

MARTIN CAPITAL
ADVISORS
LLP

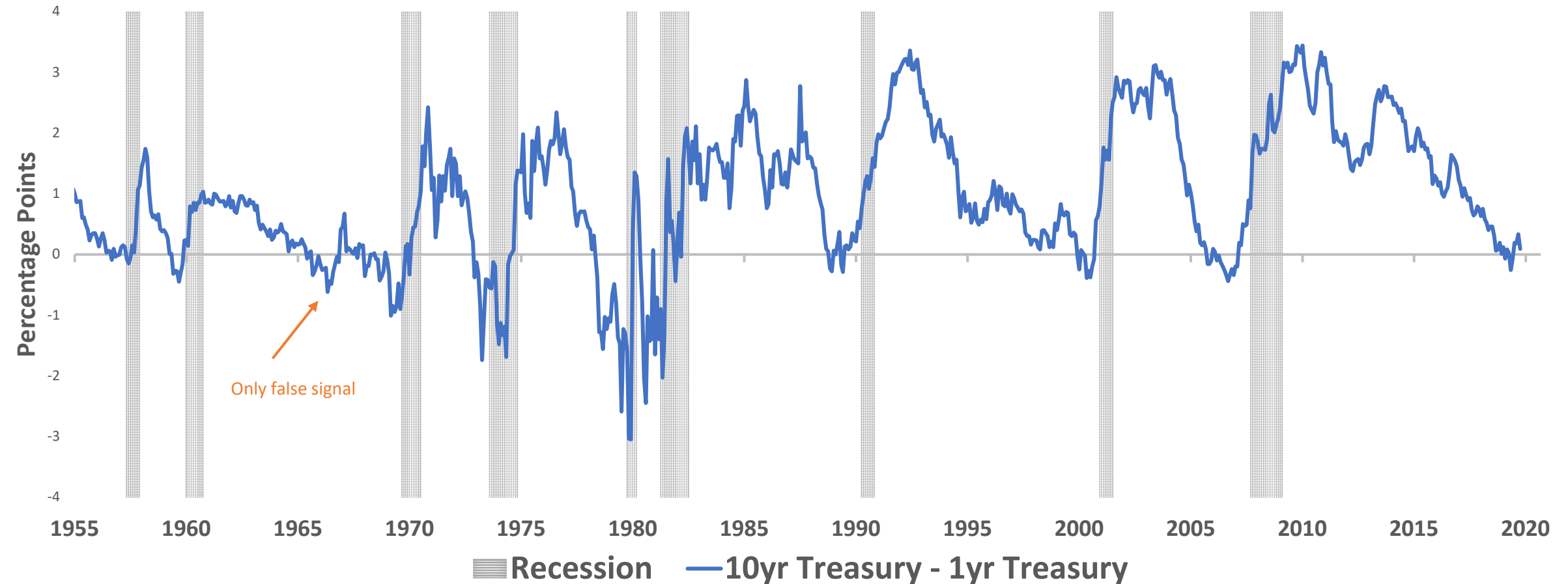
Bear Market Hedging Strategy Based on
Yield Curve Inversions

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.**”

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

SPREAD BETWEEN 10YR/1YR TREASURY



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 the higher borrowing costs will hurt the economy and slow growth, which drives down long-term rates.
- Inverted yields hurt lending and disrupt incentives since banks profit from borrowing short-term and lending long. When yields invert, there is a decline in lending and banking activity and less liquidity.

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



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



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



Not all recessions cause long-term bear markets, and stocks typically rebound quickly during a recession.



Sometimes stocks even 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

There have been 10 recessions since 1953, and only three had negative 12-mo forward returns

- Meaning in 7 of the last 10 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 so even if the stocks were sold in month 1 by month 12 stocks are normally much higher.

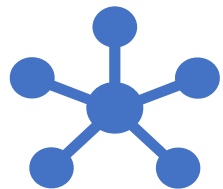
Long-term bear markets are rare and don't exist outside of recessions

- Since 1950 there have only been 7 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.

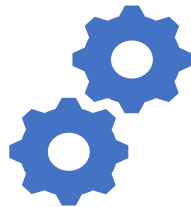
Instead of selling stocks when yields invert, a better approach is to use options to hedge a portfolio

- 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 and limit downside risk.

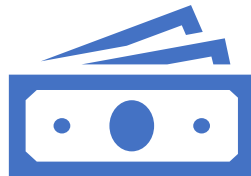
Details of the Hedging Strategy



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. This means buying put options on the S&P 500 index at a strike price that is 5% lower than where the index is trading.



The cost to purchase these put options is historically ~5% of the portfolio, but this does depend on market volatility. For example, on a \$1 million investment portfolio, the cost to purchase a 5% out-of-the money put option is \$50,000.



When the hedge is in place, the maximum downside is 10% of the investment portfolio. For example, if the market is down -20%. Your cost is 5% for the option, and a 5% loss on your portfolio before the option becomes in the money. Once the option is in-the-money, it's value will trade inverse to the market ie. If S&P is down, the value of the put options will be up.

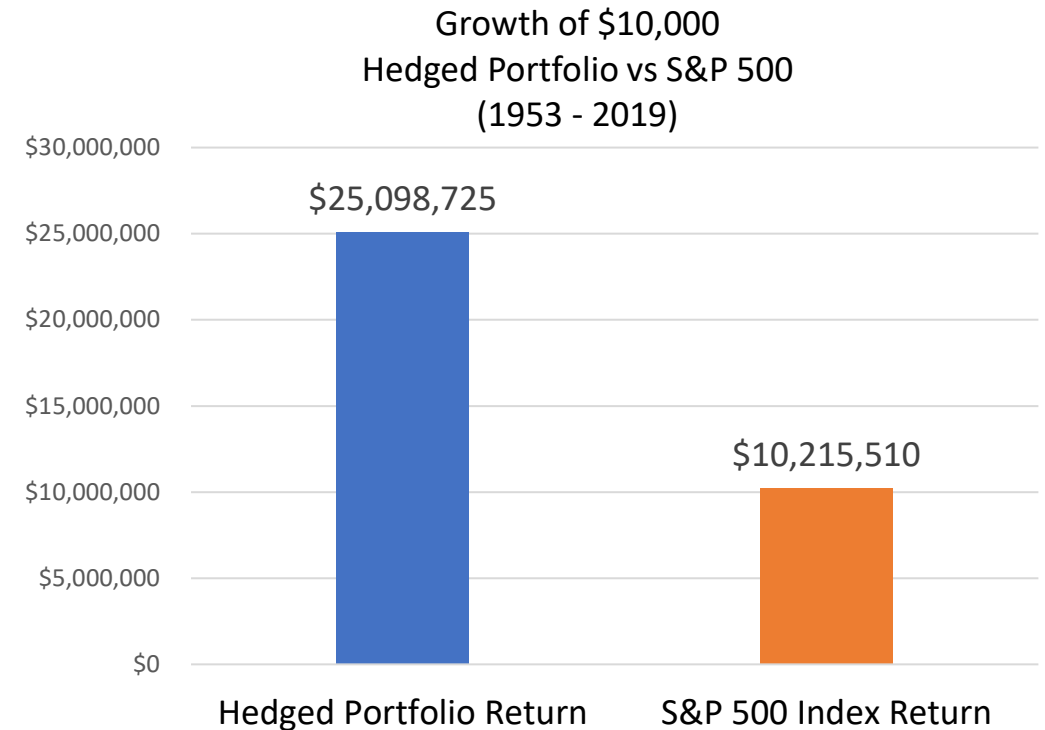
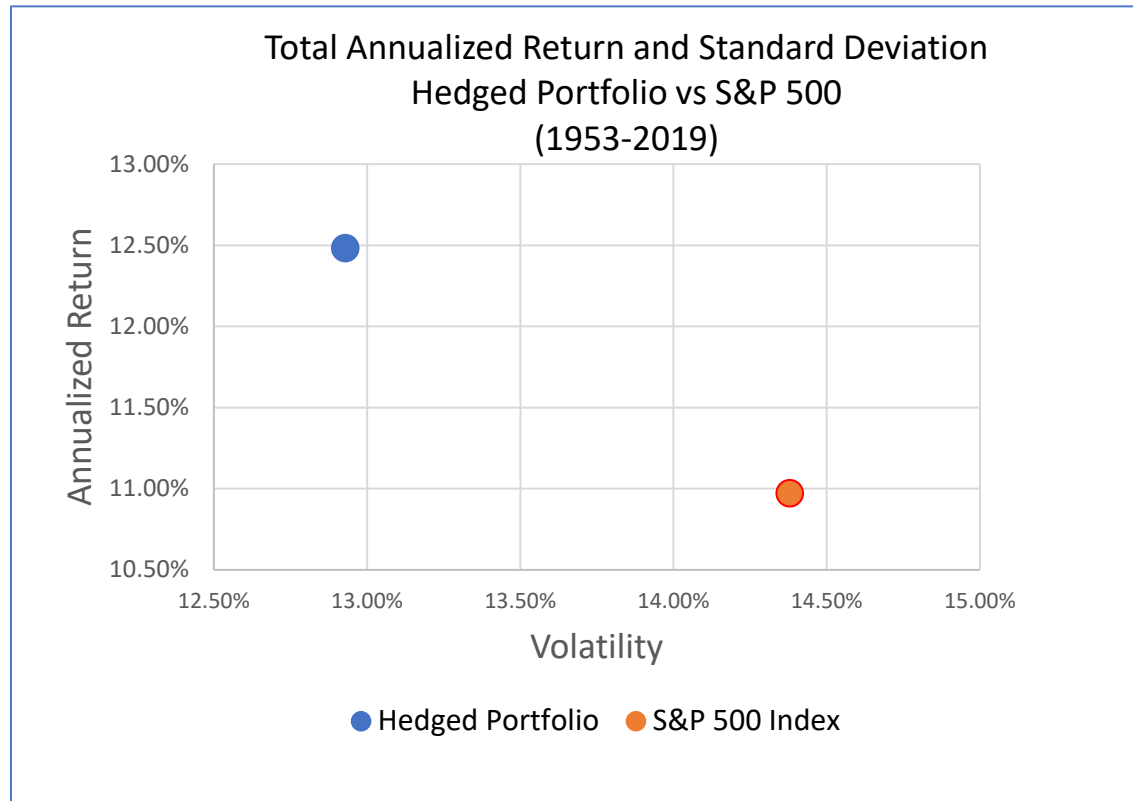
Market Scenarios and Predicted Returns

¹ Diversified Portfolio assumed to have same risk profile as S&P 500

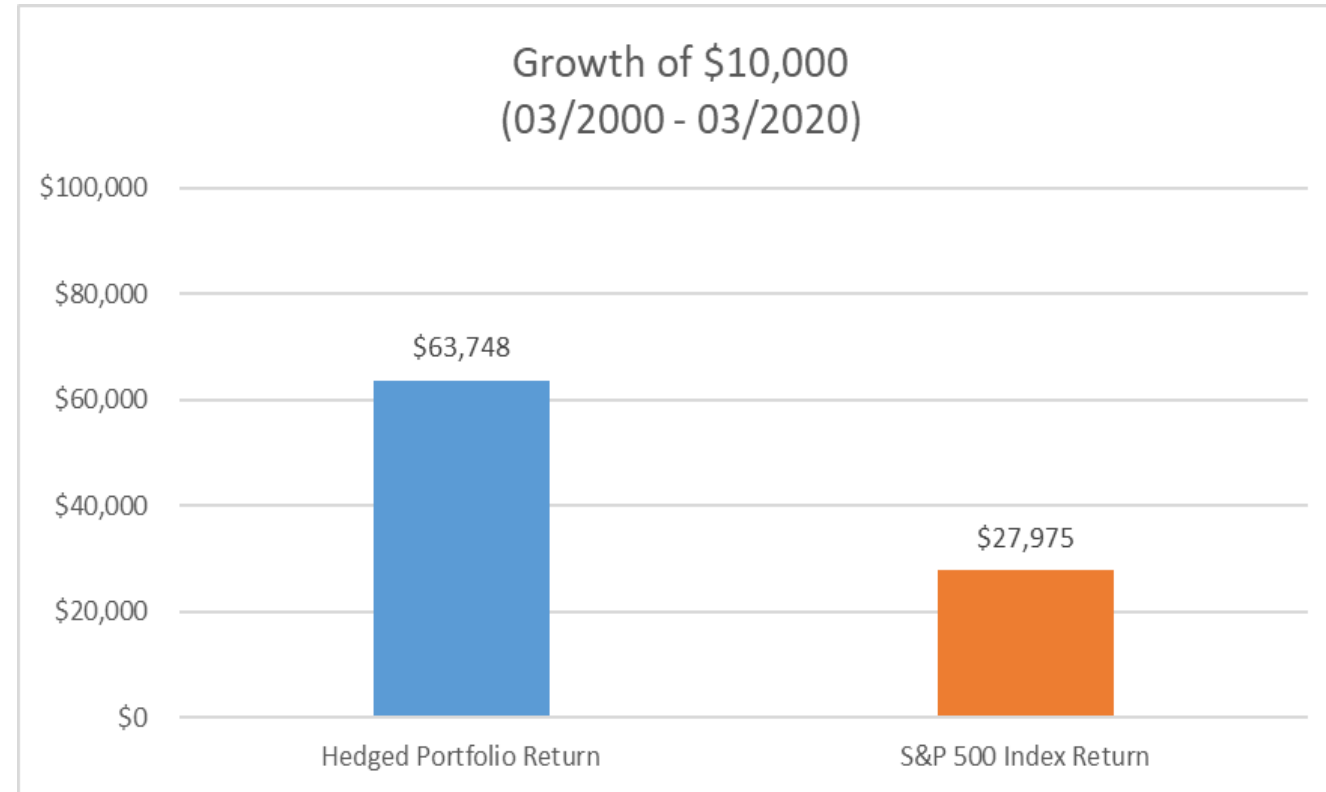
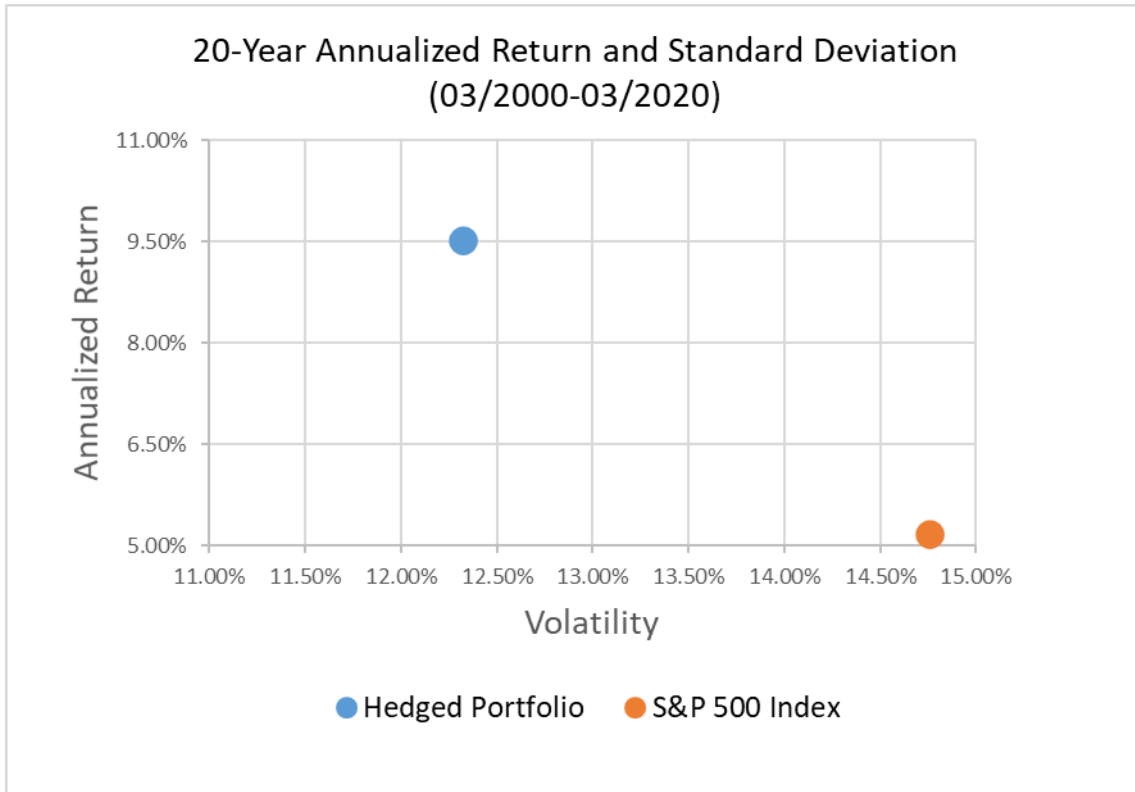
² Net Return assumes that cost to purchase the put option is 5% of the Investment Portfolio Value

S&P 500 Return	Portfolio Return on 5% Out-of-the-Money Put Option	Return of Investment Portfolio ¹	Net Return of Portfolio ²
+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%

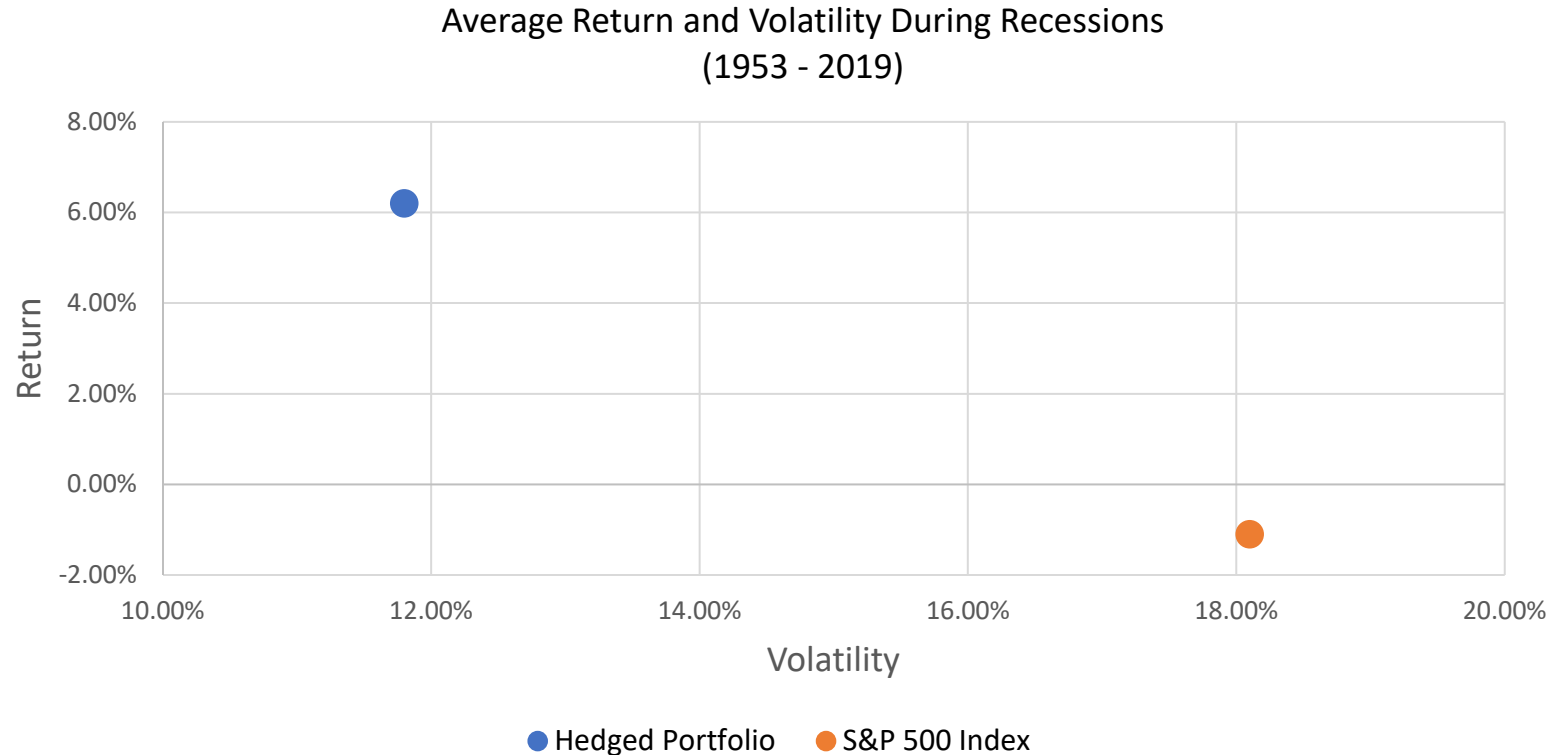
Hedging Strategy Delivers Higher Returns with Lower Volatility



Strategy Outperforms Across Multiple Timeframes: 20-Year Annualized Returns and Volatility



Hedging Strategy Outperforms During Recessions



Looking at last 10 recessions dating to 1953, the hedging strategy has an average return of +6.2% and volatility of 11.8% during recessions compared to -1.1% return and 18.1% volatility for the S&P 500.

Conclusion

- 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.