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Basic strategies on the Standard & Poor's 500 Index at the Chicago Board Options Exchange CBOE (SPX: Standard and Poor's 500® Index)

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ABSTRACT

The Bulgarian stock market still does not use fixed term transactions. Basic strategies with options and futures are difficult to understand and implement.

The purpose of this article is:

- To show the specifics and the details of the basic spread strategies used on the Chicago options exchange.

- To clarify the calculation of the break even points and areas of profit and loss for each of the main strategies.

An Excel spreadsheet and graph have been added in order to illustrate the different scenarios.

Keywords: stock market, bull spread, bears spread.

The purpose of this article is to review the specifics and the details of the basic spread strategies from the Chicago Board Options Exchange, which are still lacking on the Bulgarian stock market.

Basic characteristics of the index, described on the Exchange's web site:[1]

The Standard & Poor's 500 Index (S & P 500 Composite Index) is a market-value-weighted index of the included in it 500 shares that are traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and Nasdaq National Market System.

Unlike other indexes, the companies selected for S & P 500 are not chosen because they are the largest companies in terms of market capitalization, sales or profits. Instead, the companies chosen for inclusion in the Index are leading companies in the leading industries in the U.S. economy.

S & P 500 Index has been computed since 1923, when company Standard & Poor introduced that Index, which included 233 companies that were grouped into 26 industries.

In July 1996, following introduction of a new, comprehensive industry group classification system for all securities in the S & P Guide Stock Database, there were 105 specific industry groups in 11 economic sectors.

The presented on the Exchange's web site strategy on the S & P 500 index are four main sectors of the industry: industrial, utility services, finance and transport.

BUILDING OF BULL SPREAD WITH CALL-OPTIONS (SPX 1400/1405 BULL CALL SPREAD)

The market situation in the example is with a call option with strike price 1400 and call option with strike price 1405. They both have the same expiration date, for instance March. The one costs 33,50, and the other 30,75. The Index currently has values of 1402. If there is an investor who is inclined to believe that the market will move upwards, he should construct a bull call spread and cash in the profits which can be gained to the maximum from that spread. In order to make that spread, he should

[1] http://www.cboe.com/micro/spx/spxstocks.aspx (21.09.2013)

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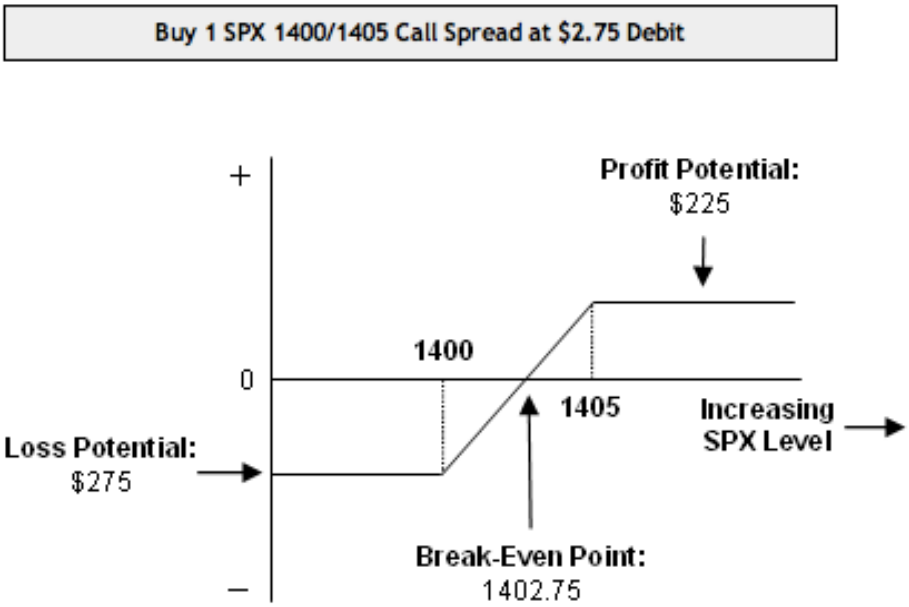
buy at the lower price and sell at the higher price. Actually, he has to buy at 1400, to sell with the option which is at strike price of 1405, and then for him a debit of 2,75 will remain, because he will pay 33,50, will receive 30,75 for the sold right and the debit expense for him will be only 2,75. Multiplied by the contract size or by the multiplier of USD 100 per point, he should pay USD 275 for the whole contract.

The following diagram depicts the chart of the profit and loss zones in a classic bull spread.In this case we see that below the strike price of 1400, the bull spread is on debit i.e. it enters the loss zones, but this in practice is the intentionally paid debit for establishing the position of 2,75 or 275, if we work with the figures for the whole contract. At total debit the position will be at the low strike price, in this case 1400. From there the curve starts to go out to the profit zones upwards, passes through the break-even point and at the next price of 1405, it gives the maximum profit which in this case is USD 225 for the whole contract.

The break-even point of the bull spread with call-option is determined always by adding to the lower price the net debit of the two premiums, or 1400 + 2,75 premium makes 1402,75 $ break-even point.

Let us see whether the Excel table would confirm this diagram which presents the profits and losses on the Exchange's web site[2].

Diagram 1



To check the correctness of the diagram in the Excel table, I took possible SPX Index level on the expiration date from 1300 to 1500, in every 20 points respectively. After that I defined the intrinsic value of the first option with strike price 1400 and paid premium of 33,50. The profits and losses of the long position of that option follow the profits and losses of the short position.

In the next column are given respectively the intrinsic values of the option which is with strike price 1405 and premium 30, 75 – long position and short position.

In the last column of this Table, I summed up the solutions in order to obtain the profits and losses from the bull call spread.

At SPX Index level 1300, the intrinsic value of the call option with strike price 1400 is with no value and out-of-the money of the paid premium, i.e. of 33, 50. And for the whole contract this has to be multiplied by 100 and to be respectively loss of USD 3350.

At that SPX Index level, the option with strike price 1405 will also have no intrinsic value and will be out-of-the-money.

[2] http://www.cboe.com/strategies/indexoptions/spxbullcallspreads/part1.aspx

Table1.

SPX index	Profit/ LossLong Call 1400	Profit/ Loss Short Call 1405	печалби/ загубиотBull Call Spread
1300,00	(33,50)	30,75	(2,75)
1320,00	(33,50)	30,75	(2,75)
1340,00	(33,50)	30,75	(2,75)
1360,00	(33,50)	30,75	(2,75)
1380,00	(33,50)	30,75	(2,75)
1400,00	(33,50)	30,75	(2,75)
1420,00	(13,50)	15,75	2,25
1440,00	6,50	(4,25)	2,25
1460,00	26,50	(24,25)	2,25
1480,00	46,50	(44,25)	2,25
1500,00	66,50	(64,25)	2,25

Let us see what happens at the highest SPX Index level of 1500, if it occurs on the expiration day.

The first option is with intrinsic value 100 or 66,5 points remain for the long position, which multiplied by 100 multiplier should give profit of USD 6650 from the long position. Naturally, what the long position gains, can be lost by the short and that is indicated in the next column The option which is with strike price 1405 at that SPX exercise settlement value gives 99 intrinsic value and respectively the short position which is of interest for us will lose 64, 25, or the short position brings a loss of USD 6425 for SPX exercise settlement value of 1500. We sum up the profit from the long position – 66, 50 with the loss of the short position 64, 25, it is seen that maximum possible profit of 2, 25 remains for the bull spread.

In the Table, the break-even points are given, determined according the rule of the bull spread, by adding the net debit of 2, 75 to the lower price and obtaining 1402, 75 as a break-even point and the call options are respectively on 0 at1433, 50, and the second one at 1435, 75.

Table2.

Break-even-points:					
Bull-Call-Spread	1400,00	+	2,75	=	1402,75
CALL OPTION 1	1400,00	+	33,50	=	1433,50
CALL OPTION 2	1405,00	+	30,75	=	1435,75

Let us check this in the table for presentation of the profit and loss from the strategy. The highest SPX Index level is of 1500. There we see the profit. This is a SPX Index level which is by 6, 99% above the initial SPX Index level. At this SPX Index level we would gain USD 225 for the whole contract.

At 1450 the profit from the overall position will be 225. Here, the action of the spread is clearly underlined, i.e., the compensation of the increasing losses by the short position with the increasing profits which the long position gives.

At 1402, 75 this is the break-even point of the spread. We shall obtain 0 there and respectively at smaller levels we shall gradually reach the total debit of USD 275 for this contract.

Table3.

SPX index	Diff in%	Long Call-Option	Short Call-Option	costs	Profit/ Loss
1500	6,99%	10000,00	(9500,00)	(275,00)	225,00
1450	3,42%	5000,00	4500,00	(275,00)	225,00
1435,75	2,41%	3575,00	3075,00	(275,00)	225,00
1433,50	2,25%	3350,00	2850,00	(275,00)	225,00
1402,75	0,05%	275,00	0,00	(275,00)	0,00
1402	0,00%	200,00	0,00	(275,00)	(75,00)
1300	-7,28%	0,00	0,00	(275,00)	(275,00)

BUILDING OF BEAR SPREAD WITH PUT-OPTIONS (BUY 1 SPX 1400/1405 CALL SPREAD AT $2.75 DEBIT)

The market situation in the example from the Exchange says that the SPX index is currently indicating values of 1398 and the choice of the premiums and the strike prices, which we may select

for the strategy, is reduced exactly to what is necessary for the spread. We have one put option with strike price of 1400, with expiration date in the month of March and a premium which is quoted currently at 27, 25.

The second put option is with strike price 1395. The expiration date is also in March, and its premium is 24, 90.

It is presumed that there is an investor who is inclined to be bearish. He expects a decrease in the Index levels and respectively is preparing to cash in profits from the fall of the included in the SPX exercise settlement values. In order to establish the bear put spread, he should purchase at the higher price the SPX 1400 put option, for which he has to pay USD 27, 25 and to sell at the lower price, i.e. a strike price of 1395, for which he will receive a premium of USD 24, 90. The net cost will remain debit – 2, 35 $ or 235 $ for the whole contract.

When spread option positions are built, it is always said that we buy at the profitable option. In this case the more profitable option is to have the opportunity to sell at 1400, instead of 1395. The higher the price at which we can sell, the more profitable the right is. That is why currently we buy the higher price and sell the lower, to establish a spread position.

On the following diagram, which is copied from the web site of the Chicago Board Options Exchange, the profit and loss zones of this spread are indicated. Its costs will be from the higher price upwards in the rising SPX levels. And from that higher price the smooth transition should start from the loss zones to the profit zones and to pass through the break-even point. The break-even point in the bear put spread has to be defined by subtracting the net debit from the higher price. In this case the investor will pay a premium of USD 27, 25 and will receive 24, 90, which means that he will be left a difference of 2, 35 as a debit. The 100 multiplier should make a total debit for entering the position of USD 235. The loss from this bear put spread could not become bigger. It will always be limited to the amount of the paid premium, i.e. to the level of USD 235.

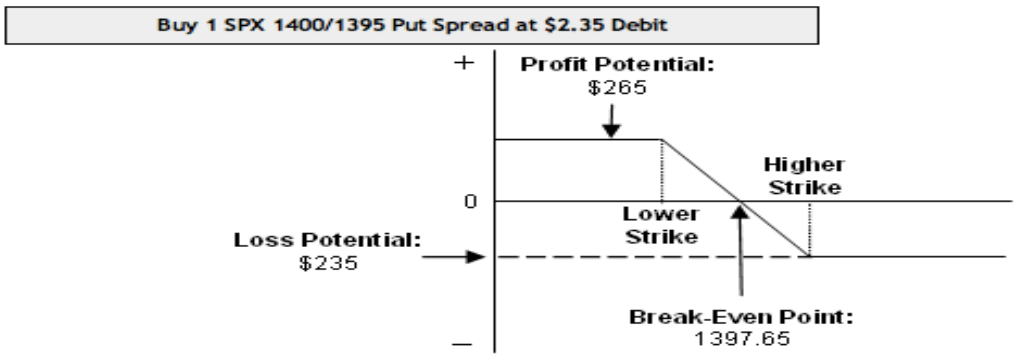


Diagram 2

To find the zero point, or the so called break-even point, we should subtract 2, 35 from 1400 (the higher price) and obtain 1397, 65 as a break-even point. That is to say, the break-even point is always calculated with the net debit per unit, and not the net debit for the whole contract. At the lower price we should reach the level of maximum profit. We reach the level of maximum profit which in this case is USD 2, 65, or USD 265 for the whole contract. The profit remains at subsequent declining of the SPX index, always limited to the amount of that USD 265. Here the spread will have its say and the profits which the long position carries with each next decrease of the SPX index level will be compensated by the losses which we shall cash in from possession of the short position.

Let us see if this is confirmed by the table?

Table 4 .

SPX Index	Profit/ Loss Long Put 1400	Profit/ Loss Short Put 1395	Profit/ Loss Bull Put Spread
1300,00	72,75	(70,10)	2,65
1320,00	52,75	(50,10)	2,65
1340,00	32,75	(30,10)	2,65
1360,00	12,75	(10,10)	2,65
1380,00	(7,25)	9,90	2,65
1400,00	(27,25)	24,90	(2,35)

1420,00	(27,25)	24,90	(2,35)
1440,00	(27,25)	24,90	(2,35)
1460,00	(27,25)	24,90	(2,35)
1480,00	(27,25)	24,90	(2,35)
1500,00	(27,25)	24,90	(2,35)

The SPX exercise settlement values on the expiration date are from 1300 to1500, again in every 20 points. Let us see what will happen with the SPX levels which show that the option is out-of-the money, at-the money, in the money?

At SPX levels of 1500, both put options should be out-of-the-money for the simple reason that they are not economically logical. If you have the right to sell something at 1400, which costs 1500, no one would exercise that option. That is why it stands as a right which is paid. The amount of the loss is the amount of the paid premium and in practice we have as a total result from the spread the debit of the net cost for establishing the position of 2, 35 points.

At result 1400 we shall have for the last time this debit in its full size, and at 1380 we shall already enter the profit zones and the spread already will retain its profits in subsequent declining of the SPX level to the amount of 2, 65 or USD265 for the whole contract.

The chart with these data shows the logics of what is displayed in the diagram from the Exchange's web site. And, of course, the break-even points are obtained where they are indicated in the Exchange's diagram. If we make the analysis as it is made by the Exchange, it is seen that at SPC index level of 1500 (a 7, 35% rise of the level towards the cash market at the moment of setting up the position) there will be a debit, the difference between the two premiums, which is 235 per contract.

The break-even points of the three positions are as follows:

Table5.

Break-even-points:					
Bull-Put-Spread	1395,00	-	-2,35	=	1397,35
PUT OPTION 1	1400,00	-	27,25	=	1372,75
PUT OPTION 2	1395,00	-	24,90	=	1370,10

At SPX exercise settlement value 1397, 65 on the expiration date, with the decrease of the SPX level only by three percentile points towards the position establishment, then the bull spread would be at zero, i.e. this is the break-even point and with every subsequent declining of the SPX level, it will retain the profit of 265.

Table6.

SPX index	Diff in %	Profit/ Loss Long Put 1400	Profit/ Loss Short Put 1395	Profit/ Loss Bull Put Spread
1500,00	7,30%	(2725)	2490	(235)
1450,00	3,72%	(2725)	2490	(235)
1400,00	0,14%	(2725)	2490	(235)
1398,00	0,00%	(2525)	2490	(35)
1397,65	-0,03%	(2490)	2490	(0)
1350,00	-3,43%	2275	(2010)	265
1300,00	-7,01%	7275	(7010)	265

On the Bulgarian Stock Exchange AD, there is still no real forward market, which is to allow the use of such spread strategies. In my opinion, the establishment of Bulgarian forward market is an important and necessary step in the development of Bulgarian Stock Exchange AD. The forward deals allow the investors to hedge their portfolios in part or in whole and thus to protect themselves from undesired for them risk. If such possibilities exist also on the Bulgarian market, they will certainly contribute to enhancement of the investors' interest to the stock exchange trade.

CONCLUSIONS

On the Bulgarian Stock Exchange AD, there is still no real forward market (market for futures and options), which is to allow the use of such spread strategies. In my opinion, the establishment of

Bulgarian forward market is an important and necessary step in the development of Bulgarian Stock Exchange AD.

The strategies in options and futures allow the investors to hedge their portfolios in part or in whole and thus to protect themselves from undesired for them risk. If such possibilities exist also on the Bulgarian market, they will certainly contribute to enhancement of the investors' interest to the stock exchange trade.

Spreads strategies in options and futures are the most commonly traded on the exchange.

Spread –strategies have limited risk. They must first be admitted to the Bulgarian market.

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