Tactical FX trading algorithms: maximising alpha and minimising footprint

By Nicholas Pratt

The FX market is very different from the equities market but there have been many similarities in the way that trading technology has developed in both asset classes. However, as Nicholas Pratt discovers, it remains to be seen if the use of tactical algorithms will translate over from equities to FX. For example, how will tactical trading algorithms be deployed to intelligently navigate difficult and less liquid market conditions while retaining low latency? What kind of tactical algorithms will prove most popular with all of the different types of FX trading firms? And just how much can the FX market learn from equities and other asset classes in terms of using tactical algorithms?

Algorithmic trading is well established in the FX market but is still some way behind the equities market in many regards, especially in the use of the more sophisticated and advanced tactical algorithms. Such algorithms have evolved in the equities market as an alternative to the more simplistic schedule-based algorithms, such as volume-weighted average price (VWAP) and have enabled more opportunistic traders with very specific trading strategies to take greater advantage of market inefficiencies or anomalies and to generate alpha.

Bloomberg Tradebook has extensive experience in developing tactical algorithms from as far back as 1998 when it created a series of trading algorithms for use on the US equities market. "We came out with algorithms like trigger trading, pegging and discretionary trading," says Gary Stone, Bloomberg Tradebook's Chief Strategy Officer. "This was the first time that these tactical features were applied to trading algorithms. We then brought a lot of these features over to the FX market along with a number of FX-specific trading algorithms to help those traders that are looking to maximise alpha."

At Bloomberg Tradebook, schedule and tactical algorithms are often used in conjunction, says Stone. The schedule-based algorithm will set out the trading parameters and then different tactical sub-algorithms will be employed to that schedule algorithm in order to get the best possible execution within the defined time-frame. "For example, a scheduled algorithm may go through a passive phase and rely on a pegging algorithm, which is a tactical algorithm but a passive one. So that is how we combine the two – one algorithm to decide how best to split the order up, and another to define how we engage the market."

Tactical trading algorithms

The philosophy behind a tactical trading algorithm is that there are certain market situations where the trader needs capability beyond the schedule to achieve the execution goals of the fund or end investor, says Stone, and this need has driven the development of these tactical algorithms. "We think there is a symbiotic relationship between scheduled and tactical algorithms. Every scheduled algo has to engage the marketplace but that order has to be as smart as possible in that engagement. This intelligence can come from a variety of sources – a smart order router, smart quoting and distribution or a smart algorithm that makes its own decisions – such as a smart peg algo, a trailing stop algorithm or a reverse scale-back algo."

All of these tactical algorithms address certain market situations or trading objectives, as opposed to a benchmark-based algorithm such as volume weighted average price (VWAP). For example, a trader may opt for a passive peg so they are not tied to a benchmark and can have the marketplace act on him. The next level of tactical algorithms involves a trailing stop where a trader will have bought his position but wants to let the marketplace decide when to exit. "I follow the marketplace up and every time it gets to a certain point, I move the stop up so that when the marketplace comes back down it will trigger an algorithm to start to exit the position. This is effectively maximising the alpha because the trader is not arbitrarily picking the point at which to exit the marketplace but relying on the marketplace to let them know when it has finished moving up or down."

Tailored for FX

As is the case with most trading algorithms, their origins lie in the equities market but there are also some tactical algorithms that are tailored specifically for the FX market and illiquid market conditions. "All of the previously mentioned algorithms, reverse scale-backs, pegs and trailing stops will be customised

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to reflect the idiosyncrasies even though the original trading strategy idea for the algorithm came from another asset class. The Average price algorithm, however, is specifically designed for the FX market. It is a stop limit order that will state an average price for an order and will take any order that it can find as long as the average price does not violate the limit. Most algorithms will work on a hard limit rather than an average. It is about getting the algos to look at the bigger picture rather than taking each order in isolation. It is about replicating the intention of a trader. There are some many orders in the FX market and when the book is marked to market it is marked on average price rather than each individual execution."

As idiosyncratic as the FX market and its participants may be, Stone says it is possible to see correlations in certain traders and the algorithms they prefer to use. "We are seeing the basic corporates and money managers starting to use algorithms and they feel comfortable with the average price algorithms or a passive pegging algorithm if they need to work an order off. They are essentially asking for a price on their block orders and are now experimenting with algorithms to do that. But when you get onto the hedge funds and proprietary traders then you are looking more at the tactical algorithms because they are used to working an order and taking control of the marketplace. As the marketplace matures we will see more money managers and corporations moving in that direction but right now it is the hedge funds and proprietary traders at regional banks that are driving the use of tactical algorithms."

As the algorithmic market has developed so far, particularly on the tactical and opportunistic side, it has carried with it an air of aggressive competition typified by many of the arbitrage-based strategies employed by hedge funds and proprietary traders. But, says Stone, Bloomberg's intention is to develop algorithms that will be positive for both the buy and sell-side.

Schedule-based versus alpha-seeking algos

There is a distinction between alpha seeking algorithms, where the users are looking to make a profit in the market, and order management algorithms, where the aim is to make execution more efficient through automation, says Timothy James, a customer engineering manager at Thomson Reuters who oversees the team responsible for algorithm development, deployment, product customisation, code optimisation and other consulting needs. "There is quite a difference between them. The clients using the tactical algorithms will be using models and will have some predictive capability. Even today there is still money to be made even from simple arbitrage algorithms. But we are seeing more and more FX traders using the order management algorithms to minimise their market impact and achieve better executions."

Tactical algorithms can be a tough value proposition for those traders that do not have a specific model or trading strategy already in mind, says James. "It is a bit harder to sell tactical algorithm software that can execute orders through a programmed API but requires the customer to put together all the intelligence. We have an aggregation product that uses a lot more interactive models and order management, execution-based algorithms that's a lot easier to sell. There's a more obvious value proposition. So the two types of algorithms are still very distinct – the schedule-based algos are more about adjusting to the market while the alpha seeking, tactical algorithms are all about taking profit out of the market. There are different perspectives involved and different levels of intelligence," says James.

Despite the clear distinction, James says he is starting to see some traders combining elements of both schedule-based and tactical algorithms, although this

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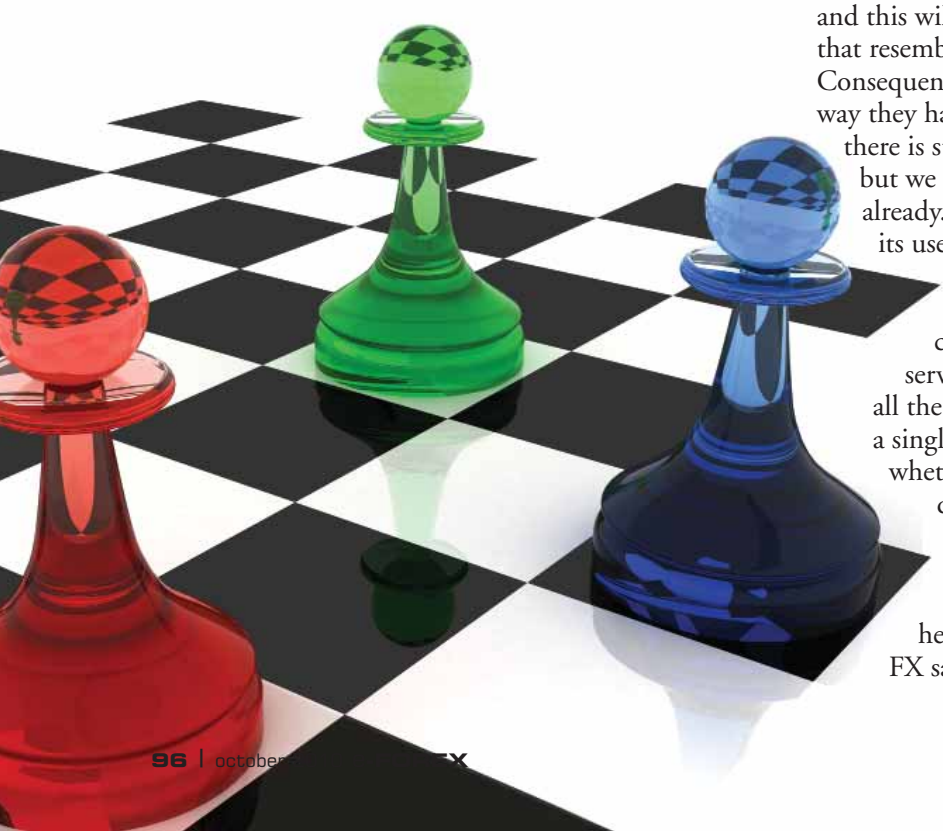
tends to involve an alpha-seeking algo user adding some elements of order management in order to minimise their market impact or achieve better prices on their large orders. What is less common is the user of an order management or execution-based algo adding some tactical elements.

There is a level of sophistication that goes into the creation of a tactical algorithm, says James. "With a schedule-based algorithm, the provider can tell a trader what it does and it can be used almost immediately; but with a tactical algorithm, no-one can give you a user guide or an instruction manual telling you exactly what to do. Tactical algorithms are less straight-forward and there is a lot of data analysis and back-testing involved."

Trading goals

The decision to deploy either tactical or schedule-based algorithms is mostly down to a firm's trading goals, says James. "For example some of our clients are concerned about latency and for some it is not the highest priority. Of course, all things being equal, everybody wants speed. We can connect to banks, ECNs, and other sources of aggregated data. For those traders that are not overly concerned about latency, connecting to aggregated data providers can be of great benefit. But this type of aggregation creates an extra hop so those traders that are concerned about latency, such as those executing reserve strategies and other market-response strategies, may want to connect directly to the banks to get better results."



Many of the traders that choose to use tactical algorithms will have a clear idea of what exactly they want to achieve and how the algorithms can help but this is not to say there is no role to be played by the algo providers. James offers three words of advice to any tactical algorithm user – testing, testing and testing. "We have an experienced team that can give advice on implementation and making the algos perform better but the testing process is massively important. It helps if you have proven to yourself that the algorithm will work before it goes live. There is some formulaic checking that can be done and there is also some simulation that can be done in Excel. Once you have the basic algo properly implemented, you can feed it data directly through an API, and see how it responds. Then you can connect it to a simulated market and make further tests. And then once it is active in the market, you can run further tests for verification purposes and to ensure that it continues to run as planned. If you are going to fail, then you want to fail in the simulation stage because it is much cheaper than failing in the real market. And a lot of the time the problem is a really minor one, such as a symbol in the wrong place."

New areas of development

So what will be the next area of development in the FX algorithmic world? In James' view the advancements in aggregation and liquidity management could well have a fundamental affect on the FX market sand the use of algorithms. "Sooner or later someone will offer the ability to connect to multiple sources of liquidity in a low latency way and this will make the FX market evolve in a way that resembles the futures and equities markets. Consequently FX algorithms may develop in the same way they have in those other markets. "Right now there is still a lot of human trading involved in FX but we are seeing some of the changes happening already. The market is becoming more efficient in its use of information and there is a lot more in the way of aggregation which provides a lot of benefits to traders. It almost creates a single exchange within a trader's server and I think within ten years perhaps, all the advancements in aggregation will create a single virtual exchange for the FX market – whether that exchange is centralised at a single destination or centralised on each trader's server."

Jonathan Wykes, director and European head of Advanced Execution Services (AES) FX sales at Credit Suisse, says that he refers to

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'opportunistic' rather than 'tactical' algorithms. "The idea is that they are seeking out opportunities in the market and actually acting like a trader. If they are used correctly, you have the opportunity to get better executions than with an algorithm which simply spreads the order out over time.

"Schedule-based algos work really well for some clients who trade passively, never look to cross the spread and are happy to let the algorithm run all day without any intervention. Traders that use opportunistic algorithms are much more likely actively monitor and intervene with their orders as market conditions change."

Typically the users of tactical or opportunistic algorithms are the macro FX traders and although many traders are pre-disposed to favour either schedule or opportunistic algorithms, the decision is not always so straight-forward and there are other factors to consider besides trading style, says Wykes. "You also have to look at how much risk you are willing to take on because, unlike a schedule-based algorithm, there is not always a 100% chance that your orders will be completed. So you must have the time and will to take a more active role in managing the algorithms."

Traders also have to ensure that they have a deep and diverse pool of liquidity at their disposal if they are to trade more opportunistically, says Wykes. "You do not want to be trading aggressively in a limited pool of liquidity so it is important to mix it up. This means looking at certain currencies, such as the G7 currencies, and certain times of day when the market is at its most liquid."

Active management

The active management involved in more opportunistic algorithms often centres on managing the tricky relationship between minimising market impact and maximising opportunity cost. For example, a trader may try to maintain an aggressive trading stance in the market without being conspicuous by ensuring that they are never first into the market. Additionally they will want to ensure that trading aggressively does not lead to a neglect of fair value when executing on orders.

In order to add this intelligence to its opportunistic algorithms, Credit Suisse relies heavily on gathering as much participation data as possible such as trading data and pricing curves. "This is the main area of development right now in terms of FX algorithms. If you look at the equities market, it started with simple VWAP algos and then implementation shortfall algorithms but many are now more opportunistic based on all the data that is going in to their development."

The same is true of the FX algo market, says Wykes, although gathering participation data in a market with no exchanges or central counterparties is a significant challenge and one that means very few firms will look to take on this responsibility themselves. "The buy versus build question is not really a debate anymore but we take an 'in-house' attitude to every client that we work with. We first provide them with a set of algorithms that reflect their trading strategy and then we look at the results and make suggestions."

Given that users are becoming more familiar with their algorithms and more sophisticated in their strategies, will the market eventually move on an almost wholesale basis to using opportunistic algorithms rather than the more passive schedule-based algorithms? Wykes does not believe that will be the case. "If you look at equities, algorithms have been around for about ten years and the schedule-based algorithms are still very much in use. It is still early days in terms of FX algos and I know that there are some essential differences between FX and equities

but I do not see the use of schedule-based algorithms developing in a particularly different way."

Not all tactical

But not all service providers working with algorithms believe that there will be a large adoption of tactical or opportunistic algorithms among FX traders. Instead many believe that the majority of FX participants will invest mainly in scheduled algorithms that are concerned with adding more efficiency and automation to the order management and execution process rather than seeking to generate alpha in a complex and sometimes unpredictable market such as FX.

"I do not want to be seen as an algo philistine but it can be difficult to square an emotional market like FX with an algorithmic-driven forecast," says Howard Tolman, chief executive of advanced trading software developer Beta Gamma Research. What happens to this strategy if something untoward happens in the market? It is a risky game and I think there are a number of FX market participants and also service providers that will not be investing in tactical algorithms."

There is also the scalability issue which has both ethical and resource challenges, says Tolman. "For example if we were to develop a prop trading algorithm it would require a degree of human testing. And if we were to deploy it with one bank it would not seem right to deploy it for another bank. So we would be better served by creating our own hedge fund rather than creating an algorithm for one bank."

More importantly though, says Tolman, there is still a great demand for order management algorithms. "If you look at how banks are managing their orders, there is still lots of work to be done there and a lot of room for innovation. The volume in the market has gone up, data feeds have improved, aggregation services have developed and electronic distribution has improved."

There are also instances when a spike in activity, say following a non farm payroll announcement, will produce a volume that will take more than a telephone call or a click-and-deal approach to handle and will require automation. "So a typical broker in the FX market may have 10,000 plus clients and be executing tens and thousands of transactions every 15 seconds. Unless that volume can be managed efficiently, they will not be able to triangulate their orders and will be leaving money on the table. So that order flow is very important and they will have to use more scheduled algorithms to manage that order flow."

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Changing relationships

The technology-driven changes in the FX market have also changed the nature of the traditional relationships, says Tolman, particularly among the non-bank participants that are purely looking for the best price. "Banks hegemony in FX is disappearing and this is creating a new focus for non-banks. They are now looking at FX as a way of making money so care less about the banking relationship. It is all about margin."

This may be a different mindset to the high frequency trader or the hedge fund that is looking for very specific opportunities and this difference is reflected in the different ways that algorithms are used. However, there are some clear steps that have to be taken by any user of an algorithm, whether it be tactical or scheduled, says Tolman. "One thing that it is vital with any algorithm or black box is the use of risk controls. How much latitude you give to the box may be decided by how much cash you have at your disposal and how strongly you feel about the technology and the algorithm. So I don't think the market will go back in terms of innovation and developing newer and more sophisticated or tactical algorithms – after all, you cannot uninvent technology - but for us and for many other providers and users of algorithms, it is more about using algorithms to solve the practical issues."