Portfolio Risk And Performance

Buffer Madness

May 8, 2025

My partner Dan who wrote the original now writes the devastating response to his predictable critics. My only criticism is he is too kind.

Last month, we posted "Rebuffed," a short piece critical of options-based strategies such as "defined outcome funds" and "buffered ETFs." It showed that the vast majority of them failed to deliver either better returns or less-severe drawdowns than a simple combination of passive equities + cash.[1]

Since then, I've gotten quite a bit of—let's call it—feedback. In this article, I 1) tackle the six main criticisms of the original piece (now using data through April 30[2], and 2) offer a theory for why an industry that lacks compelling data and economic rationale to support it still has diehard fans.

Spoiler: it's the placebo effect.

But first, the criticisms:

1) The analysis cast too wide a net.

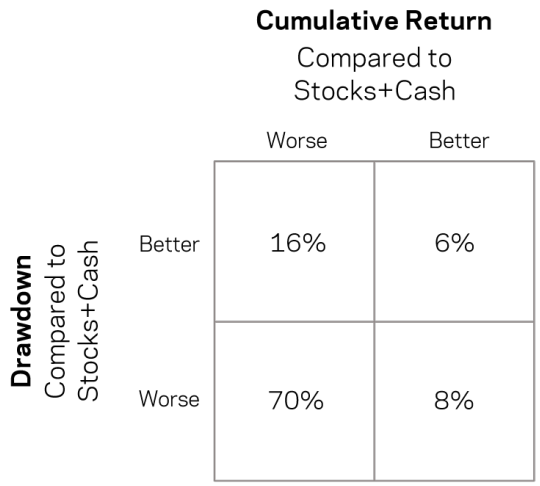
Let's start with a good point. The original analysis indeed looked at three different Morningstar categories: Derivative Income, Defined Outcome, and Options Trading - Equity Hedged. It treated them as a group, rather than separately (it was a short piece, after all). By combining these three, there's a chance that the overall disappointing performance could have been due to one bad category spoiling the bunch.

If that's the case, then it should show up in the data.

Here's the original analysis,[3] which shows how these categories performed compared to a combination of passive equities and cash. 86% of them delivered lower returns (i.e., the first column) over the past 5+ years, and 70% not only underperformed, they also had worse peak-to-trough drawdowns.[4]

Exhibit 1: All Funds in Morningstar's Derivative Income, Defined Outcome, and Options Trading - Equity Hedged categories with at least 5 years of performance

1/1/2020-4/30/2025

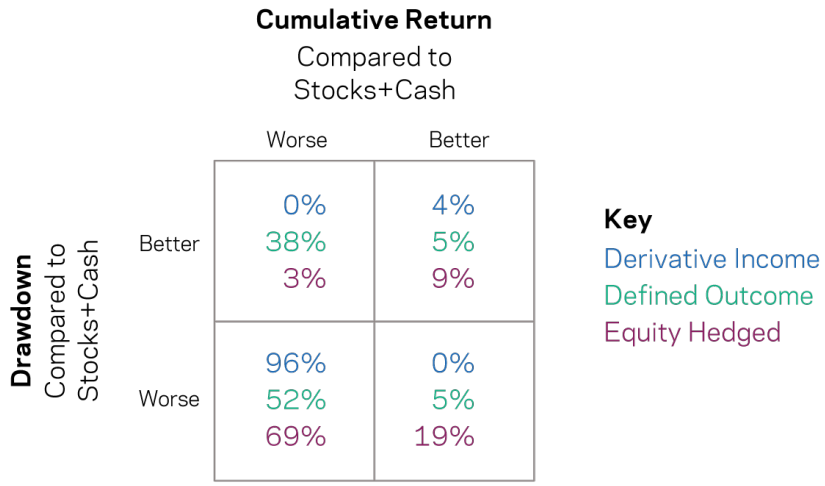


Source: AQR, Morningstar. The universe used is all funds in the Morningstar Defined Outcome, Derivative Income, or Options Trading - Equity Hedged categories with returns available from January 1, 2020, to April 30, 2025. There are 102 funds meeting these criteria as of April 30, 2025. Chart shows percent of funds in the universe fitting into each possible scenario. "Better" and "Worse" indicate each fund's performance in the either metric (total cumulative return or worst drawdown over the period) relative to its beta-matched benchmark strategy. Each fund's stock/cash benchmark is constructed by holding the S&P 500 using the fund's realized equity beta (over the period) as the portfolio weight, and the remaining weight (1 – equity beta) into US 3M T-Bills. We use the manager-defined oldest share class for each fund. All returns are net of fees as reported to Morningstar and denominated in USD. No representation is being made that any investment will achieve performance similar to those shown. For illustrative purposes only and not representative of a portfolio AQR currently manages. Past performance does not guarantee future results.

Now here's the same analysis, but split out for each of the three categories:

Exhibit 2: All Funds in Morningstar's Derivative Income, Defined Outcome, and Options Trading - Equity Hedged categories with at least 5 years of performance (by category)

1/1/2020-4/30/2025



Source: AQR, Morningstar. The universe used is all funds in the Morningstar Defined Outcome, Derivative Income, or Options Trading - Equity Hedged categories with returns available from January 1, 2020, to April 30, 2025. There are 102 funds meeting these criteria as of April 30, 2025. Chart shows percent of funds in the universe fitting into each possible scenario, split out into the three categories. "Better" and "Worse" indicate each fund's performance in the either metric (total cumulative return or worst drawdown over the period) relative to its beta-matched benchmark strategy. Each fund's stock/cash benchmark is constructed by holding the S&P 500 using the fund's realized equity beta (over the period) as the portfolio weight, and the remaining weight (1 – equity beta) into US 3M T-Bills. We use the manager-defined oldest share class for each fund. All returns are net of fees as reported to Morningstar and denominated in USD. No representation is being made that any investment will achieve performance similar to those shown. For illustrative purposes only and not representative of a portfolio AQR currently manages. Past performance does not guarantee future results.

Let's start with performance (the columns). Just as in the original analysis, the vast majority of each of these categories delivered lower returns than the stocks/cash combo (96% for Derivative Income, 90% for Defined Outcome, and 72% for Equity Hedged).

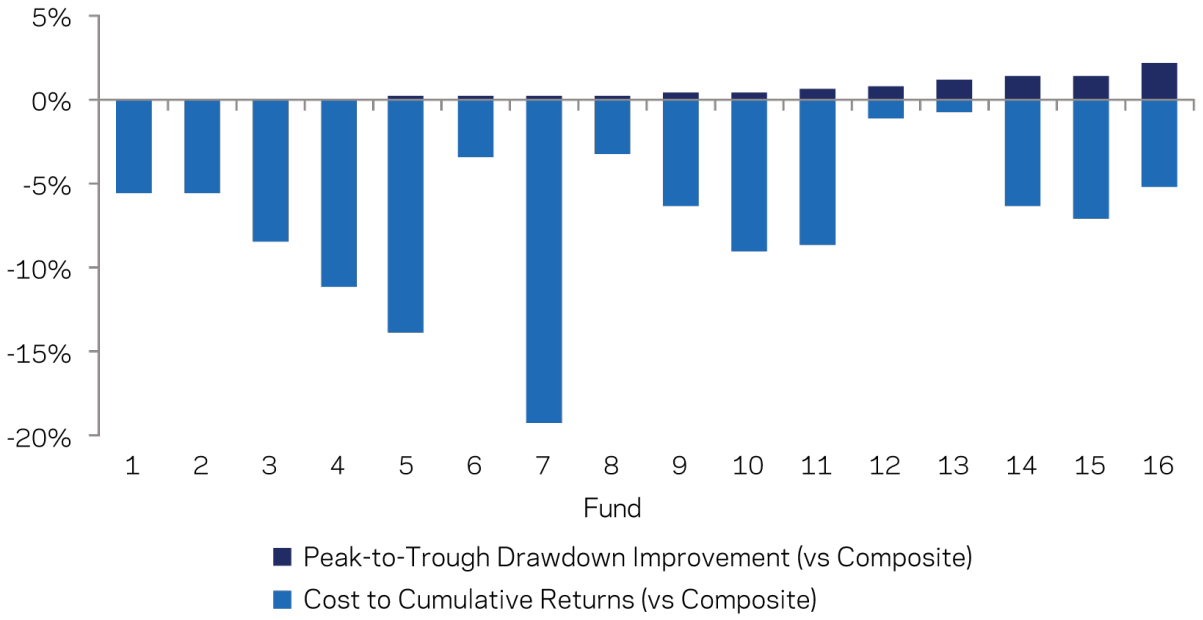
What about the worst drawdowns (the rows)? In the cases of Derivative Income and Equity Hedged the majority of funds not only had worse returns, they *also* had worse drawdowns (96% and 69% respectively) than the simple stocks/cash combo. But Defined Outcome—aka Buffered Funds—don't look quite so bad…? Sure, 90% of them underperformed our benchmark, but "only" 52% of them batted 0-for-2, i.e., delivered worse returns *and* worse peak-to-trough drawdowns. What about the 38% that went 1-for-2—the ones with worse returns (bad) but at least with a smaller peak-to-trough drawdown (good)? Was the trade-off worth it?

The chart below compares the magnitude of the good to the bad. Specifically, for the 38% of Defined Outcome funds that went 1-for-2 (there are 16 of them in this sample that delivered this combination of lower cumulative returns but a better worst drawdown), it shows the benefit in downside protection compared to the cost to cumulative returns. On average these funds, the winners of the drawdown contest at the expense of cumulative return, had one-time worst drawdowns that were only +0.7% better than the stock/cash benchmark, and paid for it with a -7.3% reduction in cumulative returns—hardly a good deal.[5]

Looking at these funds individually, even the single "best" in terms of downside protection (Fund #16) doesn't seem to be providing a trade-off most investors would find attractive. In other words, don't get too excited by the 38% of funds that made it up to the top-left quadrant.

Exhibit 3: The Cost of Comfort

The Defined Outcome Funds with a shallower worst relative drawdown paid a lot for it in cumulative returns, 1/1/2020-4/30/2025



Source: AQR, Morningstar. The universe used is all funds in the Morningstar Defined Outcome category with returns available from January 1, 2020 to April 30, 2025 that had shallower worst drawdowns and less total cumulative return than their stock/cash benchmark over the period. There are 16 funds meeting these criteria as of April 30, 2025. Chart shows the simple difference between each fund and its stock/cash benchmark, in both metrics shown (worst peak-to-trough drawdown and total cumulative return). Each fund's stock/cash benchmark is constructed by holding the S&P 500 using the fund's realized equity beta (over the period) as the portfolio weight, and the remaining weight (1 – equity beta) into US 3M T-Bills. We use the manager-defined oldest share class for each fund. All returns are net of fees as reported to Morningstar and denominated in USD. No representation is being made that any investment will achieve performance similar to those shown. For illustrative purposes only and not representative of a portfolio AQR currently manages. Past performance does not guarantee future results.

2) The analysis was over too short a time period.

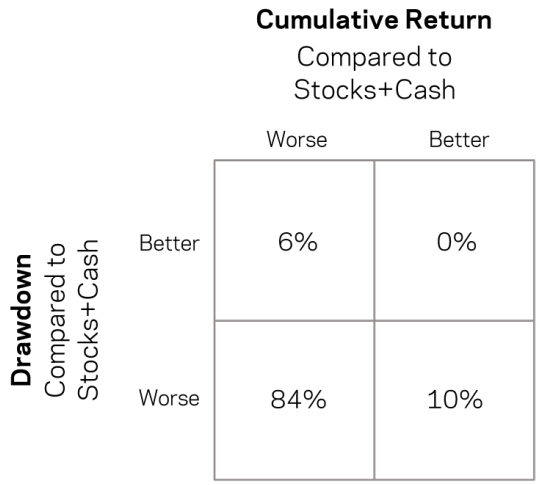
Regular readers of AQR research have come to expect analyses that use really long windows of data, be it in factors, trend-following, macro momentum, market drawdowns, or dealing with downside risk.

So why did my original analysis start only in 2020? The "problem" is that this industry wasn't very big until fairly recently—even on January 1, 2020, the three categories from our original analysis combined were only $32B.

But, again, this is an easy criticism to (at least partially) address.[6] Here's the original analysis, but rather than starting in 2020, I start in 2015, which means having only 31 funds to test.[7]

Exhibit 4: All Funds in Morningstar's Derivative Income, Defined Outcome, and Options Trading - Equity Hedged categories with at least 10 years of performance

1/1/2015-4/30/2025



Source: AQR, Morningstar. The universe used is all funds in the Morningstar Defined Outcome, Derivative Income, or Options Trading - Equity Hedged categories with returns available from January 1, 2015, to April 30, 2025. There are 31 funds meeting these criteria as of April 30, 2025. Chart shows percent of funds in the universe fitting into each possible scenario. "Better" and "Worse" indicate each fund's performance in the either metric (total cumulative return or worst drawdown over the period) relative to its beta-matched benchmark strategy. Each fund's stock/cash benchmark is constructed by holding the S&P 500 using the fund's realized equity beta (over the period) as the portfolio weight, and the remaining weight (1 – equity beta) into US 3M T-Bills. We use the manager-defined oldest share class for each fund. All returns are net of fees as reported to Morningstar and denominated in USD. No representation is being made that any investment will achieve performance similar to those shown. For illustrative purposes only and not representative of a portfolio AQR currently manages. Past performance does not guarantee future results.

If anything, including more data makes the industry look even worse! In particular, the double winner category is now the empty set. This may be surprising, given you'd expect some survivorship bias – presumably the guys who've lasted ten years would have done better than the ones who haven't been around for as long – but it's the opposite.[8]

This is exactly what we'd expect from a collection of strategies that have tended to underperform their benchmark. Even a weak strategy can have a good five years, but over ten, it's less likely, so the frequency of good results goes down.[9]

3) The analysis was over too long a time period.

Yes, you read that right.

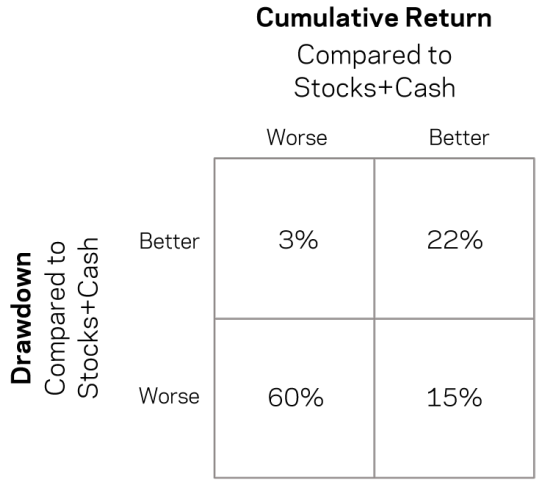
The accusation here is that 2020-to-present was an extended bull market (US equities averaged 12.5% annually), and strategies like buffered funds aren't designed to keep up with the bull.

This is another easy criticism to assail. First, the original analysis, along with every exhibit in this note, adjusts for each fund's average exposure to the market. By comparing each fund individually to a stock/cash combination that matches its equity exposure, the analysis already accounts for the fact that these strategies are expected to underperform when equities do well (they are expected to underperform 100% equities in a bull market; they are not expected, at least by their purveyors and investors, to underperform a beta-matched, less-aggressive portfolio of part equities and part cash).[10]

But, still, let's look over a shorter window. Below, rather than choosing a 5+ year presumably-buffer-unfriendly period, I instead look only at January 1, 2025 to April 30, 2025—a four-month period that might seem tailor-made for these strategies (US equities down, interest rates higher than over the past decade average, and volatility spiking to levels not seen since the Covid drawdown). Given the short period, I use weekly data here.[11] Yes, drawing a conclusion from four months is insane, but so is the criticism that I used too long a period, so let's take a look…

Exhibit 5: All Funds in Morningstar's Derivative Income, Defined Outcome, and Options Trading - Equity Hedged categories with at least 5 years of performance

1/1/2025-4/30/2025

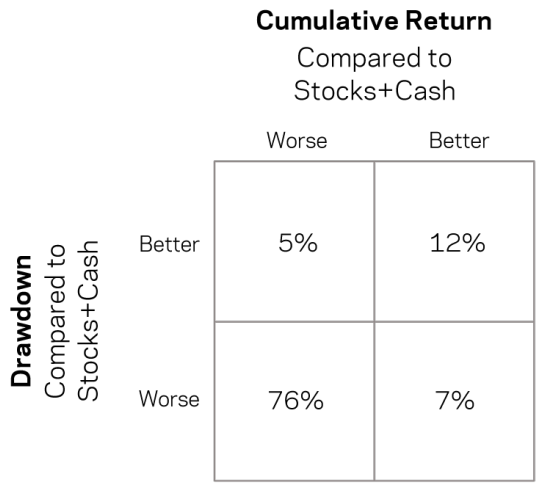


Source: AQR, Morningstar. The universe used is all funds in the Morningstar Defined Outcome, Derivative Income, or Options Trading - Equity Hedged categories with returns available from January 1, 2020, to April 30, 2025. There are 102 funds meeting these criteria as of April 30, 2025. Chart shows percent of funds in the universe fitting into each possible scenario, only over the year-to-date period, January 1, 2025 to April 30, 2025. "Better" and "Worse" indicate each fund's performance in the either metric (total cumulative return or worst drawdown over the period) relative to its (out-of-sample) beta-matched benchmark strategy. Each fund's stock/cash benchmark is constructed by holding the S&P 500 using the fund's realized equity beta (over the period January 1, 2020 to December 31, 2024) as the portfolio weight, and the remaining weight (1 – equity beta) into US 3M T-Bills. We use the manager-defined oldest share class for each fund. All returns are net of fees as reported to Morningstar and denominated in USD. No representation is being made that any investment will achieve performance similar to those shown. For illustrative purposes only and not representative of a portfolio AQR currently manages. Past performance does not guarantee future results.

Again, these strategies haven't held up in terms of drawdown protection – this time 75% of them having a worse drawdown than a stocks/cash combo (bottom row). What about Defined Outcome funds specifically—how did the downside buffers hold up? Of the 42 in this data set, 83% had worse peak-to-trough drawdowns than a period-matched stocks/cash benchmark.[12]

Exhibit 6: Defined Outcome Funds Only

Jan 1, 2025 – April 30, 2025



Source: AQR, Morningstar. The universe used is all funds in the Morningstar Defined Outcome category with returns available from January 1, 2020, to April 30, 2025. There are 42 funds meeting these criteria as of April 30, 2025. Chart shows percent of funds in the universe fitting into each possible scenario, only over the year-to-date period, January 1, 2025 to April 30, 2025. "Better" and "Worse" indicate each fund's performance in the either metric (total cumulative return or worst drawdown over the period) relative to its (out-of-sample) beta-matched benchmark strategy. Each fund's stock/cash benchmark is constructed by holding the S&P 500 using the fund's realized equity beta (over the period January 1, 2020 to December 31, 2024) as the portfolio weight, and the remaining weight (1 – equity beta) into US 3M T-Bills. We use the manager-defined oldest share class for each fund. All returns are net of fees as reported to Morningstar and denominated in USD. No representation is being made that any investment will achieve performance similar to those shown. For illustrative purposes only and not representative of a portfolio AQR currently manages. Past performance does not guarantee future results.

4) Stocks and cash aren't the right benchmark; bonds are.

There are two issues with this criticism: the first is about benchmarking, the second is about the funding source.

First, a benchmark should be related to the fund being benchmarked. This is why the benchmark for investment-grade bonds isn't commodities, and why the proper benchmark for hedge funds isn't 100% stocks.[13] If a buffered fund is long stocks and options, why would bonds be a relevant benchmark? Why not stablecoins while we're at it?[14]

The original analysis used stocks as the benchmark, since that's the asset class that the vast majority of these funds are invested in (and often themselves explicitly benchmarked to). Furthermore, the vast majority of these funds describe themselves as offering some equity (not bond)-like upside participation with smaller drawdowns. Given these strategies generally have lower equity risk than 100% in passive equities (i.e., their betas are generally less than 1.0), I adjusted the "benchmark" to account for that. If a buffered fund averaged a 0.6 beta to equities, I compared its performance to a combination of 60% stocks and 40% cash. In other words, the analysis asked, "how do these funds compare to simply holding less in stocks, and putting the rest in cash."

The second reason not to use bonds as a benchmark relates to a "funding" issue. Many of the criticisms go like this: "my client sold out of bonds to buy the buffered fund, so their 'real' benchmark is bonds, not stocks." Sure, but that's the opportunity cost, not the benchmark. An investor could have sold anything to buy a buffered ETF.[15] Although comparing the performance of the buffered ETF to the thing you sold tells you whether you made the right asset allocation decision ex post, it doesn't tell you if the ETF was worth the fees you paid for it.

The manager of the buffered ETF's goal should be to outperform a relevant benchmark, not to outperform asset classes that have nothing to do with their product.[16] If they'd like to break up their analysis into 1) "was shifting from bonds to a mix of stocks and cash a good idea," and 2) "did the fund we sell do better or worse than that simple mix of stocks and cash" they should feel free. I've already provided the answer to #2.

5) The analysis missed the point that options provide convexity. Linear metrics like beta can't evaluate inherently nonlinear, options-based strategies.

The original analysis was simple. It tested whether investors would have been better off—in cumulative returns or peak-to-trough drawdowns—by holding a combination of stocks and cash. What critics ignore or miss is that if there was value in convexity (or in time-varying exposure, or non-linearity, or any of these dynamic features that come with options), it would have shown up in the original analysis, either in terms of better downside protection or in better cumulative returns.

If convexity helped protect investors from equity market drawdowns, then we'd find peak-to-trough drawdown improvement. Over the past five years, 78% of funds failed this test (Exhibit 1). If convexity delivered longer-term value, it would have shown up in cumulative returns.

86% of them failed this test. Looking at ten-year returns is even less inspiring: 94% did worse in terms of peak-to-trough drawdown, and 90% underperformed in cumulative returns (Exhibit 4).

Simply put, if a convex strategy fails to look good in a linear analysis, it means the convexity didn't add value.[17, 18]

6) Options are a perfect hedge, they offer forward-looking certainty / deliver pre-defined outcomes.

Yes, options are a "perfect hedge" in the sense that they are contractually tied to the performance of an underlying asset for a pre-determined period. The problems are that:

1. they are costly to buy,[19, 20]
2. they expire, so you have to pay that cost over and over again,[21] and
3. the protection they offer is very often weaker than simply reducing exposure to equities.[22]

Buffered strategies may seem like a perfect hedge in concept, but the three realities above mean that the longer you hold them the more likely they are to disappoint. Of course, there can be—and no doubt will be—periods when these strategies look good (for example, when markets drop with little warning), but even there 2025 provides a great example of these still not working (see point #3). In contrast, simply holding less in equities is a "perfect" way to reduce equity risk, and (as shown throughout this note) overwhelmingly more effective both in terms of returns and worst drawdowns.

So why do people keep buying buffered funds?

Neither economic theory nor realized returns are on the side of the buffered fund industry. So why do so many of its proponents predict continued growth? How can there be demand for something that overwhelmingly underperforms both in risk and return?[23, 24]

One explanation is the placebo effect.

In medical trials the classic placebo is a sugar pill – something that doesn't have any therapeutic effectiveness, but which the patient is told is a real treatment. Even though the placebo is itself inert, some patients nonetheless claim it helps with their symptoms—the placebo *effect*.

A well-known ailment in investing is panic selling. There are "treatments" for this that are backed by theory and research. One is to reduce equity risk (the main conclusion of this article); another is to hold a more-diversified portfolio (whether through equity market diversification, or other asset classes). Promoters of buffered funds claim their products are also an effective treatment for panic selling. My analysis shows they're more likely a placebo—or worse.[25] While their managers might claim otherwise, these funds have not shown evidence of actually being effective for dealing with equity risk: the majority perform worse than simply holding less in equities, both in terms of returns and in terms of risk (via worse peak-to-trough drawdowns).[26]

For the buffered industry to grow, it seems its proponents are banking on the placebo effect as opposed to the actual efficacy of their products. Don't get me wrong; panic selling is generally bad. But charging investors for a product worse than a simpler alternative isn't a good way to treat it.

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[1] Either, not both. I.e., most of these funds not only did worse than a simple combination of stocks and cash, they also delivered those inferior returns with worse peak-to-trough drawdowns.

[2] As some people argued that adding another three months would affect our conclusions. It was a volatile time but, as we'd have guessed, changes very little of the result.

[3] Again, now updated through April 30, 2025. The original analysis looked at funds with at least 5 years of history, and started January 1, 2020. With the additional three months of data since the original piece, the number of funds now goes up from 99 to 103.

[4] As a reminder, the stocks + cash "benchmark" is tailored to each fund, based on the fund's average exposure to equity markets over the period. For example, if one buffered fund had an average equity exposure of 0.6, I use 60% stocks + 40% cash as the benchmark. If another fund has an average equity exposure of 0.9, I use 90% stocks + 10% cash. By comparing to the average, I am not giving a fund credit or blame for its longer-term beta. (If, for instance, they had their beta over the whole period intentionally above where it would normally be, and that helped or hurt, we wouldn't be accounting for this. I do not think most of these funds would claim they are making multi-year tactical beta calls, so I'm comfortable with this decision.)

[5] The median drawdown benefit was +0.5%, and the median cost to cumulative returns was -6.4%.

[6] I'd love to go back further to test other bear markets and crashes (e.g., the GFC and October 1987), but this industry didn't exist then as it does today. (Still, the period covered here does include March of 2020 for some of the early funds and 2022 for more of them—not exactly walks in the park). That said, related analysis by Antti Ilmanen, et al. that includes October 1987 and the GFC shows that even those events aren't enough to change the medium- and long-term conclusion that consistently buying options is generally a losing proposition. Yes, it remains possible that out there lurks a truly horrible event where the non-linearity of the options strategy would really kick in and change this conclusion (though not probable), but many of these funds buffer only a portion of losses anyway, and are thus unlikely to be great help.

[7] Unfortunately, the Morningstar data has no Defined Outcome funds with track records going back this far. If, however, I look at since-inception numbers for this category (i.e., attempt to use as much data as is available) I end up with a similar result: zero funds in the upper-right quadrant, and most of them in the lower left.

[8] For folks who want to know if this is true across the three categories, it is.

[9] Technically-oriented readers may wonder what happens if the equity betas are estimated "out of sample." To test this, I estimate each fund's beta over the first 5 years of the sample, and use that as the benchmark for the second 5 years. I find the same general result: only 10% percent end up in the top-left quadrant; while 81% provide worse returns and worse drawdowns.

[10] Also, this period included the March 2020 Covid crash (at least for a few of the funds around since the beginning) and the 2022 ugly market. It was not all smooth sailing.

[11] For curious readers, the beta used to build the benchmark is "out of sample," so there's no look-ahead bias. The beta is calculated using data from 1/1/2020-12/31/2024, and that value is used to calculate the equity weight for the YTD 2025 stocks+cash benchmark.

[12] For those curious about other short windows, consider 2020 and 2022 as two other times in which the Defined Outcome category (aka buffer funds) "should" have looked good. Using the same methodology as in Exhibit 1, I find 69% of Defined Outcome funds had worse peak-to-trough drawdowns than a stocks/cash combination in 2022, and in 2020, 90% percent of them did.

[13] Unless the hedge fund strategy is explicitly beta-1 to equities by design.

[14] Yes, there are crypto-linked buffer funds out there, too. (And no, they are not in this analysis (for now), as they don't have track records long enough to match the rest of this analysis).

[15] For example, the University of Connecticut replaced hedge funds with buffered ETFs. If their hedge funds were great, then maybe it was a bad idea; if their hedge funds were mostly repackaged, overpriced beta, then maybe it was a good idea. Regardless, the benchmark for their buffered ETFs that they report to their Board shouldn't be "the hedge funds we sold."

[16] One reason buffered funds are often thought of as an alternative to bonds could be because some people perceive both to have defined outcomes. With bonds, some investors assume that because a single bond has a stated maturity and a given yield, that it's riskless over its life (for simplicity let's assume there's no default risk), and curiously that the single bond is somehow safer than a portfolio of them (see #10 here). Similarly, some investors might erroneously infer that a buffered fund is able to provide a similarly defined outcome, making the two asset classes somehow "similar enough" to be alternatives for each other.

[17] Granted, it's possible that the past ten years were "missing" a black swan, and it's only in horrendous events like those where the true value of convexity emerges. Nobody can dismiss this possibility, but related research going back to January 1985 (i.e., including October 1987, the Tech Bust, and the GFC) shows the same pattern from put options – i.e., despite their convexity, they are a drag on long-term (and even medium-term) returns. But even the specter of black swan events may be insufficient justification to rationalize purchasing put options (compared to simply reducing equity risk).

[18] I'm not a "convexity cynic." There are convex strategies such as trend-following that have economic theory and empirical support behind them, and some of this evidence is extremely long-term.

[19] It's the downside risk, not the upside participation, that is responsible for the majority of returns in stocks, as well as other asset classes. On first principles it would be surprising if you got paid a premium in returns for not taking on this risk (and empirically, you do not).

[20] Even selling some of the upside (i.e., so-called collar strategies) doesn't get around this problem.

[21] This cost increases when risk is high; it's still costly in more "normal" markets, and it's still not cheap even when index volatility is low. Over time, this cost really adds up (Figure 2).

[22] Unless your option purchases and their maturities are timed just right around equity drawdowns, they may offer little downside protection (Exhibit 11). In fact, protective puts could make things worse by increasing rather than decreasing drawdowns and volatility per unit of expected return.

[23] Investor preferences of course can be at odds with rational, "mean-variance optimal" portfolios. Investors, being human, have a greater disdain for losses than enjoyment for gains (aka, Prospect Theory, as formalized in Kahneman and Tversky (1979)). The desire for certainty and protection means that buying options will generally come at the cost of returns. That goes a long way toward explaining why investors would be willing to accept lower *returns*, but it doesn't explain why investors would want something that has both lower returns *and* higher risk.

[24] In later work Kahneman, Slovic, and Tversky (1982), Kahneman and Frederick (2002), and Kahneman (2011) further unpack the meaning of Prospect Theory, finding it generally applies to individuals making unintuitive decisions under pressure and high levels of uncertainty due to lack of analysis and tools. These biases can be alleviated by removing time pressure, providing more information, and methodical analysis (i.e., the goals of this article).

[25] In a way, this shares some features with the "volatility laundering" we have shown goes on in private investing, where whether or not privates have defeated a proper equity benchmark in the past, we expect investors paying through the nose now for this version of a placebo to be likely getting "equities-minus" returns going forward. Or, at the very least, earn far less of an illiquidity premium than they've gotten in the past when the dangers of illiquidity likely dominated the placebo of volatility laundering, leading to higher expected returns for bearing a bug (illiquidity) nobody wants rather than a feature (the placebo) everyone seems to know (features you pay for with lower expected returns). Of course, the analogy here isn't perfect. The placebo being offered with buffered funds are ones where the actual reported volatility (and drawdowns) will be truthfully lower than 100% equities (though still a bad deal) where in privates the reported volatility (and drawdowns) will be far less than reality. The link is they're both making claims to safety and outperformance that we don't find credible going forward (they may be so for privates looking backwards, but buffered funds don't even get that!).

[26] Which makes sense when you look at the underlying holdings. Most of these products are straightforward "financial engineering," with the most basic adding some consistent options hedging to an equity portfolio. Of course (and as laid out in this article) this runs into a) options tend to be expensive to trade (in a market impact sense), b) options are expensive even if free to trade (in a "long-term buying options is a negative expected return" sense), and c) the products charge fees well above the superior mix of an index fund and cash that matches their beta. Given a) – c), it is not at all surprising to find the empirics shown here, but it is surprising, even with all the joys of a nice placebo, that so many investors still want them.

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