Intech®

—JANUS HENDERSON—

HARNESS VOLATILITY

In case of fire, use volatility

Protecting the value of your equity allocations

David Schofield
President, International Division

Iheshan Faasee
Client Portfolio Manager

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How to do it

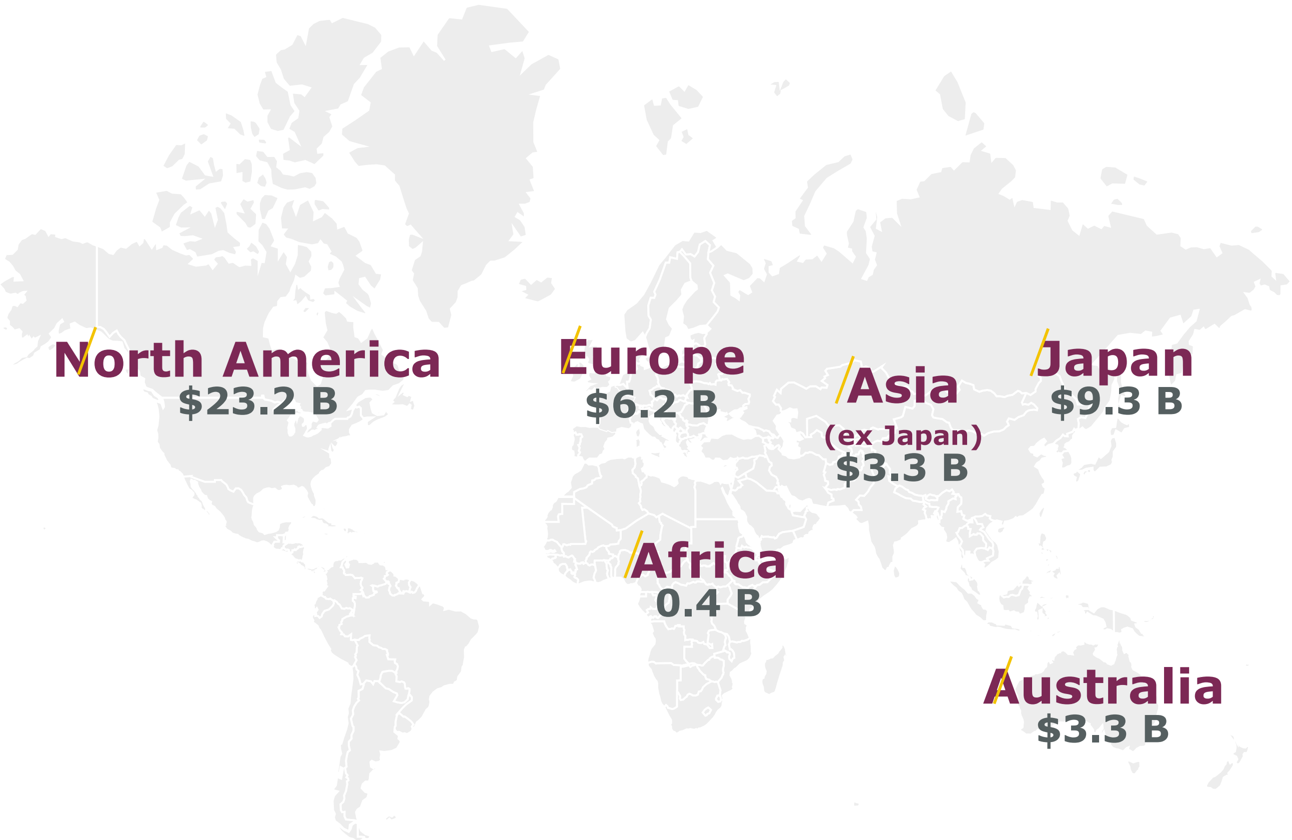
What is Intech?

01

A leader in quantitative equity investing

As of September 2019

Asset distribution by client domicile



Intech® by the numbers

30+
Year investing heritage

10+
Year average account tenure

$46
Billion in assets under management

#6
Largest global equity quantitative manager

188
Institutional clients in five continents

#5
Largest US Equity quantitative manager

The importance of avoiding losses

Portfolio volatility: the importance of limiting losses

Tech Bubble — March 2000 – January 2006

Global Financial Crisis — October 2007 – April 2013

2019

?

Drawdown

↓ **46%**

Break-Even Return

↑ **86%**

Recovery Time
3.4 years

Drawdown

↓ **54%**

Break-Even Return

↑ **116%**

Recovery Time
4.3 years

Years to Recoup Investment Losses

Annualised Return	Magnitude of Loss		
	10%	**25%**	**50%**
2%	**5**	**15**	**35**
4%	**3**	**7**	**18**
6%	**2**	**5**	**12**
8%	**1**	**4**	**9**
10%	**1**	**3**	**7**

As an investment decreases in value, the gain needed to get back to even increases substantially.

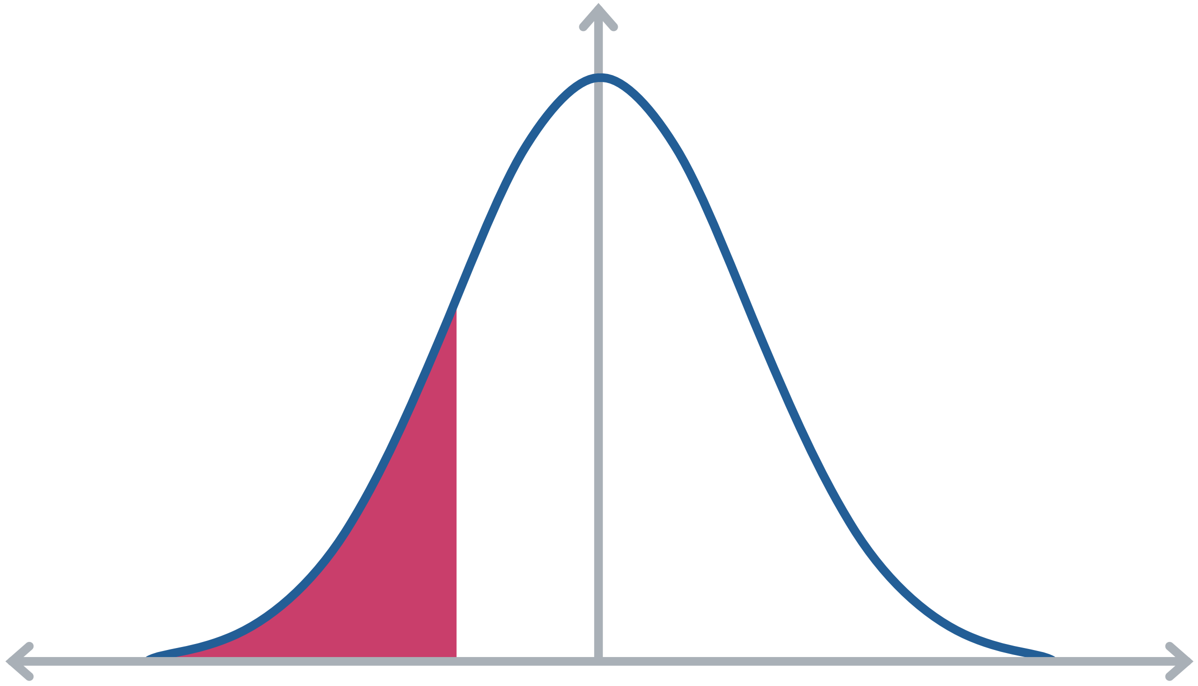
Severe market drawdowns are difficult to predict and may require years to recover from.

Drawdown and recovery time reflects MSCI World Index monthly returns. Does not represent the returns of any particular investment.
Data reflects past performance and is no guarantee of future results.

Portfolio volatility: why do we care about drawdowns?

Large equity drawdowns are NOT infrequent.

Avoiding the drawdown of the left-hand tail has the potential to increase long-term performance



MSCI World Index

Year	Maximum Drawdown	Return Needed to Break-Even
2001	-31.3%	45.6%
2002	-31.4%	45.8%
2003	-14.3%	16.7%
2004	-7.7%	8.3%
2005	-6.1%	6.5%
2006	-11.3%	12.7%
2007	-10.9%	12.2%
2008	-52.3%	109.6%
2009	-27.7%	38.3%
2010	-16.6%	19.9%
2011	-22.8%	29.5%
2012	-12.5%	14.3%
2013	-7.8%	8.5%
2014	-9.3%	10.3%
2015	-14.1%	16.4%
2016	-11.7%	13.3%
2017	-2.0%	2.0%
2018	-17.9%	21.8%

Drawdown reflects MSCI World Index daily returns within each calendar year shown. Does not represent the returns of any particular investment.
Data reflects past performance and is no guarantee of future results.

How to do it

03

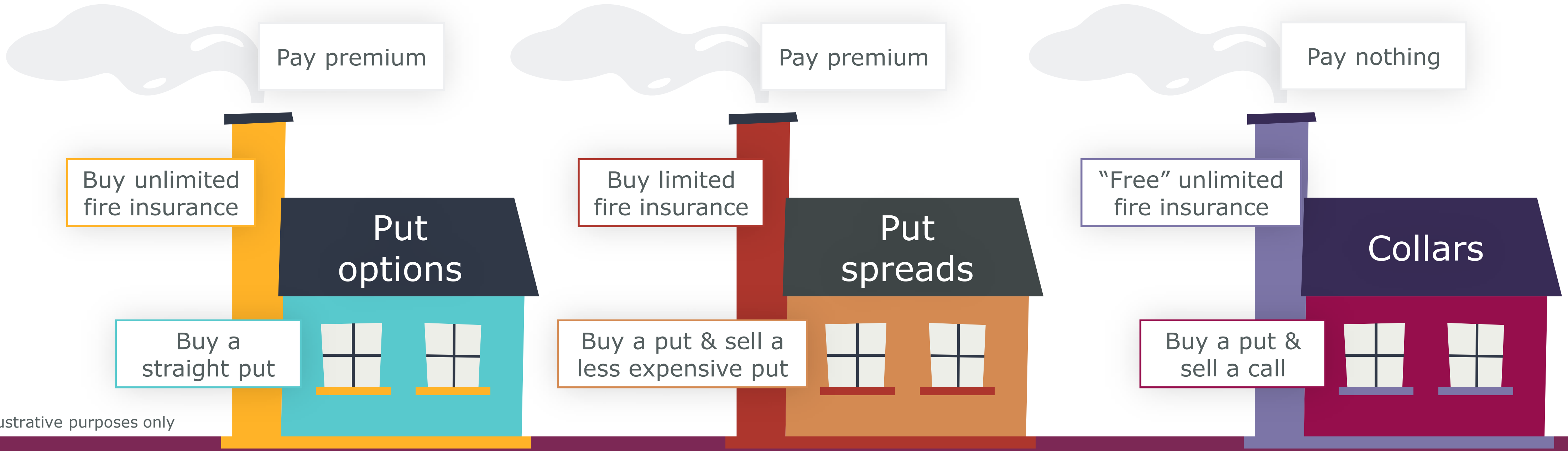
Using derivatives for protection is like buying fire insurance for your home

Pros

- Seeking to lock in your gains:
- Equity market uncertainty
- Restricted choices on alternative allocations
- Manage exposure towards an approaching valuation date or other risk events

Cons

- Guarantees are never free
- Rolling a protection strategy requires repeated payment to maintain derivative exposure
- Precision and complexity are expensive



For illustrative purposes only

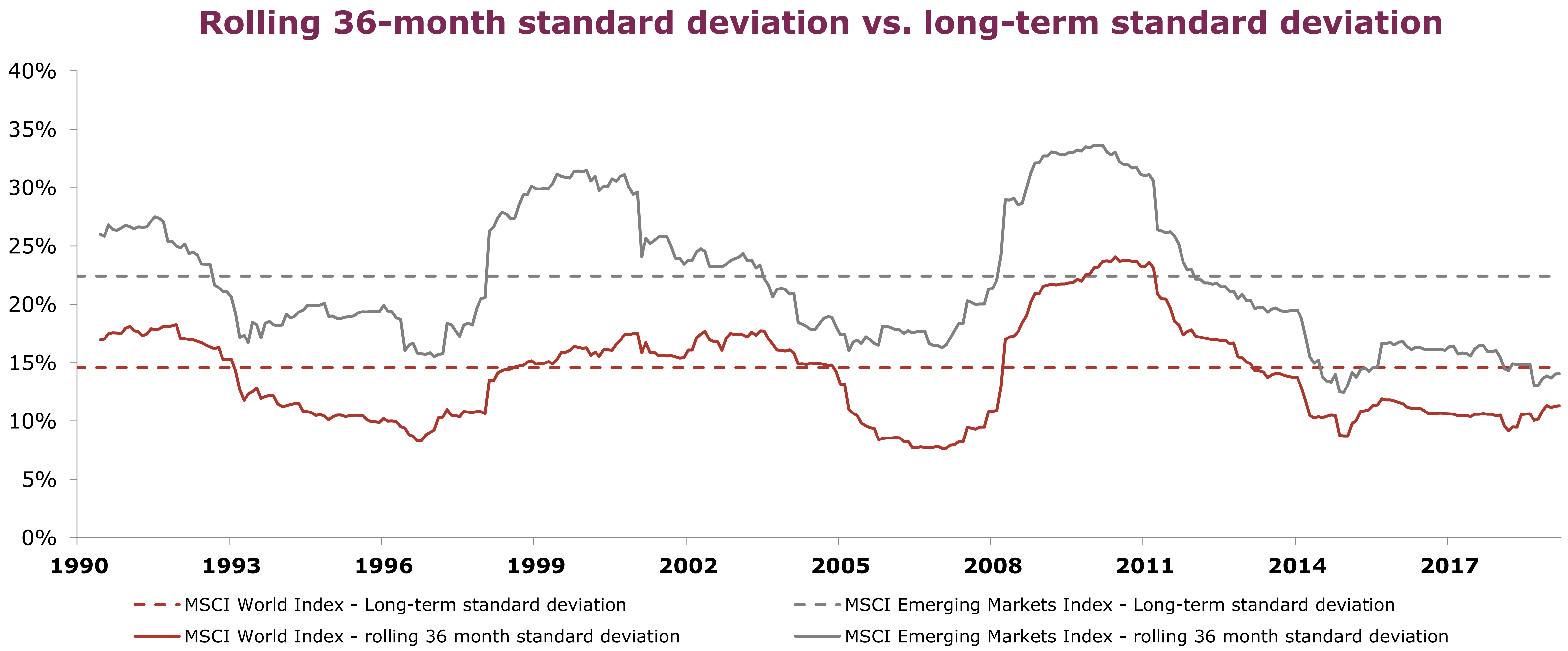
Pay premium, receive full reimbursement after any excess

Pay premium, receive limited reimbursement after any excess

No premium, full reimbursement after excess but insurance company shares in increase in house value

But volatility is volatile!

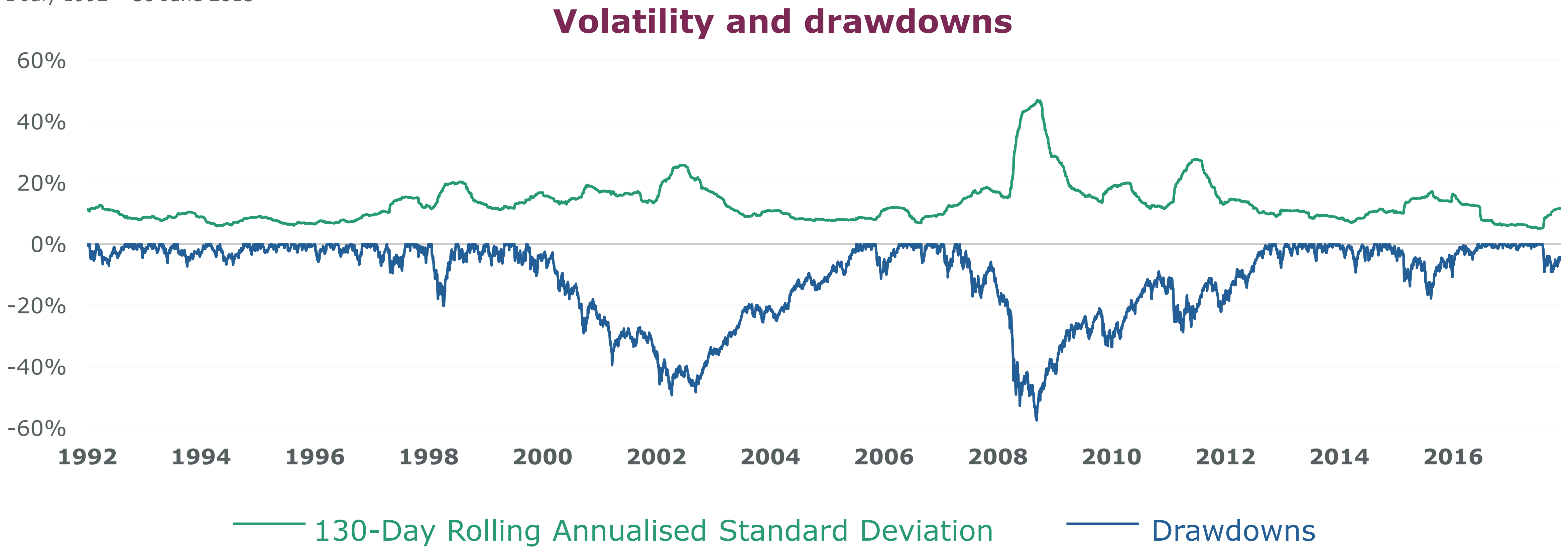
1 January 1988 – 31 March 2019



How does **volatility** correspond to market **drawdowns**?

MSCI World Index

1 July 1992 – 30 June 2018



Indexes are unmanaged and investors cannot invest directly in an index. Results reflect daily data.

Volatility spikes coincide with drawdowns and recoveries.

Experiment 1: using volatility to protect on the downside

Experiment 1: A simple, rules-based, adaptive strategy

01

If volatility ≤ **13.5%,** hold the index portfolio.

02

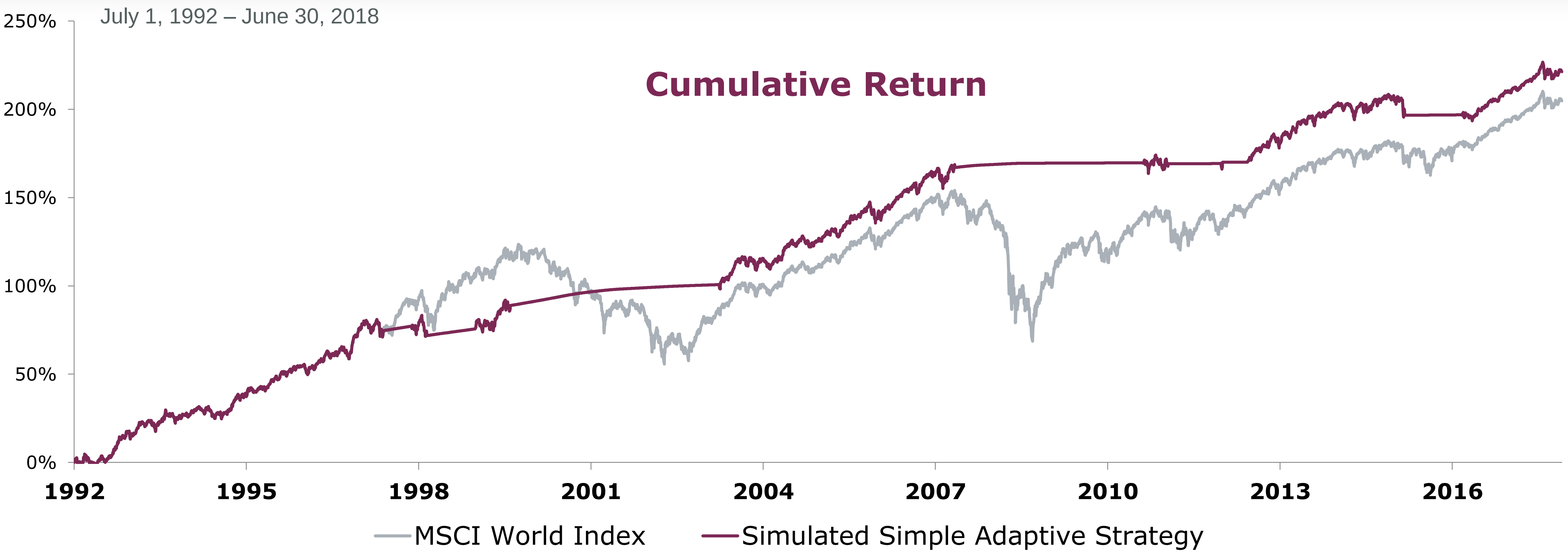
If volatility > **13.5%,** sell and switch to T-Bills.

03

When volatility < **13%** again, switch back to the index.

This strategy misses most of the drawdowns and the recoveries…

Experiment 1: results



Hypothetical illustration. Does not represent the returns of any particular investment. Indexes are unmanaged and investors cannot invest directly in an index. Results reflect daily data.
See Simulations Disclaimer at the end of this presentation for additional information.

…but it outperforms the index with about half the volatility.

Is there a better way?

03

How to adapt ***efficiently*** to the volatility climate?

Challenge:

Moving **too slowly** can create substantial active risk that may be unacceptable for most investors.

Moving **too quickly** is not a practical solution when trading costs are considered.

Example:

Long-only strategy that dynamically balances return potential and volatility reduction.

Reliable estimates of volatility may allow for an efficient adaptation.

The goal is to measure volatility, not predict it.

Experiment 2: beta and volatility

A hypothetical fully-invested variable-beta strategy that adapts to risk regimes

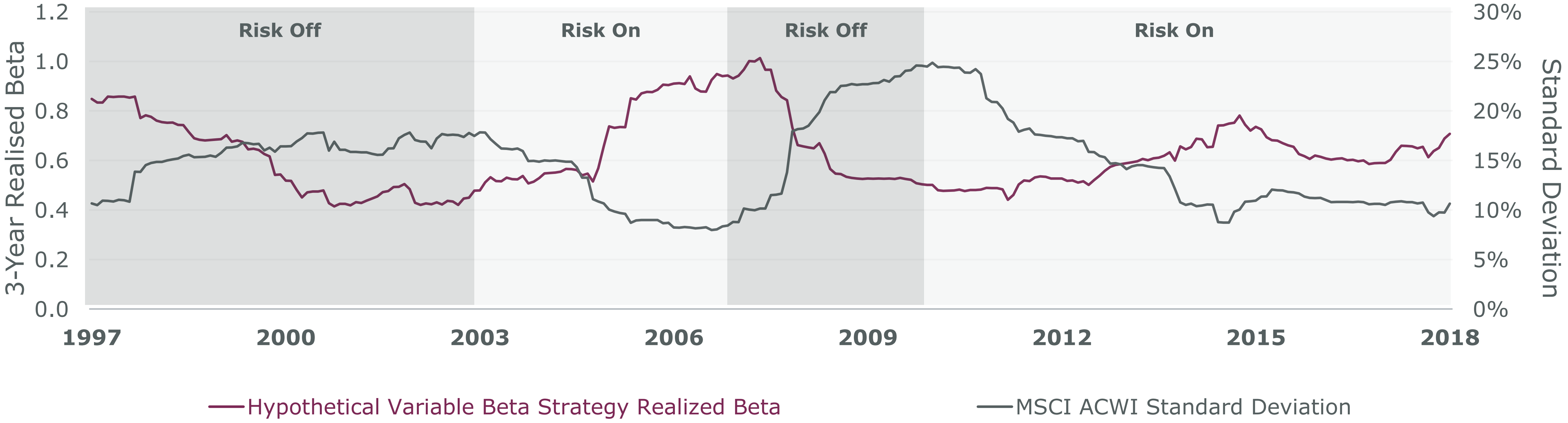
Objective: outperform the equity market with less volatility

Hybrid of active core and low volatility equity strategies

Seeks to reduce volatility, especially downside risk

Alpha-engine designed to outperform benchmarks

Beta adapts to increase and decrease systematic risk exposure

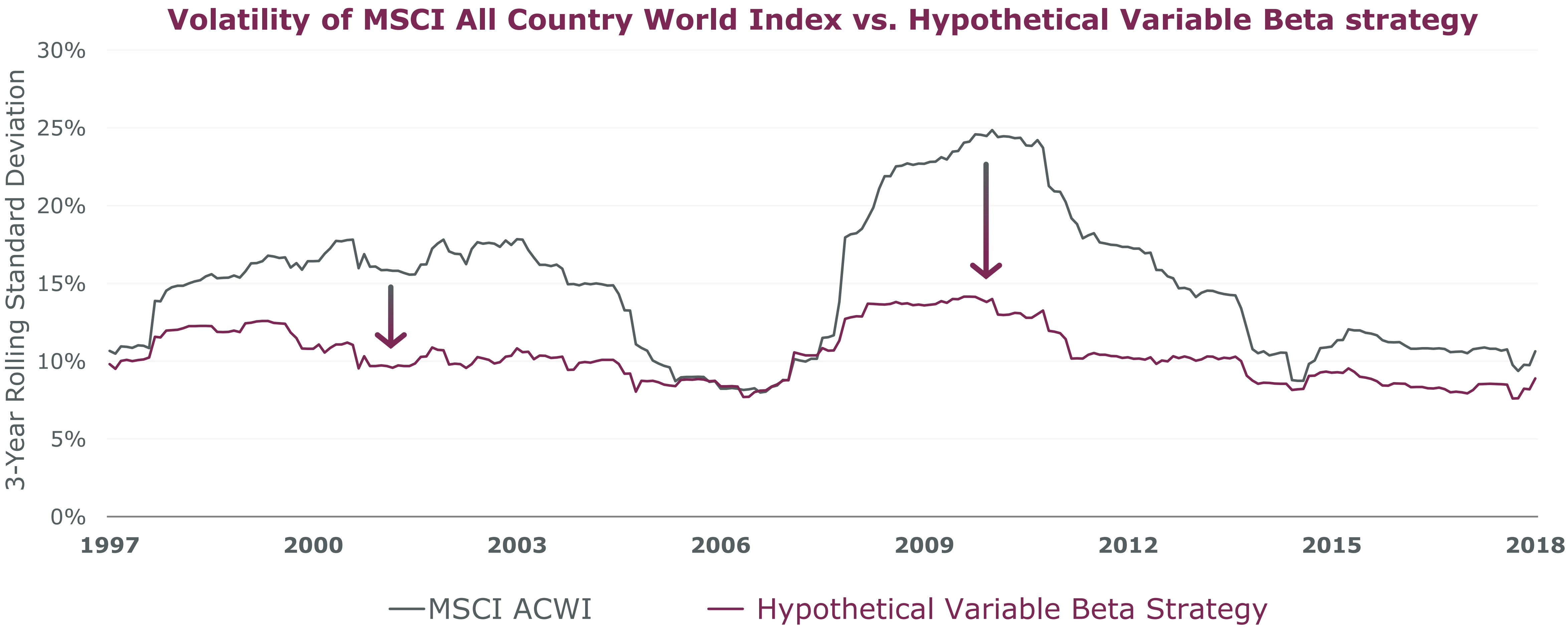


Rolling 3-year beta for a hypothetical global equity variable beta portfolio vs. a rolling 3-year standard deviation for MSCI All Country World Index.
Does not represent the performance of any particular investment.

Volatility reduction in high risk regimes tempers volatility profile

Rolling 3-year simulated standard deviation vs. MSCI All Country World Index

1 January 1995 – 31 December 2018

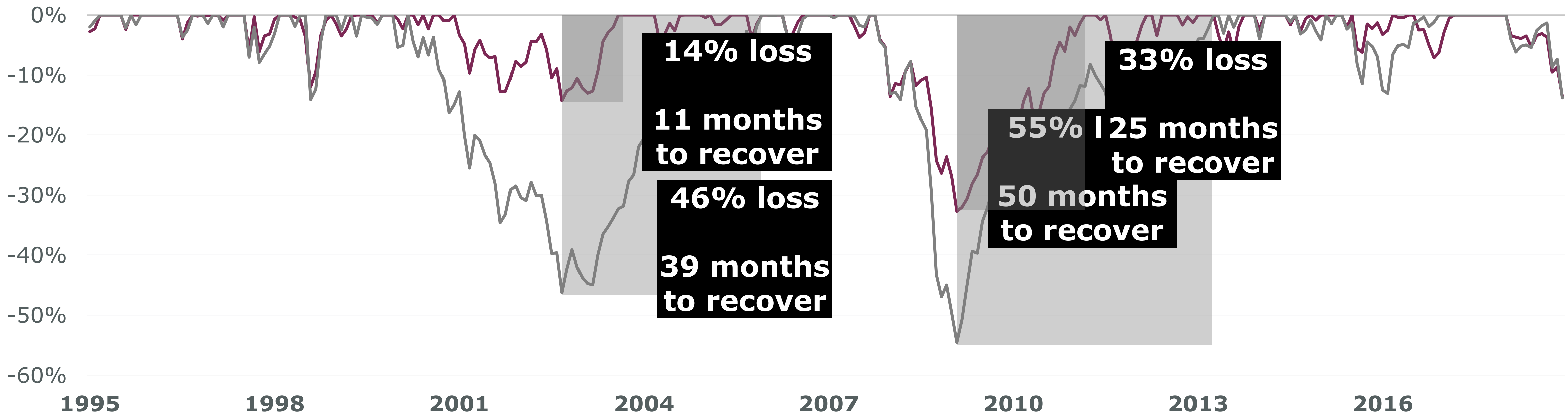


Does not represent the performance of any particular investment.

Downside protection is invaluable

Hypothetical Variable Beta Strategy
MSCI All Country World Index
1 January 1995 – 31 December 2018

Drawdown



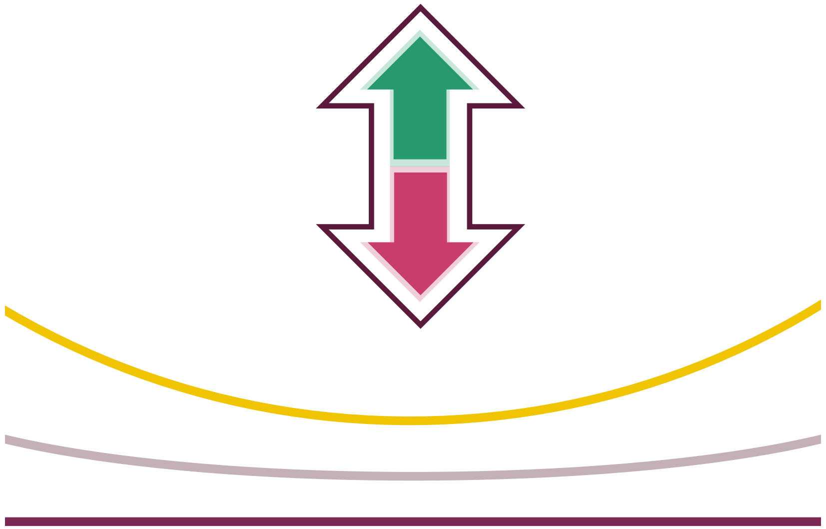
—Simulated Global All Country Adaptive Volatility —MSCI All Country World Index

The power of less severe drawdowns and shorter recovery periods

Portfolio resilience

03

Building in portfolio resilience



- We can ***guarantee*** volatility is here to stay
- Informed perspective comes from better ***estimates*** of security volatility
- ***Enhance*** your portfolio resilience by adapting to market dynamics

Any questions?

04

Intech®

JANUS HENDERSON

HARNESS VOLATILITY

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