

MARKET INSIGHTS

Improving Portfolio Performance  
During Market Declines: Examining  
a Collar Strategy on the ASX

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# Improving Portfolio Performance During Market Declines: Examining a Collar Strategy on the ASX

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## EXECUTIVE SUMMARY

The recent decline in equity markets shows the importance of investment strategies that minimise downside risk. This study analyses the performance of passive and active implementations of a collar strategy on the S&P/ASX 200 Index. A collar is used to hedge a portfolio, providing greater downside protection than standard diversification. It is an option strategy where an investor who holds an underlying security purchases a put option while simultaneously selling a call option. The collar strategy may be preferable for investors who are willing to sacrifice upside return for downside protection. The time interval examined is from 1 March, 2007 to 30 June, 2011, a period during which the S&P/ASX 200 Index declined.

The results show that using a collar strategy significantly outperforms a simple buy and hold strategy in terms of both risk and return. Furthermore, an active collar strategy, where the collar is adjusted according to changing market conditions, is shown to improve the risk/return ratio. The annualised return and standard deviation of a buy and hold strategy was -4.61% and 16.1%, respectively. For the passive and active collar strategies, the annualised return was -.24% and 0.67%, and the annualised standard deviation was 8.61% and 8.26%, respectively.

## Background

During periods of general market decline, the use of a buy and hold strategy on a well-diversified portfolio can still lead to significant losses. The use of protective option strategies are an alternative that can not only limit losses but possibly generate significant returns. One popular strategy is the collar, where an investor simultaneously buys a put option and sells a call option on the underlying security. In effect, the strategy is a combination of a covered call and a protective put, where the sale of the call option is used to fund part or all of the purchase of the put option. This limits the return, with the upper bound set to the strike price of the call option and the lower bound defined by the strike price of the put option. The collar may therefore be preferable to using the protective put or a covered call, as the use of protective puts can be expensive during periods of high volatility, while covered calls still leave investors exposed to large drawdowns.

The collar strategy can be easily implemented on the ASX. An investor holding a well-diversified portfolio that wishes to protect against market-wide risk can trade index options (referred to as XJO Index Options) that cover the S&P/ASX 200 Index. The S&P/ASX 200 Index reflects the prices of the largest 200 stocks listed on the ASX, representing approximately 80% of the whole market.

## Methodology

This study replicates the methodology of Szado and Scheeweis (2010) who examine the performance of a collar strategy on the Powershares QQQ exchange-traded fund. The collar strategy is created through the purchase of a six-month put option and a one-month call option. The options employed in the sample are the XJO index options that cover the S&P/ASX 200 index. The XJO one-month call index options began trading in early 2007. The beginning period of our study therefore starts on 1 March 2007 and ends on 30 June, 2011. The return performances of both passive and active collars are analysed.

### Passive Collar Strategy

A passive collar is a collar strategy that follows a set of criteria that do not vary with market conditions. Under the passive strategy, a collar is created by purchasing a 6-month 2% OTM put option and selling a 1-month 2% OTM call option. When either option expires, the option is settled at intrinsic value and a new option is rolled into. At each point when the portfolio is rolled-over, the portfolio is rebalanced to ensure the same ratio of the underlying, puts and calls. Returns are calculated using the daily closing bid-ask midpoint.

### Active Collar Strategy

The active collar strategy uses two sets of market signals to both adjust the moneyness of the calls and puts and the number of calls written on each roll date.<sup>1</sup>

The first signal is a momentum indicator known as the simple moving average cross-over of the S&P/ASX 200 index. The index is said to be in an upward trend if the short-term moving average is above the long-term moving average and vice versa. This study uses the 30-day and the 180-day moving average as the short-term and long-term moving average, respectively. If the market is in an upward trend, the collar is widened by moving both the put and call 1% further OTM, and vice versa. Utilising puts and calls closer to ATM gives less upside protection and more downside protection, while using puts and call further OTM provides less downside protection for greater upside return.

The second signal is a volatility indicator that uses the 50-day average of the daily S&P/ASX 200 VIX.<sup>2</sup> The VIX is a market estimate of the expected volatility of the S&P/ASX200 index. It uses the settlement prices of the put and call index options to calculate a weighted average of the markets implied volatility. At each roll date, the strategy writes 0.75 calls to each long index position when expected volatility is high (as indicated when the VIX is above the 50-day one standard deviation Bollinger band based on the 50-day moving average of the VIX). The strategy writes 1.25 calls to each long index position when expected volatility is low (as indicated when the VIX is below the 50-day one standard deviation Bollinger band based on the 50-day moving average of the VIX). This provides longer exposure during periods of high anxiety and shorter exposure during periods of low anxiety.

1 Szado and Scheeweis (2010) also employ a macroeconomic indicator based on the trend of initial unemployment claims, which we do not use in this study.

2 The S&P/ASX 200 VIX begins on 2 Jan 2008. As the study begins on the 1 March, 2007, we use the 'Citigroup Volatility Index of Australian Market' for March to December 2007. As a robustness test, we ran the volatility signal using the 'Citigroup Volatility Index of Australian Market' for the whole sample and found no qualitative change in the results.

## Results

TABLE 1: MONTHLY PERFORMANCE MEASURES OF THE S&P/ASX 200 INDEX

Monthly Data  
January 1, 2007

	ASX 200 Index	Passive Collar	Short Active Strategy
Annualised Return	-4.61	-0.24	0.67
Annualised Standard Deviation	16.10	8.61	8.26
Sharpe Ratio	-0.63	-0.67	-0.59
Maximum Drawdown	-70.28	-21.41	-21.24
Correlation with ASX/200 Index	1	0.29	0.24
Min Monthly Return	-12.66	-5.56	-6.23
Max Monthly Return	7.31	7.17	7.04
Number of Months	52	52	52
% Up Months	54	52	56
% Down Months	46	48	44

### Buy and Hold Strategy

Table 1 shows the relative results of a buy and hold strategy and the passive and active collar strategies. The buy and hold strategy has the worst performance of the three strategies over the period. For the buy and hold strategy, the annualised return of the index over the whole time period is -4.61%. Illustrated in Figure 1, investing \$100 at the start of the period has an ending portfolio value of \$79.30. The index is also highly volatile as seen in Figure 2, with the rolling standard deviation of the buy and hold strategy greater than both the passive and active collar strategies throughout the whole period. The annualised volatility is 16.1% and the maximum drawdown is an extremely large 70.28%. This means that from the maximum drawdown point, the buy and hold strategy has to increase by more than 242.47% in order to earn a positive return.

### Passive Collar

The collar strategy trades upside return for downside protection. The poor performance of the index over the period provides an ideal experiment to test whether the use of a collar strategy improves portfolio performance during an equity market decline. The results of the passive collar strategy show a significant improvement over the buy and hold approach, showing the collar's ability to provide strong capital protection during market declines. Shown in Figure 1, the investment of \$100 into a passive collar strategy yields a small loss of \$1.04 over the period for an ending value of \$98.96. This translates into an annualised return of -0.24%, significantly higher than the buy and hold strategy. Further evidence of the superior ability of the collar to protect an investor's capital is the volatility results, with annualised volatility significantly lower at 8.61%. The maximum loss experienced over the period was also smaller at 21.41%.

### Active Collar

The active collar strategy outperformed both the buy and hold and passive collar strategies in terms of risk and return. Adjusting both the moneyness of the options and the exposure of the call options lead to a slightly positive return over the period, with \$100 invested at 1 March, 2007 increasing by 2.94% to 30 June, 2011. The portfolio performance measures in Table 1 show the active collar performs better than the passive collar, with the annualised return now positive at 0.67% and the annualised standard deviation decreasing slightly to 8.26%. The maximum drawdown is similar to the passive collar at 21.24%.

3 The Sharpe Ratio is a measure of the excess return per unit of risk of an investment. An issue with the Sharpe Ratio is that when the returns are negative, the investment with the lowest return per unit of risk will have the largest ratio number. For instance, the Sharpe Ratio for the passive collar is smaller than for the Index, even though it has a higher return and lower standard deviation. Therefore, the Sharpe Ratio should only be used to compare the performance of the passive collar and the Index. In this situation, the strategy with the smallest ratio number is the better strategy.

FIGURE 1: GROWTH OF \$100 (MARCH 2007 TO JUNE 2011)

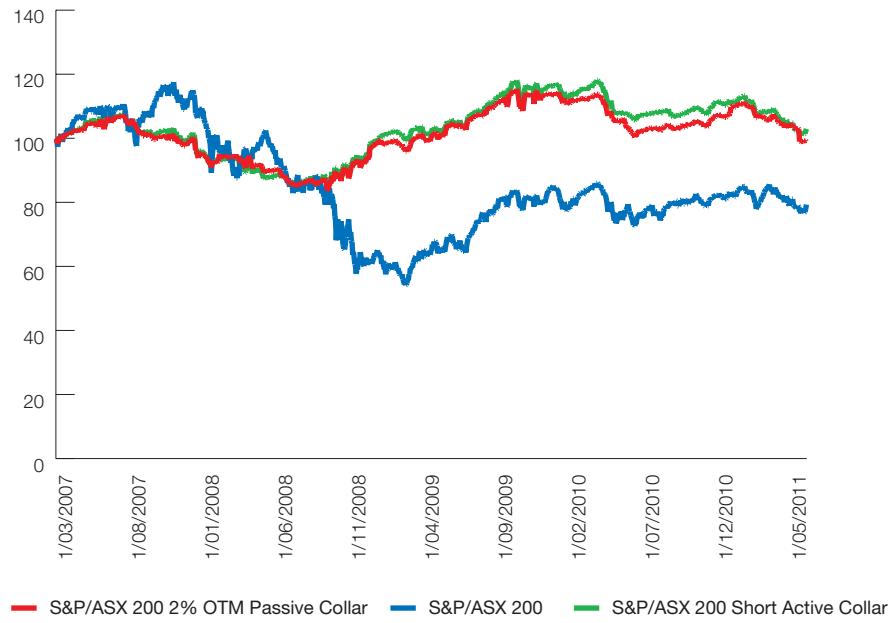
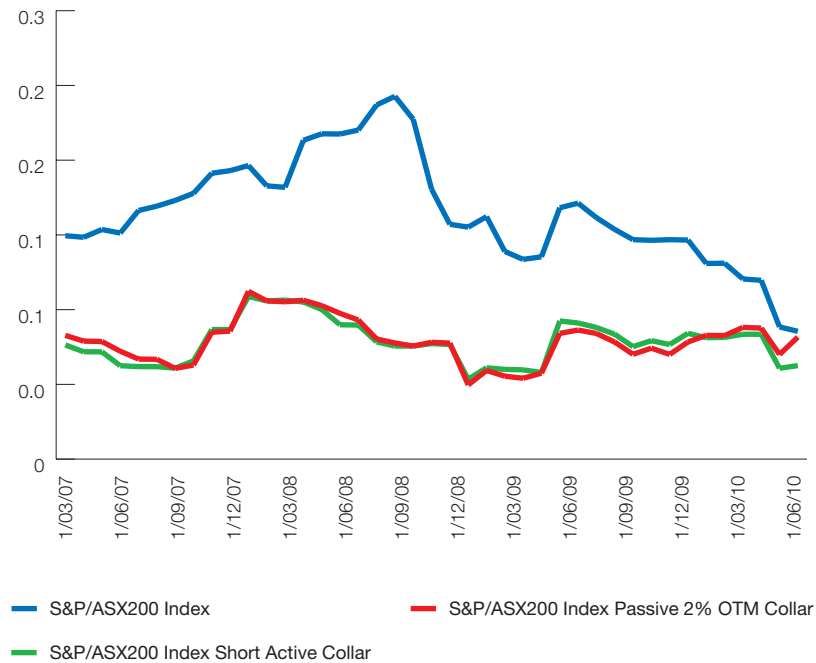


FIGURE 2: ROLLING 12-MONTH ANNUALIZED STANDARD DEVIATION (MARCH 2007 TO JUNE 2011)



## Conclusion

This study examines the performance of passive and active collar strategies on the S&P/ASX200 Index relative to a buy and hold approach. The time period is examined from 1 March, 2007 to 30 June, 2011, a period during which the index declined. This provides an ideal period to test the capital preservation ability of the collar strategy. The results show that both the passive and active collars significantly outperform the buy and hold approach across both risk and return metrics. The portfolio using the passive collar strategy suffered only a slight loss over the period, while the active collar strategy generated a positive return. This was achieved while also reducing the volatility of the portfolio by half. Implementing a collar strategy during periods of market declines therefore provides a simple method of improving returns while minimising risk.

## References

Szabo, Edward and Thomas Scheeweis, "Loosening Your Collar – Alternative Implementations of QQQ Collars," *Journal of Trading*, Spring 2010, Vol.5, No.2, pp. 35-36.

# Appendix

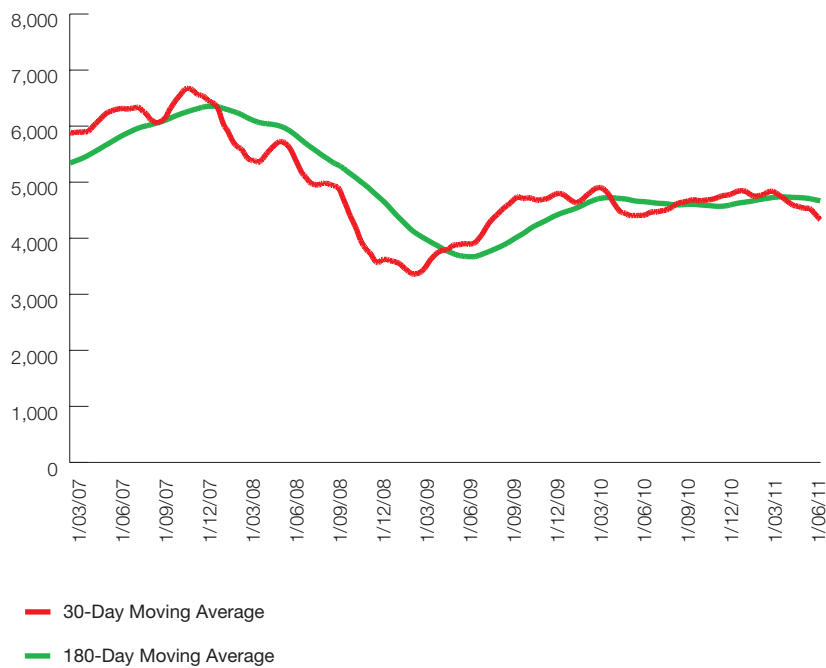
## Active Collar Strategy Indicators

As discussed previously, this study uses two signals for the active collar strategy. This is a momentum indicator based on a simple moving average cross-over and a volatility indicator based on the S&P/ASX 200 VIX.

### Momentum Indicator

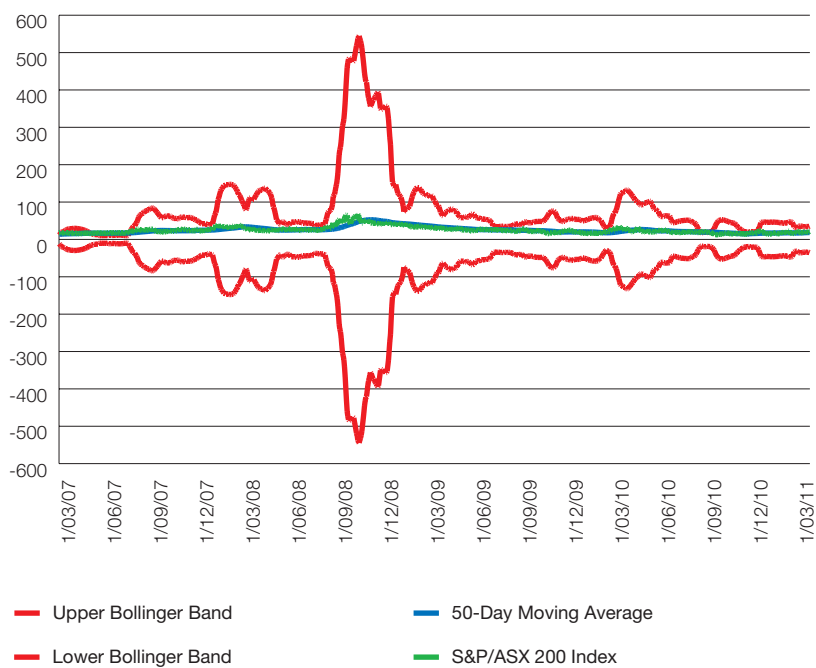
The momentum indicator employed is a simple moving average cross-over of a short-term and long-term moving average. The short-term moving average is based on the Index values of the past 30-days, and the long-term moving average is based on the Index values of the past 180-days. Figure 3 shows the momentum indicator for the time period used. When the short-term moving average is above the long-term average the market is determined to be in an upward trend and vice versa.

FIGURE 3: SIMPLE MOVING AVERAGE CROSS-OVER



## Volatility Indicator

The volatility indicator uses the 50-day average of the daily S&P/ASX 200 VIX. The number of calls written against the index varies according to the index and Bollinger band values. The Bollinger band consists of a centre line (this study uses a 50-day moving average of the Index values) and two price channels (bands) above and below the centre line. The centre line is the 50-day moving average of the S&P/ASX 200 Index. The upper and lower bounds are calculated as the 50-day moving average multiplied by the standard deviation of the S&P/ASX 200 Index for the past 50 days. The market is said to be overbought (signalling a price reversal) when the price exceeds the upper Bollinger band and is said to be oversold (signalling a price reversal) when the price exceeds the lower Bollinger band. Figure 4 shows the volatility indicator, used to determine whether the ratio of the call write will be neutral, overwritten or underwritten.



Notes

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