



2019 **ANNUAL  
MEETING**  
& EXHIBIT

October 27-30  
Toronto, Canada

## Session 188: Equity Market Returns: Reshaping the Risk Distribution

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# Risk Reduction with Low Volatility Equity Portfolios

2019 **ANNUAL  
MEETING**  
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October 2019



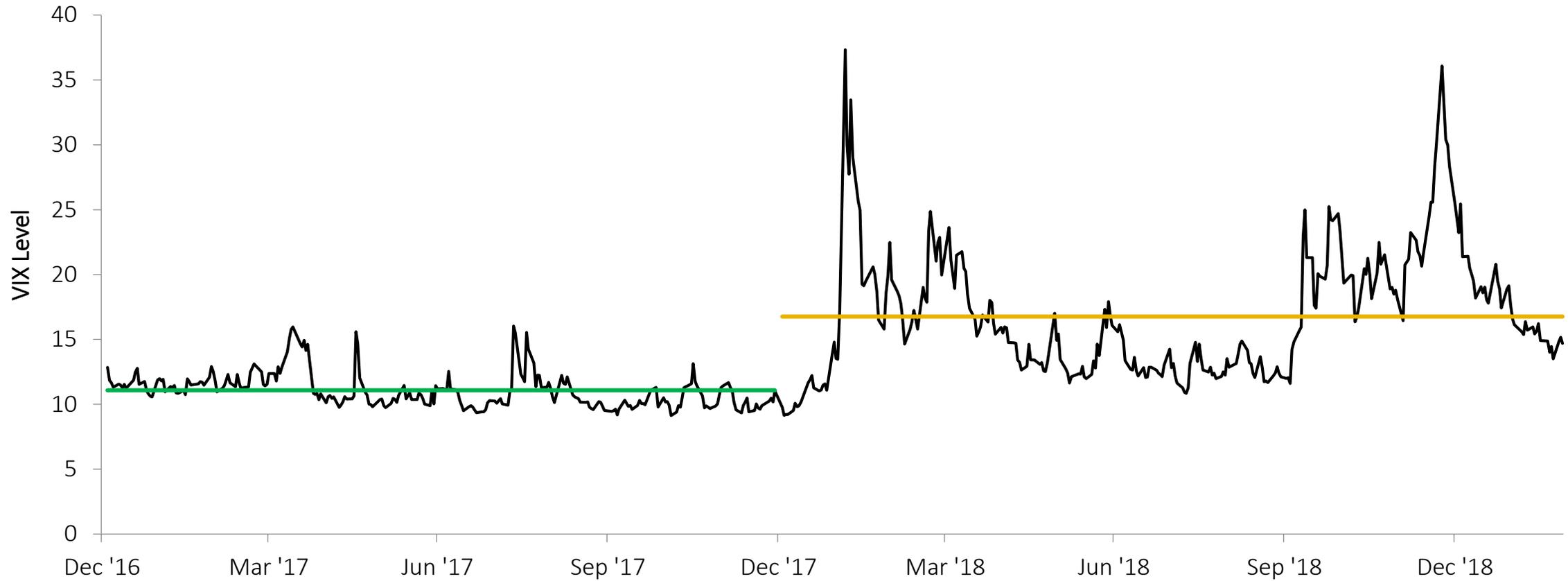
# Agenda

- Fundamentals of Low Volatility Investing
- Low Volatility and Currency Risk
- Low Volatility and Interest Rate Risk

# Fundamentals of Low Volatility Investing



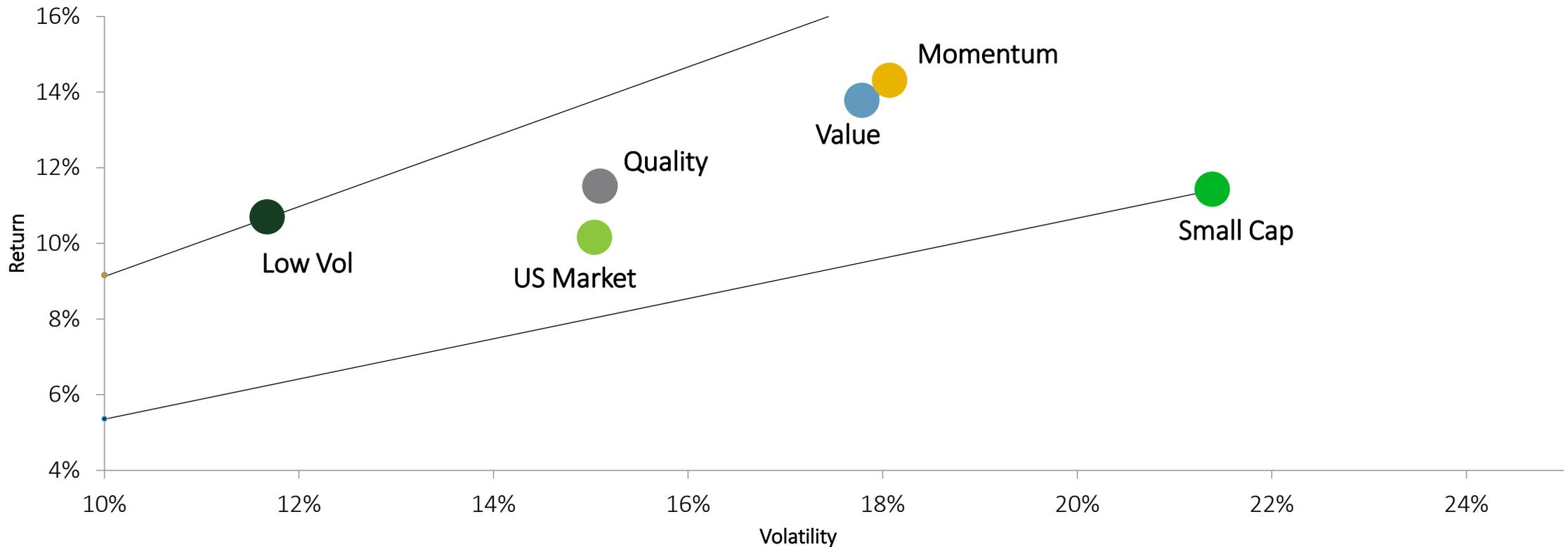
# Volatility is Back



Source: TDAM, Bloomberg Finance L.P. Data as of February 2019

# How Does this Affect the Factor Story?

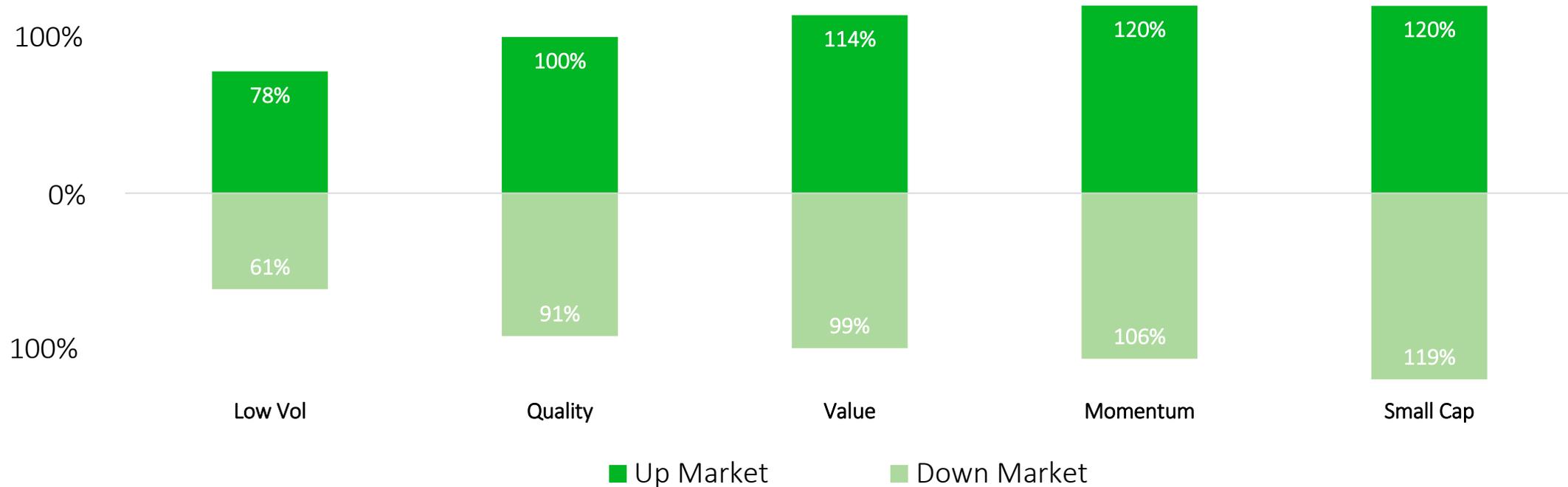
Top quintile factor performance from 1963 to 2018



Source: TDAM, Fama & French. Data from July 1963 to December 2018

# Return Asymmetry Tells Part of the Story

Factor upside and downside captures

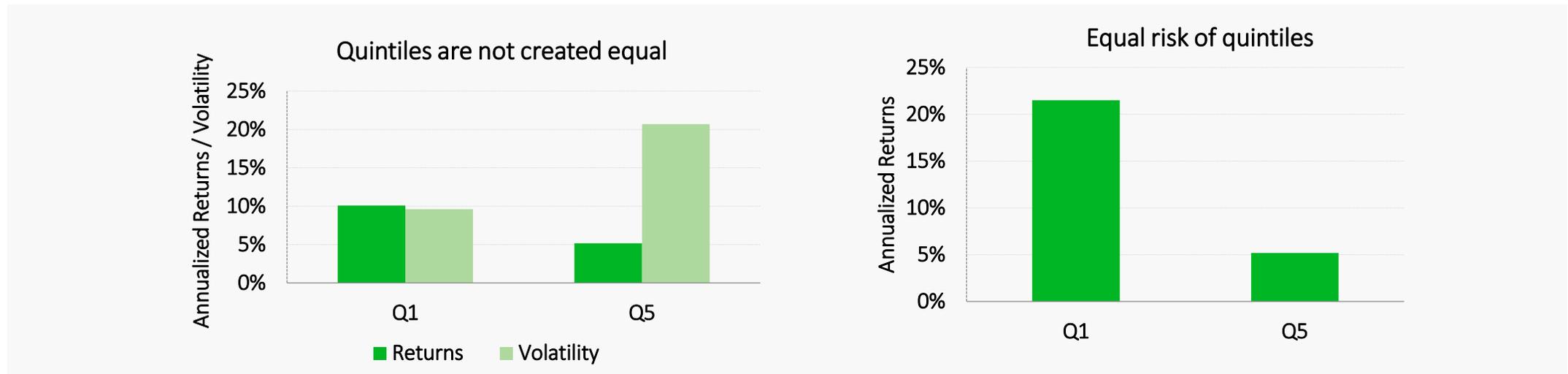


Source: TDAM, Fama & French. Data as of December 2018.

# Investment Theme

Exploiting a long-standing, often overlooked investment anomaly

- Low volatility stocks can generate strong risk-adjusted returns
- At **equal risk**, lower volatility (Q1) generate more than four times as much return as high volatility stocks (Q5)

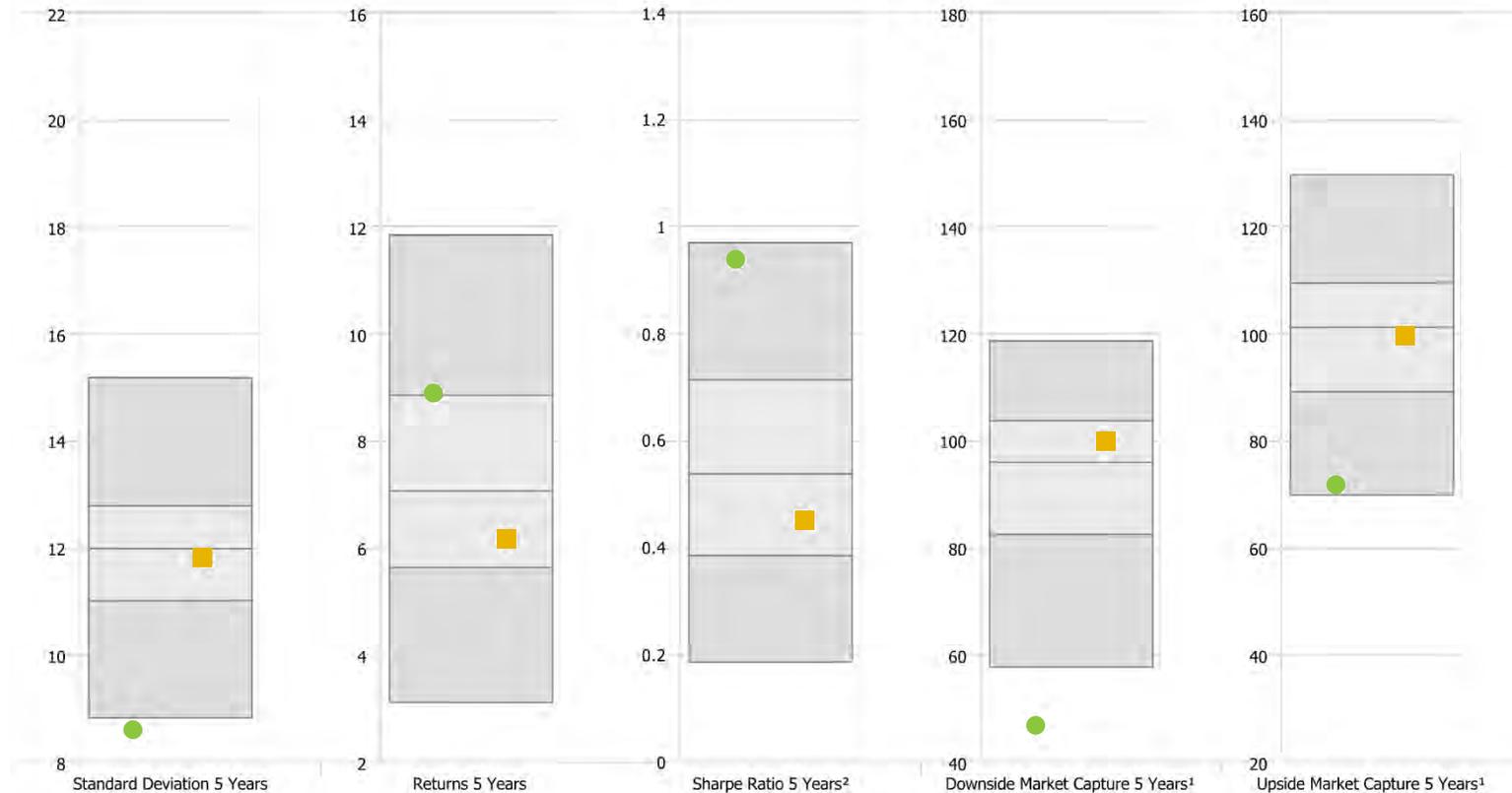


MSCI World Total Return (CAD) from 1997/05 to 2018/09. Volatility quintile portfolios are rebalanced monthly.

# MSCI ACWI vs. MSCI ACWI Minimum Volatility Index

## Universe Ranking Analysis 5 years, as of June 30, 2019

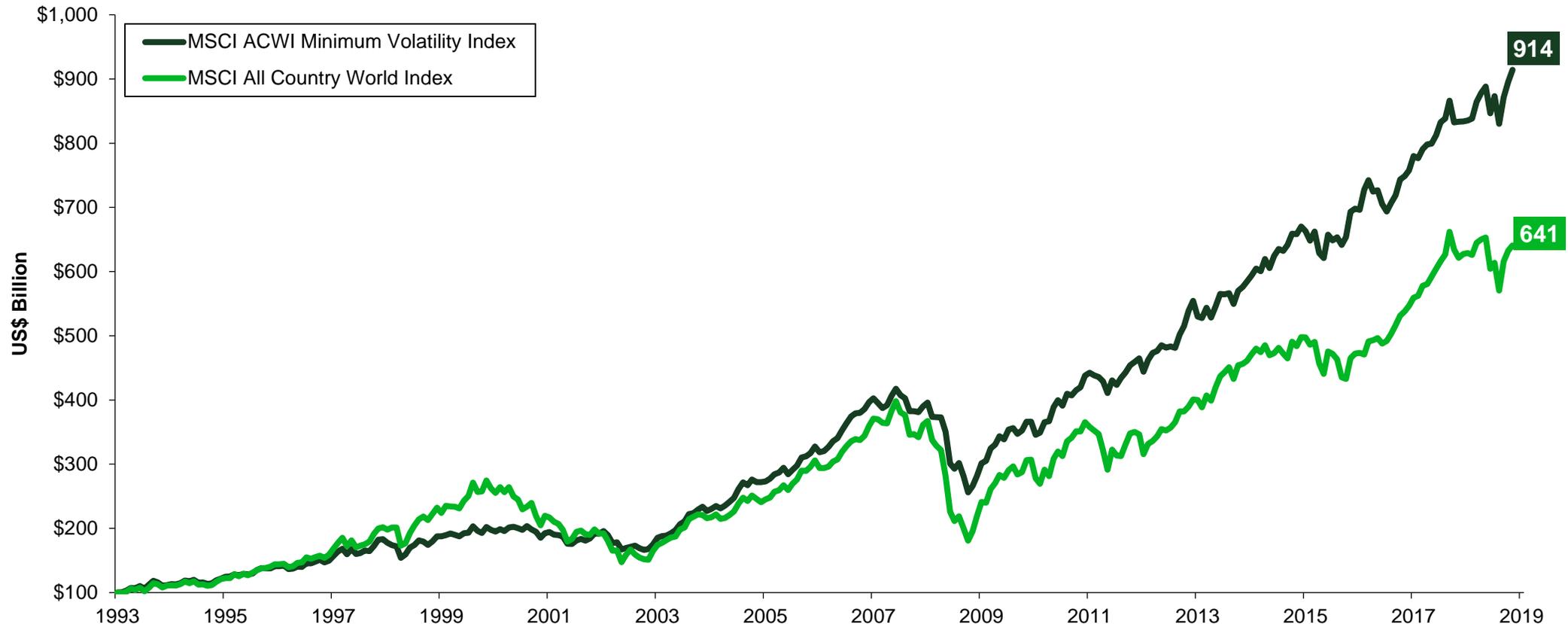
- MSCI Index: MSCI ACWI Minimum Volatility-ND
- MSCI Index: MSCI ACWI-ND



<sup>1</sup> MSCI ACWI-ND. <sup>2</sup> FTSE 3-Month T-Bill.

Universe: eVestment Global Large Cap Equity. Source: eVestment Alliance. Results displayed in USD. For illustrative purposes only.

# Have Historical Low Volatility Returns Been Outsized?



Source: MSCI Inc. As of March 31, 2019. All returns on the MSCI All Country World Indices in US dollars.

# Adaptability Is a Choice

Contemporary  
Structure

**Basic statistical model**  
Adaptive to factor changes  
Prone to spurious structure

**Ideal model**  
Adaptive to factor changes  
Persistent signals

Lagging  
structure

**Basic fundamental model**  
Slow to adapt to factor changes  
Historically proven signals

Noisy Signal

Persistent Signal

For illustrative purposes only.

# Low Volatility and Currency Risk



# Is Currency Exposure a Diversifier or Unrewarded Risk?

How selected currencies behaved in falling equity markets

## Currency Return (vs USD)

MSCI World USD

NZD	AUD	CAD	EUR	GBP	CHF	USD	JPY
-2.6%	-2.6%	-1.8%	-1.1%	-0.8%	-0.6%	0.0%	0.4%

## Currency Return (vs CAD)

MSCI World CAD

NZD	AUD	CAD	EUR	GBP	USD	CHF	JPY
-1.1%	-1.1%	0.0%	0.0%	0.0%	0.5%	0.6%	1.3%

## Currency Return (vs GBP)

MSCI World GBP

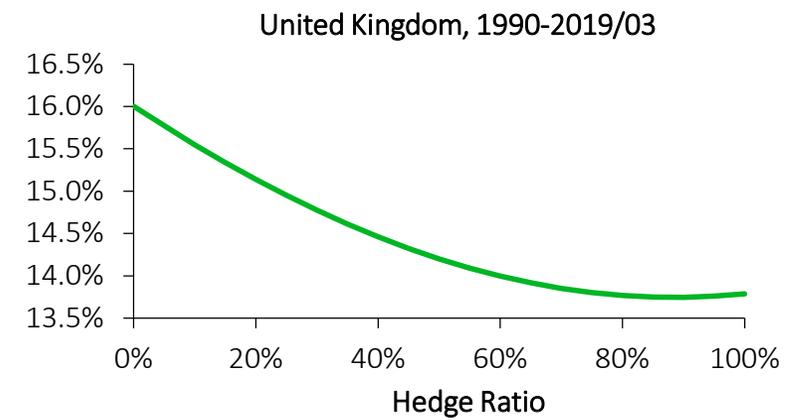
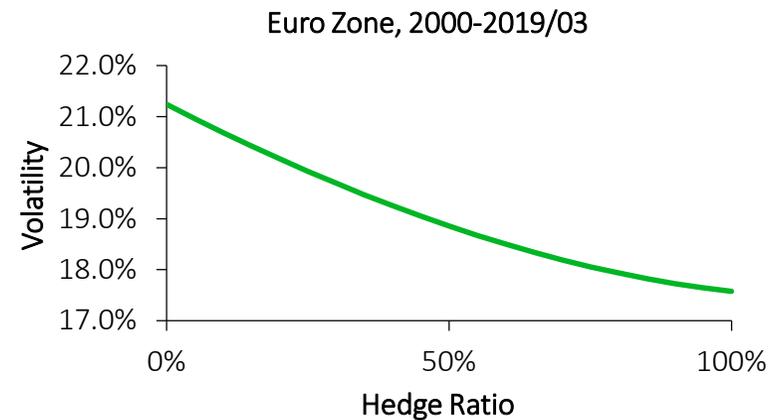
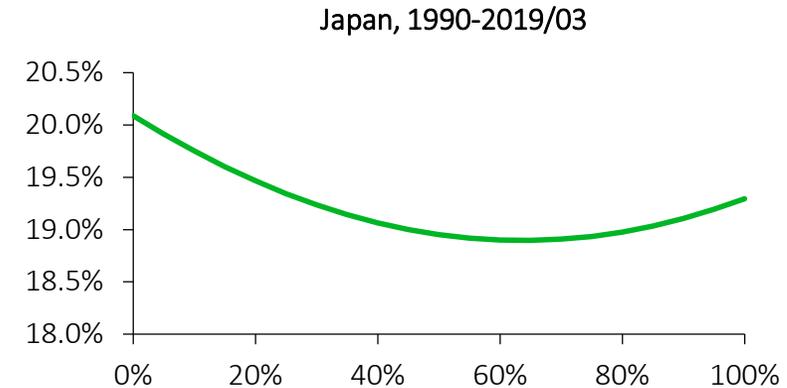
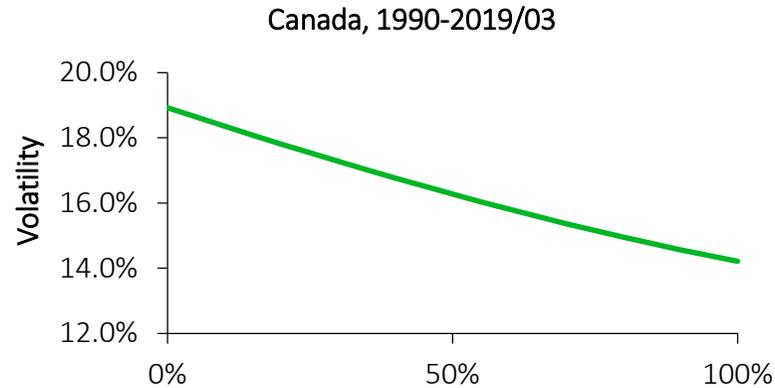
AUD	NZD	CAD	EUR	USD	GBP	CHF	JPY
-2.0%	-1.7%	-1.6%	-0.5%	-0.2%	0.0%	0.1%	0.5%

Source: MSCI Inc., TDAM. Average monthly data from January 2000 to June 2019. Note: For illustration only.

# Additional Considerations in Currency Hedging

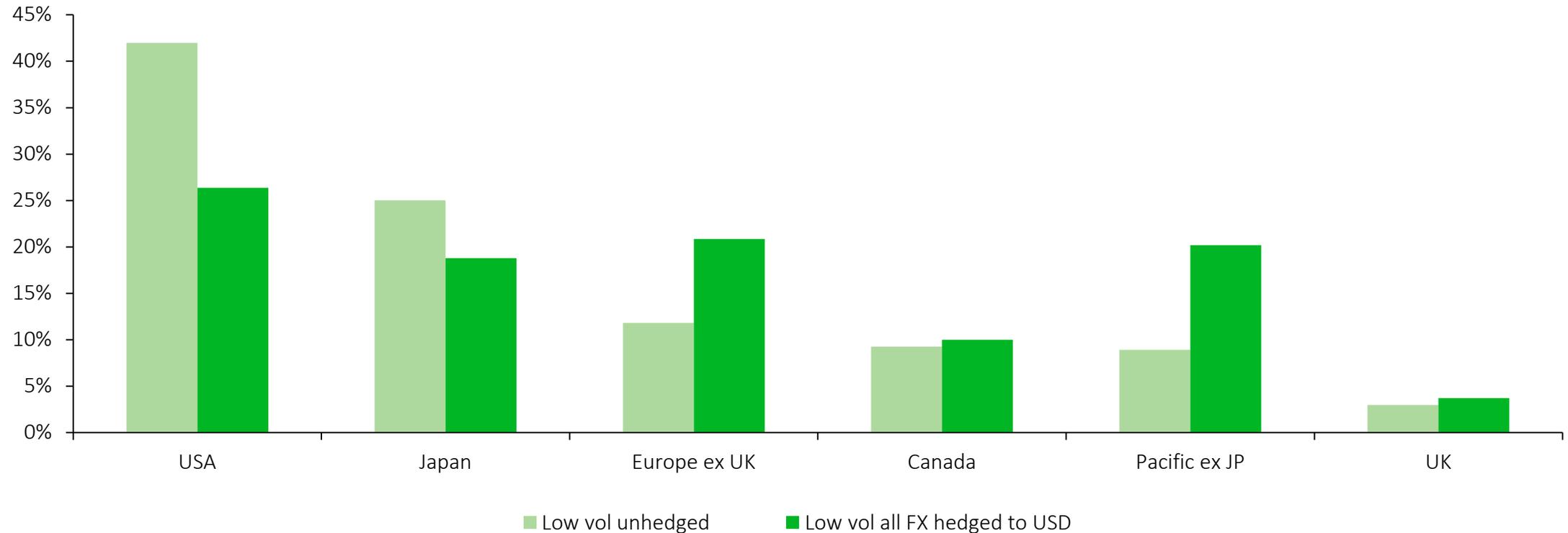
- Empirical role of currency (cyclical, counter-cyclical, or neutral)
  - Has this currency historically increased or decreased in value during market corrections?
- Impact on diversification
  - Would we hold more or less in the market if we hedged (i.e. does hedging increase or decrease risk according to risk model)?
- Currency volatility
  - How does currency volatility compare to equity volatility?

# Currency Hedging: Both Time and Currency Specific



Source: MSCI, Bloomberg Finance L.P., TDAM. As of March 31, 2019.

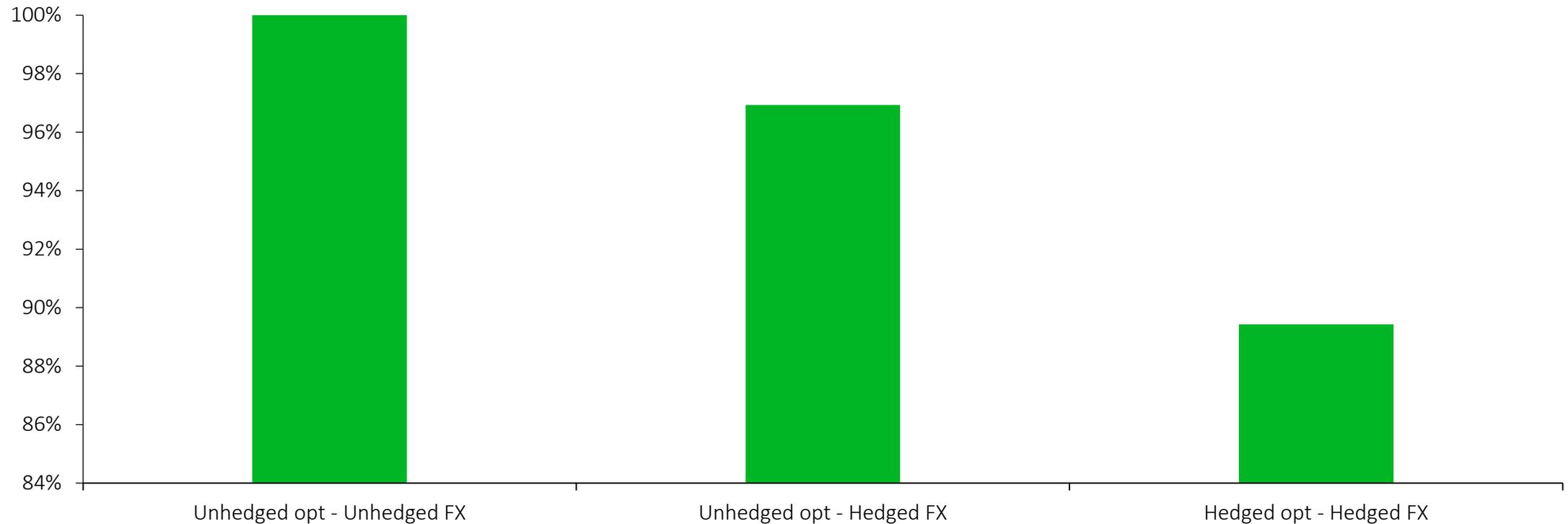
# Equity Portfolio Construction Conditional on Currency Hedging



Source: TDAM. As of March 31, 2019. For illustrative purposes only.

# Equity Portfolio Construction Conditional on Currency Hedging

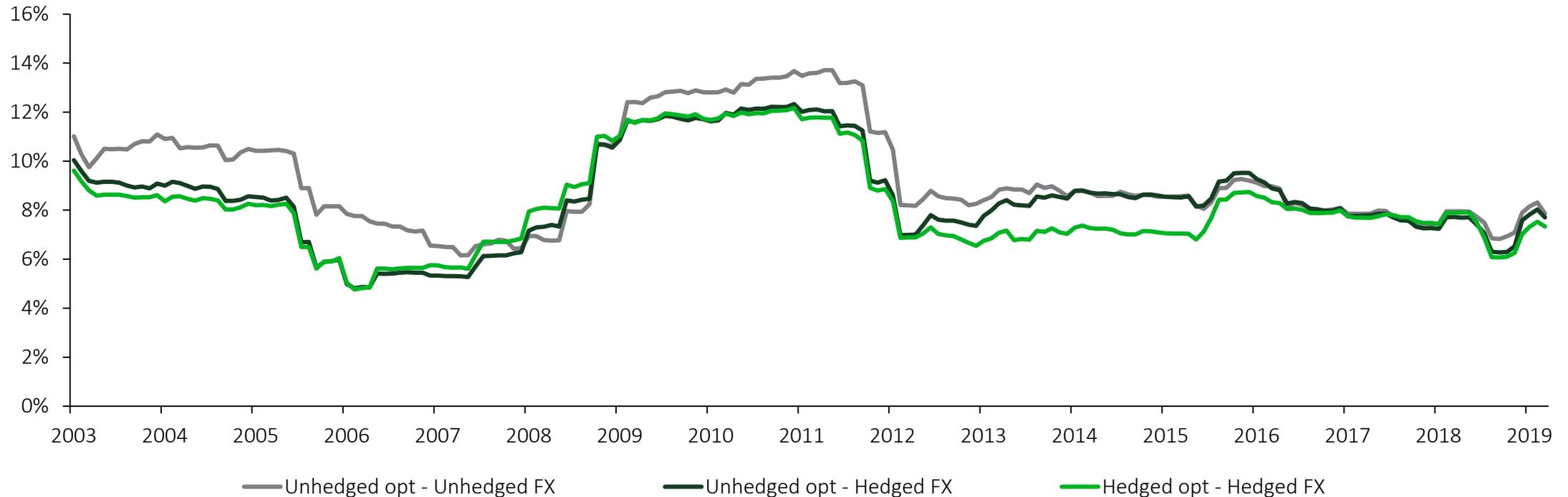
Expected volatility for different hedging policies



Source: TDAM. For illustrative purposes only.

# More Meaningful Risk Reduction with Adjusted Risk Model

36-Month Moving Standard Deviation  
(Simulated Volatilities for U.S. Strategy)



Source: MSCI, TDAM.

Simulated low volatility portfolios are based on the MSCI ACWI stocks universe. They are built by using TDAM's proprietary risk models and are rebalanced monthly. The standard deviation is computed over a sliding 36-months window of simulated gross monthly returns in USD net of transaction costs. Simulated performance is unverified, and is developed with the benefit of hindsight and has inherent limitations. It is NOT an indicator of future actual results. Methodology is available upon request.

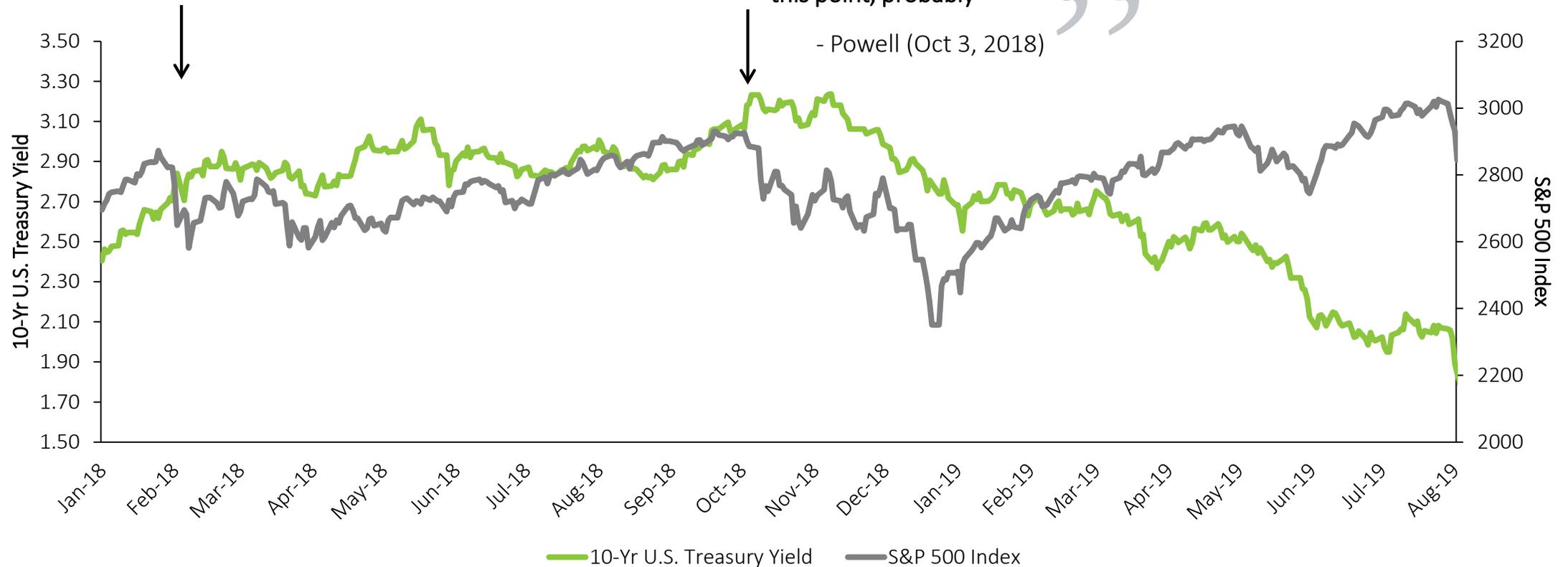
# Low Volatility and Interest Rate Risk



# 2018: A Complex Volatility Story

US Average Hourly Earnings 2.9% YoY in January, most since June 2009 (Feb 2, 2018)

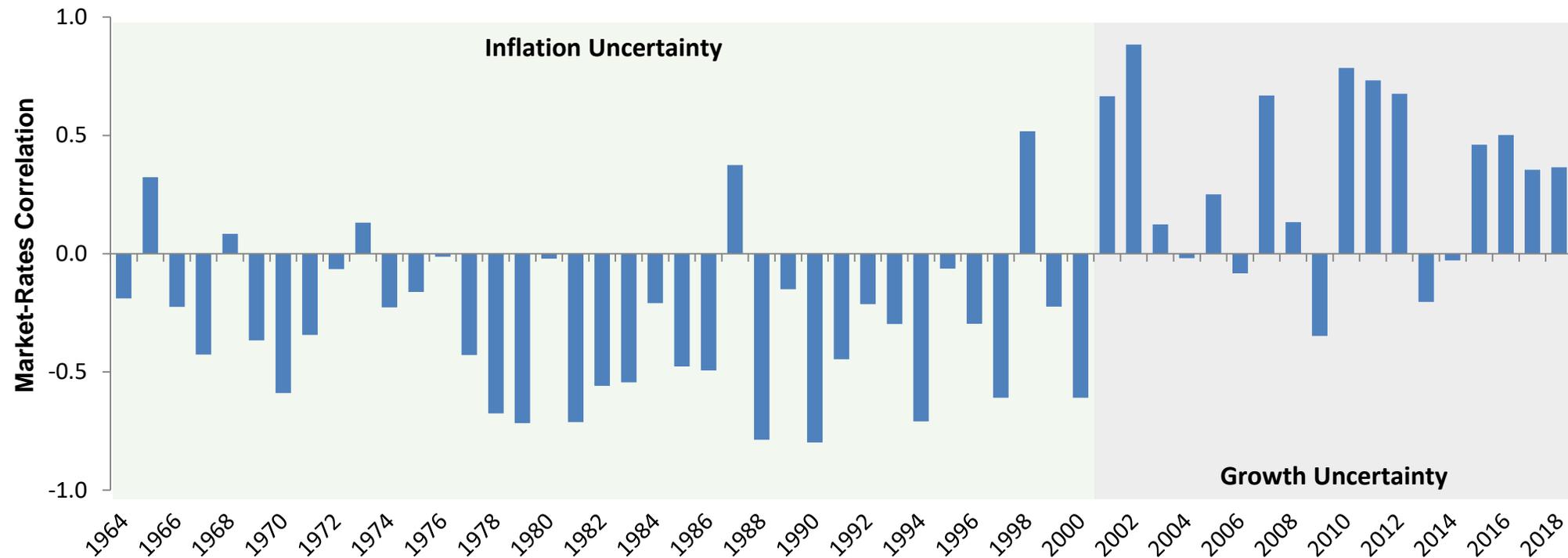
“ We're a long way from neutral at this point, probably ”  
- Powell (Oct 3, 2018)



<sup>1</sup> Jerome Powell Chairman of the Federal Reserve.  
Source: TDAM., Bloomberg Finance L.P. Data to July 31, 2019.

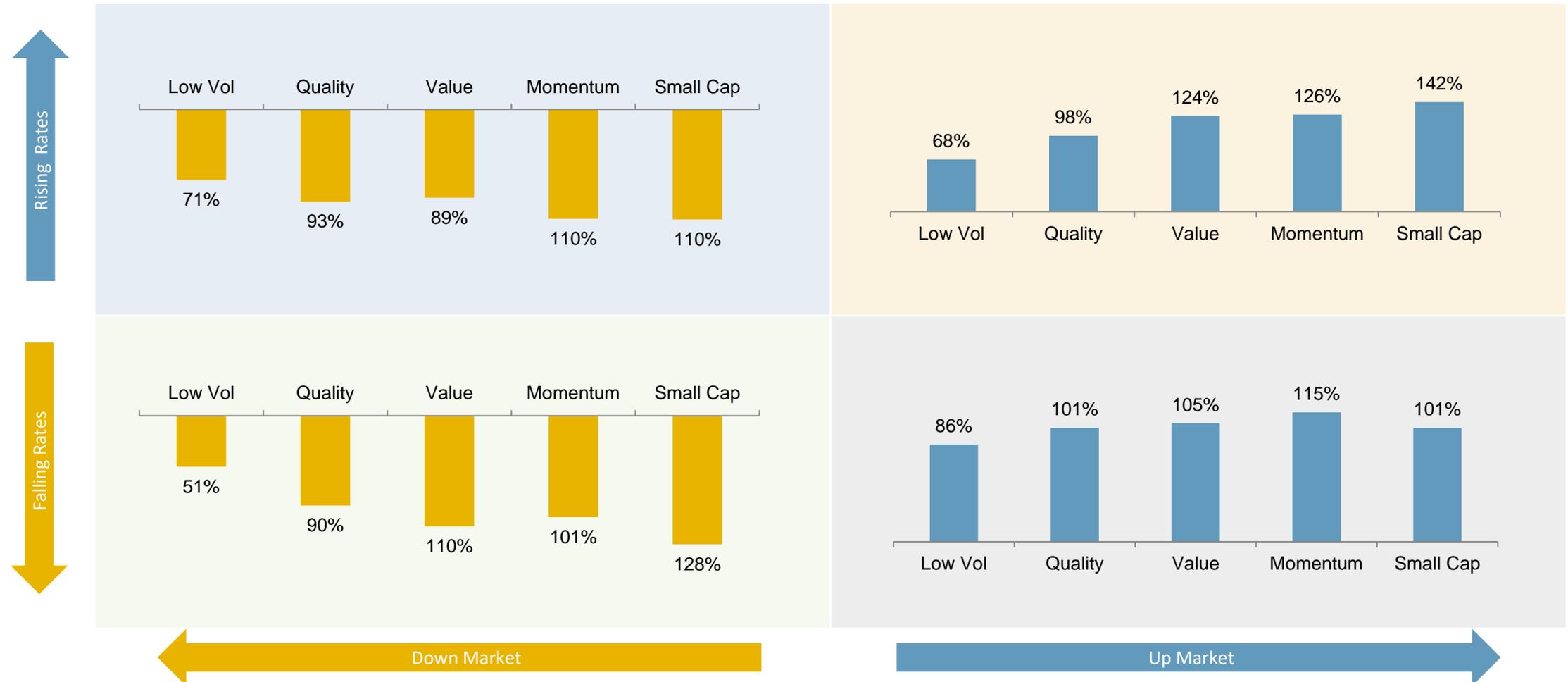
# Market Direction Isn't the Whole Story

Time-varying correlation between market and rates



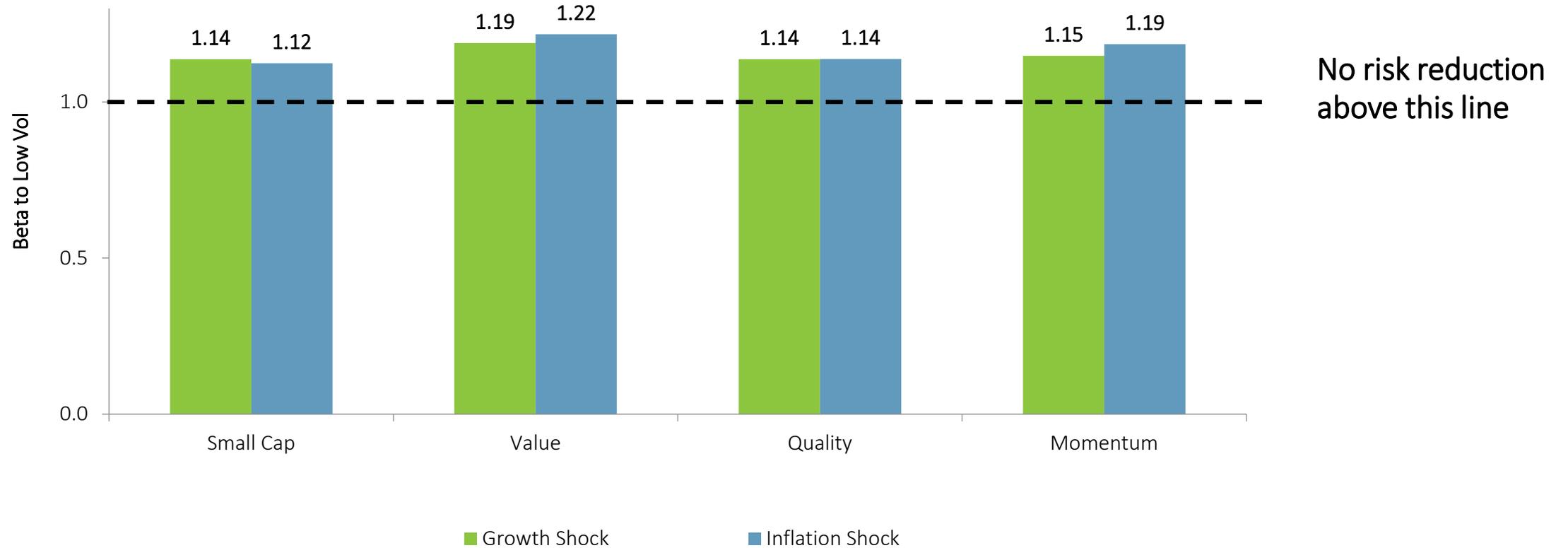
Source: TDAM., Bloomberg Finance L.P. As of December 31, 2018. Correlations are annual correlations between S&P500 Price Index returns and 10 year Treasury yield changes .

# How do Factors Perform During Market Shocks?



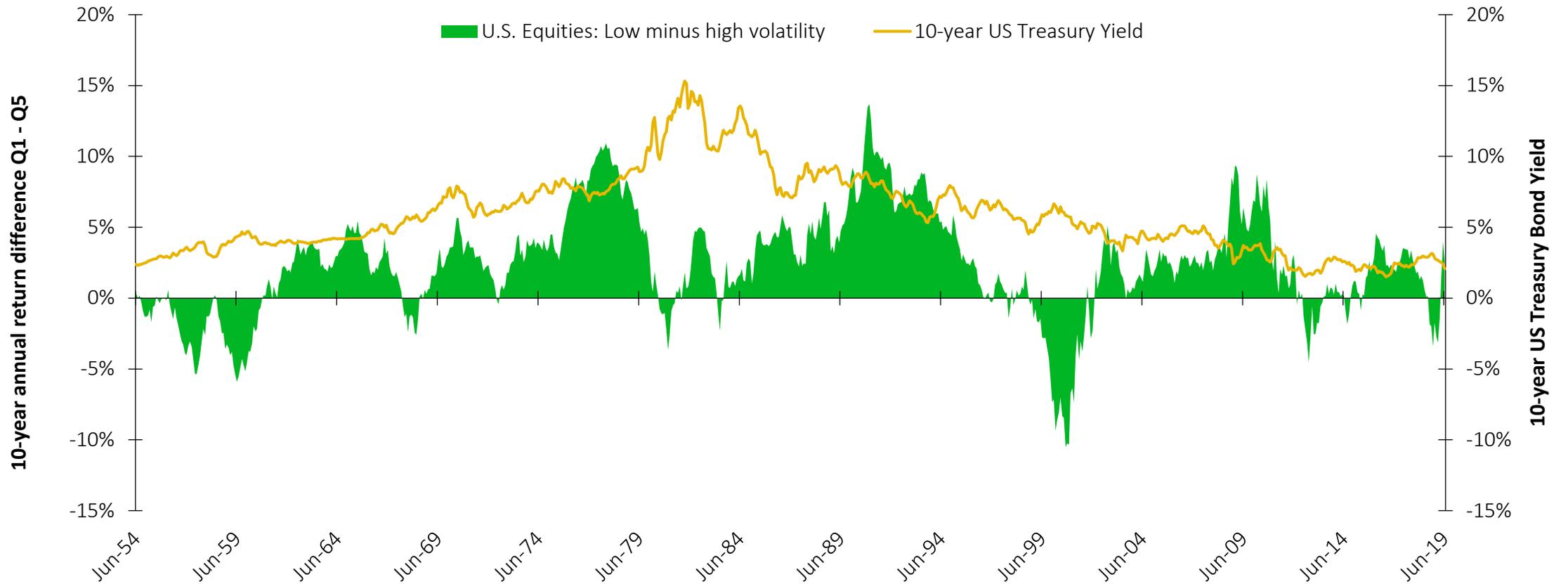
Source: TDAM, Fama & French. Data as of December 2018.

# Factor Diversification for Inflation Defense?



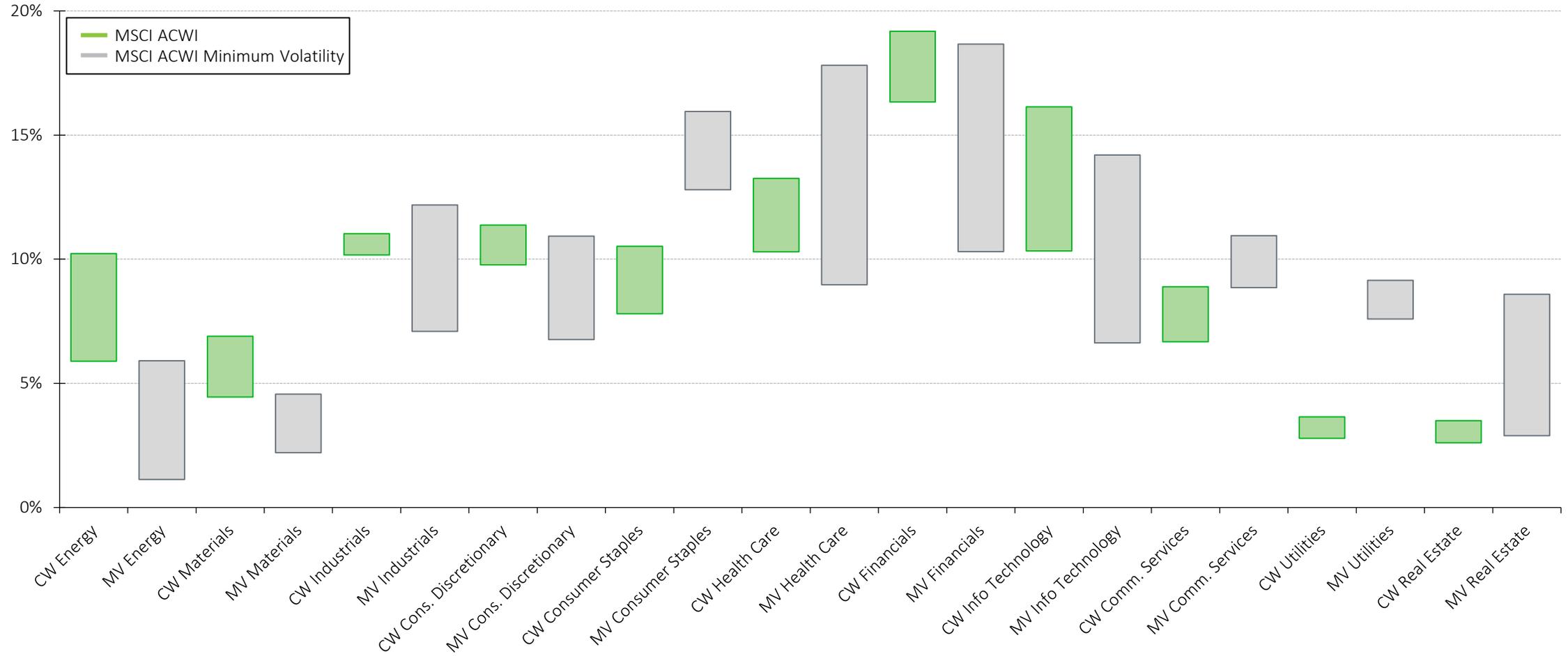
Source: TDAM, Fama & French. Data as of December 2018.

# Interest Rates: the Long-Term View



Source: CRSP (prior to 1979), Federal Reserve Economic Data (FRED), Standard & Poor's, TDAM. Data as of June 30, 2019.

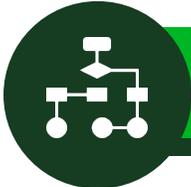
# Low Volatility Portfolios Have Shown Better Diversification



Source: FactSet. Data from March 29, 2013 to June 30, 2019. CW: Capitalization-weighted. MV: Minimum Volatility.

# Investing in Low Volatility Equities

## Key considerations

-  Tailored Equity Risk Forecasting Models
-  Systematic Risk Framework
-  Active Research

For illustrative purposes only.

# Disclosures

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The hypothetical performance information is shown for illustration purposes only and is not based on actual results, which may vary. Hypothetical performance information is subject to inherent risks and limitations, and is shown gross of fees and is calculated in U.S. dollars. No representations are being made that any proposal will achieve returns similar to the hypothetical information shown. Investors should not take this example or the data included as an indication, assurance, estimate or forecast of future or actual results. The actual performance returns may differ materially from the information shown for reasons including, but not limited to investment restrictions and guidelines, fees, timing of trade execution, investment/reinvestment of cash flows, treatment of dividends, interest fees charged including performance fees, portfolio rebalancing, borrowing fees on shorts, swap fees, the extent of leverage used, any use of derivatives, and fluctuations in the market.

Commissions, trailing commissions, management fees and expenses all may be associated with mutual fund investments. Please read the fund facts and prospectus, which contain detailed investment information, before investing. Mutual funds are not guaranteed or insured, their values change frequently and past performance may not be repeated. Mutual fund strategies and current holdings are subject to change.

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# Equity Market Return: Reshaping the Risk Distribution

Raghu Ramachandran

30 October 2019



Naïve factoring

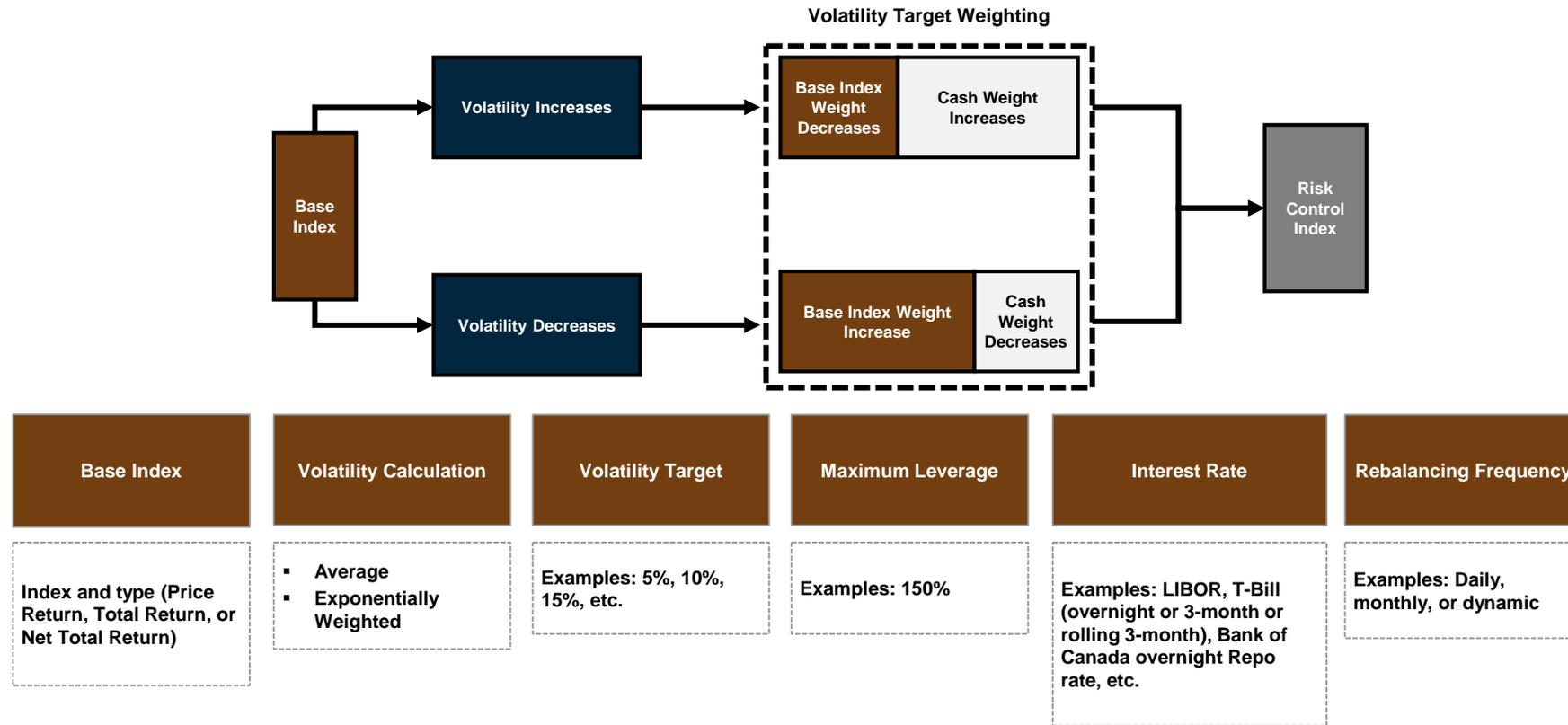
S&P 500<sup>®</sup>

Value

Growth

# Index Innovation Across Risk Management Strategies

## Risk Control: A framework for managing volatility



Source: S&P Dow Jones Indices LLC. Index data as of March 29, 2019. Index performance based on USD Total or Excess Returns. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. These charts and graphs may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Index Innovation Across Risk Management Strategies  
 Strategy Overview: **A diverse set of strategies with a broad set of uses**

Category	Attributes	Example Index Strategy
<b>Risk Control / Volatility Targeted Strategies</b>	Seeks to reduce (increase) exposure to an index / portfolio based on its volatility	S&P 500 Low Volatility Daily Risk Control 5% Index
<b>Tail Risk Managed</b>	Strategies that allocate between equity, volatility, and cash	S&P 500 Dynamic VEQTOR Index
<b>Managed Risk Strategies</b>	Using a multi-asset risk control framework combined with portfolio protection	S&P 500 Managed Risk 2.0 Index
<b>Defined / Target Outcome Strategies</b>	Portfolio strategies which define payout characteristics at the end of a specified period of time	CBOE S&P 500 Buffer Protect Index Series

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Index Innovation Across Risk Management Strategies  
 Strategy Overview: **Different strategies can be captured across multiple wrappers**

Index Strategy	Index Overview	Product Wrappers
<b>S&amp;P 500 Low Volatility Daily Risk Control 5% Index</b>	Portfolio consisting of the S&P 500 Low Volatility Index and cash with daily reallocation to achieve a 5% volatility target	<ul style="list-style-type: none"> <li>- Fixed Indexed Annuities</li> <li>- Structured Products</li> </ul>
<b>S&amp;P 500 Dynamic VEQTOR Index</b>	Dynamically allocates long-only exposure between the S&P 500, the S&P VIX <sup>®</sup> Short-Term Futures Index	<ul style="list-style-type: none"> <li>- Fixed Indexed Annuities</li> <li>- Structured Products</li> </ul>
<b>S&amp;P 500 Managed Risk 2.0 Index</b>	Volatility targeted portfolio with the S&P 500 and fixed income with a daily 22% volatility target. Capital protection allocation strategy.	<ul style="list-style-type: none"> <li>- ETFs</li> <li>- Variable Annuities</li> </ul>
<b>CBOE S&amp;P 500 Buffer Protect Index Series</b>	Portfolios consisting of the S&P 500 and S&P 500 options which cap the upside participation in order to provide downside protection	<ul style="list-style-type: none"> <li>- ETFs</li> <li>- Structured Notes</li> <li>- Structured / Hybrid Annuities</li> </ul>

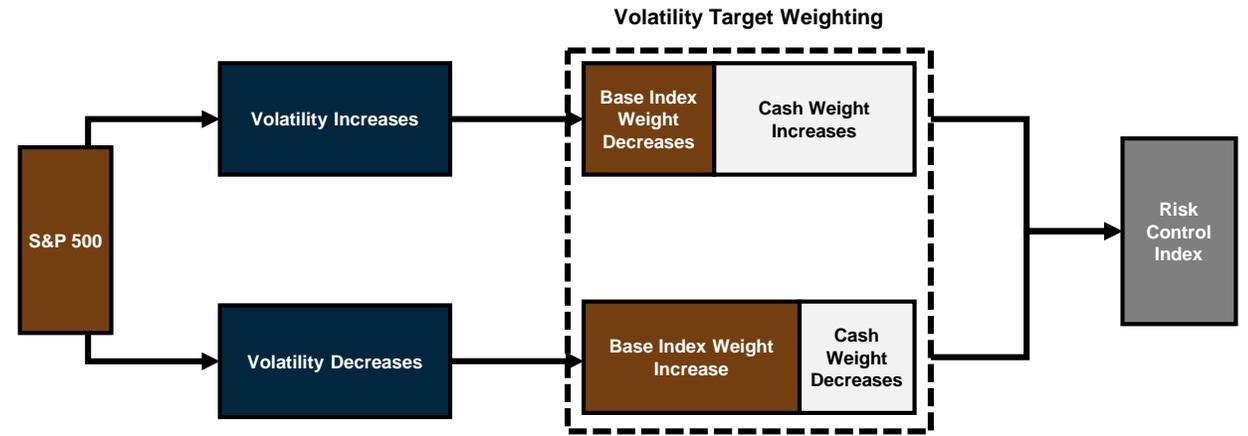
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# Risk Managed Indices

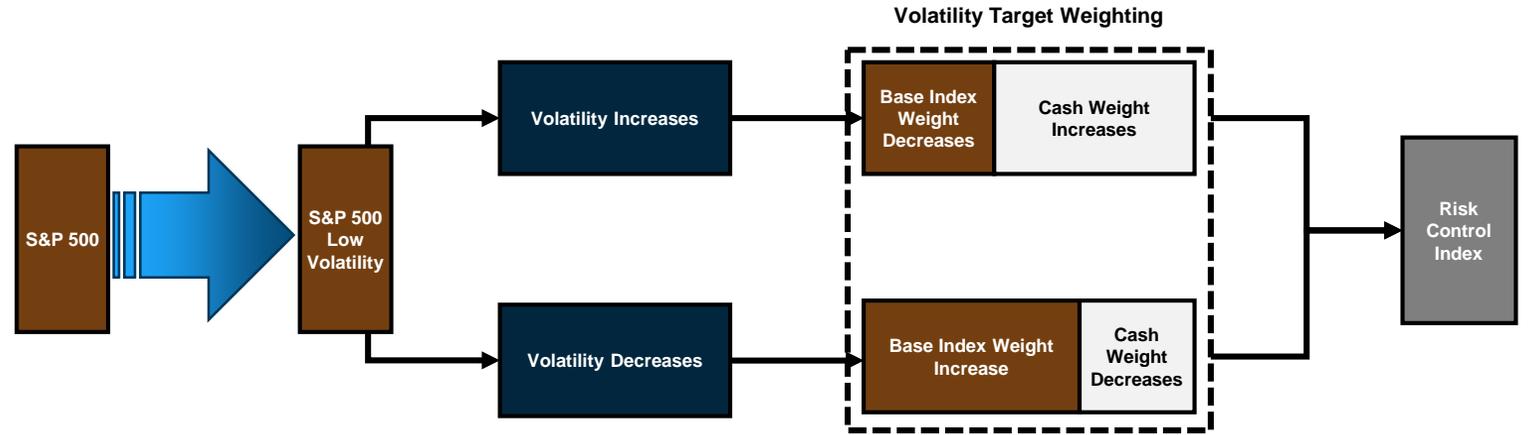
- Target Volatility Funds
- Managed Volatility Funds
- Tail Risk Funds
- Buffer Funds
- Balanced Funds

# Target Volatility

Daily Volatility Risk Control 5%  
Daily Volatility Risk Control 10%



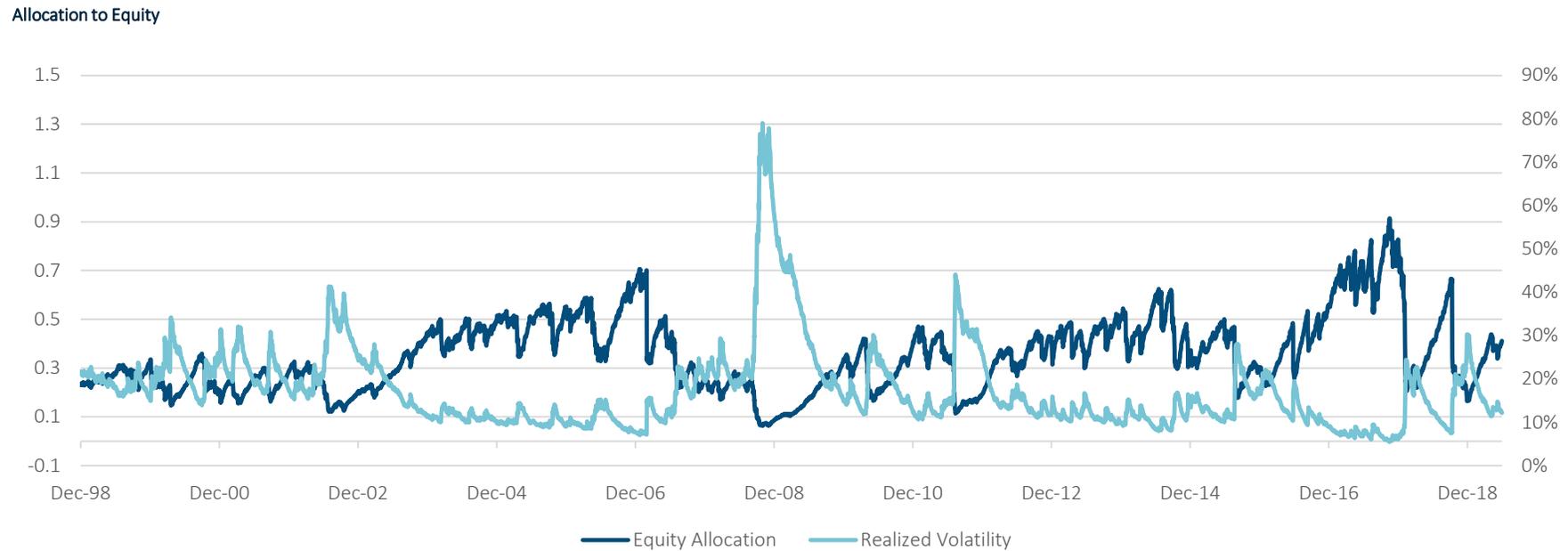
Low Volatility Risk Control 5%



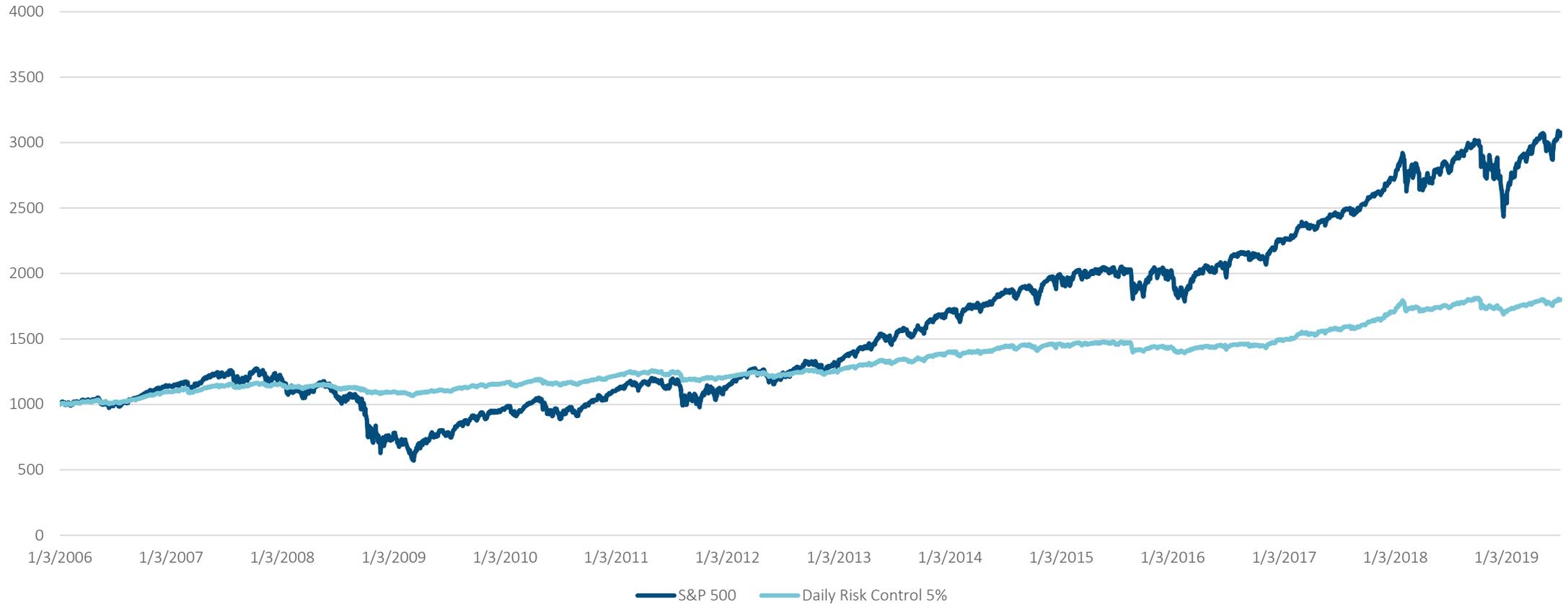
# Equity – Cash Allocation

$$\text{Equity Allocation} = \min \left\{ \text{max leverage}, \frac{\text{Volatility Target}}{\text{Realized Historical Volatility}} \right\}$$

Equity – Cash Allocation History: S&P 500 Daily Risk Control 5% Index (Max Leverage: 150%)

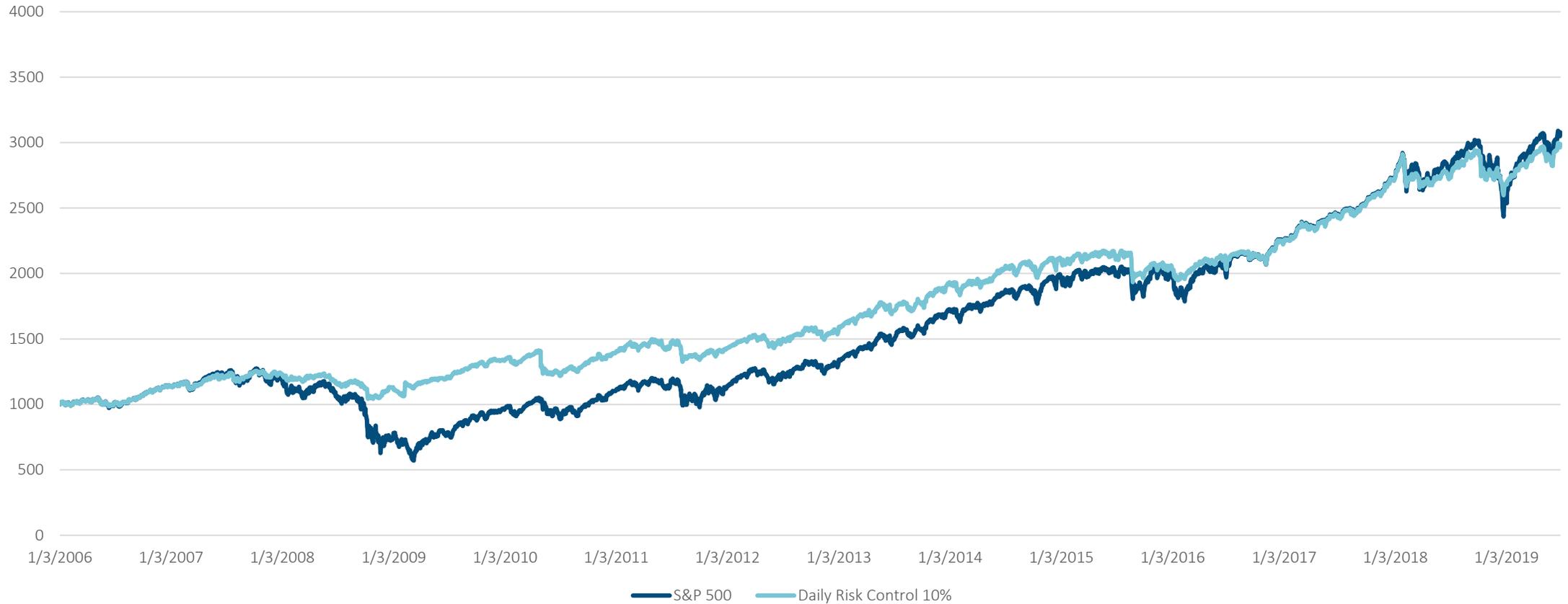


# Performance



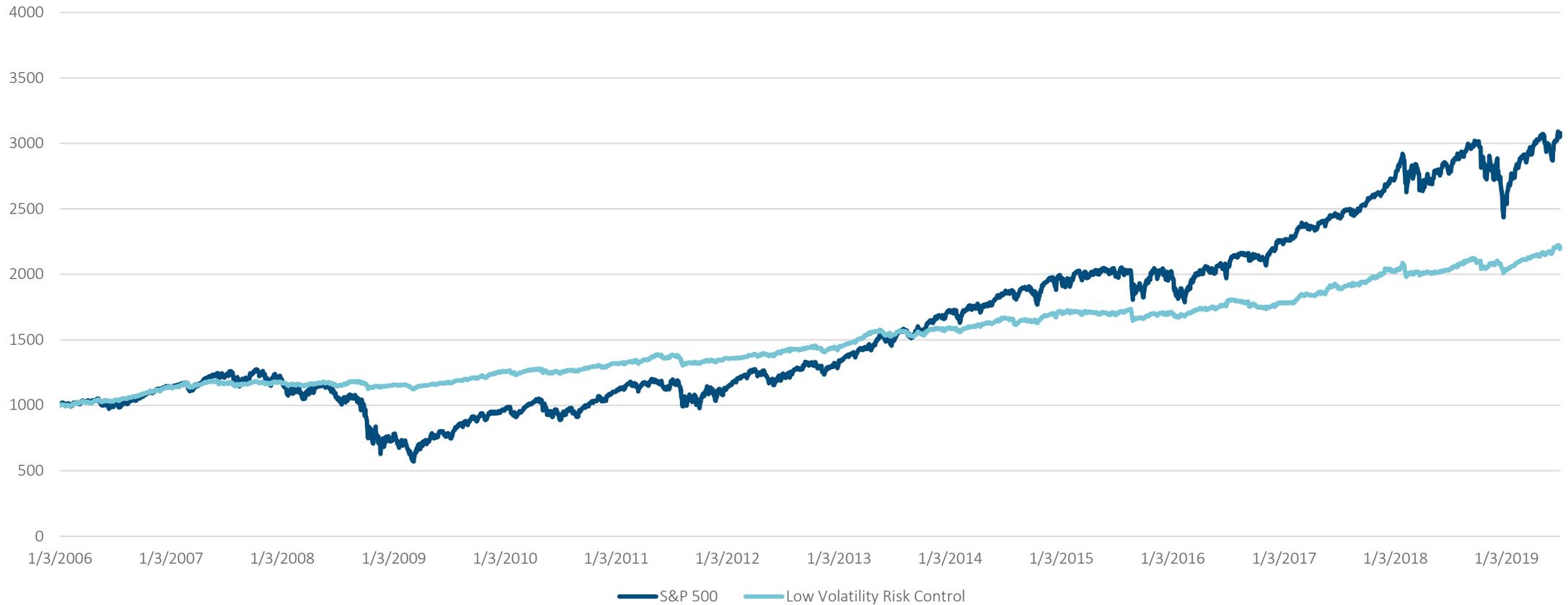
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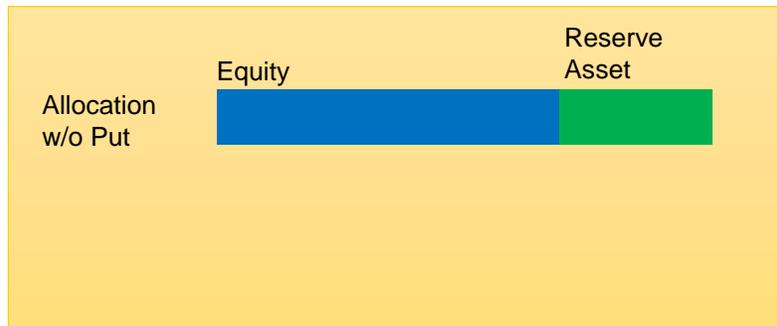
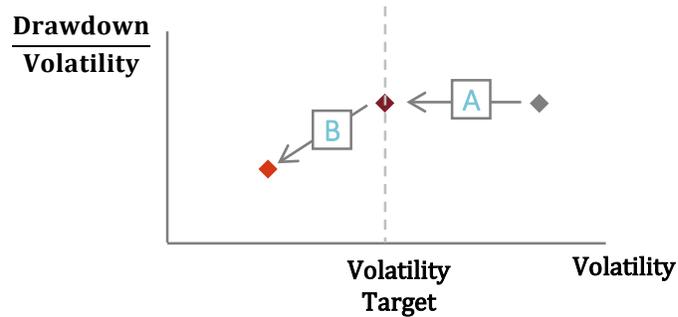
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# How the Managed Risk Overlay Works?

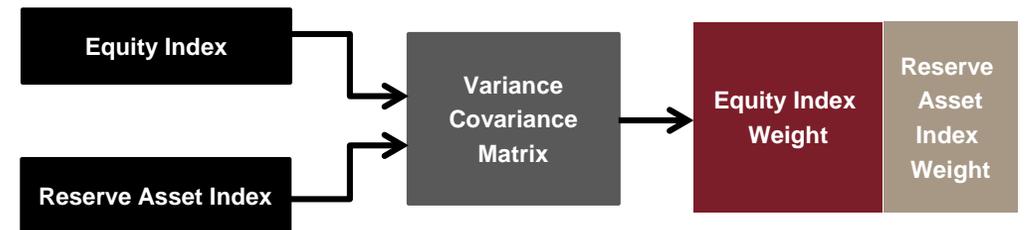


## A VOLATILITY MANAGEMENT

✓ Model:

Assume a risk control model supplying short- and long-term variance and covariance for the underlying equity and reserve asset indices

Test all combinations and seek to identify a portfolio of equity and reserve asset indices with a historic volatility equal to the target



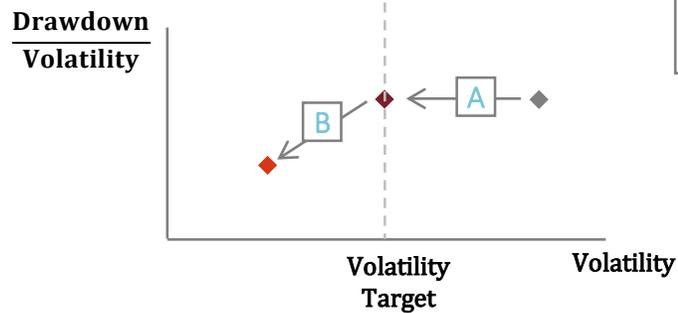
✓ Inputs:

Base Index	Volatility Calculation	Volatility Target	Calculation Frequency	Maximum Leverage	Short Selling
Index and Return Type	Exponentially Weighted	22%	Daily	100%	Not allowed

✓ Outputs: Equity and Reserve Asset Weights without hedge

- Source: S&P Dow Jones Indices LLC. Chart is provided for illustrative purposes. \*Please refer to index methodology available at [http://us.spindices.com/documents/methodologies/methodology-sp-managed-risk-2-index-series.pdf?force\\_download=true](http://us.spindices.com/documents/methodologies/methodology-sp-managed-risk-2-index-series.pdf?force_download=true) for more details.

# How the Managed Risk Overlay Works?



## B CAPITAL PROTECTION STRATEGY

✓ **Model:**

**Self-financing:** To avoid borrowing funds, a portion of the underlying volatility managed index is sold to finance the put option position

**Black Scholes theory:** replicating the put option requires a short position in the underlying volatility managed index and a long position in the M-maturity zero coupon bond

✓ **Inputs:**

Strike	Time to Maturity	Volatility	Risk Free Rate
A Multiple of a Moving Average of the Index Level	5 Years	$\leq 22\%$	Not an input, as strike is expressed in "forward moneyness" terms

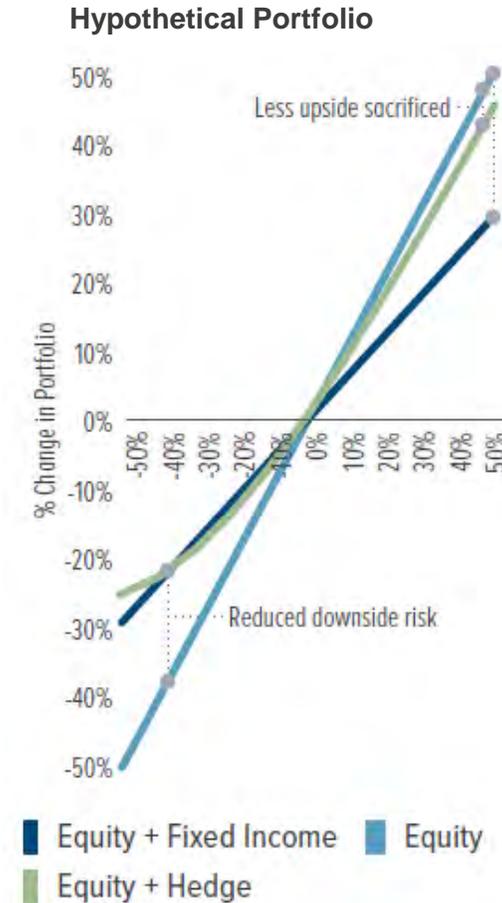
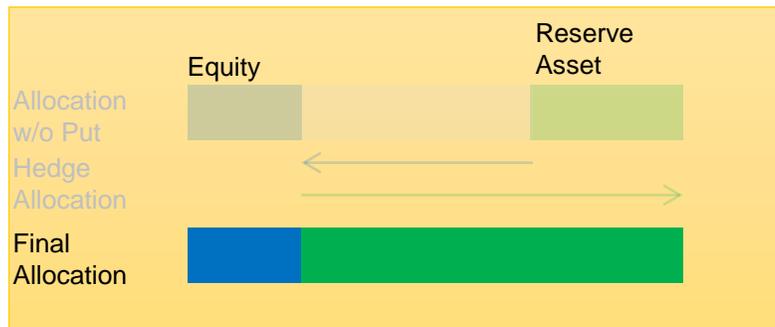
✓ **Outputs:** Hedge Allocation



# How the Managed Risk Overlay Works?

COMBINE A AND B

- ✓ Combine volatility management with put option replication to determine the target asset weights, subject to a minimum exposure of 0% and a maximum exposure of 100% for each constituent.
- ✓ **Efficient hedging:** Protection comes with a cost. Although options on broad market indices are usually expensive, put option replication in the presence of volatility management tends to have lower and more stable performance costs.
- ✓ A hypothetical portfolio is illustrated on the right.
- ✓ **Outputs:** Final Equity and Reserve Asset Weights with hedge

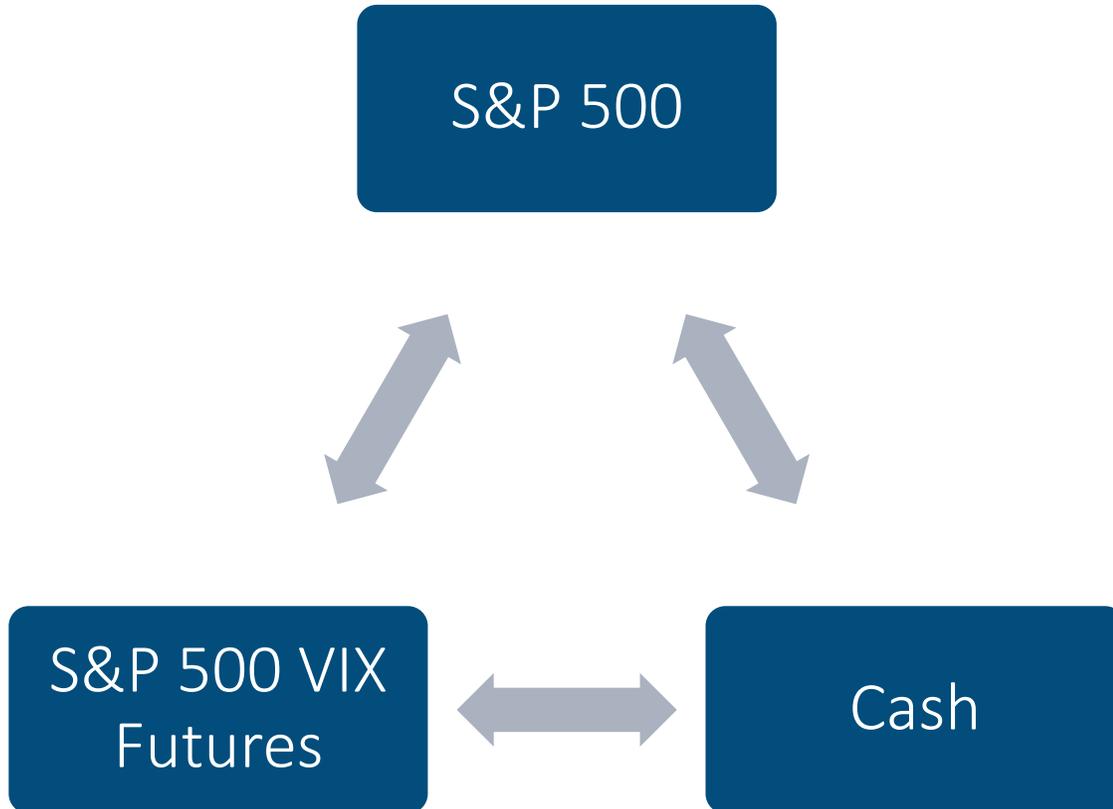


# Performance



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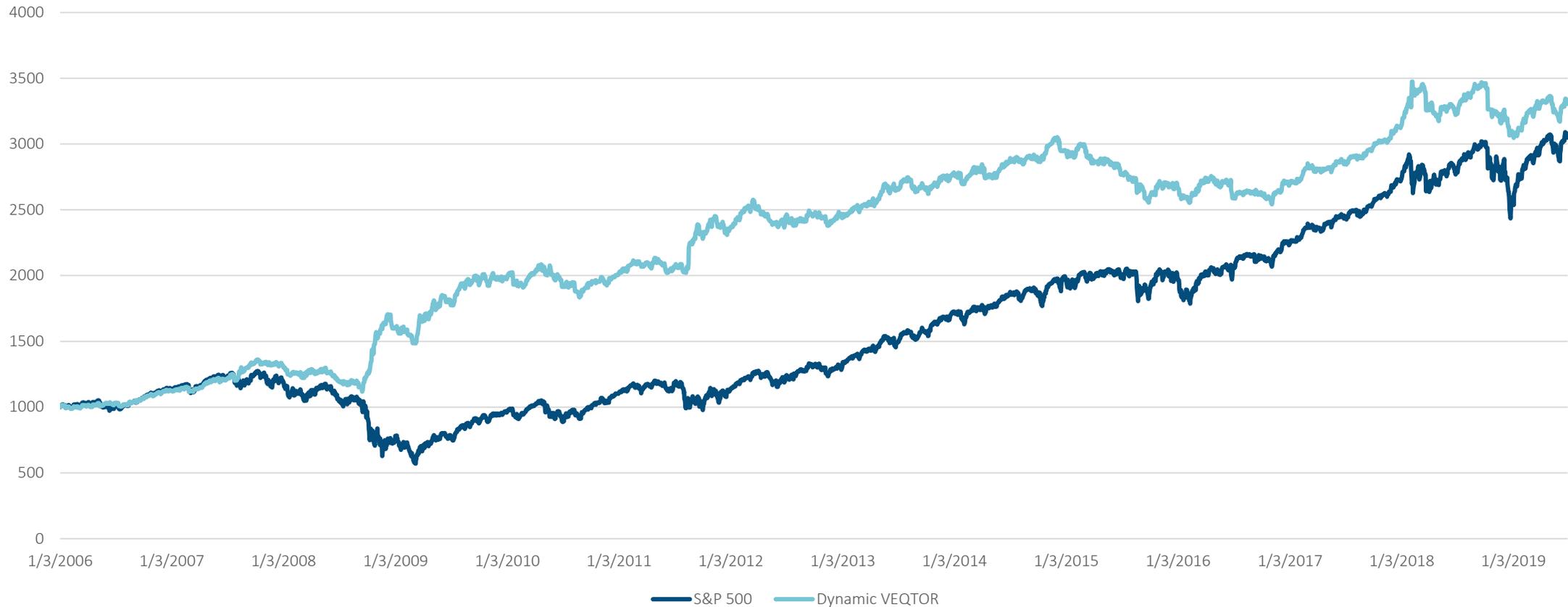
# S&P 500 Dynamic VEQTOR



S&P 500 VIX Short-Term Futures Allocation

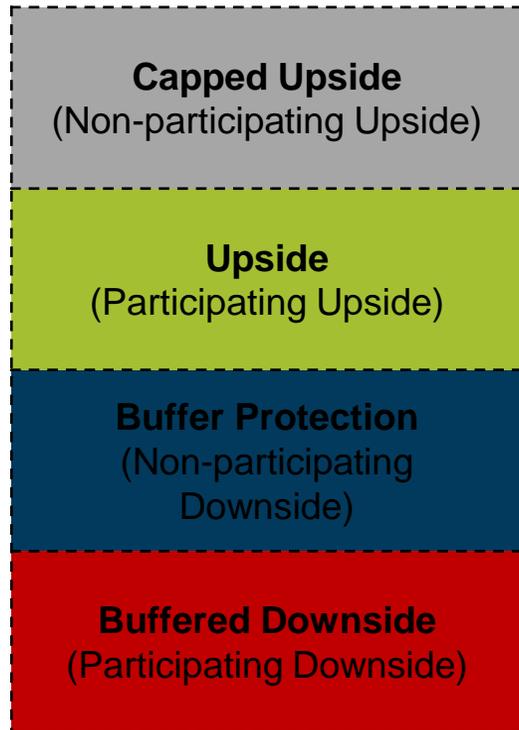
Realized Volatility	Implied Volatility Trend		
	Down Trend	No Trend	Up Trend
RV < 10%	2.5%	2.5%	10.0%
10% < RV < 20%	2.5%	10.0%	15.0%
20% < RV < 35%	10.0%	15.0%	25.0%
35% < RV < 45%	15.0%	25.0%	40.0%
RV > 45%	25.0%	40.0%	40.0%

# Performance



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Index Innovation Across Risk Management Strategies  
 CBOE/S&P 500 Buffer Protect: **Index construction / overview**



April 2019 Series –  
13% Cap

10% Protection

**Defined / Target Outcome strategies use FLEX options to capture the payoff structures**

**CBOE/S&P 500 Buffer Protect Index Series**

**Protection Level:** 10%

**Performance Cap:** Reset annually for each series

**Performance Period:** One year

**CBOE/S&P 500 15% Buffer Protect Index Series**

**Protection Level:** 15%

**Performance Cap:** Reset annually for each series

**Performance Period:** One year

**CBOE/S&P 500 30% (-5% to -35%) Buffer Protect Index Series**

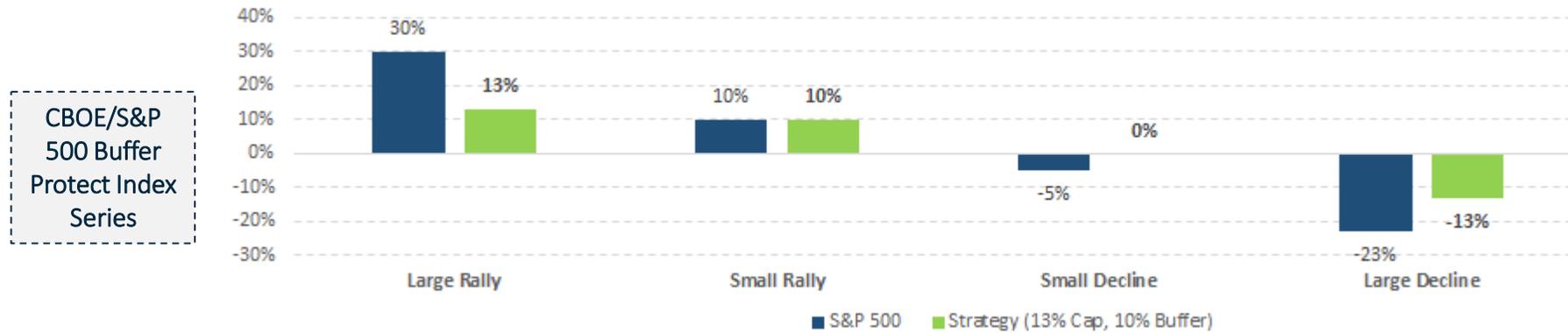
**Protection Level:** between -5% to -35%

**Performance Cap:** Reset annually for each series

**Performance Period:** One year

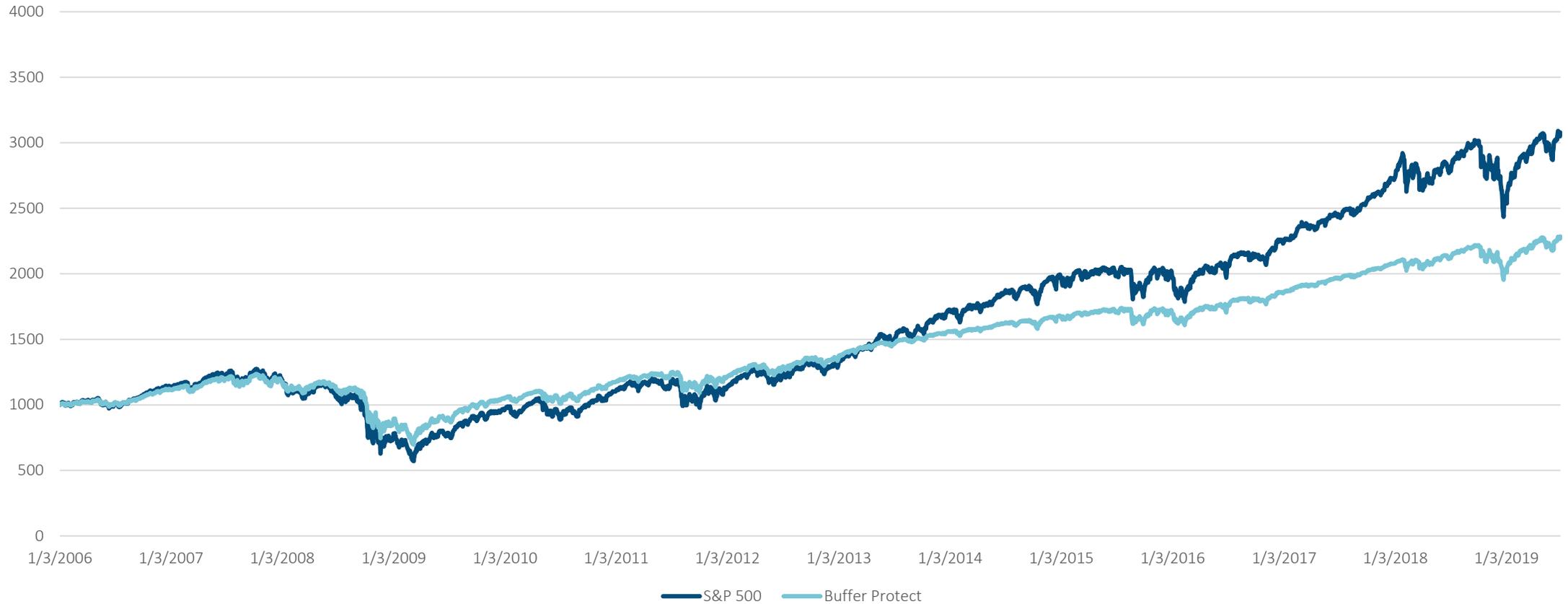
Source: CBOE, S&P Dow Jones Indices LLC. Index data as of March 29, 2019. Index performance based on USD Total or Excess Returns. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. These charts and graphs may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

## Index Innovation Across Risk Management Strategies CBOE/S&P 500 Buffer Protect: Performance Example



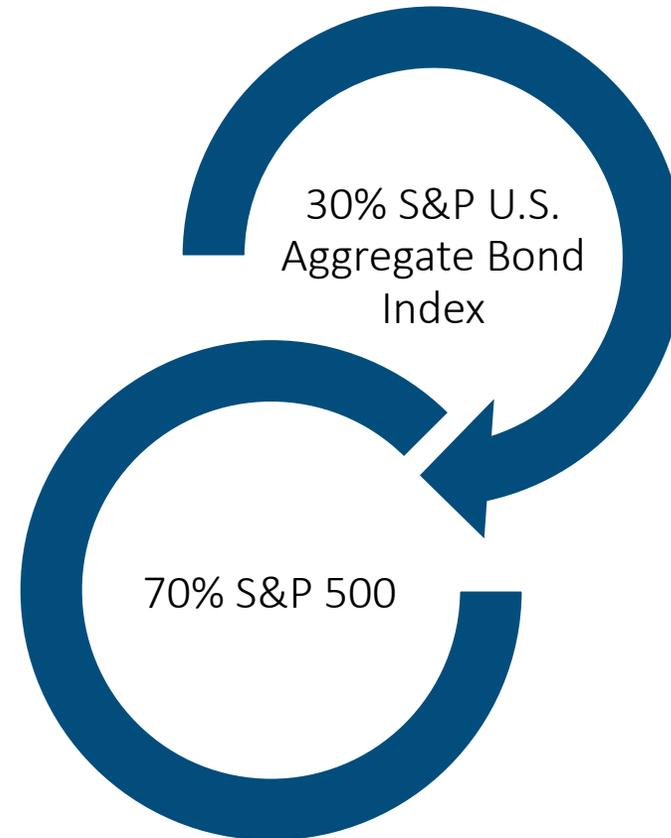
Source: CBOE, S&P Dow Jones Indices LLC. Index data as of March 29, 2019. Index performance based on USD Total or Excess Returns. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. These charts and graphs may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

# Performance

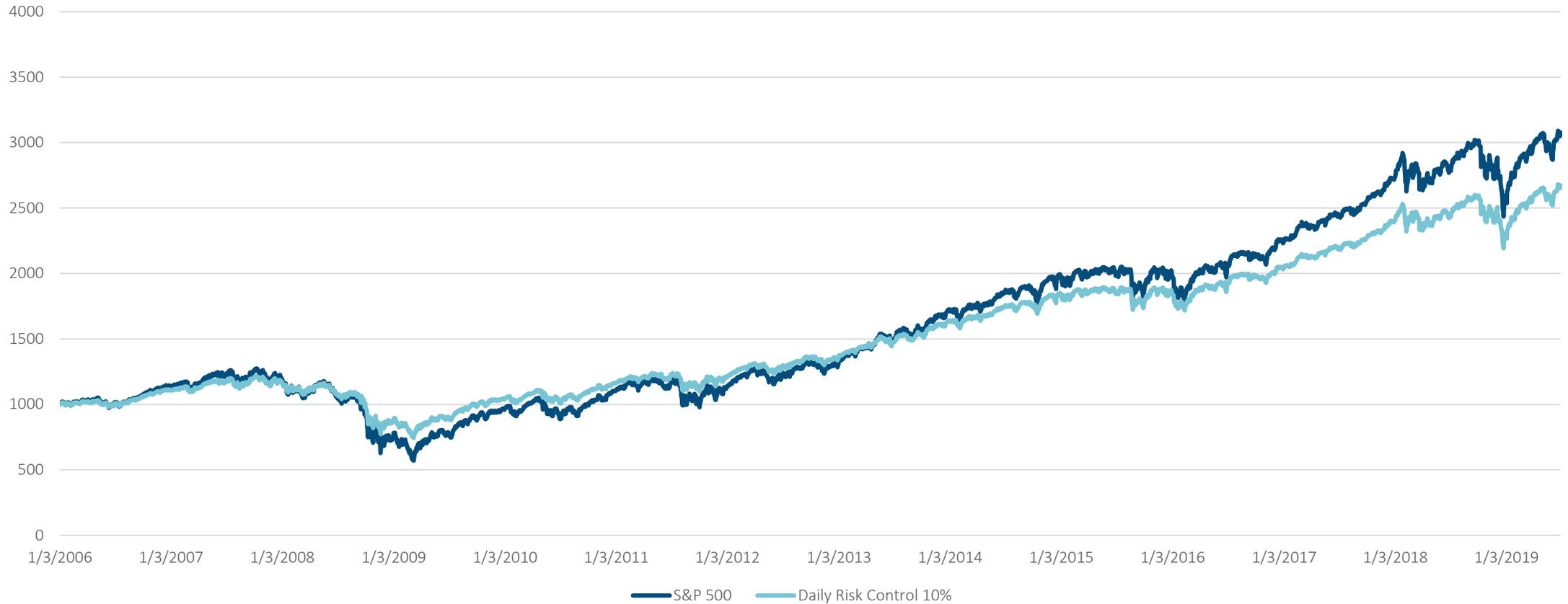


Source: S&P Dow Jones Indices LLC. Index data as of March 29, 2019. Index performance based on USD Total or Excess Returns. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. These charts and graphs may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

# Balanced



# Performance



Source: S&P Dow Jones Indices LLC. Index data as of March 29, 2019. Index performance based on USD Total or Excess Returns. Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. These charts and graphs may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

# Reshaping the Risk Distribution of Traditional Risk Managed Funds

Naoya Kobayashi, M.Sc., FSA, CFA, CERA

October 30, 2019



# Analysis of risk managed funds

Examined performance of S&P Indices that track various strategies

**SPXT5UT** S&P 500 Daily Risk Control 5% Index

• February 1990 – June 2019

**SPXMR2** S&P 500 Managed Risk 2.0 Index

• March 1990 – June 2019

**SPRO** Cboe S&P 500 Buffer Protect Index Series

• December 2005 – June 2019

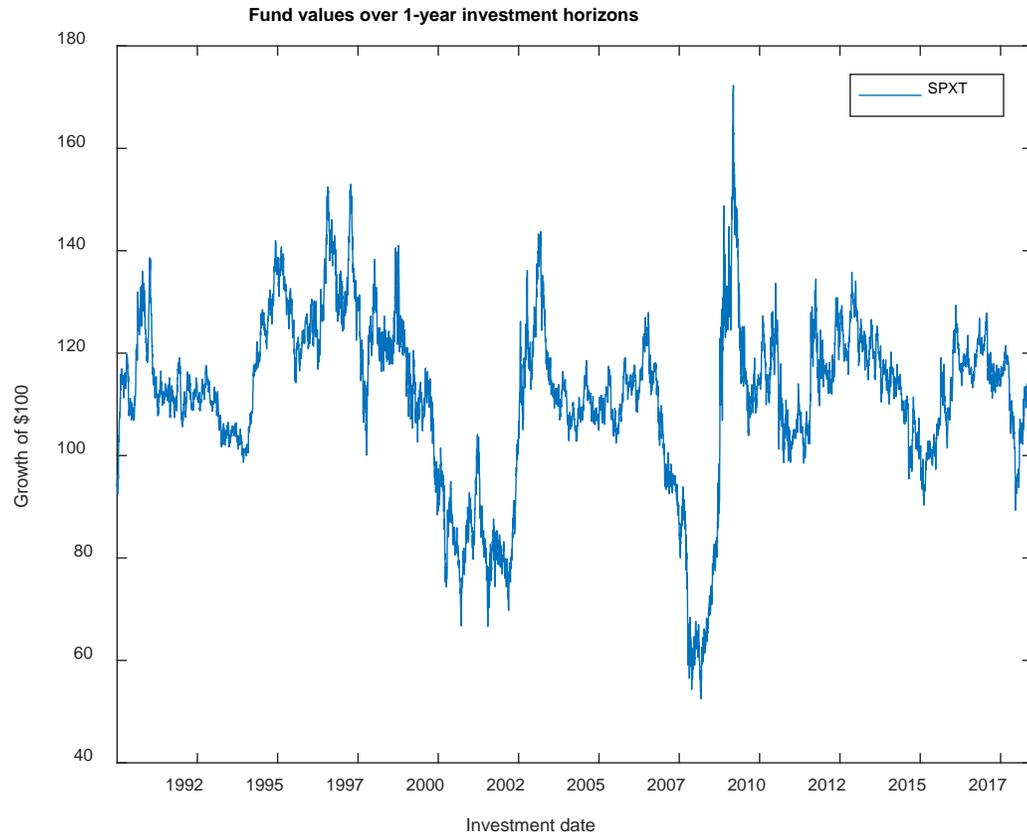
**SPVQDTR** S&P 500 Dynamic VEQTOR Index

• December 2005 – June 2019

**SPXT** S&P 500 Total Return Index (SPXT)

• January 1990 – June 2019

# 1 year investment in SPXT every day over historical period



#1: invest from 1990-01-02 to 1990-12-31

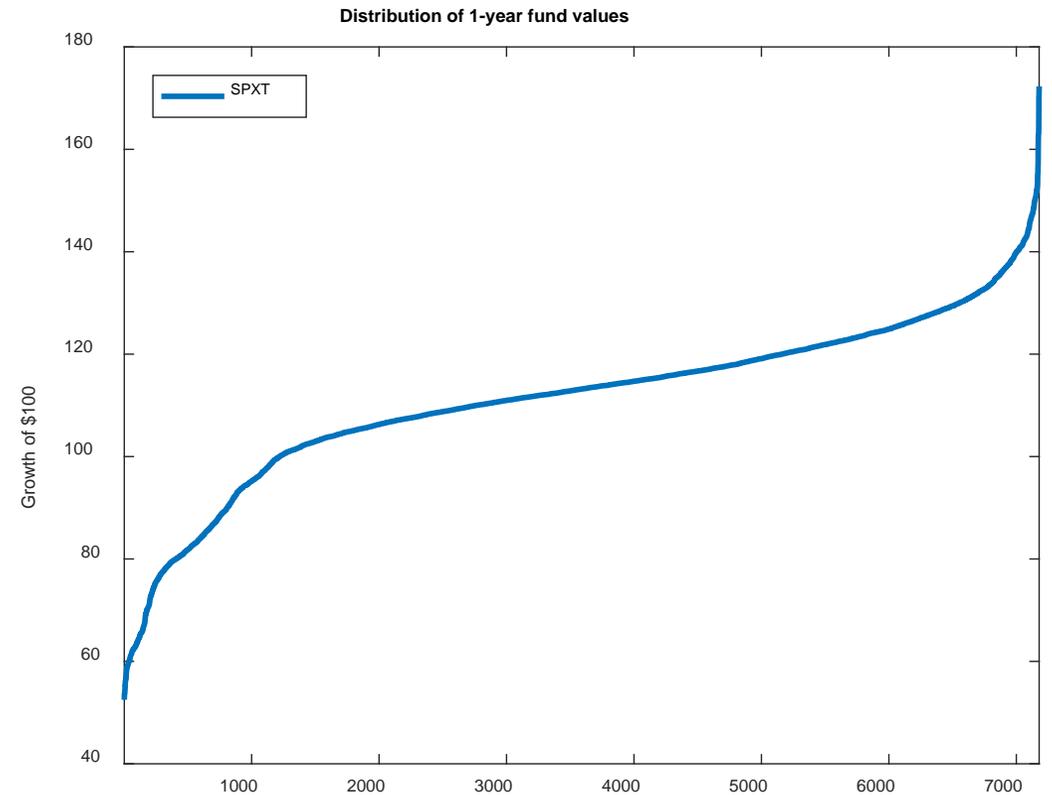
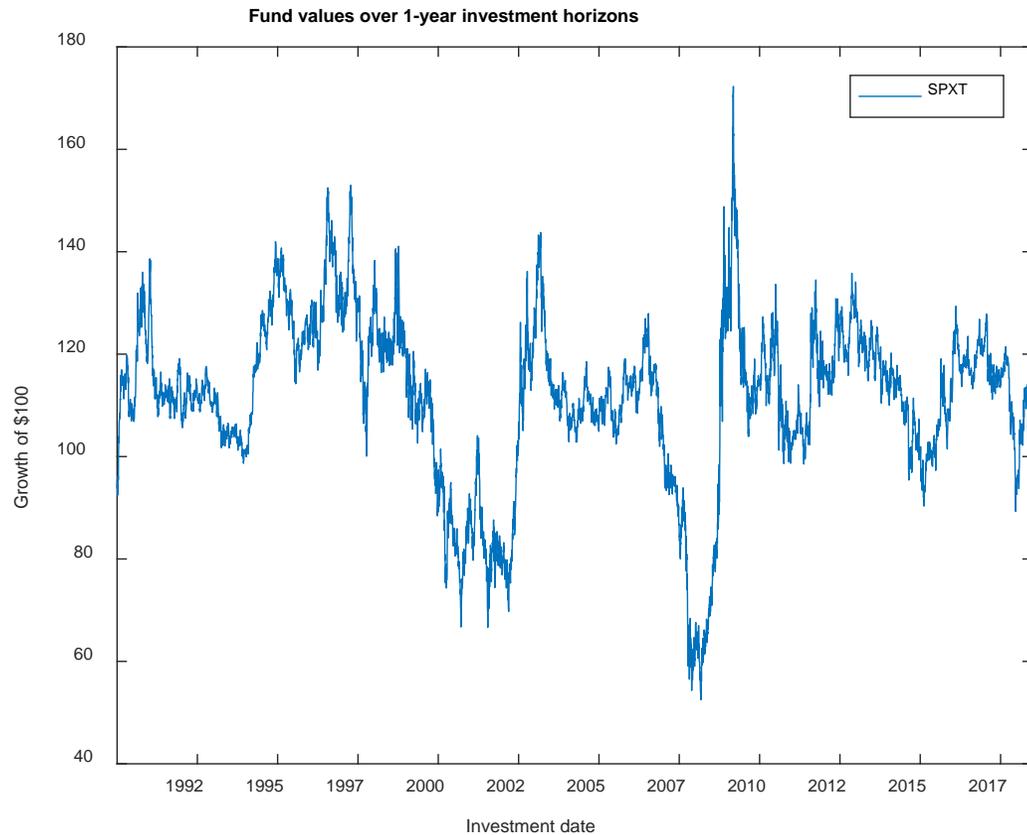
#2: invest from 1990-01-03 to 1991-01-02

:

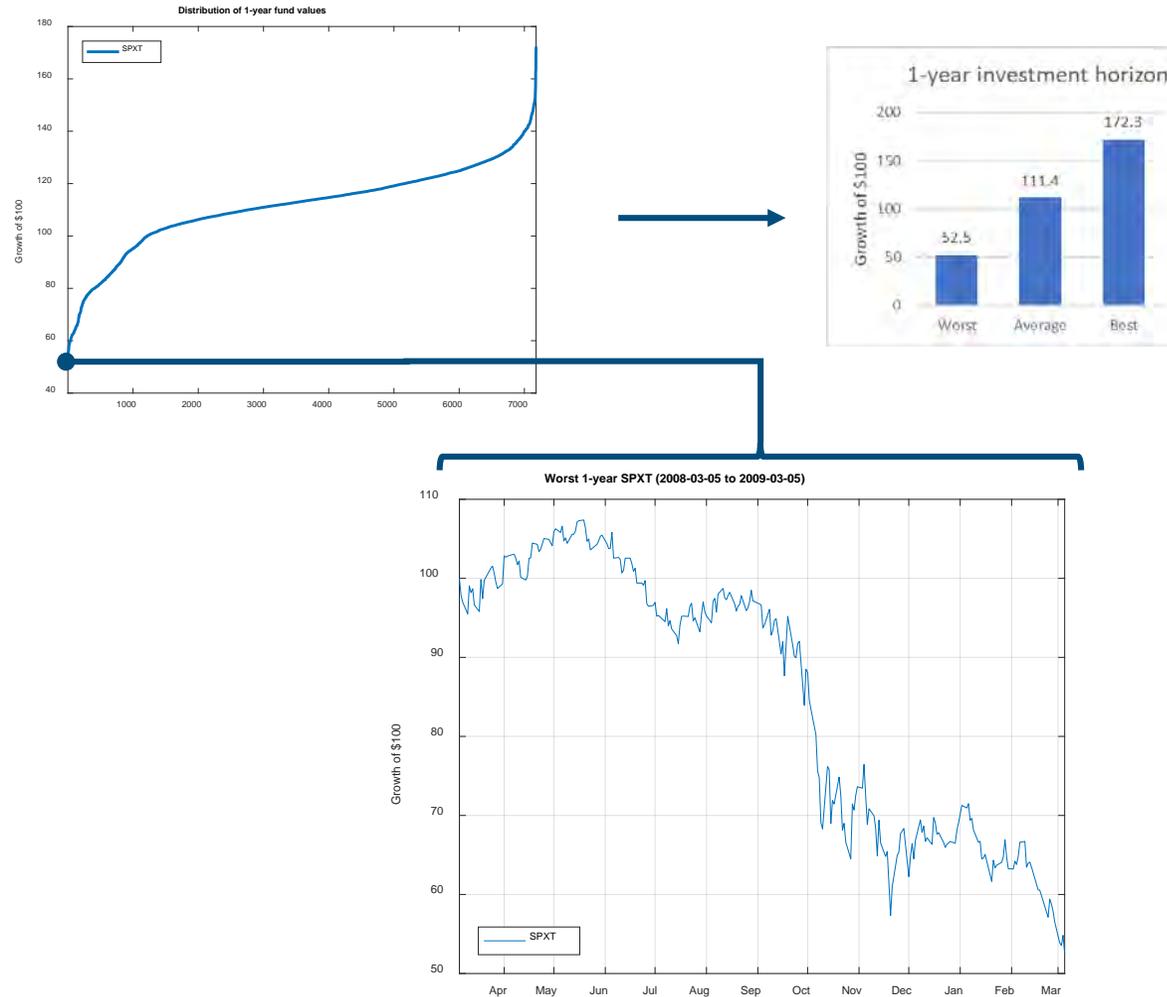
:

#7179: invest from 2018-07-02 to 2019-06-28

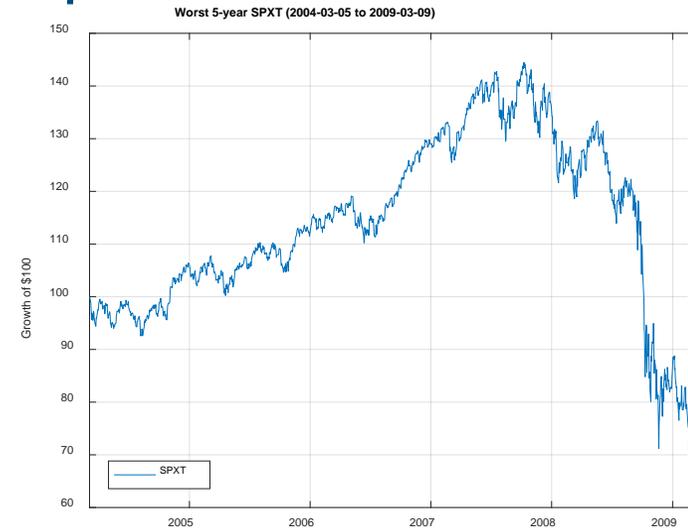
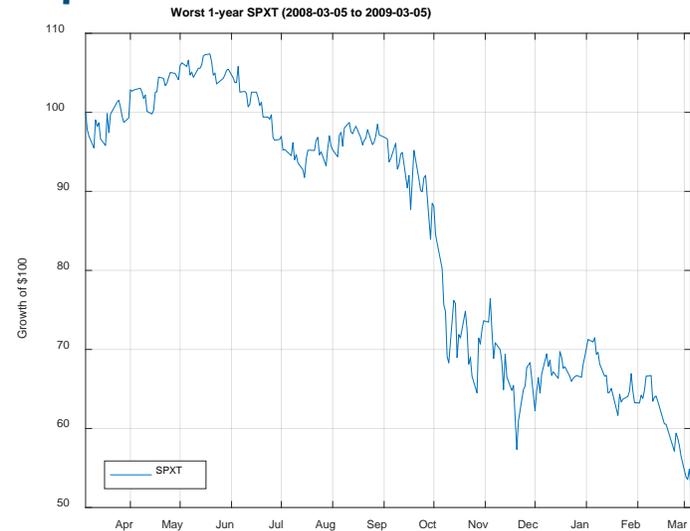
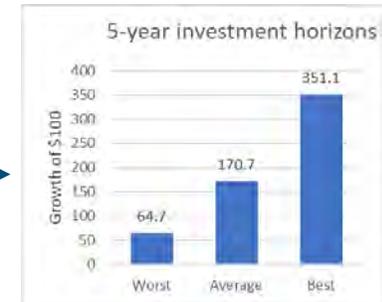
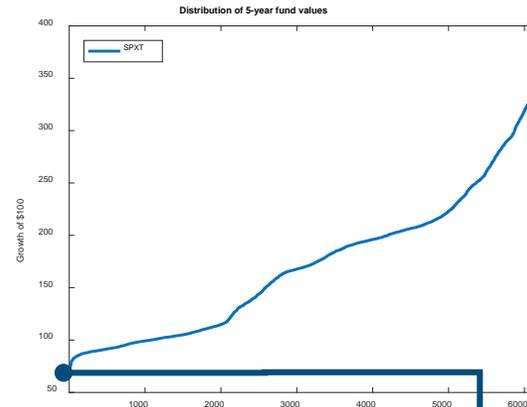
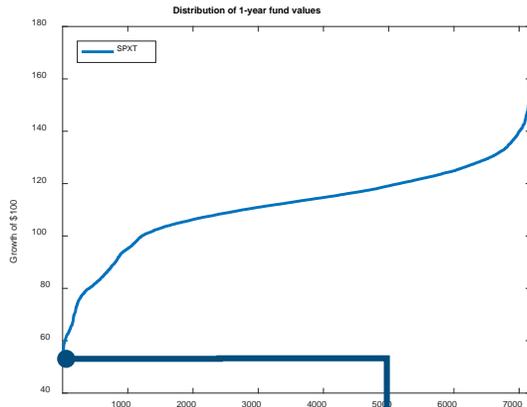
# 1 year investment in SPXT every day over historical period



# 1 year investment in SPXT every day over historical period



# Also look at 5 year investment horizons



# Target volatility funds

**SPXT5UT**

**S&P 500 Daily Risk Control 5% Index**

• February 1990 – June 2019

**SPXMR2**

**S&P 500 Managed Risk 2.0 Index**

• March 1990 – June 2019

**SPRO**

**Cboe S&P 500 Buffer Protect Index Series**

• December 2005 – June 2019

**SPVQDTR**

**S&P 500 Dynamic VEQTOR Index**

• December 2005 – June 2019

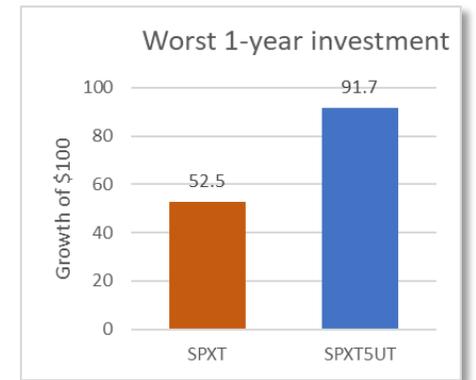
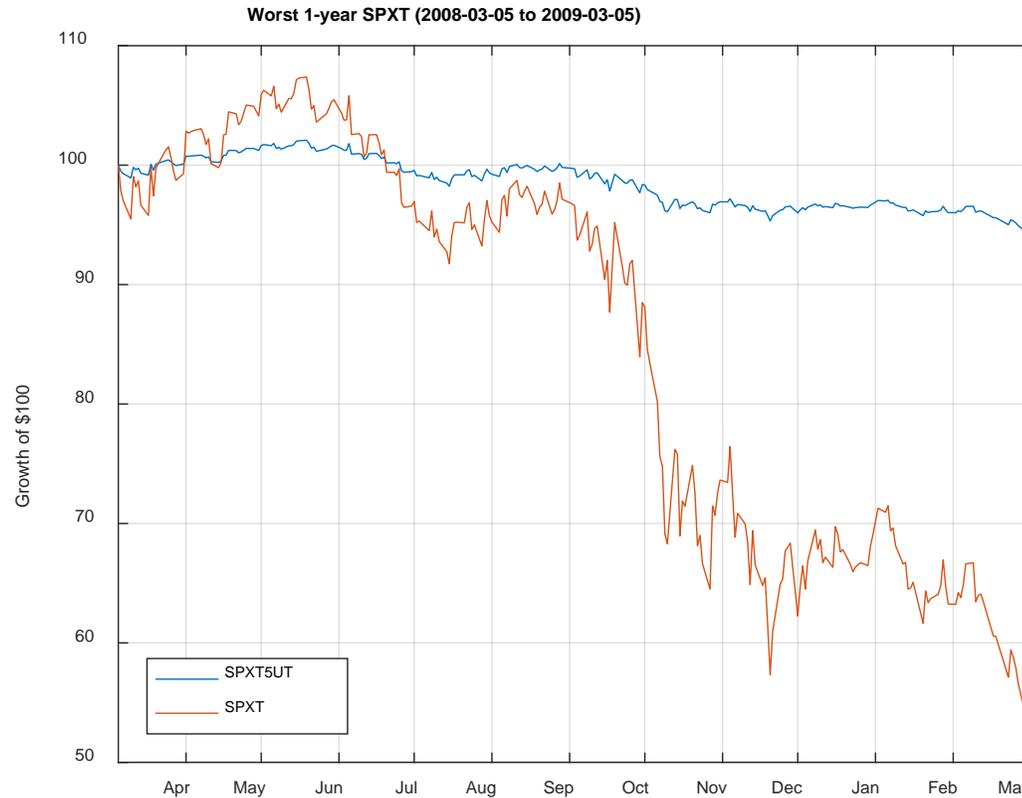
**SPXT**

**S&P 500 Total Return Index (SPXT)**

• January 1990 – June 2019

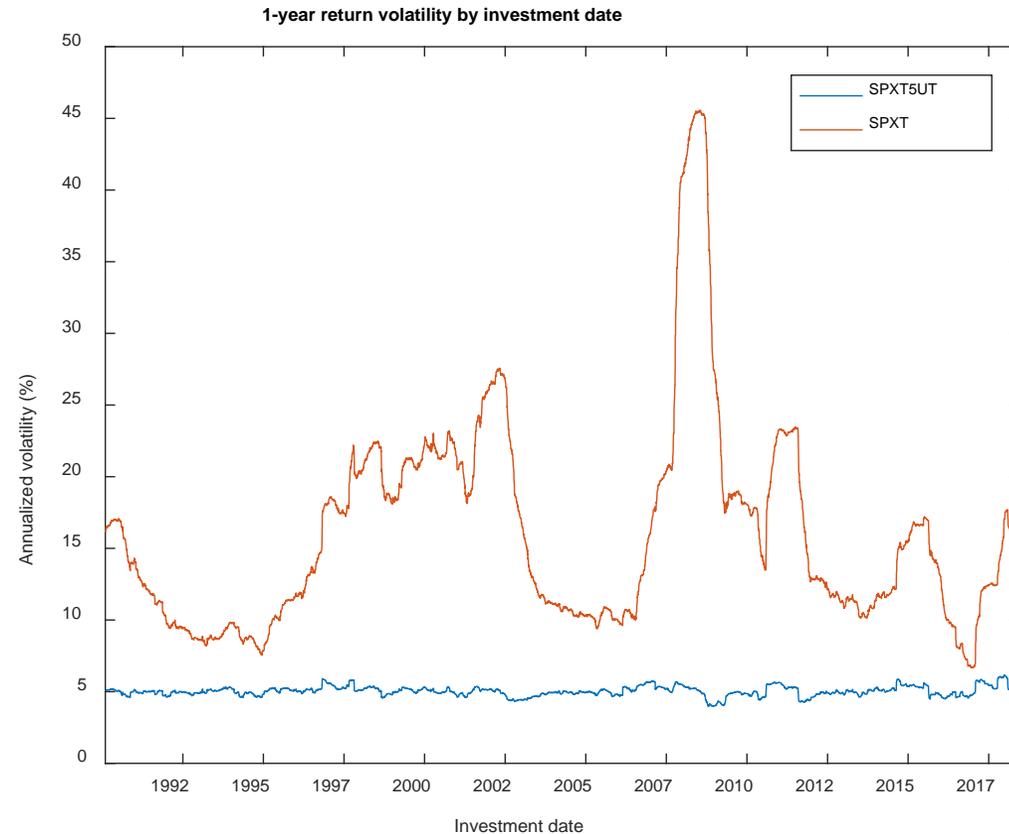
# S&P 500 Daily Risk Control 5% Index (SPXT5UT)

✓ Limited downside exposure



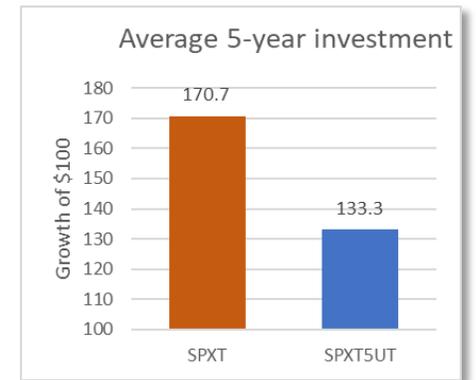
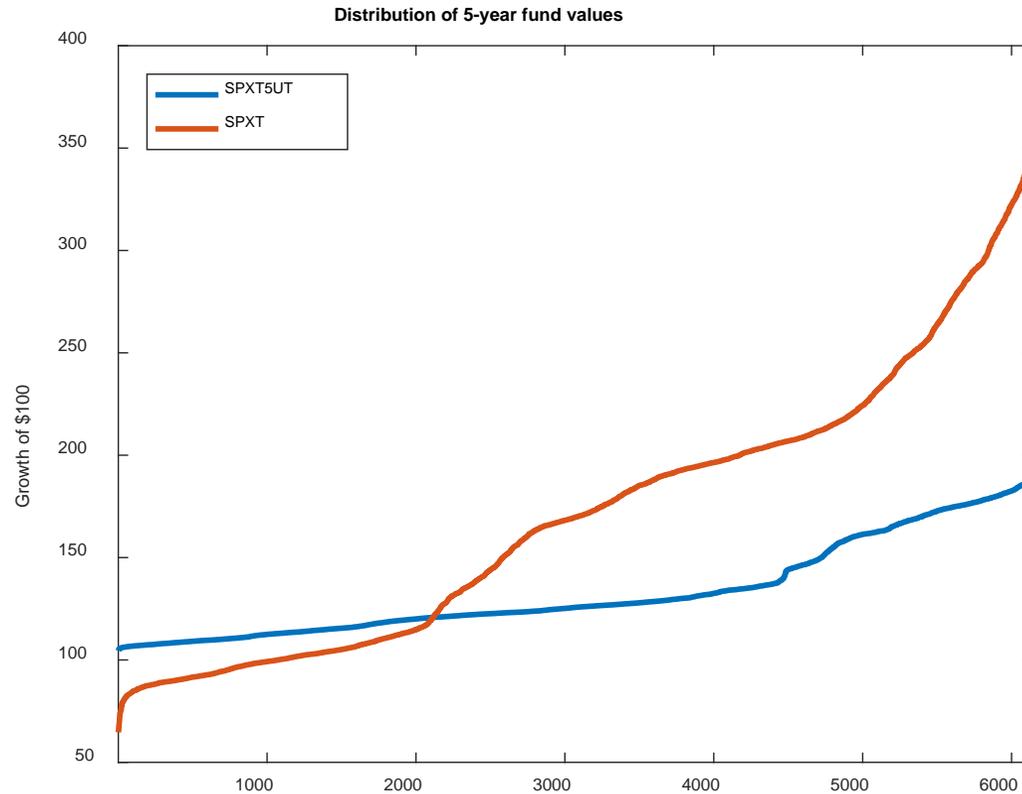
# S&P 500 Daily Risk Control 5% Index (SPXT5UT)

- ✓ Limited downside exposure
- ✓ Smoothed volatility and returns



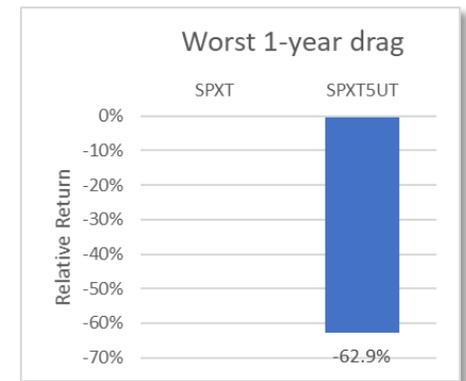
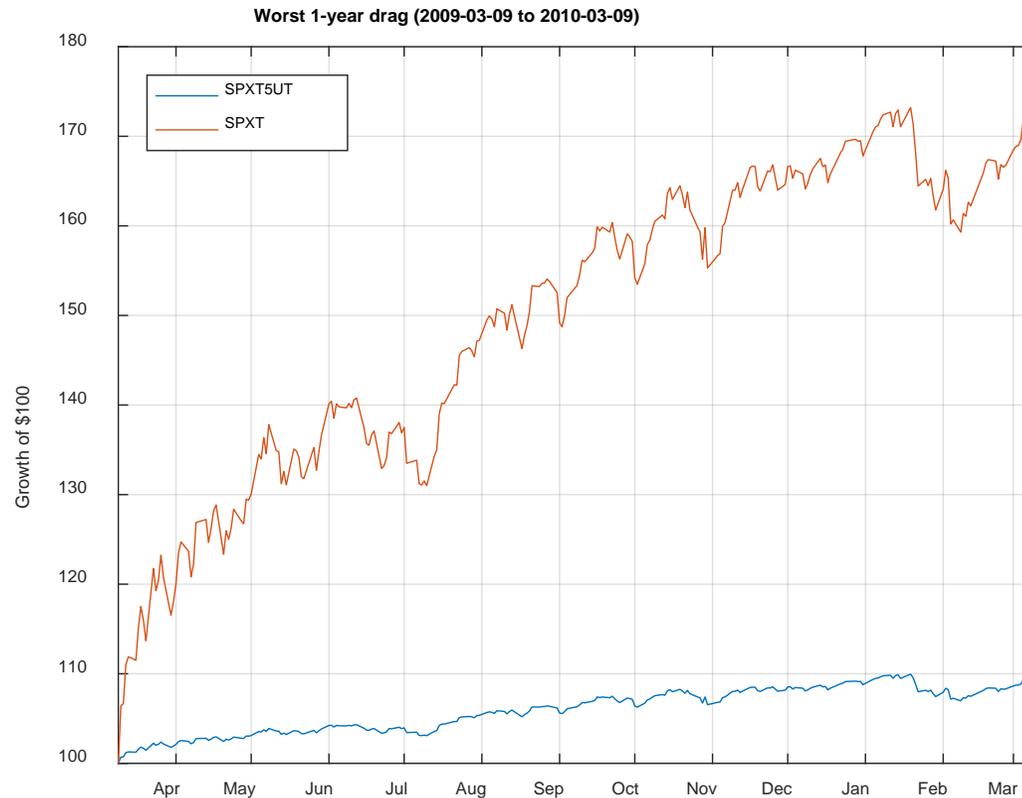
# S&P 500 Daily Risk Control 5% Index (SPXT5UT)

× Hedge inefficient



# S&P 500 Daily Risk Control 5% Index (SPXT5UT)

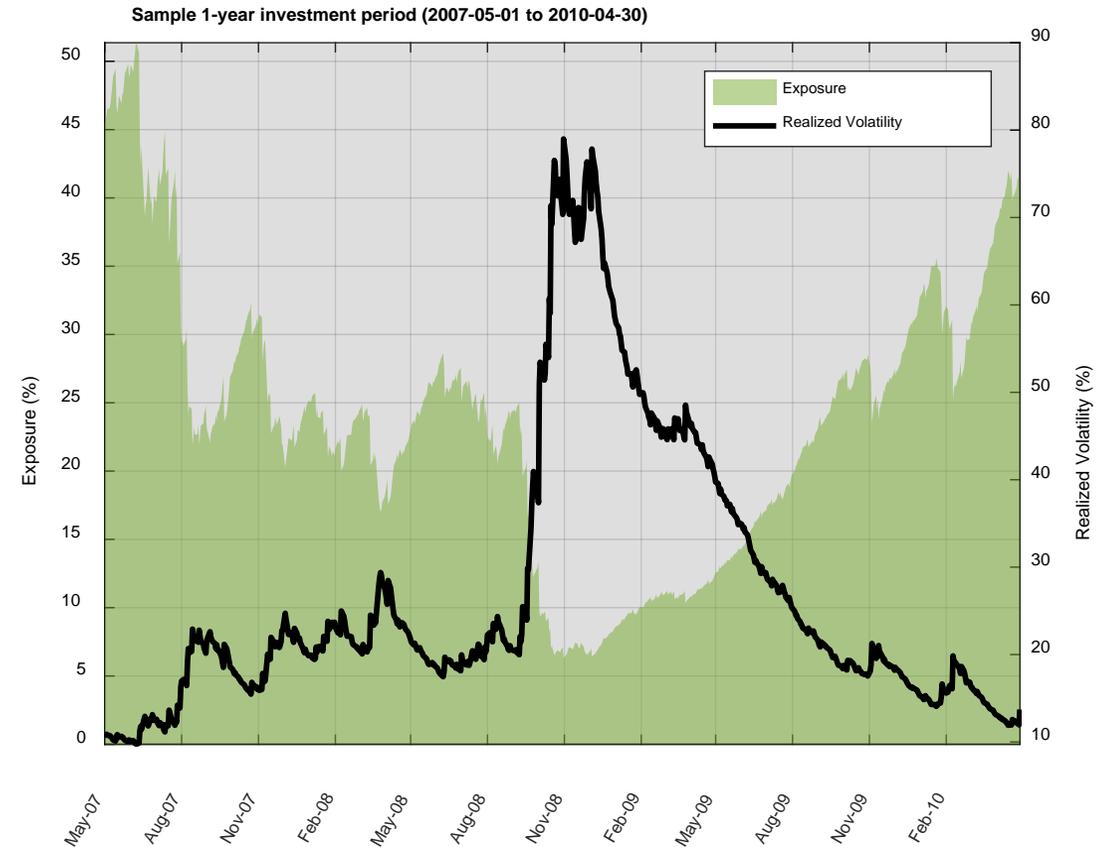
- × Hedge inefficient
- × Significant drag



# Volatility is the wrong driver

Protection too little when needed / too much when not needed

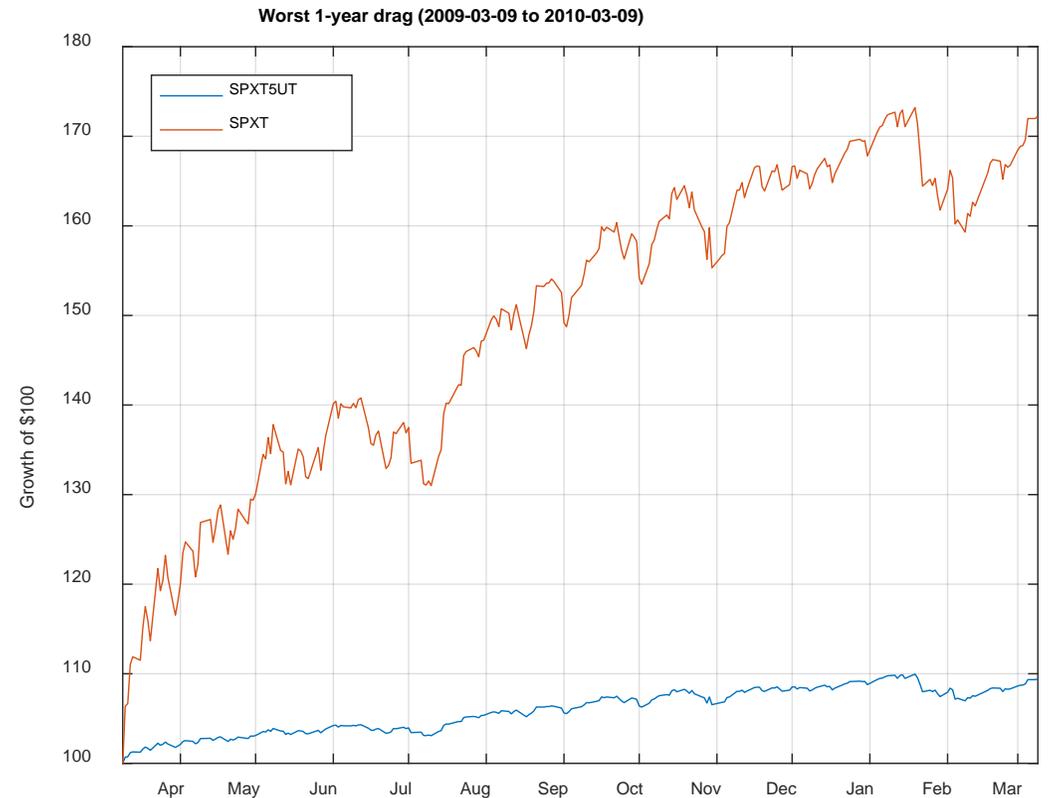
- **Realized volatility = standard deviation is a trailing measure**



# Volatility is the wrong driver

Protection too little when needed / too much when not needed

- **Realized volatility = standard deviation is a trailing measure**
- ✗ **No distinction between upside and downside volatility**
- ✗ **Cannot participate in strong recovery**



# Volatility is the wrong driver

Protection too little when needed / too much when not needed

- **Realized volatility = standard deviation is a trailing measure**
- ✗ **No distinction between upside and downside volatility**
- ✗ **Cannot participate in strong recovery**
- ✗ **Delayed signal**
- ✗ **Vulnerable to crash with no volatility warning**



# S&P indices incorporating potential strategy improvements

**SPXT5UT** S&P 500 Daily Risk Control 5% Index

• February 1990 – June 2019

**SPXMR2** S&P 500 Managed Risk 2.0 Index

• March 1990 – June 2019

**SPRO** Cboe S&P 500 Buffer Protect Index Series

• December 2005 – June 2019

**SPVQDTR** S&P 500 Dynamic VEQTOR Index

• December 2005 – June 2019

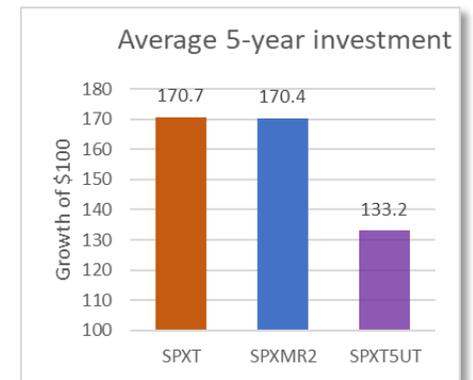
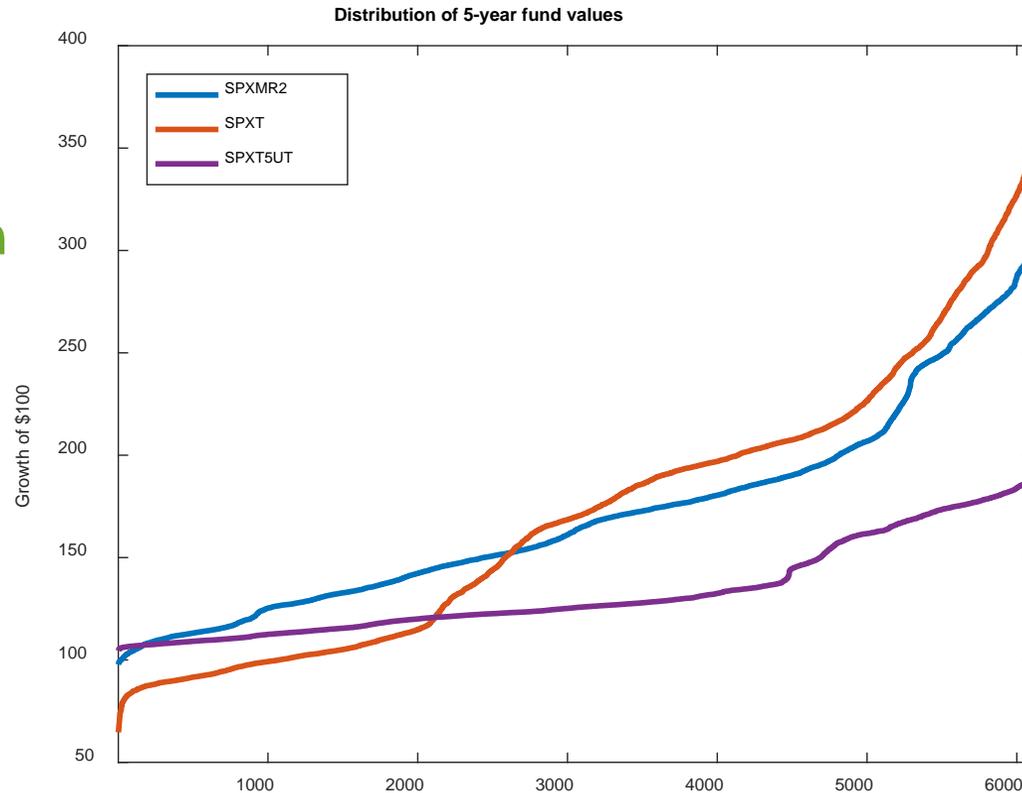
**SPXT** S&P 500 Total Return Index (SPXT)

• January 1990 – June 2019

# Improvement #1: Increase efficiency

## S&P 500 Managed Risk 2.0 Index (SPXMR2)

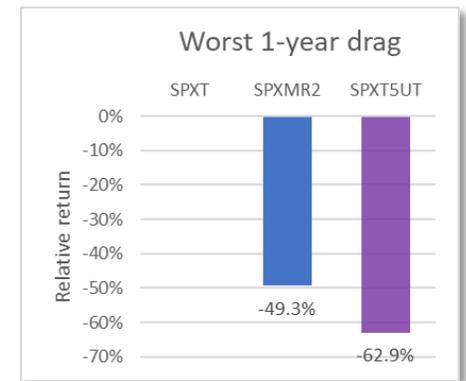
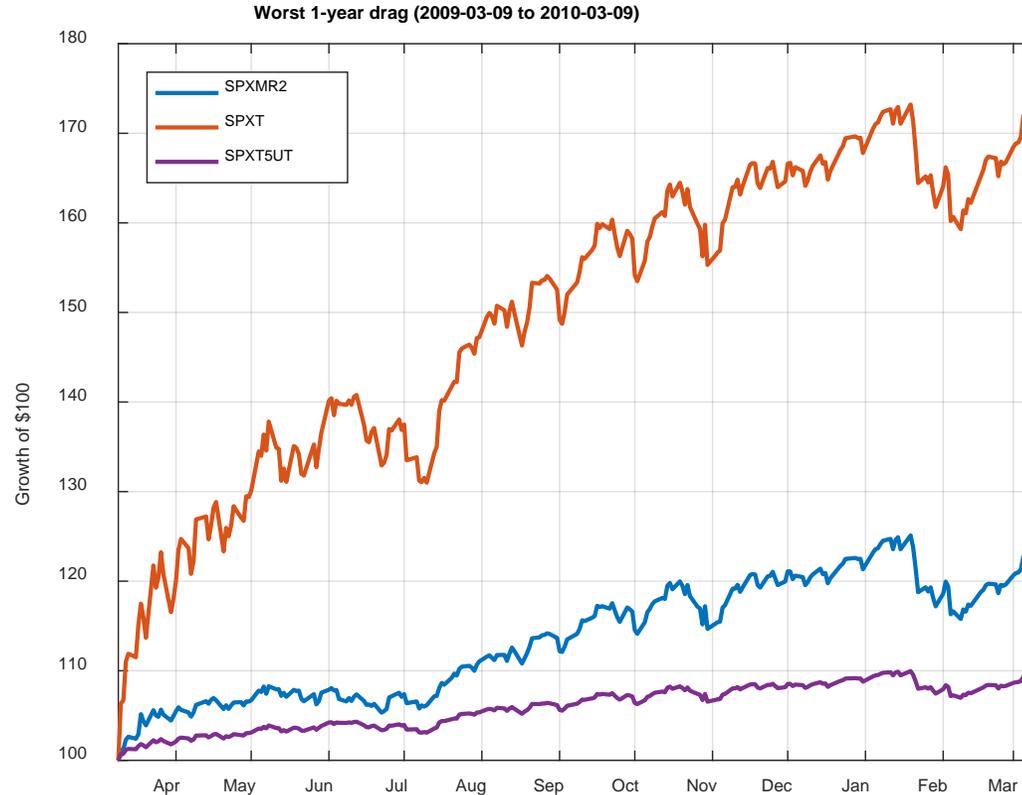
- ✓ **Limits downside exposure**
- ✓ **Synthetic put position increases efficiency of protection**
- ✓ **Not relying exclusively on volatility**



# Improvement #1: Increase efficiency

## S&P 500 Managed Risk 2.0 Index (SPXMR2)

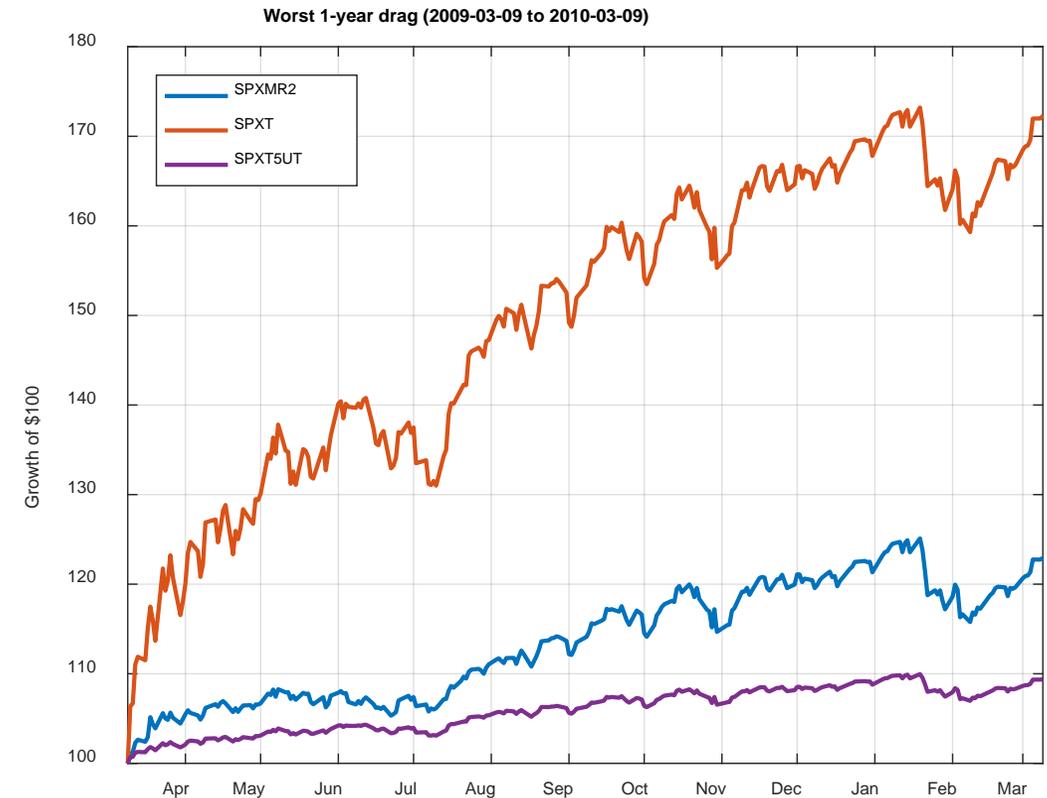
× Drag still significant



# Improvement #1: Increase efficiency

## S&P 500 Managed Risk 2.0 Index (SPXMR2)

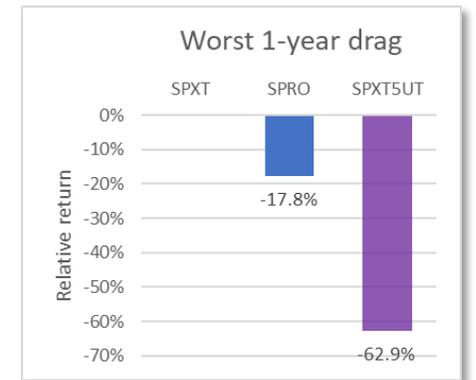
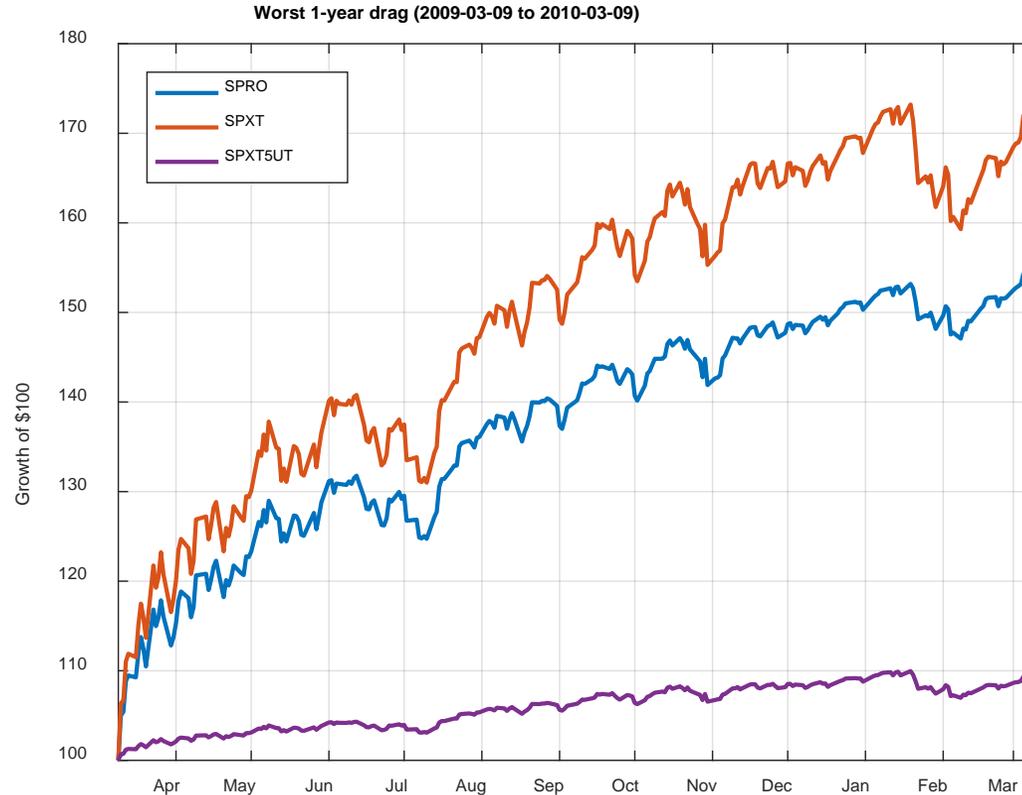
- **Moneyness of protection (moving average) is a trailing measure**
- ✗ **Cannot participate in strong recovery**
- ✗ **Delayed signal**
- ✗ **Vulnerable to crash with no volatility warning**



# Improvement #2: Incorporate option payoff

## Cboe S&P 500 Buffer Protect Index Series (SPRO)

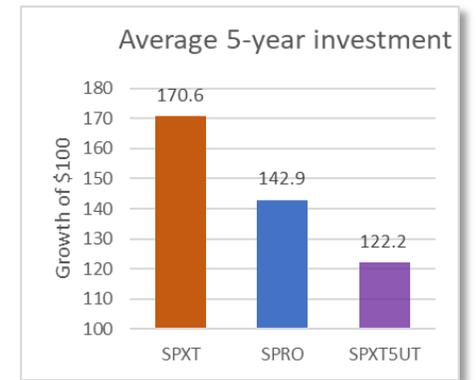
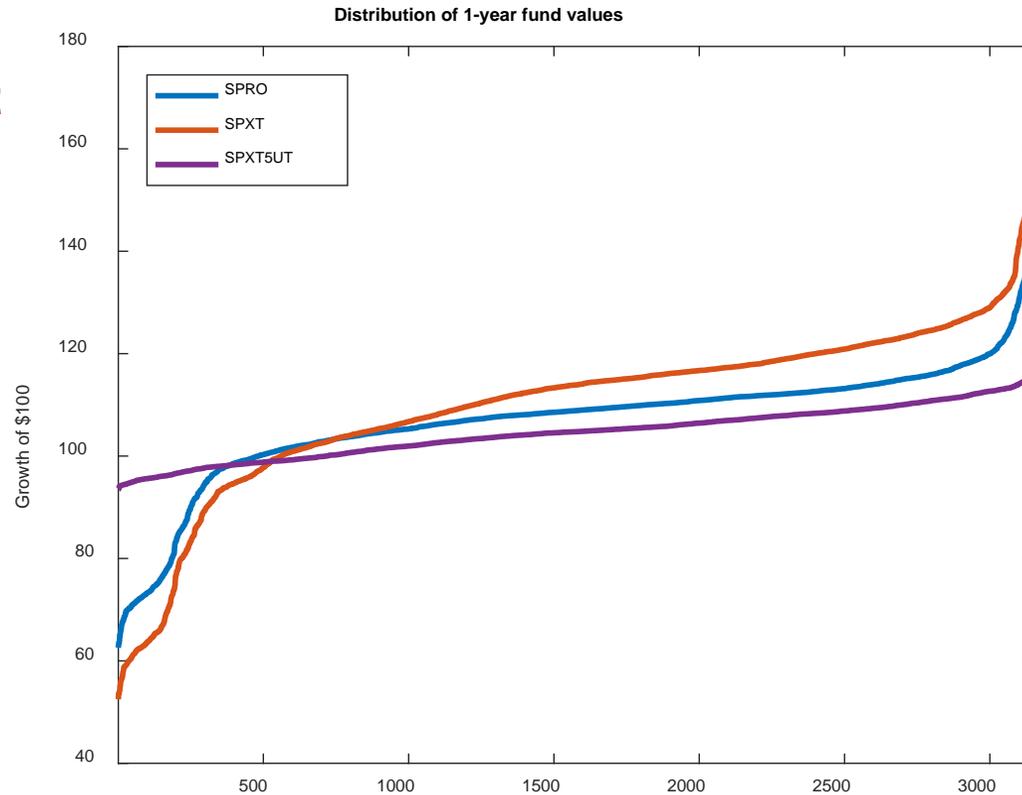
- ✓ Significant reduction in drag
- ✓ Keeps upside potential



# Improvement #2: Incorporate option payoff

## Cboe S&P 500 Buffer Protect Index Series (SPRO)

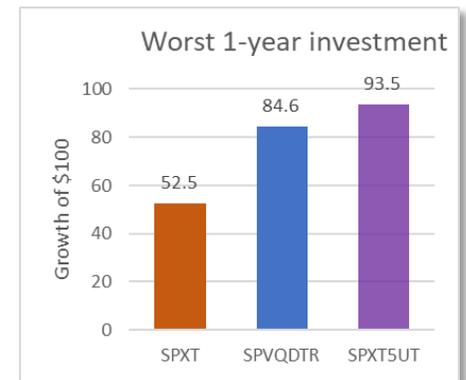
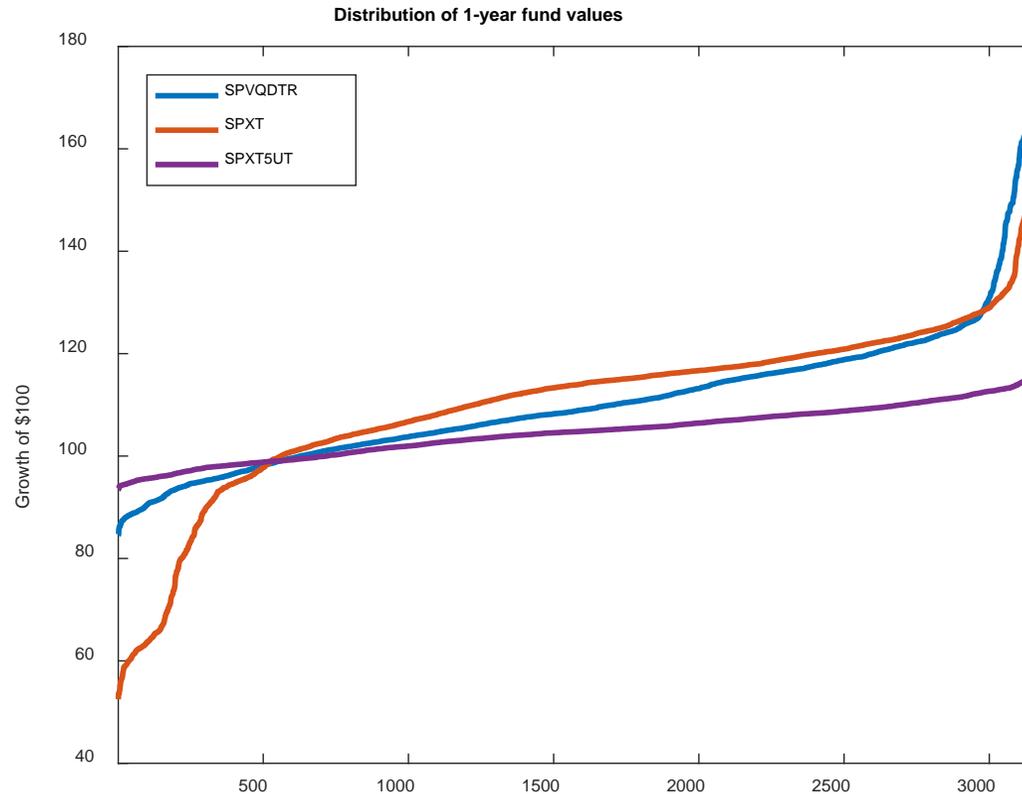
- ✘ Drag reduced, but not much protection
- ✘ Not reshaping risk distribution by much
- ✘ Protection not efficient



# Improvement #3: Incorporate VIX futures

S&P 500 Dynamic VEQTOR Index (SPVQDTR)

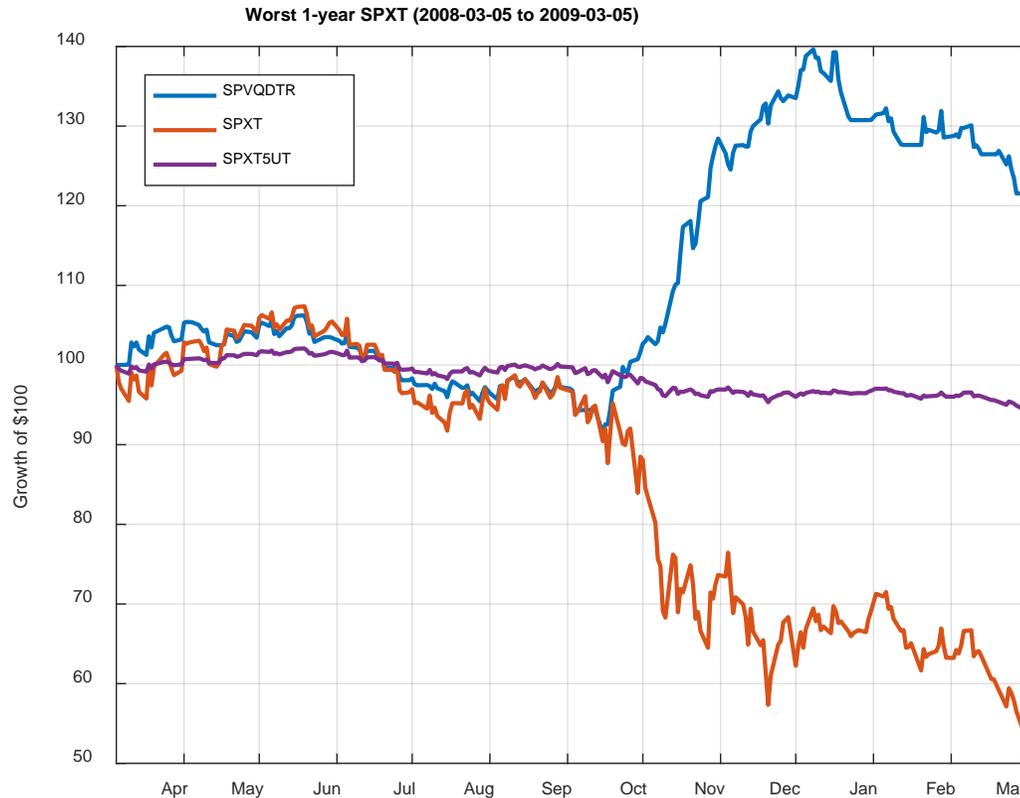
- ✓ **Beats SPXT on upside**
- ✓ **Significant reduction in drag**
- ✓ **Can protect against a sudden drop**
- ✓ **Implied volatility trend  $\Rightarrow$  forward looking**



# Improvement #3: Incorporate VIX futures

## S&P 500 Dynamic VEQTOR Index (SPVQDTR)

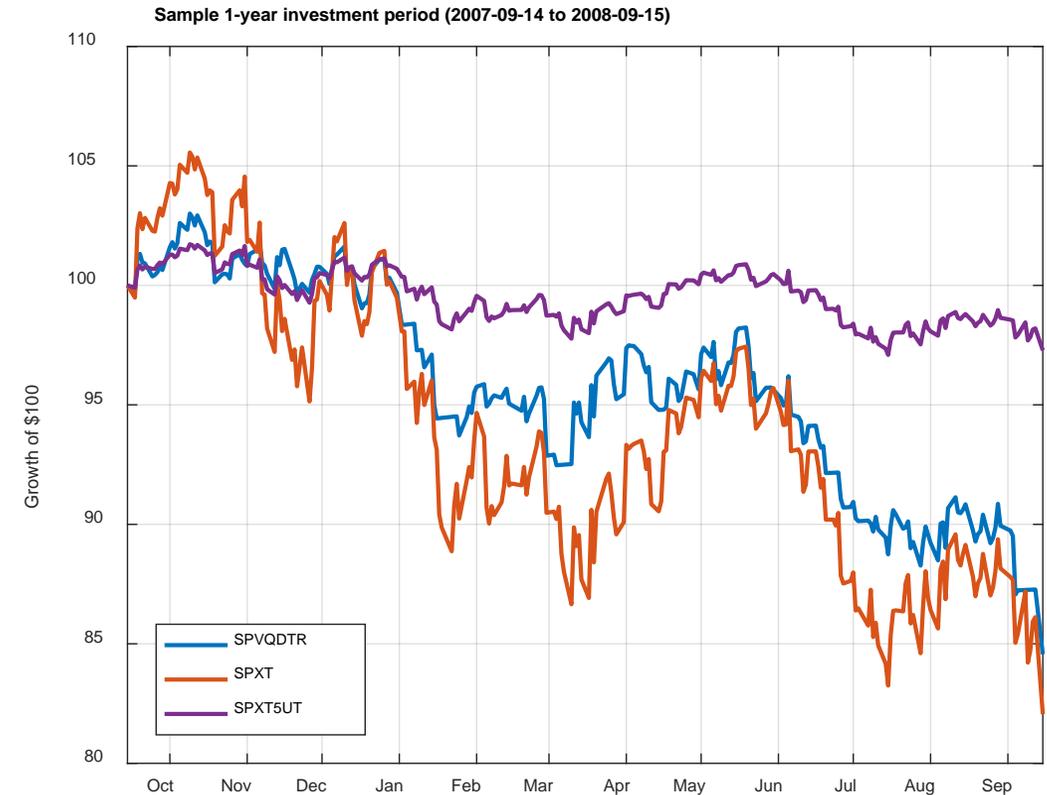
- ✓ **Beats SPXT on upside**
- ✓ **Significant reduction in drag**
- ✓ **Can protect against a sudden drop**
- ✓ **Implied volatility trend  $\Rightarrow$  forward looking**



# Improvement #3: Incorporate VIX futures

S&P 500 Dynamic VEQTOR Index (SPVQDTR)

- × Sometimes behavior very different from SPXT
- × Sometimes minimal protection / drag in down market



# Potential strategy improvements

**SPXT5UT** S&P 500 Daily Risk Control 5% Index

- Smoothed volatility and returns

**SPXMR2** S&P 500 Managed Risk 2.0 Index

- Efficient protection with put option replication

**SPRO** Cboe S&P 500 Buffer Protect Index Series

- Buy / sell options to incorporate nonlinear payoff structure

**SPVQDTR** S&P 500 Dynamic VEQTOR Index

- Forward-looking measures

# Potential strategy improvements

Work in progress

**SPXT5UT** S&P 500 Daily Risk Control 5% Index

- Smoothed volatility and returns

**SPXMR2** S&P 500 Managed Risk 2.0 Index

- Efficient protection with put option replication

**SPRO** Cboe S&P 500 Buffer Protect Index Series

- Buy / sell options to incorporate nonlinear payoff structure

**SPVQDTR** S&P 500 Dynamic VEQTOR Index

- Forward-looking measures

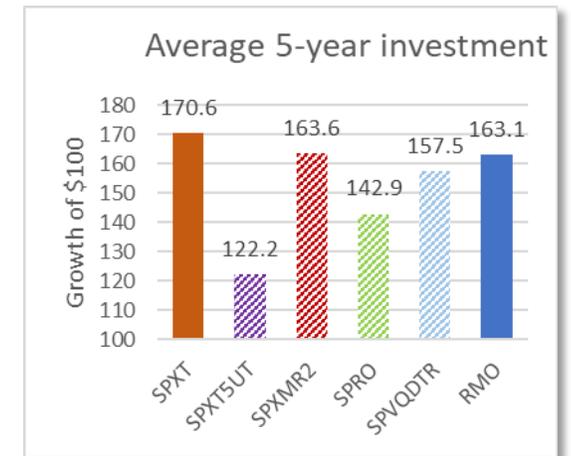
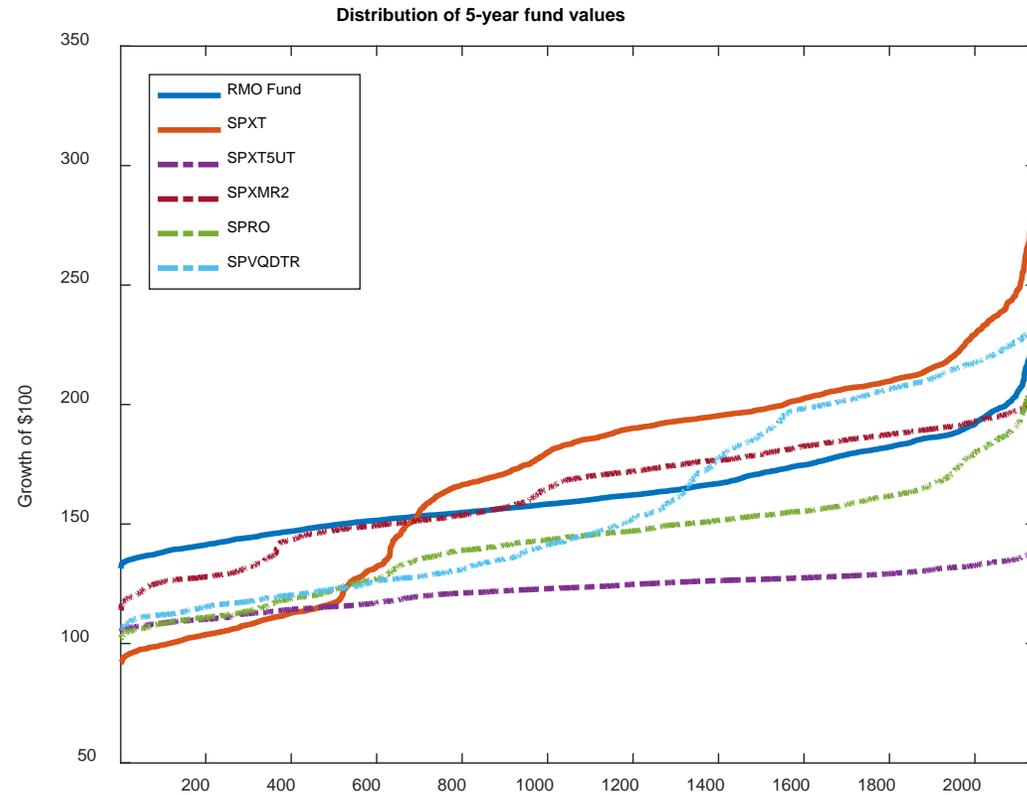
➤ Remove volatility constraint

➤ Combine best strategy elements from our study

➤ Reshape risk distribution using risk management overlay

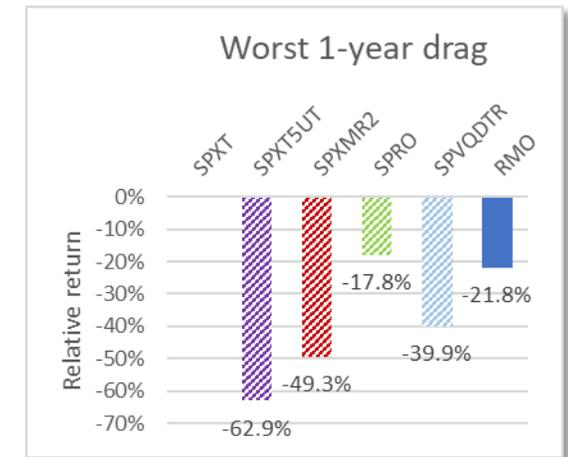
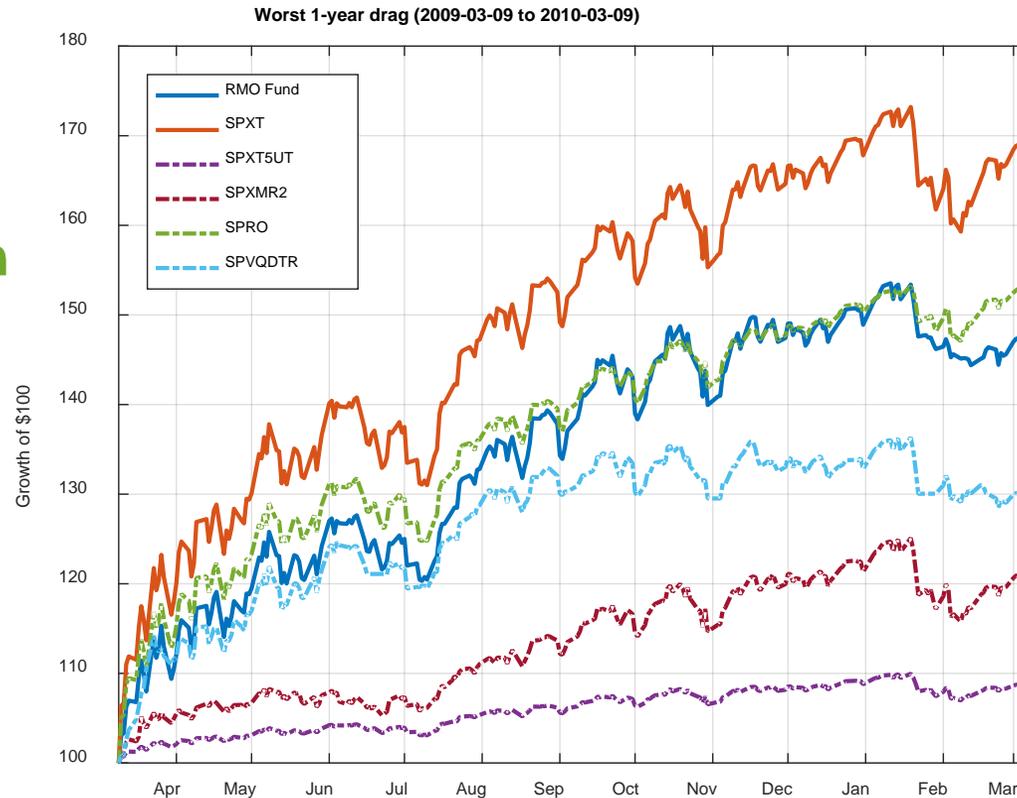
# Illustrative Risk Management Overlay Strategy (RMO)

✓ Provides efficient protection



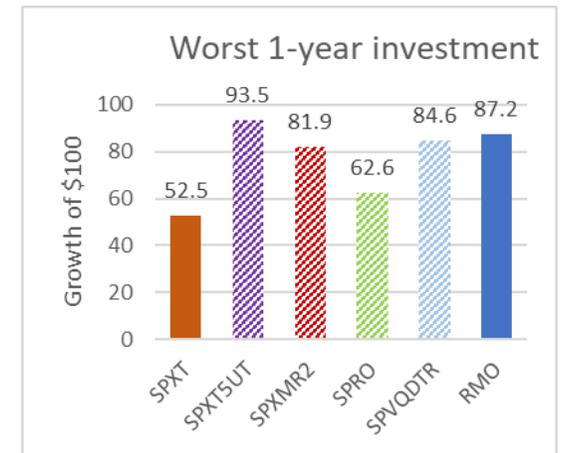
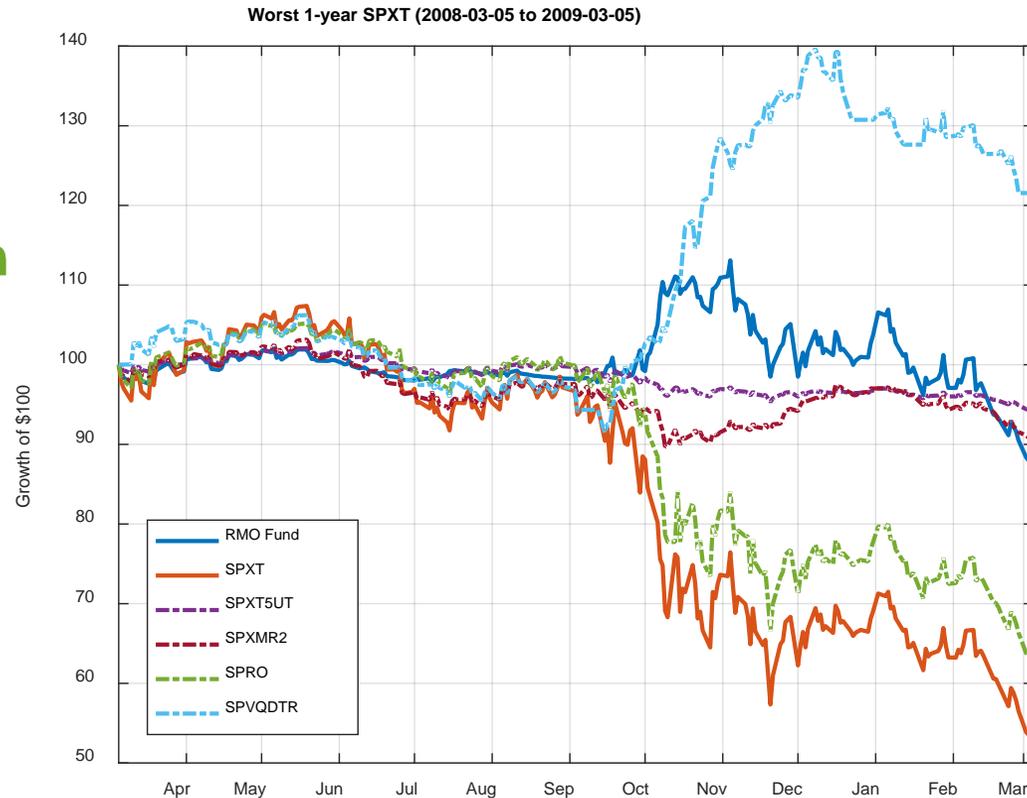
# Illustrative Risk Management Overlay Strategy (RMO)

- ✓ Provides efficient protection
- ✓ Significant reduction in drag



# Illustrative Risk Management Overlay Strategy (RMO)

- ✓ Provides efficient protection
- ✓ Significant reduction in drag
- ✓ Significantly limits downside exposure



2019 **ANNUAL  
MEETING**  
& EXHIBIT

