Can buffer strategy be an alternative 60/40 strategy?

Michael Liang, Daham Kim

Traditionally investors protected themselves and enhanced their risk-adjusted return using asset allocation. The most famous asset allocation strategy is 60/40, which allocates 60% to equity and 40% to the treasury, anticipating a negative correlation between equity-treasury and tail risk protection from the treasury's safe heaven feature. However, the recent inflationary regime and interest rate hike proved that this well-known relationship might not work as expected.

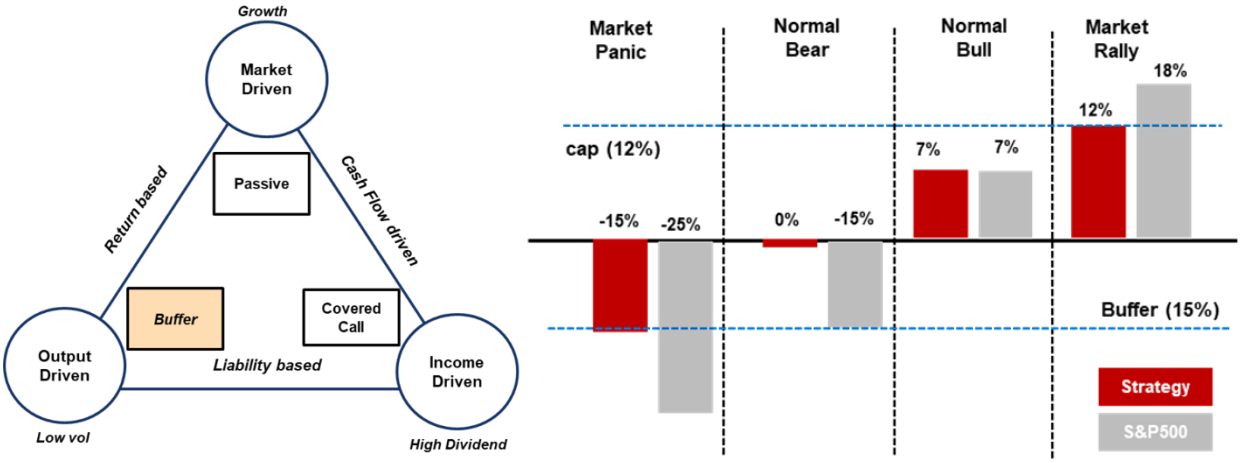

Figure1 (left):Classification of investment strategies (right):Impact of 15% buffer under different market scenario

The above left figure shows the classification of the investment strategies, which aim to maximize utility of investors. Figure1 right shows the comparison of market driven strategy (passive index strategy) with output driven strategy[1] (buffer strategy), by presenting the performance-payoff structure across different market regimes. As shown, investors who have sensitive utility decrease to tail events can have preference to buffer strategies.

Furthermore, investors' experiences during COVID-19 and following volatile interest rate regime experienced need of more robust or tailored strategy. First, as stated at the beginning, investors realized that correlation between equity and bond might not work as expected. Figure below left shows the historical correlations between equity and bond. It is evident that actual co-movement of stock and bonds is different from traditional portfolio theory. Below Table1 and Figure2 shows the historical relationship between stock and bond is not stable as expected.

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Code implementation of this project can be found in https://github.com/mLiang99/buffer_etf_strategy.git

[1] Ang, Chen, and Sundaresan, "Liability Driven Investment with Downside Risk."

	US Stocks (%)	US Bonds (%)
Jan 73–Sep 74	(42.7)	4.3
Jan 77–Feb 78	(14.3)	3.2
Dec 80–Jul 82	(16.5)	21.6
Sep 87–Nov 87	(29.6)	2.2
Jun 90–Oct 90	(14.7)	3.8
May 98–Aug 98	(13.4)	3.7
Mar 00–Dec 02	(41.5)	32.5
Nov 07–Feb 09	(50.9)	6.1
May 11–Sep 11	(16.3)	4.9
Oct 18–Dec 18	(13.5)	0.4
Feb 20–Mar 20	(19.6)	1.2
Jan 22–Sep 22	(23.9)	(14.6)
Average	**(24.7)**	**5.8**

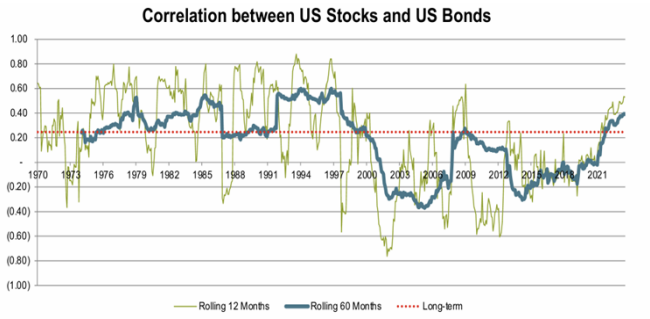
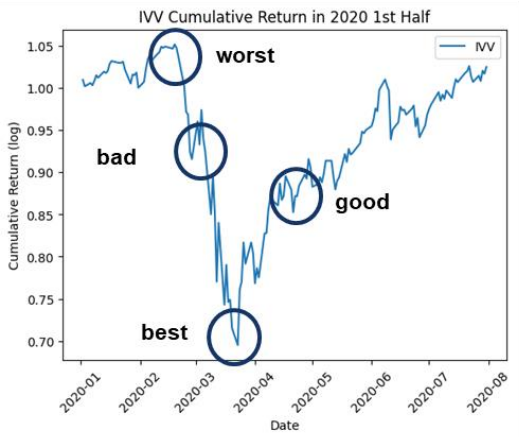


Table1 (left): U.S. stocks and bonds return during historical drawdown periods
Figure2 (right): Correlation between U.S. stocks and bonds from 1970-2024

Also, investors realized that during the extreme market movement, market timing can even hurt long-term investors[2]. Unlike long-held beliefs about long-term investment myth, market correction can spoil investors. The Figure3 below shows how market timing (1 month difference) can affect 3-year investment performance.



- **Worst: Feb 20, 2020 / Bad: Mar 10, 2020**
- **Good: Apr 15, 2020 / Best: Mar 20, 2020**

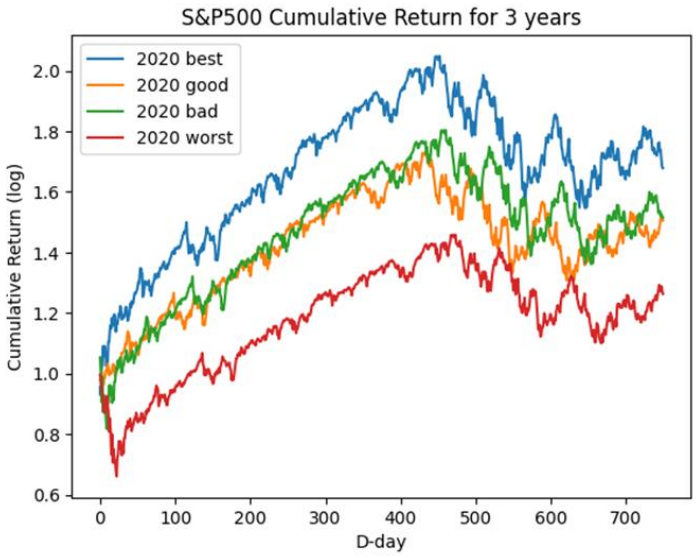


Figure3 (left): S&P500 index H1 2020, when market showed extreme movement (right): S&P 500 cumulative return from 2020-23 under 3 scenarios (Best, good, worst)

Combining these events and lessons learned during this period, investors started to reconsider what their utility function is based on their goal. Some started to consider the use of machine learning [3] or more robust optimization model[4] were one directional research to deliver better investment

[2] Bolton, Chen, and Wang, "Market Timing, Investment, and Risk Management."
[3] Lee et al., "An Overview of Machine Learning for Portfolio Optimization."
[4] Kim et al., "Robustness in Portfolio Optimization."

strategy. Others started to customize their portfolio which can maximize their utility function, which was widely used in wealth management frameworks[5].

Methodology – Pricing Buffer ETF Strategy

Buffer strategy, which uses options to protect equity investment, while compensating investment return above cap[6]. The origin of this idea is based on structured products, which package multiple derivate contracts in one vehicle and possess complexity. However, the advance of FLEX options from CBOE and ETF allowed investors to access this structured product easily and transparently using ETFs. Below figures describe the implementation design of the buffer investment strategy.

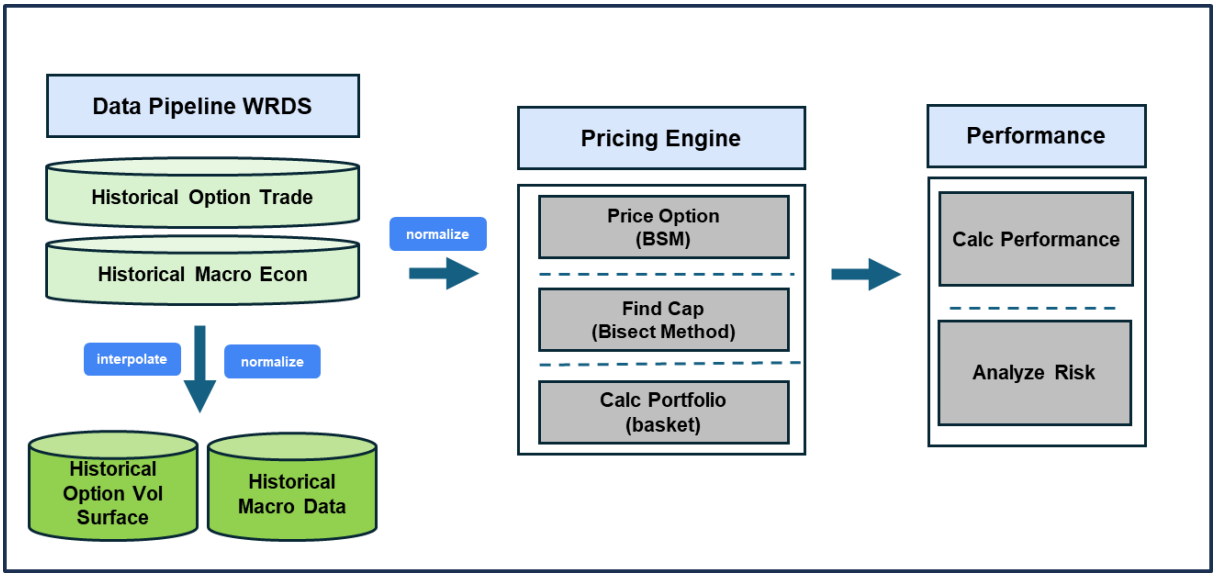
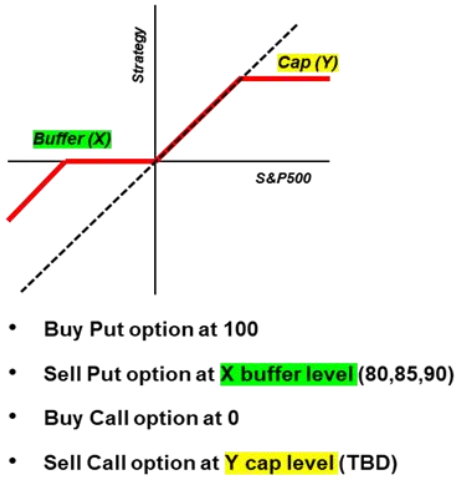


Figure4: Flowchart of the implementation of the buffer investment strategy framework

Buffer strategy's investment return at each market circumstances buffer strategy follows the below figure. The strategy protects principles until the buffer ends and shows a linear decrease after the end of the buffer. To compensate for this benefit, the strategy sells call options at cap, which limits the return if the underlying value goes above the cap. So, the overall structure will be to sell OTM calls, buy OTM put options, and buy deep ITM call options.[7] Below diagram depicts volatility surface which is most important input data and how the buffer is constructed.

[5] Arshanapalli, D'Ouville, and Nelson, "Simulation-Based Spending Rules for Investment Funds."
[6] Hill, "Evaluating Target Performance for Downside Buffer ETFs."



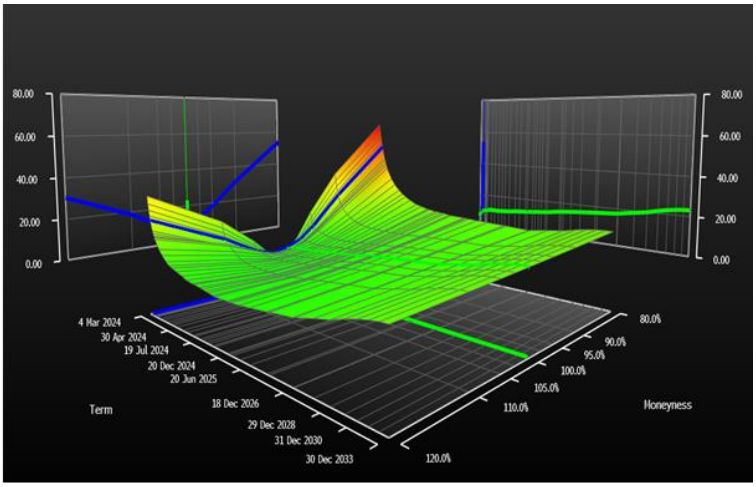


Figure5 (left): Payoff function of buffer strategy (right): S&P 500 Implied Volatility Surface in Q1 2024

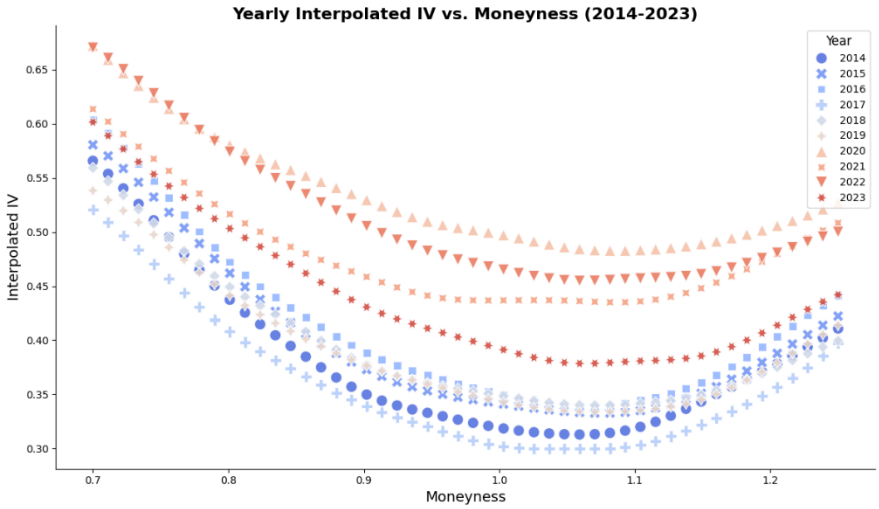


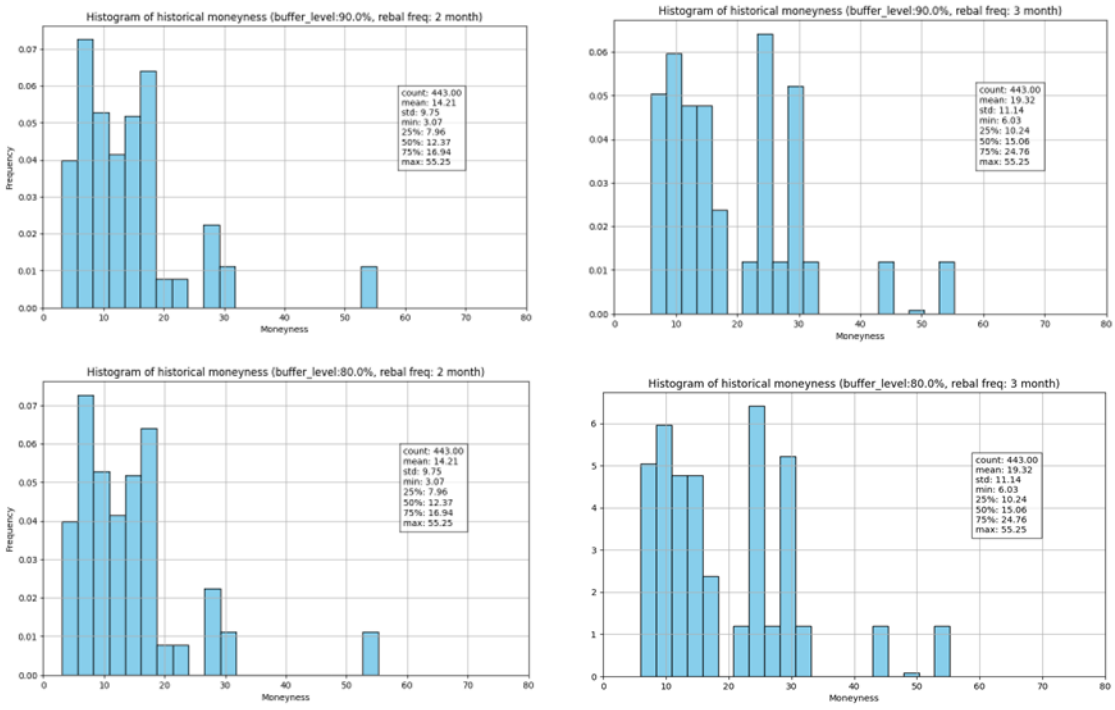
Figure6: Yearly S&P 500 Implied Volatility surface using cubic spline (using weekly IV data from WRDS)

A key aspect of this project is the construction of a historically implied volatility surface, which is closely linked to option pricing. By utilizing historical option trade data, the project aims to provide valuable insights into past option market dynamics. However, there are inherent risks, including potential biases in the historical trade data caused by shifts in market regimes[8] and the reliance on cubic interpolation methods applied to weekly data. These factors may affect the accuracy and reliability of the resulting volatility surface, especially in high volatility periods.

[8] Fuh et al., "Option Pricing with Markov Switching."

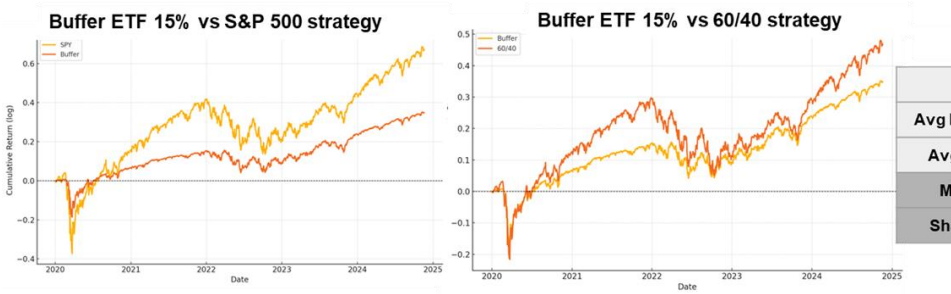
Analysis of Backtest Results

The distribution of cap levels across buffer levels (e.g., 80%, 90%) and maturities (e.g., 2, 3 months) from 2014–2023 highlights how protection and return potential adapt to market conditions. Lower buffer levels provide higher return potential but less downside protection, while higher buffer levels prioritize stability with reduced caps. Shorter maturities are more sensitive to volatility shifts, whereas longer maturities smooth fluctuations but expose portfolios to prolonged market regime changes. Due to the frequency of rebalancing, caps are rarely reached, leading to foregone returns—especially notable as the S&P 500 historically averages a 12% annual return with a standard deviation of 20%. Understanding these distributions aids investors in optimizing risk and return across varying market environments.



Figures7: Distribution of cap level with different buffers (80%, 90%) and maturities (2, 3 months) from 2014-2023

This will protect the equity portfolio if the market crashes but cap the investment return if the market rally. This is very similar to a traditional 60/40 investment portfolio. However, this buffer investment strategy does not have to worry about risk arising from the wrong correlation between equity and bond. This deterministically hedged strategy shows comparable investment returns compared to traditional indexes. Even though whether 60/40 is a good benchmark for buffer strategy is never ending question, 2020-2024 backtest result shows that buffer strategy superior result in perspective of maximum drawdown (MDD) and volatility. In addition, risk-adjusted return (Sharpe ratio) showed comparable results. The below figure is the empirical performance of buffer strategy compared to stock indexes for 2020-2024.



Strategy Evaluation

	Buffer 15%	60/40
Avg Return	7.6	17.7
Avg vol	10.9%	14.5%
MDD	-17.6%	-22.0%
Sharpe	0.61	0.66

Figures8 (left): Backtest buffer ETF 15% vs S&P 500 returns (center): Backtest buffer ETF 15% vs 60/40 strategy returns (right): Comparison table of Buffer 15% and 60/40 strategies

Buffer strategy can be used in a portfolio of core equities to help mitigate painful drawdowns and maintain some upside potential. Also, it can be used in place of a portion of fixed income exposures to pursue more growth in a long retirement, who are risk averse than others. Lastly, this strategy can give clearer investment outcomes, allowing investors to target investment returns and set financial plans easily.

Conclusion

In conclusion, even though this strategy provides a layer of protection during drawdowns and offers minimal fees with low maintenance, it raises critical questions regarding the option market's inherent volatility and complexity. Being a non-linear product, options are priced under the derivative contracts, making them particularly challenging to price during periods of unexpected market volatility or regime shifts. Additionally, there are concerns about whether the option market will remain an attractive hedging tool, especially as increased institutional demand could diminish its effectiveness and appeal. Our team will review these risks and potential shortfalls using quantitative frameworks.