Superior Risk-Adjusted Returns to Traditional Equity Portfolios Via an Overwrite Overlay

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Slow and steady returns do not good cocktail conversation make. Human nature covets the home run, and, especially in investing, the overnight moonshot is as publicized as it is rare. However, notwithstanding the low probability of realization, virtually all investors continuously remain exposed to the unlimited upside potential of each of their equity positions, either overestimating the probability of an overnight windfall or, in a behavioral-analysis framework, displaying a regret aversion bias.[1]

Juxtaposing this behavior against the academic research (and index-practitioner marketing) highlights a prevalent existential question for active managers. Can active managers consistently beat a passive-investing approach with their current approach? We wonder if consistent, complete exposure to the upside of a portfolio is in the best interests of active investors, especially if, by parting with that exposure and monetizing it, the portfolio benefits.

Our thesis is that active managers should augment their portfolio's risk-adjusted return potential and risk management by selling covered calls on their entire portfolio in a continuous and systematic manner. Our historical back test of this approach confirms that, in a supermajority of cases, this systematic overlay results in higher risk-adjusted returns relative to the traditional fully-upside-exposed portfolio. Higher risk-adjusted results are achieved via a significant decrease in the annualized volatility of portfolio returns at the expense of a much smaller decrease in the annualized portfolio return itself. Additionally, the potentially favorable tax position created by utilizing "qualified covered calls" contributes further logic to the implementation of this overlay. Finally, purely from a portfolio volatility perspective, overwritten portfolios often display distinguishing and compellingly low annualized volatilities (which can be further mitigated with a modicum of index hedging). These volatility levels qualify overwritten portfolios for consideration against fixed-income alternatives which may be new ground for the equity manager.

Our Study Methodology

We began our research utilizing Morningstar's database to isolate concentrated US-focused mutual funds. Mutual funds are ideal for our analysis because of our ability to acquire regular (quarterly) holdings data on their portfolios, in addition to our ability to compare the portfolios we create against daily published net-asset values. As we discuss in detail later, practical implementation of our strategy suggests focusing on concentrated portfolios, which we define as managers who maintain 50 positions or less on average. As such, we limited our study to mutual funds whose managers run concentrated portfolios to highlight the contribution of our proposed overlay to situations on which they could actually be employed. Our initial list of candidate funds included

[1] When displaying regret aversion, investors make decisions primarily motivated to lower the probability of emotional pain in the event adverse outcomes hit their portfolios. In this case, parting with upside potential of an equity investment only then to observe a sudden shift higher in the equity trading price would be the adverse outcome.

1,706 funds. After adjusting for 1,133 duplicate share classes, data availability, and other considerations, 391 candidate funds remained. These funds created over 421,000 quarterly underlying holdings to assess.[2]

A complete methodology of our study is included in the appendix to this paper. However, summarily, we isolated the equity components of each fund's holdings on a quarterly basis over a 9.75-year period[3] and created a modified portfolio and net asset value for each fund.

To confirm the validity of our modified portfolios, we regressed our calculated quarterly returns on the actual reported quarterly returns of the mutual funds themselves. The R^2 of that linear regression was 94.7%, giving us a very high-degree of confidence that the equity portfolios we built for this analysis well reflected the underlying portfolios of the funds.

To calculate options prices to create overwrites, we utilized the Black-Scholes approach, pulling inputs from Bloomberg. We systematically overwrote each position in the portfolio with quarterly call options, each quarter, using options whose strikes were 2.5% out of the money at initiation. We then closed the position at the quarter end at intrinsic value.[4] Option proceeds were held in cash while options were outstanding.

To produce fund level returns, we summed the total quarterly return of the underlying equity together with the return realized by selling the call option at the beginning of the quarter and then repurchasing it at quarter's end to arrive at position-level quarterly returns. Weighting these positions by their weights in the original portfolios, we created fund level quarterly returns.[5] We then compounded these quarterly returns to create a net asset value for each of the overwritten mutual funds. Along with the quarterly returns (which are used for volatility-related calculations), we can assess the risk-adjusted return characteristics of the overwritten portfolio to that of the outright equity portfolio.

Findings

Across the study period of 2q2006 – 4q2015, on a non-weighted basis, the study concludes that the integration of a covered-call overlay materially reduces portfolio volatility and materially increases the risk-adjusted returns (or return per unit of risk) of the average portfolio in the dataset:[6]

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[2] For example, Fund A owning AAPL in 4q14, Fund B owning IBM in 2q12, and Fund A again owning AAPL in 1q15 would be three quarterly underlying holdings.

[3] For funds without a complete history, we utilized the data available. The average "age" of the funds in our study was 26.5 quarters, or 6.625 years. 136 of the 391 funds (34.8%) had a full 9.75-year history. Why 9.75 years? Because our access to data became significantly more difficult back more than 40 quarters, inclusive of the one we are now in (1q16).

[4] Because we bought in the options at expiry in our analysis, underlying equity positions remained in the fund (and in our analysis) for as long as the fund kept the equity in its original portfolio.

[5] We modified the weight of each equity in the portfolio to account for any non-equity positions we originally dismissed. In other words, if a fund originally had a 4% position in IBM as part of a portfolio which was 80% equities and 20% t bills, in our analysis, IBM would be a 5% position (being 4% / 80%).

[6] When we cite the summary Sharpe Ratio, please note we are taking the average of all of the individual funds' calculated Sharpe Ratios, as opposed to dividing the average return field by the average volatility field. While differences between these two approaches will be minimal, it is important to point out the methodology if the reader calculates the statistic him/herself. This approach is followed throughout the paper.

		Outright Portfolio			Overwritten Portfolio		
	Fund Quarters	Annualized Return	Standard Deviation	Sharpe Ratio	Annualized Return	Standard Deviation	Sharpe Ratio
All Candidate Funds	10,325	7.8%	16.9%	0.53	6.2%	11.1%	0.65
Funds With Over Five Years History	8,823	7.7%	19.1%	0.43	6.4%	12.5%	0.55

We focus on funds with more than 20 quarters (5 years) of data in the study because our intention is to make the case for overwriting portfolios systematically, over the long run, to produce superior risk adjusted returns.[7] For these funds, we observe a near 28% increase in our return per unit of risk (Sharpe ratio) through utilizing the covered call overlay. Annualized returns were lower by 1.3% or 16%, but, the strategy muted volatility by more than 1/3 from 19.1% to 12.5%. In all, of the 370 funds studied[8], 293 funds or 79.2% saw a better risk return profile because of the covered-call overlay.[9]

The potential always exists for extreme results to skew the data and disrupt the integrity of our conclusions. However, our analysis allays this concern. For the funds studied, the range of annualized returns for the long-only portfolios was -14.8% to 23.4%, while the range of annualized volatility was 5.6% to 33.3%. In our opinion, these ranges do not seem atypical of a random sample of manager returns and volatilities. From that starting point, the effect of our overlay on annualized returns and annualized volatility was as follows

Decrease in Annualized Return	% of Funds		Decrease in Volatility	% of Funds
Return Increased	26.3%		Volatility Increased	0.5%
0-1% decrease	19.9%		0-2.5% decrease	6.2%
1-2% decrease	16.1%		2.5-5% decrease	26.6%
2-3% decrease	10.8%		5-7.5% decrease	51.6%
3-4% decrease	7.3%		7.5-10% decrease	12.6%
4-5% decrease	6.2%		10-12.5% decrease	2.2%
more than 5% decrease	13.4%		more than 12.5% decrease	0.3%

Beyond confirming our results are not skewed in favor of our thesis, we feel examining the bins of returns and volatilities better illuminates our finding: in roughly half of the cases (46.2%), returns were negatively affected by 1% or less. Conversely, in two-thirds of the cases, volatility was reduced by 5% or more.

Exhibiting the regret aversion discussed earlier, when considering an overwrite, managers tend to focus on a worst case and wonder "what if that was me?" To that end, we examine the bin above where, in 13.4% of cases, returns were negatively affected by 5% or more on an annualized basis

[7] However, results across the entire candidate pool parallel closely the findings for funds with greater than five years' history.

[8] Of the 391 funds studied, 21 had three quarters or less of data and were excluded.

[9] In order to reach this conclusion, we divided results up into two cases. In the first case, both the long-only Sharpe ratio and the covered-call Sharpe were positive. It is simple to determine whether the covered-call Sharpe is higher. In cases where the annualized returns are negative, however, dividing a negative return by a lower volatility number could result in a higher quotient. As such, for the second case, in order to declare a superior outcome, we mandated that the covered call portfolio have both a higher annualized return (i.e. less negative return) and a lower volatility. 270 of 342 (79%) case 1 results were favorable to the covered call. 23 of 28 (82%) case 2 results were favorable.

by systematically overwriting the equity position. Isolating those 50 cases, we find the Sharpe ratio actually increased in 19 cases (38%) and was, at least, 85% of the original Sharpe ratio in 42 of the 50 cases (84%). Across these 50 cases, the average Sharpe Ratio as a function of the initial long-only Sharpe Ratio was 98%. As such, we feel that, even in the extreme case where an overwrite severely affects returns, managers are no worse off on a risk-adjusted basis.[10]

Regime Analysis

When one examines the volatility levels during the study period and the path of the SPX (as a proxy for the market) over that time, four separate regimes emerge: (1) a relatively benign, low-volatility environment with an upward trending market from 2q06 – 4q07, (2) a reasonably turbulent and volatile period with a severe market selloff from 1q08 – 1q09, (3) a recovering market with period of high volatility from 2q09 – 4q11, and, finally (4) a rallying market with very low volatility from 1q12 – 4q15.

We review the relative performance of the overwrite overlay to a traditional long-only portfolio across each regime:

		Traditional Portfolio				Overwritten Portfolio		
	Funds	Annualized Return	Annualized Volatility	Average Sharpe		Annualized Return	Annualized Volatility	Average Sharpe
2q06-4q07	138	7.5%	10.7%	0.81		7.5%	6.4%	1.45
1q08-1q09	187	-38.7%	19.7%	(2.16)		-19.1%	17.9%	(1.11)
2q09-4q11	209	23.0%	22.9%	1.02		14.3%	15.9%	0.93
1q12-4q15	263	14.4%	12.5%	1.19		9.4%	7.5%	1.32

[10] Of the fifty cases cited, one case was excluded from the average because of the "negative Sharpe ratio" problem. In that case, the overwrite lowered returns by 12.5% while lowering volatility by 11.3%.

Of primary note is that the risk-adjusted return of the overwritten approach is superior to the traditional portfolio in three out of the four subperiods and that volatility is lower with the overlay in all of the subperiods.

In the first subperiod (2q06 – 4q07), the risk-adjusted outperformance is significant, but, moreover, on an absolute basis, the annualized return (unadjusted for volatility) is equal for both approaches – equivalent return, 40% less volatility. Given the upward creeping market, this outcome is understandable: the receipt of option premium on a systematic basis compensates for any instances in which the underlying stock's price appreciation over a given call option's life broke through the call strike price.

In the second subperiod (1q08 – 1q09), we observe a substantial outperformance of the overwrite overlay, both on an absolute return basis and on a risk-adjusted one. What is interesting about this subperiod, which encompassed the global-financial crisis, is that the vast majority of the overlay strategy's benefits comes from the sale of upside, and, less so, from a muting of volatility. Both of these results fit in context. The elevation of implied volatility in the market over this timeframe resulted in higher premiums paid by option buyers. Additionally, the sale of upside altogether turned out to be the sale of an asset, which, in hindsight, was generally worthless. As such, the incremental absolute return of the overwrite strategy was substantial. Conversely, because moves in underlying equity prices were significant to the downside, the call premium only provided a modicum of protection against mark-to-market losses and volatility.[11]

Subperiod three (2q09 – 4q11) is the sole period where risk-adjusted returns of the overwrite strategy trail the outright portfolio. Over this period, we observe a substantial recovery in stock prices (the index moved up 50% during the period) despite having an elevated level of realized volatility. A significantly bullish market (resulting in a high probability that underlying stock prices moved through the call strike prices of options sold by the overlay strategy) created a very adverse testing ground for the overwrite overlay. What is interesting and encouraging is that the risk-adjusted average return, as expressed through the Sharpe ratio, is only about 10% lower than that of the traditional portfolio.

Finally, in subperiod 4 (1q12 – 4q15), we observe a market with annualized equity returns above historic averages and reasonably low levels of volatility (meaning, first, that option premiums received by the overwrite strategy are less favorable, and, second, that the volatility of traditional portfolios should be reasonably low without mitigation). While the returns accruing to the overwrite strategy are 35% lower than those of the traditional portfolio, the volatility is mitigated by 40%, resulting in a higher Sharpe ratio for the overwrite strategy.

In all, an analysis of the subperiods within our study period indicates that the overwrite overlay is superior across most market regimes and that our macro conclusions are not due to a short period of outperformance of the overwrite strategy. Additionally, even in the market regime least

[11] Overwriting provides a "first loss" protection in that the premium buffers against a decrease in the trading price of the underlying equity. If the equity moves lower by an amount greater than the call premium received from the call option sold, the portfolio is exposed to losses from that point. Later in this paper, we discuss a strategy to mitigate this risk.

accommodative of the strategy, the cost of the overwrite implementation is not punitive, as the risk-adjusted Sharpe ratio of the overwrite overlay only trailed the traditional portfolio by about 10%.

Option Pricing and Exercise Experience

The core of option pricing in today's world is the Black-Scholes option pricing formula which is derived from a heat transfer equation in physics. Taken together with the principles of volatility arbitrage, we stipulate that, with perfect knowledge about expected future volatility (which is to say that implied volatility is assumed to perfectly equal future realized volatility), the price of a given option could be none other than that emanating from Black Scholes. If a discrepancy existed, volatility arbitrageurs would bid up or offer down the options to the appropriate calculated level.

That said, for the outright (or non-arbitrage) investor – and certainly for the long term, outright investor – option pricing and the decision to overwrite has very little to do with expected near tem volatility and even less to do with the intricacies of heat transfer. The outright investors' calculus revolves around his or her fundamentally driven view on the future trading levels of the asset and associated probabilities. We postulate that, while the pricing of an option can be no different because of the principles of arbitrage, non-arbitrage investors (fund managers) are then continuously presented with fundamentally (though not technically) mispriced options. For example, a highly volatile stock will command a high option premium. If the fundamental manager is not constructive on the potential for the stock to trade higher in the near term, selling off upside by selling a call (for a high price) is attractive, even though the call itself is fairly priced by arbitrage standards.

Evolving this concept, we believe – and believe the data proves – that options are systematically overpriced relative to upside equity potential and so the integration of a full overwrite of the portfolio with slightly out of the money options creates a better risk-adjusted payoff for the fund manager over the long term.

To analyze our thesis, we define an option's return over the quarter as the maximum of (1) 0 and (2) the ending stock price return less 2.5% plus the call premium initially received.[12] Within our study, 421,771 distinct positions were considered.[13] Of those distinct positions, only 153,232 (or 36%) resulted in a negative payoff to the option position. The payoff contribution of the option position to the portfolio is as follows

[12] Recall our study uses 102.5% calls, or, calls which are 2.5% out of the money. As such, the manager retains the first 2.5% of performance although the 102.5% call was sold. For example, if we sold at $102.5 call on a stock which was trading at 100 for $2.50 (or 2.5%), if, at quarter's end, the stock was trading at 105, the return from the option would be 0, because we would have captured the move from 100 to 102.5 and then the $2.50 option premium would have compensated us for the move from $102.5 to $105 in the stock.

[13] A position would be an equity holding for a fund for a particular quarter. So, if a fund held 50 stocks per quarter and we analyzed 20 quarters of data, we would consider that 1,000 distinct positions, even if it were the same 50 stocks in every quarter.

Option Contribution to Portfolio	< -5%	-5% to -1%	-1% to -50bps	-50bps to 0	0 to 50bps	50bps to 1%	1% to 5%	> 5%
Count	30	2,742	10,689	139,774	264,735	3,189	605	7
Percentage	0%	1%	3%	33%	63%	1%	0%	0%

86.2% of observations result in portfolio implications of -25bps to 25bps. Taken in conjunction with the volatility muting gained by the overwrite overlay (and the tax benefits discussed below), the data illustrates that the options market regularly provides the fundamental investor the ability to dampen portfolio volatility at attractive prices on a systematic basis.

Suitability Based on Strategy

Do our results differ when funds are categorized by their respective strategies? We find that all large-cap and mid-cap strategies stand to benefit from implementation of the overwrite overlay. Small-cap strategies, while not negatively affected by overwriting, do not accrue substantial gains.

Referencing Morningstar's categories, we reassessed the results of the entire study's timeframe on the basis of mutual fund strategy and observed the following results:

		Traditional Portfolio			Overwritten Portfolio				
	Number of Funds	Annualized Return	Standard Deviation	Sharpe Ratio	Annualized Return	Standard Deviation	Sharpe Ratio	Standard Deviation Decrease	Sharpe Increase
US Equity Large Cap Blend	75	7.6%	16.0%	0.56	6.2%	10.6%	0.69	5.5%	22.7%
US Equity Large Cap Growth	100	9.4%	16.4%	0.64	7.4%	10.6%	0.81	5.8%	26.2%
US Equity Large Cap Value	65	6.1%	15.4%	0.46	5.2%	10.4%	0.59	5.1%	28.0%
US Equity Mid Cap	90	6.9%	19.2%	0.39	5.4%	12.7%	0.48	6.5%	22.2%
US Equity Small Cap	12	10.3%	20.3%	0.59	6.4%	13.5%	0.59	6.7%	-0.6%

In all cases except small cap, Sharpe ratio improvement was approximately 25%.

Why the lack of increased risk-adjusted returns at the small cap level? While not the focus of this discussion, a review of the twelve specific funds reveals that a minority of managers (2) do see risk-adjusted return improvement in line with that implied by the other strategies. However, the remaining 10 show inconsistent risk-adjusted differentials. What we did observe, in all cases in this category, was the presence of volatility muting through overwriting. In line with other academic findings, the implicit conclusion/ explanation for our results is that the case for alpha is, unsurprisingly, most pronounced at the small cap level.

Yield and Tax Considerations

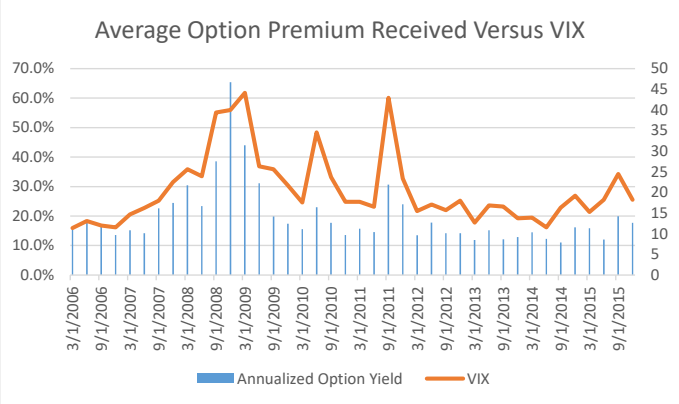
To this point in the discussion, we have viewed our overwrite proposal from a total return perspective. While that approach is certainly valid in the context of clinical portfolio optimization and applicable to all investors, a subset of investors have ongoing and continuous yield requirements and take a more focused view on the current yield of their portfolios, normally via dividend yields. For this investor, on its face, an overwrite portfolio seems an extraordinarily compelling solution. In exchange for the sale of an equity's upside potential (via the sale of an upside call), the portfolio receives premium. In a standstill case (i.e. where the underlying stock price does not move significantly), this incremental yield can be thought of as an enhancement to the dividend already attached to the equity. As such, for portfolios that traditionally limit their

selection universe to high-dividend-yield stocks, the introduction of the overwrite expands the consideration set of the portfolio manager significantly.

Referring back to our study, we calculated the average implied incremental portfolio yield by year across the mutual funds we studied. The results were as follows

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	1q2016
Average Option Yield	17.1%	16.4%	29.2%	40.1%	18.4%	18.6%	17.4%	13.3%	12.7%	16.0%	17.7%

To reiterate, these are incremental yields (to be considered in excess of dividend yield already received from the underlying equity position). Expressing these findings differently, the following shows the development of the annualized portfolio yield of the mutual funds studied versus the VIX index (which serves as a proxy for market volatility):



It should be noted that these yields are the yields one receives when selling the covered call – at the beginning of the quarter. The portfolio is left with an obligation to perform on the option, if exercised, at the quarter's end. While the implications of these obligations are included in discussions in this paper of the total returns of overwritten portfolios, for yield conscious investors and their managers, it is important to highlight the availability of tangible yield that the overlay strategy provides. At quarter's end, should the option be in a position to be exercised, the manager can elect to repurchase the option or allow the stock to be called away.

The tax benefits of the overwrite overlay are salient to a yield motivated investor, but, almost equally, to a taxable total-return-motivated investor. If structured correctly, covered calls are considered qualified covered calls ("QCC"). While straddle rules would generally suspend the accrual of holding periods when options are layered into a long stock strategy, a QCC overlay allows the underlying holding period to continue to accrete and allows for qualified dividend income and dividend received deduction and foreign-tax credits, where applicable. The QCC benefit is substantial especially for a long-term investor:

In a scenario analysis, over the life of a given equity holding, option premium sold will be treated in one of three ways. In the first case, sold premium on options which expire worthless – because the underlying equity's stock price did not move above the option's strike price at maturity – will be considered ordinary income. While unfavorably taxable, this premium can be considered "found money" or yield because the investor has received premium/ yield but, at option maturity,

has no ongoing obligation and no ramification on the portfolio. Structured as a QCC though, the holding period on the underlying equity position will continue to have accreted over the period.

For options which expire in the money, but, on which the manager wishes to continue to be exposed, options can be repurchased immediately before expiry (for intrinsic value) and rolled to the next quarter (to generate new incremental yield for the portfolio). In this case, the repurchase price of the option is netted against the initial sales price of the option and either mitigates the sales price, or, if the intrinsic value is higher than the sales price of the option initially, creates a short-term capital loss for the portfolio for taxable purposes. Gains in the underlying stock continue to reside with the underlying equity itself. Over time, especially past the one-year holding point, the portfolio can create a very virtuous and attractive cycle of accruing realized short-term capital losses and accruing unrealized, long-term capital gains.

Finally, for the rare instances where the manager allows the option to be exercised and the stock called away, the option premium is added to the price at which the call is exercised.[14]

Ability to Further Mitigate Volatility

Our discussion has focused on the integration of an overwrite overlay for traditionally long-only managers as a means by which to further optimize risk-adjusted returns. Embedded in the long only philosophy is a willingness to maintain beta exposure (exposure to market movements). Our approach increases the risk-adjusted return to the portfolio over the long run relative to a traditional, fully-exposed strategy.

While not necessarily appropriate for all investors (especially those desiring beta exposure), we now consider whether risk-adjusted returns could be further optimized by allocating some of the yield received from the overwrite overlay to an asymmetric market based hedge. Where the overwrite portfolio maintains significant downside exposure (though a better downside profile than the long-only strategy), if the introduction of a downside beta hedge can be accomplished in a cost-effective manner, the manager has created a portfolio whose only limiting factor is negative alpha.[15]

To assess the potential of this evolution, we created a portfolio of six-month put spreads struck at 95% and 85% of the then-current S&P500 level.[16] To maintain an asymmetric protection profile (because puts too near maturity and near their respective option strikes begin to look too much like a straight short position), we rolled our six-month options every three months, maintaining at a minimum approximately three months until maturity.[17]

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[14] We are not tax advisers. Our overview of tax consequences is based on our research and understanding. We recommend each reader consult a tax adviser in all cases to insure a full understanding and review of his/ her respective tax situation.

[15] In other words, if the market exposure is mitigated with the beta hedge (mostly likely through puts or a put spread package), the only potential for negative returns to the portfolio is if the manager chooses underlying equities which underperform the market by a percentage greater than that received from the overwrite overlay.

[16] So, for instance, if the S&P500 were at 1,000, we would have purchased a 950 strike put and sold an 850 strike put, thereby, at maturity, immunizing the portfolio for moves of the S&P between 950 and 850.

[17] If our puts were allowed to come too close to maturity, as the market moved through the put strike, the puts would start to look more and more similar to a straight short position in the index. While that is welcome as the market

Aggregating across all funds (as we have done throughout this study), the Sharpe ratios of the beta hedged portfolios were not substantially dissimilar from those of the overwrite portfolio. However, in a small number of cases, the introduction of a beta hedge increased the risk-adjusted return substantially.

What the beta hedge did do was, unsurprisingly, further mute volatility. Referencing the first table in this paper, we showed how volatility across the study period move from 16.9% to 11.1% with the introduction of the overwrite overlay. The introduction of the beta hedge mutes this volatility further to an average of 8.7%, though, in about 25% of the funds studied, the market neutral overwrite portfolio's annualized volatility was below 7%. Especially in the current low-rate environment where capital normally comfortable in fixed income sits dormant on the sidelines, we believe a market-neutral overwrite strategy might create a win-win for investors able to put their capital to work at attractive risk-adjusted returns in the equity markets through this market-neutral overwrite strategy and for equity managers to open their expertise up to a heretofore unserved group of prospects.

Practical Implementation

In our opinion, an overwrite implementation is most attractive for concentrated portfolios with long-term holdings periods. Implementing the overwrite process on a 1:1 basis with each underlying holding definitionally increases the number of positions held in the portfolio by 100%. Further, the rolling of short-dated calls[18] requires operational capacity. So, for instance, a 30-position portfolio which rolled calls each quarter would result in an additional 240 trades per year.[19] Against the backdrop of the operational constraints of the manager, clearly, a more concentrated portfolio translates our theoretical arguments into a practical reality more palatably.[20]

Aside from reducing operational needs via lower turnover (and lessening the need to unexpectedly change the underlying and options portfolios if an underlying positon change occurs), our belief that longer holding periods are preferable for this strategy revolves around the tax benefits discussed, which, especially in an up trending market, we believe are substantial.

As a last comment on practical implementation, in our backtest, we utilized the Black-Scholes pricing methodology to calculate option premiums. The implied volatility of options is perhaps the most salient input to that model. For all calculations, we used the then-current trailing 60-day

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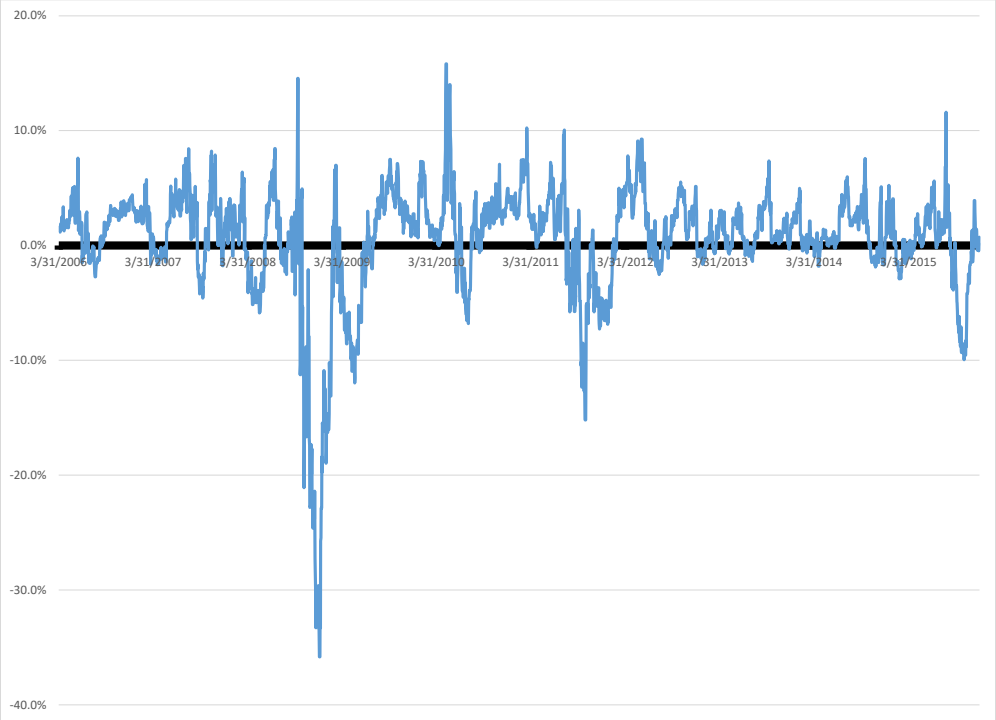
moves lower, such a position would sting equally as badly if the market recovers (but remains below the put strike). As such, we keep a minimum of three-months maturity in our put/ put spreads. Were we to implement this strategy and were the market to move down significantly, we would assess an intraquarter roll-down of the hedge.

[18] While we have simulated quarterly calls in this study to parallel the availability of quarterly data, we tend to believe a program which rolls two-month calls is slightly more advantageous.

[19] 30 options must be rolled per quarter (which is to say 30 calls bought in or closed and 30 calls newly sold).

[20] Whether listed or over-the-counter, the operational complexity around post-trade maintenance of overwritten positions is relatively minor. Master confirmation agreements can sit under traditional ISDA agreements and create a confirmation process that looks very similar to that of traditional equities. Moreover, by posting the underlying equity as collateral against the short-call position, the OCC (Options Clearing Corp) or the counterparty becomes fully immunized, and variance-margin efforts never need be taken by the manager.

volatility to calculate our premiums. We believe this input approach is a conservative one, as implied volatilities tend to be above historical trailing volatilities in the normal case. As such, our results might prove to be conservative, as higher option premium would result in higher annualized returns to the strategy and provide more downside cushion in down-trending markets. All to say that higher volatility levels would improve the expected results from implementation of the overlay. The following chart illustrates the difference between 60-day implied call volatility on the S&P500 and the trailing 60-day historical volatility on the S&P500:



In approximately 2/3 of cases, implied volatility is higher than historical volatility.

Concluding Thoughts

More and more, investors are gravitating toward viewing the efficacy of various strategies in terms of return per unit of risk. Our research has shown that traditional equity mutual funds (and similar strategies) would be well served by considering integrating a systematic overwriting process into their portfolios and risk-management regimes. Over the past ten years and across various climates of market volatility and market trends, our analysis indicates that overwritten portfolios often produce more favorable risk-adjusted returns than traditional, long-only approaches.

As we discussed in the introduction to this paper, remaining exposed to unbridled optimism creates a deadweight loss to most portfolios (i.e. foregoing the incremental returns available from selling upside which is only rarely realized). For the anecdotal concerns of missing the next overnight success and archetypal "hares" of the world, we point to our tortoise-like constant and grinding accrual of yield premium to the portfolio and the risk-mitigating benefits it brings. Importantly, none of our recommendations affect the fundamental research an investment manager undertakes.

We simply prefer to see the manager "count cards" and continuously benefit from selling off upside rather than "hoping."

We introduced an existential question to traditional, long-only money managers, especially in the face of never-ending commentary in favor of passive strategies. Our final table provides motivation for thought on the ability of equity managers to produce risk-adjusted returns superior to those of passive strategies and shows that, with prudent evolution, superior risk-adjusted returns by active (concentrated) managers are both theoretically possible and pragmatically feasible:

	Traditional	S&P500	Overwrite
2q06 - 4q07	0.81	1.32	1.45
1q08 - 1q09	-2.16	-1.62	-1.11
2q09 - 4q11	1.02	1.23	0.93
1q12 - 4q15	1.19	2.16	1.32
Entire Period	0.53	0.50	0.65