

F Defining algos in futures markets

At its simplest, the term algorithm is used to describe a set of rules for solving a problem in a finite number of steps. Algorithms affect every aspect of our lives, from deciding which elevator arrives first to forecasting the weather. Yet, in financial markets, the term 'algo' rapidly takes on more sinister connotations; it conjures up highly emotive and sometimes negative images of black boxes spiralling out of control and unscrupulous (even illegal) trading behavior. The truth is, however, that most algorithms in financial markets provide the same benefits in terms of efficiency and predictability that they bring to our everyday lives.

The idea of using algos in finance first emerged in cash equities, but the changes sweeping through derivatives markets have ignited demand for more intelligent access to futures and options too. Here we unravel some of the algo myths and highlight what derivatives market practitioners can learn and improve upon from experiences elsewhere.



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Confusing method with intention

Perhaps the biggest mistake made when considering algos is to confuse the method with the intention. If firms or individuals deliberately set out to abuse markets, then the frequency or speed with which they do so is irrelevant. They are breaking the law and should be punished accordingly. A more sanguine look at algos reveals that there are essentially three categories. The first and most benign are those algos that aim to achieve a certain benchmark, such as volume-weighted average price (VWAP) or time-weighted average price (TWAP), with minimum market impact. Next come those that aim to optimize traders' workflow and automate reaction to market events, taking advantage of faster reaction times and better discipline that are provided by pre-defined logic in the algo. For example, triggering orders at specific times around specific market thresholds, or working orders over a specific time period such as the market open and close. The third, and perhaps most contentious, are those that aim to capture alpha explicitly, either through the algo

itself or by virtue of the speed or frequency at which it operates. This last category has been the subject of considerable public and political scrutiny, in the US particularly. Again, however, the mistake that is often made is to confuse fairness with transparency. Financial markets, like many aspects of life, are not and never have been fair. Trading has always been about speed. This dates right back to the days when the Rothschild banking dynasty made its first fortune in London by using carrier pigeons instead of riders on horseback to learn the outcome of the Battle of Waterloo a full day ahead of official bulletins.

Transparency, not fairness, is really the key issue here so that regulators, other market practitioners and the public at large can see what is going on. They can then decide if, how, and when they wish to participate.

Algos for derivatives

Although derivatives contracts are more complicated in concept and trading style than cash equities, their

non-fungibility simplifies execution logic significantly. The same liquidity cannot be dispersed across multiple lit and dark sources and so the need to look intelligently across different markets, or hit specific benchmarks, has never existed to anything like the same extent. This is all changing, however, as regulations such as Dodd-Frank converge the OTC and exchange-traded derivatives markets so that a broader range of economically equivalent – but still not necessarily fungible – contracts are available to choose from in any given situation. On top of this, the formal concept of ‘best execution’ is being extended by regulators to cover derivatives both in terms of implicit cost (slippage) and, potentially, the explicit costs of favoring one venue or clearing house over another.

The net effect of all these changes is that complexity in derivatives market structure is rapidly going up and so algos are becoming a crucial part of both buy-side and sell-side armories. Just as they have in equity markets, algos look set to become a key competitive differentiator.

Cash equities – an obvious starting point?

When developing algos for derivatives it may seem like a natural starting point to simply lift out and repurpose what has worked for equities. Experience shows that this approach is likely to come unstuck fairly quickly. One reason for this is that derivatives actually reflect a broad range of underlying asset classes, from fixed income through to FX and even physical commodities such as grain or oil. Each of these, in turn, has different trading characteristics and so the ‘one size fits all’ approach that works for cash equities will inevitably be flawed. Another reason is that linking individual contracts together into multi-legged strategies is a far more common practice in derivatives than it is in cash equities trading. Finally, derivatives markets operate on a 24-hour basis and the contracts themselves extend out over time and so do not have the immediate closure associated with buying or selling a simple stock within normal exchange hours.

Expanding variety and choice

In the face of these challenges, the more enlightened Futures Commission Merchants (FCMs) and their buy-side clients are deploying a wide variety of algorithms that have been developed from the ground up. Demand is generating an expanding array of choices and most of these algorithms can be clearly differentiated from those designed to support high-frequency trading and other more controversial trading strategies.

Derivatives market participants are also extending this beyond the most simple type one algos that were based upon VWAP and TWAP benchmark strategies. One such theme is to mask order types so that trading intention and potential information leakage is minimized. These algos are preferable to using standard exchange iceberg order types as they offer much greater levels of sophistication, control and discretion. Other popular models include automation algorithms that remove the need to manually monitor the market, along with those designed to track and hit newer and more relevant performance benchmarks, such as a static price, or even dynamically updated goals.

Many firms also use algos to manage the relationships between orders, including complex order chain building; so when a certain condition occurs, the algorithm triggers a pre-defined response. Perhaps among the most complicated are those algos that eliminate errors associated with trading multiple products across multiple regions. These can make sure that a firm places its order at the right time – or ensure it is not placing the wrong order type on the wrong market and then having the exchange reject it.

The demand for these types of algos has and will continue to increase as volatility returns to the markets and electronic trading volumes rise. As the market becomes more complex, it is nearly impossible for humans to fulfill all of these requirements manually. That’s not to say there aren’t clear challenges along the way.

The science of compliance

There is growing acceptance of the role algorithms can play in reducing errors and increasing efficiency across the markets. Less widely understood, though, is the need to make them compliant and meet the multitude of regulatory requirements and standards being imposed on the industry. The key issues here are transparency, accountability and the prevention of rogue or runaway behavior.

As regulators have come to understand just how prolific algorithmic trading is becoming, they have naturally sought to protect markets from abusive and potentially damaging practices. This has taken a number of directions, including the introduction of circuit breakers at exchanges and placing formal obligations on market participants to document and test their code better. Regulators are also insisting that participants maintain complete histories of algorithmic behavior so that detailed forensic analysis can take place in the event of a problem.

In Europe this even includes subjecting all algorithms to independent scrutiny from “competent authorities”. Some jurisdictions are going even further by requiring participants to identify or tag their algo flow so that it can be more easily identified as it works its way through different pools of liquidity.

The obvious aim of all this is to raise the bar in terms of best practice for the development and deployment of algorithms. This is a sensible objective, especially in light of a number of high profile algo failures, but some of these regulations have arguably gone too far and are placing unnecessary cost and burden on practitioners.

Nevertheless, the rules are here to stay and will only get tougher. This means that firms need to find ways that industrialize their algorithms and in such a way that their deployment and control can be automated and centralized. Algo ‘frameworks’ are now emerging that meet all the necessary regulatory best practice requirements but don’t impinge on creativity when it comes to algo creation.

For those firms that operate on an international basis, such frameworks have become a business necessity. The framework approach divorces the heavy lifting of differing regional compliance obligations from the actual algorithm itself. Only by achieving this are these firms able to offer globally consistent trading outcomes, maintain client confidence and stay on the right side of the law. It also means that new algorithms can be developed safely and deployed much more quickly. Given how high the stakes are, this is important. When multiplied over tens of thousands of transactions a day, saving just fractions of a tick per transaction soon adds up and creates significantly better client outcomes. So, those firms that can innovate more quickly in developing and modifying their algos are likely to emerge the winners.

Algos in the trading workflow

In isolation, algo frameworks are not the complete answer, as equity markets learned the hard way. When multimarket trading was introduced in the US, and later in Europe, a number of firms developed algo solutions that were separate from their central workflow and order management system (OMS). Horror stories abounded of algos misfiring through the execution layer and, worse still, these problems were sometimes not discovered until it was too late. In some cases the consequences were nothing short of catastrophic and so, with today’s level of regulatory scrutiny, firms would be wise to take heed of this lesson.

Such integration is important not just because that in-flight visibility and control over algos is vital, but because this needs to happen in the same place and at the same time as all the other trading decisions are made, executed and monitored. Otherwise early warning systems are duplicated, client expectations are poorly managed and often unseen risks start to pile up.

You cannot manage what you cannot measure

Just as we have seen in cash equity markets, the rise in algo trading has spawned a similar growth in analytics. It's essential to be able to prove to yourself, to your client and to the regulator that your algo did what it was supposed to do. As the regulatory concept of best execution tightens its grip on derivatives, algos without appropriate analytics will fast become redundant.

The question is, where should this analysis take place and by whom? For the buy-side this presents a particular problem. When trying to choose between different brokers, all armed with impressive-sounding algos, how can they make the right choice? This is especially hard as each broker is effectively marking their own homework and often will use different metrics to calculate their success. If the buy-side is going to take derivatives algos seriously then, it will need to ensure that it has the right tools for the job.

Derivative algos are here to stay

Markets will only ever get more intertwined and asset classes will continue to converge. Derivatives markets are at an exciting inflexion point as structural changes will mean that the complexity of accessing liquidity will soon outstrip the human processing capacity of even the savviest traders. Algorithmic trading, therefore, is becoming an essential part of accessing liquidity but this needs to be done responsibly, measurably and in line with increased regulatory oversight. Those firms that can utilize algorithmic frameworks that are embedded within their order management systems will be able to achieve this and, at the same time, create sustainable competitive advantage for themselves.