

Optimizing Short Volatility Strategies

Enhancing Returns with Covered Calls
and Protective Puts



Executive Summary

Rates ETF option selling captures volatility and generates consistent returns over pure ETF allocation

- The **US Treasury Bond UCITS ETF** (20+ years maturity) has **high duration** but limited upside due to low yields.
- High volatility presents an opportunity to **systematically harvest risk premia**
- Selling upside is advantageous as the **yield of the bonds in the index** can be **lower than financing costs**.

Short volatility strategies can be tailored along various dimensions.

- Daily vs. Monthly Selling: **Daily selling** offers **more stable alpha** and **Sharpe ratio** with **more regular cash flows**
- Strike Options: **OTM** for **higher potential gains** but very volatile or **ATM** for **more stable alpha**
- Target Yield Strategies: **High target yield** works well in **low-volatility** environments but **very risky in adverse markets**
- Stop-Loss Impact: **Improves returns significantly** across all scenarios, with no single best level for all market conditions
- Strike Selection vs. Variable Weight: **Variable weight** is **superior** in **volatile markets**
- Calls vs. Calls & Puts: **Calls & Puts** delivers **higher alpha**
- Gap Strike for Calls & Puts: **OTM outperforms** in **volatile markets** whereas **ATM** provides **more stable alpha**

Agenda

- 1 Scope and Data
- 2 Analysis and Results
- 3 Appendix

1 Scope and Data

Overview Of The Underlying Asset And Data Scope

Key Characteristics of the Index

- Tracks **U.S. Treasury bonds** with maturities of **+20 years**
- Offers a **semi-annual distribution**, providing regular income
- Shows **high sensitivity** to rate changes due to long duration

Scope of Study

- Our analysis focuses on the **iShares USD Treasury Bond +20yr (ODTL) ETF**, utilizing data since 2021
- We rely on **daily option prices** for all strikes and maturities from our **internal** database

Why shorting IDTL ?

- **Shorting IDTL is "cheap"** as financing cost are higher than the yield to underlying
- **High duration** leads to significant **volatility**, allowing us to sell options at **higher prices**. By consistently **harvesting** this **volatility**, we enhance portfolio returns with some extra risk

IDTL Historical Chart



2 Analysis and Results

Daily Option Selling Performs Better In Negative Scenario

Which Selling Frequency is the Best One ?

Hedging Dynamics

Monthly Selling

- **Full hedging** established at the beginning of the month

Daily Selling

- **Gradual hedge** development throughout the month
- Potentially weaker hedge early in the month

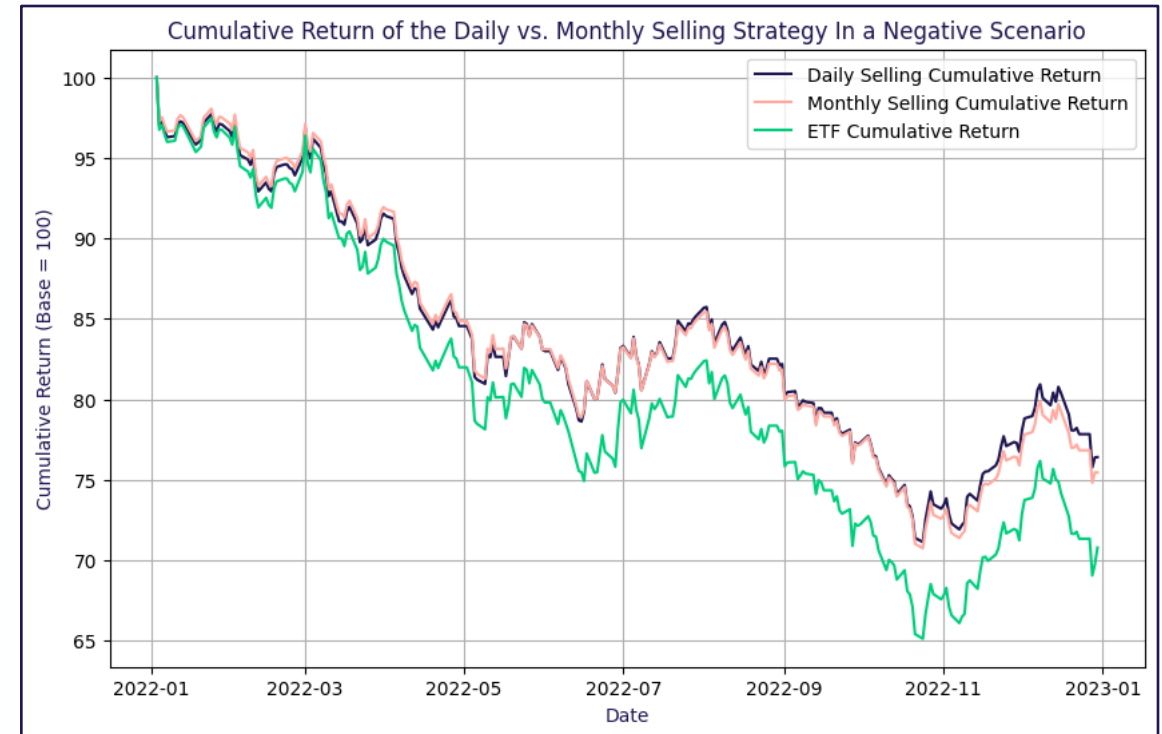
Cash Flow Characteristics

Monthly Selling

- **Irregular cash** flows aligned with a single transaction

Daily Selling

- **More consistent** and compounding cash flows
- Ability to **remain closer** to the **ATM** strike during selling



ATM strike selection, 5% target yield, no stop loss, calls only

Daily Selling Provides More Consistent Cash-Flow And More Stable Alpha

Key Observation

Alpha & Risk-Return Profile

Daily selling ensures more stable alpha, reducing the risk of negative performance

Monthly selling can achieve higher alpha, but at the cost of greater downside risk

Returns & Sharpe Ratio Across Scenarios

Daily selling outperforms in negative scenarios

Monthly selling excels in positive markets

Volatility & Strategy Considerations

Both strategies surpass ETF performance, improving risk-return efficiency

Daily selling provides more consistent cash flow, while monthly selling offers a stronger initial hedge

Scenario (Positive Negative Neutral)	Index	Daily Selling	Monthly Selling
Annualised Alpha		2,76%	3,94%
		0,79%	-0,73%
		0,66%	0,65%
Beta vs. Underlying		0,817	0,798
		0,835	0,814
		0,877	0,871
Annualised Return	11,56%	12,12%	13,07%
	-28,75%	-23,20%	-24,14%
	1,13%	2,05%	2,05%
Annualised Volatility	12,31%	10,23%	10,00%
	18,03%	15,33%	14,94%
	14,60%	13,12%	13,05%
Annualised Sharpe Ratio	0,978	1,232	1,355
	-1,599	-1,518	-1,621
	-0,143	-0,089	-0,089
Max Drawdown	-6,08%	-5,37%	-5,28%
	-33,20%	-27,22%	-27,86%
	-20,06%	-16,72%	-16,82%

Researchers Are Right OTM Strategies Deliver Stronger Risk-Adjusted Returns In Volatile Market

Researchers Shorted OTM Options. Best Strategy?

In-the-Money Calls

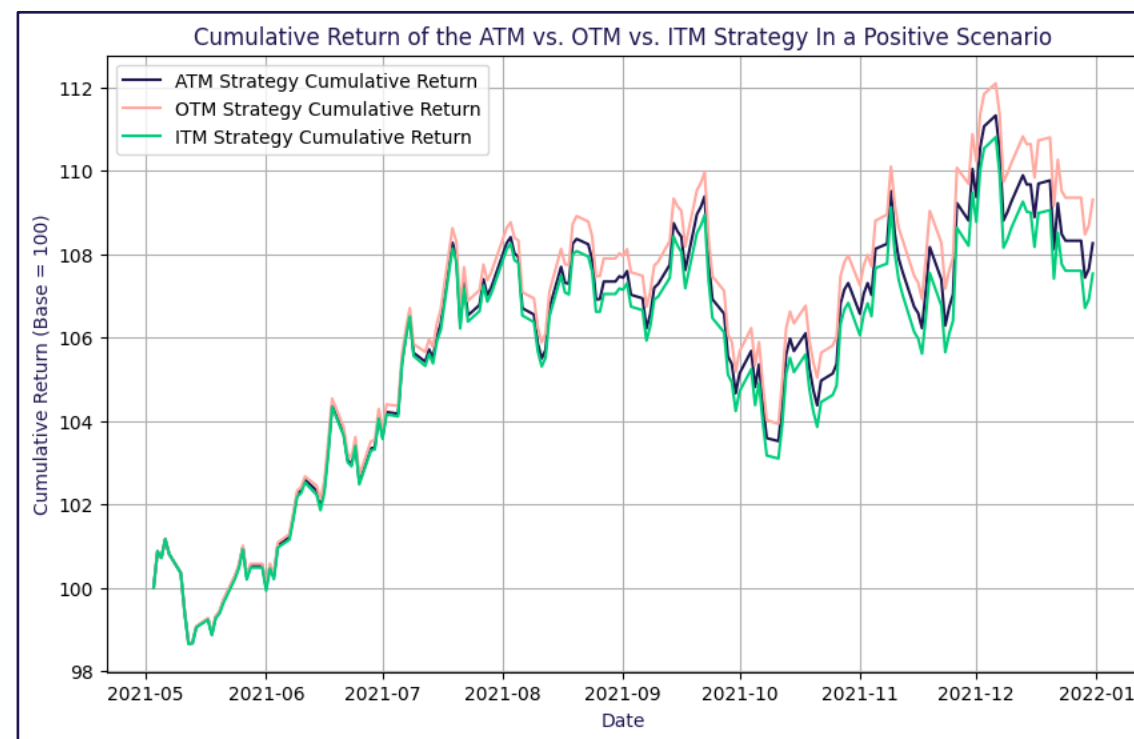
- **Higher premiums** generated upon selling
- **Increased risk of exercise** at expiry, leading to potential losses
- Creates a larger buffer to offset adverse market movements

Out-of-the-Money Calls

- **Lower premiums**, but safer positioning
- **Reduced probability** of being exercised
- Mitigates downside risk, particularly in volatile markets

At-the-Money Calls (Baseline)

- **Balanced approach** with moderate premiums and risk
- Serves as a control for comparison



Daily selling, strike selection, 5% target yield, no stop loss, calls only

Maximizing Returns With OTM Strategies; Higher But Unstable Alpha

Key Observation

Alpha and Risk Trade-Offs

- **OTM options capture highly volatile alpha**, with strong gains in positive markets and heavy losses in downturns.
- **ATM options offer a more stable approach**, consistently delivering positive alpha across various market conditions

Performance and Volatility Considerations

- **ITM options** perform best in **neutral/low-volatility** markets, providing stable returns
- **OTM options** are ideal for **high-volatility environments**, offering higher potential returns but greater risk exposure

Choosing the Right Strategy

- The **best approach depends on market conditions**, as each option type has distinct strengths and weaknesses

Scenario (Positive Negative Neutral)	-2% ATM (ITM)	ATM	+2% ATM (OTM)
Annualised Alpha	1,49%	2,76%	4,38%
	0,41%	0,79%	1,37%
	1,19%	0,66%	-0,65%
Beta vs. Underlying	0,832	0,817	0,812
	0,836	0,835	0,837
	0,893	0,877	0,857
Annualised Return	11,03%	12,12%	13,68%
	-23,63%	-23,20%	-22,67%
	2,54%	2,05%	0,78%
Annualised Volatility	10,40%	10,23%	10,19%
	15,30%	15,33%	15,60%
	13,38%	13,12%	12,85%
Annualised Sharpe Ratio	1,106	1,232	1,390
	-1,549	-1,518	-1,459
	-0,050	-0,089	-0,190
Max Drawdown	-5,36%	-5,37%	-5,49%
	-27,54%	-27,22%	-26,98%
	-17,06%	-16,72%	-16,60%

Target Yield Strategies Superior Performance With Higher Yields In Low Volatile Markets

Lower Exposure or Larger Cushion ?

Adjusting the **target yield** influences both the **risk** and **returns** of the strategy

Targeting an additional **5% yield** through option selling

Lower Target Yield (<5%)

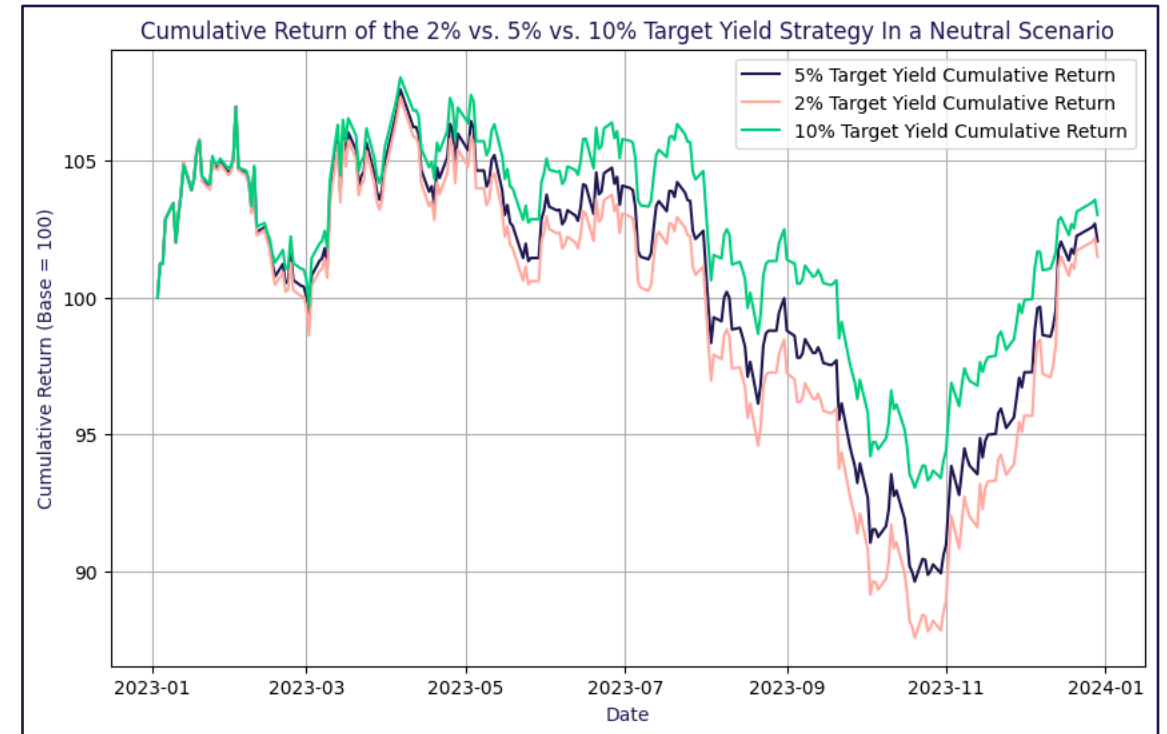
- **Lower risk exposure.**
- **Lower premiums** collected

Higher Target Yield (>5%)

- **Higher premiums cushion downside risk**
- **Increased risk** of adverse market impacts

Determine the relationship between target yield and

- Risk-adjusted returns
- Long-term sustainability of the strategy



Daily selling, ATM strike selection, no stop loss, calls only

High Target Yields Larger Cash Cushion But Too Risky In Extreme Volatility

Key Observation

High Target Yields and Market Conditions

- **High target yield** strategies **perform well** across different approaches but **struggle in extreme volatility**
- During recent high-volatility periods (End 2023), **lower target yields outperformed**, proving more resilient

Cash Cushioning and Risk Control

- **Higher target yields** build a **stronger cash cushion** but is **very risky in adverse market**, this risk can be **mitigated** by using **stop-loss** to minimize the impact on the portfolio

Performance in Low Volatility Environments

- **High target yields excel in low-volatility markets**, as seen in recent years
- Every key metric (returns, risk-adjusted performance) **favors high target yields when volatility is low**

Scenario (Positive Negative Neutral)	2%	5%	10%
Annualised Alpha	1,35%	2,76%	5,10%
	-0,35%	0,79%	2,78%
	0,19%	0,66%	1,44%
Beta vs. Underlying	0,858	0,817	0,749
	0,870	0,835	0,779
	0,926	0,877	0,798
Annualised Return	11,20%	12,12%	13,64%
	-25,36%	-23,20%	-19,60%
	1,48%	2,05%	3,00%
Annualised Volatility	10,72%	10,23%	9,45%
	15,87%	15,33%	14,65%
	13,86%	13,12%	12,05%
Annualised Sharpe Ratio	1,090	1,232	1,495
	-1,603	-1,518	-1,343
	-0,125	-0,089	-0,018
Max Drawdown	-5,52%	-5,37%	-5,12%
	-29,43%	-27,22%	-23,55%
	-18,44%	-16,72%	-13,89%

Stop Loss A Must-Have, Improving Alpha And Returns

Are Stop Loss Efficient ?

Key Mechanism

- Introducing a **stop loss** to manage downside risk by **cutting losses** on sold options
- **Daily monitoring** of option prices
- Triggered when the ratio of **market price to book price** falls below a specified **threshold**

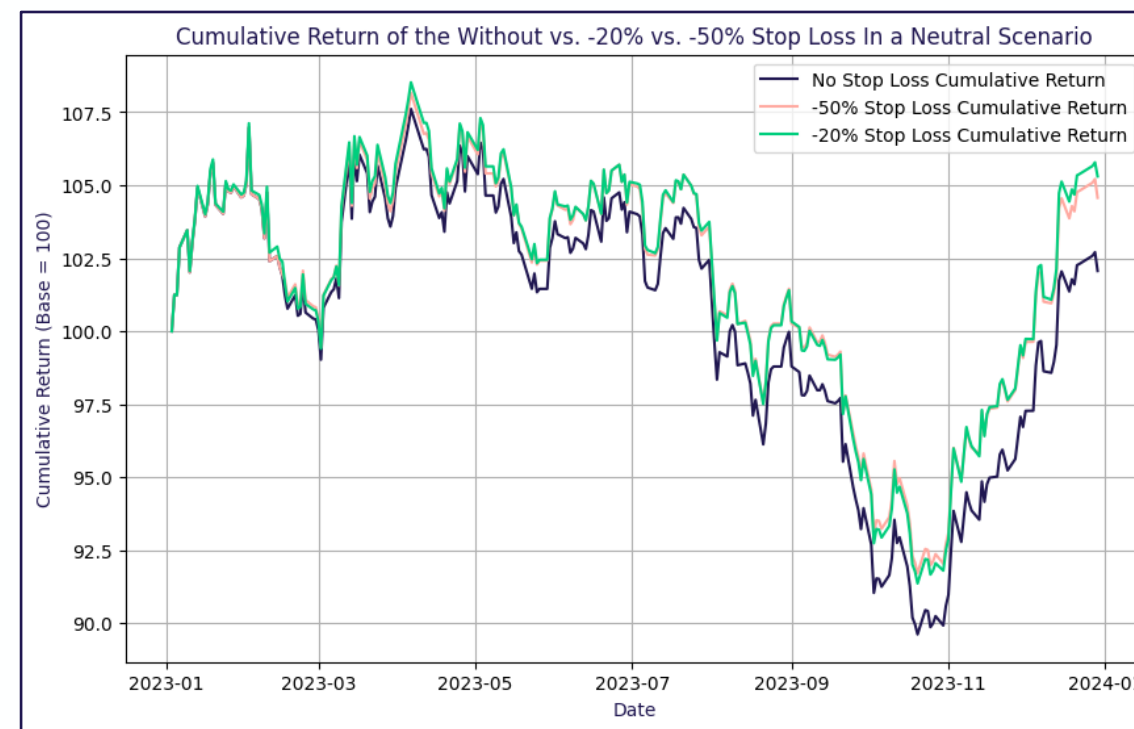
Risk Management

- **Prevent excessive losses** by buying back options when the threshold is breached
- Protect the portfolio against adverse market moves

Threshold Variations

Testing different stop loss levels to evaluate

- Conservative settings (tight thresholds)
- Aggressive settings (wider thresholds)



Daily selling, ATM strike selection ,5% target yield, calls only

The Optimized Threshold For The Stop Loss Varies Across Different Scenarios

Key Observation

Impact of Stop-Loss

- **Stop-Loss significantly enhances returns and alpha** by cutting losing trades before they deepen
- **Stop-Loss implementation is beneficial** in all market scenarios

Effectiveness Across Market Conditions

- **Closing losing positions early prevents deeper losses**
- It has a **moderate impact on max drawdown** but does not notably reduce volatility

No Universal Optimal Level

- **No single stop-loss level is best**, its effectiveness depends on the underlying asset's price path

Scenario (Positive Negative Neutral)	Without Stop Loss	Stop Loss of 20%	Stop Loss of 50%
Annualised Alpha	2,76%	5,34%	5,17%
	0,79%	2,51%	3,02%
	0,66%	3,88%	3,11%
Beta vs. Underlying	0,817	0,820	0,806
	0,835	0,819	0,808
	0,877	0,880	0,863
Annualised Return	12,12%	14,74%	14,40%
	-23,20%	-21,02%	-20,21%
	2,05%	5,26%	4,53%
Annualised Volatility	10,23%	10,27%	10,10%
	15,33%	14,97%	14,84%
	13,12%	13,16%	12,93%
Annualised Sharpe Ratio	1,232	1,481	1,473
	-1,518	-1,410	-1,368
	-0,089	0,155	0,102
Max Drawdown	-5,37%	-5,16%	-5,05%
	-27,22%	-25,48%	-24,61%
	-16,72%	-15,81%	-15,21%

Target Yield vs. Exposure Focus Variable Weight Strategy Delivers Higher Returns And Alpha

Strike or Weight Adjustments ?

Hedging Dynamics

Variable Strike

- **Adjust strike price** to meet the target yield
- Higher premiums for ITM options, lower premiums for OTM options

Variable Weight

- **Keep a fixed ATM strike** and **adjust option quantity** to reach the target yield

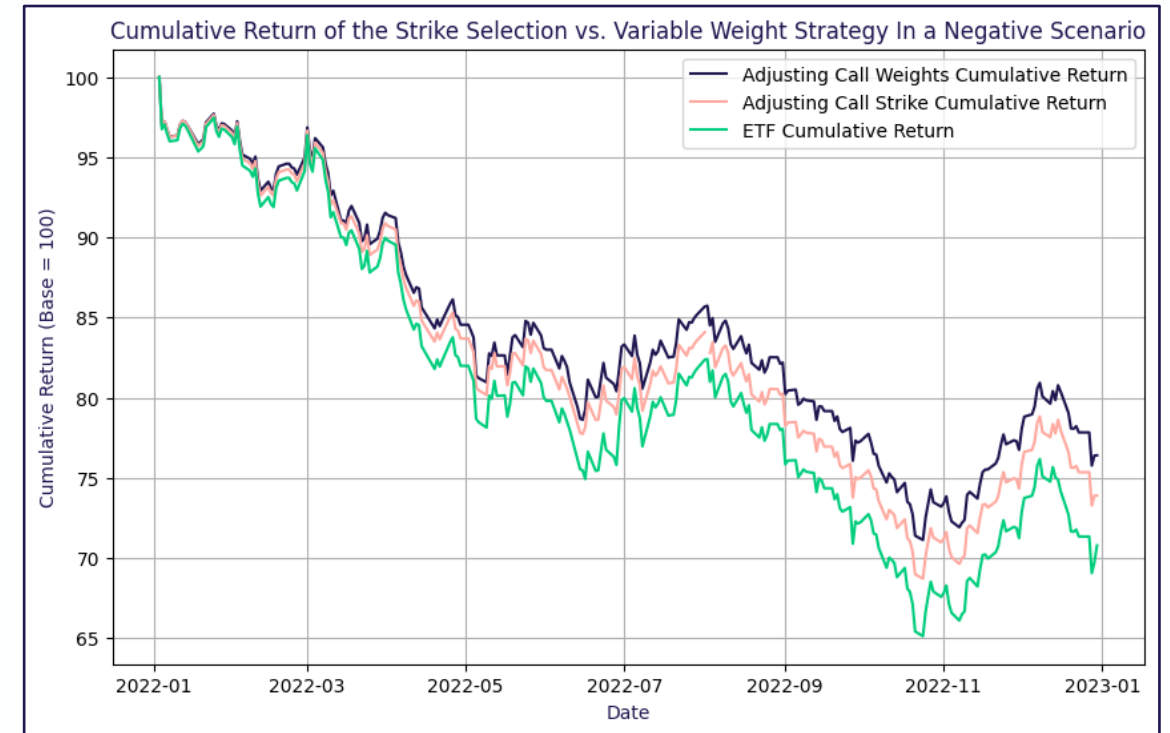
Strategic Comparison

Variable Strike

- Directly **impacts premiums** and **exercise probability**

Variable Weight

- Keeps strike risk constant but **adjusts exposure**, affecting diversification and leverage



Daily selling, 5% target yield, no stop loss, calls only

Variable Weight Strategy Higher Returns With Comparable Volatility

Key Observation

Performance in Volatile Markets

- Variable weight strategy outperforms in volatile markets with higher alpha and Sharpe ratio
- In neutral markets, both strategies perform similarly, making volatility a key determinant of success

Limitations of Strike Selection

- Strike selection can underperform, even compared to the ETF itself, highlighting its inefficiency

Preferred Approach

- Fixing the strike and adjusting quantity is superior to fixing quantity and adjusting strikes
- This method ensures more stable performance

Scenario (Positive Negative Neutral)	Index	Strike Selection	Variable Weight
Annualised Alpha		0,33%	2,76%
		-0,78%	0,79%
		0,71%	0,66%
Beta vs. Underlying		0,866	0,817
		0,866	0,835
		0,930	0,877
Annualised Return	11,56%	10,28%	12,12%
	-28,75%	-25,76%	-23,20%
	1,13%	1,99%	2,05%
Annualised Volatility	12,31%	10,81%	10,23%
	18,03%	15,81%	15,33%
	14,60%	13,96%	13,12%
Annualised Sharpe Ratio	0,978	0,995	1,232
	-1,599	-1,634	-1,518
	-0,143	-0,088	-0,089
Max Drawdown	-6,08%	-5,49%	-5,37%
	-33,20%	-29,63%	-27,22%
	-20,06%	-18,51%	-16,72%

Maximizing Alpha The Power Of Combining Calls & Puts

Are Researchers Right about Selling Calls & Puts ?

Research Insights

Previous studies suggest

- **Lower portfolio volatility** with calls and puts
- **Improved Sharpe ratio** due to balanced risk exposure
- Better performance in sideways or volatile markets

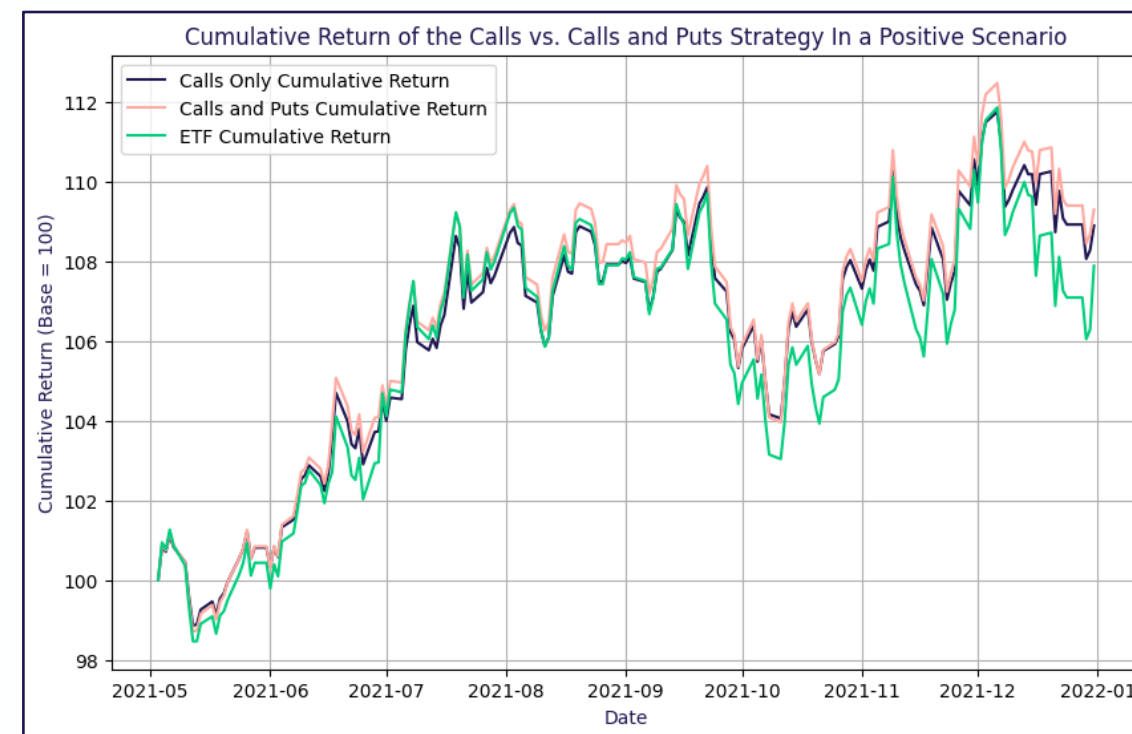
Calls and Put strike are symmetric between the ATM strike

Researchers Quotes

"Adjusting call/put strikes balances yields and **enhances consistency.**"

"Covered **OTM calls and puts offer higher income** than covered calls alone."

"A **combined strategy** provides **better downside protection.**"



Monthly selling, ATM strike selection, 5% target yield, no stop loss

Calls & Puts Outperforming, Especially In Negative Scenarios

Key Observation

Higher Volatility but Better Alpha

- **Calls & Puts strategy is more volatile**, leading to a higher max drawdown than selling calls only
- **Alpha is stronger in Calls & Puts**, making it the preferred choice in most scenarios

Risk and Return Profile

- **Sharpe ratio remains similar between both strategies** despite the higher volatility in Calls & Puts
- **Higher beta in Calls & Puts** makes it more sensitive to market movements, aligning closely with the index

Scenario-Based Performance

- **Calls & Puts outperform in all scenarios** except the positive one, where calls alone perform better

Scenario (Positive Negative Neutral)	Index	Calls	Calls and Puts
Annualised Alpha		3,94%	3,79%
		-0,73%	-0,20%
		0,65%	0,93%
Beta vs. Underlying		0,798	0,860
		0,814	0,897
		0,871	0,927
Annualised Return	11,56%	13,07%	13,66%
	-28,75%	-24,14%	-25,99%
	1,13%	2,05%	2,21%
Annualised Volatility	12,31%	10,00%	10,78%
	18,03%	14,94%	16,42%
	14,60%	13,05%	13,87%
Annualised Sharpe Ratio	0,978	1,355	1,312
	-1,599	-1,621	-1,588
	-0,143	-0,089	-0,072
Max Drawdown	-6,08%	-5,28%	-5,83%
	-33,20%	-27,86%	-30,22%
	-20,06%	-16,82%	-18,14%

OTM Provides Leverage, ATM Captures Growth In Calm Markets

ATM / ITM or OTM when Selling Calls & Puts ?

Exploring Strike Influence

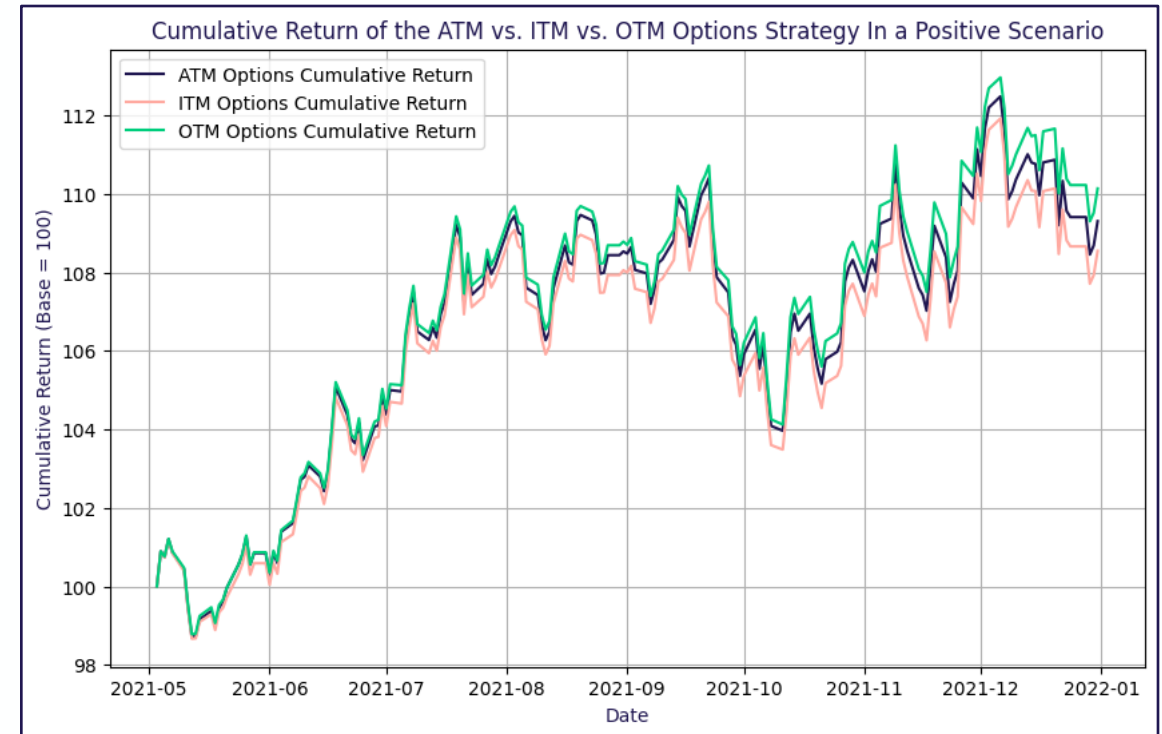
- Investigating how strike selection affects performance

Maintaining Exposure

- To keep consistent exposure, **strikes** must remain **symmetric** around ATM
- This ensures **delta compensation** between calls & puts

Comparing Different Strikes

- Evaluating ATM, ITM, and OTM options
- Assessing their impact on returns, risk, and portfolio stability



Monthly selling, Calls and Puts, 5% target yield, no stop loss

Optimizing Strike Selection OTM Excels In Volatile Markets, ATM Gives More Stable Alpha

Key Observation

Risk vs. Reward Trade-Off

- OTM options are the riskiest, showing highly volatile alpha and Sharpe ratios across scenarios
- ATM options provide the most stable alpha, ensuring consistent positive performance with lower variability

Sensitivity

- Beta is slightly higher for ITM options, indicating greater sensitivity to market moves

Drawdown and Risk Appetite

- OTM options have the lowest max drawdown, offering better downside protection
- Choosing the best strategy depends on risk appetite, balancing return potential vs. stability

Scenario (Positive Negative Neutral)	Calls and Puts (-2% ITM)	Calls and Puts (ATM)	Calls and Puts (+2% OTM)
Annualised Alpha	2,50%	3,79%	5,05%
	-0,45%	-0,20%	0,18%
	0,80%	0,93%	-1,44%
Beta vs. Underlying	0,873	0,860	0,859
	0,894	0,897	0,896
	0,934	0,927	0,889
Annualised Return	12,53%	13,66%	14,91%
	-26,16%	-25,99%	-25,57%
	2,06%	2,21%	-0,08%
Annualised Volatility	10,92%	10,78%	10,78%
	16,33%	16,42%	16,45%
	13,99%	13,87%	13,39%
Annualised Sharpe Ratio	1,192	1,312	1,428
	-1,607	-1,588	-1,559
	-0,082	-0,072	-0,246
Max Drawdown	-5,75%	-5,83%	-5,96%
	-30,36%	-30,22%	-29,57%
	-18,48%	-18,14%	-17,80%

Thank you!

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Appendix

Optimizing Cash Flow With Adaptive Option Selling Strategies

Key Goals and Core Concept

Goals of the presentation

- Present and compare various **short volatility** strategies to identify the most effective one through **back-testing**
- Generate consistent **cash flows** by **selling** calls and puts, while maintaining exposure to the underlying asset
- Research inspired by the paper “**Applications of Stock Index Options for Income Enhancement**” by John Burrello, Frank J. Fabozzi, Han Liang, Anil Sood, and Kari Vatanen

Important point of the research paper

- High volatility leads to higher option premiums and yields
- Selling options with the **same strike prices** without adapting to market conditions is a **common pitfall**

Focus on 1-month expiry options

- **Avoid selling options** with less than **5 days to expiry** due to **high volatility**
- Instead, sell options with the **next available expiry date** to **minimize gamma risks**

Portfolio Allocation

- **90% invested in the underlying**
- Maintain a **10% cash buffer** to quickly repurchase the underlying if needed, ensuring consistent exposure

Manage **exposure** and **delivery**

- No buybacks are performed after selling, except for managing exercised options
- At every delivery date, if an option is exercised, we deliver the underlying from our portfolio and then **buy it back to maintain exposure**

Testing The Strategy In Three Market Scenarios

Scenario Choice

Approach

To evaluate our strategy, we analyze **three market scenarios**

Positive Scenario Index price increases

Negative Scenario Index price decreases

Neutral Scenario Market remains stable

Data Periods

- Positive Scenario May 2021 to December 2021
- Negative Scenario January 2022 to December 2022
- Neutral Scenario January 2023 to December 2023

Assumptions

- No transaction costs
- No impact on market prices due to trades

