

# PORTFOLIO PROTECTION: ONE SIZE FITS NONE

## Investment Insights Series

The desire among institutional investors for portfolio protection<sup>1</sup> (hereafter simply referred to as 'Protection') ebbs and flows based on their most recent experience. Despite the fact there is no shortage of research papers advising investors to not pay for explicit Protection because it is too expensive in terms of negative carry cost, the pandemic-induced sell-off in March 2020 has renewed investors' interest in Protection strategies. For investment fiduciaries, it is difficult to see a strategy register negative returns quarter in and quarter out. And therein lies the challenge of allocating capital to Protection strategies: everybody wants Protection, but no one wants to pay for it.

Despite the negative carry cost, institutional investors seek out Protection strategies because they implicitly or explicitly acknowledge that portfolio diversification fails when risk assets are in a free fall. The notion that portfolio diversification is the only 'free lunch' in investing is flawed: it imparts benefits when markets are functioning normally (when one does not need Protection) but fails miserably at times of market stress (when everyone needs Protection).<sup>2</sup> Research papers advising against explicit Protection are often based on long-term averages and simplifying assumptions that completely ignore the spending needs of pension plan sponsors during crisis periods. Severe drawdowns are infrequent and episodic in nature; therefore, the challenge with looking at long-term averages (10 years or longer) is that they tend to mask these infrequent episodes of market drawdowns.

Despite the prevailing advice to the contrary, we believe investors need explicit Protection within their diversifying strategies and at the overall plan level. Protection is valuable, not just because it protects existing plan assets during stress periods, but also because it enables plan sponsors to avoid forced selling to meet their ongoing spending needs, especially when markets are in a free fall.

## Protection is 'too expensive'

Certainly not all Protection is too expensive; therefore, a clarification is in order. When investors remark Protection is too expensive, what they often mean is that passive systematic buying of put options (i.e., explicit Protection) to hedge against equity losses is too expensive. That statement is uncontroversial. As a rule of thumb, past researchers have pegged the cost of

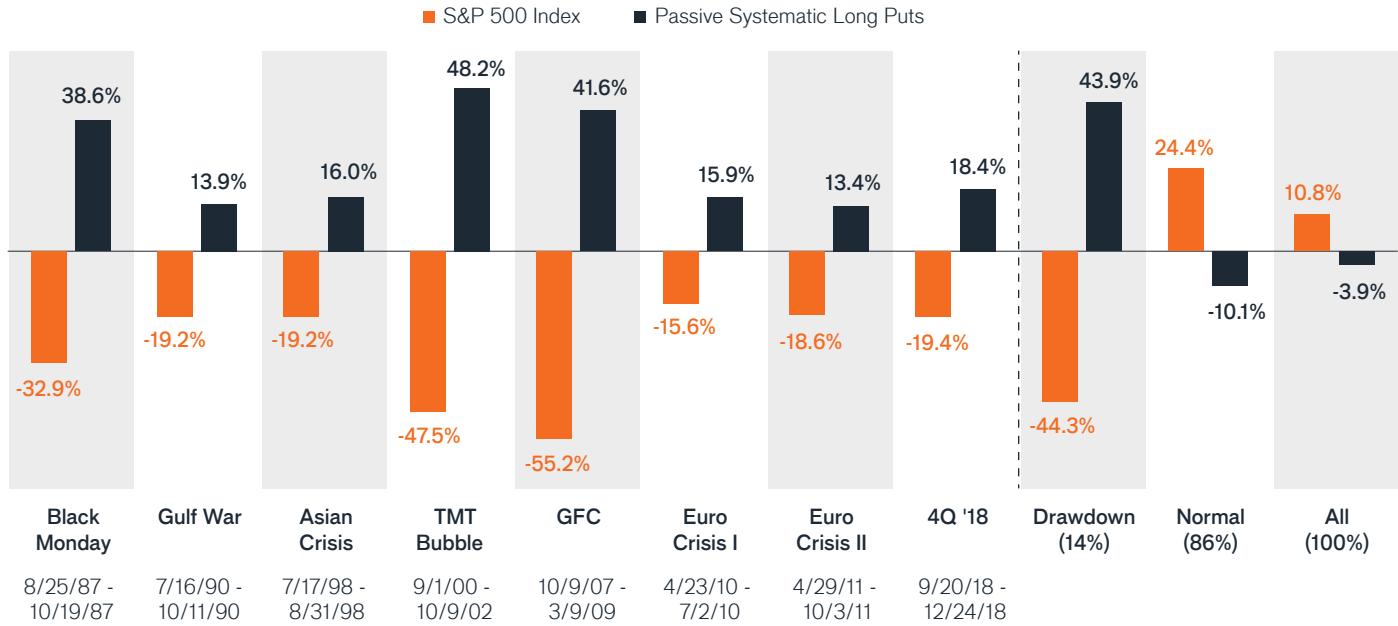


**Suny Park, CFA, CPA**  
Head of Institutional  
Client Strategy,  
North America

## Key Takeaways

- Protection is valuable, not just because it protects existing plan assets during stress periods but also because it enables plan sponsors to avoid forced selling to meet their ongoing spending needs, especially when markets are in a free fall.
- Despite its cost, our research indicates a systematic put option strategy that provides 'always on', non-timed, long convexity exposure that captures substantial positive alpha in severe left-tail sell-offs should play a prominent role in Protection portfolios.
- In constructing Protection portfolios, plan sponsors are faced with explicit Protection that is expensive, but has proven to be highly effective, and implicit Protection that is less expensive but with no ex-ante guarantee of its effectiveness in the next crisis. Protection portfolios should combine both explicit and implicit Protection strategies or assets that address different types of crises. When it comes to Protection, one size fits none.

Exhibit 1: Systematic Long Put Strategy - A Compelling Track Record in Portfolio Protection (1985 - 2018)



Source: Harvey, Campbell R., Edward Hoyler, Sandy Rattray, Matthew Sargaison, Dan Taylor and Otto Van Hemert. "The Best of Strategies for the Worst of Times: Can Portfolios be Crisis Proofed?" 17 May 2019.

systematically maintaining a passive put option program at around 5.0% per year. More recently, Campbell Harvey et al. estimated the cost of maintaining a passive at-the-money long put program at -3.9% per year (1985 – 2018)<sup>3</sup>. That is a meaningful drag on performance, especially when, during the same period, the S&P 500® Index returned 10.8% per year.

Despite its cost, the systematic long put strategy has demonstrated a compelling track record in protecting against large equity losses during crisis periods, as shown in Exhibit 1. However, from an optics standpoint, it is extremely difficult for investment committees to always maintain exposure to a Protection strategy that reports negative returns in normal environments (representing 86% of all observations). And this hindrance has led many in the investment community away from explicit Protection strategies to the following implicit Protection investment strategies, or assets perceived to be more cost-effective than systematic long put option strategies:

1. U.S. Long Treasuries
2. Gold
3. Trend-following or time series momentum
4. Alternative risk premia
5. Low-volatility (or low-beta) equities
6. Quality (or defensive) equities

The foregoing list is by no means exhaustive. We will briefly opine on the benefits and costs associated to each one of the foregoing assets and investment strategies.

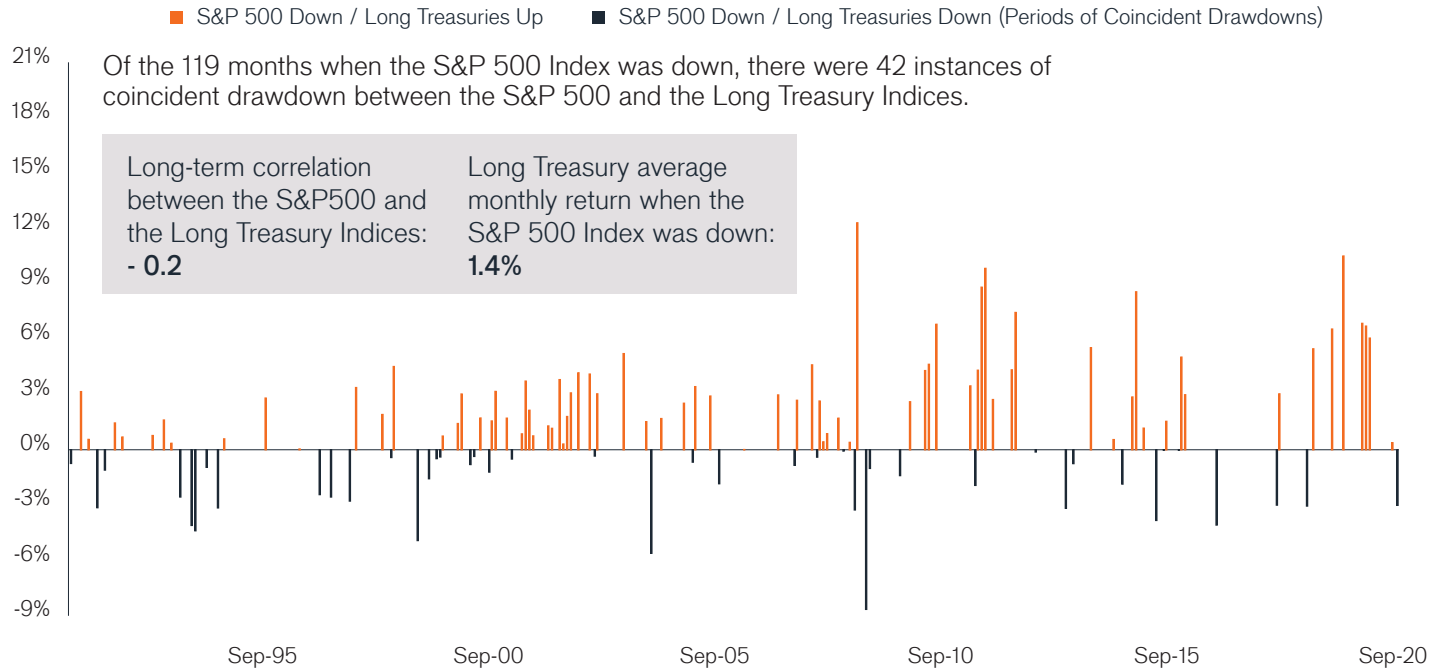
### U.S. Long Treasuries

In our opinion, as a capital preservation asset, long-dated U.S. Treasuries ('Long Treasuries') deserve a place in Protection portfolios. As proxied by the Bloomberg Barclays US Treasury Long Index in Exhibit 2, Long Treasuries have generated an average monthly return of 1.4% in all months when the S&P 500 Index registered a negative return.

Prospectively, however, some question the future efficacy of Long Treasuries for two major reasons:

1. If equities fall due to unexpected inflation or rising interest rates, then Long Treasuries may not provide the necessary Protection.
2. Given where the yield for 30-year Treasuries recently stood (1.65% as of 31 December 2020), there is limited room for yields to fall, especially if the Federal Reserve maintains a zero lower-bound target on policy rates.

**Exhibit 2: Coincident Drawdown - Long Treasuries and the S&P 500 Index (Oct-90 to Sep-20)**



Source: Bloomberg, Janus Henderson Investors.

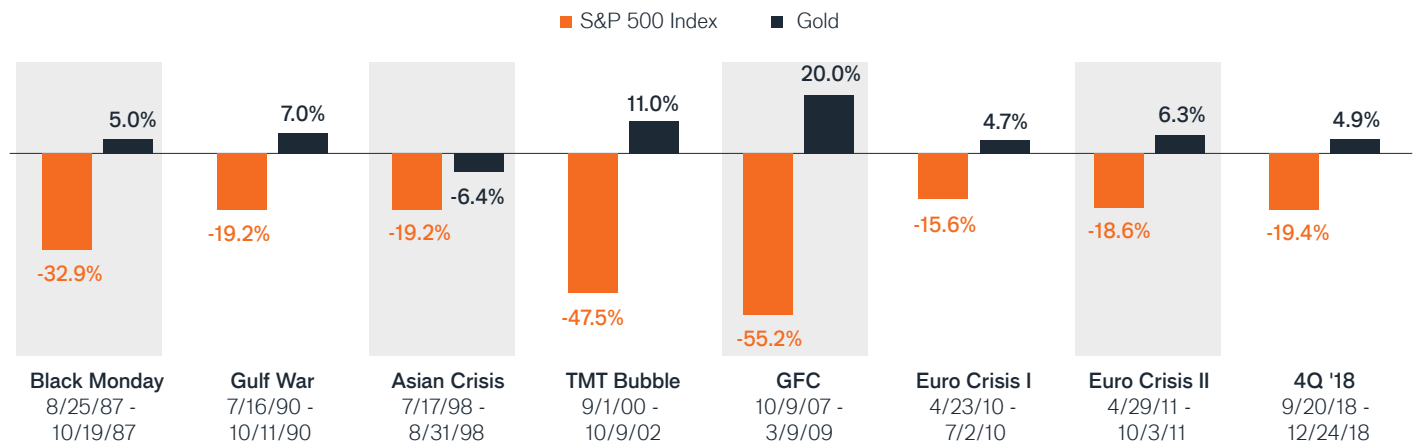
There are merits to both, although, no further explanation seems necessary on the second point. As demonstrated in Exhibit 2, Long Treasuries do not always protect against equity sell-offs. While the long-term realized correlation between Long Treasuries and the S&P 500 Index has been negative (-0.2), there have been 42 instances (12% of all monthly observations) when Long Treasuries and equities witnessed coincident monthly losses – October 2020 being the most recent example. Notwithstanding, Long Treasuries’ track record in protecting against equity losses seems pretty compelling, especially when they have delivered returns in excess of 8.5% per year for the past 30 years.<sup>4</sup>

**Gold**

As a hedge against uncertainty, the benefits of holding gold appears to be in the eyes of the beholder. Beginning with Black Monday, with the exception of the 1997 Asian Financial Crisis, gold has performed exceptionally well as a crisis hedge, as shown in Exhibit 3.

However, despite its protection properties, some investors cannot bring themselves to invest in gold because it is not an income-producing asset. For the past 30 years, gold (as proxied by the S&P GSCI Gold Total Return Index) has returned 5.0%<sup>5</sup> per year. Given the similar rate of coincident drawdown with equities (16%<sup>6</sup> for gold versus 12% for Long Treasuries), the latter clearly has been a more cost effective hedge than gold.

**Exhibit 3: Performance of Gold in Crisis Environments (1985 - 2018)**



Source: Harvey, Campbell R., Edward Hoyle, Sandy Rattray, Matthew Sargaion, Dan Taylor and Otto Van Hemert. "The Best of Strategies for the Worst of Times: Can Portfolios be Crisis Proofed?" 17 May 2019.

## Trend-following (or time series momentum) strategies

There is general agreement in the investing community that trend-following strategies also belong in Protection portfolios. In persistent, trending sell-off environments like the aftermath of the 2000-2002 technology-media-telecom (TMT) bubble or the 2008 Global Financial Crisis, existing shorter-term equity hedges expire and the cost of re-hedging often becomes prohibitively expensive. In such environments, trend-following CTA strategies can provide highly efficient left tail protection, as demonstrated in Exhibit 4.

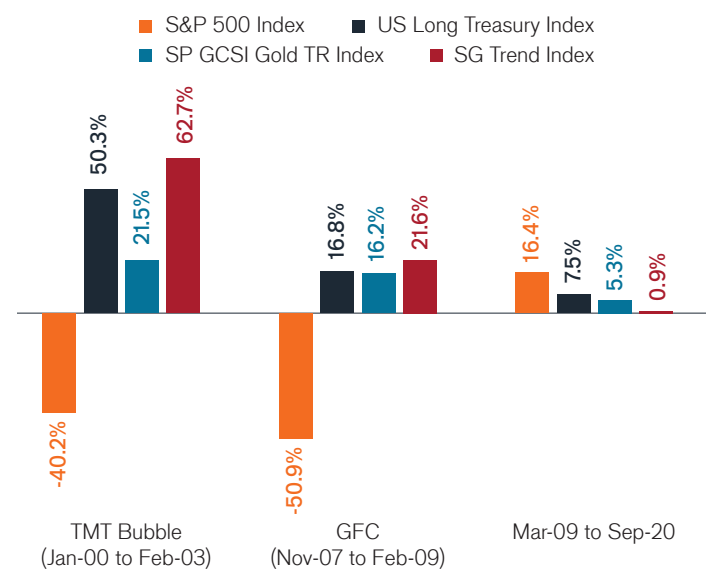
However, since the nadir of the Global Financial Crisis, trend-following strategies (as represented by the SG Trend Index) have badly lagged equities, Long Treasuries and even gold, as shown in the right set of bar graphs in Exhibit 4. While trend-following strategies have proven their mettle in the aftermath of the TMT bubble and the 2008 GFC, in recent periods, the opportunity cost of holding trend-following strategies has been rather high.

## Alternative risk premia

In recent years, some institutional investors have turned to alternative risk premia ('ARP') strategies as an implicit hedge against equity sell-offs. By design, ARP strategies target a long-term Sharpe ratio between 0.5 and 1.0 with low correlations (generally less than 0.3) to stocks and bonds. This combination of high-expected Sharpe ratio and low correlation to equities has appealed to cost-conscious investors seeking an

implicit hedge against equity sell-offs. While the correlation at the index level versus the S&P 500 Index (Exhibit 5A) has been close to the long term target, the realized returns since inception of the ARP index have been downright disappointing, as shown in Exhibit 5B. Counterintuitively, some ARP strategies included in the index chose to sell volatility that has high sensitivity to equity beta to boost returns, and that partially explains why the realized correlation at the index level has been slightly higher than the average long-term target of 0.3 or less.

### Exhibit 4: Protection Qualities of Trend-Following CTA Strategies



Source: Bloomberg, Janus Henderson Investors.

## Comparative Statistics - ARP vs. Long Treasuries, Gold and Trend-following (Jan-16\* to Sep-20)

Exhibit 5A: Correlation to the S&P 500 Index

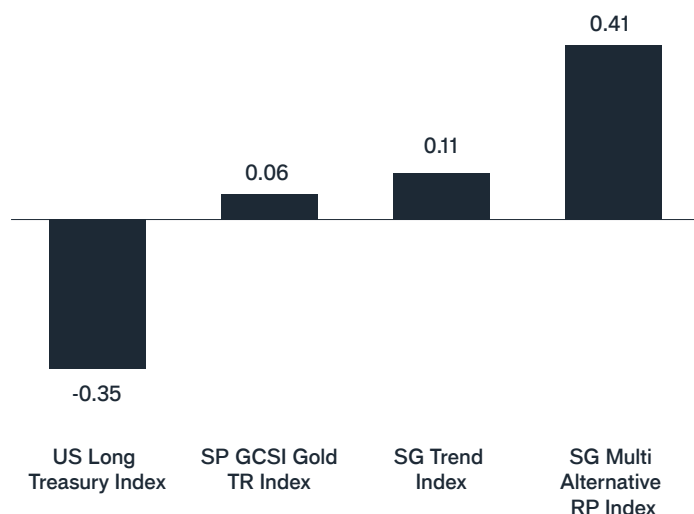
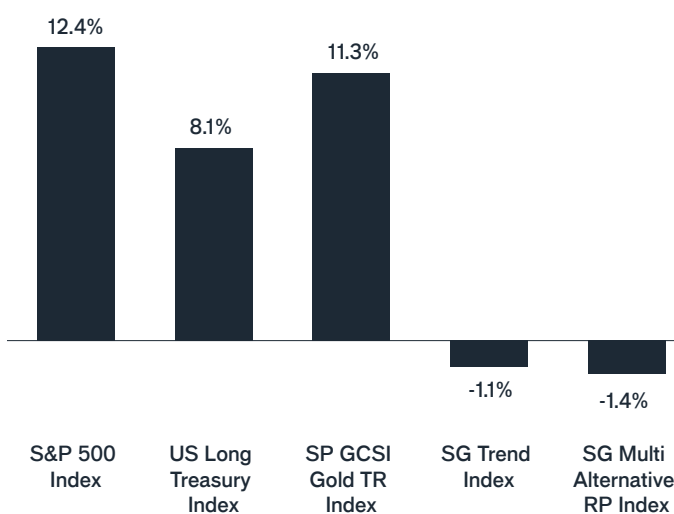


Exhibit 5B: Annualized Returns



Source: Bloomberg, Janus Henderson Investors.

\* January 2016 represents the inception date of the SG Multi Alternative RP Index.

## Low-volatility (or low-beta) and quality (or defensive) equities

There appears to be some evidence that low-volatility (or low-beta) stocks as a group exhibit higher Sharpe ratios than high-volatility (or high-beta) stocks. Therefore, one can construct a beta-neutral portfolio of long low-volatility stocks and short high-volatility stocks with low correlation to equities designed to generate positive returns during crisis periods.

Similar to a beta neutral long-short portfolio of low- and high-volatility stocks, there is empirical evidence that indicates a market-neutral portfolio of long high-quality stocks and short low-quality stocks can offer Protection during periods of severe market stress. Exhibit 6 shows comparative correlation statistics of long-short low-beta and long-short quality portfolios versus Long Treasuries.

Exhibit 6A shows the correlation statistics between the S&P 500 Index and the proxy portfolios for Low Beta, Quality and Long Treasuries at the beginning and end of four different crises. For example, the correlation between the S&P 500

Index and the Low Beta portfolio for 30 days leading up to the beginning of the Black Monday crisis was -0.70 and -0.67 during the last 30 days of the crisis. For the Quality portfolio, the correlation between the two was positive 0.41 at the beginning, but -0.53 at the end of the Black Monday crisis.

What stands out in Exhibit 6 is the perverse behavior of the Low Beta portfolio during the COVID-19 crisis. During the equity bull market leading up to the crisis, the Low Beta portfolio exhibited a negative correlation (-0.71), meaning that it lagged the S&P 500 Index; conversely, during the crisis when equities were in a free fall, it participated in equity losses as evidenced by positive correlation (0.75) – the exact opposite of what investors would want in a Protection strategy. For the entire COVID-19 crisis, the Low Beta portfolio sported a high positive correlation of 0.75 to the S&P 500 Index (Exhibit 6B).

The Quality portfolio performed better, exhibiting basically zero correlation with the S&P 500 Index at the beginning, at the end, and during the COVID-19 crisis drawdown. The COVID-19 crisis stands out from the other three major crises shown in that correlation statistics (with the exception of Long

### Comparative Statistics - Low Beta, Quality and Long Treasuries

Exhibit 6A: Trailing 1-Month Correlations versus the S&P 500 Index (Beginning and End of Crisis Periods)

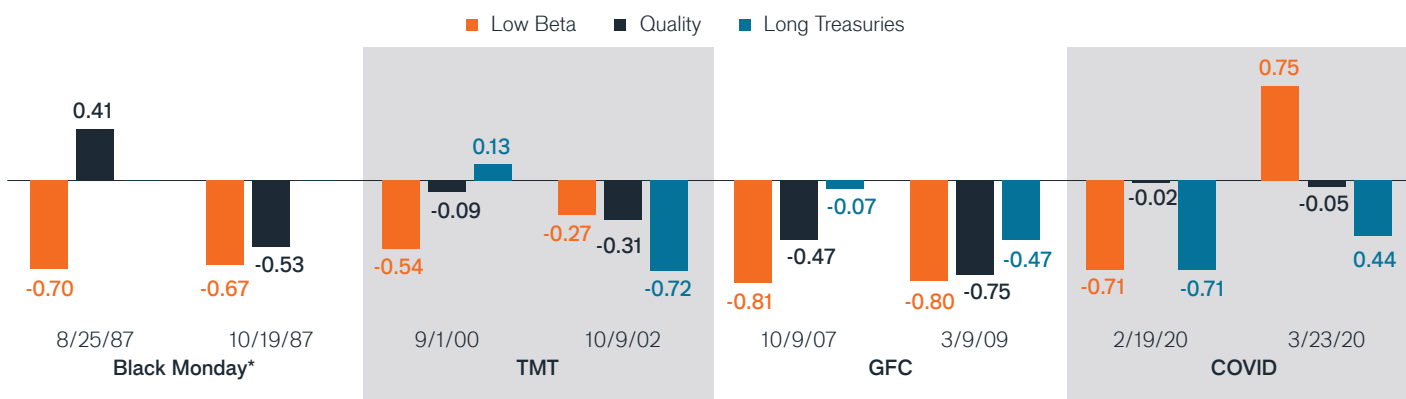


Exhibit 6B: Correlations versus the S&P 500 Index (Duration of Crisis Periods)



\* Data for High Yield, Long Treasuries and US Corp Excess Return over Duration-Neutral Treasuries is not available for Black Monday.

Source: <https://www.aqr.com/Insights/Datasets>. Janus Henderson Investors

Treasuries) are meaningfully higher for Low Beta, Quality, and the other three risk assets highlighted for illustrative purposes. The latter demonstrates each crisis is unique and that there are no foolproof implicit crisis protection strategies. And just because a strategy or an asset has provided portfolio protection in past crises, there are no guarantees that it will provide the same level of protection in the next crisis.

### The importance of protection for institutional plans with ongoing spending needs

Most research papers advocating for implicit, as opposed to explicit, Protection make a simplifying assumption regarding spending needs of institutional investors. Put more bluntly, they assume no spending by hypothetical institutional investors. This one simplifying assumption can have grave consequences – especially for mature defined benefit ('DB') plans that make regular and relatively constant benefit payments throughout normal and crisis environments.

Consider a mature DB plan ('Plan') whose annual benefit payments to its retirees and contributions to the plan represent 8.0% and 5.0%, respectively, of the beginning plan assets on 1 January 2000. This hypothetical plan makes equal quarterly benefit payments to its retirees and receives contributions semi-annually.

In Exhibit 7, one can appreciate the material impact that ongoing benefit payments can have on the terminal value of Plan assets. At the end of September 2020, roughly 20 years from the beginning of the period, the more realistic Plan with ongoing net benefit payments lagged a Plan with no ongoing benefit payments by \$13.4B in terminal value. The Plan asset reconciliation in Exhibit 7B shows that \$6.35B in difference is due to cumulative net distributions and \$7.03B due to sacrificed returns associated with those distributions. The latter point is worth elaborating.

Retirees expect benefit payments whether the stock market is going up or going down; therefore, plan sponsors do not have the luxury of pausing benefit payments when markets are down. In a prolonged crisis such as the one following the TMT

### The Impact of Benefit Payments on Plan Assets during Crises (Jan-00 to Sep-20)

Exhibit 7A: Terminal Value of Defined Benefit Plan (With and Without Ongoing Net Benefit Payments)

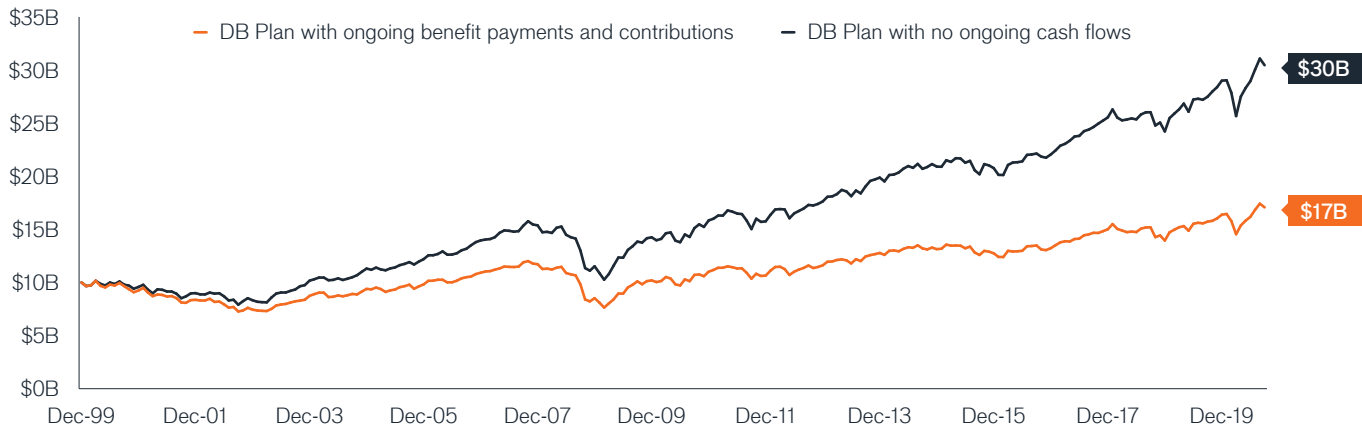


Exhibit 7B: Plan Asset Reconciliation of Defined Benefit Plan (With and Without Ongoing Net Benefit Payments)

**Plan Asset Reconciliation**  
(1 Jan 2000 - 30 Sep 2020):

	DB Plan with...		Difference
	Benefit Payments	No Benefit Payments	
Beginning Plan Assets (1 Jan 2000)	\$10,000,000,000	\$10,000,000,000	
- Net Distributions	(6,350,000,000)	-	(6,350,000,000)
+ Capital Appreciation	13,421,197,358	20,455,690,929	(7,034,493,571)
<b>Ending Plan Assets (30 Sep 2020)</b>	<b>\$17,071,197,358</b>	<b>\$30,455,690,929</b>	<b>\$(13,384,493,571)</b>
Dollar-Weighted Internal Rate of Return	0.53%	5.76%	

Source: Bloomberg, Janus Henderson Investors.

Exhibit 7 Fact Pattern: Terminal Value calculated assuming a 60%/40% mix between the MSCI ACWI and Bloomberg Barclays US Aggregate Index; annual benefit payments representing 8% of the Jan 1, 2000 plan assets occurring at the end of each quarter in quarterly installments; and contributions of 5% occurring bi-annually. Plan assets are rebalanced quarterly.



bubble, between 2000 and 2002, many plans were forced to sell plan assets to meet their benefit obligations even when the S&P 500 Index was down 20%, 30% or 40% from its peak. During this period, benefit payments far exceeded contributions to DB plans because companies, states, cities and local municipalities were in no financial position to make meaningful contributions to their respective plans. As a result, many plan sponsors sacrificed future returns on plan assets sold to meet benefit obligations to their retirees.

Previously we remarked: “Research papers advising against explicit Protection are often based on long-term averages and simplifying assumptions that completely ignore the spending needs of investors during crisis periods.” When quantifying the cost of Protection, those research papers do not take into consideration the opportunity cost of selling plan assets when markets are down significantly. The hypothetical DB Plan in Exhibit 7 made cumulative net benefit payments of \$1.4B<sup>7</sup> following the burst of the TMT Bubble, during the 2008 Global Financial Crisis and during the COVID-19 crisis. Returns sacrificed, as a result of the sale of plan assets when equities were down, approximated \$3.1B<sup>7</sup> as of 30 September 2020.

Protection is valuable, not just because it protects existing plan assets when financial markets are in a free fall, but also because it may provide necessary funds for benefit payments when plan sponsors can least afford to sell plan assets. It allows plan sponsors to remain invested in the market over the short term when markets may be down to capture future positive long-term returns.

### Implementation

In the early 2010s, a U.S. institutional consultant, introduced a form of portfolio protection called a ‘Crisis Risk Offset’ portfolio (CRO) to its consulting clients. In one permutation, the CRO portfolio consisted of long-duration Treasuries, trend following and alternative risk premia. Other institutions have opted for explicit tail hedging strategies to protect plan assets against major losses. What these different Protection implementations demonstrate is that institutional investors see the value in Protection, but there is no one right way of creating the most optimal Protection portfolio.

Notwithstanding, we respectfully disagree with most in the use of systematic put option strategies. It is almost impossible to anticipate a rapid, liquidity-induced, and exacerbated sell-off such as Black Monday in October 1987 or the most recent pandemic-related sell-off in March 2020. Therefore, despite its cost, a systematic put option strategy that provides ‘always on’, non-timed, long convexity exposure that captures substantial positive alpha in severe left-tail sell-offs should play a prominent role in Protection portfolios.

While systematic put option hedging strategies may provide this type of exposure, our research indicates there is room for a

discretionary macro strategy that focuses on owning Protection when it is needed but minimizing Protection when it is not. Examples of such macro-risk environments would include the past Greek debt crisis, the Brexit vote and the 2016 U.S. election. The strategy would buy, but not sell, convexity; hence, when volatility is identified to be cheap on a forward basis and in relation to the risk environment, it would opportunistically add long-volatility exposure.

Despite the recent disappointments, we agree with most in relying on trend-following CTAs to protect against persistent, trending sell-offs like the one experienced during the 2008 Global Financial Crisis. Trend-following CTAs seek to systematically capture trends in global markets and generate positive returns over business cycles. The convex payoff profile of time-series, trend-following strategies has historically provided highly efficient left tail protection in periods of extended market stress.

As a safe-haven asset, we believe Long Treasuries deserve a place in Protection portfolios. However, given the current level of yield, the future expected returns from Long Treasuries may be meaningfully lower than for the past 30 years. In addition, Long Treasuries may experience coincident drawdowns with equities if unexpected high inflation is the reason for the fall. However, few assets or investment strategies can match the capital preservation and income-producing qualities of Long Treasuries in times of market stress.

Earlier we remarked: “...from an optics standpoint, it is extremely difficult for investment committees to always maintain exposure to a Protection strategy that reports negative returns in normal environments (representing 86% of all observations).” This roadblock to implementing Protection strategies is real for most plan sponsors. For this reason, Protection strategies (especially explicit Protection) should not be presented or viewed in isolation; rather, they should be combined with other uncorrelated alpha-generating strategies such as complex risk premia or a long-short quality strategy so that, at the aggregated level, they may generate positive returns during normal market environments while providing Protection during periods of market stress.

### Bringing it all together

The cost of explicit Protection such as systematic put option strategies is expensive. This is true, but when making that assertion, many ignore the opportunity cost of sacrificed returns due to the sale of plan assets during extended periods of market stress. As quantified previously, in a compounding world, this opportunity cost is material, especially over a long investment horizon. In terms of the dollar-weighted internal rate of return (‘IRR’), the estimated difference between a DB plan with ongoing benefit payments versus one with no benefit payments, as shown in Exhibit 7<sup>8</sup>, is in excess of 5.0% per year in sacrificed IRR over a 20-year period.

While the drawdown levels may have been similar across past major crises, each crisis is unique and the effectiveness of various Protection strategies will vary from one crisis to the next. Even though both trend-following CTAs and low-volatility equities were highly effective between 2000 and 2002 following the TMT Bubble and in 2008 during the Global Financial Crisis, both performed poorly as Protection strategies in the most recent COVID-19 crisis.

Therefore, in constructing Protection portfolios, plan sponsors are faced with explicit Protection that is expensive, but has proven to be highly effective, and implicit Protection that is less expensive but carries no ex-ante guarantee of its effectiveness in the next crisis. Based on our research, a Protection portfolio should combine both explicit and implicit Protection strategies or assets that address different types of crises. When it comes to Protection, one size fits none.

Having experienced three major crises in a span of 20 years, plan sponsors and their consultants alike are wary of market gyrations that can adversely impact the terminal value of plan assets. As demonstrated in Exhibit 7, while a plan with no cash outflows may not need Protection because it can ride out the ups and downs of the financial markets, unfortunately, that is not the real world we live in. Institutional investors have ongoing spending obligations that must be met even when equities are down 20%, 30% or 40%. Protection is valuable, not just because it offers protection to existing plan assets during stress periods but also because it may enable plan sponsors to avoid forced selling to meet their ongoing spending needs, especially when markets are in a free fall.

## About the Author

### Suny Park, CFA, CPA

Suny Park is Head of Institutional Client Strategy, North America at Janus Henderson Investors. In this role, Mr. Park is responsible for providing thought leadership on key issues and customized client analysis to institutional investors in the United States and Canada. Prior to joining Janus in 2012, Mr. Park served as the head of global portfolio solutions and co-head of investment research for Rogerscasey. Past experience also includes international equity research for Northern Trust Global Advisors, business acquisition and distressed loan investing for GE Capital Services, pricing of weather derivatives for Koch Industries and public accounting for Deloitte & Touche.

Mr. Park received his bachelor of science degree in accounting from The King's College and an MBA in analytic finance from the University of Chicago, Booth School of Business. He holds the Chartered Financial Analyst and Certified Public Accountant (inactive status) designations. He has 30 years of financial industry experience.

<sup>1</sup> Portfolio Protection refers to an investment strategy or set of investment strategies that aims to offset losses associated with equities in periods of market stress.

<sup>2</sup> Park, Suny. Janus Henderson Investors Investment Insight Series: "A Hole in Strategic Asset Allocation." April 2018.

<sup>3</sup> Harvey, Campbell R., Edward Hoyler, Sandy Rattray, Matthew Sargaison, Dan Taylor and Otto Van Hemert. "The Best of Strategies for the Worst of Times: Can Portfolios be Crisis Proofed?" 17 May 2019.

<sup>4</sup> Source: Bloomberg, Janus Henderson Investors.

<sup>5</sup> Source: Bloomberg.

<sup>6</sup> Source: Bloomberg, Janus Henderson Investors. Calculation based on the S&P GSCI Gold Total Return and the S&P 500 Indices.

<sup>7</sup> Source: Janus Henderson Investors. Simulated data based on fact pattern in Exhibit 7B.

<sup>8</sup> Source: Janus Henderson Investors.

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151 Detroit Street, Denver, CO 80206 | [www.janushenderson.com](http://www.janushenderson.com)