CME Group
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Research & Product Development

Understanding EOM Fair Value Settlements

Daily settlement prices for CME Group domestic stock index futures are normally established by reference to representative values within the closing range. But on the last business day of each month, or at the end-of-month (EOM), the daily settlement is established by reference to futures Fair Values (FV). This policy was introduced in December 1999 and applied to good effect ever since. This is intended to explain the utility and mechanics behind this process.

What is "Fair Value?" – Futures will price to levels driven by arbitrage activity. If a stock index futures contract becomes over-priced ("rich") to spot equities, an arbitrageur might buy the equities represented in the index and sell futures with the expectation that the spread or basis between spot and futures will revert to an equilibrium value such that arbitrage no longer appears profitable. Or, if a stock index futures contract becomes under-priced ("cheap") relative to spot, sell spot and buy futures. In either case, such arbitrage activity serves to reestablish equilibrium pricing relationships. To assess the return associated with an "arb" transaction, one must consider the attendant costs. The costs of buying and holding stocks on a leveraged basis are measured in terms of finance charges mitigated by the receipt of dividend income.

$$\text{Futures} = \text{Spot Equities} + \text{Finance Charges} - \text{Dividends}$$

This equation presumes that arbitrageurs will borrow to purchase stocks at prevailing short-term interest rates. Thus, fair value is a function of finance charges less dividends. Actually, the basis between futures and spot prices (basis = spot – futures) can flutter up and down considerably within a band before arbitrageurs will perceive a profitable arb opportunity. That band is a function of the costs associated with the transaction including brokerage, slippage plus a profit margin. THUS, fair value dictates where futures theoretically *should* trade … not necessarily where they *will* trade.

Negative Carry – Normally, stock index futures price at successively higher levels in successively deferred months into the future. This is due to the fact that short-term interest rates typically exceed stock dividend yields. This is known as "negative carry" because it costs more to buy and hold stocks in terms of finance charges than stocks yield in dividends. Sometimes, rates may dip below dividend yields and stock index futures price at successively lower levels in successively deferred months. This is known as "positive carry."

FV Settlement Procedures – On the last day of the month, Exchange staff conduct a survey of major market participants to facilitate calculation of fair values in each domestic stock index futures. The survey does not directly inquire with respect to FV. Rather, staff solicits information regarding the appropriate short-term interest rate and expected dividend payments to apply to each stock index. High and low responses are disregarded and the remaining marks are averaged and utilized in the FV calculation. Staff captures spot index values at 3:15 p.m. (Central) to apply to the calculation, coordinated with the normal 3:15 p.m. futures close. This delayed sampling is consistent with the fact that final closing values of index constituents are sometimes unavailable, and index values do not settle down, until sometime after the 3:00 p.m. (Central) NYSE close. The results of these FV calculations are promptly transmitted to the marketplace moments after the 3:15 p.m. futures close. Indicative FV numbers are made available by the Exchange periodically throughout the day.

Utility of FV Settlements - CME Group domestic stock index products normally close and settle 15 minutes after the cash close. The basis may be affected as futures fluctuate, sometimes sharply, during those final 15 minutes. This may be problematic for traders practicing coordinated cash/futures strategies. But the opportunity to lay off equity exposures in futures subsequent to the cash close has proven quite beneficial. The use of FV settlement procedures addresses this "tracking error" while allowing futures to continue 15 minutes past the 3:00 p.m. cash close. FV settlements represent a 3:00 p.m. price, coordinated with the cash close but information breaking after 3:00 p.m. may nonetheless impact futures prices causing futures to trade away from FV settlements. FV settlement procedures have resulted in an explosion of cash/ futures investment activity and attendant open interest since 1999. In particular, use of stock index futures as a surrogate investment vehicle, providing the "beta" in portable alpha programs, has been a major boom to our markets. - *John Labuszewski & Lucy Wang*