



Long Short Equity Portfolio



Dashboard

- Scan to take a look the Portfolio

Macro Review



Federal Reserve's Interest Rate Hikes

Increasing borrowing costs
reduce consumer spending
and business investment



Geopolitical Risks from Constant Wars

Wars disrupts regional
stability and trade



China's Economic Challenges

Faltering real estate sector and
92 trillion yuan government debt

HSI Trend



2

Assumptions

- Tense macro-financial situation will not improve.
- Historical trends are likely to re-emerge.

For future **3**
months

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Benchmark Comparison



01

Introduction

Portfolio Overview



Long/Short



Derivatives



Benchmark

- \$10,000,000 for stock and \$100,000 for derivatives
- Long and short stocks from HSI and HSCEI
- Take positions in derivatives to protect the portfolio on rainy days
- Final target performance benchmark is HIBOR + 4%, which is 9.3%



02

Stock Basket

Selection Principles
Allocation Scheme
Risk Management
Implementation

Static Criteria



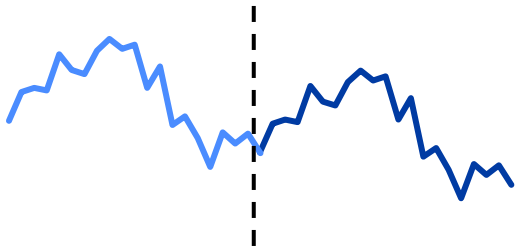
- Stocks from **HSI** and **HSCEI**
- Current Market cap larger than **50,000** million
- One year total return larger than **12%**

Dynamic Criteria



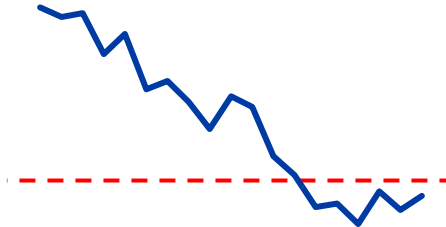
Key Assumption

The historical data can reflect the future trends of the market



Position Change

- Mainly depending on the rebalance frequency
- Extreme case: The stop loss order is exercised



Portfolio Criteria

- Use the top influential stocks that can explain at least 75% of the market variance
- Methodology: Principal Component Analysis (PCA)

Risk Management

Risk Management Principle

Diversification

No less than 10 securities

Position Size

Single short no more than 6% NAV
(warning)
Single short no more than 10% NAV

Gross Exposure

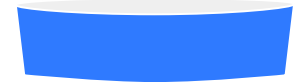
Must between 60% to 400%

Beta

Beta: -15% to 15%

Stop Loss

If the stock falls 15% or more below
the entry, it will be sold (if no
protective put)



How to
implement?



Understand the Procedure



Data

Bloomberg Screening,
Yahoo Finance Download



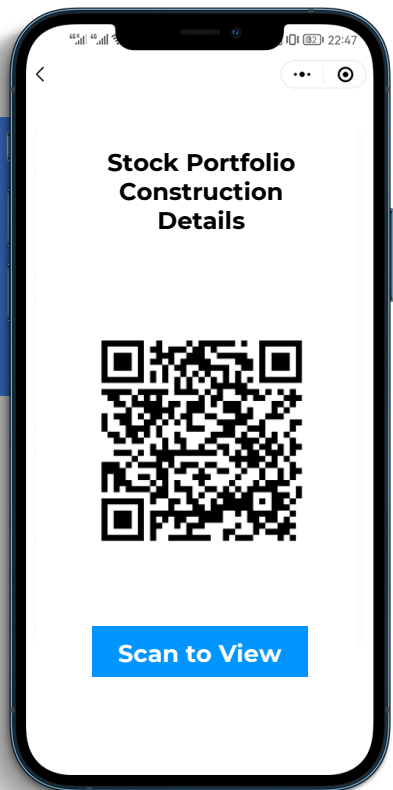
Selection

Principal Component Analysis,
Top 10 Influential Stocks



Allocation

Efficient Frontier,
Practical Consideration



Tips

- **NO** math worries
- **OPTIONAL** python code

Understand the Procedure



Data

Bloomberg Screening,
Yahoo Finance Download



Selection

Principal Component Analysis,
Top 10 Influential Stocks



Allocation

Efficient Frontier,
Practical Consideration

Data Overview

48

Tickers

Static Criteria

Bloomberg

200+

Days

Most recent data

yahoo!
finance

Data Retrieval

48 Tickers

Static Criteria

Bloomberg

- EQS<GO> **for Stock Tickers**
- OMON<GO> **for Option Data**
- BQL() , BDH() **as Bloomberg API**
- Python + **Bloomberg API**

Most recent data

yahoo!
finance

Data Retrieval

48

- yfinance as API
- **Retrieve Stock Price**
- **Retrieve HSI Index Price**

Static Criteria

Bloomberg

200+
Days

Most recent data

yahoo!
finance

Understand the Procedure



Data

Bloomberg Screening,
Yahoo Finance Download



Selection

Principal Component Analysis,
Top 10 Influential Stocks



Allocation

Efficient Frontier,
Practical Consideration

Preprocessing

- Stationary
 - Calculate 1-day log return, i.e. $\ln \frac{P_t}{P_{t-1}}$
 - Minimize error
- Format input
 - 48×48 matrix
 -

$$\underbrace{\left\{ \begin{bmatrix} \ln \frac{P_{1,ticker\ i}}{P_{0,ticker\ i}} & \cdots & \ln \frac{P_{1,ticker\ j}}{P_{0,ticker\ j}} \\ \vdots & \ddots & \vdots \\ \ln \frac{P_{48,ticker\ i}}{P_{47,ticker\ i}} & \cdots & \ln \frac{P_{48,ticker\ j}}{P_{47,ticker\ j}} \end{bmatrix} \right\}}_{48\ Tickers}^{48+ \text{ Dates}}$$



How each stock plays a
role in recent market
trends.

Principal Component Analysis (PCA)

Stock Selection



Using PCA as a tool
For each rebalance period



Top 10 influential stocks
75% market movements

Understand the Procedure



Data

Bloomberg Screening,
Yahoo Finance Download



Selection

Principal Component Analysis,
Top 10 Influential Stocks



Allocation

Efficient Frontier,
Practical Consideration



Weights to balance
between returns
and variance.

Efficient Frontier

Weight Allocation

Efficient Frontier

- Objective: $\min(\text{Portfolio Variance})$
- Constraints:
 - $\sum_{i \in S_i} w_i = 1$: Total weight is 1
 - $\mu \geq 40\%$: Expected return is 40% p.a.
 - $-0.2 \leq w_i \leq 1$: No more 20% short sell

Practical Consideration

- Lot size



03

Derivatives

Hedging Strategy
Derivatives Selection
Trading Principles
Outcomes

Hedging Strategy

**Overall
Portfolio**

Bullish

Long Position



Protective Put



Bearish

Short Position



Protective Call



Bullish Stock Position

Monthly
Rebalance

Married Put



Short-term Bullish strategy with high volatility



Protection against drastic depreciation



High transaction costs from frequent rebalance



Focus on the largest portion of the stock portfolio

Option Selection

Aug. 1st: 0992.HK

Spot Price: \$8.96

Shares: 370,000

Weight: 0.3329

Strike Price: \$9.00

(Nearest to the spot price)

Premium: \$0.5300

Shares: 370,000

Contract Size: 2,000

Contracts: 185

Sept. 4th: 2899.HK

Spot Price: \$12.68

Shares: 472,000

Weight: 0.6090

Strike Price: \$12.50

(Nearest to the spot price)

Premium: \$0.2100

Shares: 472,000

Contract Size: 2,000

Contracts: 236

Oct. 3rd: 0836.HK

Spot Price: \$14.94

Shares: 260,000

Weight: 0.3913

Strike Price: ???

(Nearest to the spot price)

Premium: ???

Shares: 260,000

Contract Size: ???

Contracts: ???

Hedging Effects

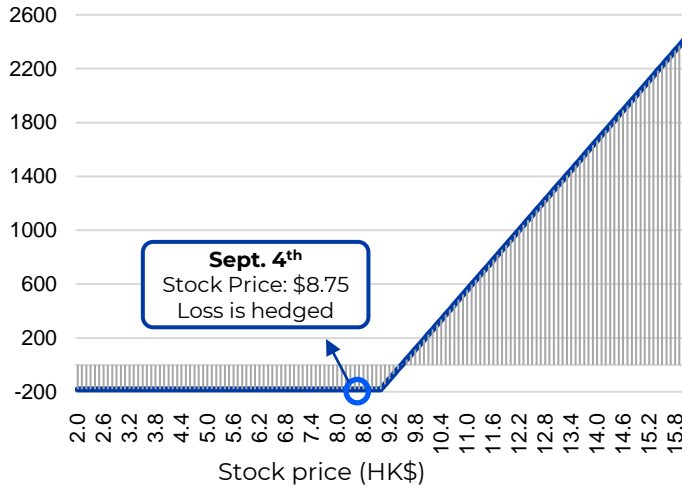
Under “Rainy” Days



- Stock price goes against our expectation
- Losses are limited to acceptable range

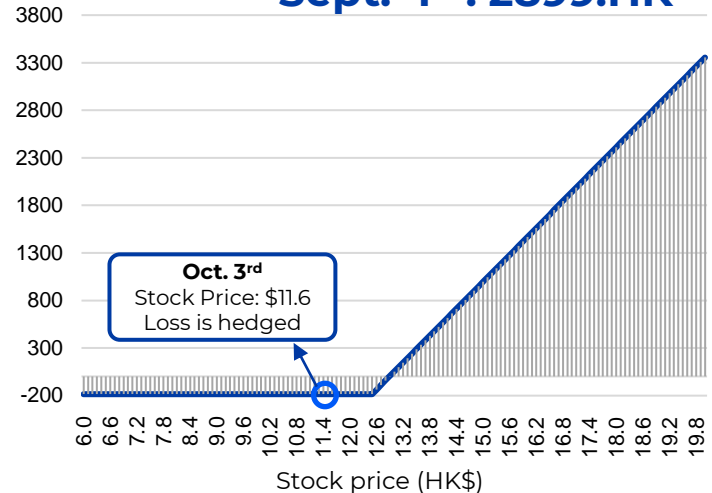
Stock + Option
P/L (HK\$ 1,000)

Aug. 1st: 0992.HK



Stock + Option
P/L (HK\$ 1,000)

Sept. 4th: 2899.HK



Hedging Effects

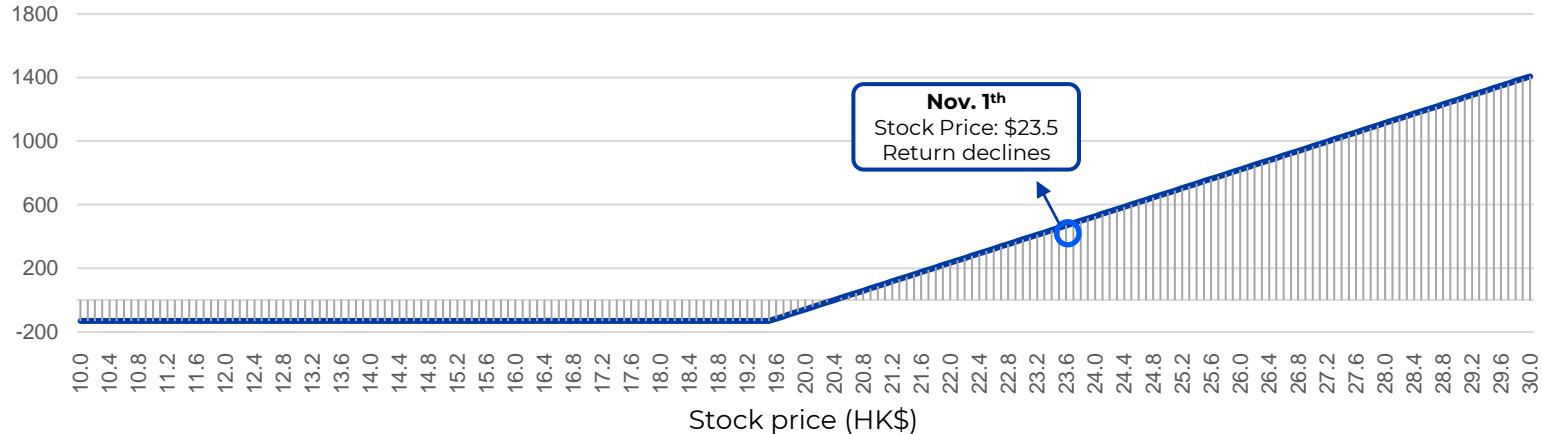
Under “Sunny” Days



- Stock price goes with our expectation
- While return declines, gains on stock movements are still earned

Stock + Option
P/L (HK\$ 1,000)

Oct. 3rd: 0981.HK





04

Backtesting

Backtesting Set-Up
Historical Performance
Risk Management
Limitation

Backtesting Set-up

Fictitious Portfolio

- \$10.1 million HKD long/short equities
- long direction view
- 10 stocks (either long or short) each month by PCA
- Hedge the largest holding with covered calls and protective puts

Investment Horizon

- Period: 1 Aug – 9 Nov 2023
- Duration: ~3 months (69 trading days)
- Rebalancing frequency: monthly basis

Portfolio Timeline

Equities Allocation

Options

1/8/2023 - 31/8/2023

As of 1/8/2023

Ticker	Holding	Return
0992.HK	33%	▼ 3%
1810.HK	32%	▲ 1%
9961.HK	23%	▼ 2%
0981.HK	17%	▼ 1%
9988.HK	10%	▼ 8%
9888.HK	0%	▼ 8%
1024.HK	-1%	▼ 7%
2269.HK	-1%	▲ 5%
9868.HK	-4%	▼ 9%
0241.HK	-10%	▼ 16%

Protective Put (0992.HK):
156,000@11.5, 1-month

4/9/2023 - 30/9/2023

As of 4/9/2023

Ticker	Holding	Return
2899.HK	60%	▼ 7%
1099.HK	36%	▼ 1%
9868.HK	32%	▼ 8%
0836.HK	21%	▼ 1%
2020.HK	0%	▼ 5%
0388.HK	-9%	▼ 7%
1209.HK	-10%	▼ 11%
2269.HK	-10%	▲ 1%
6862.HK	-10%	▼ 7%
3968.HK	-10%	▲ 3%

Protective Put (2899.HK):
470,000@12.5, 1-month

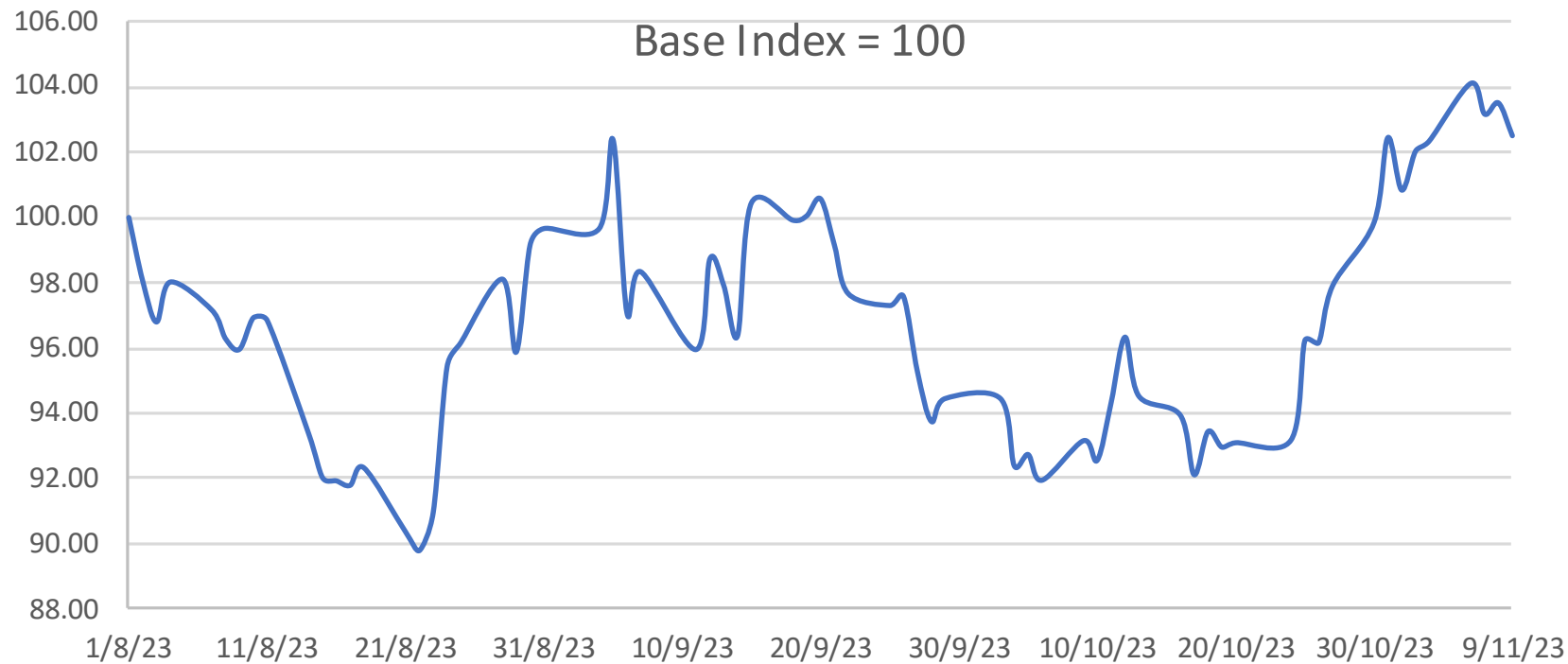
3/10/2023 - 9/11/2023

As of 3/10/2023

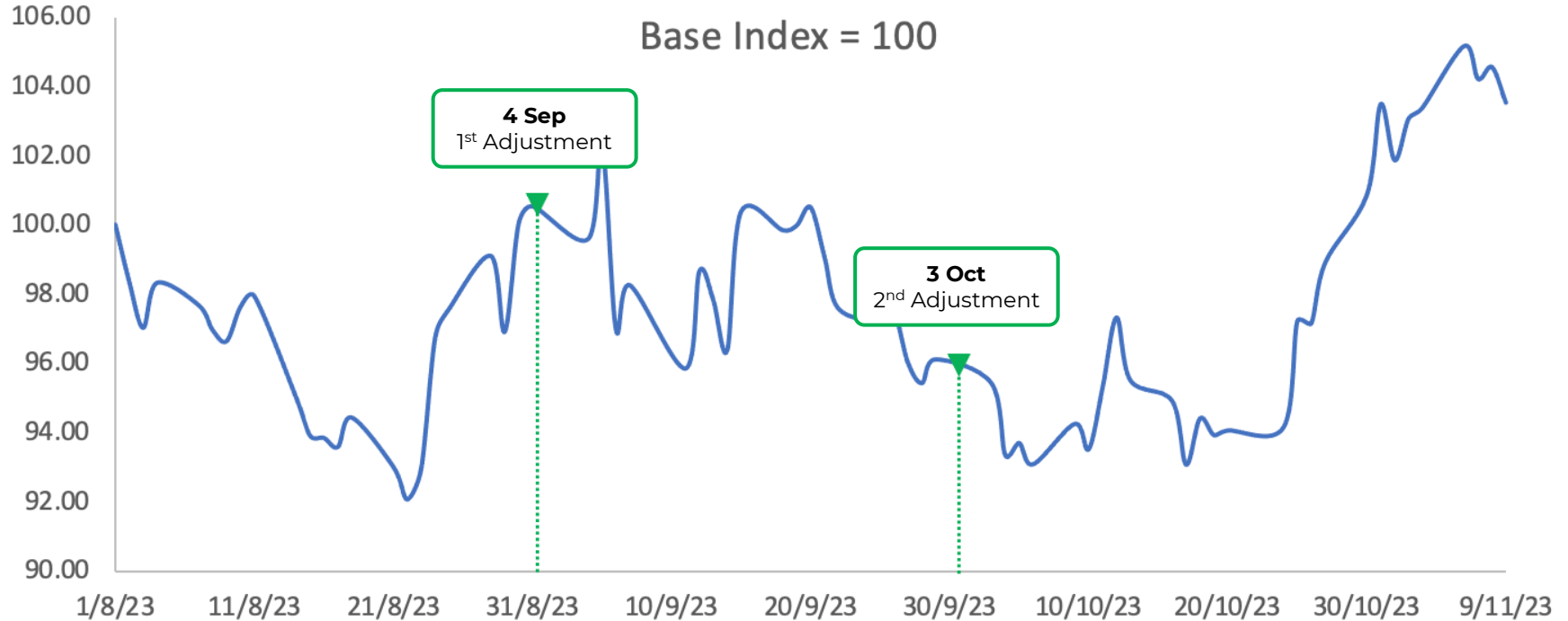
Ticker	Holding	Return
0836.HK	37%	▼ 2%
0981.HK	27%	▲ 23%
2015.HK	25%	▲ 11%
2899.HK	22%	▲ 1%
1209.HK	7%	▼ 3%
1109.HK	0%	— 0%
9868.HK	-2%	▼ 10%
2628.HK	-7%	▼ 12%
2269.HK	-7%	▲ 15%
0241.HK	-10%	▲ 2%

Protective Put (0989.HK):
90,000@19.5, 1-month

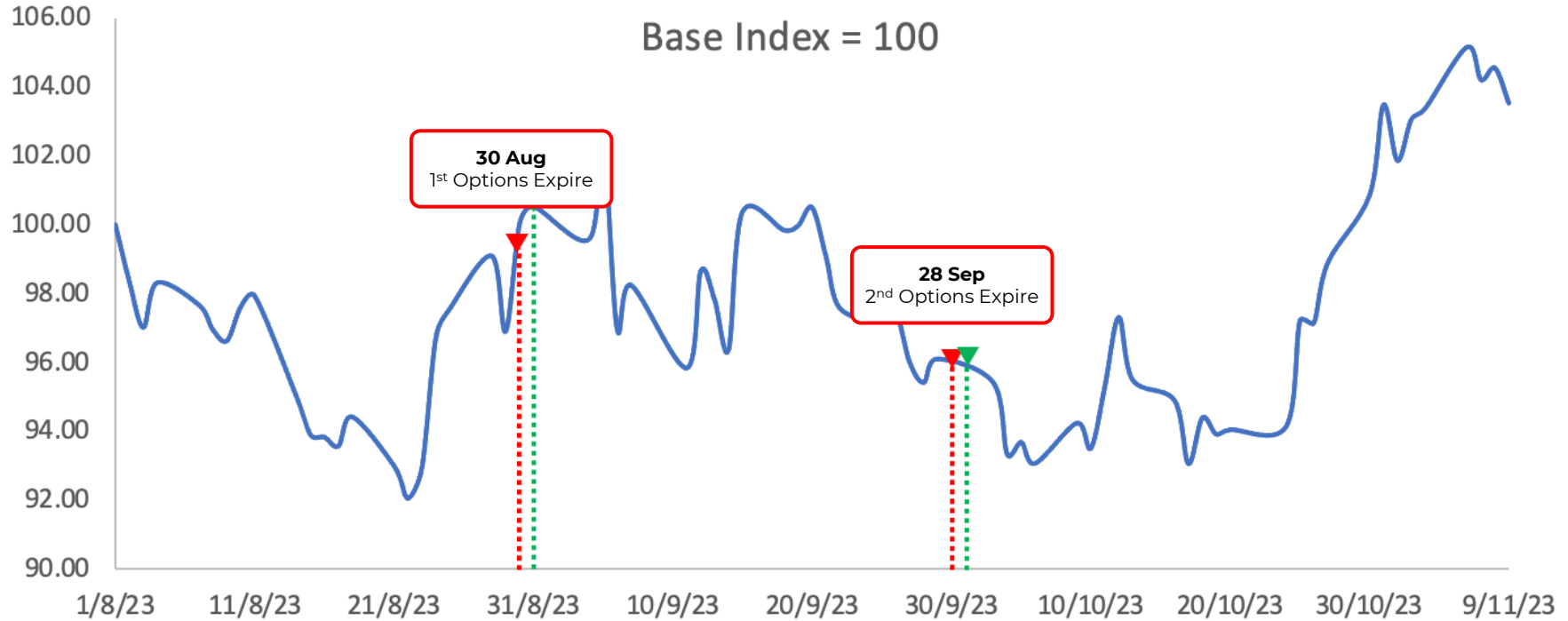
Overall Performance



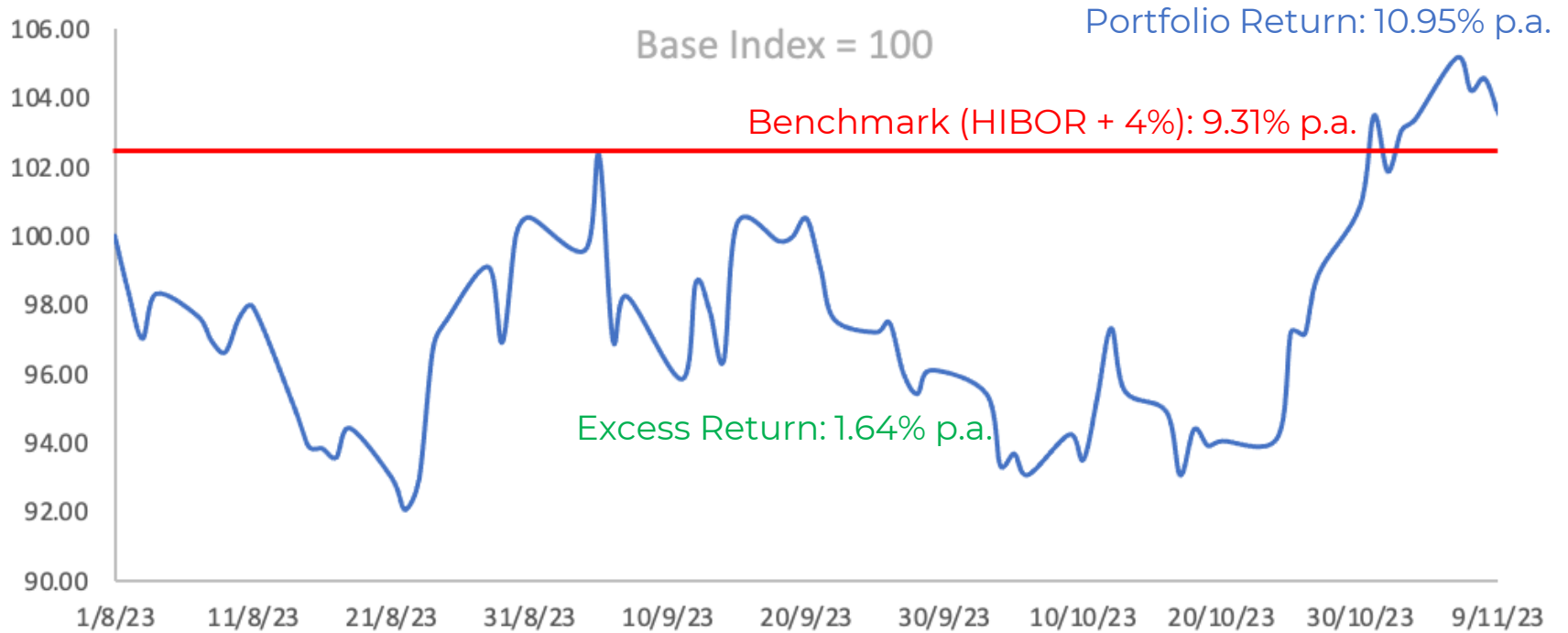
Portfolio Adjustments



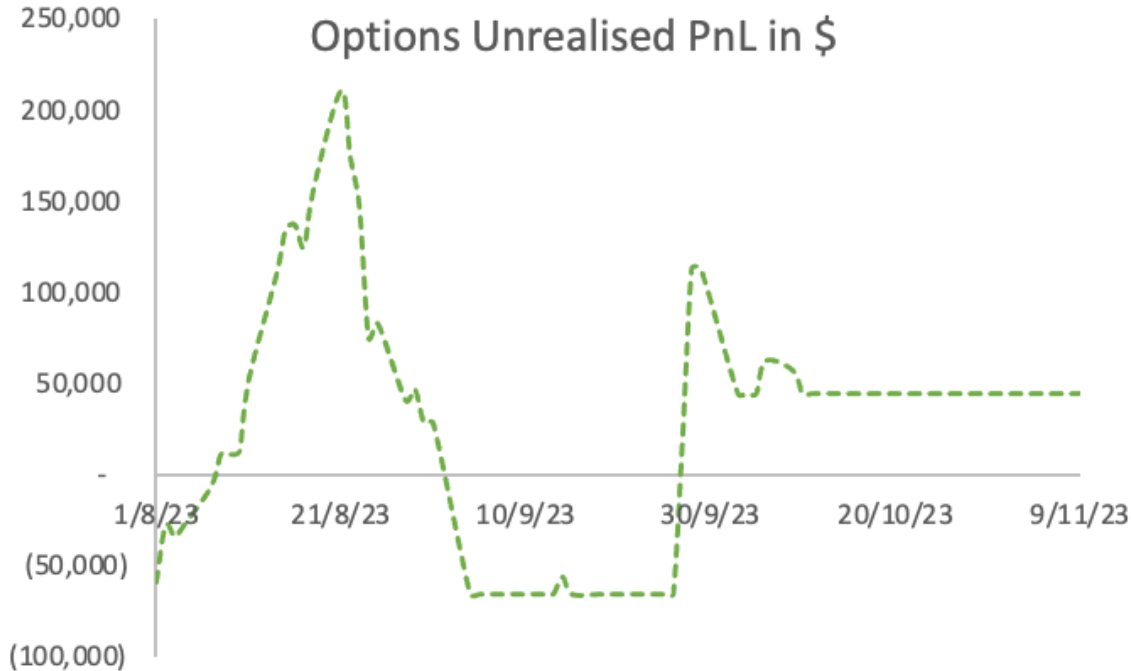
Derivatives Profit Realisation



Overall Performance

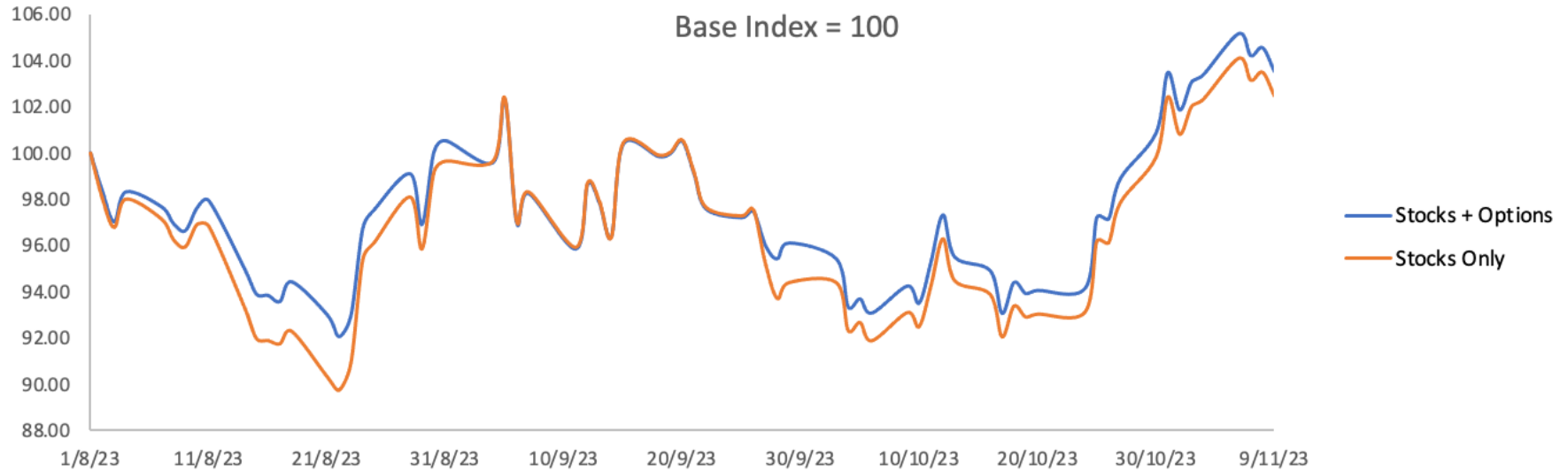


Derivatives Strategy PnL



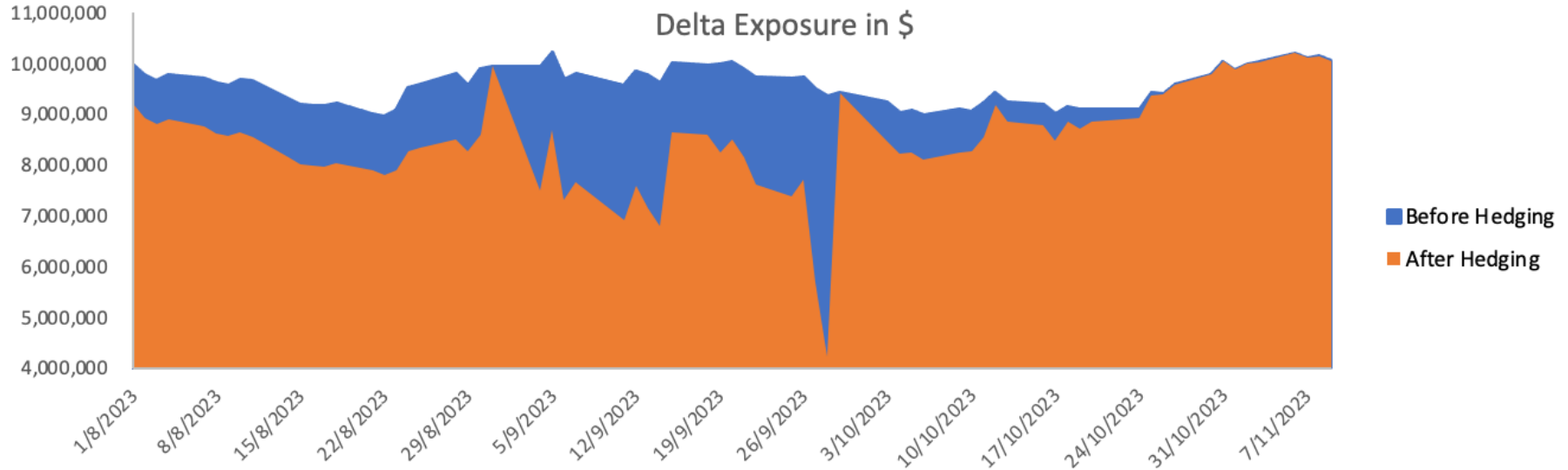
- Unrealized return
- Options valuation: $(S - K) - \text{Premium}$
- Positive return at the end of the investment horizon

Stocks + Options vs Stocks Only



- Stocks + Options Return : **3.91%**
- Stocks Only Return : **2.67%**
- Yield Enhancement : **1.24%**

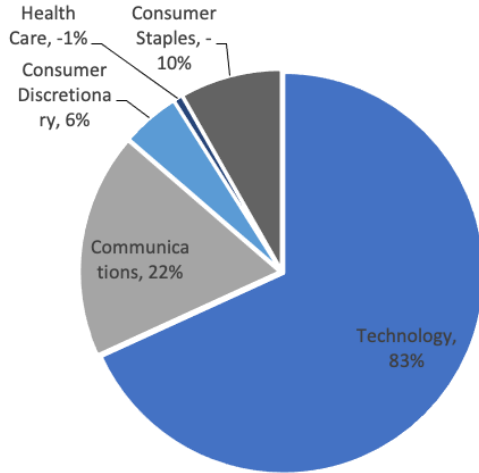
Delta Hedging



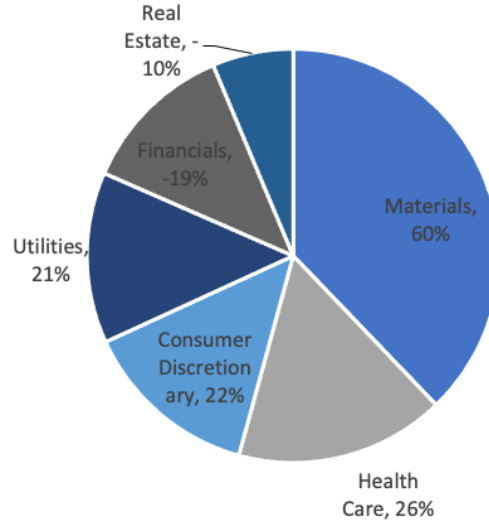
- Main objective is not to make the portfolio delta-neutral
- But delta hedging helps limit downside risk and reduce volatility

Diversification

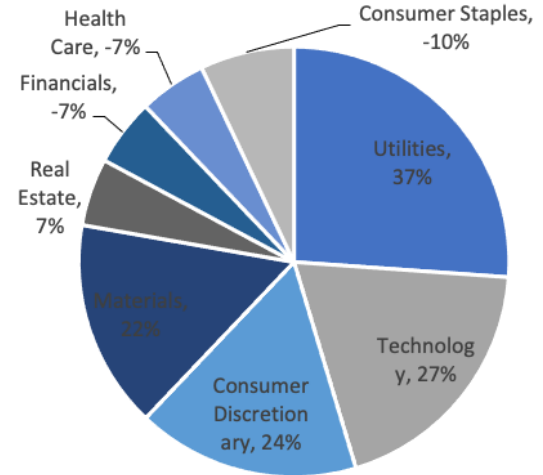
As of 1/8/2023



As of 4/9/2023



As of 3/10/2023



- Slightly biased towards technology sector in the August allocation
- Overall, the portfolio is well-diversified

Monthly Return and Volatility by Month

- Monthly return is improved in Aug. and Step., slightly decreased in Oct.
- Daily volatility by month is reduced in Aug. and Step., slightly increased in Oct.

With Hedging

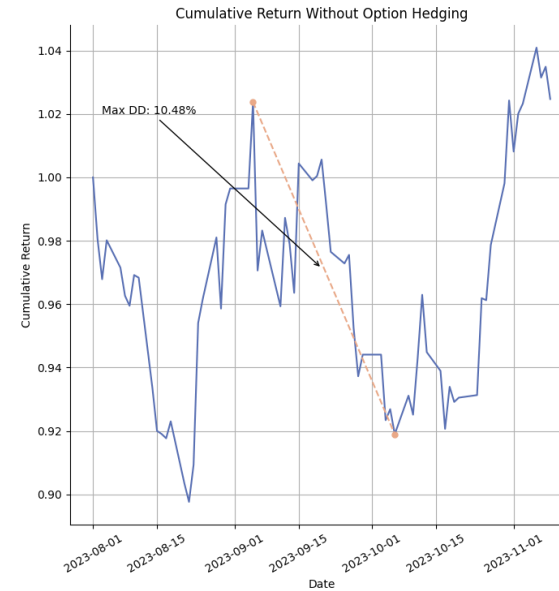
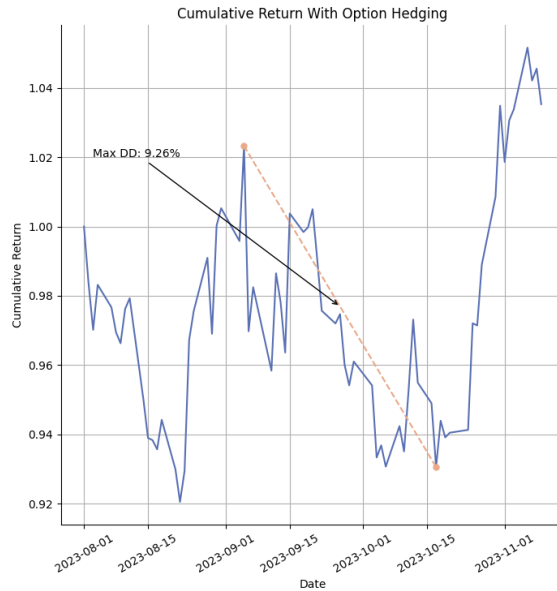
Monthly Return	
Aug	0.53%
Step	-3.49%
Oct	8.45%
Daily Volatility	
Aug	1.64%
Step	2.10%
Oct	1.49%

Without Hedging

Monthly Return	
Aug	-0.35%
Step	-5.26%
Oct	8.49%
Daily Volatility	
Aug	1.88%
Step	2.16%
Oct	1.48%

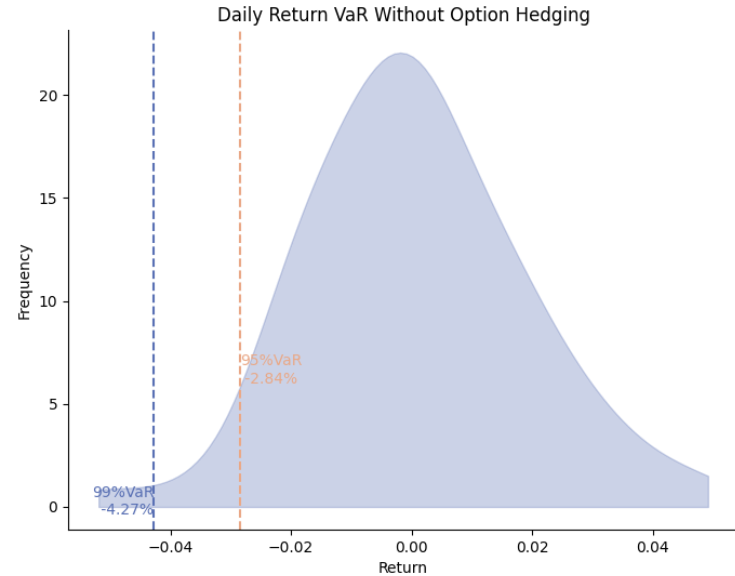
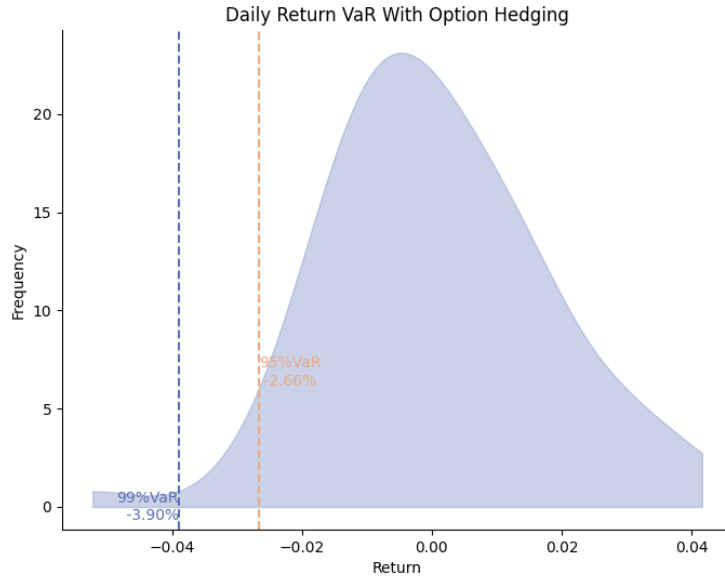
Maximum Drawdown

- Max Draw Down is improved by **1.22%**



Daily Return Histogram and VaR

- 99% VaR is improved by **0.37%**, 95% VaR is improved by **0.18%**.



Limitations

Costs

- Zero transaction cost (both explicit and implicit)
- 0.5% borrow cost as given

Options

- Hold options until expiration
- Approximate daily options price using payoff

Earnings

- Zero dividend
- Zero cash investment gain

Stocks

- Return based on closing price
- Adequate liquidity

Risk Management

Diversification

No less than 10 securities

Satisfied ✓

Position Size

Single short no more than 6% NAV
(warning)
Single short no more than 10% NAV

Satisfied ✓

Gross Exposure

Must between 60% to 400%

Satisfied ✓

Beta and Delta

Beta: -15% to 15%

Satisfied ✓

Stop Loss

If the stock falls 15% or more below
the entry, it will be sold (if no
protective put)

Satisfied ✓

Q & A

Thank you!