

# Buy-Write Strategy for Fund Managers

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Risk and Return Characteristics  
of the Buy-Write Strategy on the  
Russell 2000® Index

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## About OIC

The Options Industry Council (OIC) was created as a non-profit organization to increase the awareness, knowledge and responsible use of exchange-listed options among retail investors, their financial advisors and institutional investors. Options are a versatile but complex product, and that is why OIC hosts options seminars, webcasts and podcasts, distributes software and literature, and maintains a web site and Help Desk – all focused on options education.

OIC was formed in 1992. Today, its sponsors include the U.S. options exchanges and The Options Clearing Corporation. The OIC Roundtable is the independent governing body of the Council and includes representatives from the exchanges, member brokerage firms and OCC. These organizations have one goal in mind: to provide a financially sound and efficient marketplace where investors can hedge investment risk and find new opportunities for profiting from market participation.

## About Russell 2000® Index

The Russell 2000 Index offers investors access to the small-cap segment of the U.S. equity universe. The Russell 2000 is constructed to provide a comprehensive and unbiased small-cap barometer and is completely reconstituted annually to ensure larger stocks do not distort the performance and characteristics of the true small-cap opportunity set.

The Russell 2000 Index measures the performance of the 2,000 smallest securities in the Russell 3000 Index, which represents approximately 8% of the total market capitalization of the Russell 3000 Index. As of the latest reconstitution in 2006, the average market capitalization was approximately \$760 million; the median market capitalization was approximately \$600 million. The largest company in the index had an approximate market capitalization of \$2 billion and the smallest, \$220 million.

A Summary of

# Risk and Return Characteristics of the Buy-Write Strategy on the Russell 2000 Index

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The Options Industry Council (OIC), as part of its mission to provide education and research to institutional investors, helped sponsor a study of the performance of a buy-write strategy on the Russell 2000 Index. The study was conducted by The Isenberg School of Management's Center for International Securities and Derivatives Markets (CISDM) at the University of Massachusetts. CISDM is a non-profit research and education center and is considered one of the leading academic centers in the area of alternative investment research. Results of the study show that returns on the buy-write strategy can outperform the index. Research support for this study was provided by OIC. Research results, however, represent those of the authors and do not necessarily represent the views of OIC. The following pages contain a summary of the study as well as an explanation of the buy-write, or covered call, strategy.

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Using data from January 18, 1996 to November 16, 2006, a study by Kapadia and Szado demonstrated that a passive buy-write strategy of one month to expiration calls on the Russell 2000 Index consistently outperformed the index on a risk-adjusted basis. Over the 10-year study period, the Russell 2000 Index had an annualized return of 10.67% while the 2% out-of-the money ("OTM") buy-write strategy on the Russell 2000 returned an almost identical annualized 10.60% and an at-the-money ("ATM") buy-write returned

an annualized 9.21%. These buy-write returns were produced with a significant reduction of annualized volatility. The ATM buy-write strategy yielded a one-third lower annualized volatility of 13.36% compared to 20.52% for the Russell 2000 and 14.85% for the OTM strategy (see summary statistics on page 5). An illustration of the volatility reduction benefits of buy-writing using a rolling 24-month annualized return calculation can be found in Figure 3.

## One Month At-the-Money Buy-Write Growth of \$100

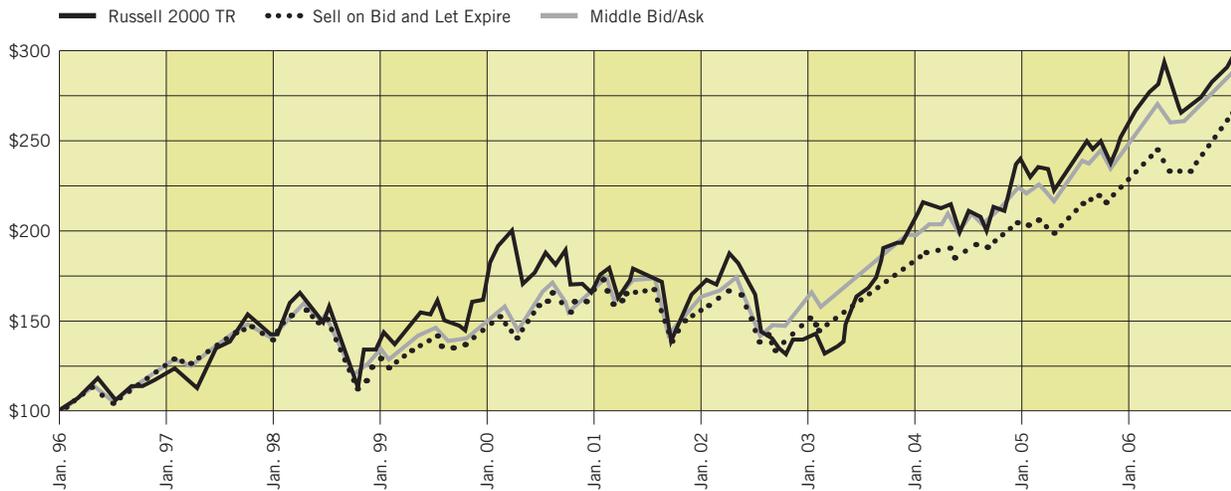


Figure 1. Graph of the growth of a \$100 investment in the Russell 2000 vs. ATM buy-write strategy.

To evaluate the performance in varying market conditions, the study developed sub-period analysis. Specifically, the period from February 2003 to November 2006, when the Russell 2000 experienced a high sustained growth at a relatively low volatility, was one of the worst market conditions for the buy-write strategy. Even in this market environment, the study found that the buy-write strategy easily outperformed the Russell 2000 by standard measures, returning two-thirds of the index return at half its volatility. Meanwhile, in the sub-period up to February 2003, the OTM and ATM buy-write strategy outperformed the Russell 2000 on an absolute basis by returning an annualized 6.19% and 5.06%, respectively vs. a 3.84% return for the index but with only two-thirds of the Russell 2000 volatility (see summary statistics on page 5).

Consistent with the previous literature which have found that the buy-write strategy on the S&P 500® outperformed the S&P 500 (references: see Whaley (2002), Ibbotson Associates (2004), Lehman Brothers (2005), Hill et al (2006) and Callan (2006)), this study found that a buy-write strategy on the Russell 2000 Index outperformed the index on a risk-adjusted basis. However, the selection criteria for the calls are important in determining the strategy's returns. This is the case because both transaction costs and the volatility risk premium (the premium of implied volatility over realized volatility) have a significant impact on returns, and the magnitude of both these factors varies significantly across options with differing moneyness and time to expiration.

## One Month At-the-Money 24-Month Rolling Annualized Returns



Figure 2. 24-month rolling annualized returns for the one month at-the-money buy-write strategy, and the underlying Russell 2000 Index.

## One Month At-the-Money 24-Month Rolling Annual Return Volatility

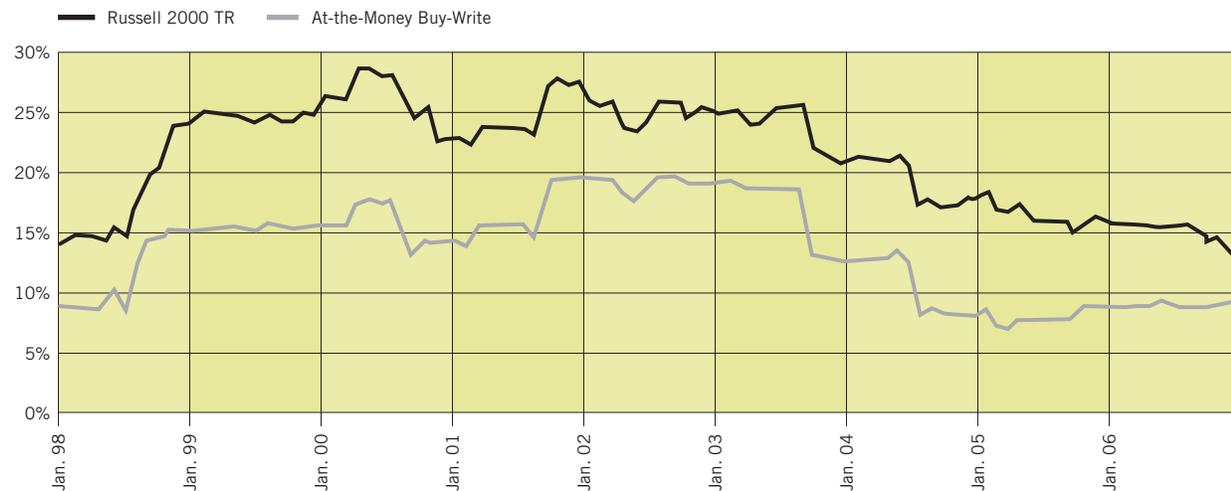


Figure 3. 24-month rolling annualized standard deviation of returns for the one month at-the-money buy-write strategy, and the underlying Russell 2000 Index.

The break point for the sub-period was chosen specifically because of the strong and steady three-year run up that the Russell 2000 experienced from its low in February 2003 (as can be observed in Figure 1). This period is the epitome of an unfavorable environment for the performance of a buy-write strategy. The annualized return for the Russell 2000 over this 45-month period was 24.82%. In comparison, the annualized return in the earlier period was 3.84%. In addition, the run up occurred with low volatility – the annualized volatility in the February 2003 to November 2006 period was 15.34% compared with 22.69% for the earlier period of January 1996 to February 2003. Even in this unfavorable market environment, the ATM buy-write strategy performed credibly, with an annualized return of 17.51%. The annualized volatility of the strategy was only 8.00% compared to the Russell 2000's volatility of 15.34%. In other words, the buy-write strategy achieved over two-thirds of the index return at about half the index volatility.

Figure 2 illustrates the two-year rolling annualized returns of the ATM buy-write strategy. While the absolute performance gap between the buy-write and the Russell 2000 fluctuates significantly, the gap is often extremely small. In fact, during the unfavorable later period, the gap is frequently non-existent or negative. In contrast, Figure 3 shows a quite consistent wide volatility gap between the buy-write and the Russell 2000, with the buy-write typically exhibiting a 5 to 10 percentage point reduction in rolling volatility.

## Conclusion

The study examined the returns on buy-write strategies on the Russell 2000 Index over the period 1996-2006. Overall, the results suggest that the buy-write strategy can outperform the index. The outperformance was largely limited to writing one month calls while the strategy of writing two month calls typically underperformed both the one month strategy and the index. It is clearly evident that the method of execution of the strategy as well as transaction costs and the choice of the option has a large impact on the performance of the strategy. Results indicate that if the option was written at the theoretical Black Scholes price associated with the realized volatility, the buy-write strategy would underperform the index over the sample period. In this light, the study provided only a conservative analysis of the buy-write strategy's performance, since the implementation does not allow for an active selection of the moneyness or time to expiration of the calls. There is some evidence in the literature that a more active approach to call selection can result in significantly higher absolute and risk-adjusted returns (references: see Renicker and Mallick (2005)).

*The authors thank the participants at the 2006 CISDM conference for comments and suggestions. Please address correspondence to Edward Szado, CISDM, University of Massachusetts, Amherst, MA 01003, 413-577-3166, or email: eszado@som.umass.edu. For more information on CISDM, visit [www.cisdms.org](http://www.cisdms.org).*

Summary Statistics for the one month Buy-Write Strategy – index vs. 2% ITM, 2% OTM and ATM over the entire sample period and two sub-periods:

	Russell 2000	2% OTM	ATM	2% ITM
<b>1/18/1996 to 11/16/2006 (130 mos.)</b>				
Annualized Return	10.67%	10.60%	9.21%	9.60%
Annualized Standard Deviation	20.52%	14.85%	13.36%	11.98%
Mean Monthly Return	1.03%	0.94%	0.81%	0.83%
Median Monthly Return	2.18%	2.75%	2.34%	1.68%
<b>1/18/1996 to 2/20/2003 (85 mos.)</b>				
Annualized Return	3.84%	6.19%	5.06%	5.74%
Annualized Standard Deviation	22.69%	17.00%	15.41%	14.13%
Mean Monthly Return	0.53%	0.63%	0.52%	0.55%
Median Monthly Return	1.48%	2.72%	2.40%	1.78%
<b>2/20/2003 to 11/16/2006 (45 mos.)</b>				
Annualized Return	24.82%	19.45%	17.51%	17.28%
Annualized Standard Deviation	15.34%	9.40%	8.00%	5.88%
Mean Monthly Return	1.96%	1.53%	1.38%	1.35%
Median Monthly Return	2.46%	2.80%	2.25%	1.50%

Summary Monthly Risk-Adjusted Performance Measures for the one month Buy-Write Strategy – index vs. 2% ITM, 2% OTM and ATM over the entire sample period and two sub-periods:

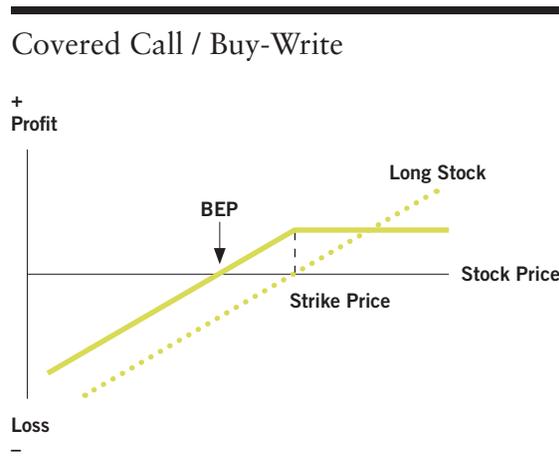
		Russell 2000	2% OTM	ATM	2% ITM
<b>Biased Measures Under Non-normality</b>					
	1/18/1996 to 11/16/2006				
	Sharpe Ratio	0.122	0.148	0.132	0.151
	Jensen's Alpha		0.168%	0.097%	0.179%
	Beta	1.000	0.646	0.573	0.478
	M <sup>2</sup>		0.155%	0.062%	0.176%
	Treynor Ratio	0.007	0.010	0.009	0.011
<b>Unbiased Measures Under Non-normality</b>					
	1/18/1996 to 11/16/2006				
	Leland's Alpha	0.000%	0.141%	0.070%	0.151%
	Leland's Beta	1.000	0.684	0.610	0.517
	Stutzer Index	0.120	0.142	0.127	0.144
	1/18/1996 to 2/20/2003				
	Leland's Alpha	0.000%	0.149%	0.050%	0.101%
	Leland's Beta	0.998	0.697	0.624	0.546
	Stutzer Index	0.027	0.055	0.036	0.048
	2/20/2003 to 11/16/2006				
	Leland's Alpha	-0.007%	0.296%	0.305%	0.596%
	Leland's Beta	1.004	0.583	0.493	0.310
	Stutzer Index	0.396	0.447	0.455	0.596

# Buy-Write Strategy

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The covered call is a strategy in which an investor writes a call option contract while at the same time owning an equivalent number of shares of the underlying stock. If this stock is purchased simultaneously with writing the call contract, the strategy is commonly referred to as a “buy-write.” In either case, the stock is generally held in the same brokerage account from which the investor writes the call, and fully collateralizes, or “covers,” the obligation conveyed by writing a call option contract. This strategy is the most basic and most widely used strategy combining the flexibility of listed options with stock ownership.

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## Market Opinion

Neutral to bullish on the underlying stock.

## When to Use

Though the covered call or buy-write can be utilized in any market condition, it is most often employed when the investor, while bullish on the underlying stock, feels that its market value will experience little range over the lifetime of the call contract. The investor desires to either generate additional income (over dividends) from shares of the underlying stock, and/or provide a limited amount of protection against a decline in underlying stock value.

## Benefit

While this strategy can offer limited protection from a decline in price of the underlying stock and limited profit participation with an increase in stock price, it generates income because the investor keeps the premium received from writing the call. At the same time, the investor can appreciate all benefits of underlying stock ownership, such as dividends and voting rights, unless he is assigned an exercise notice on the written call and is obligated to sell his shares. There is a significant chance that an option whose underlying stock is paying a dividend may be exercised prior to expiration.

## Risk vs. Reward

Maximum profit will occur if the price of the underlying stock you own is at or above the call option's strike price, either at its expiration or when you might be assigned an exercise notice on the call before it expires. The risk of real financial loss with this strategy comes from the shares of stock held by the investor. This loss can become substantial if the stock price continues to decline in price as the written call expires. At the call's expiration, loss can be calculated as the original purchase price of the stock less its current market price, less the premium received from the initial sale of the call. Any loss accrued from a decline in stock price is offset by the premium you received from the initial sale of the call option. As long as the underlying shares of stock are not sold, this would be an unrealized loss. Assignment on a written call is always possible. An investor holding shares with a low cost basis should consult his tax advisor about the tax ramifications of writing calls on such shares.

<b>PROFIT POTENTIAL</b> Limited	<b>UPSIDE PROFIT AT EXPIRATION IF ASSIGNED</b>	<b>UPSIDE PROFIT AT EXPIRATION IF NOT ASSIGNED</b>
<b>LOSS POTENTIAL</b> Substantial	Premium Received plus Difference (if any) Between Strike Price and Stock Purchase Price	Any Gains in Stock Value plus Premium Received

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Risk vs. Reward.

## Break-Even Point (BEP) at Expiration

**BEP:** Stock Purchase Price less Premium Received

## Volatility

**If Volatility Increases:** Negative Effect

**If Volatility Decreases:** Positive Effect

Any effect of volatility on the option's price is on the time value portion of the option's premium.

## Time Decay

**Passage of Time:** Positive Effect

With the passage of time, the time value portion of the option's premium generally decreases – a positive effect for an investor with a short option position.

## Alternatives Before Expiration

If the investor's opinion on the underlying stock changes significantly before the written call expires, whether more bullish or more bearish, the investor can make a closing purchase transaction of the call in the marketplace. This would close out the written call contract, relieving the investor of an obligation to sell his stock at the call's strike price. Before taking this action, the investor should weigh any realized profit or loss from the written call's purchase against any unrealized

profit or loss from holding shares of the underlying stock. If the written call position is closed out in this manner, the investor can decide whether to make another option transaction to either generate income from and/or protect his shares, to hold the stock unprotected with options, or to sell the shares.

## Alternatives at Expiration

As expiration day for the call option nears, the investor considers three scenarios and then accordingly makes a decision. The written call contract will either be in-the-money, at-the-money or out-of-the-money. If the investor feels the call will expire in-the-money, he can choose to be assigned an exercise notice on the written contract and sell an equivalent number of shares at the call's strike price. Alternatively, the investor can choose to close out the written call with a closing purchase transaction, canceling his obligation to sell stock at the call's strike price, and retain ownership of the underlying shares. Before taking this action, the investor should weigh any realized profit or loss from the written call's purchase against any unrealized profit or loss from holding shares of the underlying stock. If the investor feels the written call will expire out-of-the-money, no action is necessary. He can let the call option expire with no value and retain the entire premium received from its initial sale. If the written call expires exactly at-the-money, the investor should realize that assignment of an exercise notice on such a contract is possible, but should not be assumed. Consult with your brokerage firm or a financial advisor on the advisability of what action to take in this case.

For more information on OIC or the buy-write strategy, or for a copy of the full study, contact The Options Industry Council at 1-888-OPTIONS or visit [www.OICoptions.com](http://www.OICoptions.com).

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