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Yield Curve Hedging Strategy

# An inverted yield curve is the best predictor of recessions

Glenn D. Rudebusch and John C. Williams of the Federal Reserve Bank of San Francisco (2008) found that “for over two decades, research has provided evidence that the yield curve, specifically the spread between long- and short-term interest rates, contains useful information for signaling future recessions... Indeed, we **show that professional forecasters appear worse at predicting recessions a few quarters ahead than a simple real-time forecasting model based on the yield spread.**”

Materials from this presentation were influenced by Keith Phillips of the Federal Reserve Bank of Dallas – San Antonio Branch who has presented on the Predictive Powers of the Yield Curve, and who has noted that the 10-yr/1-yr yield spread can predict changes in business cycles.

# When 10-year rates fall below 1-year rates a recession typically follows

Spread Between 10 - 1 Year Treasury

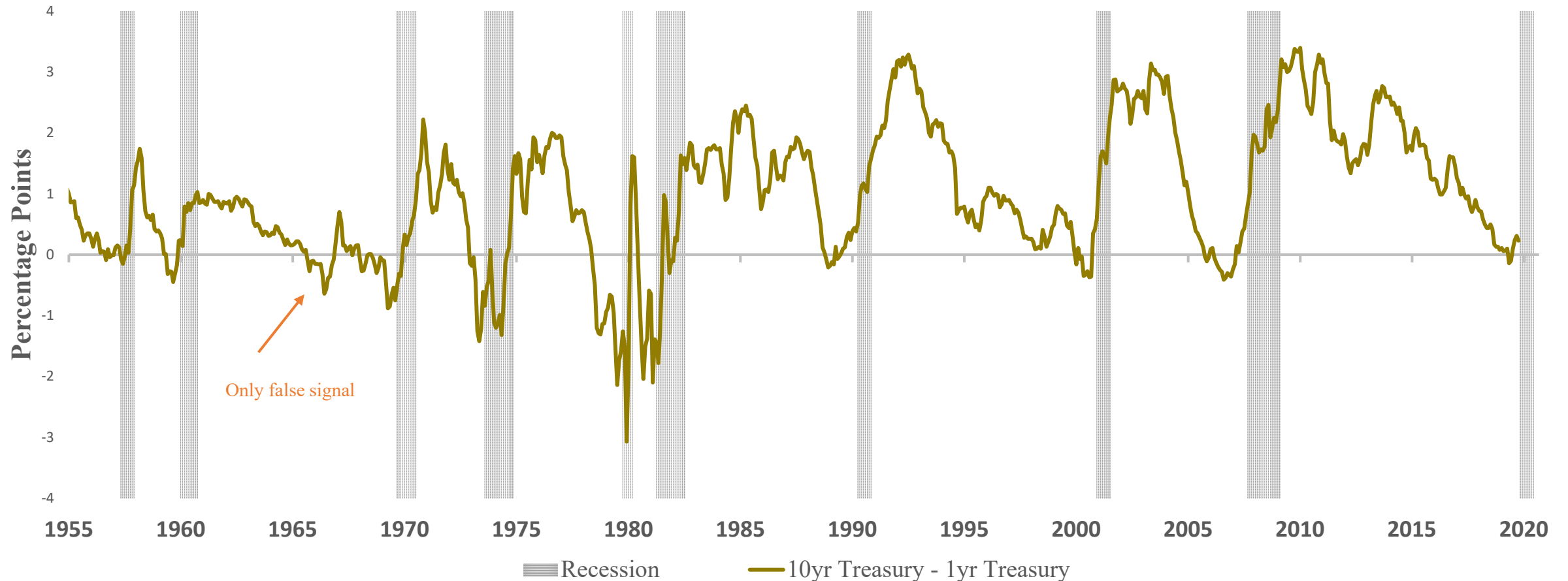


Chart derived from Keith Phillips Presentation on "Predictive Powers of the Yield Curve".

# Why an inverted yield curve is a powerful predictor of recessions

- The curve becomes inverted when the Fed is pursuing tight monetary policy and has raised short-term rates to fight inflation.
- As short-term rates rise due to Fed policy, the bond-market anticipates that higher borrowing costs will hurt the economy and slow growth, which drives down long-term Treasury rates.
- Inverted yields hurt lending and disrupt incentives for both banks and consumers. Since banks profit from borrowing short-term and lending long, when yields invert, lending becomes unprofitable. This causes declines in lending, borrowing, and less liquidity, ultimately leading to a recession.

# While inverted yields predict recessions, an inversion does not necessarily mean stocks should be sold



Timing between when the yield curve inverts and recessions vary between 6 months and 18 months.



Timing a yield curve inversion with a stock market peak is difficult.



Most recessions do not cause long-term bear markets, and stocks typically rebound quickly during a recession.



More often, stocks climb higher during recessions. For example, in 1982 the market rose +20% during the recession.

# Most recessions are mild, and it's normally a mistake to sell stocks even at the beginning of a recession

2020 marked the 11th recession since 1953, and only three recessions have negative 12-mo forward returns

- Meaning in most recessions, if the stock portfolio was sold even in the first month of the recession, the portfolio would have missed out on higher stock prices in 12 months.
- The average recession is 11 months. If the stocks were sold in first month of the recession by month 12 stocks are usually much higher.

Long-term bear markets are rare and don't exist outside of recessions

- Since 1950 there have only been 8 years when S&P total returns were down more than 10% for the year.
- Even in 1987, when the Dow fell as much as 23% in one-day, the pull-back was short-lived since the economy was not in a recession, and the market rallied to finish up 5.3% for the year.

**Instead of  
selling stocks  
when yields  
invert, a better  
approach is to  
use options to  
hedge a  
portfolio**

- While the yield curve is a powerful predictor of recessions, it could be wrong in the future. Also, not all recessions lead to bear markets.
- Instead of selling stocks, buying put options on an index provides a way to hedge a portfolio against severe and long-term bear markets, while also participating in the upside if the market continues to advance.
- By purchasing put options a portfolio is hedged since the value of the put option will trade opposite to the value of a long portfolio.
- A put option is a form of insurance on a long portfolio. Allowing the portfolio to gain exposure to the upside while limiting downside risk.

# Details of the Hedging Strategy

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We have developed a proprietary yield curve signal by analyzing short-term and long-term yields, market returns, and economic data to determine an accurate way to forecast severe recessions.

Once the inversion signal is triggered, the strategy is to purchase one-year 5% out-of-the money puts on the S&P 500 index. The number of put options purchased must be equivalent to the value of the long portfolio.

For example, if the value of a long portfolio is \$900,000 and the SPY trades at \$300 when the signal is triggered, the strategy would buy 30 put contracts at a strike price of \$285 that expire in one-year. These 30 put contracts represent 3,000 shares of SPY, which is the equivalent value of the long portfolio at the time of the signal trigger (1 put contract = 100 shares; 30 contracts = 3,000 shares x \$300 = \$900,000).



# Details of the Hedging Strategy

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The cost to purchase enough 5% out-of-the-money put options to cover the value of the long portfolio is historically ~5% of the portfolio, but the price of the option does depend on market volatility at the time of purchase.

For example, if the long portfolio has a value of \$900,000, then the cost to purchase 30 contracts at a strike of \$285 with one-year expiration is historically about \$45,000. Meaning the cost to purchase each put option contract is \$15 (30 contracts x 100 shares per contract = 3,000 shares at \$15 = \$45,000).

If the value of the long portfolio is perfectly correlated with the S&P 500, this means that when the hedge is in place, the portfolio is protected and can only decline a maximum of -10%.

For example, if the market is down -20%, and the SPY now trades at \$240, down from \$300 at the time of the put option expiration, then the value of the long portfolio is now \$720,000. However, the put option is now worth \$135,000 since it's now in-the-money \$45 ( $\$285 - \$240 = \$45 \times 30 \text{ contracts} \times 100 \text{ shares per contract}$ ). Since the option cost \$45,000, there's now a gain of \$90,000 on the put option, meaning the total value of the portfolio is \$810,000 or down -10% ( $\$720,000 + \$90,000$ ).

# Details of the Hedging Strategy

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Conversely, if the market is up +20% at the time of the option expiration and SPY now trades at \$360, then the value of the long portfolio is now worth \$1,080,000. However, the put option is worthless since it's out-of-the-money, therefore the total value of the portfolio is  $\$1,080,000 - \$45,000 = \$1,035,000$  or +15%.

With the options hedging strategy, a long portfolio is protected from experiencing a loss greater than -10%, but still participates in the upside if a market correction does not occur.

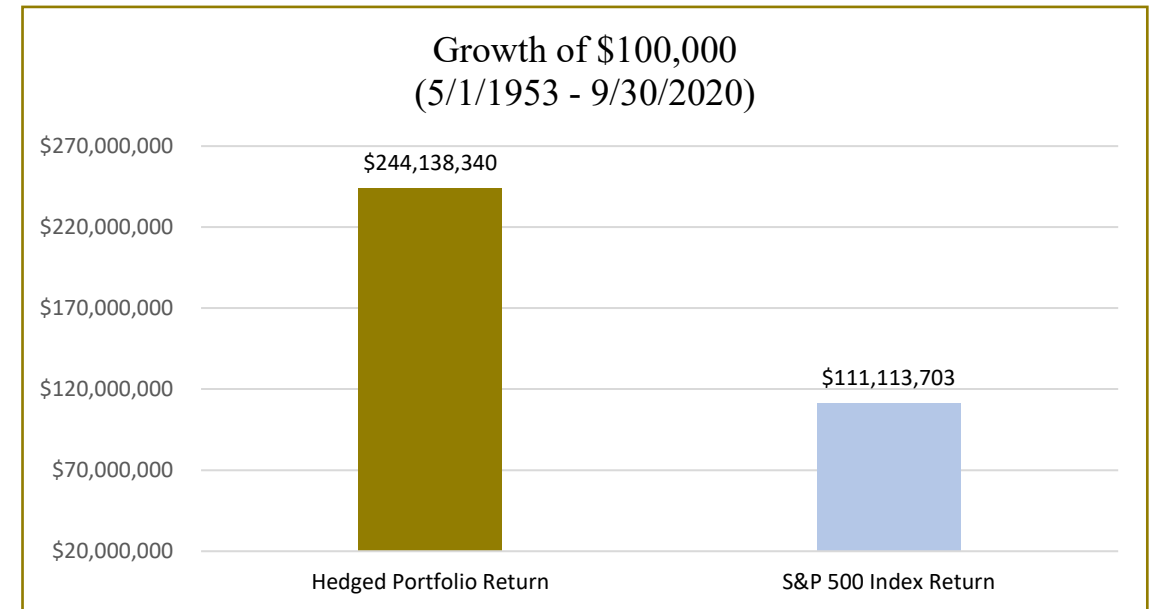
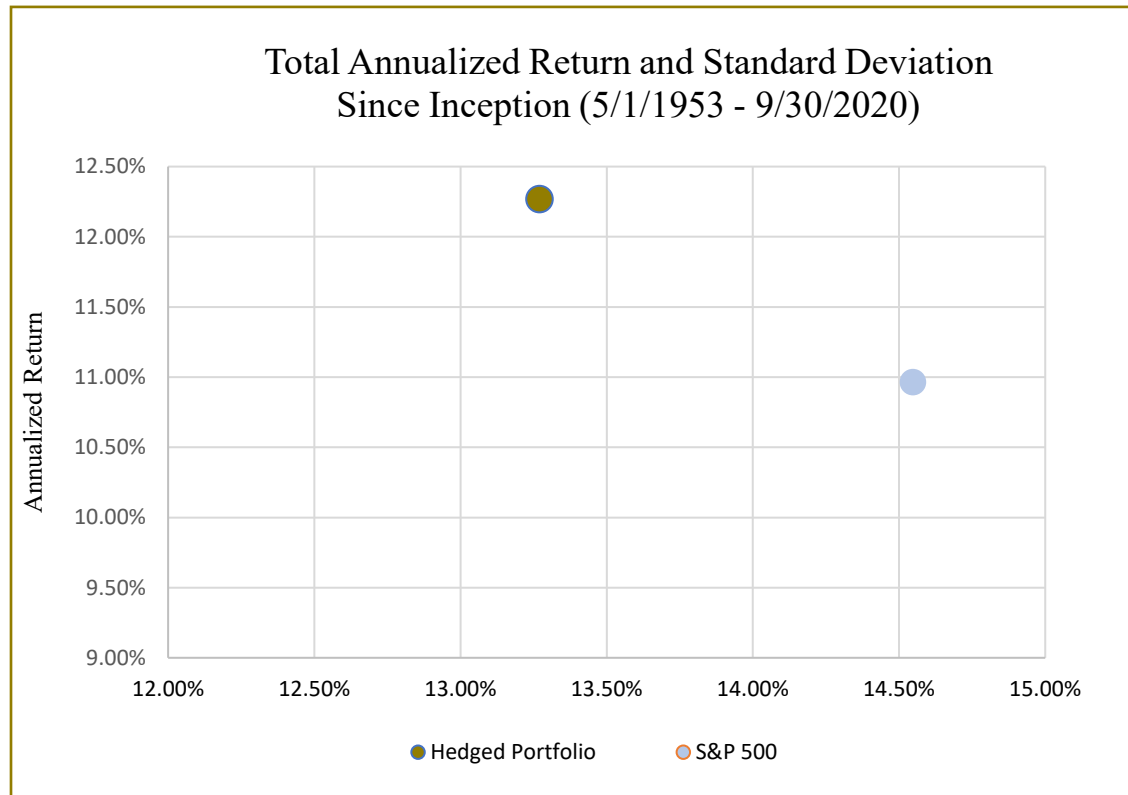
## Market Scenarios & Predicted Returns

<sup>1</sup> Diversified Portfolio assumed to have same risk profile as S&P 500

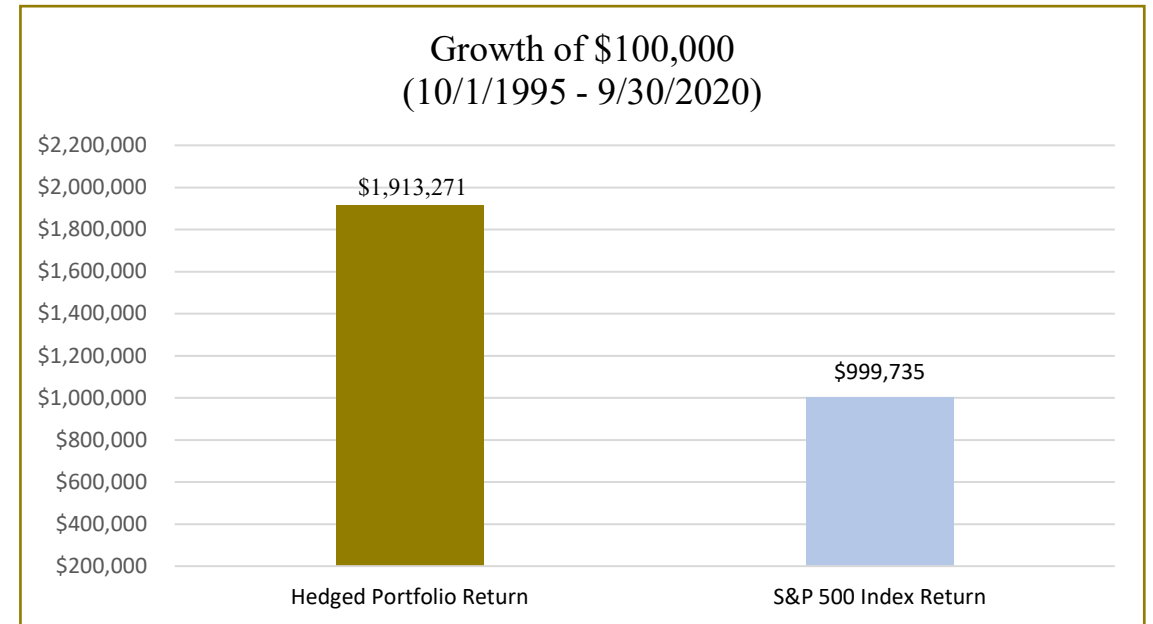
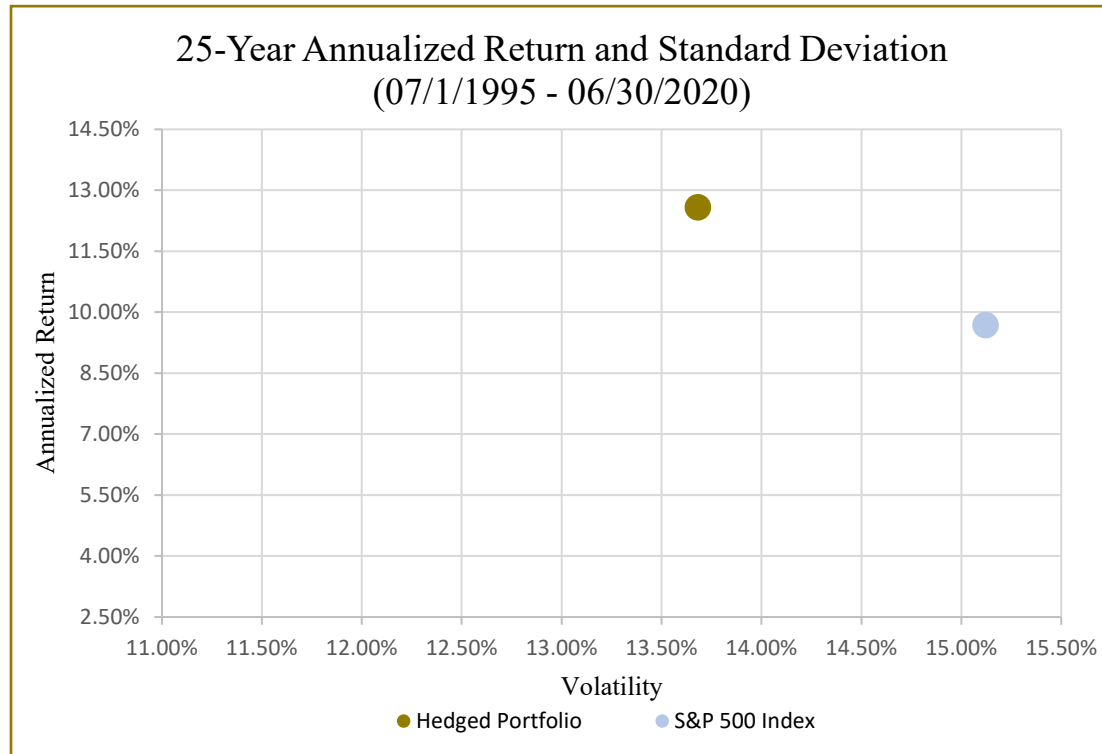
<sup>2</sup> Net Return assumes that cost to purchase the put option is 5% of the Long Investment Portfolio Value; however, actual cost may vary.

S&P 500 Return	Portfolio Return on 5% Out-of-the-Money Put Option	Return of Investment Portfolio <sup>1</sup>	Net Return of Portfolio <sup>2</sup>
+30%	-5%	+30%	+25%
+20%	-5%	+20%	+15%
+10%	-5%	+10%	+5%
0%	-5%	0%	-5%
-5%	-5%	-5%	-10%
-10%	+0%	-10%	-10%
-20%	+10%	-20%	-10%
-30%	+20%	-30%	-10%
-40%	+30%	-40%	-10%

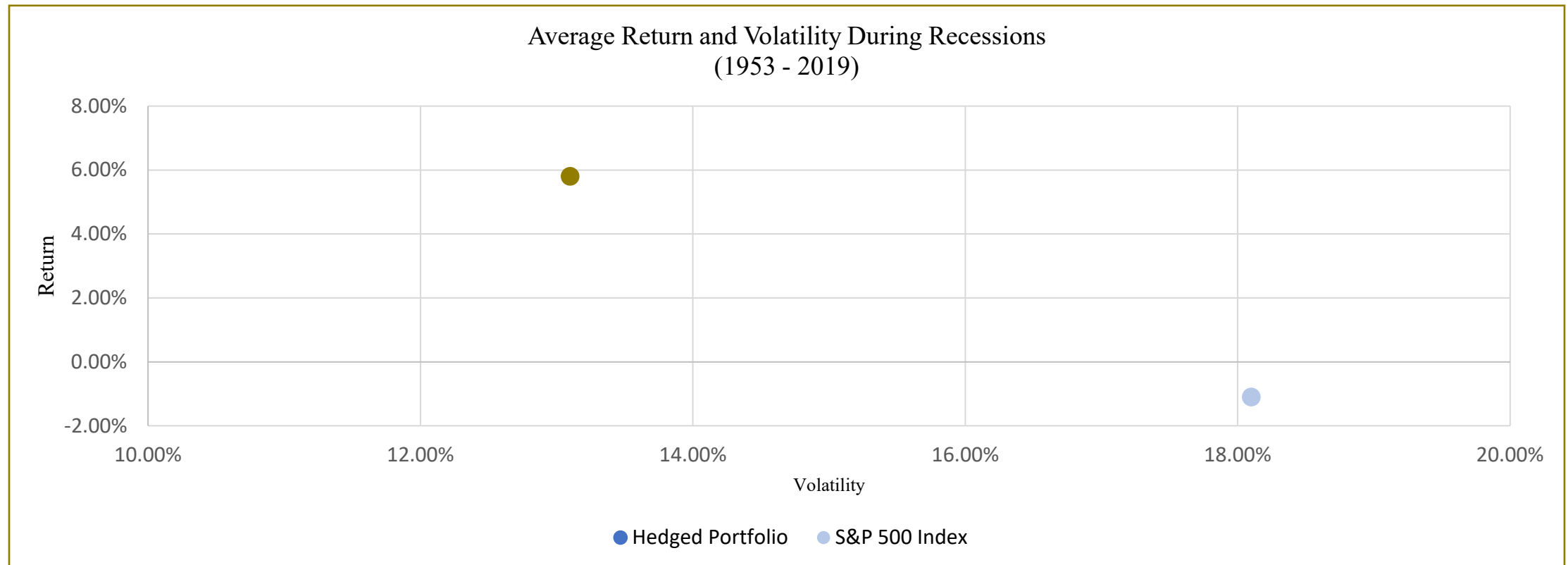
# MCA Yield Curve Hedging Strategy Delivers Higher Returns with Lower Volatility



# MCA Yield Curve Hedging Strategy Outperforms Across Multiple Timeframes: 25-Year Annualized Returns and Volatility



# MCA Yield Curve Hedging Strategy Outperforms During Recessions



Looking at past 10 recessions dating to 1953, the hedging strategy has an average return of +5.8% and volatility of 13.1% during recessions compared to -1.1% return and 18.1% volatility for the S&P 500.

# Conclusion

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- The yield curve is a powerful predictor of recessions, and investors need to have a strategy for when the curve inverts.
- Not all recessions lead to bear markets. During most recessions' stocks are often significantly higher by the end of the recession.
- A more prudent strategy is not to sell stocks, but to hedge against the bear markets caused by severe recessions by purchasing put options on an index like the S&P 500.
- Options provide a form of insurance that limits downside risk, while keeping the portfolio fully invested to still participate if stocks go up.
- Using our proprietary yield curve signal, and back-testing the portfolio to 1953, the hedged strategy would have generated significantly higher returns with lower volatility compared to the S&P 500 over multiple timeframes.