

By contrast, there are elements of the equity markets which have very considerable liquidity. Indices, such as the S&P500 Index, are generally very liquid, and for all intensive purpose beyond the type of “monopolisation” that is possible with individual equities. Here, valuation models and rebalance strategies have a much better, even excellent, chance to perform within reasonable bounds. However, these (liquid) segments of the equity markets have their own idiosyncrasies impacting options trading directly. One of the most noticeable characteristics of index/basket based equity products (which includes ETFs’, “Sector” products such “utilities”, “transports”, etc) is that fund and institutional managers have very specific “risk management” strategies that collectively create “saw tooth” price dynamics and “vol skews” as discussed in the next Section. These effects include various activities, such “asset allocation into bonds” or variations on hedging strategies that fall in to the “programmed trading” category. All of this can result with “asymmetric sudden” price declines (i.e. saw tooth). This has important ramifications for options trading, since it means that on those “sudden” days Delta and other rebalancing strategies will be difficult/costly. Notice, that the difficulty will exist even when there is good liquidity, since the rapidly moving markets will mean large “hedge slippage”, particularly for short options positions since you will not be able trade fast enough to keep up with the market movements.

14.5.4 Market Dynamics and Instrument/Forward Proxies – Some Heuristics

This Section provides some comments/reviews of various market dynamical and usage issues arising in equity options trading. This is by no means an exhaustive list, with additional considerations later in this Book, and with detailed considerations in [5.a] and [8.a].

One way to consider market issues is to consider them as two categories: Drift/Forward price related, and volatility/uncertainty related. Of course, these cannot be separated completely as demonstrated by the appearance of the “Ito term” in the drift. The use of “drift-side machinery”, such as mean-reversion to control the “uncertainty envelop”, and the Heath-Jarrow-Morton result, show that drift is just the term-structure of volatility. Nevertheless, some useful results follow from this “splitting” of perspectives.

14.5.4.1 Market Drift vs. BSM Drift: The Pay-Out is on Forward Price

One of the key points emphasised throughout the TG2 Series is the observation that options pay-out wrt the actual forward price on the exercise date. This point is worth repeating from time-to-time as it is easy to become submerged only in volatility, distribution, etc aspects of options trading as the determinant of your P&L.



Figure 14.5 – 1 Two different market dynamics in the S&P500: a) Channelling, with declining (relative) volatility, and b) Increasing (relative) volatility with large reversal. The red circles show “saw-tooth” examples, and the aqua lines show increasing absolute volatility during an up-trend, while the purple lines show also an increasing volatility regime, but now during a (big) down-trend.

The “With Div” and “W/O Div” examples above demonstrate this point. Short-dated options under low volatility circumstances will have increasing “vol dominance”. Long-dated options during periods of relative calm will be increasingly “drift dominated”. Obviously, considerations of this sort will be heavily impacted by non-stationary circumstances such as the difference between the two equity market periods as in Figure 14.5 – 1 a) and b). One period (a) illustrates 10-years of S&P500 with relatively little and steady (absolute) volatility (red lines), but dominated by drift. By contrast, “singular” event such as “9/11” or the “crash of 2008” are volatility dominated, and with increasing absolute volatility as illustrated in b).

The trickiest situations may be those with extreme non-stationarity. For example, suppose you had a 10-year call option on the S&P500 as part of a long-term outlook on a bull market based on an expectation of “channelling”. Then, something like “9/11” hits a week before expiration, which is the antithesis of channelling as illustrated by the increasing divergence of the aqua lines in Figure 14.5 – 1 b). Volatility is highly non-stationary here, and so (being long vol in this example) the position would be expected to profit considerably from the non-stationarity, and which BSM does not account for (and vice versa for the counterparty short the option).

This example is a little contrived since that 10-year option would have been (likely) “Delta 1” (i.e. so deep ITM that it is synthetically the pure underlying) long before 1-week to expiration, and likely some rebalancing would have taken place earlier (e.g. locking in profits etc.). Then, the impact of non-stationarity is reduced.

This point should also emphasise the critical importance of the rebalance strategy, to be revisited in Chapter 22, and in [5.a] and [8.a].