Box Spreads:
Exchange-listed Options Strategies for Borrowing or Lending Cash

Introduction & Key Benefits

Exchange-listed options offer an innovative solution for borrowing or lending cash through the use of the box spread options strategy. This paper will explain the box spread; tell how it is used as a form of secured financing; and demonstrate how listed-options can be a competitive marketplace for borrowing and lending cash.

Market participants searching for collateralized financing that decreases counterparty exposure and increases transparency can find it in the exchange-listed options markets. The key benefits of using an exchange-listed box spread as a financing tool include:
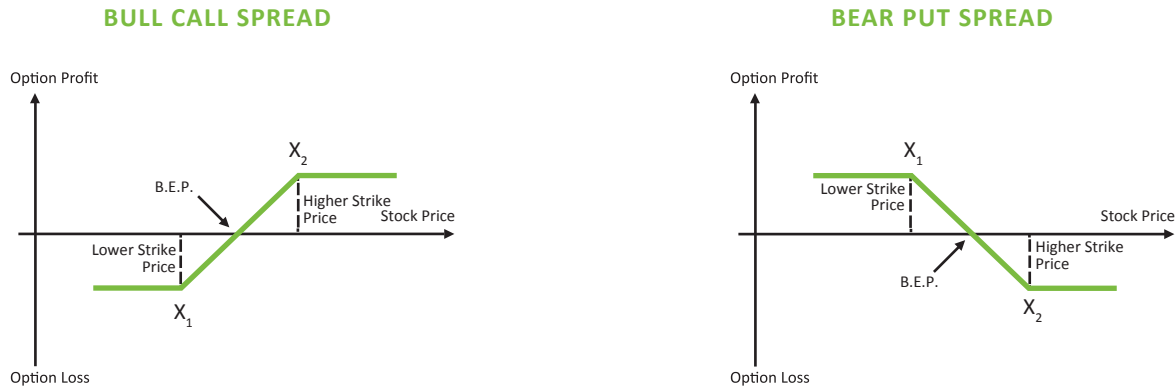
- Competitive implied interest rate of the box spread.
- Buyer (lender) and seller (borrower) are protected from counterparty credit risk because the transaction is guaranteed by The Options Clearing Corporation (OCC)-the largest equity derivatives clearing organization in the world.
- Capital efficiencies can be achieved through portfolio margining and any margin surplus in the portfolio may be applied to collateralize the box spread.
- Additional efficiencies can be achieved through substituting collateral held by OCC.
- The box spread can be liquidated by an offsetting transaction easily and transparently on an exchange.
- Potential 60% long-term and 40% short-term tax treatment under section 1256 of the Tax Code.

Box Spread Strategy

The box spread strategy can be viewed as the combination of a synthetic long and a synthetic short index options contract. The synthetic long consists of buying a call and selling a put with the same strike and expiration. The synthetic short consists of buying a put and selling a call at the same strike and expiration.

SYNTHETIC LONG

SYNTHETIC SHORT
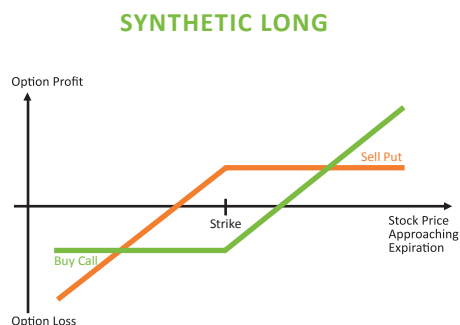
A box spread can also be viewed as the combination of a bull call spread and a bear put spread. The bull call spread consists of buying a call option and selling another at a higher strike. The bear put spread consists of buying a put option and selling another put at a lower strike. The box requires that the lower strikes be the same (X_1) and that the higher strike be the same (X_2) and that all four legs have the same expiration date.

BULL CALL SPREAD

Option Profit

X_2

B.E.P.

Higher Strike
Price

Stock Price

Lower Strike
Price

X_1

Option Loss

BEAR PUT SPREAD

Option Profit

X_1

Lower Strike
Price

Stock Price

Higher Strike
Price

B.E.P.

X_2

Option Loss

Box Spread Example

When constructing a box spread for the purpose of financing, it is beneficial to use European-style options.[1] European-style options ensure that the box spread cannot be exercised early which would result in the cancellation of the effective loan before the term date.

Options on the S&P 500® Index (SPX) are used in this example. SPX options are European-style, have a notional value of $200,000 (when index is at 2,000); are cash settled; have a multiplier of 100; are priced and quoted in transparent, competitive auction markets; are marked-to-market daily; and clear through OCC which guarantees all trades. Further, SPX options are listed with weekly, monthly, quarterly, and customized Flex expirations.

In practice today, SPX box spreads frequently trade in 1000 point differentials. For example, the September 1000 strike and the September 2000 strike box with 46 days to September expiration is quoted as:

999.35 bid

999.40 offered

Calculating the Loan Rate

The SPX box spread quotes below imply the following interest rates:

Bid at 999.40:

[(1000 – 999.40) / 999.40] (365/46) = 0.48%

Offered at 999.35:

[(1000 – 999.35) / 999.35] (365/46) = 0.52%

In essence, buying the box is like buying a zero coupon bond. You pay 999.40 for something that later will be worth 1,000 with no equity risk, so you are fixing a yield of 0.48%, with OCC as counterpart.

Let's assume there are 1,000 contracts on the bid and on the offer, if you do this on 1,000 contracts then 1000 box interval X $100 multiplier X 1,000 contracts equals a $100 Million loan. If instead you sell the box at 999.35, then you are borrowing at 0.52%.[2]

In our example, the expiration value is always $1,000 as demonstrated in the table below.

| SPX Expiry Level	100	500	1000	1500	2000	2500
Long 1000 Call	0	0	0	$500	$1,000	$1,500
Short 1000 Put	($900)	($500)	0	0	0	0
Long 2000 Put	$1,900	$1,500	$1,000	$500	0	0
Short 2000 Call	0	0	0	0	0	($500)
Box Value	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000

So, if at expiration the SPX settles at 1000, then the 1000 struck options are at-the-money and worthless. The 2000 calls will be out-of-the-money and likewise expires worthless. The holder of the box exercises the 2000 puts and recovers their intrinsic value less the initial net debit.

However, if at expiration the SPX settles at 2000, then the 2000 options are at-the-money and worthless. The 1000 puts will be out-of-the-money and are worthless. The 1000 call may be exercised to recover their intrinsic value less the initial net debit.

The buyer of this box will always generate $60 ($1,000 value at expiration - 999.40 initial net debit) in profit while the seller of the box will always generate a $60 loss. Why sell this box? Because the initial net debit for the buyer represents a credit for the seller of the box. It is effectively a loan secured by the Options Clearing Corporation.

Discount Loan Structure

When you combine all four legs of the box spread, the payoff diagram looks like a risk-free asset, therefore, the box spread synthetically produces the payoff of a zero coupon bond.

BOX SPREAD

A Box Spread yields a risk-free (Rf) rate.
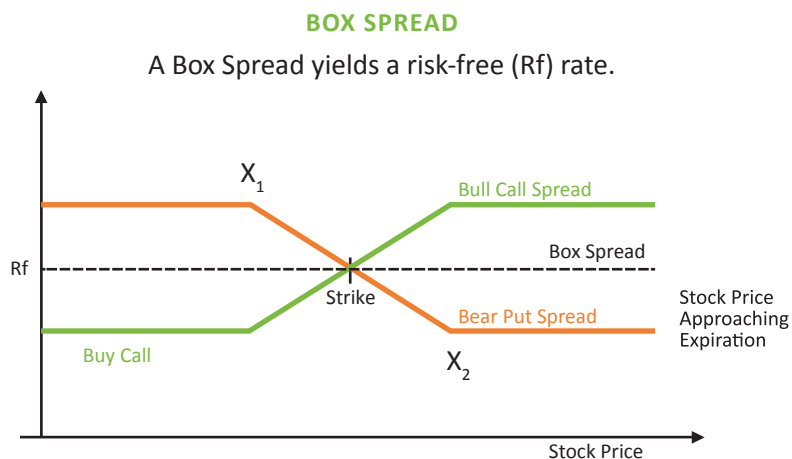
Boxes allow market participants to create a loan structure similar to a Treasury bill. T-bills are "discount" instruments that are purchased at a value less than the stated face value. Upon maturity, bills call for the return of the stated face value.

For example, one might buy a $1 million 90-day T-bill for $998,000. Ninety days later, the $1 million face or principal value is returned and the $2,000 discount is earned as interest. One may represent the rate on this transaction as a 0.80% or 80 basis point discount yield [= (360/90) x ($2,000/$1,000,000)]. The effective rate on a box represents a "discount yield" similar to a quoted T-bill rate.

Cash Flow Considerations

A SPX option box spread will result in the delivery of cash on the business day following expiration. The exercise-settlement value (symbol: SET) is calculated using the opening sales price in the primary market of each component security on the expiration date. The exercise-settlement amount is equal to the difference between the exercise-settlement value and the exercise price of the option, multiplied by $100.

The maturity terms of a box are very flexible so market participants get the transparency of T-bills, but the flexibility of a bank loan.

Tax Treatment

Under section 1256 of the Tax Code, profit and loss on transactions in certain exchange-traded options, including SPX and SPXpm, are entitled to be taxed at a rate equal to 60% long-term and 40% short-term capital gain or loss, provided that the investor involved and the strategy employed satisfy the criteria of the Tax Code.[3]

Conclusion

This paper reviews how market participants can use exchange-listed options to borrow or lend cash through the use of the options **box spread** strategy. The key benefit of using box spreads as a financing tool is the competitive effective box interest rate. Other key features include the trade is executed on an exchange and therefore cleared and guaranteed by The Options Clearing Corporation[4] thus decreasing counterparty risk and increasing capital efficiencies with respect to portfolio margining requirement. Finally, the trade can be easily and transparently managed as one would an options trade.

About OCC

OCC is the world's largest equity derivatives clearing organization and the foundation for secure markets. Founded in 1973, OCC operates under the jurisdiction of both the U.S. Securities and Exchange Commission as a Registered Clearing Agency and the U.S. Commodity Futures Trading Commission as a Derivatives Clearing Organization. OCC now provides central counterparty clearing and settlement services to 18 exchanges and trading platforms for options, financial futures, security futures and securities lending transactions. More information about OCC is available at www.theocc.com.

Disclaimers

Options involve risks and are not suitable for everyone. Individuals should not enter into options transactions until they have read and understood the risk disclosure document, Characteristics and Risks of Standardized Options, available by visiting OptionsEducation.org or by contacting your broker, any exchange on which options are traded, or The Options Clearing Corporation at 125 S. Franklin St., #1200, Chicago, IL 60606.

In order to simplify the calculations used in the examples in these materials, commissions, fees, margin, interest and taxes have not been included. These costs will impact the outcome of any stock and options transactions and must be considered prior to entering into any transactions. Investors should consult their tax advisor about any potential tax consequences.

Any strategies discussed, including examples using actual securities and price data, are strictly for illustrative and educational purposes and should not be construed as an endorsement, recommendation, or solicitation to buy or sell securities. Past performance is not a guarantee of future results.

Footnotes

[1] Box spreads are considered a strategy for professional traders and market-makers due to the transaction costs involved.

[2] This example does not including fees and commissions. Exchange fees are not negotiable, but can vary by user type and are subject to fee caps. Brokerage fees are negotiable and would need to be assessed to banks by brokerage firms. We cannot state how low or high commissions may be for the institutions involved in such trades.

[3] Market participants should consult with their tax advisors to determine how the profit and loss on any particular option strategy will be taxed. Tax laws and regulations change from time to time and may be subject to varying interpretations.

[4] OCC has regulatory responsibility to maintain sufficient liquidity resources to meet liquidity requirements under both normal and stressed market conditions. OCC's financial resources must be sized to cover the liquidity obligations of its largest clearing member firm or a "cover one" standard.

With box spreads the seller of the box is quite frequently a market maker clearing through one of several large clearing firms. These market maker clearing firms are typically OCC's largest clearing firms. Thus, they are a key determinate of the size of OCC's committed credit facility, its main liquidity resource. At the clearing firm level the individual legs are aggregated into larger positions based upon expiry to forecast potential liquidity needs. Typically, the largest positions are on quarterly expirations. On the Monday following expiration of the box the seller has a cash obligation. With the aggregation across multiple clients and with a concentration of activity involving quarterly expirations a clearing firm's liquidity obligation could exceeded the size of OCC's committed credit facilities.

To insure the adequacy of its financial resources, OCC has a liquidity margin call policy in place that can cause OCC to require a clearing member to maintain a certain amount of cash margin deposits when their aggregated liquidity demand exceeds certain thresholds. The policy begins 30 days prior to expiration, and has specific thresholds at both the 30 day and 5 day horizon. To avoid the policy thresholds market participants may wish to look at using non-quarterly expiries as the basis for option boxes.