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Volaris Capital Management

Truncate Left Tail Risk Without Destroying the Body of Returns

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Truncating Left Tail Risk Without Destroying the Body of Returns

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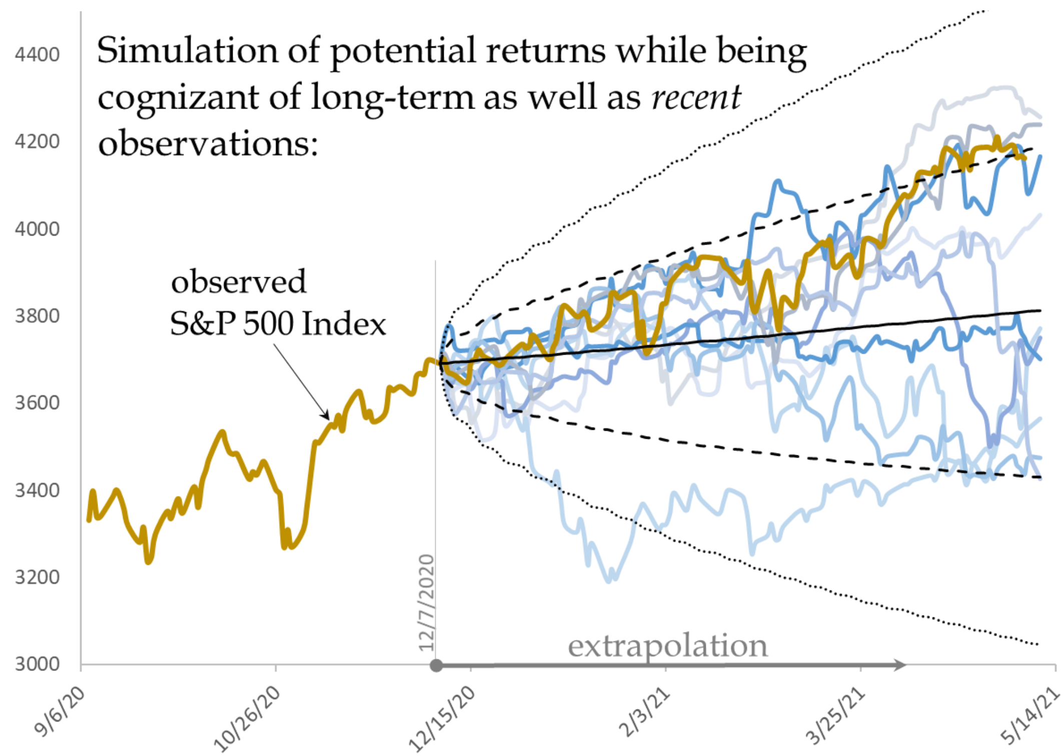


Take calculated risks. That is quite different from being rash.

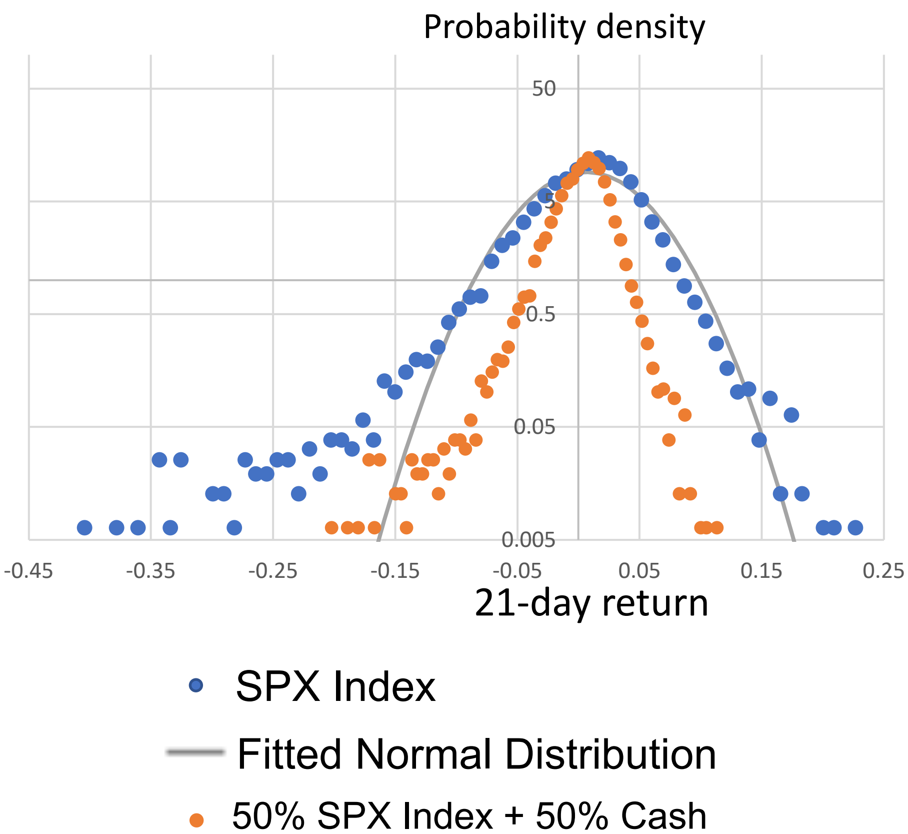
General George Patton

www.volariscapital.com

Presentation Overview

- Fat Tails in Equity Markets
  - Tail Risk vs. Body Risk
- Conventional Option-based Hedging Programs
- Option Risk-Return Informed Hedging:
  - Risk Aware Approach to Options
  - Asymmetry of Residual Risks
- Self-Financed Tail Positive Convexity
  - Single Stock and Index Solutions

Fat Tails in Equity Markets



Confidence Level (%)	S&P 500 Twenty-One Day Return	Return of Fitted Normal
99.9	-0.26	-0.13
99	-0.12	-0.10
95	-0.07	-0.07
90	-0.04	-0.05

The probability density of the 21-day S&P 500 Index Returns are shown accompanied with associated Confidence Levels, along with the corresponding fitted normal distribution.

 Source: Bloomberg, Volaris Capital Management, LLC.

Data shown is from 1/3/1950-3/29/2019.

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Tail Risk vs. Body Risk

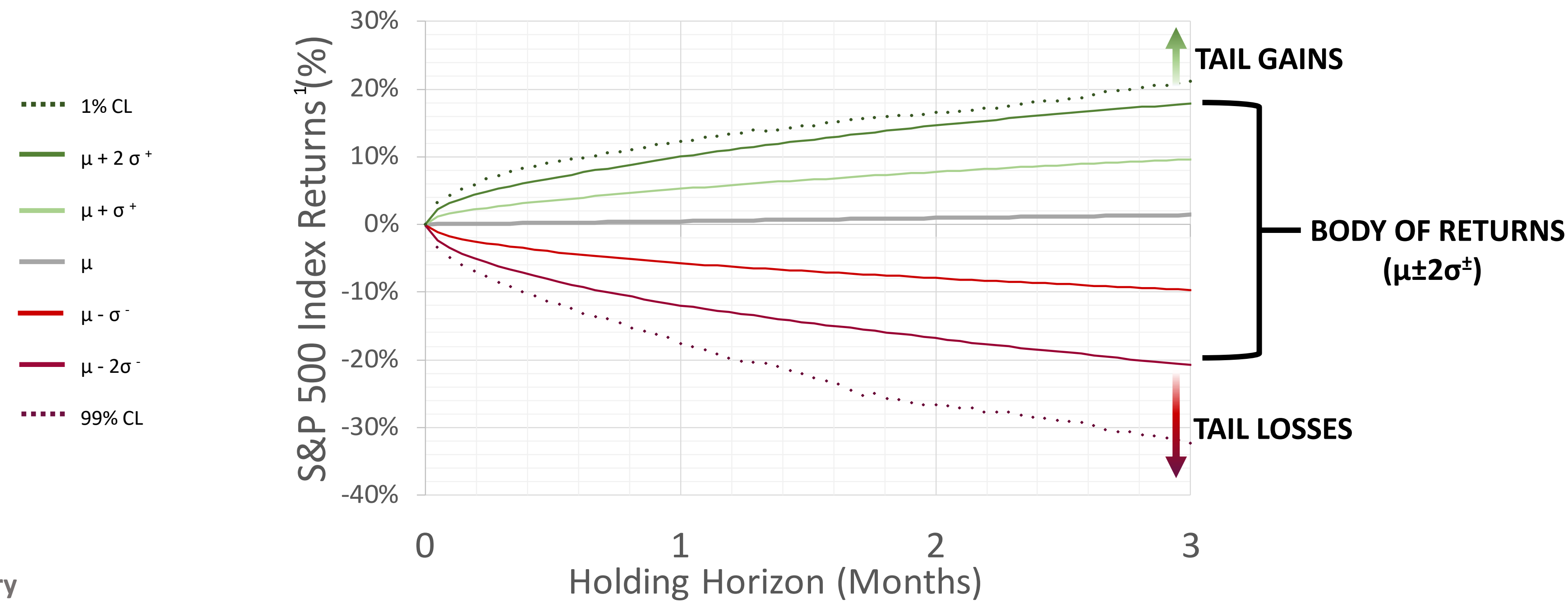
Returns associated with significant fear (downside) and euphoria (upside) in the market are Tail Risk.

+ The band of uncertainty of returns increases with investment holding horizon (i.e., Term).

  At *one-month holding horizon,* the two-upside standard deviation return is **+10%** and the two-downside standard deviation return is **-12%**.
  At *two-month holding horizon*, the two-upside standard deviation return is **+14%** and the two-downside standard deviation return is **-17%.**

+ Depicted below is the term structure of tail risks.

  At *one-month holding horizon,* the 1% confidence level of return is **+12%** and the 99% confidence level return is **-18%.**
  At *two-month holding horizon,* the 1% confidence level of return is **+16%** and the 99% confidence level return is **-27%.**



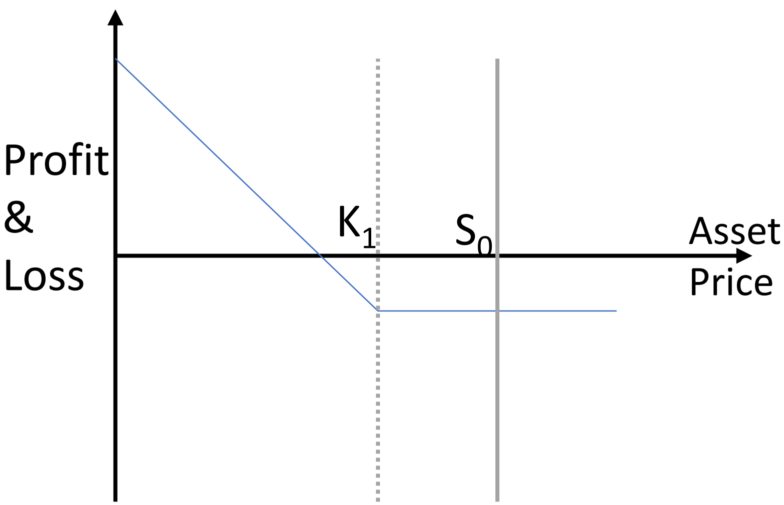
Glossary

μ Mean
σ^+ Upside Standard Deviation
σ^- Downside Standard Deviation
CL Confidence Level

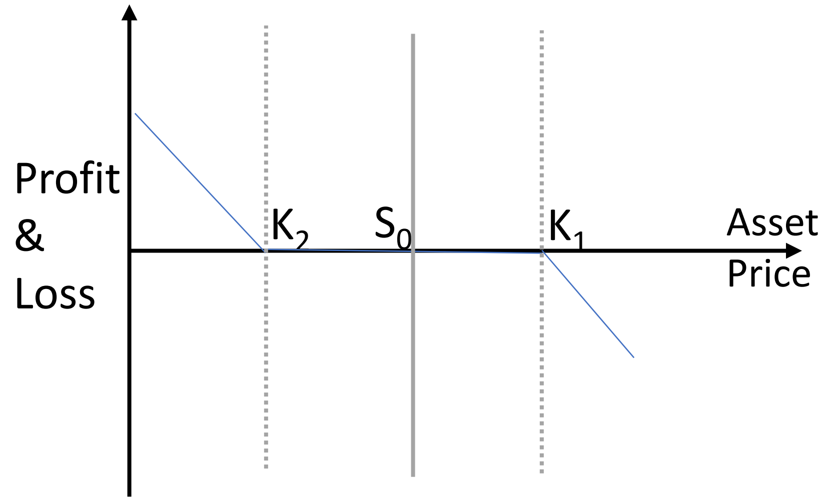
[1]Return statistics are based on daily rolling returns over multiple holding horizons.
Source: Bloomberg, Jan 1928 –Jan 2020

CONVENTIONAL HEDGING PROGRAMS

Protective Put

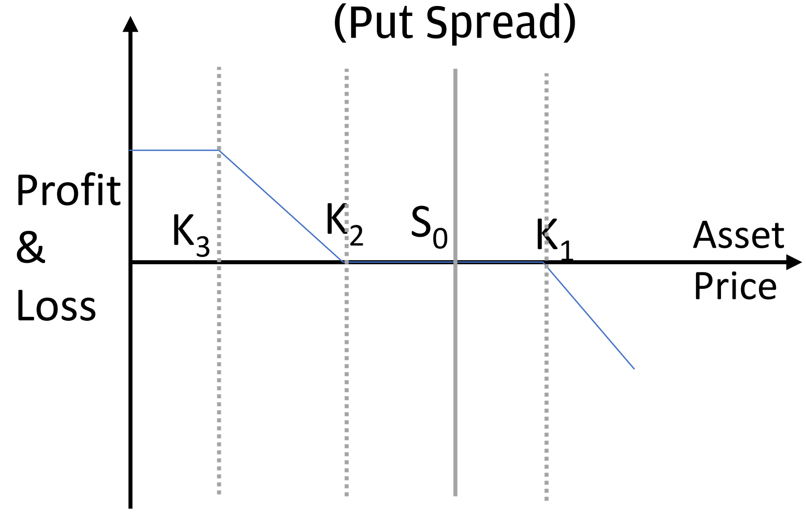


Collar Hedging Program

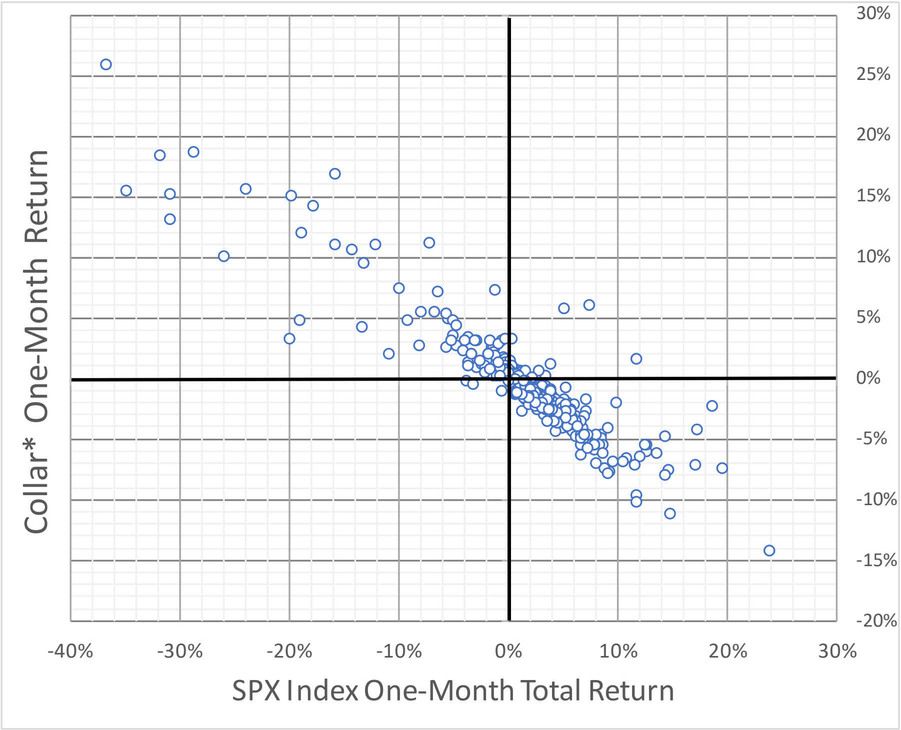


Collar Hedging Program

(Put Spread)



Collar Hedging Program



Significant elimination of positive returns

**Collar returns are of JP Morgan Collar Hedging program (JHQAX US Equity) minus the SPTR Index performance.*

JHQAX US Equity: JP Morgan Hedged Equity fund participates in the broad equity markets while hedging overall market exposure relative to traditional long-only equity strategies. The Fund uses an enhanced index strategy to invest in these equities, which consist of common stocks of large capitalization U.S. companies.

SPTR Index: Total return of S&P 500 Index.

N.B. One-month return constitutes an arithmetic sum of the 21 trailing daily returns. Dec 2019-Sept 2021.

Collar Hedging Program

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Source: Bloomberg

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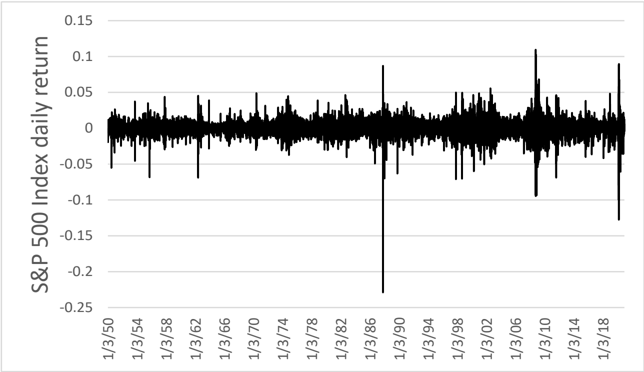
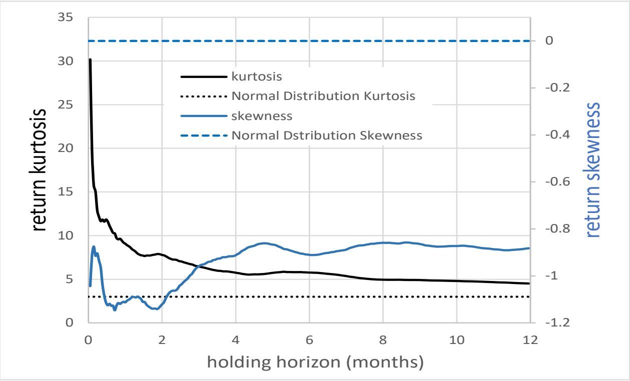
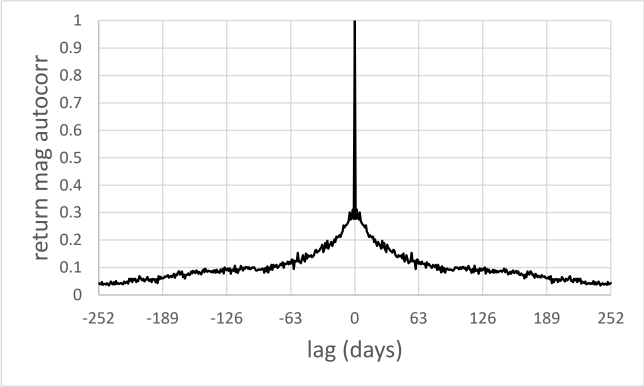
Real Returns

+ RYTHMS & RHYMES

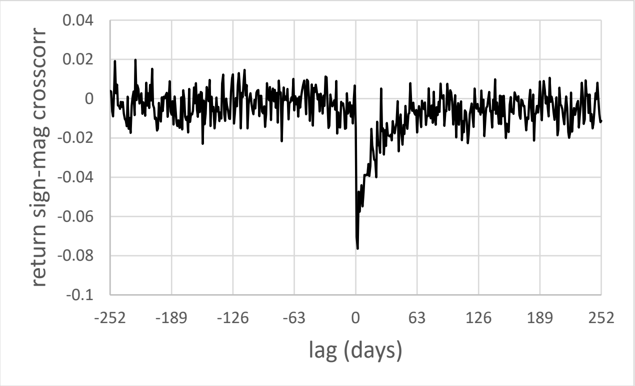


+ NON-NORMALITY





+ PERSISTENCE



+ ASYMMETRY

"**Molecules colliding** randomly under thermal agitations have **nothing in common** with the human enterprise of **risk-taking, trading,** and **price discovery**".

Anonymous 2000 AD

 Source: Bloomberg, Volaris Capital Management, LLC.

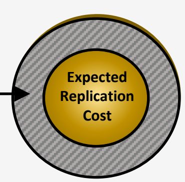
Risk-Aware Approach

- Our tool to describe the asset is a **Real-World Stochastic Model:**
  - We exploit observed persistence & lead-lag relationships between return magnitude and sign and other *conditioning variables* using a *vector auto-regressive* framework to realistically capture the first four moments of return term structure.

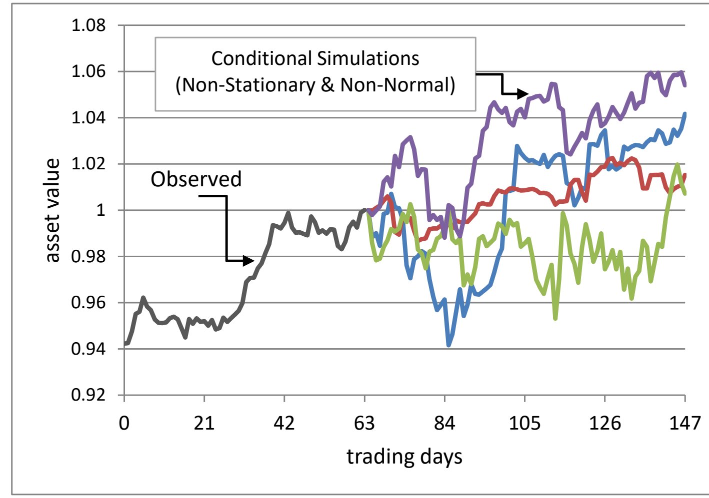
- Our tool for analyzing options is **Multi-Variate Variational Calculus:**
  - The pair of *optimal functions* being sought are the hedge-ratio and expected attempted replication cost as a function of the underlying. The functional being minimized is the wealth change variance.
  - An explicit articulation of the optimal hedging strategy at each time-step enables an *ex-ante* assessment of residual risks.

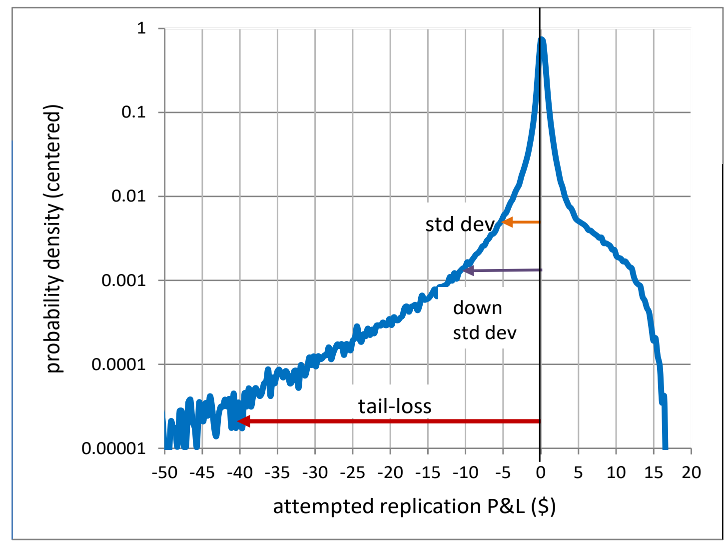
- We infer Option Risk Premiums by comparing price with Expected Costs of Attempted Replication.

$$\underset{option\text{-}price}{C} = \underbrace{\overline{G-\Delta W^{h}}}_{expected\ replication\ cost} + \underset{risk-premium}{\overline{\Delta W}}$$



$$G : option\ payoff \qquad \Delta W^{h} : hedge\ P\,\&\,L$$



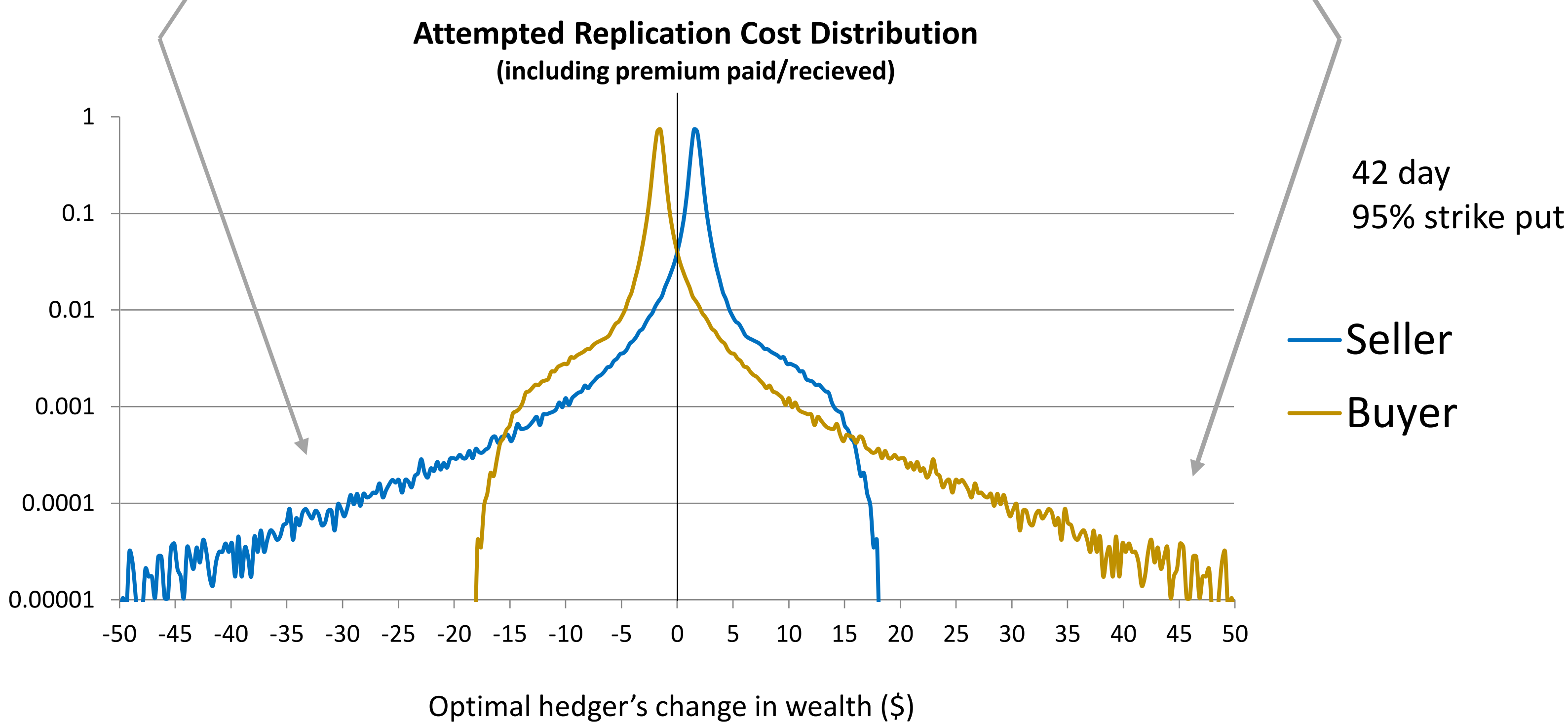


 Source: Bloomberg, Volaris Capital Management, LLC. All images are for illustrative purposes only. Please see important disclosures.

Asymmetry of Residual Risk

Opportunity: Own Positive Carry
Challenge: Adverse Negative Surprise

Challenge: Negative Carry Costs
Opportunity: Own Positive Surprise



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Self-Financed Tail Positive Convexity

Excess Kurtosis of Asset Returns

$\Downarrow$

Distribution of P&L of Hedged Option

- Option sell positions exhibit adverse asymmetry.
- Option buy position exhibit favorable asymmetry.

Five Cardinal Characteristics of SPX Index Options
1. Disparity Between Out of the Money Puts and Calls
2. Asymmetry Between Buyer and Seller
3. Exploding Asymmetry at Expiry
4. Exploding Asymmetry with Out-of-the-Moneyness
5. Elements of Timing (recognizing Volatility environment)

Challenges of Indexation in S&P 500 Index Volatility Investment Strategies

https://ssrn.com/abstract=3427350

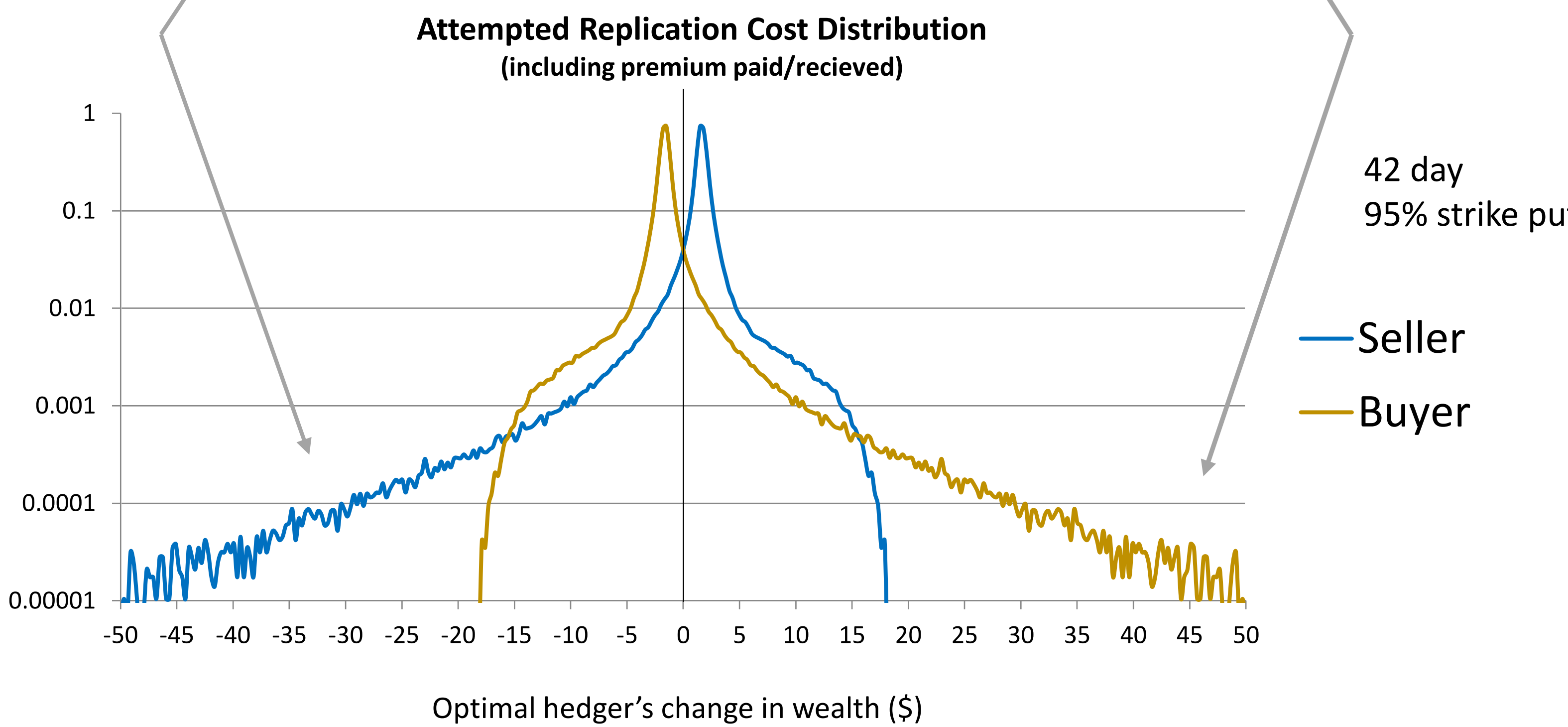
Volaris portfolio composition systematically seeks portfolio configurations with **controlled expected costs** and **favorable asymmetry**.

[1]For more on the research approach visit www.volariscapital.com/research

Asymmetry of Residual Risk

Opportunity: Own Positive Carry
Challenge: Adverse Negative Surprise

Challenge: Negative Carry Costs
Opportunity: Own Positive Surprise



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INSTANTANEOUS MARKET SHOCK SCENARIO

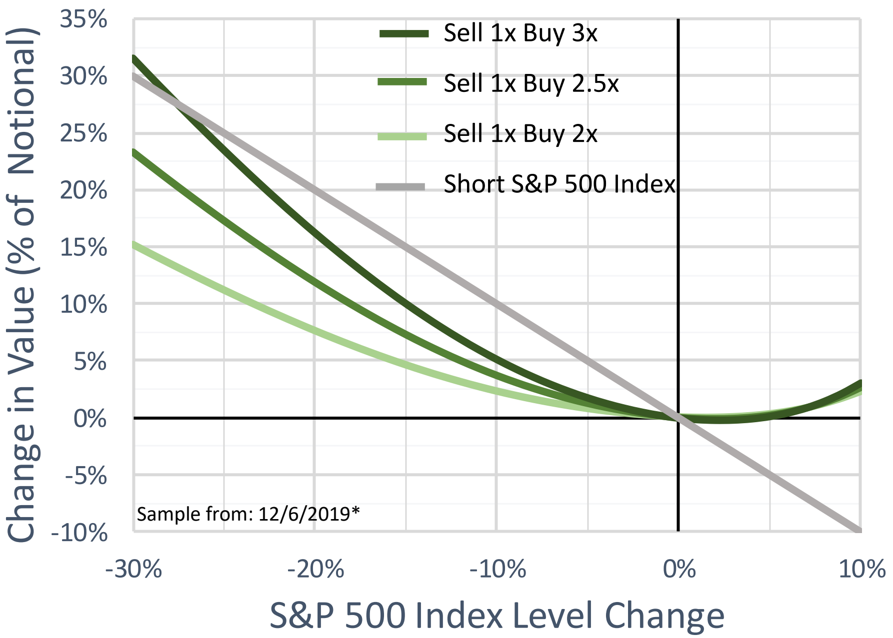
An analysis of portfolio value under different S&P 500 Index (SPX) and implied volatility shock scenarios may help one understand how the strategy can behave under various market conditions and extreme events.

- The relationship between SPX and implied volatility employed here is a simplification and SPX option implied volatility is affected by a number of factors other than a move in SPX.
- The scenario analysis accounts for all the sold and purchased options. Purchased options exceed sold options in quantity (2x,2.5x,3x).

*The instantaneous snapshot scenario analysis depicts an **idealized portfolio at inception**, assuming the following:*

1) Portfolio shown with no contribution from time decay.
2) All options subject to a percent volatility change of -*n* times that of SPX (where n varies from 2 to 4 depending on option tenor and the sign of the SPX move).

Sample Portfolio Scenario Analysis

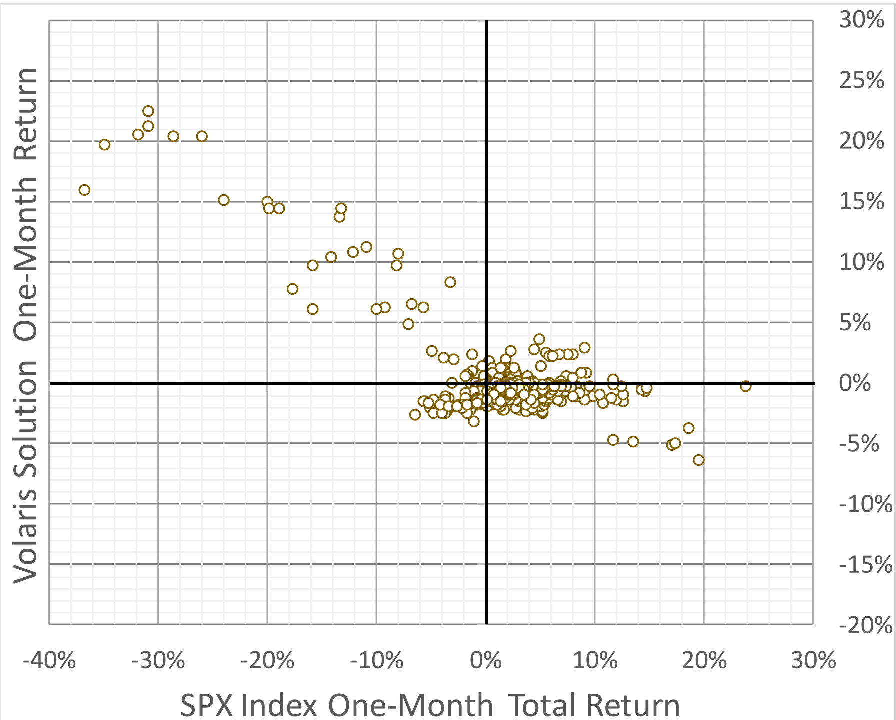


Important Considerations of Snapshot Scenario

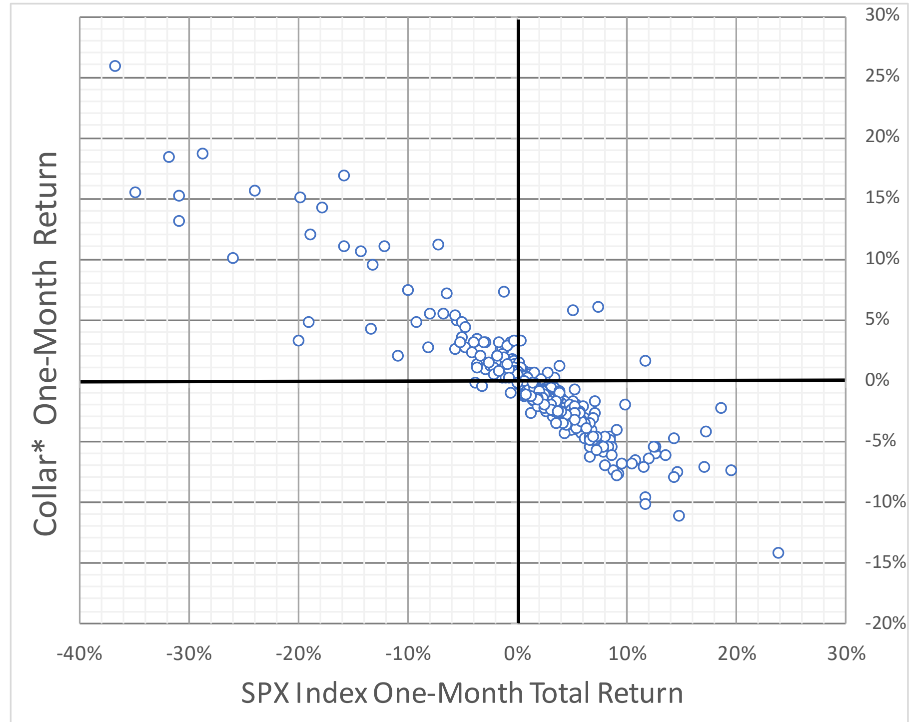
- The potential gains are associated with significant directional exposure and can be reversed without significant monetization.
- The scenario analysis does not display the time-decay of the value and sensitivity of the portfolio.
- The scenario analysis does not capture trading/rebalancing and associated costs.
- Rolling option structures to maintain target profile may incur debits.
- A sharp decrease in fear reflected in the option prices can cause losses to the strategy.

*All images are for illustrative purposes only. Please see important considerations.

Volaris Solution



Collar Hedging Program



Source: Volaris Capital Management LLC ("Volaris"), Bloomberg . Past performance does not guarantee or indicate future results. More information is available upon request. All images are for illustrative purposes only. The Tail Risk Opportunity strategy is a composite performance which consists of the performance of number of individual accounts. Net returns account for management and performance fee. These materials do not constitute an offer to sell or an offer to buy securities.

Volaris Solution: Volaris Tail Risk Opportunity (3x) which is afforded to equity-type collateral under Reg-T.

**Collar is the returns of JP Morgan Collar Hedging program (JHQAX US Equity) minus the underlying SPTR Index performance.*

JHQAX US Equity: JP Morgan Hedged Equity fund participates in the broad equity markets while hedging overall market exposure relative to traditional long-only equity strategies. The Fund uses an enhanced index strategy to invest in these equities, which consist of common stocks of large capitalization U.S. companies.

SPTR Index: Total return of S&P 500 Index.

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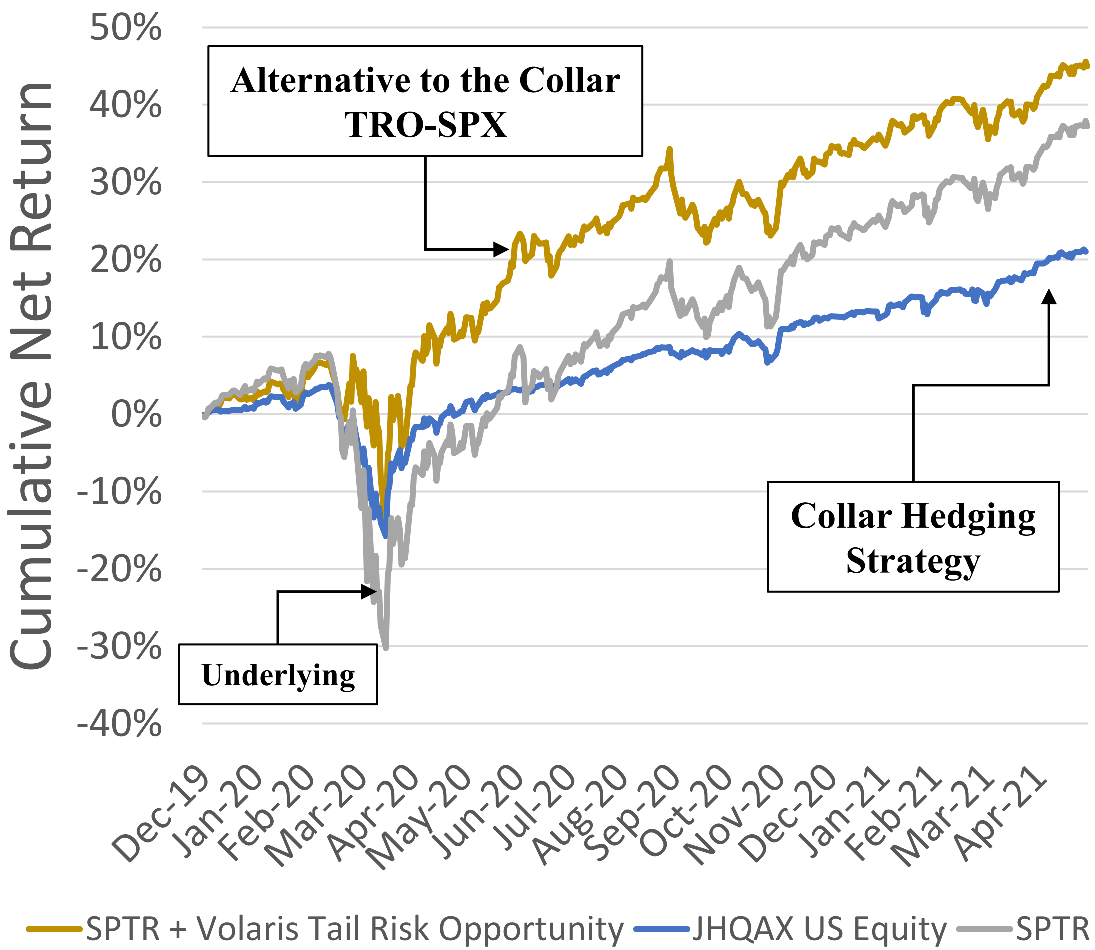
Tail Risk Opportunity Framework compared to a Collar Hedging Program



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JHQAX US Equity: JP Morgan Hedged Equity fund is an open-end fund that seeks capital appreciation. The Fund participates in the broad equity markets while hedging overall market exposure relative to traditional long-only equity strategies. The Fund uses an enhanced index strategy to invest in these equities, which consist of common stocks of large capitalization U.S. companies.

SPTR Index: Total return of S&P 500 Index.

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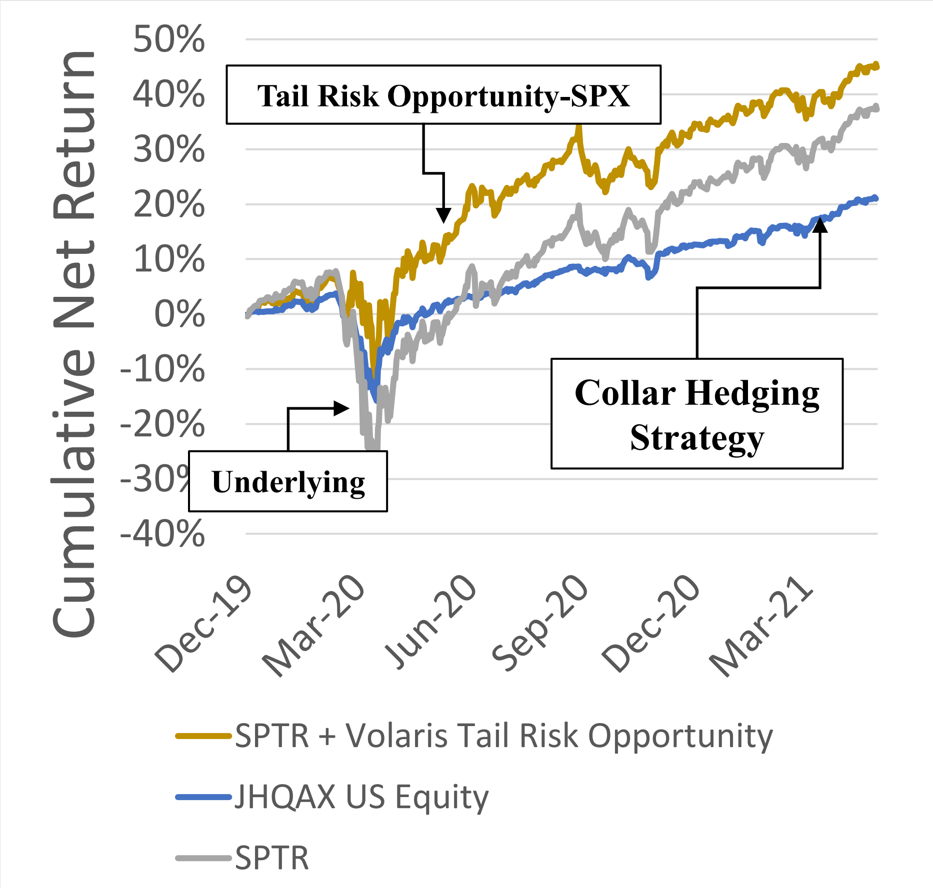
Self-Financed Tail Positive Convexity



Tail ETF Features:

- Tail ETF purchases OTM SPX Index options and is invested in Treasury Bonds.
- Buying expensive puts is unsustainable.

Volaris **Tail Risk Opportunity** Features:

- Self-Financed, Carry-controlled Positive Surprise

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What are the **Risk/Reward** Implications of a **Concentrated** Equity Position?

- Potential to participate in price appreciation.
- Significant concentration risk.
- Lack of diversified portfolio.
- Potential lack of yield/return source.

What are the Potential Considerations of **Selling** Large Equity Positions?

- Liquidity of underlying shares.
- Tax implications of selling shares.
- Potential restrictions on sale of stock.

VOLARIS OVERLAY SOLUTIONS

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- Clients may use existing portfolio holdings (stocks, bonds, etc.) as collateral to employ Volaris strategies.
  - **Minimal opportunity cost** implementation employing listed options in Separately Managed Account.
    - Defined risk strategies with **transparency** and daily **liquidity.**

ADDITIONAL RETURN SOURCE

VOLATILITY INCOME

Risk-controlled participation in S&P 500 Index option risk premium.

CALL WRITE

Opportunistic selling of call-options for large stock position holder.

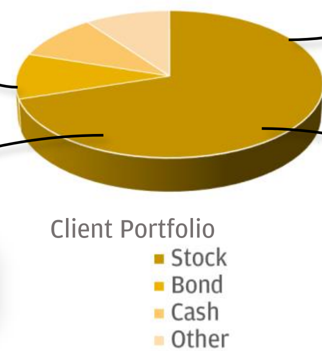
GAIN IN EXTREME MOVE

TAIL RISK OPPORTUNITY SPX

Performing asset in deep S&P 500 Index downturns.

TAIL RISK OPPORTUNITY SINGLE STOCK

Performing asset in deep stock downturns.



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Sustainable Yield and Tail Risk Opportunities

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- *We provide investors access to yield and tail-risk opportunities in the options market.*

- *Our insights, based on experience and active research, are applied to pursue client's goals.*

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- Margaret Sundberg, Portfolio Manager
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