



## September 2021 Newsletter

Dear Investor,

The Global Volatility Summit (“GVS”) brings together volatility and tail hedge managers, institutional investors, thought-provoking speakers, and other industry experts to discuss the volatility markets and the roles volatility strategies can play in institutional investment portfolios. The GVS aims to keep investors updated on the volatility markets throughout the year, and educated on innovations within the space.

**Gladius Capital Management has provided the latest piece in the GVS newsletter series.**

Cheers,  
Global Volatility Summit

Questions? Please contact [info@globalvolatilitysummit.com](mailto:info@globalvolatilitysummit.com)  
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## GLADIUS SOLUTIONS - VOLATILITY VIEWS

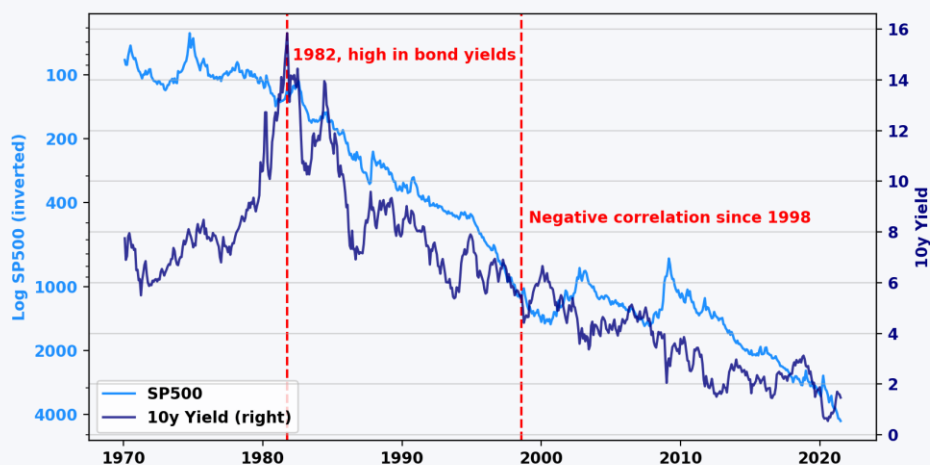
Q3 2021

### HEDGING 'TRANSITORY' INFLATION

With unprecedented monetary and fiscal policy initiatives over the last year, markets may well be at the crossroads of a change in bond yields, inflation dynamics, and stock-bond correlations. What follows here is a review of the current environment, highlighting the underrating of inflation risks in stock and bond markets, followed by a discussion of portfolio hedges using options.

A plot of bond yields over the last 50 years shows their secular downward trajectory; stocks (plotted inversely) have also benefited and have reached their highest valuations in history.

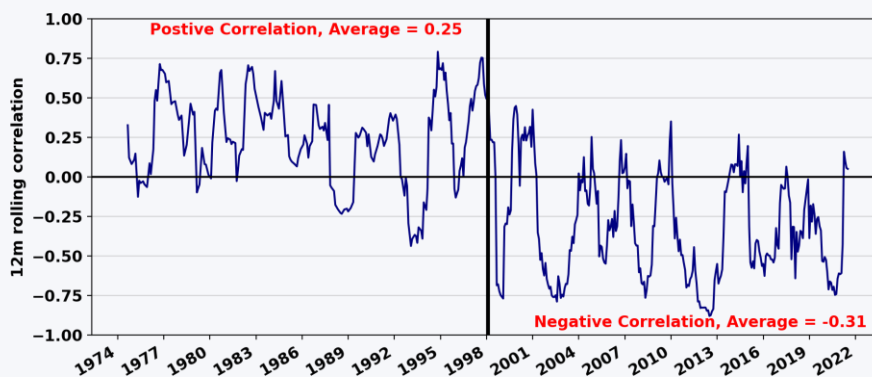
Bond Yields and Stock Valuations 1970 - Present



Source: Gladius proprietary and Bloomberg

As an added benefit, stock-bond correlations shifted to negative territory around 1998, fueling the risk parity trade and widespread acceptance of the '60-40' portfolio allocation paradigm.

Stock Bond 12 Month Rolling Correlation 1970 - Present



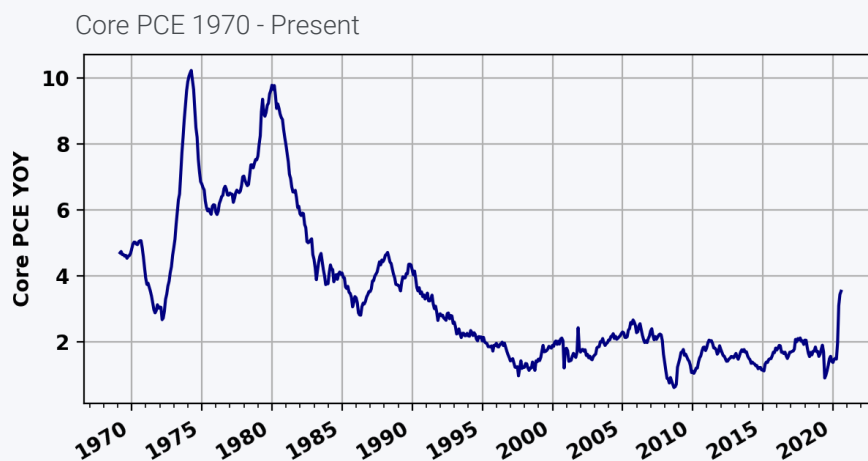
Source: Gladius proprietary and Bloomberg

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## Largest Inflation Spike In Three Decades

Both the core Consumer Price Index (CPI) and the Personal Consumption Expenditures (PCE), the latter being the Fed's preferred gauge of inflation, have spiked in Q2 2021 to levels comfortably over the highs since the mid-90s.



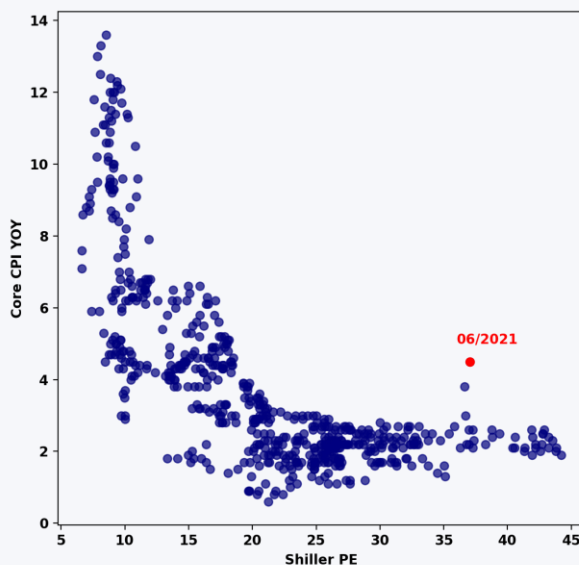
Source: Gladius proprietary and Bloomberg

The last half century in finance has been driven by falling bond yields and inflation, leading to high equity valuations and ultra-compressed credit spreads. Furthermore, as the Fed has been the largest single buyer of Treasuries through its QE programs, the yields' trajectory, at least in the past decade, can take the Fed as its primary causal factor.

## Stock and Bond Valuations are Inconsistent with Recent Inflation Levels

A scatter plot of the core CPI versus the Shiller PE ratio shows much lower SP500 market valuations at comparable inflation levels.

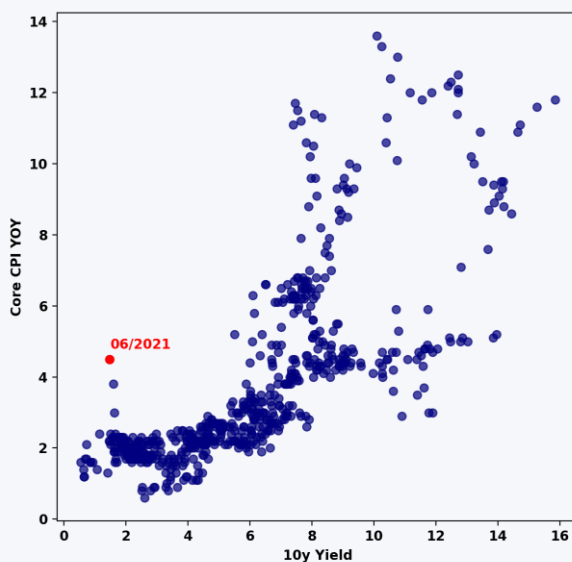
Shiller PE and Core CPI Scatter 1970 - Present



Source: Gladius proprietary and Bloomberg

Similarly, core CPI plotted against 10-year bond yields shows the latter's upside potential.

10-year and Core CPI 1970 - Present



Source: Gladius proprietary and Bloomberg

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The current stock and bond market valuation levels in the preceding scatter plots concur with the Federal Reserve's view that the spike in inflation will be transitory. Stocks, however, are too highly valued, and bond yields are too low to be consistent with the recent high inflation readings. Thus, a non-transitory inflation outcome would be expected to shift both stock and bond valuations lower.

### What Next?

The Fed's party line has been that the current spike in inflation – relative to their long-held 2% target - will be transitory and bond and stock markets have thus far wholly concurred with that view.

Markets, however, have underrated the risks of:

1. A persistent and higher (than 2%, the Fed's 'target') level of inflation, lowering equity operating margins, and/or
2. Bond yield reflation, increasing corporate financing rates.

Now more than ever, the potent combination of radical monetary and fiscal policy could end the current low inflation environment. In an environment where persistent inflation occurs, the Fed would be faced with Hobson's choice: tighten policy and sacrifice the asset owners; or maintain policy and sacrifice those most affected by inflation. With the Fed already moving towards tapering their asset purchases (QE) in this 'transitory' environment, a risk-off move in markets with an inflationary backdrop would put the Fed in a bind. Decreased intervention – through QE or rate reductions - by the Fed could effect a seismic shift in the stock-bond negative correlation regime that has been in place since 1998 and which has been a key volatility buffer during market shocks: in a positive correlation regime, bonds would not act as a hedge to declining stocks. Accordingly, investors may want to consider hedges in their equity portfolios.

### Constructing Hedges Using Options

Designing a hedging program starts with defining the risk to be reduced eg. equity risk. The focus here will be on options, chosen for their limited liability characteristics and their ability to deliver precise attachment points. Then, the high-level attributes to consider for a hedge include 1. attachment, 2. directness, and 3. cost (broadly represented by implied volatility). Constructing a hedge is an exercise in managing trade offs between these attributes.

#### 1. Attachment:

The degree of attachment is the level at which the hedge is expected to engage and reflects the loss tolerance of the investor. Hedges can be cheapened by:

- Giving up protection below a certain lower level and/or
- Forgoing participation in equity returns above a certain level.

#### 2. Directness:

The directness of the hedge can be altered - with a view to making it cheaper - by taking:

- Correlation risk - relying on historical correlations between the market-to-hedge and the auxiliary market.
  - Eg. using SP500 puts to hedge EM risk.
  - Eg. using Treasury bond options to hedge SP500 risk.

- Contingency risk - predicated on ascribing a higher-than-market-expected joint probability for the hedge event and another event
  - Eg. using SP500 puts to hedge EM risk.
  - Eg. SP500 put that pays off only if the 10-year Treasury yield is above 3% (which would be cheaper than the straight SP500 put).

Less direct hedges are often cheaper but are unlikely to work if the assumptions do not pan out. There also may be a time lag between the event and payoff.

### 3. Cost

For direct hedges, cost is determined by the level of implied volatility – more generally, by the implied volatility surface. The implied volatility can be thought of as the market's pricing of insurance and is related to the expected move for the underlying asset.

For the simplest hedge – buying a put – cost increases with the level of the volatility surface. But for a hedge where options are sold, the cost may actually decrease with increasing volatility. For indirect hedges, the cost can depend on other variables like implied levels of correlation.

## Hedge Constructions for Equities

Should inflation not be transitory, equity valuations are likely to be at risk. Below, we have illustrated various hypothetical hedge constructions for equities :

1. Direct equity hedge - moderate attachment, uncapped upside: SP500 1y 90P
2. Direct equity hedge - moderate attachment with upside tradeoff: SP500 1y collar
3. Direct equity hedge - low attachment (captures tail risk): SP500 Two Factor Tail Hedge
4. Indirect equity hedge – long TLT 1y 110C to hedge SP500

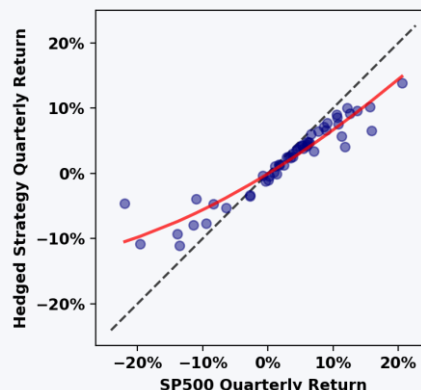
### 1. Direct equity hedge - moderate attachment, uncapped upside: SP500 1y 90P

We can hedge the equity by purchasing puts directly. With a strike around 90%, the put can be reactive to most sell-offs. The put gives complete protection without an upside cap. However, the cost is usually high.

An example is using the 1-year 90% put. To reduce the starting time dependency, we can purchase puts on March/June/September/December, each with 25% notional of the equity.



Source: Gladius proprietary and Bloomberg



Gross and Hypothetical

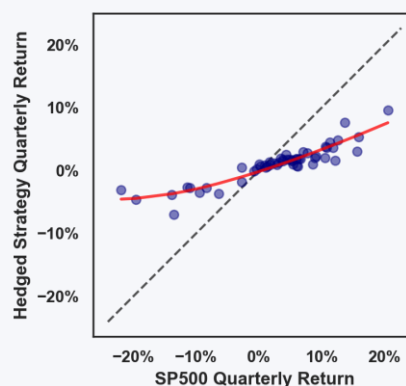
## 2. Direct equity hedge - moderate attachment with upside tradeoff: SP500 1y 90-105 collar

A collar strategy usually consists of an OTM (out-of-the-money) put while writing an OTM call. It reduces the cost by giving up some upside.

An example is purchasing the 1-year 90% put while writing the 1-year 105% call. As in the case of the 1-year 90% put, we allocate 25% notional to each quarterly series.



Source: Gladius proprietary and Bloomberg

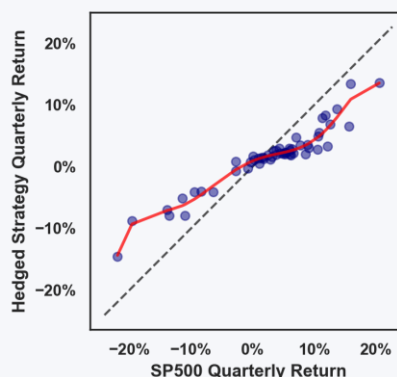


Gross and Hypothetical

The cost can be further decreased by giving up some downside protection. For example, we can additionally sell the 1-year 80% put, constructing a 'put spread collar'. This structure provides partial downside protection for an equity drawdown of -10% to -20%, but is however more cost effective than the straight collar.



Source: Gladius proprietary and Bloomberg



Gross and Hypothetical

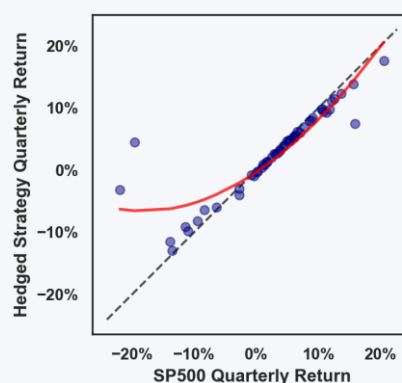
### 3. Direct equity hedge - low attachment (captures tail risk): SP500 Two Factor Tail Hedge

Gladius has developed a two-factor tail hedging (TFTH) strategy, which uses both short-term and long-term deep OTM puts for effective hedging in different tail events. The deep OTM puts have lower attachment point but also lower hedging cost. They may fail to respond to mild drawdowns but can be effective during a major crash. However, the deep OTM puts can also get expensive when the market is extremely stressed. To control the cost and monetize gains systematically during a volatility event, we can set a fixed budget and a rolling schedule for the strategy.

The figures below show the performance of the TFTH strategy with a 2% annual budget overlaid on the SP500 .



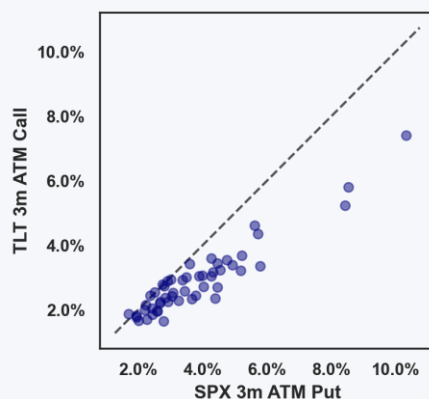
Source: Gladius proprietary and Bloomberg



Gross and Hypothetical

### 4 Indirect equity hedge with long TLT calls

Since the correlation between stocks and bonds has been negative since about 1998, 20 Year Treasury Bond ETF (TLT) calls can be used as an indirect hedge for the SP500. TLT calls are usually cheaper than SP500 puts, as shown by the scatter plot below.



Source: Gladius proprietary and Bloomberg

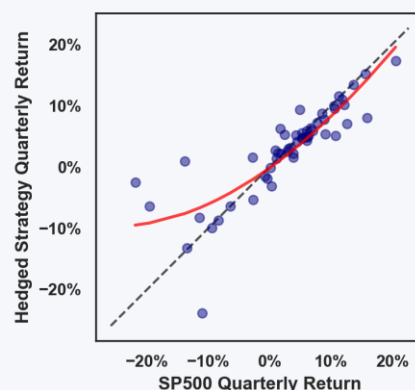


To eliminate starting point dependency, as in the case of the 1-year 90% put hedge example, we can purchase 1-year 110% TLT calls on March/June/September/December with 25% notional on each series.

As the graph shows, although the TLT calls can also provide effective downside protection without a cap, sometimes the hedge failed to engage when the SP500 was down. If stock-bond correlations were to shift to their pre-1998 regime, this hedging strategy would not work.



Source: Gladius proprietary and Bloomberg

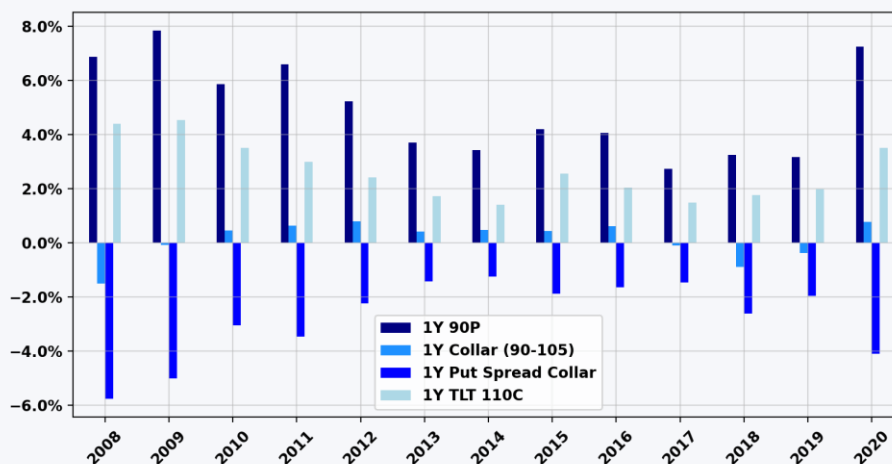


Gross and Hypothetical

## Hedge Constructions for Equities – Attributes and Tradeoffs

The figure below shows the annual initial cost for the different hypothetical hedge constructions for equities (negative cost means upfront capital inflow).

Annual Premium 2008 - 2020



Source: Gladius proprietary and Bloomberg

The following table is a summary of the different equity hedges discussed and the key attributes and tradeoffs.

Strategy Attributes	1Y 90% Put	Collar		Tail hedge (TFTH)	1Y 110% TLT Call
		Standard (90P, 105C)	Put spread		
Upfront Cost	High	Low	Negative (very low)	Low	Medium
Attachment - Upside	Uncapped	Capped	Capped	Uncapped	Uncapped
Attachment - Downside	Full protection	Full protection	Partial - give up some protection on large drawdowns	Partial - extreme drawdowns only	Full protection (if the correlation holds)
Directness	Direct	Direct	Direct	Direct	Indirect - takes correlation risk

## Summary

- The long, secular move from 1980 towards lower yields and inflation may be at an end.
- The potential for persistently higher inflation is not currently priced in by stocks and bonds.
- Persistent higher inflation can lead to:
  - Lower equity valuations
  - Higher bond yields
  - Shift in the stock-bond negative correlation regime, with implications for portfolio construction
- Now may be a prudent time to consider portfolio hedges to protect against equity risk.

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