

A strategic view of execution

Having taken an up-close look of execution on the micro level, Jan Jonsson, vice-president of product management at Neonet, zooms out to consider the macro perspective.

Execution objectives have to be selected depending of the size of the investment and the available liquidity. These objectives serve as input at the macro level of execution and typically involve dividing a large investment decision into smaller, more manageable parts. Each smaller part is then transmitted to the micro level of execution, which involves access to markets and smart order routing.

The cost of trading

There are explicit costs of trading, such as crossing spreads, commissions, taxes and fees. There are also implicit costs in the form of market impacts and market movements that are trickier and demand special attention. Key factors include:

- **Market impact** – the extent to which the buying or selling moves the price

away from the buyer or seller. A financial institution that is seeking to manage its market impact needs to limit the pace of its activity.

- **Market movement** – the risk (in time) that the market will move in an unfavourable direction. This risk increases with the time spent executing an order.
- **The trade-off** – During execution, there are many potential events in addition to our own actions that could affect our execution. If we, pre-trade, have an opinion or feeling about where the market is heading, we may choose to trade with a short time horizon and can thereby cause market impact. If we believe that the market will move in a favourable direction we may simply wait and not trade at all.

Most of us don't have access to this short-term market information and are simply seeking to trade in and out of position in a neutral and balanced manner. Avoiding market impact becomes a key factor. Studies show that the optimal participation rate is somewhere between 2% and 15% (depending on factors like instrument liquidity, size of order and volatility).

Executing with a too high participation rate may lead to market impact. As Figure 2 shows, too low rate takes an unnecessarily long time, causing market movement risk (i.e. loss of alpha). The trade-off between market impact and market risk (time) is an important decision point for managing the investment. This decision is the input for the macro level of execution.

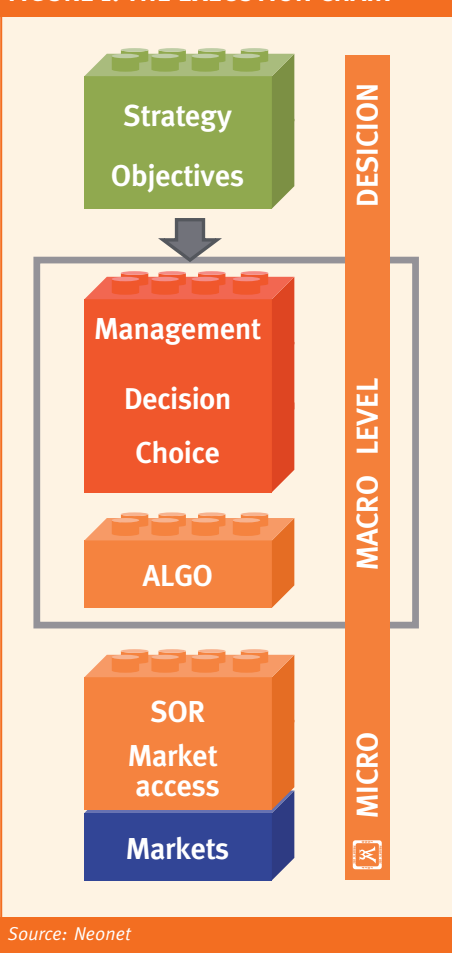
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Benchmarking

There are several common benchmarks, but each have their problems:

- **Implementation shortfall (IS)** – the difference between the arrival price and the final execution price (price including commissions, taxes, etc.). Also known as ‘slippage’. The drawback is that it includes the effects of all other participants’ actions and all other significant events occurring in the market during our execution (noise).
- **Market impact** – How much did our execution move the price? Market impact is difficult to benchmark and there is no de facto standard, although there are some actions that should be avoided:
 - Executing at a too high participation rate
 - Placing a relatively large order that is totally visible in the order book
 - Constantly reposting orders in patterns that is easy to detect and sends signals
 - Buying several levels at one time
 - Entering relatively large orders in a dark pool, with no minimum accepted quantity (allowing gaming).

FIGURE 1: THE EXECUTION CHAIN

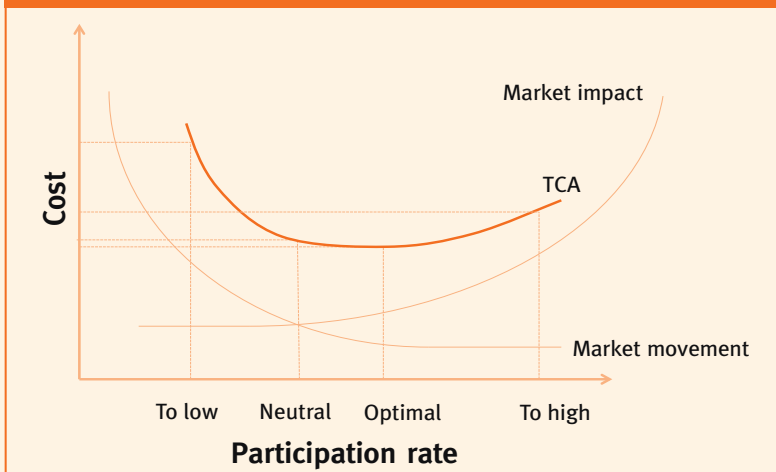


Source: Neonet

- **VWAP** – The volume weighted average price during the time of execution. The final execution price is compared to the market volume weighted average price for the duration of the order. Drawback is that it is relatively easy to game, meaning that market impact should be monitored at the same time.
- **Pre-trade estimate** – Through theoretical models it is possible to calculate an estimate of the final execution price, which is then compared to the execution price. This is associated with the same drawback as implementation shortfall, since there are many unpredictable factors that can affect the result. Some benchmarks such as VWAP and spread capture are more focused on measuring the execution when we have no pre-trade view of where the market is heading. For others, such as implementation shortfall, the trick is to separate our execution from the market noise. One solution is to analyse huge numbers of orders over a long period of time using advanced cause and effect models.
- **Spread capture** – The ratio of passive and aggressive fills. Passive execution captures one spread. Aggressive execution crosses the spread – with no capture. A high spread capture indicates good venue selection.

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FIGURE 2: PARTICIPATION RATE VERSUS COST



Source: Neonet

“With implementation shortfall, the trick is to separate our execution from the market noise.”

Algorithms

Generally, all algorithms have built-in anti-pattern recognition functionality, for example randomising order size and the time between orders to avoid sending signals that might cause market impact. The choice of algorithm is closely linked to the choice of benchmark. TWAP, VWAP and Participate are all very similar, they are just different ways of entering and following a volume distribution that is either assumed to be linear, following a historical pattern, or trying to follow current market conditions.

- **TWAP (time-weighted average price)** – Splits a large order into smaller equal-sized parts or slices that are spread over the selected time duration.
- **VWAP** – Follows the market’s normal volume distribution based on historical data.
- **Participate** – Executes at a set participation rate, for example 15% of the market.
- **IS** – In simple terms, this removes the balancing of market impact and market risk from the customer/broker and leaves the choice to the IS algorithm.

- **Dark** – By executing an order using so-called dark pools, the user can enjoy a minimum of pre-trade information leakage and minimized market impact. Dark is commonly used by other algorithms which have volumes that are not active in the lit-market.

Best execution

Everything done at the macro level is dependent on how well the micro level performs the actual trading. Both layers have to be well tuned, tightly integrated and benchmarked to achieve a good overall result in line with your intentions. All machine-handled algorithms add some kind of rules and pattern to the trading that can potentially be detected (there are patterns even in chaos). Making frequent changes in settings is one part of the trimming process, but is also part of an anti-gaming strategy.

At Neonet, we strive to deliver a truly transparent and independent execution service with an optimised balance of quality and cost. ■

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