

US Equity Futures Watch

S&P 500 Futures Intraday Roll Cost Monitor

Intraday on 8 Mar, the S&P 500 e-mini futures traded 62bps (VWAP) to Fed Funds using bottom-up dividends

The volume weighted roll cost for the quarter has been 58bps

On 8 Mar, \$158.7bn in S&P 500 e-mini contracts rolled

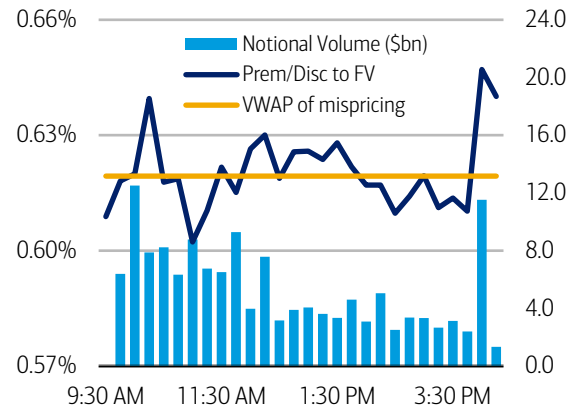
The total notional of S&P 500 ES futures rolled this quarter is \$250.4bn

Open interest implies 27.0% of e-mini contracts have rolled to Jun-24 versus a prior one-year average of 27.0%

This calculation uses a percentage of roll volume based on history that equates to new Jun-24 open interest and is subject to change

Exhibit 1: SPX futures (ES) intraday roll cost on 8 Mar

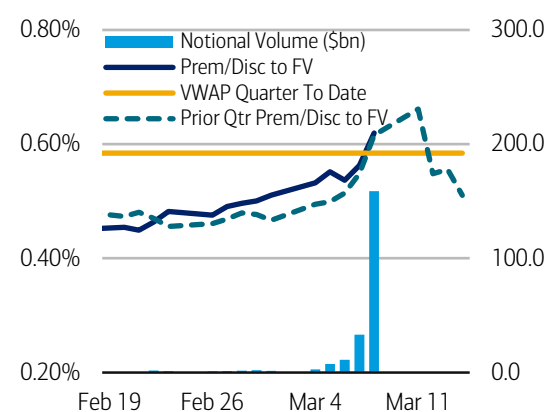
The ES roll traded between 60 and 65bps rich to Fed Funds today



Source: BofA Global Research. Intraday day measured in 15-minute intervals
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Exhibit 2: SPX futures (ES) quarter-to-date VWAP roll cost

The roll richened to 62bps vs. Fed Funds today which is in line with where it traded at this point last quarter



Source: BofA Global Research. Daily data based off intraday prices.
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08 March 2024

Futures
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Exhibit 3: Mar-24/Jun-24 Roll Progress Summary

Based off intraday data, vs. Fed Funds, bottom-up divs

| Contract | Mar 8 | Quarter to Date |
|----------------------------|--------|-----------------|
| E-mini S&P 500 (ES) | 0.62% | 0.58% |
| E-mini Russell 2000 (RTY) | 0.33% | 0.32% |
| E-mini NASDAQ-100 (NQ) | 0.62% | 0.57% |
| E-mini S&P Midcap 400 (FA) | 0.32% | 0.32% |
| E-mini DJ Indus. Avg. (DM) | 0.61% | 0.59% |
| E-mini Russell 1000 (RSY) | 0.69% | 0.69% |
| S&P/TSX 60 (PT) | -0.32% | -0.32% |

Source: BofA Global Research. PT financing vs. CDOR 3M rates.
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Refer to important disclosures on page 5 to 7.

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Timestamp: 08 March 2024 06:57PM EST

Exhibit 4: Mar-24/Jun-24 North America Equity Index Futures Roll Progress Summary

Data as of 8 Mar

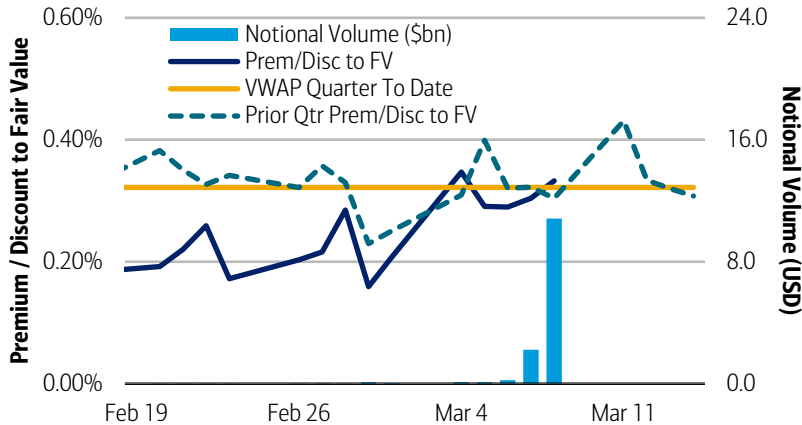
| Contract | Roll Pace | Annualized Roll Cost | | | | | Notional Roll Volume Traded (\$mn) | | | | Number of Contracts Traded | | | |
|----------------------------|-----------|----------------------|-----------------|--------------|-----------|--|------------------------------------|-----------------|--------------|-----------|----------------------------|-----------------|--------------|-----------|
| | | Mar 8 | Quarter to Date | Last Quarter | Last Year | | Mar 8 | Quarter to Date | Last Quarter | Last Year | Mar 8 | Quarter to Date | Last Quarter | Last Year |
| E-mini S&P 500 (ES) | 27.0% | 0.62% | 0.58% | 0.59% | 0.41% | | 158,707 | 250,444 | 817,210 | 742,384 | 615,602 | 978,934 | 3,534,150 | 3,426,674 |
| E-mini Russell 2000 (RTY) | 24.1% | 0.33% | 0.32% | 0.36% | 0.11% | | 10,830 | 14,166 | 125,439 | 114,430 | 103,351 | 135,617 | 662,237 | 619,146 |
| E-mini NASDAQ-100 (NQ) | 24.6% | 0.62% | 0.57% | 0.58% | 0.40% | | 21,055 | 33,218 | 143,261 | 131,288 | 57,775 | 91,814 | 441,049 | 448,579 |
| E-mini S&P Midcap 400 (FA) | 41.5% | 0.32% | 0.32% | 0.38% | 0.15% | | 4,282 | 4,632 | 13,334 | 12,693 | 14,444 | 15,637 | 50,363 | 49,768 |
| E-mini DJ Indus. Avg. (DM) | 28.9% | 0.61% | 0.59% | 0.63% | 0.42% | | 4,710 | 6,274 | 26,703 | 24,946 | 24,255 | 32,348 | 146,084 | 145,331 |
| E-mini Russell 1000 (RSY) | 52.9% | 0.69% | 0.69% | 0.64% | 0.44% | | 2 | 2 | 175 | 379 | 15 | 15 | 688 | 1,610 |
| S&P/TSX 60 (PT) | 32.0% | -0.32% | -0.32% | -0.50% | -0.66% | | 17,776 | 20,687 | 73,560 | 78,127 | 67,655 | 78,760 | 299,742 | 324,400 |

Source: BofA Global Research. All roll costs are calculated as their volume weighted averages over the respective period. All notional volumes are measured in USD Millions with the exception of the S&P/TSX60 which is measured in CAD Millions. The roll cost for the last year is over all contracts traded in the prior four completed quarters. Last year's volume and contracts traded are the averages of the prior four quarters' values when available. Roll pace is defined as the open interest of the second contract plus a percentage of the number of spreads traded divided by the combined open interest of the front and second contracts.

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Exhibit 5: Russell 2000 E-mini (RTY) quarter-to-date VWAP roll cost

The Russell 2000 roll richened again today

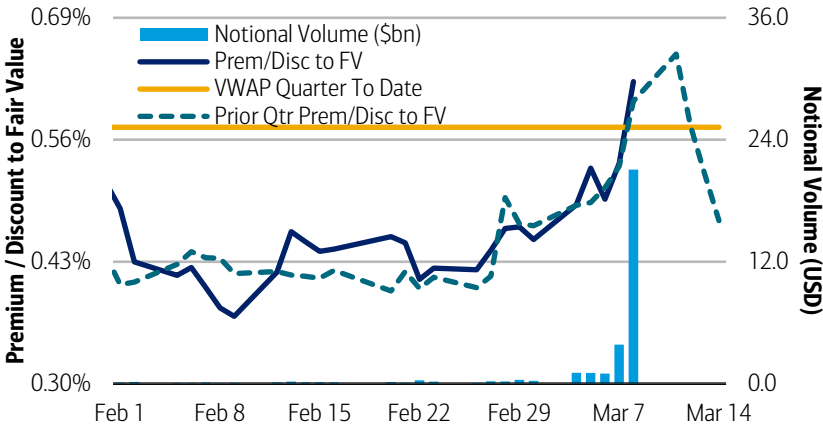


Source: BofA Global Research. Daily data based off intraday prices.

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Exhibit 6: NASDAQ-100 E-mini (NQ) quarter-to-date VWAP roll cost

The NQ roll significantly richened on Friday



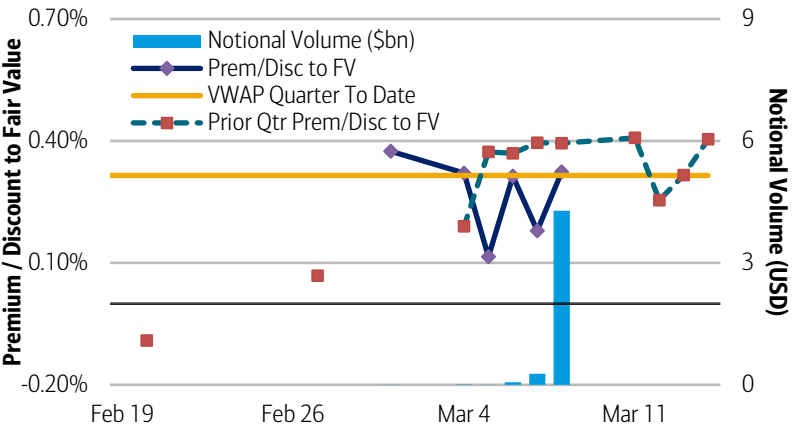
Source: BofA Global Research. Daily data based off intraday prices.

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Exhibit 7: S&P Midcap 400 E-mini (FA) quarter-to-date VWAP roll cost

The S&P Midcap 400 richened today

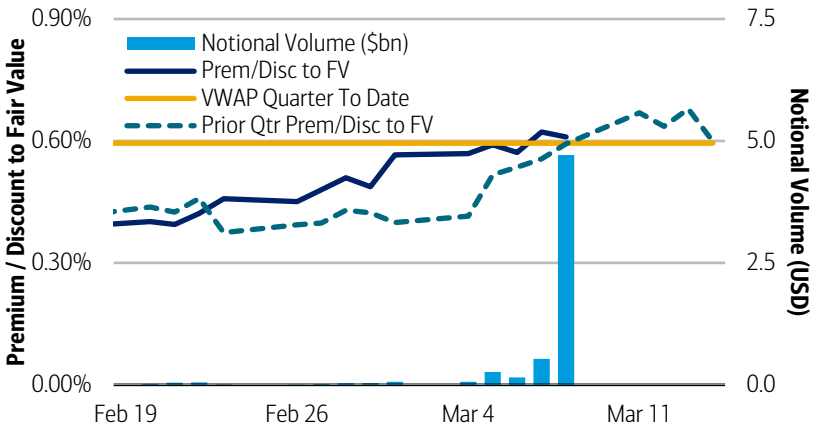


Source: BofA Global Research. Daily data based off intraday prices.

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Exhibit 8: Dow Jones Industrials Average E-mini (DM) quarter-to-date VWAP roll cost

The Dow roll slightly cheapened on Friday



Source: BofA Global Research. Daily data based off intraday prices.

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Roll Cost Methodology

Our roll cost for all futures with the exception of the S&P/TSX60 is based on Fed Funds implied of forward rates and our index dividend forecasting model. The S&P/TSX 60 uses the three month Canada Bankers Acceptance futures instead of Fed Funds.

Our methodology assumes that Fed Funds is the funding rate for the futures arbitrage. An assumption of the 3m LIBOR would generally cheapen the roll cost statistics. Our index dividend forecasts are obtained via a proprietary algorithm that forecasts the dividends of each index constituent and aggregates these forecasts to the index level. We use gross forecasted dividends which may differ from the amount actually realized for investors that are subject to withholding taxes. An unavoidable roll risk arises as the forecasted dividends may differ from those that are actually realized.

Our reported roll cost is the spread between the interest rate that would force the spread transaction price to fair value and the actual interest rate implied by Fed Funds. The futures fair value depends on the price of the underlying cash index and its dividend forecasts. A positive (negative) roll cost implies that the futures are trading at a premium (discount) to fair value.

The roll cost is reported as an annualized cost.

Intraday Roll Cost Calculation

In our calculations we match the roll spread price with (1) the immediately preceding Fed Funds forward rate, (2) the immediately preceding underlying cash index price, and (3) our dividend forecasts over the duration of the two nearest month futures contracts computed before the beginning of trading each day.

Volume Weighted Average (VWAP) Roll Cost Calculation

Intraday VWAPs are volume weighted for all trades that day. This methodology gives the largest weight to the trades of the largest size. Quarter-to-date VWAPs are computed as a VWAP of the individual intraday VWAPs using each day's total volume as weights.

Notional Volume Calculation

The "notional volume traded" is an estimate of the dollar volume of futures that were rolled. Intraday, this is calculated as the number of spreads traded in each 15 minute interval from 9:30AM EST to 4:00PM EST multiplied by both the contract multiplier and the last cash index price in that interval. For daily aggregated values, the total volume of spread each day is multiplied by the last cash index price and the contract multiplier.



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