

Analysis of Zero-Cost Collar & Covered Call

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Abstract. This paper introduces two option strategies, zero-cost collar and covered call. After calculating various performance metrics, plotting return graphs, and discussing strategy performance, we show the specific differences between the two options strategies and provide suggestions to investors. The results show that these two strategies do increase overall return, but mainly due to the initial premium received from the shorting call options from the covered call.

Keywords: Option; Zero-cost collar; Covered call.

1. Introduction and Strategy Overview

This report analyzes the performance of two option strategies based on historical data. The two strategies employed in this report are zero-cost collar and covered call (Linden, 2005; Marie, 2012; Diaz and Kwon, 2017; Diaz and Kwon, 2019). First, a zero-cost collar is constructed by taking a long position of one at-the-money put option, and a short position on one out-of-the-money call option. The strategy does not require initial investment on the options since the option positions cancel each other out. It is most effective at hedging volatility, but it also gives up the upside profit potential. Essentially, a zero-cost collar is equivalent to buy a protective put while writing a covered call. Second, a covered call is constructed by taking a long position on the underlying stock and a short position on the out-of-the-money call option. A covered call can help the investors earn premiums while still holding ownership of the stock with the trade-off of giving up the upside potential. In this report, a total of 10,000 of Apple’s shares were purchased on January 2nd, 2020, which is used to construct the covered call.

The rest of this report is organized as follows. The second section calculates various performance metrics, plot return graphs, and discuss strategy performance (Question 1 to 7). The third section discusses some additional considerations related to the two strategies (Question 8 to 10). The last section concludes this report.

2. 2 Performance Tracking and Evaluation

The initial investment date is January 2nd, 2020 and the trading price of Apple at that date was \$75.93 per share. Thus, the 10,000 shares would cost $75.93 * 10,000 = 759,300$. A covered call also involves shorting an out-of-the-money call option. Here the strike of the call option is determined to be 150. The call option price is thus \$22.05. This would construct the covered call.

To construct the zero-cost collar, an at-the-money put option is used, which has the minimum price of \$0.01. To match the price on the call option, the call option strike price has to be \$187.50. Thus, the total initial investment is the costs to purchase shares minus the premium collected from writing calls, which is \$538,800 initial cash outlay (Question 1). The details are shown in Table 1 below.

Table 1. Option Strategy Construction

Option Strategy	Position	Size
Covered Call	Long 10,000 Apple Shares	$22.05 * 10,000 = 220,500$
	Short 10,000 Call @ 150	$-75.93 * 10,000 = -759,300$
Zero-Cost Collar	Long 10,000 Put @ 75.93	Offset Each Other
	Short 10,000 Call @ 187.50	
Total		538,800 Outlay

At the end of the period, which is August 2020, the total value of the combined position is \$150. Thus, the total return of the time period is $150 * 10,000 / 538,800 - 1 = 178.40\%$ (Question 2). This is higher than the return from simply holding the stock, which is $162.28 / 75.93 - 1 = 113.73\%$.

Despite a lower final value, the premium received in the beginning make the combined position of covered collar and zero-cost collar a more attractive investment than stock holding alone.

From January 2020 to August 2022, there is a total of 31 months, which is 2.58 years. Therefore, the annual return can be calculated as . The annual return of the investment is thus 48.64% (Question 3).

The following plots show the monthly value of the investment. The plot shows that there is a high coincidence between the covered call, the combined position, and the apple stock. This is due to the call used in covered call is deeply out of the money and would not exercise until later when Apple stock price climbed up. However, as discussed above, covered call gives up the upside profit potential, which is also evident in the plot. Meanwhile, the zero-cost collar does not generate a profit except in the early months. This is because zero-cost collar is profit-capped if the stock price actually increases, which is the case of Apple in the past two years. Overall, the trend shown in the plot is consistent with the theory.

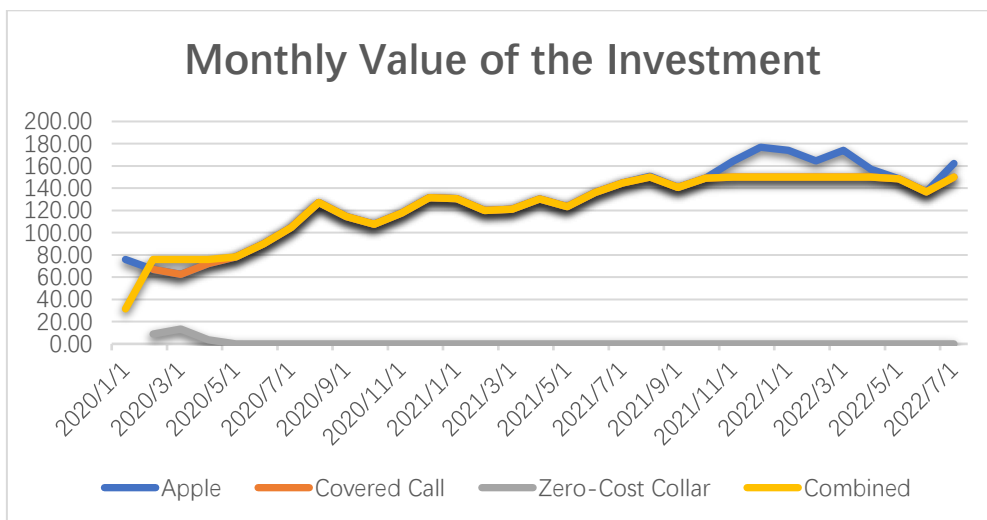


Figure 1. Monthly Value of the Investment (Question 4)

Similar to the plot above, the following plot shows the monthly return of the stock, covered call, zero-cost collar, and the combined position. The return shows that the volatility is mostly contributed by the fluctuation in stock price. This makes sense. Zero-cost collar and covered call are all used to hedge volatilities and has limited upside potential. When stock price increases, their return becomes zero.

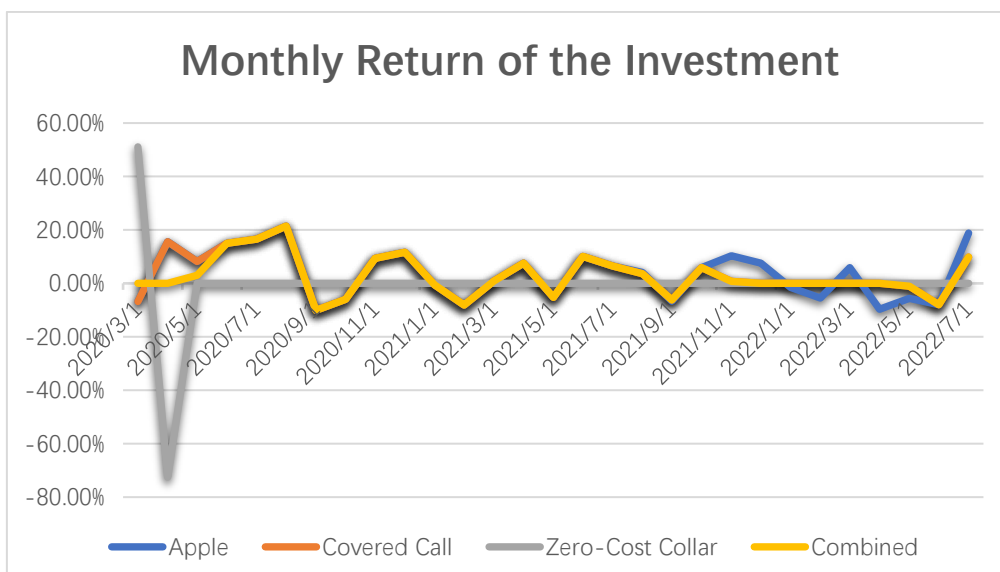


Figure 2. Monthly Return of the Investment (Question 5)

By the two plots shown above, the month with the maximum loss is September 2020 (Question 6) while the month with the maximum gain is August 2020 (Question 7). The initial fluctuation of zero-cost collar is high, but the amount is quite small compared to the combine position. Overall, August 2020 has the highest gain in term of both amount and percentage for the combined position while September 2020 has the most losses.

3. Additional Considerations

Up to August 2022, the total amount of gain per share is $150 - 53.88 = \$96.12$. The current stock price is \$162.28. To protect 80% of the gain (\$76.90) until June 21st 2024, a put option with the same maturity date would satisfy the need. The payoff of the put option would be $\max(S - K, 0)$. Along with the stock. This would become a protective put. The most losses the investor can afford is thus $96.12 - 76.90 = \$19.22$. Thus, the put option strike price should be $162.28 - 19.22 = \$143.06$. According to Yahoo Finance, the put options with strike prices \$140 and \$145 are \$11.80 and \$13.50 respectively. By linearly interpolation, the put price with strike \$143.06 would be

Therefore, the put option with strike price \$143.06 and maturity date of June 21st, 2024 is currently trading at \$12.84 (Question 8). This is the put option to use to protect 80% of the gain so far.

To offset some of the premiums paid by the above call options, the portfolio can also short some call options. The call option needs to be out-of-the-money and has less premium than the put option. By the option price table from Yahoo Finance, the call option strike price needs to be higher than \$230 to satisfy this criterion (Question 9).

A call option with strike price 20% over current price, which is $162.28 * 1.2 = \$194.74$, maturing at June 21st 2024 is currently trading at \$22.40, according to data from Yahoo Finance. The plot of the initial investment plus the call option is shown below. Note that the plot is identical to the figure 2 (plot for question 5) since the call option is deep out-of-the-money and is never in-the-money from 2020 to 2022. Up until August 2022, Apple's stock price never exceeded the strike price of \$194.74 and thus the option is never exercised and would not affect the overall return of the portfolio during the months. Therefore, it only affects the initial investment committed, which lowers amount by premium 22.40 per share. The monthly return is still the same throughout the time period.

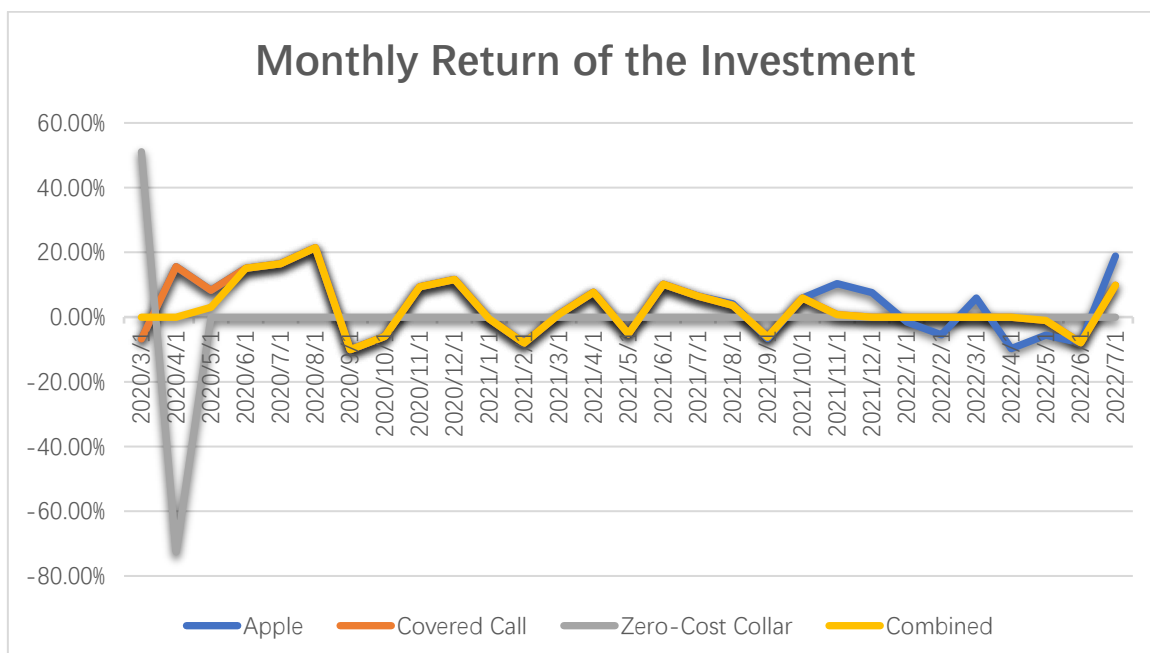


Figure 3. Monthly Return of the Investment (Question 10)

Table 2 below provides a summary to the answers to all questions to the final project for a quick and concise review.

Table 2. Summary of Results

No.	Question	Answers
1	Size of Initial Investment	\$538,800
2	Return on Investment	178.40%
3	Annual Return on Investment	48.64%
4	Monthly Value Plot	See Figure 1
5	Monthly Return Plot	See Figure 2
6	Month with Maximum Loss	September 2020
7	Month with Maximum Return	August 2020
8	Put Option to Use and Costs	Put with strike \$143.06, currently trading at \$12.84
9	Strike Price of the Call	Call Option with Strike Price Higher than \$230
10	Plot with New Option	See Figure 3

4. Conclusion

To sum up, this report constructs two option strategies (zero-cost collar & covered call) and analyzes their performance from January 2020 to August 2022. The results show that these two strategies do increase overall return, but mainly due to the initial premium received from the shorting call options from the covered call. The combined position actually lowers the upside profit potential compared to holding the stock alone. The performance is unique since the stock price of Apple is on a sharp increasing trend throughout the time period and the performance of the strategies could be drastically different for a more fluctuating stock.

References

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