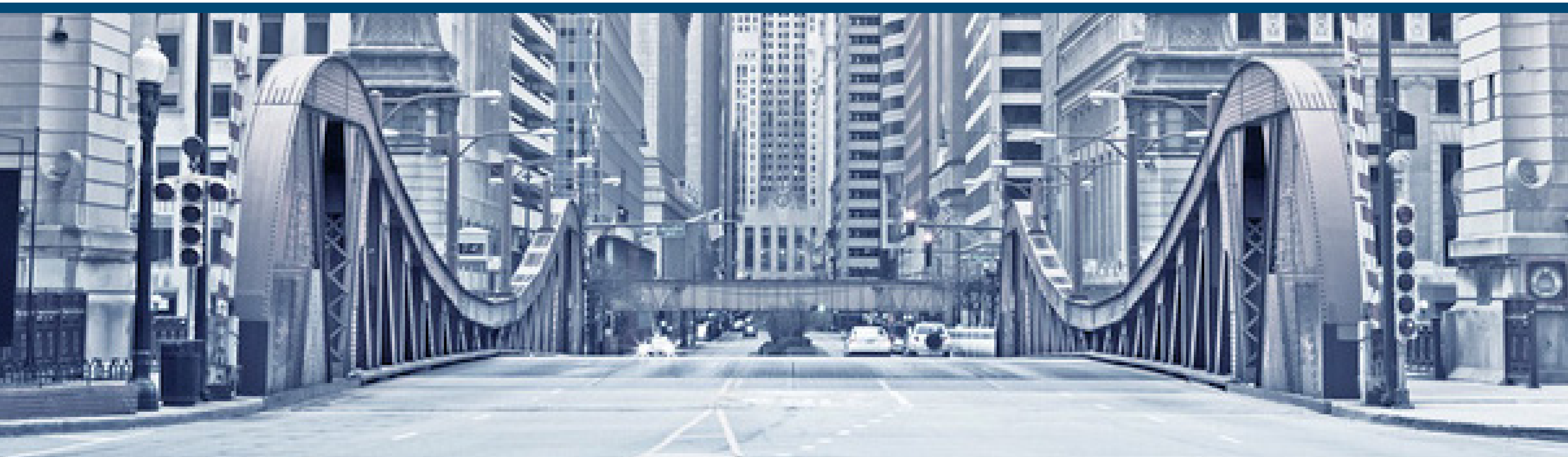
SPIDERROCK
ADVISORS

Structured Note Replication

A Fiduciary Response to Structured Notes



Our Company

SpiderRock Advisors is an asset management firm **focused on providing customized option overlay** strategies to investors. Combining world-class technology with comprehensive derivative expertise, we are **making it easy for Institutions and Financial Advisors** to add option strategies to their investment portfolios.

Year Founded:	2013
Full Time Employees:	34
Portfolio Management Team:	5
Firm AUM:	$3.1 billion

Our Company Portfolio Management

ERIC METZ, CFA
President, Chief Investment Officer

Eric oversees all investment strategies and portfolio management activities at the firm. Prior to joining SRA, Eric was the Derivatives Strategist and Portfolio Manager at RiverNorth Capital Management, managing both mutual fund and hedge fund assets. He began his career with the Chicago Trading Company on the floors of the Chicago Mercantile Exchange (CME) and the Chicago Board Options Exchange (CBOE). After the trading floors, Eric was a senior trader and partner at both Ronin Capital and Bengal Capital, proprietary trading firms specializing in volatility arbitrage.

Eric graduated, Magna Cum Laude, from the University of Michigan with a B.S.E in Industrial and Operations Engineering. He earned his M.S.E., with honors, in Industrial and Operational Engineering, and was enrolled in the program's PhD program. Eric is a CFA Charterholder, a member of the CFA Institute, the CFA Society of Chicago and a board member of the OIC Institutional Advisory Council.

FRED SLONEKER
Deputy CIO, Chief Quantitative Strategist

Fred joined SpiderRock Advisors in 2019 and now serves as Deputy Chief Investment Officer as well as Chief Quantitative Strategist. Prior to joining SRA, Fred was the Head Quantitative Trader for a series of volatility-focused proprietary trading funds in Chicago. He began his career as a Trader and Portfolio Manager for hedge funds JMG Triton Offshore and Claire Capital Management in San Francisco, specializing in convertible arbitrage strategies. He later created and managed a volatility strategy for Toronto Dominion (TD) Securities.

Fred graduated from the California Institute of Technology (Caltech) with a B.S. in Economics.

SpiderRock Advisors | Partnerships

SpiderRock has partnered with BlackRock to deliver customized and scalable option overlay solutions to a broader wealth management audience. In addition to being SRA's exclusive distribution partner, BlackRock made a minority investment into our firm, demonstrating their belief in SpiderRock's ability to deliver the benefits of option overlay strategies. BlackRock is confident in SpiderRock's ability to deliver overlay solutions and their risk management benefits to their entire SMA business.

SpiderRock has partnered with Luma to provide their users with direct access to Structured Note Replication strategies via Separately Managed Accounts (SMAs). Through this partnership, Luma's cutting edge technology and analytical tools will empower investors on its platform to effectively analyze, compare, and invest in SpiderRock's Structured Note Replication strategies.

BlackRock is **one of the world's largest providers of SMAs**

$150B+
entrusted to us by SMA clients
102k+
accounts managed and serviced

SpiderRock's experts are **dedicated to managing option overlay strategies**

20+
years of experience managing option portfolios by each of the senior PMs

Luma is **one of the world's leading multi-issuer technology platforms for structured products**

30+
different structure types, underliers all which can be linked to a variety of selections and configurable product variables

BlackRock Partnership Date: July 2021
Luma Partnership Date: June 2023

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Credit Risks to Structured Notes

Barclays Lost Track of Its Notes

Matt Levine | Bloomberg

"...there was no internal control in place to track in real time the amount of securities offered and sold against the amount of securities registered."

Concerns About Credit Suisse Mount After Debit Slide

Margot Patrick | The Wall Street Journal

"Credit Suisse Group AG came under renewed pressure over its financial health after the value of its riskiest bonds sank and the cost to insure against default rose sharply."

Lehman's '100% Principal Protection' Means Pennies for Notes

Bradley Keoun | Bloomberg

"Lehman's Sept. 15 bankruptcy leaves holders of the notes waiting in line with other unsecured creditors for what's left of their money."

Sources: 1) Barclays Lost Track of Its Notes, Bloomberg, Oct. 2022. 2) Concerns About Credit Suisse Mount After Debit Slide, The Wall Street Journal, Oct. 2022. 3) Lehman's '100% Principal Protection' Means Pennies for Notes, Bloomberg, Sept. 2022.

Structured Note Basics

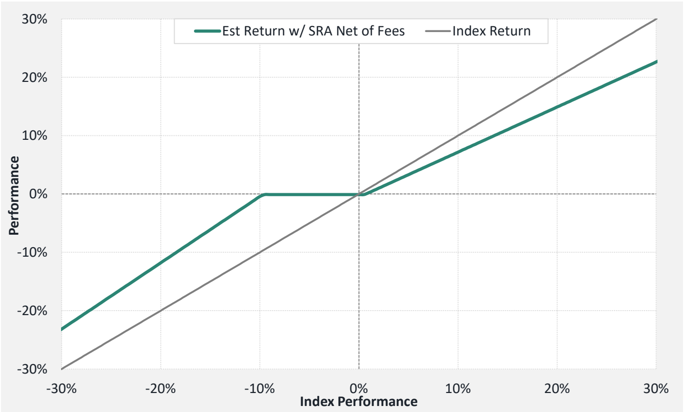
A structured note refers to a packaged hybrid security that is comprised of a bond component as well as a derivatives (option overlay) component. As such, these products can be replicated with daily liquid, listed instruments.

Structured Notes are linked to a single underlying asset, basket of underlying assets or worst-of group of assets.

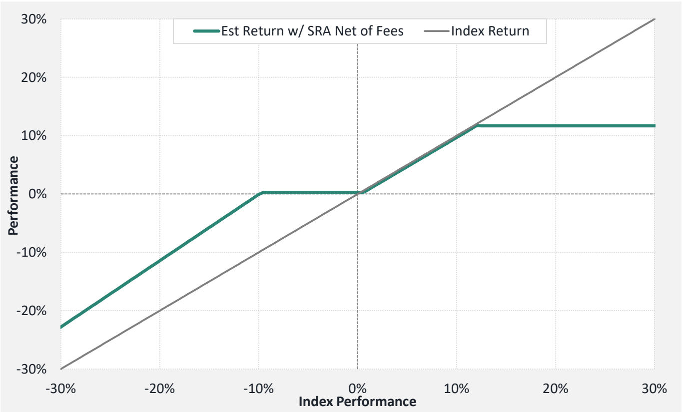
Notes can be constructed to either pay a coupon, participate in asset appreciation or provide protection in a down market.

Common Structures

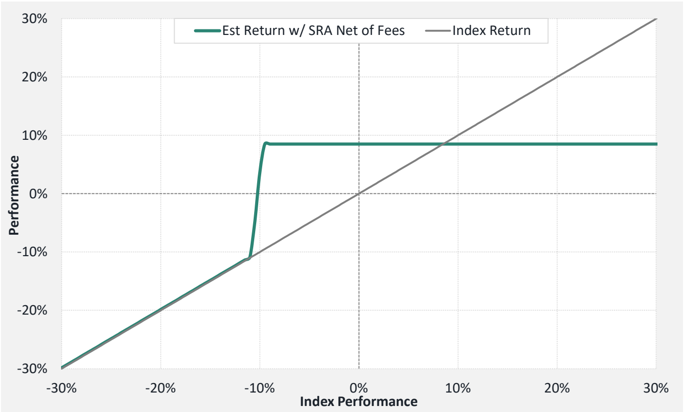
Buffer Growth Note



Buffer Growth Capped



Callable Yield Note



- Callable notes are usually callable quarterly at the discretion of the issuer
- Auto-callable notes are callable based on predefined criteria

Components of Structured Notes

Maturity: In general, equity-linked structured notes have a term between 2 and 5 years. Certain interest rate-linked notes can have a maturity over 20 years.

Underlying Asset: A structured note's payoff is linked to an underlying asset, a basket of underlying assets or the worst-of performance among a group of assets.

Protection: Some structured notes have barriers. Should the underlying asset fall below a barrier, the buyer is subject to capital losses. In addition, certain notes that provide investors with coupons may not pay the coupon if the underlying asset is below a barrier. Soft barriers refer to a payoff where, if the reference underlying is below the barrier, the note holder receives a payoff equal to the net performance of the underlying asset. A hard barrier protects the investor such that losses are only realized when the reference asset is below the barrier. For example, in a theoretical situation where a referenced underlying asset is down 21%, a 20% hard buffer would result in a 1% loss to the investor whereas a soft buffer (also sometimes called a "knock-in" or "European" buffer) would lose 21%.

Return: Notes are typically classified as: growth notes, yield notes or protection notes. Given the structure of the embedded option overlay, notes will either yield a contingent coupon, participate on the upside at a predefined ratio to underlying performance, or have an inverse payoff to the underlying performance if it is a protection note.

Risks of Structured Notes

Liquidity Risks: Structured notes are not liquid and the buyer should be prepared to hold the note until maturity. Currently, secondary market liquidity is only provided by the issuer of the note. Thus, bids are typically well below fair value in the secondary market. Moreover, mark to market prices are also typically below fair value.

Market Risk: Structured note performance is linked to an underlying index that may suffer losses. Worst-of structures are linked to the poorest performing underlying asset amongst a group of reference assets.

Default Risk: Most structured notes are comprised of an unsecured bond issued by the issuer and embedded derivatives that determine the payout. If an issuer becomes insolvent, theoretically a note could lose 100% regardless of the underlying asset return. For example, when Lehman Brothers filed for bankruptcy, many of the notes they issued were unsecured and rendered worthless (including a sample of notes marketed as, "100% Principal Protected"). Most investors lost ~80% of their investments in notes issued by Lehman. Outcomes varied, as certain investments were partially recovered due to bankruptcy proceedings and lawsuits.

Complexity Risk: Structured notes often have several conditions and contingencies too sophisticated for the average investor. Banks can use this to their advantage to overprice products and make it difficult for individuals to estimate potential risk/return outcomes. After 2008, it was determined Lehman had designed notes that advertised high stated or apparent yields but with low expected yields, sometimes negative.

Sources: "Structured Products In the Aftermath of Lehman Brothers" www.SLCG.com & "The Failure and Resolution of Lehman Brothers" www.newyorkfed.org

SpiderRock Advisors
Structured Note Replication

Flexibility and Transparency: Standard issue notes are cash purchased. Unlike traditional notes, SpiderRock Advisors' SNR strategy allows investors to retain and control the collateral that is underlying the investment. In our standard operational setup, the options and collateral are placed in one separately managed account. That collateral can be invested at the advisors'/clients' discretion in any marginable assets (cash, treasuries, municipal bonds, etc.), potentially resulting in an additional income stream.

Collateral Efficiency: SRA can operate with minimum amount of marginable collateral based on custodial limitations, client's aggregate assets and their custodial margin relationship. In applicable situations, SRA can run SNR strategies in an option-only separately managed account.

SpiderRock Advisors
Structured Note Replication

Structured Notes serve investors as an approach to invest in a defined payoff. They have frequently used combinations of "downside buffers" and "upside accelerators" to create payoffs that are more complex than standard long-only equities. Typically, these structures are long equity exposure with an associated option overlay.

Given the **constraints of the product type (high fees, low liquidity, low transparency, and credit risk)**, there are several ways that SpiderRock Advisors can improve upon the existing structured note framework.

SRA is excited to share Structured Note Replication in four formats:

1. Customize Your Own
2. Construct Alternative to Existing SN Proposals
3. Off the Shelf (Pre-Defined Structures)
4. Existing Note Hedging

Traditional Structured Notes vs SpiderRock Advisors' Replication

Traditional Structured Notes		SRA Structured Note Replication
200+ Bps Embedded Fee* (Below Fair Value)		60 bps
2-7 Year Lock Up		Daily Liquidity
Poor Secondary Market Liquidity		Extremely Liquid Options Market
Fully Paid For Security	VS	Flexibility With Respect To How To Invest Collateral
Complex Structures (Lack of Transparency Determined by Bank's Funding Needs)		Full Position-Level Transparency
Credit Risk of Issuer		No Credit Risk**
Reinvestment Risk		Customizable

*Bank Issued Structured Notes compared to near identical listed market structures
**Option transactions and settlements are fully guaranteed by the Options Clearing Corporation

Morningstar Research

"In 2013, the SEC began requiring issuers to disclose estimated fair values for structured notes. We reviewed a sample group of about 50 notes issued in the United States at the beginning of 2020. On average, the issuer-reported fair values were about 97.1% of the value investors paid to purchase the note. That translates into an average markup or embedded fee of 2.9%."

"A popular variation is notes where returns are tied to more than one index or underlying security. In almost every case, the final payoff investors receive is based on performance of the underlying asset with the lowest returns. Quite simply, it's hard to think of another example where investors would voluntarily purchase something that promises to give them the worst of multiple outcomes."

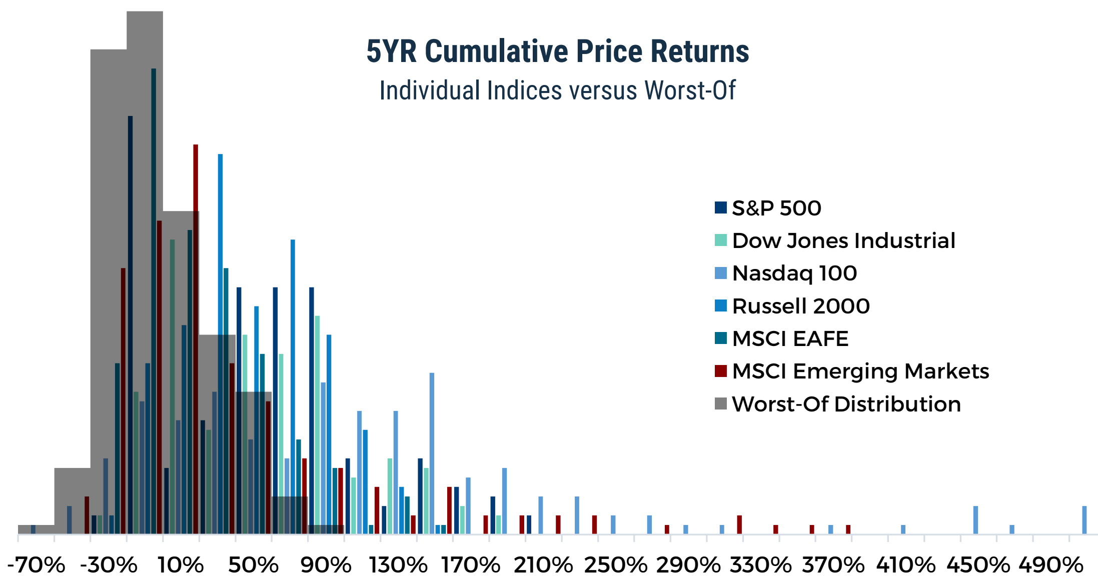
Morningstar - Advisor Insights
"A 13% Yield: What Could Go Wrong"
Amy C. Arnott, CFA
Jun 2, 2020

Arnott, Amy C. "A 13% YIELD: What Could Go Wrong?" Morningstar, Inc., 2 June 2020.

Esoteric Note Features
Worst-Of | Contingent Auto-Callable Coupons

Features like "Worst-Of's" and "Contingent Coupons" allow note issuers the ability to advertise higher headline yields and participation rates. These features increase product complexity, making it more difficult to model fair value and fully comprehend the risks.

While higher headline figures may be attractive, these features can represent significant negative value to the holder and should be thoroughly reviewed.



Data Source: Bloomberg (Rolling 5-yr Price Return; 12/31/1990 - 03/31/2023)

Structured Note Replication

Customize Your Own | Construct Alternative to Existing

SpiderRock Advisors' Structured Note Replication (SNR) provides investors an alternate approach to investing in structured outcomes. SpiderRock's option-based solutions benefit from daily liquidity, transparent fees (tiered starting 60bps), transparent holdings and no credit risk*.

The following slides illustrate how SpiderRock Advisors can compare traditional structured notes with investable structures in the listed options market.

While the basis of many notes can be constructed with options, certain features cannot be perfectly replicated (ex. auto-callable, contingent coupons, worst-of, etc.). Please reach out to SpiderRock Advisors for a custom proposal.

Review Note Terms (Preliminary/ Final Prospectus) → **Estimate Note's Fair Value (Embedded Fees)** → **Review Listed Market Alternatives** → **SRA Generates Custom Structured Note Replication (SNR) Proposal**

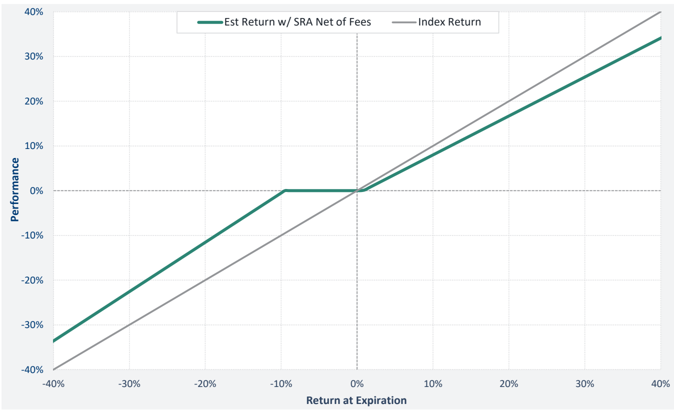
*Option transactions and settlements are fully guaranteed by the Options Clearing Corporation

Replacing Standard Bank-Issued Note Types

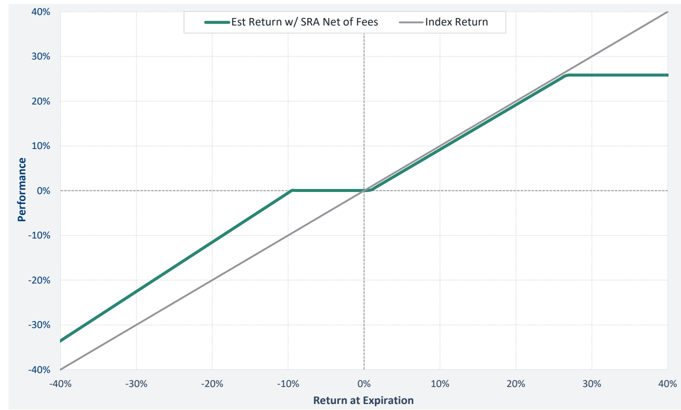
	Protect Principal	Yield Alternatives	Growth & Equity Outperformance	
Investment Themes	POTENTIAL UPSIDE, MINIMAL RISK	POTENTIAL INCOME, MODERATE RISK	CAPPED UPSIDE; BUFFERED DOWNSIDE	CONTINUOUS UPSIDE; BUFFERED DOWNSIDE
Traditional Structured Notes	CAPITAL PROTECTED NOTES	CONTINGENT YIELD NOTES	CAPPED ACCELERATED RETURN BARRIER/ BUFFER	UNCAPPED ACCELERATED BARRIER/ BUFFER
Potential SRA Alternatives	ZERO COUPON; CALL SPREADS	PUT WRITING LEVERAGED RATIOED SHORT PUT SPREADS	CALL SPREADS; PUT WRITING	ACCELERATED RISK REVERSALS

Off the Shelf (Pre-Defined Structures)

Buffered Growth

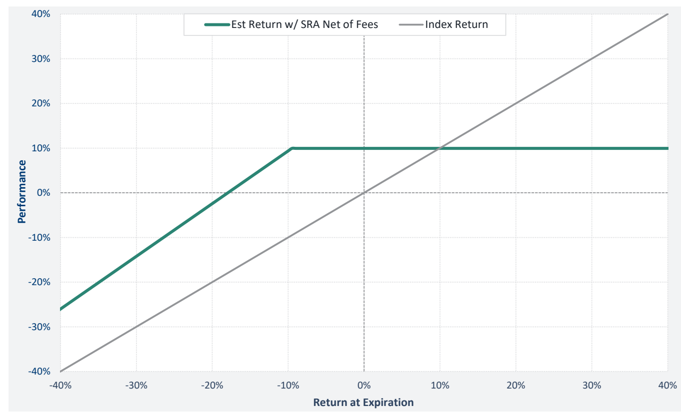


Buffered Growth Capped



Barrier Yield

Buffered Yield

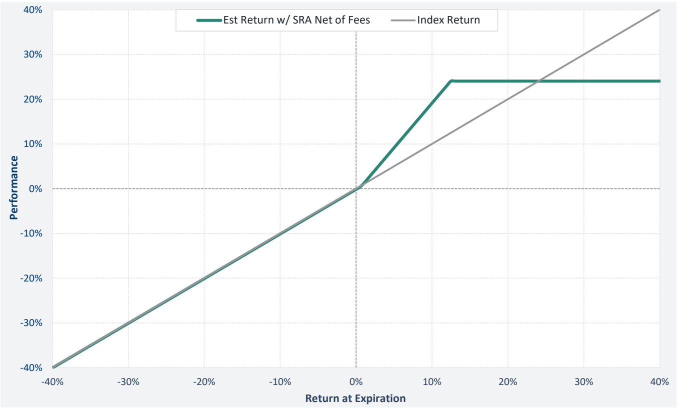


Liquid Optionable ETFs

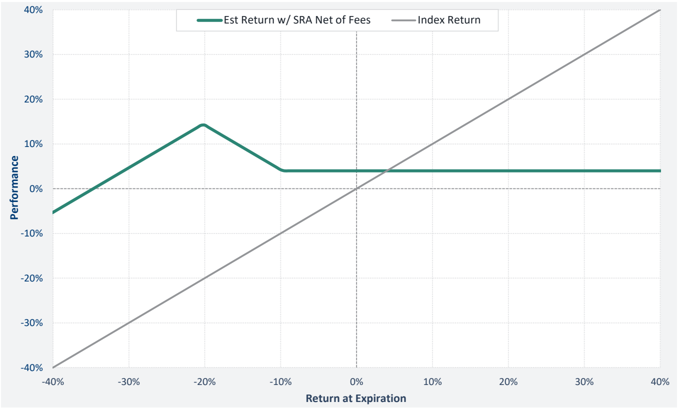
1. S&P 500 - SPDR S&P 500 ETF [SPY] | S&P 500 Index [SPX]
2. Nasdaq 100 - Invesco Trust ETF [QQQ] | Nasdaq 100 Index [NDX]
3. Russell 2000 - iShares Russell 2000 ETF [IWM] | Russell 2000 Index [RUT]

Off the Shelf (Pre-Defined Structures)

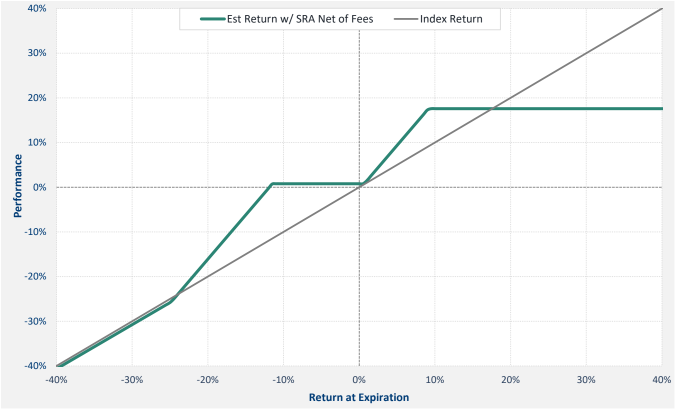
Accelerated Upside (Capped)



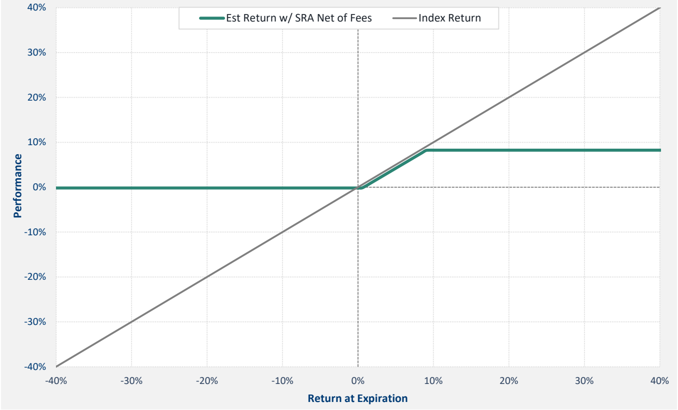
Bearish



Stairstep



Capital Protected Growth



Liquid Optionable ETFs

1. S&P 500 - SPDR S&P 500 ETF [SPY] | S&P 500 Index [SPX]
2. Nasdaq 100 - Invesco Trust ETF [QQQ] | Nasdaq 100 Index [NDX]
3. Russell 2000 - iShares Russell 2000 ETF [IWM] | Russell 2000 Index [RUT]

Collateral Management

Advisors can choose between two standard collateral management methodologies in SpiderRock Advisors' Structured Note Replication

1. SpiderRock Managed (Default)
   - Included as a service with no additional management fees
   - SRA will allocate available collateral to tenor matched treasury notes and bills
   - Collateral yield assumptions will be included in the proposal's terminal payout profile

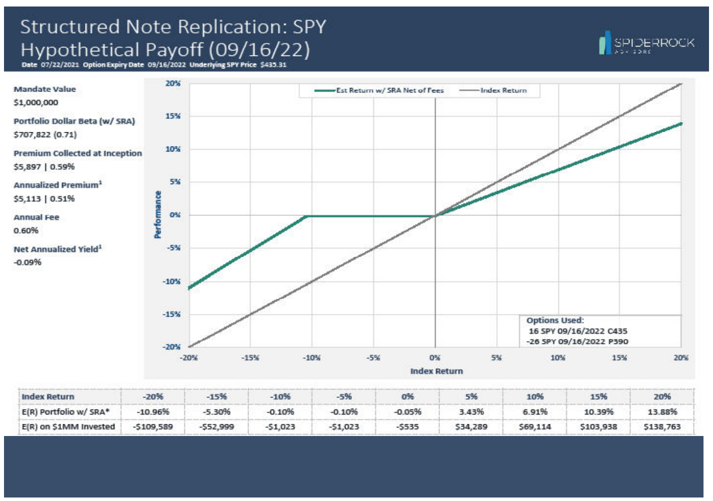
2. Advisor Managed
   - Advisor retains control of collateral and has the discretion to allocate to bank cash, treasuries, munis, credit, etc.
   - Collateral yield assumptions (by default) will not be included in the proposal's terminal payout profile[1]

[1]Yield assumptions can be overwritten by advisor input for illustrative purposes only; option selection methodology will be uneffected.

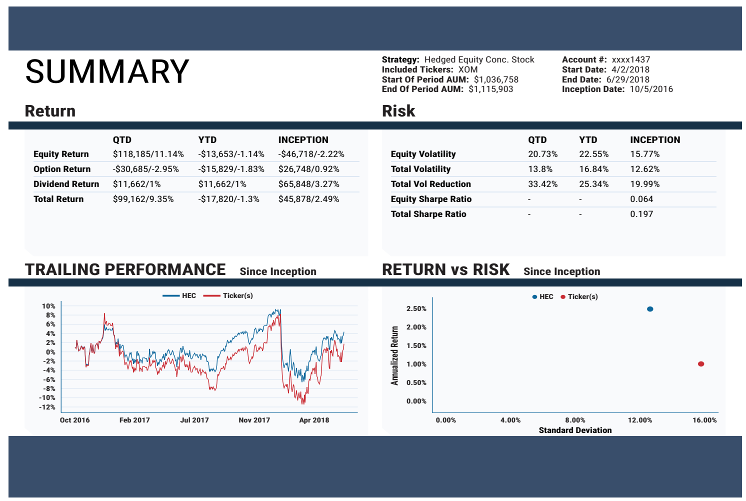
SpiderRock Advisors

As your firm's outsourced derivatives desk, SpiderRock Advisors is with you every step of the way. SRA is committed to providing advisors with client-friendly proposal generation, active management, and quarterly performance reporting.

Proposal Generation:



Performance Reporting:



Definitions

Equity Value - The dollar value of the single equity ticker provided; Calculated as Market price * Number of Shares

Portfolio Value - The dollar value of all positions in the portfolio

Portfolio Beta SPY (basis risk ticker) - The equivalent portfolio dollar value to SPY based on beta of holdings; Calculated as SUM(Dollar Delta Equity * Equity Beta)

Portfolio Beta SPY (basis risk ticker) w/SRA - The equivalent portfolio dollar value to SPY based on beta of holdings and options implemented; Calculated as the SUM(Equity & Option Dollar Betas)

Risk Reduction - The estimated risk reduction when SpiderRock strategy is implemented; Calculated as the SUM(Option Dollar Deltas/Dollar Delta of Equity) *100

Idiosyncratic Risk Reduction - The estimated single stock risk reduction when SpiderRock strategy is implemented; Calculated as the SUM(Option Dollar Deltas)/Dollar Delta of Equity) * -1.0

Tenor - Displays the number of calendar days until the expiration of the option

Option Moneyness - Moneyness describes the intrinsic value of an option. Calculated as 1.0+ ((Strike of Call or Put Option – Underlying Price)/Underlying Price) * 100

Market Risk Replacement - Used in SpiderRock Exchange Fund Replication. Describes the amount of index risk used to replace single stock risk; Calculated as SUM(Index Options Dollar Delta/Dollar Delta Equity)

Beta to SPX (basis risk ticker) - Beta of underlying equity to SPX. Beta of 1 is the default for Exchange Fund Replication

Premium Collected $/% - The maximum amount of premium the option(s) would collect at expiration.
Premium Collected Dollars; calculated as Sum of all (Cost Basis of Option * Quantity * 100)
Premium Collected Percentage; calculated as Premium $/Portfolio Value

Annualized Premium - The Premium Collected figures expressed in annualized terms
Annualized Premium Dollars calculated as (Premium Collected Dollars/Tenor) *365)
Annualized Premium Percentage calculated as Annualized Premium Dollars/ Portfolio value

Dividend - For single stock, the annualized dividend is shown. For portfolio, the annualized weighted average dividend is shown

Annual Fee - The annual fee charged by SpiderRock for the implementation of the strategy. This fee does not include commissions/fees that may be charged by the custodian. Return w/SRA Net of fees includes the SRA fee calculated over the tenor of the option positions.

Net Annualized Yield - SUM(Annualized Premium + Dividend – Annual Fee)

Synthetic Tax Savings - The estimated day one tax savings if the user chooses to reduce risk with an overlay rather than selling shares OR the estimated tax bill if the user reduces risk by selling shares and realizing capital gains tax; Calculated as: Portfolio Dollar Value * Risk Reduction (%) * Tax Rate (%) * (1- cost basis (%))

Cost Basis is the assumed percentage of the market value at the time of the proposal

Long Term Capital Gain (LTCG) of 23.8% is the assumed rate but can also be overridden if short term or blended rates are provided

Disclosures

The information contained herein is proprietary and confidential to SpiderRock Advisors, LLC ("SpiderRock") and is intended only for the use of the individual or entity to whom SpiderRock directs it.

Actual strategy returns from live portfolios may differ materially from hypothetical returns. There is no substitute for actual returns from a live portfolio. HYPOTHETICAL PERFORMANCE IS NOT A GUARANTEE OF FUTURE RETURNS. In fact, hypothetical performance results have many inherent limitations and no representation is being made that any trade will or is likely to achieve profits or losses similar to those shown or that a market for securities will exist as shown. There are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved by any particular trade or trading program.

All brokerage commissions, custodial fees and any other transaction fees related to the purchase or sale of securities are for the account of the underlying client.
Past performance is not a guide of future results and the value of investments and the income derived from them can go down as well as up. This information is provided for your information only and does not imply that your actual portfolio will achieve returns similar to those shown on prior slides. Your actual portfolio and performance may look significantly different based on your specific asset allocation, strategy selection, client guidelines, objectives and restrictions. A different time period might display a different set of results. Future pricing may differ, and such options may cease to be offered.

Margin Accounts; Rights Connect with Margined Securities. Margin transactions involve the possibility of greater loss than transactions for which you are not borrowing money. If the value of the securities and other assets in your account falls, you may be required to deposit additional assets to secure your loan. Alternatively, a custodian may sell your securities and other assets to pay down or pay off the loan without prior notice to you and at a loss or at lower prices than under other circumstances. You remain solely liable for any deficiencies arising from such sales.

Although certain information has been obtained from sources believed to be reliable, we do not guarantee its accuracy, completeness or fairness. We have relied upon and assumed without independent verification, the accuracy and completeness of all information available from public sources.

References to indices, benchmarks or other measures of relative market performance over a specified period of time are provided for your information only and do not imply that the portfolio will achieve similar results. The index composition may not reflect the manner in which a portfolio is constructed. While an adviser seeks to design a portfolio which reflects appropriate risk and return features, portfolio characteristics may deviate from those of the benchmark.

No representation regarding the suitability of these instruments and strategies for a particular investor is made.

It is possible that the markets or pricing will be better or worse than shown in the projections; that the actual results of an investor who invests in the manner these projections suggest will be better or worse than the projections; and that an investor may lose money by investing in the manner the projections suggest. Simulated returns may be dependent on the market and economic conditions that existed during the period. Future market or economic conditions can adversely affect the returns.

SpiderRock does not provide tax, legal, or accounting advice. This material has been prepared for informational purposes only, and is not intended to provide, and should not be relied on for, tax, legal, or accounting advice. You should consult your own tax, legal, and accounting advisors before engaging in any transaction. It is also the responsibility of the client and/or individual to ensure that the necessary account documents have been completed with the appropriate custodian prior to enabling SpiderRock to enter trades on the client's or individual's behalf. Preparation of such documentation may lead to significant delays from the time in which this analysis has been prepared and when trades may be entered and SpiderRock will not be liable for any lost profits and/or
opportunities caused by this delay.

Options involve risk and are not suitable for all investors. Please refer to Characteristics and Risks of Standardized Options (http://www.optionsclearing.com/about/publications/character-risks.jsp), and the SpiderRock Advisors ADV, which includes specific Risk Statements and Disclosures, Privacy Policy, and Terms & Conditions, copies of which can also be obtained by contacting our Client Support Department at support@ spiderrockadvisors.com.

Market Conditions may include but are not limited to volatility, stock price, interest rates and premiums, government action and regulation, and other "Acts of God" such as natural disturbances, public health crises and the threat of war or terrorism.