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Equity Derivatives

MONTRÉAL EXCHANGE

A guide to SXF roll

"The roll"

A roll period occurs in equity index futures contracts because the contracts have quarterly expiry dates, and many holders of futures contracts, for instance those achieving a passive index exposure via futures or option market makers which hold their delta positions via futures, intend to continue holding their exposure after the "front month" (i.e. shortest expiry date) future contract expires. Rolling a long futures position involves - for example in the upcoming roll period - selling a long position in the contract expiring March 2019, and simultaneously buying an equivalent position in the June 2019 contract. The roll price can be defined as the following spread:

Roll = Deferred Futures ("back month") – Nearby Futures ("front month")

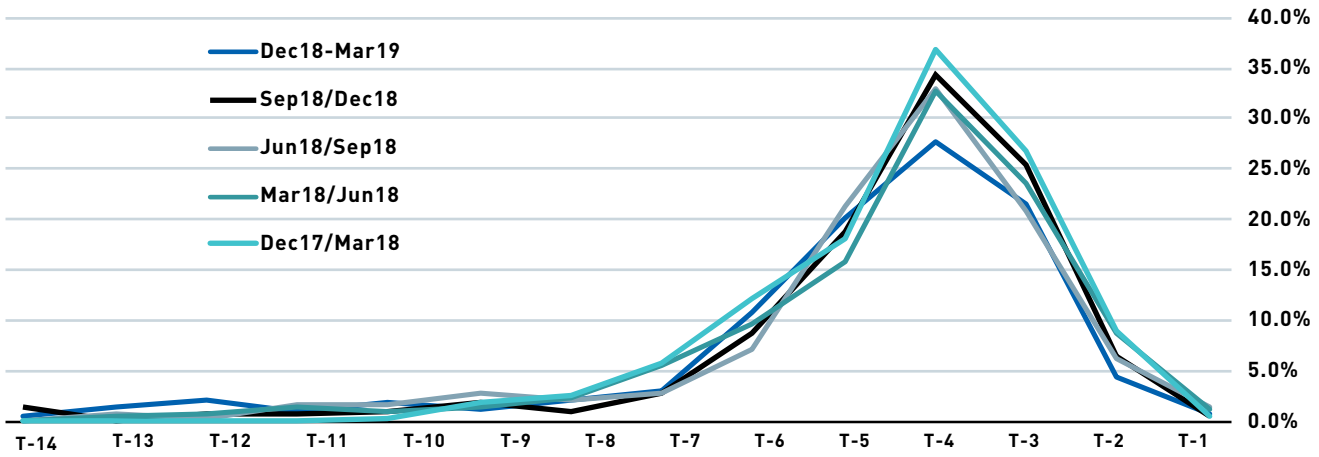
By doing so before the expiry, an investor maintains his/her futures positions meant to achieve his/her investment objectives, rather than letting the contract settle - usually on the morning of the third Friday of the quarter-end month. Otherwise, he/she incurs the risk of begin exposed to market price variations between the time of settlement and the time he/she would initiate a position in the new "active" contract.

The "active" contract typically has far more trading and depth of liquidity, therefore prior to the roll period, open interest is usually concentrated in the front contract until switching to the back contract during the roll period. At that point the back contract which has by now taken over the greater part of trading and liquidity becomes the "active" contract.

Figure 1 shows the volume traded in the roll as a percentage of the open interest of the active contract 14 business days prior to the expiry since December 2017. The pattern is very consistent and we can observe that the bulk of the roll activity occurs during a 4-5 period which usually starts the Thursday preceding the expiration Friday (T-6) with a lot of the trading concentrated around the Monday of the expiry week (T-4).

Rolling all or most of the positions that exist in the front contract to the back contract is a large amount of activity in both contracts concentrated into just a few days. As a result, depending on supply and demand, opportunities emerge periodically as long and short investors search for the liquidity to close their positions in the front contract. This search for liquidity can cause the front (or back) contract to trade "rich" or "cheap" to fair value. Many investors try to gain an edge by anticipating the deviations of the roll price from its fair value, thus capturing additional performance, for example by rolling "cheap" if he/she is long front month futures contracts. Other investors, including market makers trade the roll as a standalone product, by trying to buy it "cheap" and sell it "rich".

FIGURE 1
Volume of roll as % of the open interest of "active" contract (based on OI at T-14)



Source: Bloomberg, LFC calculations

In what follows, we will focus on the main drivers of the roll dynamic.

Fair value

In absence of an imbalance in supply and demand for the roll, it's value should match exactly that of its fair value. The fair value of the roll is simply the difference between the fair values of the front contract and back contract.

As a reminder the fair value of a futures contract has two main drivers: interest rates and dividends. In fact, the holder of a futures contract plus a cash position should have the same P&L than the holder of the corresponding basket of stocks (replicating the index) using the same amount of cash. Unlike the holder of the basket of stocks the holder of a long future position does not receives the stock dividends over the holding period. But, the holder of the future receives interest on its equivalent cash position. As a result, a simplified measure of fair value of a future is:

Fair value = Index level x [interest rate x (# of days to future expiry/360)]

- Dividends (over the period left to future contract expiration)

Therefore, for a given level of the equity index the only way the fair value of the futures can change is either because:

a) the interest rate over the remaining "life" of the future contract changes

or

b) the stock dividends over the remaining "life" of the future contract changes

Let us take the practical example of the SXF (S&P/TSX60 futures). On Feb 27th, the March 2019 contract has 16 days to expiry:

S&P/TSX60 = 957.35

Interest rate (annualized funding cost during the duration of the future contract holding) = 1.95%

Dividend points to March 15th, 2019 = 2.64

The fair value of the future contract = 955.14

Practitioners often will refer to the spread between the front and back month's contracts when discussion the fair value, in this example, the fair value would be quoted at -1.81 points.

One important point to note is that, different market participants have different funding costs and therefore their estimate of fair value can vary. For instance, a major financial institution has a funding rate which is usually more attractive (lower) than other type of investors, resulting in a higher estimate for the fair value than an institution which can borrow only at higher rates.

How and how far can future prices deviate from fair value?

As mentioned, not all investors' fair value estimations are equal, given the differences in their borrowing cost or tax treatment on dividends. Additionally, similar to all markets, supply and demand drive prices. For instance, some investors such as CTAs use exclusively futures to implement their strategies – and cannot use a basket of stocks - to go long or to short the index, and they would do so even if futures are slightly away from fair value. Their trading flows can cause the price to deviate from the fair value.

However, should the price of the futures deviate substantially from the fair value, arbitrageurs could step into the picture. In practice if futures are very "cheap" to fair value, an investor could buy future contracts and short the corresponding basket of stocks, and also lock his/her interest rate over the remaining period, to realize a risk-free profit. The reverse is true if the futures trade "rich" to fair value. Yet, for arbitrageurs to step in, several conditions need to be met. First, the deviation from fair value must be large enough to cover transaction costs and trading slippage, second, anyone wanting to trade the basket of stocks versus the futures need to have a specific operational set-up allowing to implement that type of trade and lastly, this kind of trade usually requires committing balance sheet (i.e. a certain amount of capital to meet regulatory and margin requirements) which can be a hindrance for many investors and make the trade less attractive given the opportunity cost.

Fair value uncertainty

The two elements than can result in uncertainty around the fair value are the level of interest rates and dividends paid during the life of a futures contract. Given that at the time of the roll there is only 7-8 days left to the expiry of the front contact, the effect of any such changes will be negligible on the front contract.

However, with regards to the longer dated contract some important uncertainty could materialize, in particular if a contentious central bank meeting with relatively uncertain outcome falls during those few days where the roll is active or if unexpected dividend increases or cuts are declared during those few days. Obviously, these are rare occurrences. To highlight this risk let us look at the upcoming roll in March 2019. The Bank of Canada (BoC) has a monetary policy meeting on March 6th, just at the start of the roll activity. Now, at this point in time, the consensus is that the BoC will hold the overnight rate steady at 1.75% but in a hypothetical scenario that the odds of a hike or cut switch drastically, the outcome would affect the interest rate going forward. More importantly, there are 2 more meetings before the June 2019 futures expire. Should the BoC signal a new bias towards hiking or cutting rates that would affect the fair value of the long-dated contract. Similarly, any surprise dividend announcements during the roll period will affect the fair value of the longer dated contract and hence the roll price.

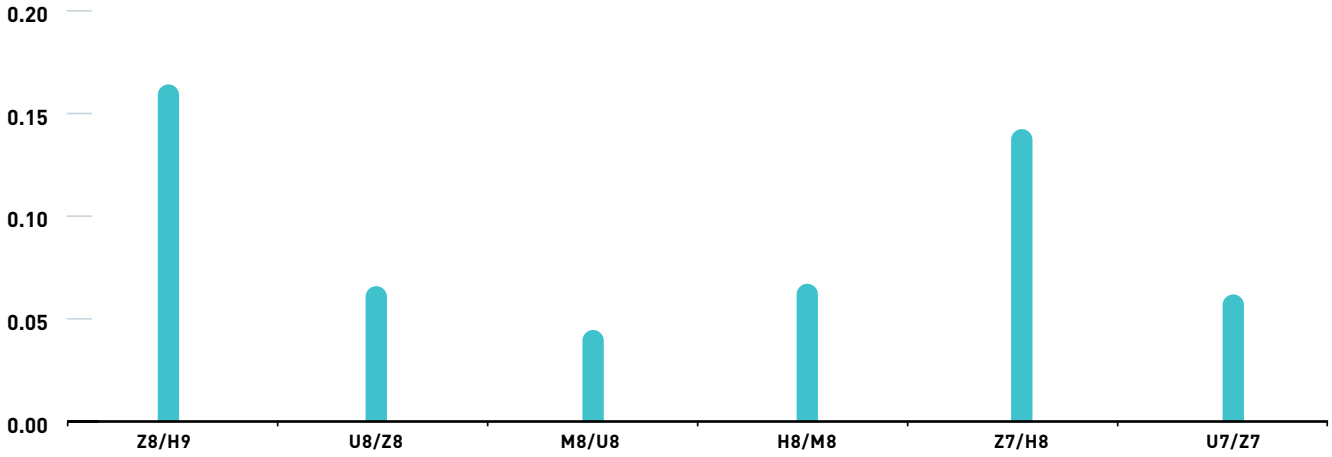
Positioning

The positioning of market participants has by far the most influence in the price action of the roll. Holder of future positions on the front contract will try and achieve an optimal outcome during the roll period. The goal of most investors is to minimize their "roll cost".

Figure 2 shows the price range of the roll as a percentage of the S&P/TSX60 index for all roll periods since December 2017. The roll price can vary in a 5 bps to 16 bps range with an average of 9.1 bps. This means, by executing the roll "perfectly" (i.e. a long (short) investors buying (selling) at the low (high) of the trading range) an astute investor could optimize his/her P&L by 9 bps each quarter. That represents a 36 bps impact on an annual basis. This is a very important impact considering that many holders of future positions are major institutions (in particular pension funds and endowment funds) that hold a passive index position and their benchmark is or would include the S&P/TSX60 total return.

FIGURE 2

Trading range of the roll as a % of the S&P/TSX60



Source: Bloomberg, LFC calculations

The fact that liquidity in the roll is available for a very short window combined with a strong motivation of investors to gain an edge in rolling their front contract position, results in a competitive market where positioning plays a key role.

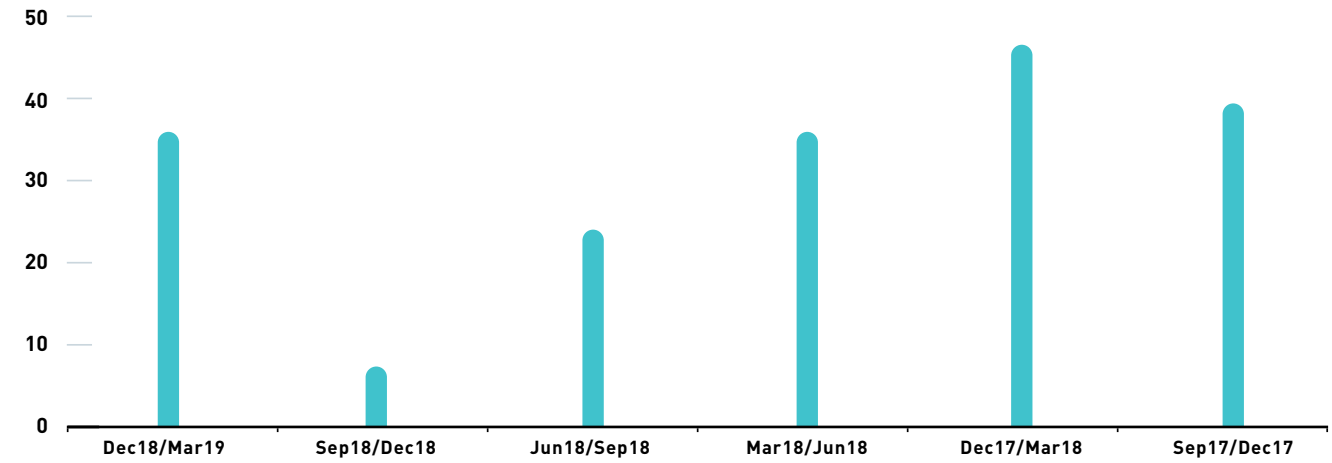
How to get a sense of positioning?

Looking at the correlation between the price of the roll and open interest over the remaining life of the front contract can in some cases be insightful. A significant positive correlation indicates that new positions in the back contract are being established at higher prices. This means that on aggregate, holders of long positions are aggressively rolling their position and/or that holder of short positions might be contemplating or are willing to let their positions expire. Typically, this would be institutional investors who have over-the counter-products or options positions expiring at the same quarterly maturity. The reverse can also be true. If price and open interest have a significant negative correlation over the life of the contract, it is likely that holders of short front month positions are driving the price and/or that an important portion of holders of long positions either want or are willing to let their positions expire.

The change in preference or the need of investors in rolling their positions can be seen in figure 3. The graph shows the % of front month contracts that were still open at the end of day just prior to expiry (as a % of the open interest outstanding 14 days prior to expiry). Since September 2017, on average around 2/3 of open interest of the front month contract has been rolled into the back month. But in December 2017 nearly half of the December 2017 futures contracts were left to expire. While in September 2018, nearly all the front month contract futures were rolled into December 2018 futures contracts.

FIGURE 3

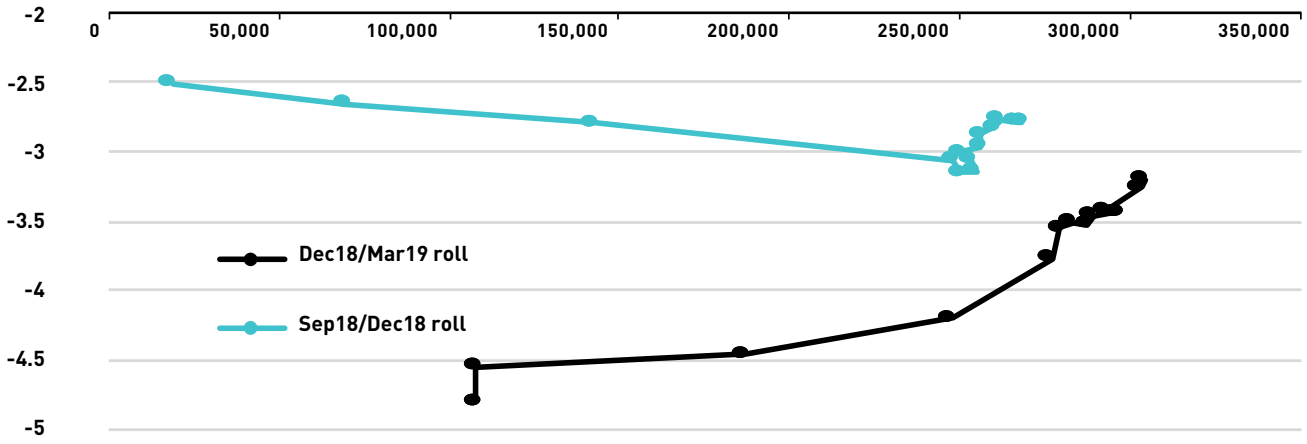
Percentage of front month contract which were not "rolled" by expiry (relative to OI 14 days prior to expiry)



Source: Bloomberg

Meanwhile figure 4 highlights the point we made with regards correlation of prices and open interest. During the Dec18/Mar19, the price of the roll decreased continuously till the last 2 days of the roll period. In contrast, the Sep18/Dec18 roll period is much more stable and the roll has a non-significant correlation between its price and open interest.

FIGURE 4
Roll price vs. open interest of front contract



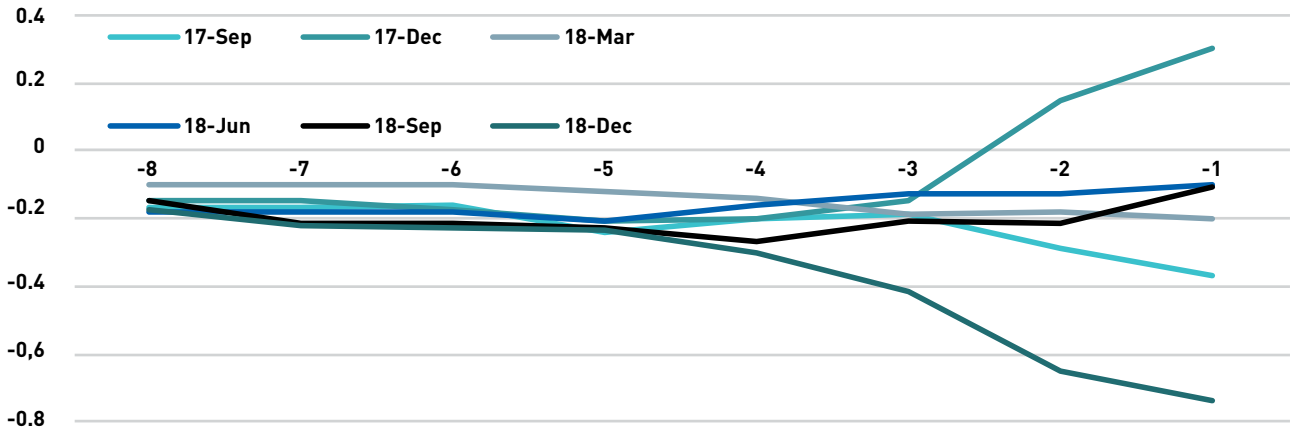
Source: Bloomberg

Historical context

Looking back at previous roll periods and putting in context the price behavior versus the fair value can also provide some valuable insights.

Figure 5 shows the deviation of the daily-volume weighted average price (VWAP) of the roll prior to expiry versus the fair value of the roll, for the 8 days preceding the expiry of the font future contracts. (Courtesy of Société Générale Canada's database).

FIGURE 5
VWAP deviation from fair value of roll during the roll period (in index points)



Source: Société Générale Canada

The roll starts trading about 0.20 index points cheap to the fair value. Then, in most cases price action has been stable through the roll period. This structural cheapness, can in part be explained by the fact that some investors see an advantage in holding the basket of stocks and selling futures due to some dividend and tax considerations.

Yet, December 2017 and December 2018 were each marked by a strong deviation from fair value in the last few days of the roll, trading quite rich in December 2017 and quite cheap in December 2018 as we approached expiry. We can put forward several explanations. First, investors might have waited till the last days before acting on the roll and in each case the prices start moving in a direction that did not favor them. They tried to catch up and thus

helped accelerate the trend. Their behavior, compounded by a general lack of liquidity near year end, as many investors are away, could have further exacerbated the move. Second, in December and through the year end, the balance sheet of many broker-dealers is already "full" (i.e. no capital can be deployed) reducing their ability and desire to arbitrage any potential inefficiencies in the market. Without these major players stepping into the market, the roll price was "free" to deviate from fair value. The fact that in December 2017 the roll traded rich to the fair value might also explain why some investors let their positions expire (nearly half the futures were not rolled which is noticeably above the 32% average), as we saw in figure 3.

Conclusion

As we enter the Mar19/June19 roll period, the open interest in the SXF March 2019 contracts stands at 311,000, the highest at a similar time than any roll in the recent past. The fact that the trading hours were extended to 2 am EST for SXF recently has probably contributed to the increase in open interest. It is also the first roll period where the spread contract will be trading at 2 am and it will be worthwhile and quite interesting to monitor what type of activity is present in early session as far as volume and the price behavior of the roll are concerned.

From a practical perspective our review of recent rolls, points to the following:

- The roll is likely to start being active on and after March 7th.
- The roll is likely to start trading slightly cheap to fair value - historically 0.20 index point on average - and long holders should contemplate rolling at least part of their holding early given that asymmetry.
- It is important to monitor the change of open interest in relation to roll price to detect potential clues on general positioning of market participants.
- It is important to keep in mind that any noticeable deviation from fair value is likely to further increase as we approach the expiry of the front contract.
- Those who have a strong view on potential changes in the discourse and the bias of the BoC on March 6th, which would affect interest rates expectation, should consider rolling at least part of their positions in light of their view, if they find some liquidity before March 6th. That would consist of buying the roll if they think the BoC will be quite hawkish and the selling of the roll if they expect a surprisingly dovish BoC.

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In addition to niche derivatives strategies, LFC also provides risk-management, hedging and overlay advisory services to family offices, institutional investor and businesses.

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