



TRANSACTION COST ANALYSIS FOR DERIVATIVES

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Introduction to the SpiderRock TCA concept

In an environment of increased regulatory scrutiny and fierce competition, Transaction Cost Analysis (TCA) is increasingly important to help firms measure how effectively portfolio orders are being executed. In the derivative space, the TCA concept is fairly new. Due to the nature of a derivative, which is tied to an underlying asset, simple equity style arrival time TCA metrics are not appropriate and often give spurious answers. At SpiderRock, we believe that measuring TCA for derivatives is about more than simply the price improvement at time of execution. This method speaks to improvement but is silent on what you really pay the market. We believe a better approach is to turn the question around estimate what your counterparty(s) are likely making (or losing) when they trade with you. We believe this approach gives a more accurate picture of what you are truly paying (or collecting) from your market interaction and is a more appropriate metric for evaluation true execution performance.

SpiderRock TCA metrics are based on a simple model: Your counter-party will act like a market maker and will hedge their side of all trades in the underlying market(s) immediately and will then look to get out of their risk exposure a short time after trading with you. We assume, in this context, that your counter-party can execute underlying market hedge trades at exactly mid-market at any size. We also assume that they can get out of the trade they executed with you at mid-market in the derivatives market 10 minutes after they traded with you, all without paying any transaction fees. Given these basic assumptions, we can precisely measure what your counter-party made (or lost) trading with you and, conversely, what you made or lost trading with them. We believe this approach gives a better indication of what your true cost of accessing market liquidity than any of the available alternatives.

What does TCA mean for Derivatives?

In the context of trading derivatives, TCA can be tricky as trading a derivative depends on the volatility of the underlying asset and the notion that the underlying asset price moves faster than the derivative price itself. Timing the execution of a derivative relative to the move of its underlying asset is key. This is why we measure execution performance on a “10-minute forward delta neutral P&L” metric, as opposed to looking at the price improvement at time of execution. When trading options, how much do you pay the market to trade is the same to ask how much do you pay the market makers to cross bid/ask prices. The answer is half the spread between bid/ask prices. The trick to reducing this half spread cost is to time the crossing of the bid/ask prices so that it corresponds to a contraction of the spread from its average width. In this dynamic, comparing your fill price to the mid-market mark 10 minutes after execution when prices revert to a normal state, often translates into a mid-market or close-to-mid-market fill. Without micro-market dynamic measurement technics, a market participant would most likely cross the market blindly and pay half the spread to the market makers. With precise micro-market dynamic measurement technics, the market

participant can take advantage of the mean reverting characteristic of the derivative market and optimize the timing of crossing the market so that the trade would have a high likelihood of being at the mid-market mark or better a few minutes after it was executed.

The SpiderRock model really mimics how market makers behave and help market participants reducing their transaction costs. When market makers trade against a customer order, they hedge immediately with stock. The SpiderRock model assumes the market maker gets out of both the option and stock positions 10 minutes later at mid-market, thus realizing a profit on the option trade.

In the listed equity option market, exchange fees are typically plus or minus \$0.25 to \$0.50 per contract but the total access cost when crossing blindly can easily be \$3.00 or more per contract when factoring in market makers' likely profitability. Technics to reduce this cost are becoming more and more relevant in the derivative space and involve a high level of expertise in both market structure and technologies applied to trading derivatives.

What is the likely cost of Execution...PRE-CA?

SpiderRock is modeling the likely profitability of the market maker on a per trade basis, by archiving every print in the marketplace, identifying whether it went up on the bid or offer with precision, and making assumptions on a variety of criteria such as high/low delta, volatility, volume, stock price, penny/non-penny stock and many more variables to characterize the trade. In essence the PRE-CA model represents a performance benchmark across all listed options; what a customer pays the market is the reversed image of the market maker profitability.

How can I bit the benchmark?

As we mentioned above, precise micro-market dynamic measurement technics allows the market participant to take advantage of the mean reverting characteristic of the derivative market. At SpiderRock we believe quality of execution is an inherent part of the transaction cost. We have engineered algorithmic execution strategies to outperform the pre-CA benchmarks and give our clients the flexibility to be more or less aggressive on fill rates. Some of the SpiderRock Algorithms are calibrated on this 10-minute forward delta neutral P&L, and are being triggered only when user limits are not violated and the probability of this P&L metric being positive reaches a certain threshold. More specifically, the SpiderRock Algo engines continually

score every tick of the market for an opportunity of positive 10-minute delta neutral P&L metric. Our α Algos TAKER are designed to trigger an order to cross the market when such opportunity has a high enough probability scoring. In addition, the client can couple dynamic posting strategies (α Algos MAKER), which can enhance fill quality and mitigate exchange fees by capturing maker rebates.

Lastly, an important aspect of optimizing trading strategies is monitoring P&L in real time calculations throughout the execution process. By enabling the execution P&L of a strategy to be monitored in real-time, and also allowing the strategy to use these calculations to adjust its own behavior, trading profits can be maximized while risks are minimized. The SpiderRock platform is an integrated system, which computes these real time P&L calculations, and helps the client optimize trading strategies.