CASE STUDY

Downside Protection During Market Drawdowns

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ABOUT QMA

QMA began managing multi-asset portfolios for institutional investors in 1975. Today, we manage both systematic quantitative equity and global multi-asset strategies as part of PGIM, the global investment management businesses of Prudential Financial, Inc. (PFI). Our investment processes, based on academic, economic and behavioral foundations, serve a global client base with $127.2 billion in assets under management as of 12/31/2019.

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To learn more about our MPS strategy, please contact QMA in the US at +1 (866) 748-0643 or in the UK at +44 (0) 20-7663-3400.

Given recent market volatility, there has been a greater focus on analyzing the tradeoff between upside growth in equities and downside protection in defensive equity strategies. QMA's US Market Participation Strategy (MPS) was designed in 1992 to participate in about 65% of the market upside with only about 30% of the downside of the S&P 500 Index. This combination of reduced maximum drawdown with significant upside capture has provided annualized returns in line with the S&P 500 Index over the long term—but with significantly less volatility. This strategy is guided by our portfolio management team's almost 30 years of experience[1] in designing and managing MPS (inception date 1/1/1992).

In our study, we compare various defensive equity strategies to QMA's MPS, which combines S&P 500 Index call options and US Treasuries. We find that MPS not only compares well with, or outperforms, most of the other defensive strategies, but it does so consistently during significant equity market drawdowns.

[1] As of 3/20/2020.

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QMA US Market Participation Strategy (MPS)

QMA's US Market Participation Strategy (MPS) seeks to provide upside participation when the US equity market advances, while reducing downside risk.[2] The strategy utilizes long-dated S&P 500 call options in combination with US Treasuries. Call options seek to provide upside participation with downside protection, while US Treasuries serve as a safe haven during turbulent market conditions. Using a disciplined process, exposures (market, volatility and duration) are actively managed in response to the changing market environment.

Coronavirus Crisis/Market Drawdown

As the Coronavirus (COVID-19) crisis spreads worldwide, with cases growing exponentially, and we look at "lockdowns" across many parts of the world, global equity markets have swooned. Markets remain extremely volatile as investors try to comprehend the financial impact to the global economy going forward.

Having entered an equity bear market in the US, we looked at the performance of MPS and comparable defensive strategies over the past month (Feb 20th to March 20th), to see if any of these strategies have indeed provided any measure of downside protection. As the table below shows, MPS has performed well compared to a range of popular defensive strategies.[3] We compared MPS against BXM (buy-write or covered call writing), PPUT (protective put), a 60/40 Balanced Portfolio (60% S&P 500 Index, 40% Bloomberg Barclays US Aggregate Bond Index.), SP5LVIT (S&P 500 Low Volatility Index) and VXAO (ICE BofA Merrill Lynch All US Convertibles Index). We also show the S&P 500 Total Return Index (SPTR) as a proxy/benchmark for the US equities market.

Coronavirus Crisis (2/20/2020 – 3/20/2020):

MPS* (Gross)	MPS* (Net)	BXM	PPUT	60/40	SP5LVIT	VXAO	SPTR
–10.6%	**–10.7%**	–29.1%	–10.0%	–19.9%	–32.4%	–26.1%	–31.8%

*Preliminary US MPS Composite returns.
Source: QMA, Bloomberg, FactSet and Markit.
Past performance is not a guarantee or reliable indicator of future results.

Past Drawdowns

While MPS has performed as expected so far during the Coronavirus crisis, we thought it would be interesting to see how it performed during past crises. Since MPS has a long track record (almost 30 years), and we've been in a bull market for most of this period, two crises are most relevant: the Global Financial Crisis (2007-2009) and the Tech Bubble Burst (2000-2002).

Again, throughout both time periods, MPS delivered on its objective of reducing downside risk and limiting significant drawdowns:

Global Financial Crisis (11/1/2007 – 2/28/2009; monthly data):

MPS* (Gross)	MPS* (Net)	BXM	PPUT	60/40	SP5LVIT	VXAO	SPTR
–10.0%	**–10.4%**	–35.8%	–38.2%	–32.5%	–33.5%	–40.5%	–50.9%

*US MPS Composite returns. Source: QMA, Bloomberg, FactSet and Markit.
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Tech Bubble Burst (9/1/2000 – 9/30/2002; monthly data):

MPS* (Gross)	MPS* (Net)	BXM	PPUT	60/40	SP5LVIT	VXAO	SPTR
–17.0%	**–17.5%**	–30.2%	–32.3%	–22.8%	9.0%	–31.8%	–44.7%

*US MPS Composite returns. Source: QMA, Bloomberg, FactSet and Markit.
Past performance is not a guarantee or reliable indicator of future results.

[2] There is no guarantee that this objective will be achieved.
[3] Detailed descriptions for each strategy are listed in the Appendix.

Long-Term Performance

While it is interesting to look at performance in down markets, it is also useful for the sake of completeness to evaluate the totality of performance of these strategies—not only in "bad times," but throughout time (in both up and down markets).

The table below lists key performance and risk statistics for all of the strategies mentioned above.

Long-Term Periodic Performance (Annualized) as of 2/29/2020:

	MPS* (Gross)	MPS* (Net)	BXM	PPUT	60/40	SP5LVIT	VXAO	SPTR
5 year								
Return	5.5%	5.2%	4.8%	7.4%	7.2%	9.9%	7.7%	9.2%
Std Dev	7.8%	7.8%	8.3%	10.3%	7.5%	10.4%	8.8%	12.6%
Sharpe Ratio	0.56	0.52	0.45	0.60	0.81	0.84	0.75	0.64
Max Drawdown	–9.1%	–9.1%	–10.8%	–10.5%	–7.6%	–9.5%	–14.2%	–13.5%
Sortino Ratio	0.79	0.72	0.39	0.88	1.08	1.04	0.97	0.80
15 year								
Return	6.8%	6.5%	4.8%	6.2%	7.1%	9.5%	7.7%	8.4%
Std Dev	7.2%	7.2%	10.3%	10.9%	8.5%	10.5%	11.4%	14.1%
Sharpe Ratio	0.75	0.70	0.34	0.44	0.67	0.78	0.55	0.50
Max Drawdown	–11.7%	–12.2%	–35.8%	–38.9%	–32.5%	–35.4%	–42.1%	–50.9%
Sortino Ratio	1.19	1.12	0.33	0.62	0.80	0.91	0.60	0.61
25 year								
Return	8.5%	8.1%	7.2%	6.7%	8.2%	11.0%	8.8%	9.6%
Std Dev	8.9%	8.9%	10.6%	11.7%	8.9%	11.2%	12.0%	14.7%
Sharpe Ratio	0.67	0.64	0.45	0.36	0.65	0.75	0.53	0.48
Max Drawdown	–19.0%	–19.5%	–35.8%	–38.9%	–32.5%	–35.4%	–42.1%	–50.9%
Sortino Ratio	1.04	0.98	0.46	0.54	0.87	0.98	0.63	0.64

*US MPS Composite returns.
Source: QMA, Bloomberg, FactSet and Markit.

As the table shows, **MPS** provides consistent risk-adjusted returns annualized over time, while reducing risk and limiting drawdowns over each period considered (5, 15 and 25 years). Some of the other strategies have outperformed at times during the periods shown above, but **MPS** has the lowest volatility and the best drawdown performance.

No investment strategy or risk management technique can guarantee returns or eliminate risk in any market environment.

Appendix

BXM – CBOE S&P 500 BuyWrite Index

The CBOE S&P 500 BuyWrite Index (BXM) is a benchmark index designed to track the performance of a hypothetical buy-write strategy on the S&P 500 Index.

The BXM is a passive total return index based on (1) buying an S&P 500 stock index portfolio, and (2) "writing" (or selling) the near-term S&P 500 Index "covered" call option, generally on the third Friday of each month. The SPX call written will have about one month remaining to expiration, with an exercise price just above the prevailing index level (i.e., slightly out of the money). The SPX call is held until expiration and cash settlement, at which time a new one-month, near-the-money call is written.

We consider the BXM a passive proxy and benchmark for a covered call strategy.

PPUT – CBOE S&P 500 5% Put Protection Index

The CBOE S&P 500 5% Put Protection Index is designed to track the performance of a hypothetical strategy that holds a long position indexed to the S&P 500 Index and buys a monthly 5% out-of-the-money S&P 500 Index (SPX) put option as a hedge. The PPUT Index rolls on a monthly basis, typically every third Friday of the month.

60/40 Balanced Portfolio (60% S&P 500 Index, 40% Bloomberg Barclays US Aggregate Bond Index)

This portfolio return is calculated monthly by adding 60% of the S&P 500 Index Total Return and 40% of the Bloomberg Barclays US Aggregate Bond Index return.

SP5LVIT – S&P 500 Low Volatility Index

The S&P 500 Low Volatility Index measures the performance of the 100 least volatile stocks in the S&P 500 Index. The index benchmarks low volatility or low variance strategies for the US stock market. Constituents are weighted relative to the inverse of their corresponding volatility, with the least volatile stocks receiving the highest weights.

VXAO – ICE BofA Merrill Lynch All US Convertible Index

The ICE Bank of America Merrill Lynch All US Convertibles Index is an unmanaged index that consists of convertible bonds traded in US-dollar denominated investment grade and non-investment grade convertible securities sold into the US market and publicly traded in the United States. The index constituents are market value-weighted based on the convertible securities prices and outstanding shares, and the underlying index is rebalanced daily. Convertibles offer the potential to participate in equity markets, while still providing bond-like defensive features in turbulent markets.

SPTR – S&P 500 Total Return Index

The S&P 500 Index is an unmanaged index that is widely regarded as the standard for measuring large-cap US stock market performance. The total return includes the price return plus dividends reinvested in the index.

Notes to Disclosure

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