



FTS Real Time System Project: Stock Index Options

Question: How do you trade stock index options using the FTS Real Time Client?

In the sequence of FTS Real time option exercises you will learn all about option trading, in terms of theory and practice. Option trading provides investors with leverage and informational based trading as well as providing a instrument for controlling risk. To understand this latter dimension of option trading requires understanding the theory behind option trading including how to work with the underlying arbitrage free pricing model for options. The FTS Real Time Trading client takes you beyond just learning how to trade option by providing a powerful interactive analytical support system designed to teach the following important lessons.

The carefully designed sequence of FTS trading exercises are designed around the following major objectives. First, you will learn how option markets work from an institutional perspective. Second, you will learn how to apply the theoretical model of option pricing to the real world markets. Third, you will assess how well this model describes real world option prices. Fourth, you will learn about synthetic or replicating position by attempting to identify and exploit temporary pricing differences. Finally, you will learn how to exploit your knowledge of option markets to manage risk and return using options.

In this first exercise, you will learn about the institutional details associated with option markets in the context of trading options on the S&P 500 stock index.

Stock Index Options Terms and Notation

The ticker window in the FTS Real Time Client is displayed below:

Ticker Window. Click on a Ticker to trade

User Tip File Edit Options

Note: Indicative Quotes Only. All settlement is at real-time prices at the server.

Ticker	Name	Currency	Description
SPX1018L900	SPX Call Eur 900 Dec 18 2010	US Dollar	European
SPX1018L950	SPX Call Eur 950 Dec 18 2010	US Dollar	European
SPX1018L1000	SPX Call Eur 1000 Dec 18 2010	US Dollar	European
SPX1018L1050	SPX Call Eur 1050 Dec 18 2010	US Dollar	European
SPX1018L1100	SPX Call Eur 1100 Dec 18 2010	US Dollar	European
SPX1018L1150	SPX Call Eur 1150 Dec 18 2010	US Dollar	European
SPX1018L1200	SPX Call Eur 1200 Dec 18 2010	US Dollar	European
SPX1018L1250	SPX Call Eur 1250 Dec 18 2010	US Dollar	European
SPX1018L1300	SPX Call Eur 1300 Dec 18 2010	US Dollar	European
SPX1119C900	SPX Call Eur 900 Mar 19 2011	US Dollar	European
SPX1119C950	SPX Call Eur 950 Mar 19 2011	US Dollar	European
SPX1119C1000	SPX Call Eur 1000 Mar 19 2011	US Dollar	European
SPX1119C1050	SPX Call Eur 1050 Mar 19 2011	US Dollar	European
SPX1119C1100	SPX Call Eur 1100 Mar 19 2011	US Dollar	European
SPX1119C1150	SPX Call Eur 1150 Mar 19 2011	US Dollar	European
SPX1119C1200	SPX Call Eur 1200 Mar 19 2011	US Dollar	European
SPX1119C1250	SPX Call Eur 1250 Mar 19 2011	US Dollar	European
SPX1119C1300	SPX Call Eur 1300 Mar 19 2011	US Dollar	European
SPX1118F900	SPX Call Eur 900 Jun 18 2011	US Dollar	European

The index option defined on the S&P 500 index has a ticker symbol “SPX” and is traded on the CBOE (Chicago Board Options Exchange). The notional value of one contract is US\$100 times the value of the S&P 500 stock index.

In the FTS Real Time Client, by viewing the ticker definitions, you will see contractual details:

Ticker Definitions. Double Click a ticker to trade it

File Edit Options

Ticker	Name	Currency Name	Trade Allowed	TradeDays	St
SPX1118F1200	SPX Call Eur 1200 Jun 18 2011	US Dollar	Yes	23456	0
SPX1118F1250	SPX Call Eur 1250 Jun 18 2011	US Dollar	Yes	23456	0
SPX1118F1300	SPX Call Eur 1300 Jun 18 2011	US Dollar	Yes	23456	0
SPX1018X900	SPX Put Eur 900 Dec 18 2010	US Dollar	Yes	23456	0
SPX1018X950	SPX Put Eur 950 Dec 18 2010	US Dollar	Yes	23456	0
SPX1018X1000	SPX Put Eur 1000 Dec 18 2010	US Dollar	Yes	23456	0
SPX1018X1050	SPX Put Eur 1050 Dec 18 2010	US Dollar	Yes	23456	0

Index option expiration months:

Month Codes		
	Options	
Month	Calls	Puts
January	A	M
February	B	N
March	C	O
April	D	P
May	E	Q
June	F	R
July	G	S
August	H	T
September	I	U
October	J	V
November	K	W
December	L	X

Example:

For the SPX1118F1200 ticker:

SPX is the CBOE ticker code for S&P500 index options.

F you can see above is a June expiration Call option.

1118F refers to 2011 and the 18th of “F” = June

1200 is the strike price for this option contract.

One contract controls \$100* S&P500 index = \$100*1165.16 = \$116,516.00 when the S&P500 index is 1165.16.

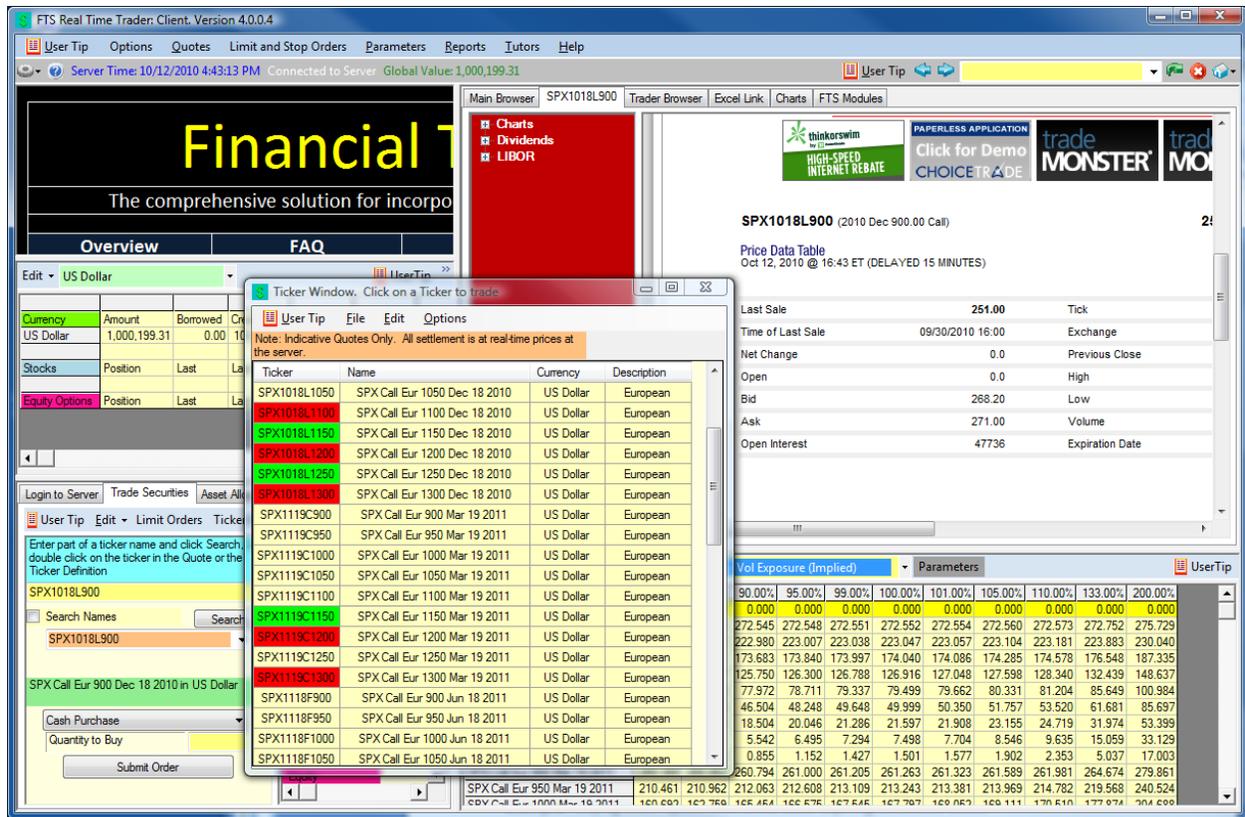
This will be current to when the trading exercise is running. It contains the name, the ticker symbol and margin information. The ticker contains both settlement month and year information.

Trading Options

Refer to the floating Ticker Window in the FTS Real Time Client:

Ticker	Name	Currency	Description
SPX1018L900	SPX Call Eur 900 Dec 18 2010	US Dollar	European
SPX1018L950	SPX Call Eur 950 Dec 18 2010	US Dollar	European
SPX1018L1000	SPX Call Eur 1000 Dec 18 2010	US Dollar	European
SPX1018L1050	SPX Call Eur 1050 Dec 18 2010	US Dollar	European
SPX1018L1100	SPX Call Eur 1100 Dec 18 2010	US Dollar	European
SPX1018L1150	SPX Call Eur 1150 Dec 18 2010	US Dollar	European
SPX1018L1200	SPX Call Eur 1200 Dec 18 2010	US Dollar	European
SPX1018L1250	SPX Call Eur 1250 Dec 18 2010	US Dollar	European
SPX1018L1300	SPX Call Eur 1300 Dec 18 2010	US Dollar	European
SPX1119C900	SPX Call Eur 900 Mar 19 2011	US Dollar	European
SPX1119C950	SPX Call Eur 950 Mar 19 2011	US Dollar	European
SPX1119C1000	SPX Call Eur 1000 Mar 19 2011	US Dollar	European
SPX1119C1050	SPX Call Eur 1050 Mar 19 2011	US Dollar	European
SPX1119C1100	SPX Call Eur 1100 Mar 19 2011	US Dollar	European
SPX1119C1150	SPX Call Eur 1150 Mar 19 2011	US Dollar	European
SPX1119C1200	SPX Call Eur 1200 Mar 19 2011	US Dollar	European
SPX1119C1250	SPX Call Eur 1250 Mar 19 2011	US Dollar	European
SPX1119C1300	SPX Call Eur 1300 Mar 19 2011	US Dollar	European
SPX1118F900	SPX Call Eur 900 Jun 18 2011	US Dollar	European

By clicking on a particular ticker, such as SPX1018L1150 then the screen changes to appear as follows:



The top right window contains important information about the time of the last option sale. This will reveal whether or not the last traded price is a stale price. Options are less liquid than stocks and especially when you move away from at-the-money. As a result, the Last Traded Price which is used in analytical support may stale.

Second, in the bottom LHS of the screen the trading window appears. Margin trading of options is not permitted in the US and so this is prohibited in the FTS system. You can execute a cash buy (pay the option premium) or a cash sell (write the option) in the FTS System.

Example: Buying 1 call option with strike 1150 expiring December 2010.

Pre-Trading Screen:

The screenshot displays the FTS Real Time Trader Client interface. The main window title is "FTS Real Time Trader: Client: Version 4.0.0.4". The interface is divided into several sections:

- Navigation Menu:** Includes "User Tip", "Options", "Quotes", "Limit and Stop Orders", "Parameters", "Reports", "Tutors", and "Help".
- Server Information:** Shows "Server Time: 10/12/2010 6:26:10 AM" and "Connected to Server: Global Value: 1,000,199.31".
- Main Content Area:**
 - Top left: "Financial" banner with "The comprehensive solution for income" and "Overview" / "FAQ" buttons.
 - Top right: "Trading Center" with advertisements for "PAPERLESS APPLICATION", "thinkorswim", and "TRADEKING".
 - Center: "SPX1018L900 (2010 Dec 900.00 Call)" with a "Price Data Table" showing "Last Sale: 251.00", "Time of Last Sale: 09/30/2010 16:00", "Net Change: 0.0", "Open: 0.0", and "Bid: 0.0".
- Order Entry Section (Bottom Left):**
 - Search for "SPX1018L900" and "SPX Call Eur 900 Dec 18 2010 in US Dollar".
 - Order type: "Cash Purchase".
 - Buttons: "Quantity to Buy" and "Submit Order".
- Analytics Table (Bottom Right):**

Underlying	Position	Beta	Port Delta	Port Gamma	Port Vega	Port Theta			
S&P 500 INDEX	0	1.00	0.0000	0.0000	0.0000	0.0000			
Beta-Weighted			0.0000	0.0000	0.0000	0.0000			
Mkt Price	Underlying	Contracts	Imp Vol	User Vol	User Price	Implied Delta	Implied Gamma		
	SPX Call Eur 900 Dec 18 2010	251.00	1,165.32	0	N/A	0.1896	268.1226	0.9957	0.0000
	SPX Call Eur 950 Dec 18 2010	191.00	1,165.32	0	N/A	0.1896	218.6430	0.9919	0.0001
	SPX Call Eur 1000 Dec 18 2010	164.50	1,165.32	0	N/A	0.1896	169.7556	0.9730	0.0006
	SPX Call Eur 1050 Dec 18 2010	119.00	1,165.32	0	N/A	0.1896	122.9825	0.9135	0.0016
	SPX Call Eur 1100 Dec 18 2010	83.50	1,165.32	0	0.2051	0.1896	81.2502	0.7715	0.0029
	SPX Call Eur 1150 Dec 18 2010	48.00	1,165.32	0	0.1899	0.1896	47.9358	0.5991	0.0041
	SPX Call Eur 1200 Dec 18 2010	21.70	1,165.32	0	0.1728	0.1896	24.8794	0.3789	0.0044
	SPX Call Eur 1250 Dec 18 2010	6.70	1,165.32	0	0.1559	0.1896	11.2727	0.1677	0.0032
	SPX Call Eur 1300 Dec 18 2010	1.65	1,165.32	0	0.1506	0.1896	4.4532	0.0536	0.0015
	SPX Call Eur 900 Mar 19 2011	0.00	1,165.32	0	N/A	0.1896	256.9631	0.9722	0.0003

Post Trading Screen:

The screenshot shows the 'Quote Window' for the contract 'SPX Call Eur 1150 Dec 18 2010 in US Dollar'. On the left, there is a search interface with the ticker 'SPX1018L1150' entered. Below the search, there are fields for 'Cash Purchase' and 'Quantity to Buy' (set to 1), with a 'Submit Order' button.

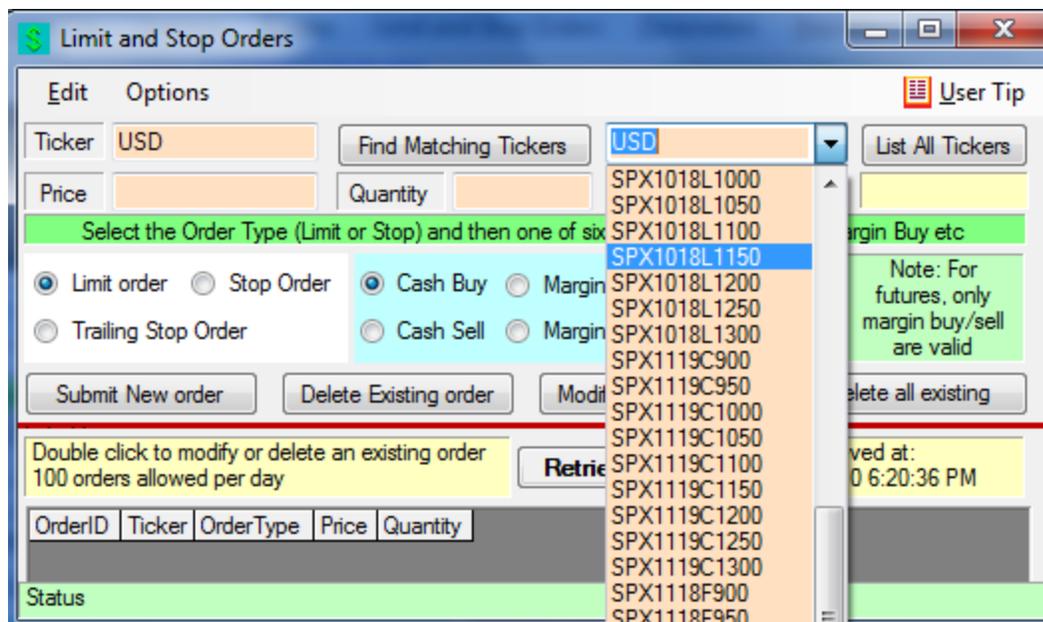
Account Item	Value	Account Item	Value
Position Value	4,770.00	Cash Position	995,229.81
Cash Purchases	1	Cash Borrowed	0.00
Market Value	4,770.00	Credit Remaining	100,000.00
Margin Purchases	0	Borrowing Rate	0.6150%
Market Value	0.00	Lending Rate	0.1150%
Loan	0.00	Buy VWAP	0.0000
Deposit	0.00	Sell VWAP	0.0000
Equity	0.00	Buy Volume	0.00
Percentage	0.00	Sell Volume	0.00
Short Sales	0		
Market Value	0.00		
Deposit	0.00		
Cash Held	0.00		
Equity	0.00		
Percentage	0.00		
Div's Receivable	0.00		
Buy VWAP	4,950.00		
Sell VWAP	0.00		
Buy Volume	1.00		
Sell Volume	0.00		
Contract Size	100		
Strike Price	1,150.00		
Expiration Date	12/18/2010		
Expiration Hour	5PM		

In this example, the options were purchased at the Ask price which equaled 49.5. The price or premium is $\$100 \times 49.5 = \4950.00 and this option controls a position equal to $\$100 \times 1,150 = \$115,000$ that can be exercised on the 12/18/2010 at 5pm.

Alternatively, you can enter limit cash buy or cash sell orders by clicking on the menu item Limit and Stop Orders (see below):

The screenshot shows the top of the 'FTS Real Time Trader: Client. Version 4.0.0.4' window. The menu bar includes 'User Tip', 'Options', 'Quotes', 'Limit and Stop Orders', 'Parameters', 'Reports', 'Tutors', and 'Help'. Below the menu bar, the server time is '10/9/2010 6:15:30 PM' and the global value is '999,999.81'. A large yellow text overlay reads 'Financial Trading'.

You can then click on List All Tickers and select the contract of interest:



This pop up window lets you submit limit orders that will be continuously monitored for you until you delete them from the system. If you are trading the options then you can also submit Stop Orders and Trailing Stop Orders. The difference between a limit order and a stop order is that a limit buy order buys at the price you specify or better whereas a stop order would buy at your price or worse. Similarly for a sell order. The idea behind the stop order is that you want to close out a position if you think the price will keep moving adversely against you. This is why it buys or sells at the price you specify or worse.

Project Requirements:

All projects should contain a cover sheet that list the full name of each team member.

Required questions:

- (1) At the beginning of the week make some long and short index option trades (e.g., at least 5-trades. At the end of the week reverse the trades so you end up with only cash. Did you make a gain or loss?
- (2) For one of your option contracts that you trade explain precisely the gain or loss you made for that contract. That is, how was it realized?