-24.2	4.7	8.1	-7.6	12.0	12.5	2.5	-8.5	13.8	6.9	1.9	-1.4	-20.8	20.8
HFRX MMS				8.4	13.0	-0.4	16.8	5.1	-2.1	8.1	1.4	5.8	-1.4	-1.8	4.2	1.4	-1.5	4.4	9.5