FTS Real Time System Project: Interpreting the Prices of Stock Index Futures

Question: Are the prices obtained through cost-of-carry model the same as the real market prices?

Stock Index Futures Project: Objectives

The objective of this project is to build upon the project where you learnt how to apply the cost of carry model to estimate the price of a stock index future and use this model to reverse engineer information from actual futures prices using futures defined on the S&P500 and Nasdaq 100 indexes. Reverse engineering will provide accurate data if the the predicted prices are the same as the real world prices on average. The objective of this project is to for a few randomly sampled time periods do this comparison.

Your first task is to contrast your financial cost of carry with your assessed dividend yield.

A Note of Backwardation:

In the current low interest rate environment it is possible that the financial cost of carry is less than your forecast dividend yield. If this is the case, the predicted futures price will exhibit a phenomena that is called “backwardation.” Backwardation arises when the arbitrage free futures’ prices are predicted to be smaller than the underlying spot price. For the case of stock

index futures this is expected to occur whenever the dividend yield is larger than the financial cost of carry.

Project Requirements:

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

Required questions:

(1) For the case of the e-mini futures defined on the S&P 500 and the Nasdaq 100 index do you observe backwardation or not? Is this predicted (why or why not)?

(2) During different trading days collect a sample of at least 15 observations for the underlying index value and the futures prices for each of the contracts. Compute the mean of absolute deviations (i.e., absolute value of the difference between the futures price and the predicted futures price at the time you recorded). You should use the analytical support in the FTS Real Time Client to make your observations: (e.g., record Actual Mkt Price and the Implied Price at exactly the same point in time during the trading day.)

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		Actual					Implied			
	Convention	Mkt Price	Underlying	Basis	Risk Free	Div Yield	Price	Underlying	Risk Free	Div Yield
E-MINI S&P 500 DEC 2010	Actual/360	1,119.5000	1,125.5900	6.0900	0.2904%	2.1500%	1,120.4150	1,124.6700	-0.0385%	2.4789%
E-MINI S&P 500 MAR 2011	Actual/360	1,114.7500	1,125.5900	10.8400	0.4106%	2.1500%	1,115.8010	1,124.5300	0.2239%	2.3367%
E-MINI S&P 500 JUN 2011	Actual/360	1,106.5000	1,125.5900	19.0900	0.4756%	2.1500%	1,111.4020	1,120.6250	-0.1030%	2.7286%
E-MINI NASDAQ 100 STK IDX DEC 2010	Actual/360	1,952.2500	1,955.8300	3.5800	0.2904%	0.7500%	1,953.6080	1,954.4710	0.0096%	1.0308%
E-MINI NASDAQ 100 STK IDX MAR 2011	Actual/360	1,952.5000	1,955.8300	3.3300	0.4106%	0.7500%	1,952.5110	1,955.8190	0.4095%	0.7512%
E-MINI NASDAQ 100 STK IDX JUN 2011	Actual/360	1,861.2500	1,955.8300	94.5800	0.4756%	0.7500%	1,951.7900	1,865.1030	-5.6739%	6.8995%

(3) Given your data recorded in part (2) comment on the accuracy of the cost-of-carry model across the two indexes (S&P500 and Nasdaq 100) as well as across different times to maturity. Do any patters occur – such as is one index on average more accurate than the the others and also is one maturity more accurate than another?

(4) Given your answer to (3) in general how accurate would you rate the cost of carry model?

(5) Discuss whether or not you can increase the accuracy of the cost of carry model for each index by adjusting your inputs?

(6) Given your answers to each part summarizes what differences, if any, you have observed when you apply the cost-of-carry model to e-mini futures defined on the S&P500 index and the Nasdaq 100 index?