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Using option strategies in trading

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Abstract

This article is focused on trading stocks and improvement of long and short positions in case of negative stock's price development. For this purpose, we use Vertical Ratio Call Spread and Vertical Ratio Put Spread option strategies. We also show in theory and in practice as well the ways of creating these option strategies and their usage for spreading the profit interval for long and short positions open, and without any additional costs.

Keywords: option strategies; trading; options; stocks.

1. Introduction

Recently, investors face very strange development on financial markets. Financial markets started to live their own life far away from the real economy and real values. As the result, there is not only high volatility, but also unpredictable development of stocks' prices. This uncertainty leads to fear and reserve of large number of investors (Raisová & Bánociová, 2012). It is not surprising, as investors, as well as most of people, are afraid of any helping from state or elsewhere in financing their lives and needs, especially when retired and they are much more dependent on their savings (Pavlíková, Buleca, & Bánociová, 2012).

Financial derivatives are instruments, which are discussed very often as one of the issues that caused or at least contributed to the financial crisis significantly. On the other hand, despite macroeconomic consequences of existence of financial derivatives, their importance for investors is very high. In this article, we focus on financial

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options, which might be a strong tool for both individual and institutional investors (Císař & Dufala, 2010). They might be used for trading, arbitrage, hedging and making new financial instruments. Rather deep search has been done so far in the field of hedging, either usage of vanilla options (Amaitiek & Šoltés, 2010; Rešovský, Bálint, & Amaitiek, 2010) or barrier options (Šoltés & Rusnáková, 2012, 2013), as well as investment certificate creation (Šoltés, 2010, 2012).

The aim of this article is to provide investors with possibilities, how to increase their chances to close long or short position on stock market with profit or without loss at least, in case of negative price development. For this purpose, two option strategies can be used. The aim of this article is to show in theory and practice, how Vertical Ratio Call Spread and Vertical Ratio Put Spread option strategies can be created and how they can be used in situations in which long or short positions are open and price of the stocks are developing in not positive way.

2. Option strategy Vertical Ratio Call Spread

To be Vertical Ratio Call Spread strategy (VRCS strategy) created, we need call options with two different strike prices. The strategy can be recommended to investors if expected, that the amount of underlying asset is close to higher strike price of used options at options maturity.

The VRCS strategy can be created by purchasing a smaller number of call options n_1 with lower strike price x_1 and premium p_{1N} per option and selling higher number of call options n_2 with higher strike price x_2 and premium p_{2P} per option.

If profit function from purchasing call option is:

$$P(S)=\begin{cases} -n_1 p_{1N} & ak\ S < x_1, \\ n_1\left(S - x_1 - p_{1N}\right) & ak\ S \geq x_1, \end{cases} \tag{1}$$

And profit function from selling call option is:

$$P(S)=\begin{cases} n_2 p_{2P} & ak\ S < x_2, \\ -n_2\left(S - x_2 - p_{2P}\right) & ak\ S \geq x_2, \end{cases} \tag{2}$$

Than by adding the two positions we get profit function from IVRCBS strategy which is:

$$P_{VRCS}(S)=\begin{cases} n_2 p_{2P} - n_1 p_{1N} & ak\ S < x_1, \\ n_1 S - n_1 x_1 + n_2 p_{2P} - n_1 p_{1N} & ak\ x_1 \leq S < x_2, \\ \left(n_1 - n_2\right)S + n_2 x_2 - n_1 x_1 + n_2 p_{2P} - n_1 p_{1N} & ak\ S \geq x_2. \end{cases} \tag{3}$$

If we choose n_2 that fulfill the following condition

$$n_2 \geq \frac{n_1 p_{1N}}{p_{2P}}, \tag{4}$$

the strategy can be created with no initial costs and has only one break-even point.

In a special case, if $n_1 = 1$, $n_2 = 2$ and x_2 is chosen to fulfill the condition $2p_{2P} - p_{1N} = 0$, the profit function from VRCS strategy is:

$$P_{VRCS}(S)=\begin{cases} 0 & ak\ S < x_1, \\ S - x_1 & ak\ x_1 \leq S < x_2, \\ -S + 2x_2 - x_1 & ak\ S \geq x_2. \end{cases} \tag{5}$$

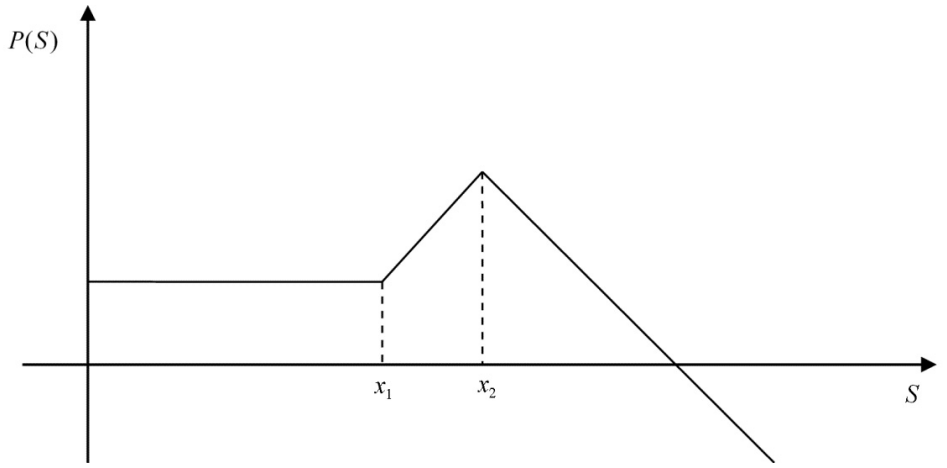

Fig. 1. The graph of profit function of VRCS strategy

3. Option strategy Vertical Ratio Put Spread

Option strategy Vertical Ratio Put Spread (VRPS strategy) can be created by selling higher number of put options n_1 with strike price x_1 and premium p_{1P} per option and purchasing smaller number of put options n_2 with higher price strike x_2 and premium p_{2N} per option.

The profit function from the first position is:

$$P(S)=\begin{cases} n_1\left(S-x_1+\overline{p_{1P}}\right) & ak\ S<x_1, \\ n_1\overline{p_{1P}} & ak\ S\geq x_1. \end{cases} \tag{6}$$

The profit function from the second position is:

$$P(S)=\begin{cases} -n_2\left(S-x_2+\overline{p_{2N}}\right) & ak\ S<x_2, \\ -n_2\overline{p_{2N}} & ak\ S\geq x_2. \end{cases} \tag{7}$$

By adding the two positions we get the strategy with limited profit during the price of underlying asset is increasing and theoretically unlimited loss during the price of underlying asset is decreasing. The profit function from this strategy is:

$$P_{VRPS}(S)=\begin{cases} (n_1-n_2)S-n_1x_1+n_2x_2+n_1\overline{p_{1P}}-n_2\overline{p_{2N}} & ak\ S<x_1, \\ -n_2S+n_2x_2+n_1\overline{p_{1P}}-n_2\overline{p_{2N}} & ak\ x_1\leq S<x_2, \\ n_1\overline{p_{1P}}-n_2\overline{p_{2N}} & ak\ S\geq x_2. \end{cases} \tag{8}$$

If the condition

$$n_1\geq\frac{n_2\overline{p_{2N}}}{\overline{p_{1P}}} \tag{9}$$

is satisfied, the strategy can be created with no initial costs and has only one break-even point.

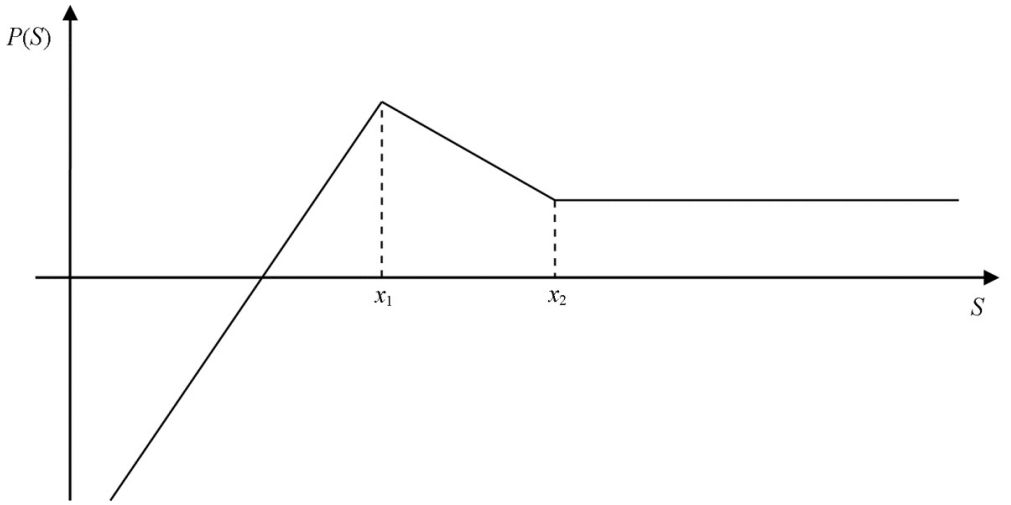

Fig. 2. The graph of profit function of the VRPS strategy

If the strategy is created with no initial costs, as a result of the profit function, the strategy is unprofitable only in cases where:

$$S < \frac{n_1 x_1 - n_2 x_2 - n_1 \overline{p_{1P}} + n_2 \overline{p_{2N}}}{n_1 - n_2}, \tag{10}$$

However the loss grows linearly with the decrease in the spot price S.

Whereas the maximum profit is limited by the value $n_2 x_2 - n_1 x_1 + n_1 \overline{p_{1P}} - n_2 \overline{p_{2N}}$, which is achieved if $S = x_1$, it is not recommended for trading in practice. But the strategy is usable in specific cases to improve trading position as will be seen later.

3.1. The rescue of badly evolving position on the spot market

In trading, we often face the situation where a long position on the spot market is opened and the price of underlying asset is decreasing. In this case one of the possibilities is to wait to share be recovered, but it might be very long lasting and sometimes unattainable. Therefore, it is appropriate to use Vertical Ratio Call Spread strategy. By creating the strategy the zero point can be reduced and so a long opened position can be rescued. We should realize that the rescue is at the expense of participation in the profit if the changes in the price development are in our favor – if the price again increases.

We will use the Put and Call options on SPDR Gold Shares quotation listed in Table 1.

If we hold 100 pieces of share named SPDR Gold Shares with purchase price 175 and the price dropped to 170, we create Vertical Ratio Call Spread strategy by purchasing 100 call options with the price lower than the original purchase price and by selling 200 call options with strike price equals to current price, i.e. 170. When choosing lower strike price, is assumed that creating strategy is with no initial costs, alternatively the creation of the strategy should provide profit. In our case, the premium that we pay for purchasing each of 100 options should not be more than $2*22,90 = 45,80$, meaning that all strike prices suit. Let us choose the lowest possible strike price – we purchase 100 call options with strike price 140 and premium 41,15 per option.

The profit function from the long position is:

$$P_{LP}(S) = 100S - 17500 \tag{11}$$

Table 1. Call and Put options on SPDR Gold Shares quotation

Strike Price	Call Option		Put Option	
	Bid	Ask	Bid	Ask
140	40,40	41,15	6,10	6,45
150	34,10	34,30	9,20	9,55
160	28,00	28,30	13,25	13,60
170	22,90	23,35	18,30	18,65
175	20,55	21,00	21,10	21,50
180	18,80	19,20	24,20	24,55
185	17,15	17,60	27,50	27,85
190	15,50	15,90	31,00	31,35
195	14,05	14,75	34,55	35,00
200	13,15	13,55	38,25	38,75
205	11,80	12,40	42,20	42,75
210	10,90	11,40	46,20	46,75
215	9,90	10,40	50,05	50,85

Source: http://finance.yahoo.com/q/op?s=GLD+Options

The profit function from the created strategy is:

$$P_{VRCS}(S) = \begin{cases} 465 & ak\ S < 140, \\ 100S - 13535 & ak\ 140 \le S < 170, \\ -100S + 20465 & ak\ S \ge 170. \end{cases} \tag{12}$$

The profit function from new position created by the combination of the long position and option strategy Vertical Ratio Call Spread is:

$$P_{VRCS+LP}(S) = \begin{cases} 100S - 17035 & ak\ S < 140, \\ 200S - 31035 & ak\ 140 \le S < 170, \\ 2965 & ak\ S \ge 170. \end{cases} \tag{13}$$

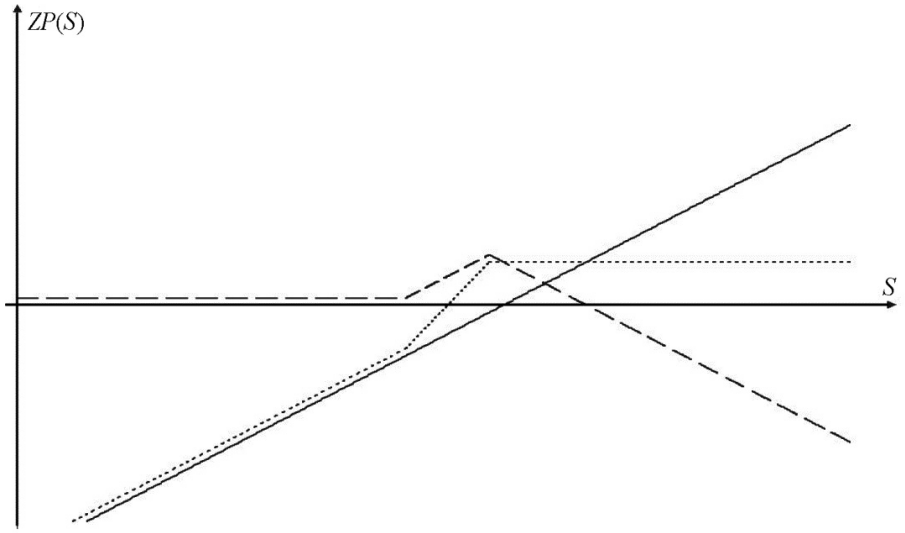

Fig. 3. The graph of both positions and the resulting position

As can be seen, using option strategy decreased the zero point from 175 to 155,18. The price drop to this level is still not losing.

Analogical is situation where the short position on the spot market is opened and the price of underlying asset is increasing. Also in this case it is possible to improve our position by using suitable option strategy, which is Vertical Ratio Put Spread.

Let us assume that we realize short selling 100 pieces of share SPDR Gold Shares at a price 170 and that price increased to 175. Our position is at loss, which can be eliminated by waiting for price turning and till the direction of share development suit us. The waiting can be long lasting and what is more, the money in the trade in this unfavorable situation cannot be used for something else.

Let us create Vertical Ratio Put Spread strategy by selling higher number of put options n_1 with strike price 175 and option premium 21,10 and by purchasing lower number of put options 100 with higher strike price 200 and premium 38,75 per option to be with no initial costs. To fulfill the condition:

$$21{,}10n_1 - 100 \cdot 38{,}75 \geq 0 \tag{14}$$

$$n_1 \geq 183{,}6 \tag{15}$$

So we should purchasing 184 put options with higher strike price. The profit function from this strategy is:

$$P_{VRPS}(S) = \begin{cases} 84S - 12192{,}60 & ak\ S < 175, \\ -100S + 20007{,}40\ ak & 175 \leq S < 200, \\ 7{,}4 & ak\ S \geq 200. \end{cases} \tag{16}$$

As is known, the profit function from short position is:

$$P(S) = -100S + 17000 \tag{17}$$

So the profit function from strategy created by combination of short sell position and Vertical Ratio Put Spread is:

$$P_{VRPS}(S) = \begin{cases} -16S + 4807{,}40 & ak\ S < 175, \\ -200S + 37007{,}4\ ak & 175 \leq S < 200, \\ -100S + 17007{,}4 & ak\ S \geq 200. \end{cases} \tag{18}$$

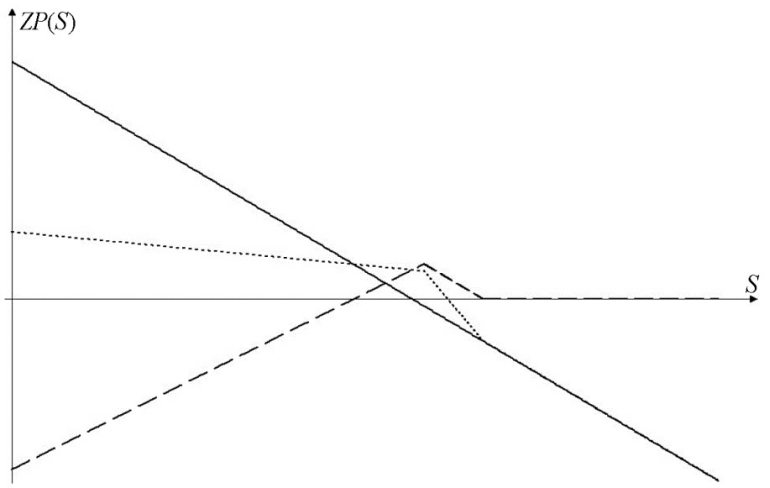

Fig. 4. The graph of both positions and the resulting position (dotted)

By using Vertical Ratio Put Spread the break-even point is increased to $185,04$, our chances to cancel the trade without the loss have significantly increased.

4. Conclusion

Financial options are strong tool not only for hedging, but they can be also very useful in trading. Options strategies Inverse Ratio Call Spread and Inverse Ratio Put Spread are appropriate for improvement of long or short positions. This can be done very easily and, as shown in this article, might be very useful for investors, to rescue badly evolving investing position. Moreover, this can be done without any additional costs needed.

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