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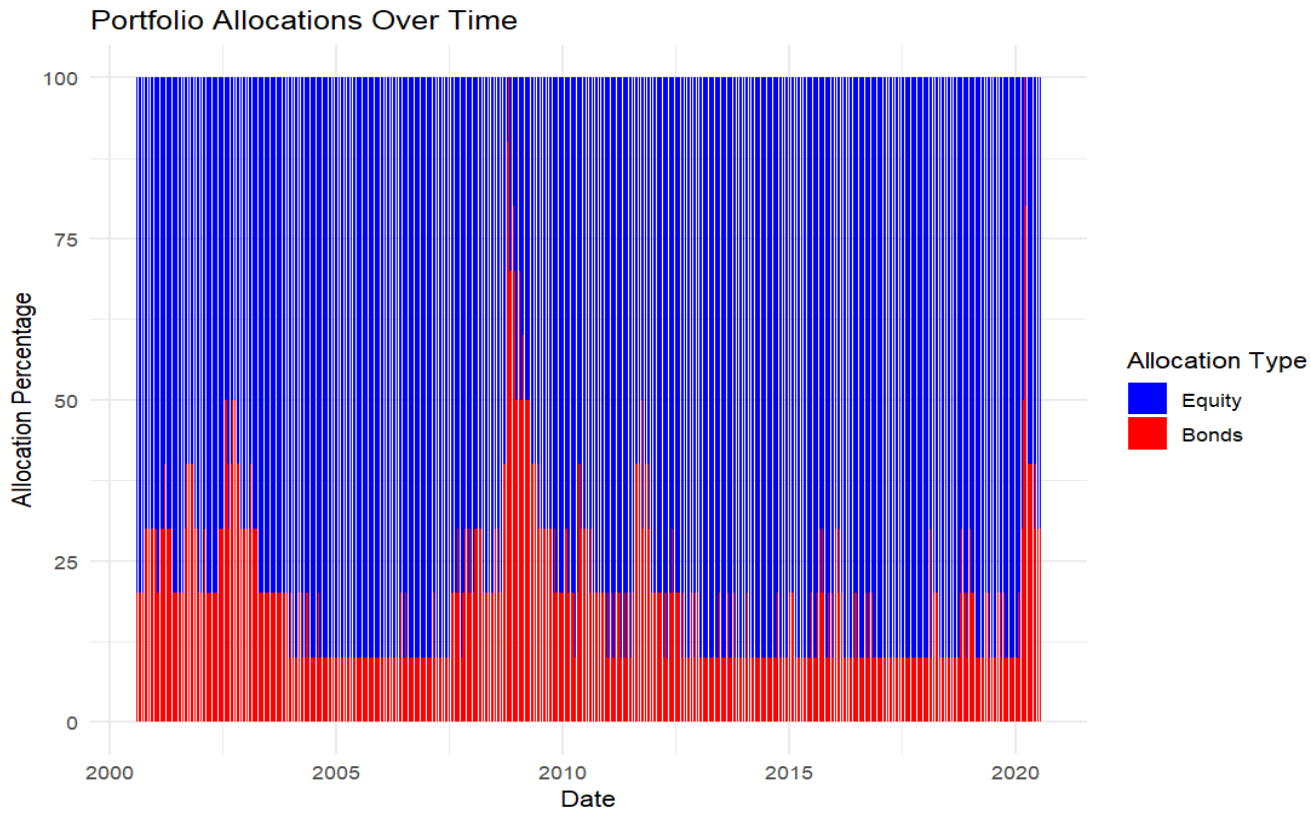
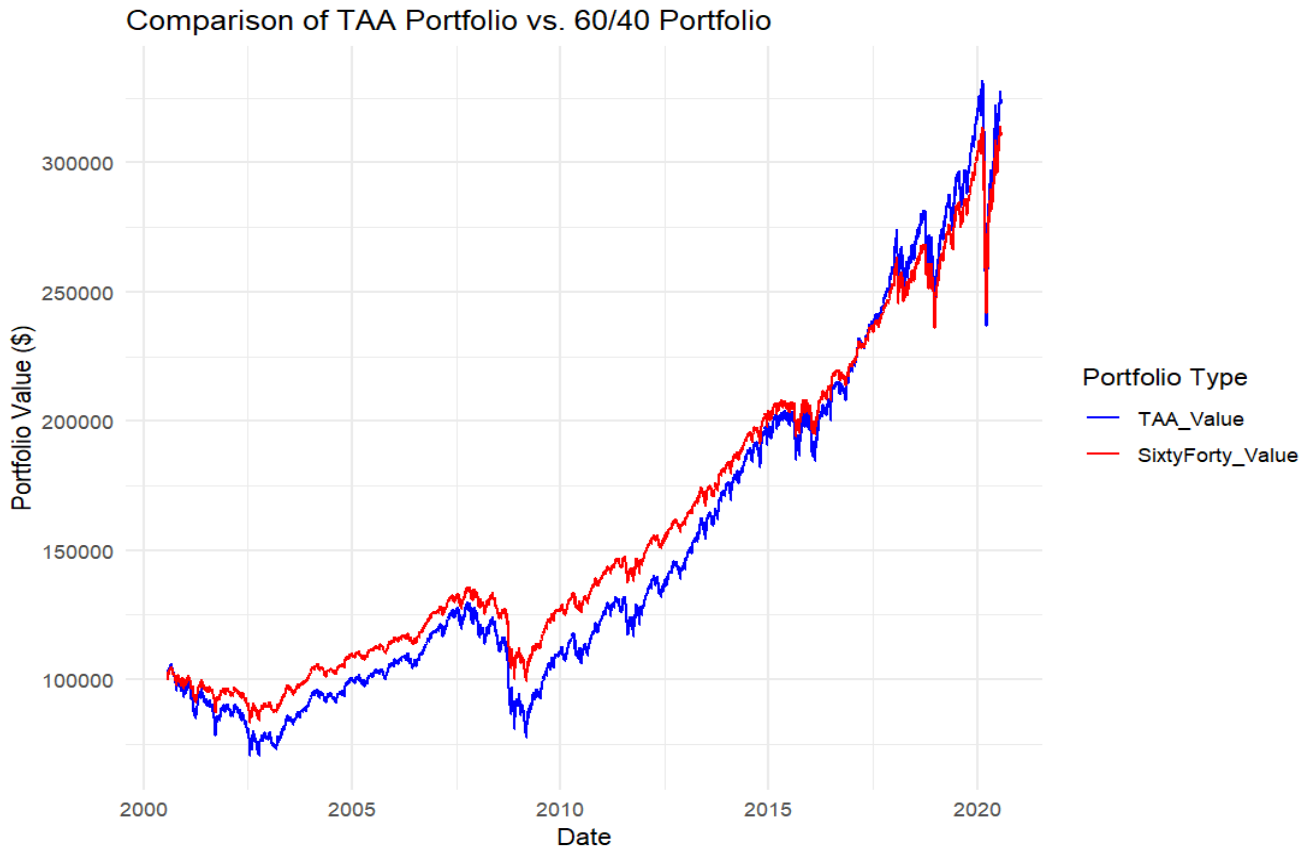
Tactical Asset Allocation Portfolio on VIX Pricing

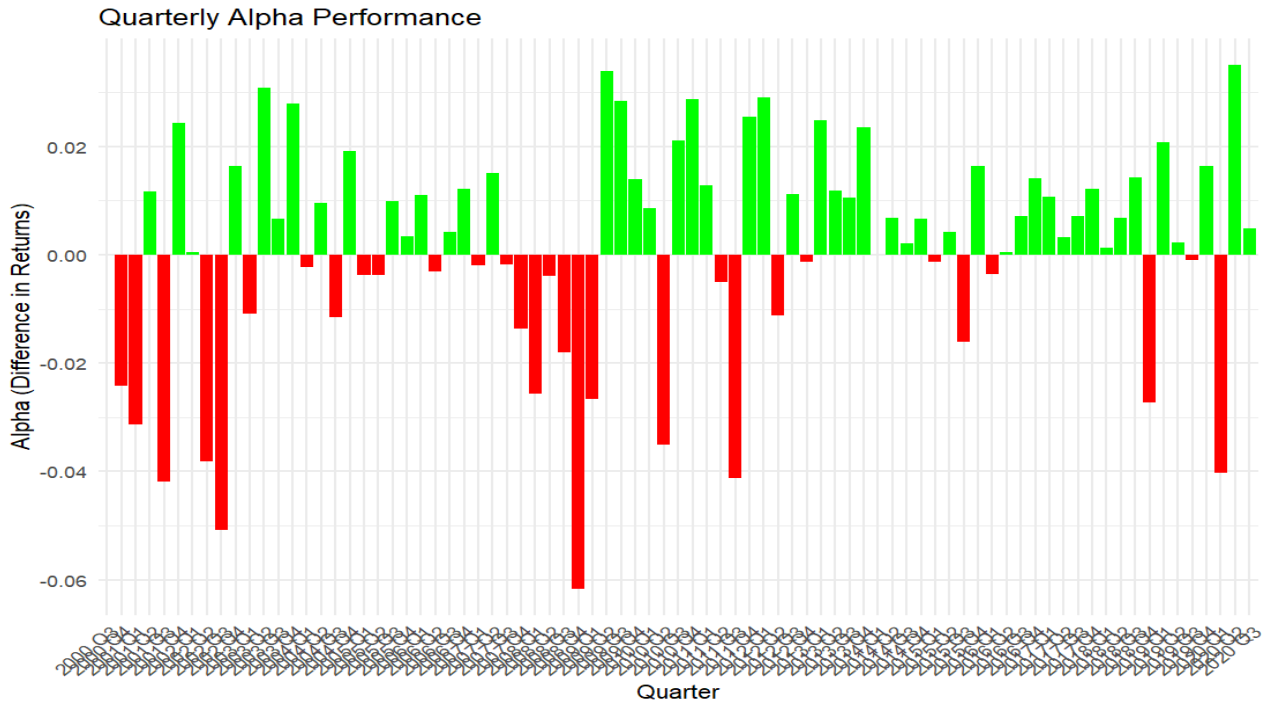
Introduction | Implementation

The portfolio discussed in this article is a Tactical Asset Allocation (TAA) based of the price flucuation of the VIX index (a volatility index that measures the expectation of market volatility which is derived from option pricings). The thesis behind this TAA is that when the VIX is low, a riskier asset like the S&P 500 should have a larger weight in the portfolio to capitalize on less volatile gains, and when the VIX is high, the portfolio should be readjusted to have a less risky asset like LBUSTRUU (Major Bond Index) to mitigate the loss exposure of the portfolio. The timeline for the portfolio is based on data from 2000 to 2020. This portfolio is compared to the traditional 60% equity and 40% bond portfolio. The implementation of this portfolio started with choosing the allocations of equity and bond investments based on the VIX data. To do this, the VIX was separated into 10 equal parts from the minimum value to maximum value. After the VIX was assigned to each day, the next step was to assign allocation values to the investments. The allocations were chosen as follows: lower 10% VIX is 10% Bond, 10-20% VIX is 20% bond and so on. Once these allocations were assigned for each day, the portfolio was built. There was no specified rebalancing time period. When the VIX surpasses or falls a threshold, the portfolio is automatically rebalanced to the assigned allocations.

Performance


Portfolio Allocations Over Time
Allocation Percentage
100
75
50
25
0
2000
2005
2010
2015
2020
Date
Allocation Type
Equity
Bonds


Comparison of TAA Portfolio vs. 60/40 Portfolio
Portfolio Value ($)
300000
250000
200000
150000
100000
2000
2005
2010
2015
2020
Date
Portfolio Type
TAA_Value
SixtyForty_Value



	Annual Return	Annual Volatility	Sharpe Ratio	Max Drawdown	Beta
TAA	6.84%	13.79%	0.49	40.52%	1.4
60/40	6.10%	9.43%	0.64	27.07%	

Analysis

The portfolio mentioned closely tracked the 60/40 portfolio, except during market downturns. When crashes occurred, a large portion of the portfolio was allocated to the bond index, and a significant reduction in the equity portion was observed. Although this strategy is effective in the first quarter of crashes, the portfolio misses opportunities for gains when markets rebound. Notably, during the 2020 crash, the TAA portfolio experienced a 40% drawdown. This was largely due to the portfolio being heavily weighted in equities at the time of the crash and failing to rebalance in time, as the VIX was low. The TAA portfolio's volatility is higher than that of the 60/40 portfolio. This difference in volatility stems from the portfolio being heavily weighted in equities for most of the specified time period. Consequently, the Sharpe ratio is lower for the TAA portfolio. Lastly, the alpha for the TAA portfolio is higher than that of the 60/40 for many of the quarters, but when the 60/40 outperforms the TAA, it does so significantly. To better optimize this portfolio, more

variables should be incorporated into the proxy to avoid sole reliance on the VIX index. Additionally, the level of allocations based on the VIX momentum should be analyzed.