CME Group

STOCK INDEXES

Pace of the Roll Monitor

2nd Quarter 2012

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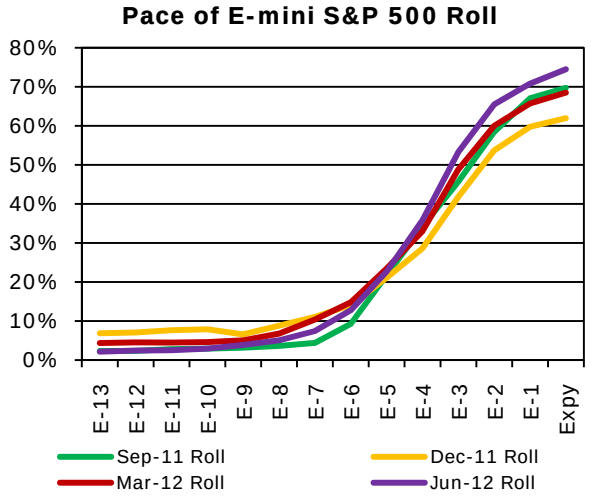
The spread between June 2012 and September 2012 E-mini Standard & Poor's 500 (S&P 500) futures during the "roll" period, as we approached expiration of the June contract, was generally typical of what has transpired in recent roll periods.

Financing rates implicit in the June 2012/September 2012 spread hovered in a range of perhaps 5-15 basis points below prevailing LIBOR rates. This is consistent of what has been observed during the last several roll periods with the exception of the prior period in March 2012 when we observed reasonable convergence between implied financing rates and LIBOR.

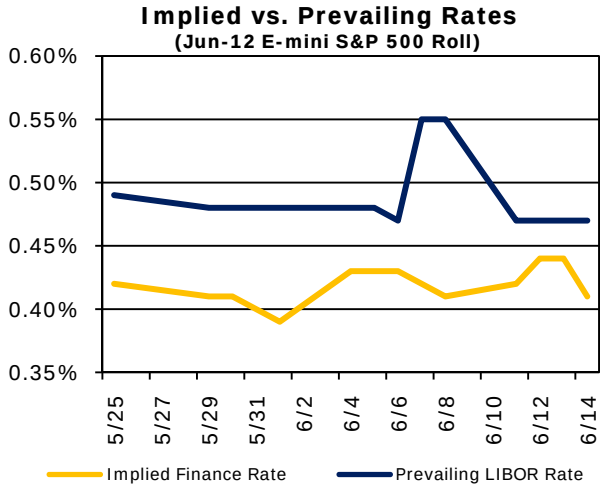
This article is intended to review this situation and discuss how one may monitor it using CME Group's Equity Quarterly Roll analyzer. [1]

Most Recent Roll

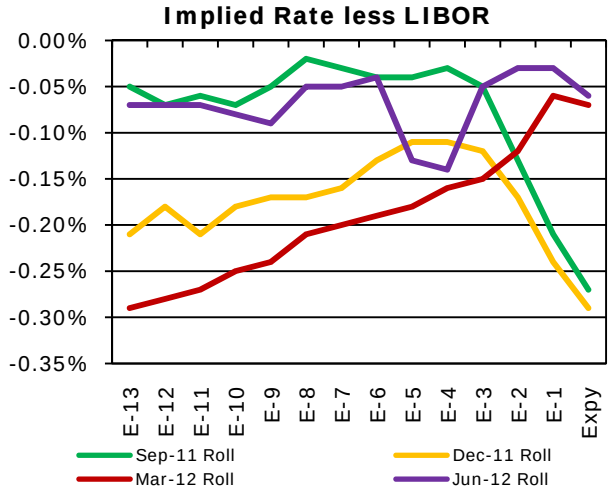
Asset managers notably including portable alpha managers follow the value and pace of the roll closely. They do so because a passive long strategy requires that they execute a roll transaction on a regular quarterly basis.



Thus, it is often interesting to monitor how much open interest has rolled or transferred from the expiring or nearby contract month to the deferred month. CME Group's Equity Quarterly Roll Analyzer provides this information in graphic and tabular form beginning approximately one month prior to the expiration of a quarterly futures contract. (See graphic and Table 1 for the pace of roll in recent months.)



Our graphic depicts how the roll progressed relative to historic averages during recent roll periods in the thirteen (13) days before futures contract expiration. We depict the percentage of aggregate open interest held in the expiring and first deferred quarterly contracts that has rolled.



The Quarterly Roll Analyzer further provides information regarding the implicit financing rate and compares it to prevailing LIBOR rates – see Table 2 below for details. During the June 2012 roll period, as open interest transferred from nearby June 2012 to the deferred September 2012 futures contract, we note that implicit financing rates remained consistently below prevailing LIBOR rates.

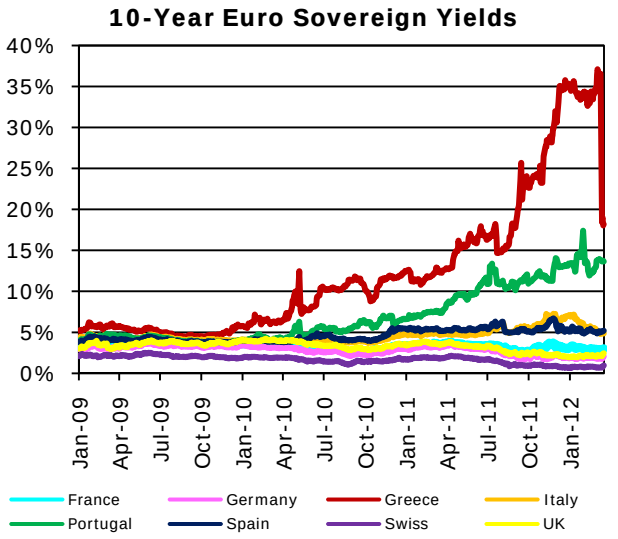
[1] CME Group Equity Quarterly Roll Analyzer may be accessed at www.cmegroup.com/trading/equity-index/paceofroll/main.htmlindex/paceofroll/main.html

This departs from the pattern observed in March 2012 when the implied and LIBOR rates converged nicely. It further departs from patterns observed in September 2011 and December 2011 when the gap between LIBOR and the implied finance rate grew wider as we moved through the roll period.

Explaining the Spread

Domestic equity market action during the 2nd quarter 2012 has, thus far, been dominated by news of the ongoing European sovereign debt crisis; along with a slight weakening in domestic economic conditions.

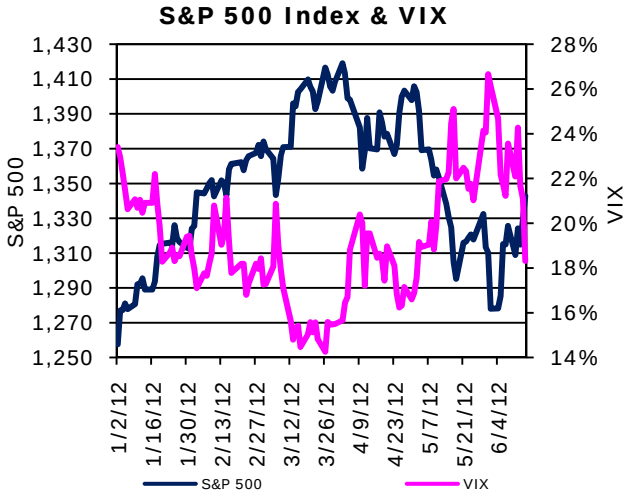
Markets nervously held their breath in front of the June 17th Greek elections and fiscal flare-ups in Spain. While the pro-bailout party prevailed in the elections, this may represent but a temporary reprieve in the ongoing crisis to the extent that Greek voters wish to remain in the Eurozone but continue to balk at the requisite austerity measures. It remains unclear how the new Greek government will reconcile these inherently conflicting demands.



Meanwhile, the Spanish banking sector remains fragile and seeks a $125 billion bailout from the European Union. Fears persist that the contagion may soon spread to Italy, the 3rd largest economy in Europe. All this is reflected in high European sovereign debt yields, led by the fiscally weakest European nations such as Greece, Portugal, Spain and Italy.

On the domestic front, 1st quarter 2012 GDP was most recently reported at +1.9% and down from the 3.0% reported in the 4th quarter 2011. The unemployment rate, which had been trending down in recent months, seems stuck at 8.2%. The weight of the European situation is even felt in the emerging markets as Chinese economic growth is slowing as well.

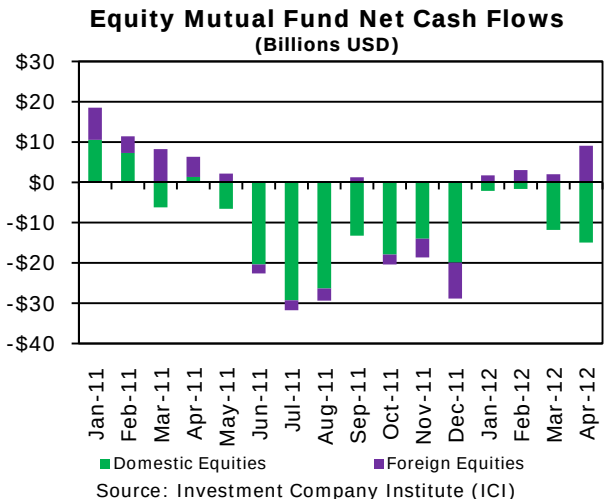
The result has been a weak 2nd quarter performance of the S&P 500. The S&P 500 declined from its April 2nd peak of 1,419.04 to a June 1st trough of 1,278.04, for a peak-to-trough decline of 9.9%. Meanwhile, the S&P 500 Volatility Index (VIX) bounced from a late March trough near 14% to over 26% by early June. [2]



These patterns are reflected in an inspection of flow of fund data for equity mutual funds. Equity markets generally performed admirably during the 1st quarter of 2012 as the S&P 500 generated a total return of 12.56%, inclusive of price performance plus dividend income. This served to stem the outward flow of investment from domestic equity

[2] Note that there is a consistent inverse relationship between equity values and the VIX. This may be explained by the observation that equities often break swiftly and suddenly as investors seek to liquidate positions quickly in response to troublesome economic news. Thus, volatilities tend to advance in bear markets. On the other hand, equities tend to rally slowly and steadily. The steady influx of funds into the equity markets as a result of retirement programs, implemented with automated payroll contributions, such as 401Ks contributes to this effect. Thus, equity markets tend to exhibit declining volatilities in bull markets.

mutual funds that had been experienced throughout the lackluster year of 2011, based upon data published by the Investment Company Institute (ICI). However, as conditions began to weaken entering the 2nd quarter, the flow of funds reversed downward again albeit rather cautiously and on a scale that falls short of the 2011 reversals.



These liquidations during late March and into April 2012 weighed on stock index futures and the effects were observed in the performance of the S&P 500 as well as the quarterly roll.

Relevant Financing Rate

As discussed in previous editions of this report, the value of a futures contract is not only a function of market conditions, but further a function of the financing rate relevant to the particular trader. *E.g.*, if one is able to finance one's position at a more favorable rate, that implies that the futures or forward value may be reduced. Thus, the value of a futures contract might be intrinsically different depending upon your relevant financing rate.

To the extent that commercial loan demand is weakened by the state of the economy and the prospects of slow growth, the relevant financing rate for futures trading activities may shift. When the economy is heated up, aggressive borrowers may turn to LIBOR based financing. But when loan demands abate and delveraging becomes the order of the day, funding demands may adequately be serviced by borrowing at a generally reduced Fed Funds rate, as reflected in the Overnight Index Swap (OIS) rate.

Thus, while we have traditionally compared the financing rate implicit in stock index futures to LIBOR, some would suggest that OIS provides a more apt comparison. To the extent that the economy has not fully recovered from 2008's subprime mortgage crisis and we appear to be entering dangerous economic straits, the implied financing rate may hover below LIBOR rates, shading towards OIS values.

Conclusion

Interested parties are advised to consult our website to access our Equity Quarterly Roll Analyzer at www.cmegroup.com/trading/equity-index/paceofroll/main.html.

This website tool represents a valuable and popular way of monitoring activity during a critical period of market activity.

Table 1: Pace of E-Mini S&P 500 Roll

	Mar-11 Roll	Jun-11 Roll	Sep-11 Roll	Dec-11 Roll	Mar-12 Roll	Jun-12 Roll
E-13	5.83%	3.27%	2.31%	6.86%	4.37%	2.17%
E-12	5.89%	3.30%	2.35%	7.10%	4.53%	2.46%
E-11	6.26%	3.48%	2.83%	7.65%	4.51%	2.54%
E-10	7.46%	4.29%	2.94%	7.88%	4.63%	2.93%
E-9	7.87%	4.60%	3.17%	6.59%	5.08%	3.90%
E-8	10.73%	5.51%	3.62%	8.81%	6.79%	5.07%
E-7	16.63%	7.62%	4.41%	11.08%	10.41%	7.45%
E-6	20.39%	10.58%	9.30%	14.10%	14.81%	12.77%
E-5	29.71%	21.69%	21.72%	21.07%	23.46%	22.68%
E-4	35.70%	32.15%	34.18%	28.64%	33.00%	35.83%
E-3	44.50%	42.66%	45.70%	41.82%	48.83%	53.27%
E-2	50.74%	57.55%	58.40%	53.72%	60.00%	65.46%
E-1	56.98%	64.38%	67.04%	59.74%	65.70%	70.77%
Expiry	59.72%	66.95%	69.73%	61.92%	68.47%	74.45%

Table 2: Detailed E-Mini S&P 500 Roll Data
(June 2012)

Days to Expiry	Date	Spread VWAP	Implied Financing	LIBOR	Spread vs. LIBOR
20	5/25/12	-6.46	0.42%	2,292	0.49%
16	5/29/12	-6.50	0.41%	9,404	0.48%
15	5/30/12	-6.54	0.41%	3,123	0.48%
14	5/31/12	-6.55	0.40%	14,354	0.48%
13	6/1/12	-6.63	0.39%	35,489	0.48%
10	6/4/12	-6.69	0.43%	57,008	0.48%
9	6/5/12	-6.69	0.43%	80,712	0.48%
8	6/6/12	-6.66	0.43%	176,482	0.47%
7	6/7/12	-6.68	0.42%	409,331	0.55%
6	6/8/12	-6.71	0.41%	531,969	0.55%
3	6/11/12	-6.69	0.42%	663,468	0.47%
2	6/12/12	-6.63	0.44%	556,322	0.47%
1	6/13/12	-6.62	0.44%	328,251	0.47%
0	6/14/12	-6.74	0.41%	288,288	0.47%

Appendix – About the Roll

Many asset managers routinely buy and hold a passive position in stock index futures. This tactic allows one to secure the returns in the underlying stock index such as the S&P 500, which is often regarded as the benchmark or bogey against which asset manager performance may be measured.

Portable alpha managers in particular follow the value and pace of the roll closely. They do so because a passive long strategy requires that they execute a roll transaction on a regular quarterly basis.

Thus, it is often interesting to monitor how much open interest has rolled or transferred from the expiring or nearby contract month to the deferred month. Further, it is interesting to watch the implied financing rate in the roll and compare it to prevailing LIBOR rates.

CME Group's Equity Quarterly Roll Analyzer provides this information beginning approximately two weeks prior to the expiration of a quarterly futures contract on the 3rd Friday of the contract month.

Maintaining a Position

"Rolling" one's long position forward from an expiring nearby to a deferred futures contract is commonplace in the context of a "portable alpha" program. This strategy is intended to secure core or "beta" returns as indicated by a "benchmark" such as Standard & Poor's 500 (S&P 500) stock market index. Further, portable alpha managers attempt to enhance overall portfolio returns by layering on an additional trading strategy in pursuit of excess or "alpha" returns.

But, unlike equities, futures are not perpetual in nature but rather expire on a periodic basis. Of course, the convention in stock index futures is to provide for a quarterly expiration on the 3rd Friday of March, June, September and December.

Thus, asset managers passively holding long positions in an expiring contract must "roll forward" their positions. This is accomplished by selling the expiring contract and reestablishing their long positions in the next contract month.

"Roll" Forward → Sell Nearby & Buy Deferred Futures

The price at which one may roll forward is easily found in the spread between nearby and deferred futures contracts.

$$Roll = Deferred\ Futures - Nearby\ Futures$$

E.g., assume that Dec-11 E-mini S&P 500 futures are at 1,196.50 while Mar-12 E-mini S&P 500 futures are at 1,190.50. Thus, the roll may be quoted as the spread or -6.00 index points (= 1,190.50 – 1,196.50).

$$Roll = 1{,}190.50 - 1{,}196.50 = -6.00\ index\ points$$

Positive and Negative Carry

While the roll may readily be calculated, the next question is whether or not it fairly reflects prevailing market conditions. As a general rule, the "fair value" of a stock index futures contract ($FV_{futures}$) may be calculated by reference to "cost of carry" considerations. In other words, what would it cost to buy and carry until term an equity portfolio that reflects the value of the underlying index (*Spot*).

We assume that one finances the portfolio at prevailing short-term rates, such as LIBOR rates (*R*); and, benefits from the accrual of dividend income measured in index points (*Div*) over so many days (*days*) until futures maturity.

$$FV_{futures} = Spot + Financing - Dividends$$
$$= Spot\ x\ \left(1 + R\left(\frac{days}{360}\right)\right) - Div$$

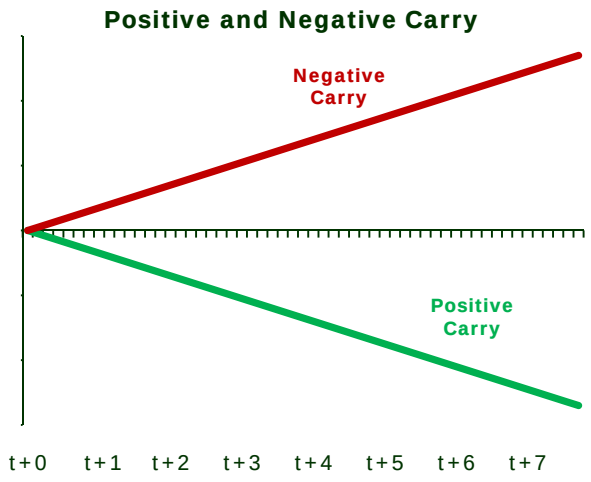
E.g., assume that the S&P 500 Index is at 1,196.80, short-term LIBOR rates are at 0.59%, there are 108 days until expiration and we expect 7.90 index points of dividend accrual until futures contract expiration. Thus, we may calculate the fair value of a futures contract at 1,191.02.

$$FV_{futures} = 1{,}196.80\ x\ \left(1 + 0.59\%\left(\frac{108}{360}\right)\right) - 7.90$$
$$= 1{,}191.02$$

Where the cost of financing exceeds the expected receipt of dividend income, stock index futures should trade at premium to the spot index value. As a result, deferred futures should generally trade at a premium to nearby futures and the roll is quoted as a positive number. This is a condition known as "negative carry" in futures markets because financing costs exceed dividend receipts. Negative carry is the condition normally expected in stock index futures.

But sometimes, the anticipated dividend stream exceeds financing costs. This is the case currently as short-term interest rates, driven fundamentally by Fed monetary policy, are at historically all-time lows with target Fed Funds at 0-0.25%.

As such, deferred futures should trade at discount to nearby futures and the roll is quoted as a negative number. This is a circumstance known as "positive carry" because dividend receipts exceed financing costs.



Implicit Financing

How might one determine whether the "roll" is cheap or rich? One might attempt to calculate the fair value associated with the nearby and deferred futures contracts. Or, one might get to the heart of the matter by calculating the financing rate implicit (*Imp Fin*) in the value of the roll (*Roll*).

In order to calculate this value, we also need to know the price of nearby futures ($Futures_{nearby}$); the number of days between expiration of nearby and deferred futures ($Days_{between}$). Finally, we need to estimate the dividends that will accrue between the expiration of the nearby and deferred futures ($Div_{between}$) as well as dividends that will accrue until expiration of the nearby futures contract ($Div_{to\ nearby}$).

$$Imp\ Fin = \left(\frac{36000}{days_{between}}\right)\left(\frac{Roll + Div_{between}}{Futures_{neearby} + Div_{to\ nearby}}\right)$$

E.g., the roll is at -5.75 index points, there are 108 days until expiration of the deferred futures contract, nearby futures are at 1,196.00. We estimate that there will be 7.00 index points in dividends accrued between expirations and an additional 1.15 index points in dividends accrued until expiration of nearby futures. The implicit financing rate is calculated as 0.2783% or approximate 28 basis points.

$$Imp\ Fin = \left(\frac{36000}{108}\right)\left(\frac{-6.00 + 7.00}{1{,}196.50 + 1.15}\right) = 0.28\%$$

We can compare this implied financing rate of 0.28% to prevailing financing rates to determine whether the Roll appears rich or cheap.

E.g., assume that prevailing Libor rates are at 0.59% while the implied financing rate is at 0.28% or 31 basis points below prevailing rates. This suggests that the Roll is rather low or cheap. Thus, it may be an opportunity time to "buy the roll" by buying deferred and selling nearby futures.

E.g., assume that the implied financing rate is at 0.70% while prevailing rates are at 0.59%. This would suggest that the Roll is rather high or rich. Thus, it may be more opportune to "sell the roll" buy selling deferred and buying nearby futures.

Implicit Financing < Prevailing Rate → **Roll is "Cheap"**

Implicit Financing > Prevailing Rate → **Roll is "Rich"**