

20.7 “Trading” Volatility

“Trading volatility”⁵⁹⁸ is the price fluctuations on which trades are actually transacted. One might imagine that all of the previous volatilities in this Chapter would be a sufficient representation of this. Alas, it’s just not so.

Aside: The expression “trading volatility” is closely related to “P&L volatility”, though in this Series of books, trading volatility tends to be use in the context of a “single structure” (e.g. a single option or small collection of instrument acting as a single mini-position). The expression “realised volatility” is also closely related to “trading volatility”.

The manner in which specific moment to moment, day to day fluctuations occur affects trade ideas, hedging/rebalancing, and of course it is the actual value on which mark-to-markets and P&L/regulatory reporting are based on. The “summary” measures of volatility, as introduced above, are just that “summary measures”. Moreover, the vast majority of those measures are, at best, on valid “on-average”.

With the exception of “buy and hold” (options) strategies, the “reality of real world trading” is that your welfare is directly related to sum total of all of the individual steps/trades over a holding period. These steps are directly related to the actual market fluctuations that actually occurred, and not some “summary measure”.

Aside: In particular, the dominant perspective taken in these books (as they are intended for professional traders) is the issue of “rebalance volatility”. In a fundamental sense, there is the need to address the continuous rebalance assumption in the BSM. However, it is more than that. In practice, the rebalance frequency is not dominated by time as such, but rather by position value/risk measures. For example, some traders rebalance whenever there is a 1 standard deviation move in the underlying.

As a consequence, it is almost never the case that traders rebalance everyday (i.e. in some homogenous time step increment manner), nor that they rebalance on closing prices, which is the usual implied assumption with historical volatility.

⁵⁹⁸Please note the terminology, a quoted implied volatility may be something you can trade on, but this is not the same as volatility of the underlying price fluctuation on which you must trade to rebalance over the course of holding period or strategy.

An alternate equivalent perspective on trading volatility might be “what vol should I have used in my options pricing so that my (risk-adjusted) P&L would have worked out “correctly” (whatever correctly is for your mandate)?

Consider the four market scenarios in Figure 20.7 – 1. Each of these scenarios has the same “measured” or “summary volatility”. That is, it is entirely possible to have dramatically different “looking” time series, but each with the same (statistical) variance or volatility. This is a bit like the difference between a zero-coupon curve and IRR. The IRR is a convenient “summary measure”, but it is possible to have two very different looking (zero coupon) yield curves resulting with the same IRR.

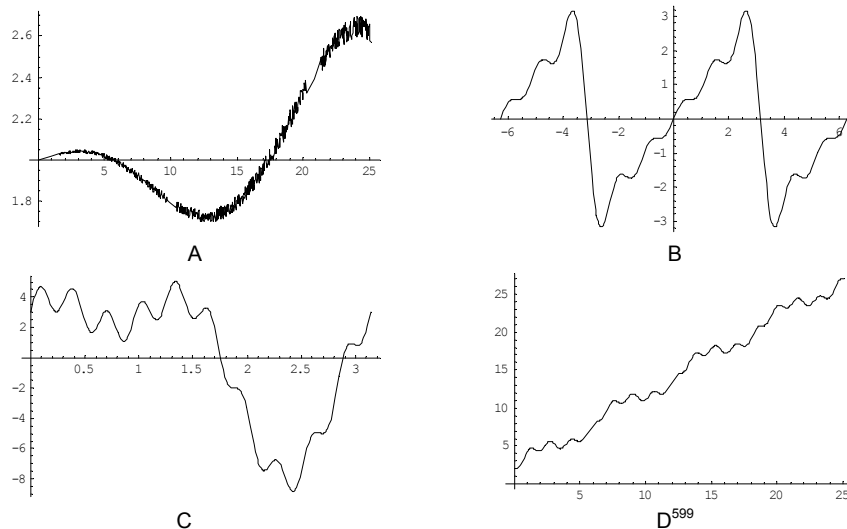


Figure 20.7 – 1. Four (fundamentally) different market conditions each can be constructed to have the same historical volatility.

Now ask yourself, if you were short volatility (i.e. you had sold options) and your mandate required you to manage your position within specific Delta limits, then would you care which of the market condition in Figure 20.7 – 1 you had to face? If the answer is yes, then it must be agreed that the summary measures are incomplete or inadequate from a “trading volatility” perspective.

It is easy to demonstrate that you would definitely prefer different market scenarios for different types of positions. Time series D or A in Figure 20.7 – 1 are much “friendlier” environments for a short volatility (i.e. short Gamma) position than, say, time series B. Rebalancing in smooth, primarily trending, markets is infrequent, easy, and without too much slippage, all while the short Gamma means you are taking in Theta. However, the same position under B would be “a bit of mare” since you would have to rebalance often, your rebalances would be always locking-in large losses “after the fact”, and slippage would be tremendous.

⁵⁹⁹ This is a slightly “naughty” example of market condition, since de-trending the series would show a dramatically different statistical volatility, but the point should be clear nonetheless.