



Institute  
and Faculty  
of Actuaries

# Scottish Board and Knowledge Sharing Scotland

Suzanne Vaughan - Scottish Board



# The Scottish Board

- The Scottish Board of the IFoA is accountable to members in Scotland and has three main key responsibilities (KRs):-
  - **KR1 – Encourage and Develop the Actuarial Community in Scotland.** Key success to date has been the KSS CPD events. Greater links to students and understanding optimal communication strategy are 2016 objectives as well as greater oversight of the wider CPD programme in Scotland.
  - **KR2 – Raise the Profile of Actuaries and the Profession in Scotland.** The profile and understanding of the IFoA was substantially enhanced by the Independence Vote with many new strong relationships made. Further 2016 work on Engaging Employers, Financial Education in schools, Schools/Universities, Media and PR as well as maintaining political engagement.
  - **KR3 – Encourage and Advance Academic Developments in Scotland.** The key success has been use of the Endowment Fund to help set up the ARC. We would welcome member input on use of the remaining Endowment Fund. The key 2016 roadmap for this KR is to understand and develop structure around academic developments in Scotland as well as develop a forward plan for the Endowment.
- The Leader of the Scottish Board is Alan Watson (Aon Hewitt), the Deputy Leader is Catherine Thorn (Prudential) and the Regions Manager is Tess Joyce ([Tess.Joyce@actuaries.org.uk](mailto:Tess.Joyce@actuaries.org.uk)). We'd actively like more member feedback on the Scottish Board activities and willing volunteers to join the Board to help support the profession in Scotland.

# Summary of Scottish Events



- This is a KSS event put on by the Scottish Board in relation to feedback from members wanting more frequent and less formal CPD events in Scotland.
- Future KSS events for 2016/2017 are:-
  - Actuarial Data Needs – David Alison and Meshali Chotai, KPMG
    - Thursday 27 October, Edinburgh
  - Presidential visit and IFoA Strategy refresh – Colin Wilson, President of the IFoA and Derek Cribb, CEO IFoA
    - Tuesday 1 November, Glasgow
    - Wednesday 2 November, Edinburgh
    - Wednesday 2 November, Stirling
  - Delivering effective presentations for Actuaries – David Hare, Deloitte
    - Wednesday 23 November, Edinburgh
  - Genomics basis of Human Lifespan? - Peter Joshi
    - Wednesday 11 January 2017, Stirling
  - The changing pensions landscape - Steve Webb, Director of Policy and External Communications at Royal London and former Pensions Minister.
    - Wednesday 25 January 2017, Edinburgh. Morning and evening sessions

# **Target-Risk Equity Funds**

**Edinburgh – Scottish Board**

**25 October 2016**

**Presented by John Caslin on behalf of the Authors**

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# Disclaimer

**The views expressed in this presentation are  
those of the authors,**

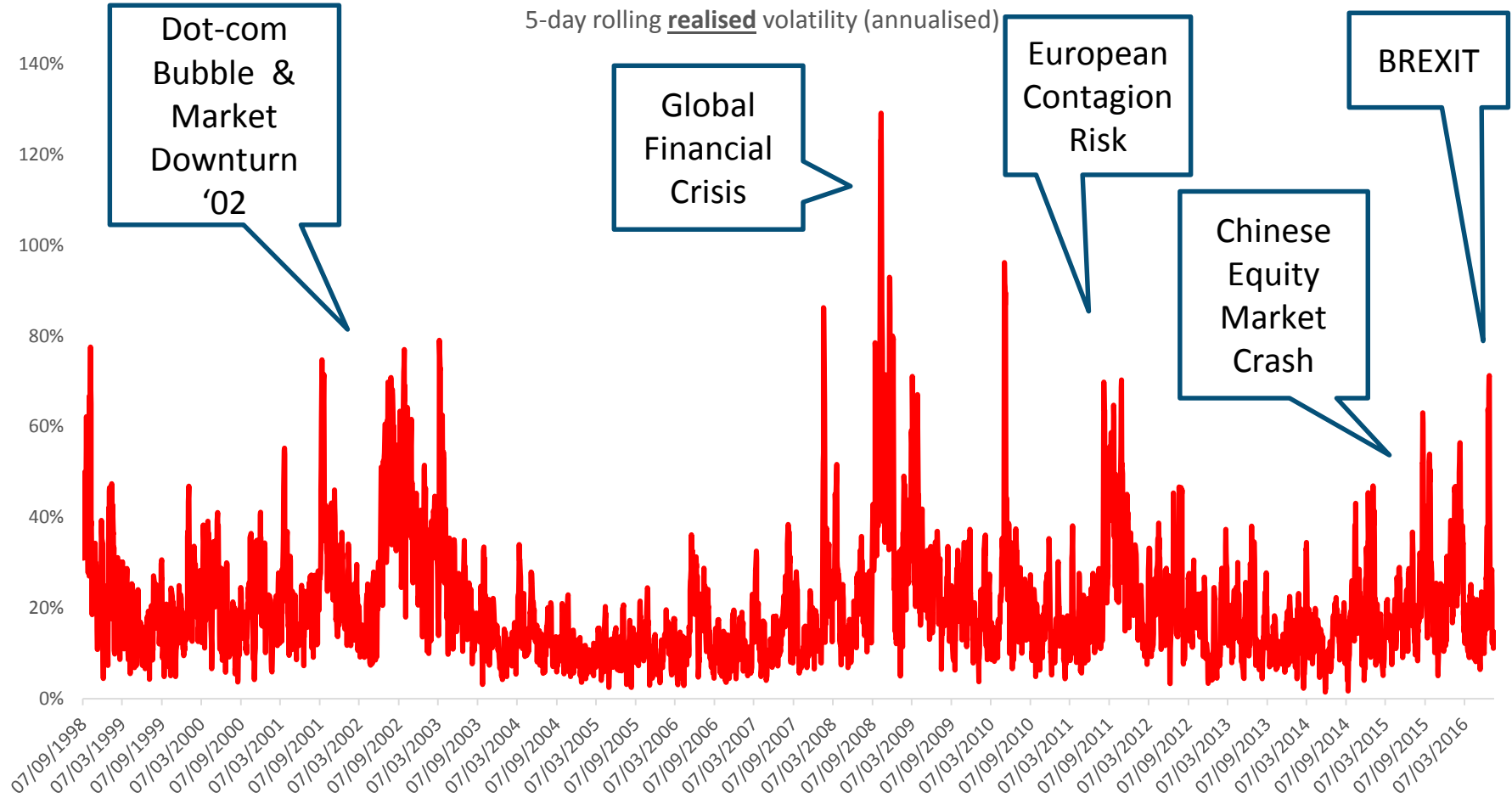
**John Caslin, Mark Caslin, Patrick Hogarty, and  
Simon Stroughair,**

**of the paper and not necessarily of the  
Staple Inn Actuarial Society**

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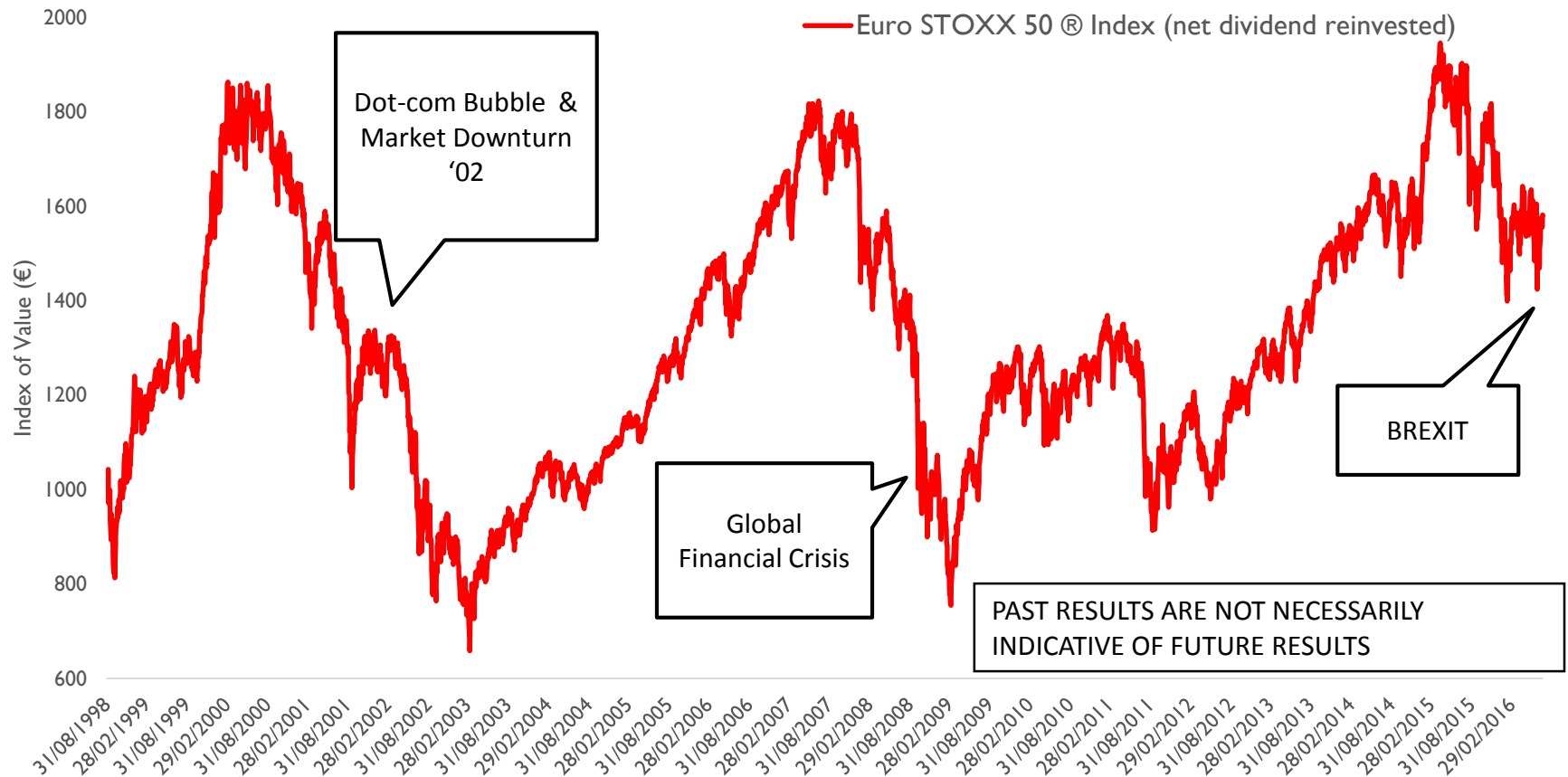
# Huge Variation in Equity Volatility

Euro STOXX 50<sup>®</sup> (net dividends reinvested)  
5-day rolling realised volatility (annualised)



# Huge Peak-To-Trough Falls in Value

## Index of Value



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# What is a Target-Risk Equity Fund?

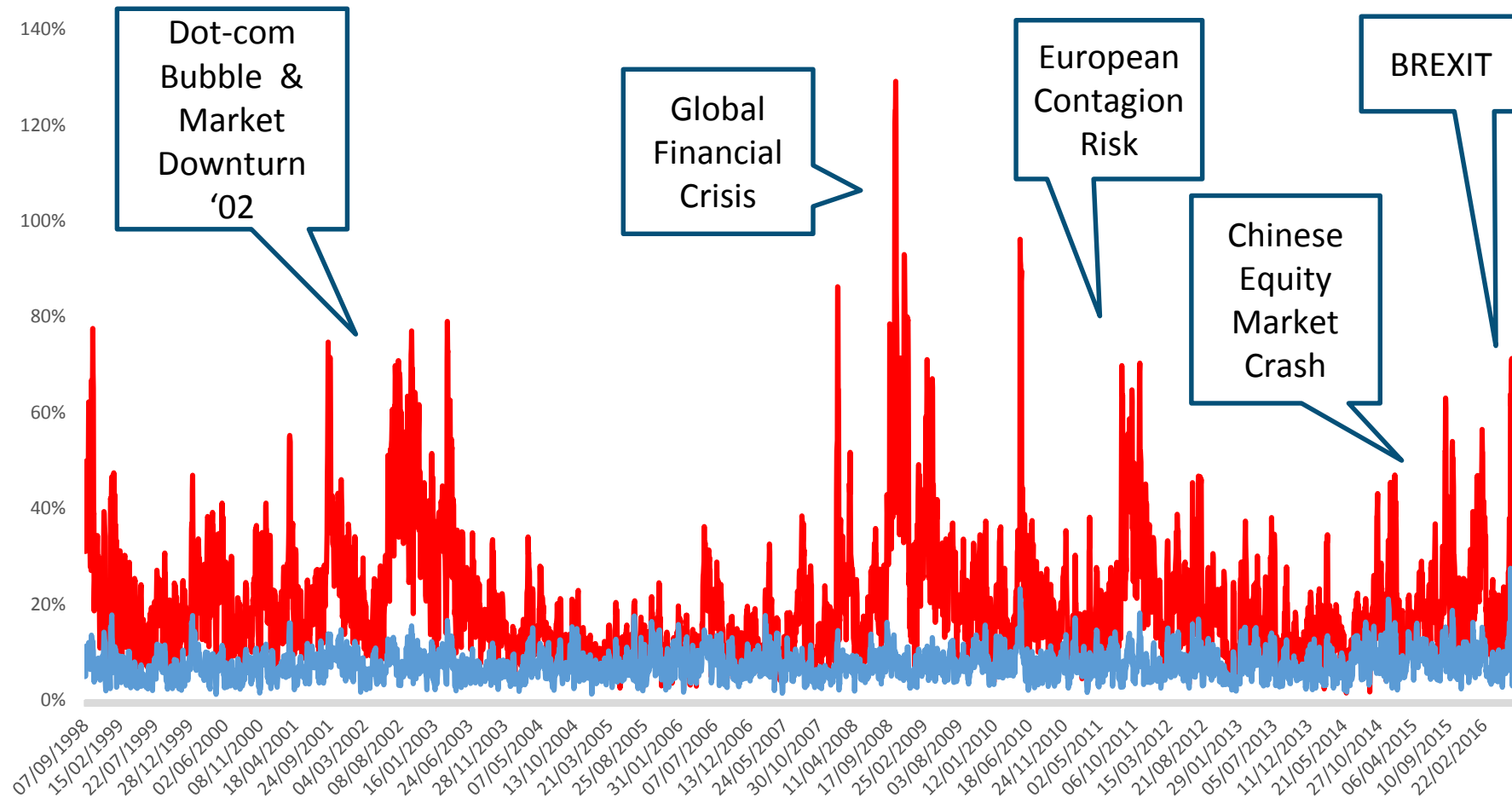
- Aim
    - Keep the fund's volatility in a tight range around the target level
  - Method
    - Forecast the risk of the fund
    - Vary the exposure to equities inversely to the forecast risk
-



# Huge Variation in Equity Volatility

8% Target-Risk Equity Fund vs Euro STOXX 50<sup>®</sup> (net dividends reinvested)

5-day rolling realised volatility (annualised)



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# Research Findings

- EURO STOXX 50<sup>®</sup> Index with net dividends reinvested
    - Period: 1 September 1998 to 31 December 2015
  - Target -risk level: **8% p.a.** of the value of the fund
    - Same return every **three to five years**
    - Cut peak-to-trough falls in value by **64%**
-

# **Large Peak-to-trough Falls in Value Destroy a Portfolio**

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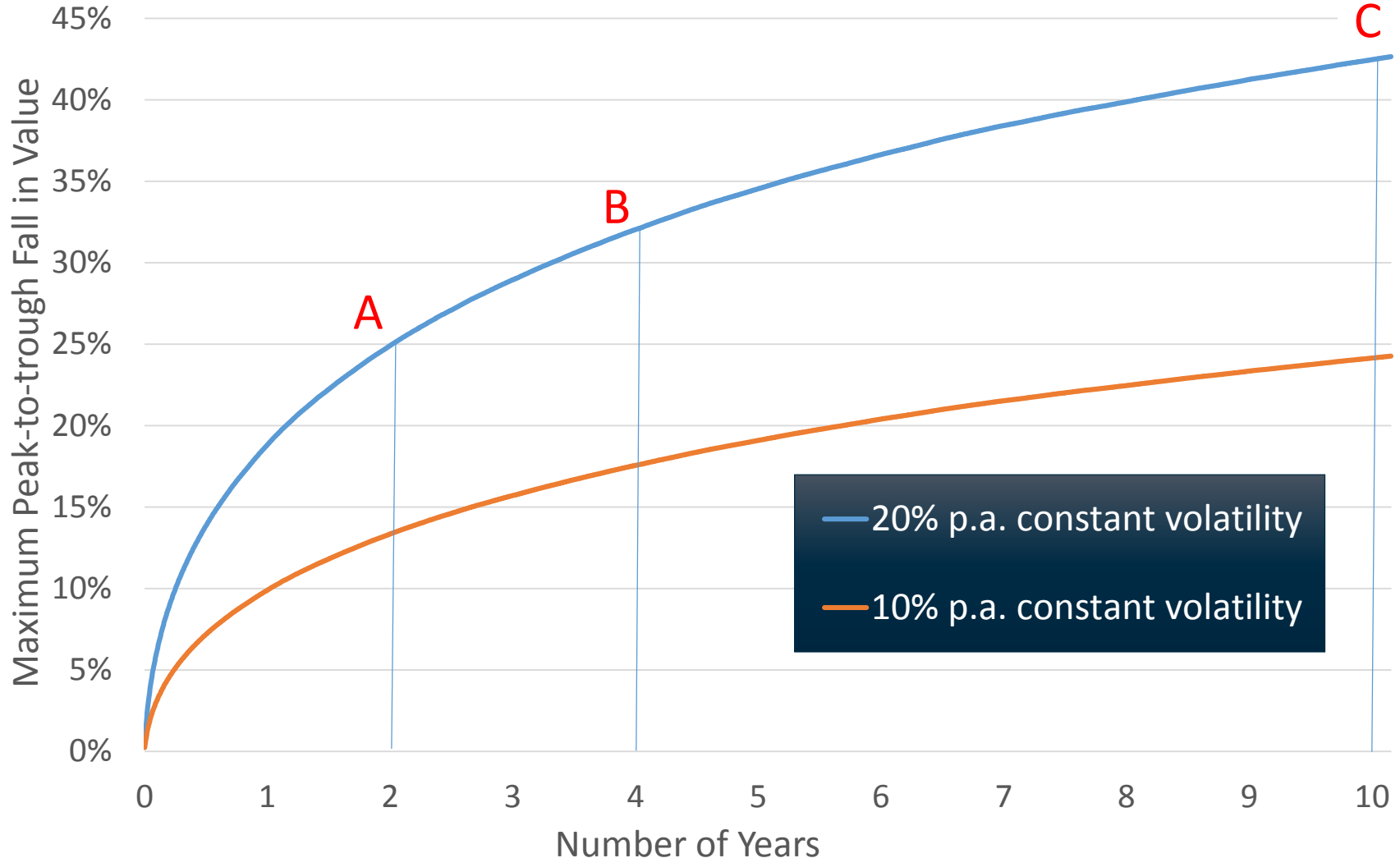
# Key Drivers

of Peak-to-trough falls in Value

1. Volatility level
  2. Time window
  3. Volatility of volatility
  4. Return
-

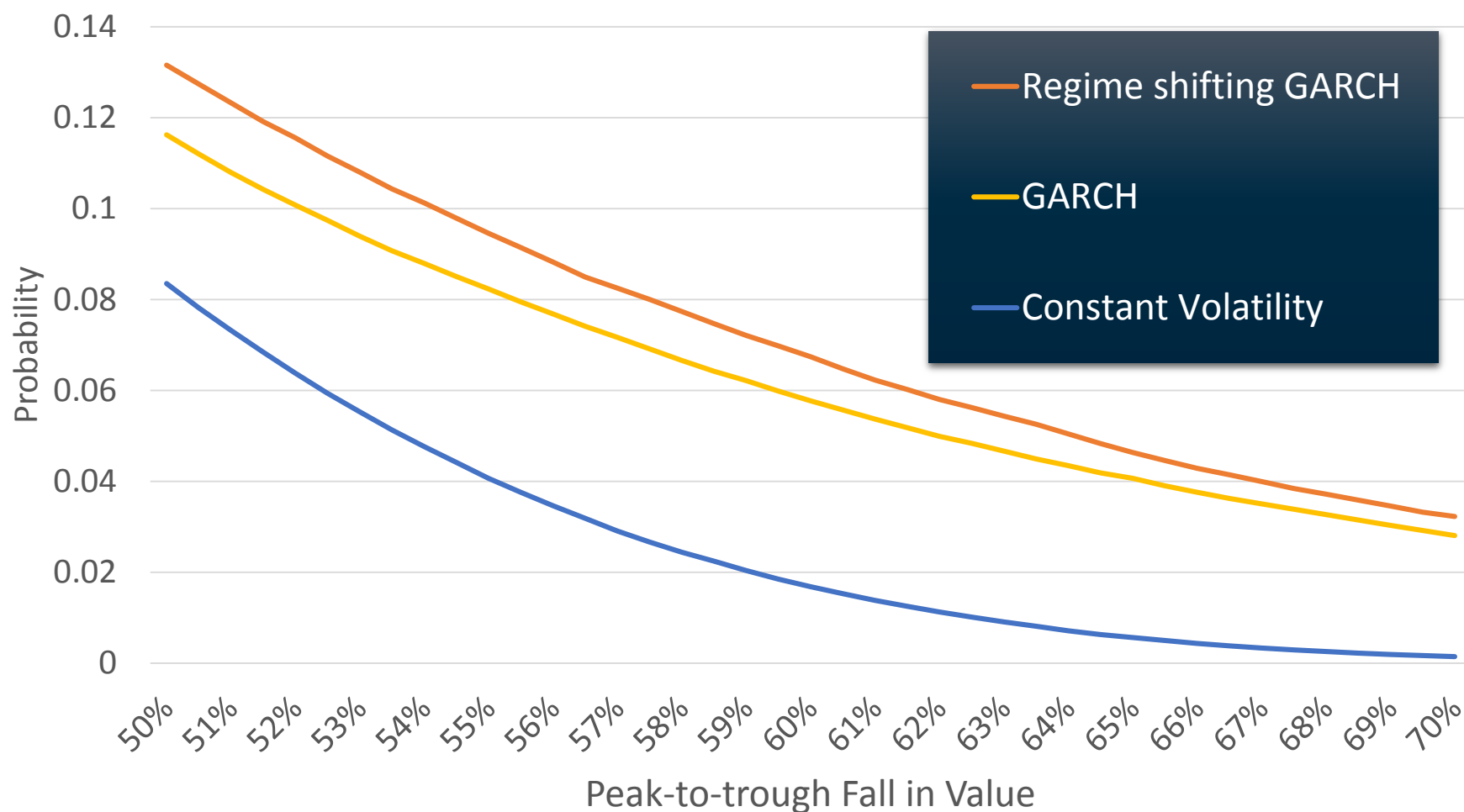
# Volatility Level and Time Window

Maximum Peak-to-trough Fall in Value v. Time in Years

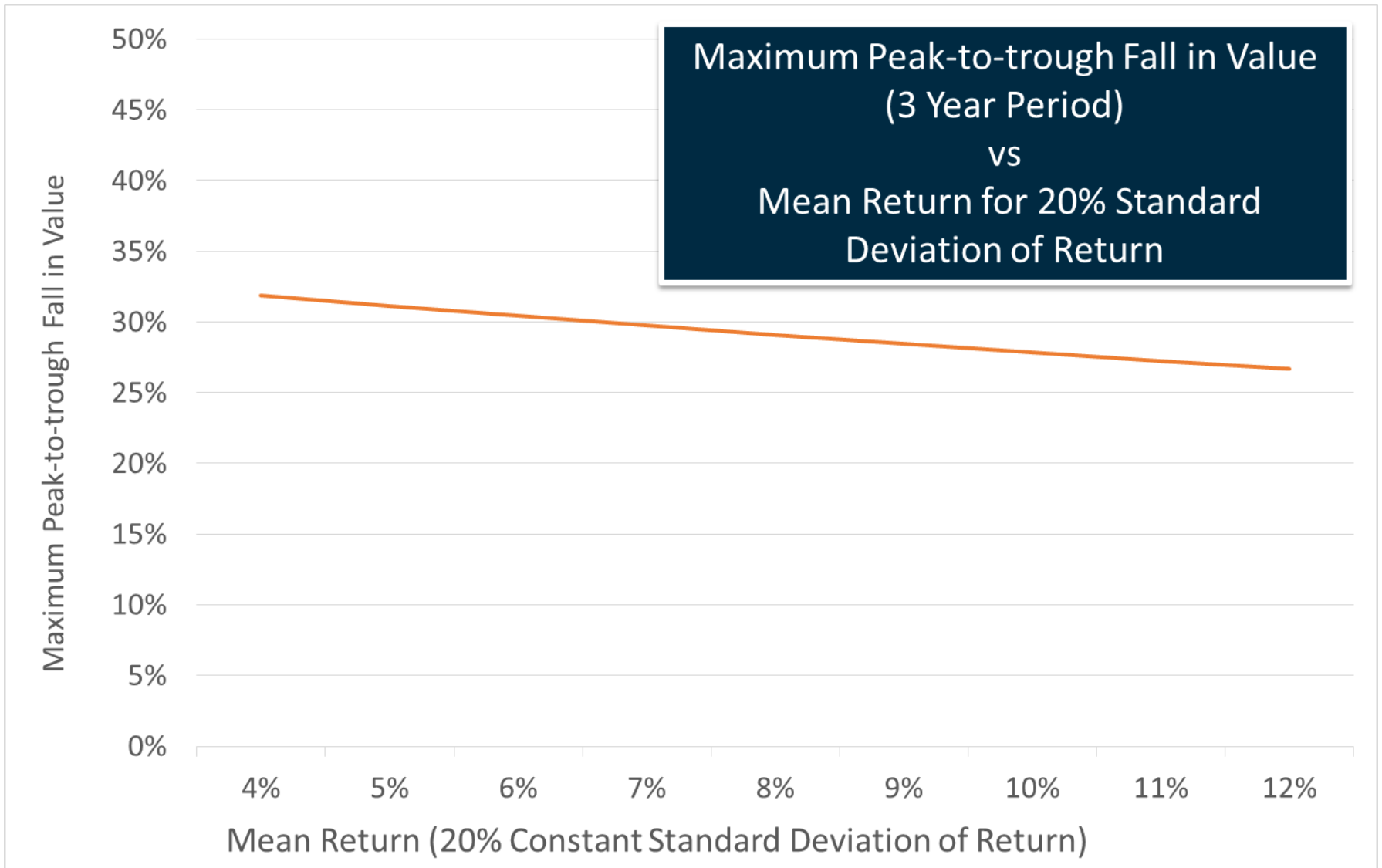


# Volatility of Volatility

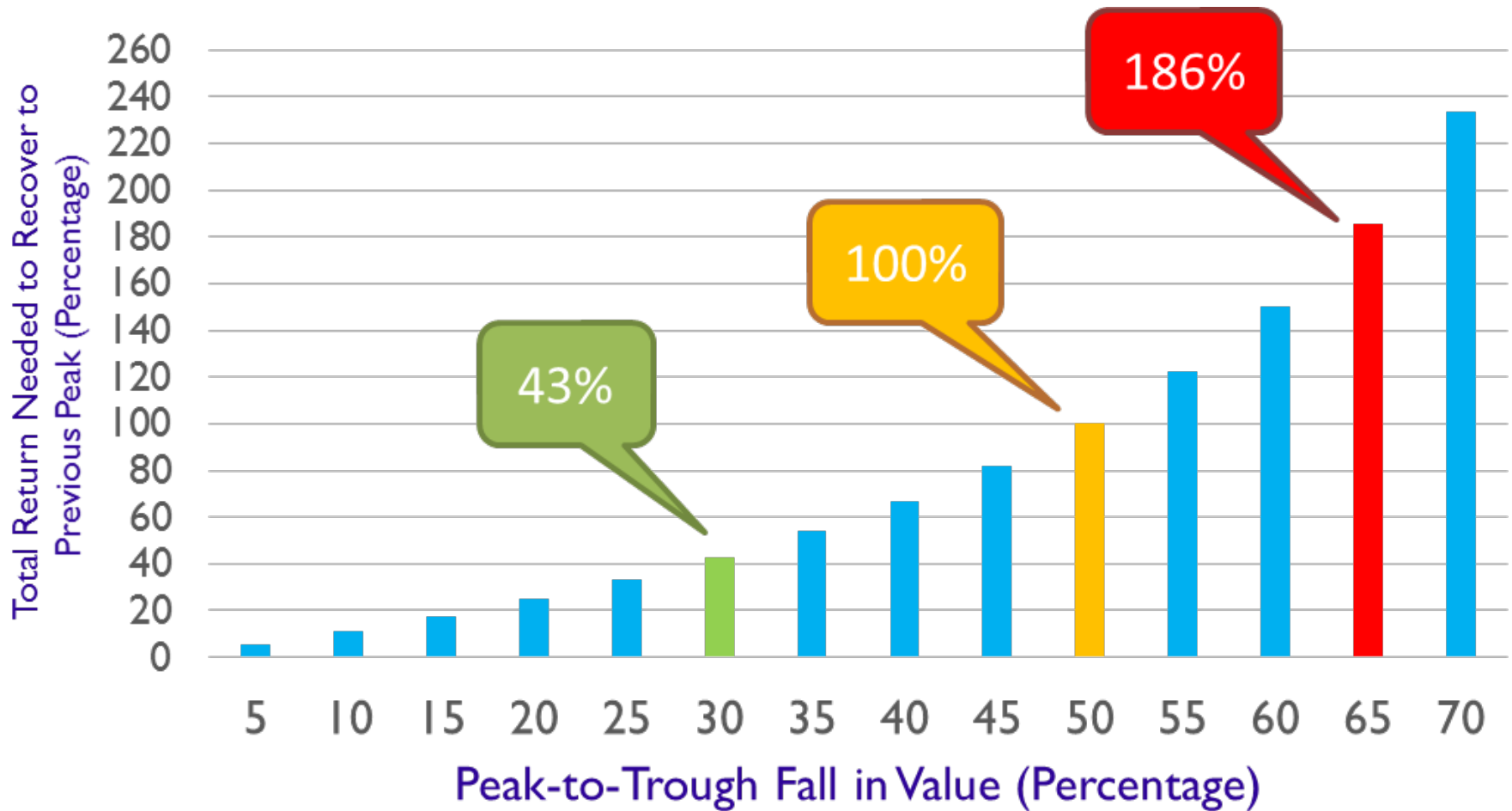
Probability of Maximum Peak-to-trough Falls in Value  
over a 3-year Time Period



# Return



# Return Required to Recover from Losses





**Can we capture the  
long-term return of  
equities while avoiding  
the large  
peak-to-trough falls in  
value?**

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# Controlling Portfolio Risk

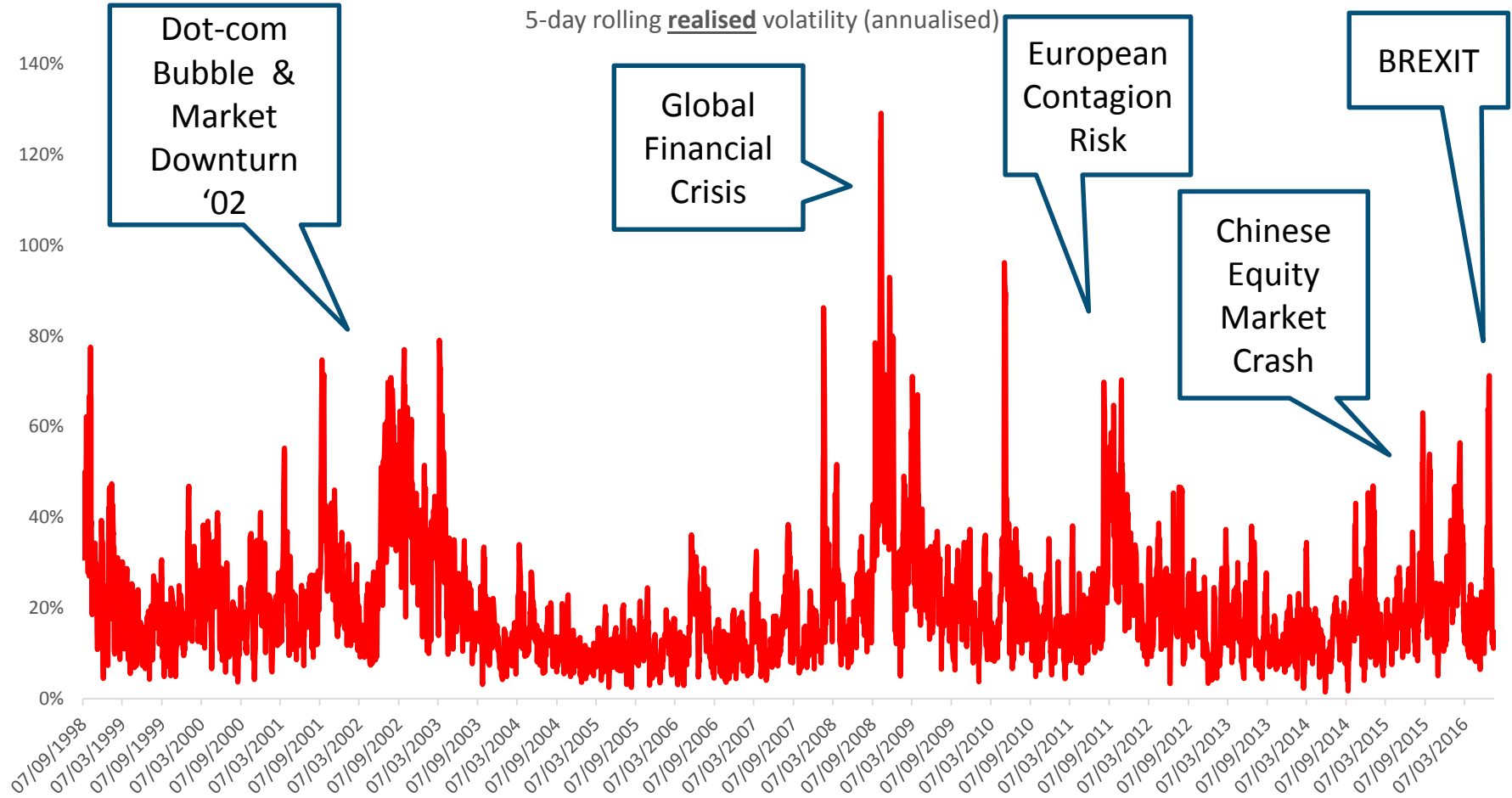
## Two Approaches

1. Diversification
2. Direct control of risk

# Diversification

# Huge Variation in Equity Volatility

Euro STOXX 50<sup>®</sup> (net dividends reinvested)  
5-day rolling realised volatility (annualised)

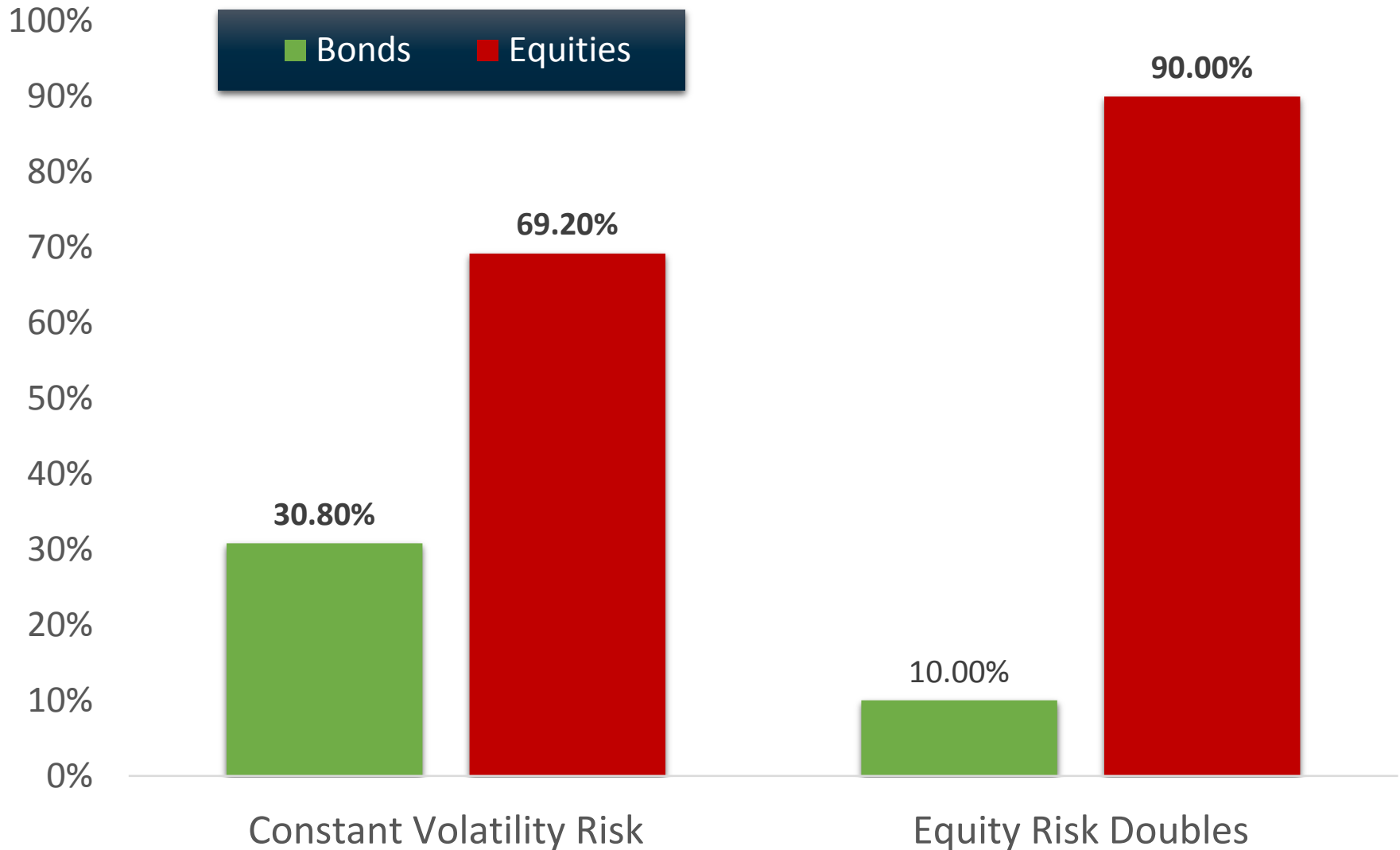


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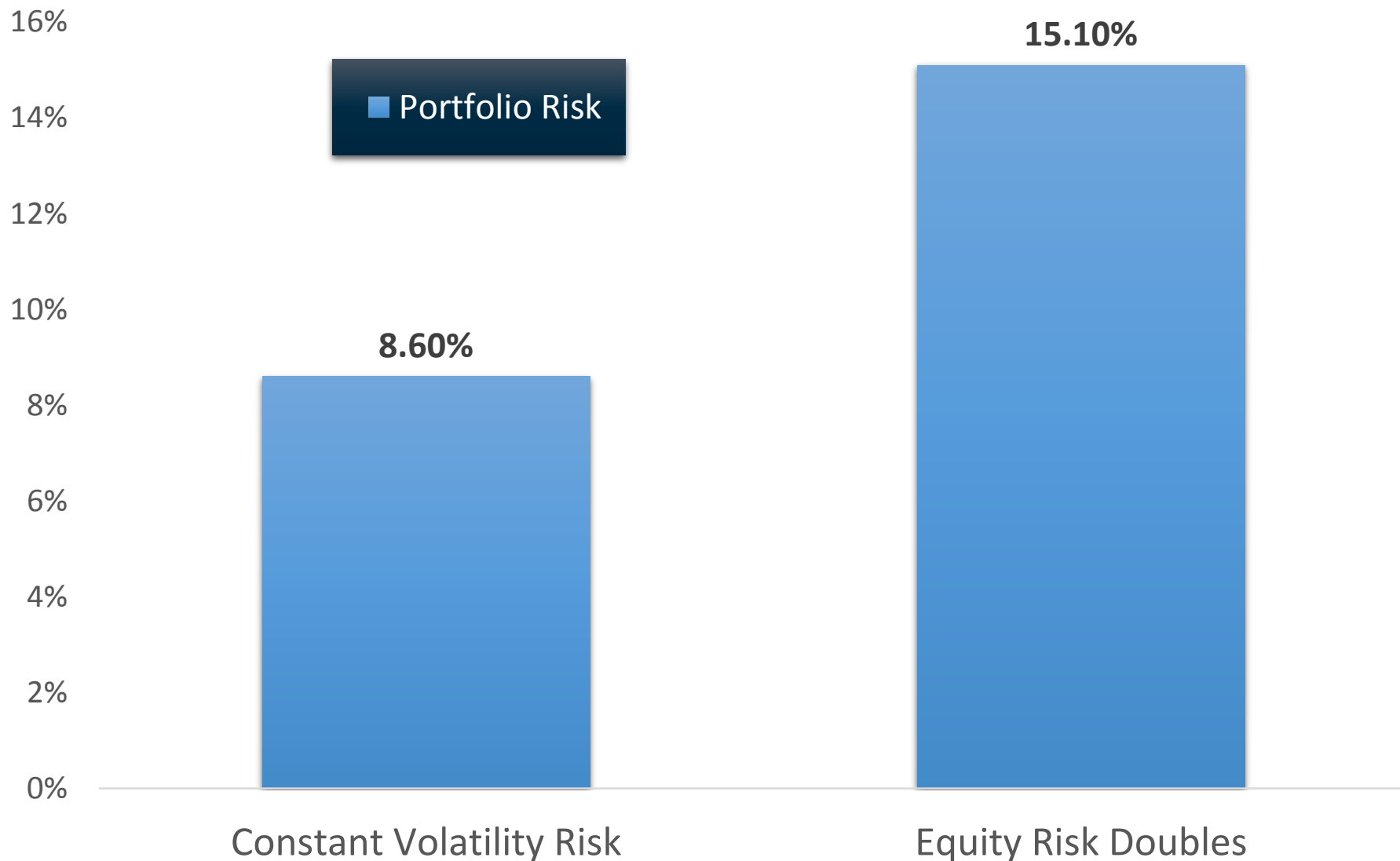
# Diversification

- Exposure to a range of asset classes
    - Impression of diversification
    - One asset class in the portfolio is riskier than all the others and exhibits huge variation in risk
  - Efficient frontier analysis
    - Assets have constant volatility
  - Illustration: 60% bond 40% equity portfolio
    - Assumptions:
      - **Risk**: 8% bonds, 18% equities, zero correlation
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# Source of Portfolio Variance



# Overall Portfolio Risk



# **Direct Control of Risk**

## **Target-Risk**

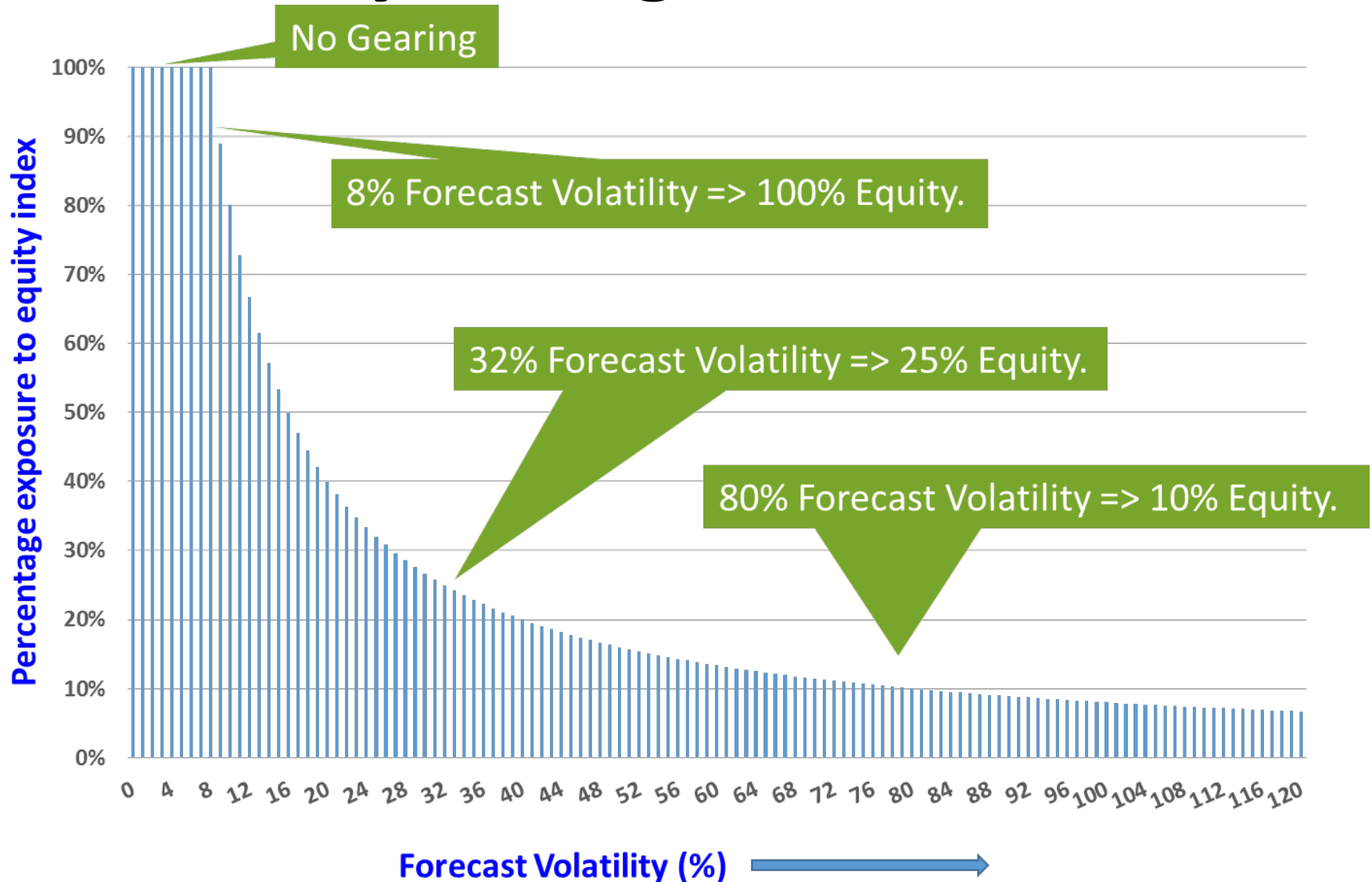


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# Controlling Portfolio Risk Directly

- Target -risk
    - Choose the risk level:
      - Investor's maximum tolerable loss
      - Given time period
      - Given probability
    - Forecast portfolio risk
    - Adjust exposure to equities inversely to forecast risk
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# How do you target risk?



# **Designing a Target-Risk Equity Fund**

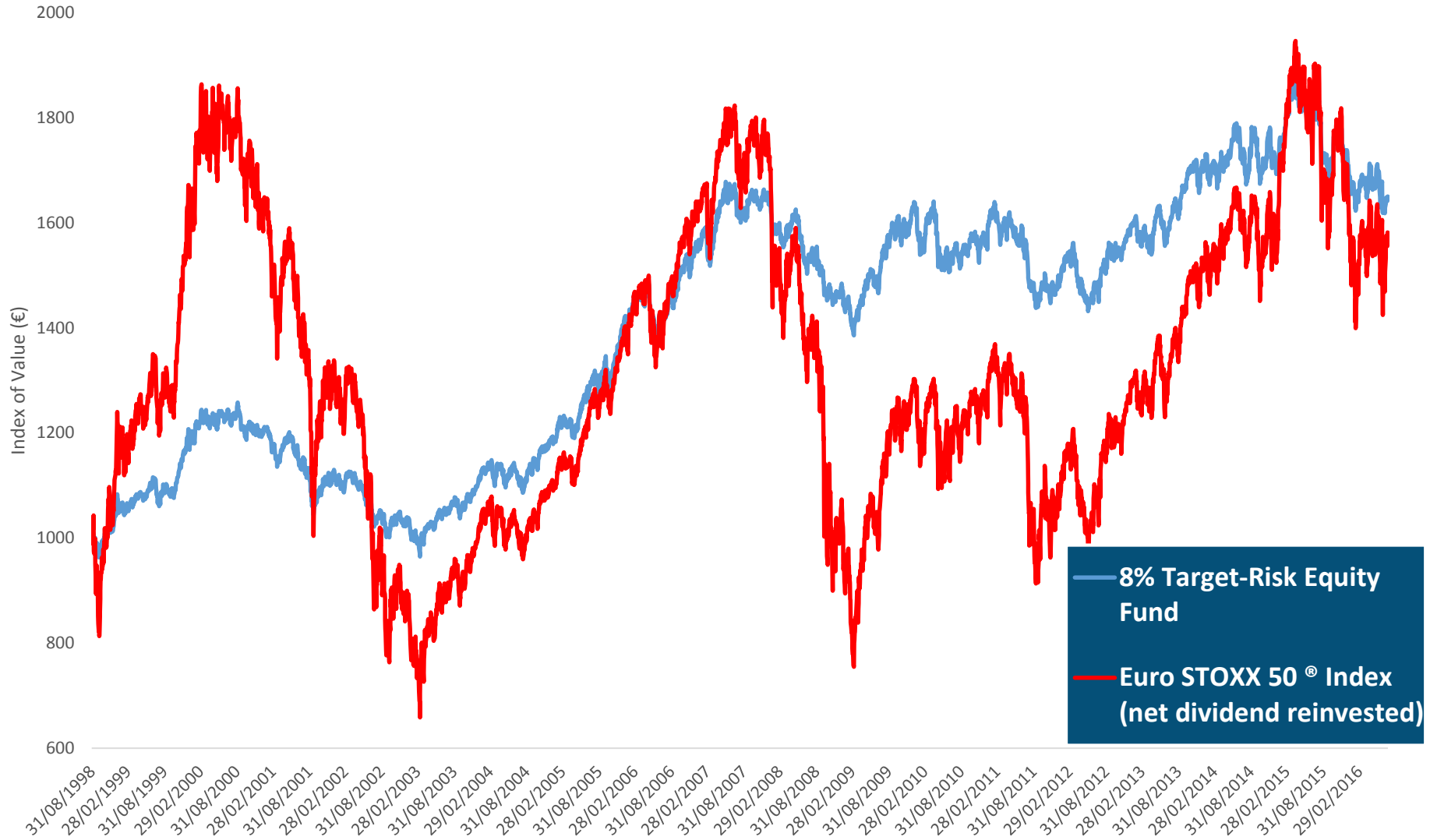
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# Design

## Target-Risk Equity Fund

- Choice of risk level
  - Risk and return do not scale linearly
  - Realised Risk and its implications for leverage and the target-risk level
  - Liquidity of underlying equity portfolio
    - Transaction costs
  - Ability to forecast volatility
-

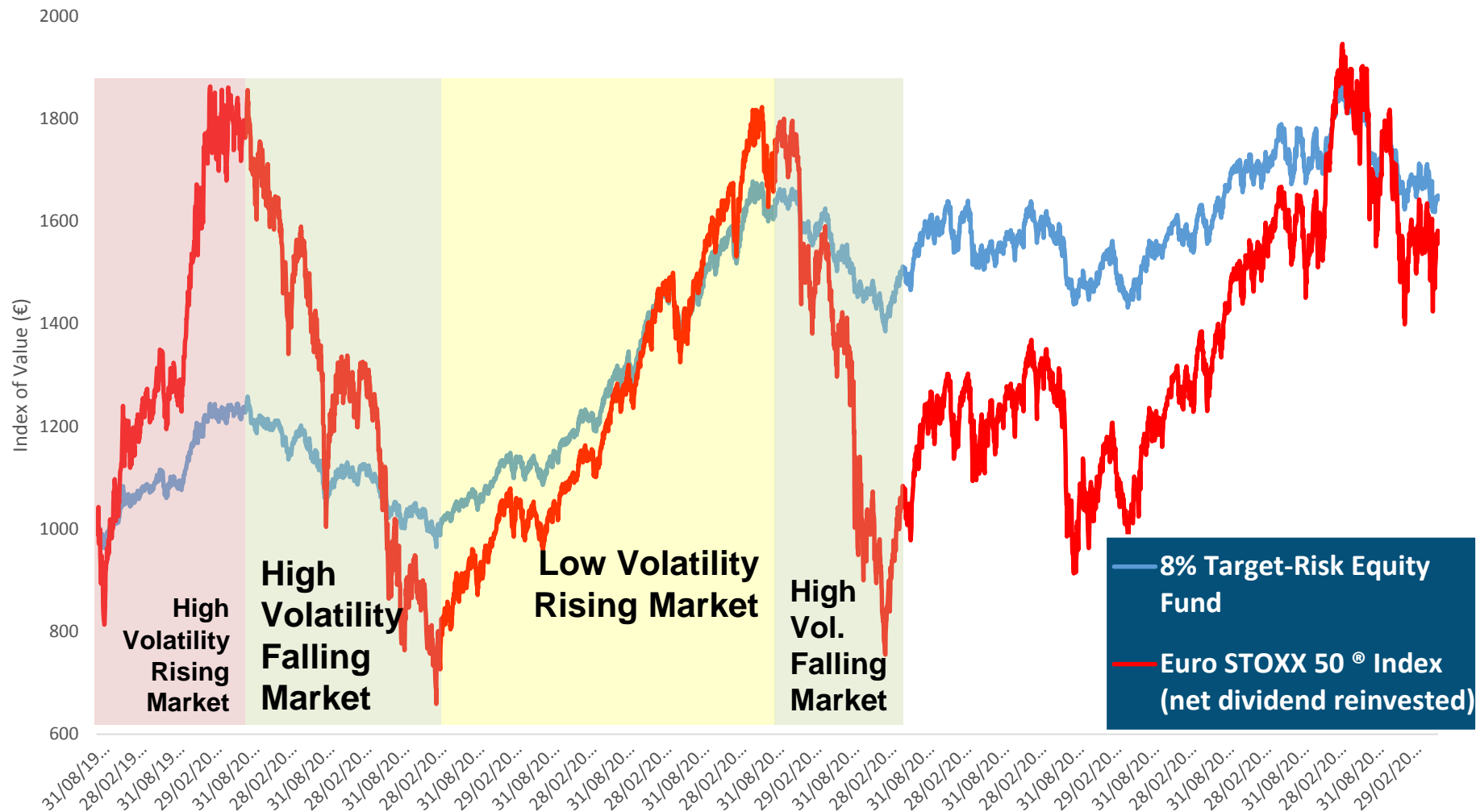
# Index Of Value



# Summary of Research Results

Fund / Parameter for the Period 1 September 1998 to 31 December 2015	8% Target-risk Fund	EURO STOXX 50® Index with Net Dividends Reinvested
Annualised daily volatility (%)	8.1	24.4
Maximum peak-to-trough fall in value (%)	23.3	64.6
Annualised Return (%)	3.2	3.1
Simple Sharpe Ratio	0.40	0.13

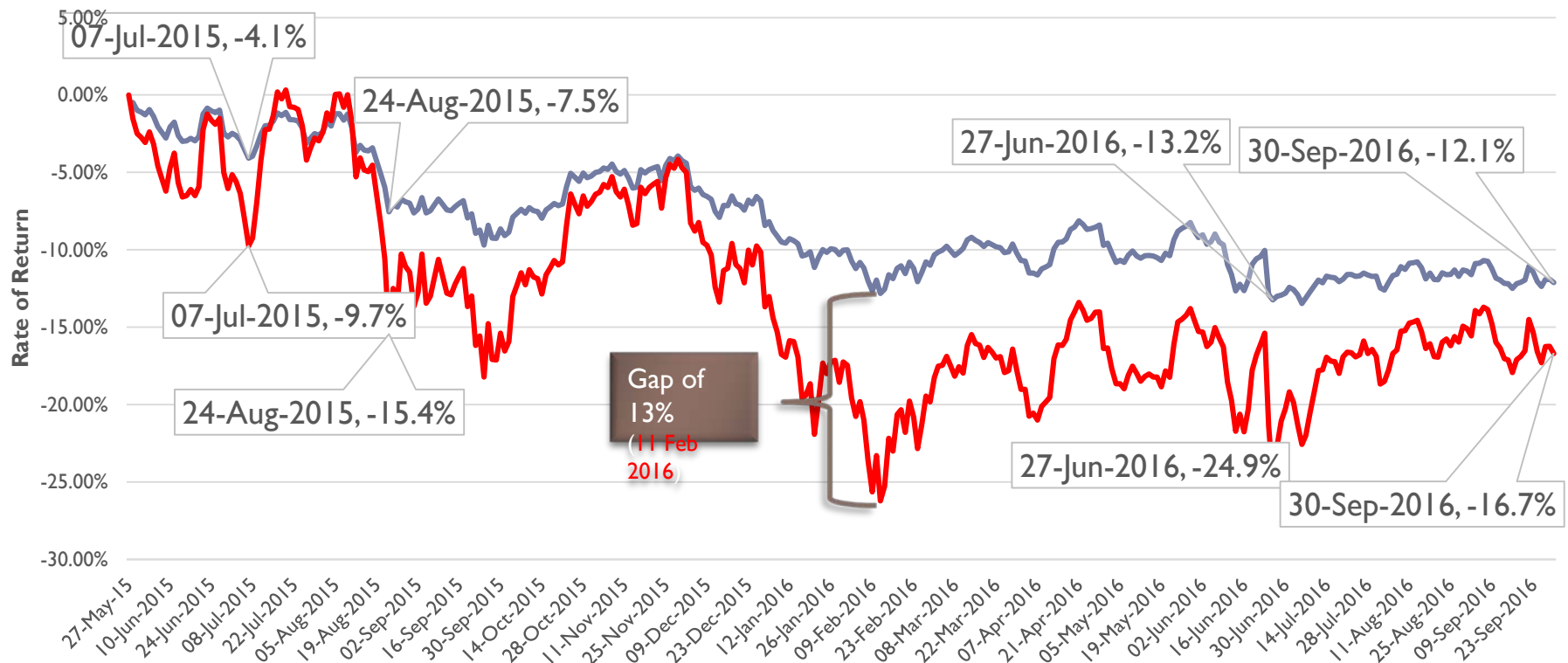
# Expectations Management



# Live Trading - Returns

CALM Eurozone Equity Fund vs Euro Stoxx 50® Index (net dividends reinvested)  
Since Inception (28 May 2015)

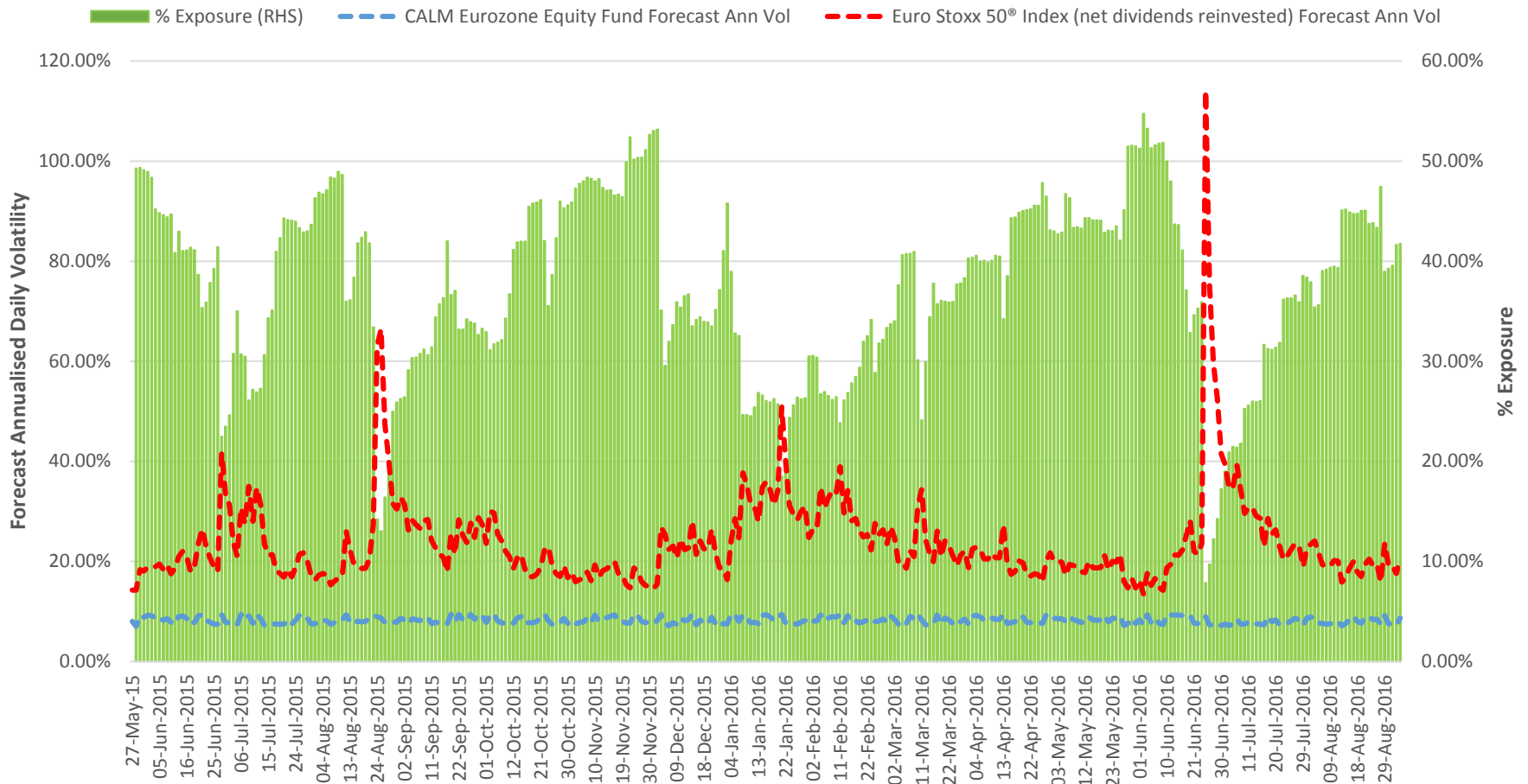
— CALM Eurozone Equity Fund ROR — Euro Stoxx 50® Index (net dividends reinvested) ROR





# Live Trading – Volatility Control

CALM Eurozone Equity Fund  
% Exposure - Since Inception (28 May 2015)



# Applications

# Pension Drawdown Funds

Probability of Pension Drawdown Fund running out of money  
v. years from commencement



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# Defined Benefit Pension Plans

- Low yield environment equities look attractive
  - Equities raise risk of a breach of the funding requirement
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- Target-risk approach
    - Risk of equity portion is controlled
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# Insurance Companies – Solvency II

- Investment assets: The *prudent person principle*
  - *Own funds* >  $MAX(SCR, MCR)$
  - Equity holdings increase the SCR
  - Equity analysts' views
- 
- *Target-risk equity likely to be a better means of including equities in “own funds”*
  - *Demonstrates the **IDENTIFY, MEASURE, MONITOR, MANAGE, CONTROL, and REPORT** requirements*

# Summary

# Summary

## Research results

- Same return every three to five years
- 1/3<sup>rd</sup> of the risk of the index
- 64% reduction in peak-to-trough falls in value

March of regulation and accounting standards  
demanding more risk control

## Significant applications for

DB and DC Pensions ✓

Multi-Asset Portfolios ✓

Pension Drawdown  
Funds ✓

Capital Protection Products ✓

# Paper

UK version of the paper is available



**Thank you for coming along  
and for your attention**