Embedding algorithms into FX buy-side strategies

William Essex sets out to discover what types of FX algos have been proving most popular with FX buy-side trading firms and how their use is being refined.

Algorithmic trading of FX is relatively new. We know that. You can’t just plug an equity algo into an FX trade and expect it to impress you. We know that too. You need to use an algo built specifically for FX, of which there are many. Barclays Capital’s BARX Powerfill, CitifX Intelligent Orders, Credit Suisse’s Advanced Execution Suite (AES), Deutsche Bank’s Autobahn, BNP Paribas’ CORTEX IX would probably be up at the top of your list, along with JP Morgan’s AlgoX and others.

“We are now as sophisticated as our counterparts in equities,” says James Dalton, director, FX algorithmic execution, Citigroup. Equally sophisticated, but different. The markets are different; the tools for interpreting, trading and executing need to accommodate that difference. Also, if scale of supply can be taken to indicate scale of demand, there’s also buy-side diversity to accommodate. Long-term users of FX algos include commodity trading firms such as Campbell & Company, whose president, Mike Harris, spoke recently about a proliferation of liquidity. “Compared to ten years ago, there are so many different sources now,” said Harris. The hedge fund Harmonic Capital Partners uses execution algos on a “case by case” basis, according to investment partner Patrik Safvenblad, while software designers (and test-traders) like Yuri Martemianov respond to a new wave of enthusiasm for AI and machine learning with an emphasis on hand-on, built-in experience.

“The notion that everybody in this industry must be a trader seems strange to me, although I know they must. AI’s development requires very varied knowledge,” says Martemianov in a discussion of his PAMTT trading system.

ENDURING VERITIES IN A NEW WORLD

There is buy-side diversity, and to a long-time observer, this is also a strange new world in which to be trading the world’s oldest asset class. The new (launched mid-2012) hedge fund Alacritity FX (see the Tradertalk article later in this edition), which uses algos to trade spot FX, tweets its moves (“Heading into the first election results we are fully risk on – long aud/jpy,” tweeted @AlacritityFX at 4.02pm on 6th November 2012), while maintaining a conventional monthly commentary online (“JPY crosses were the main story as the demand for yield from the investor community increased,” wrote manager David Hitchins post-April 2013). Clicking the word “followers” on any FX-related Twitter account pretty much counts as market research. LinkedIn groups such as “Algorithmic Trading” and “Forex Trading” can also provide an informative, if sometimes disconcerting, insight into life on the further shores of the global FX market.

Mind you, there are also some enduring verities in FX. Alex Krishtop, trading systems designer at Edgesense Solutions, says: “FX is a market-makers’ market. If you are a buy-side trader, or developer, restrictions are applied to your trades, to prevent interfering with market makers.” FX is ancient and large and we might say that it has its own character. But if, as Krishtop says, FX is a market-makers’ market, in the zero-sum sense that the equities market isn’t, one case for algos is that they might just give us a new edge. The thinking goes like this: if you could reliably predict what the dollar’s going to do next week, you’d be playing golf today. But even if your superpowers don’t stretch that far, algo technology gives you a shot at something almost as good. Krishtop says: “The most important question for those on the buy side is how market makers make their decisions.”

Tracking what those people think – and are likely to do - about the dollar, rather than just being stuck with catching the currency, becomes a form of “complex event-history processing” with algos and their associated technology. This is attractive thinking to the FX community. It is also, please note, the kind of market intelligence that exploits the more detailed audit trail that is achievable with an algo. This is significant: algo usage delivers an unequivocal audit trail – or “order trail”, if you prefer the simpler term. We’ll come back to this point (and see also the box “Trusting the algo” for Krishtop’s further views on the human factor).

First, why now? Why publish this article in the middle of a season of new algo launches, at a time when commentary on the FX-algo phenomenon is, let’s face it, not in short supply. The question might seem to answer itself, but there’s a further aspect that we may all be too busy to spot. Algo trading of FX is new, etc., but the primary interest today is that it seems to have reached an inflection point between rapid evolution (slow at first, accelerating over the past couple of years) and what we might call a “coming of age” phase characterised by dialogue between a buy-side that knows what it wants and what it can get (and won’t settle) and a wider community responding to this evolved demand.

So the question is not just, how did we get here? But more usefully, it’s also: now that we’ve reached “the end of the beginning”, where are we going next, and how are we going to get there? At an algo-specific level, it’s also: what types of algorithm have been proving most popular with buy-side FX trading firms, and what types are likely to prove popular in future?

WE GOT HERE FROM WHERE?

No doubt the lessons of history are useful, but a trawl through the back story is not what we need right now. Let’s bypass the lot with “When it comes down to it, there are probably about six or seven different things in FX that you could take into account in an execution strategy, in terms of parameters, to change the way an algorithm behaves. Increasingly, clients want to know how an algorithm has been optimised. I’m getting an increasing number of requests to understand what’s going on under the hood.”
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“The challenge in the FX market has always been that there hasn’t been sufficient data, because there hasn’t been enough electronic trading for market participants to be able to establish what was an effective algorithm and what was not.”

Nicolas Vitale, founder and director of Alpha Novae, says: “We have noticed a clear shift in our clients’ perception of the use of Forex algorithms. Several years ago, everything was about automating systematic manual strategies for the reasons everyone now knows: cost saving, productivity, speed, respect for rules, quantification of the strategies. These days, the buy-side is more aware of how the Forex market’s microstructure works, and what it means to them in term of execution quality.”

Several years ago we were all pretty much stunned. Now we’re waking up. Vitale is describing a trend that is central to the future development of FX algos: the buy side’s interest in understanding and controlling what is done for them. This is not universal, as we shall see, because another way of staying safe in a potentially dangerous (and hard to trust?) financial world is to keep things simple – but it is significant. Vitale says: “More and more buy-side traders are now looking to keep control of the whole trading chain, from the alpha signal generation to the execution. Trusting a sell-side intermediary to execute algos for them is not good enough.”

Algo trading of FX is an emerging/emerged discipline (last echo of that analogy) that expresses its point of origin. If we can invoke a comment that was widely made, albeit not always justifiably, in the aftermath of the big crash: no algo trader of FX is going to let complexity run ahead of comprehension.

TODAY’S ALGOS KEEP IT SIMPLE – FOR NOW

Let’s get to the algo-specific questions. What types of algo are popular now, and what types are likely to be popular in future?

First, a point on take-up. Jim Kwiatkowski, global head of transactions sales, marketplaces, financial and risk, Thomson Reuters, says: “It’s only in the past year or so that FX algos have become popular amongst our buy side clients.” This may seem late, given the history above, but a variety of factors are combining to make today an inflection point. Not the least is a brief analogy drawn from urban development. Visit an “emerging market” city, and even the architecture will remind you of the “late-mover advantage” whereby economies can skip whole stages of evolution. Walk through Manhattan, say, and you can see every stage of the invention of the modern city. By contrast, in a newly “emerged” city like (supply your own example), the architecture, the urban planning, everything expresses the point at which the economy hit the big time. It all starts from there.

Algo trading of FX began in 2006/2007, which was a busy time in any asset class you care to mention – special mention for equities, of course, and the “flash crash” was a formative experience for anybody moving out of equities and into FX. For our purposes, that emerging-market analogy – leapfrogging the gradual stages; FX algos born in the “fire” of the global crash – might be instructive.

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– again, we’ll come back to this – compliance, regulation and TCA. Post-crash, we have regulation. Fiduciary obligations, compliance, the need to track everything. Algos plug directly into your TCA, to give you all the evidence you need.

So what algos? Kwiatkowski says: “When we talk to buy side clients we know that many are looking for relatively simple tools to assist them with the trading challenges they have. Many of the more advanced algos aren’t being fully utilised just yet.”

We’ll park that “just yet” for a moment. Kwiatkowski continues: “We have a lot of interest amongst our client base in the TWAP algorithm; another execution method, which enables anonymous execution and allows the trader to control the size, time horizon, average fill price and type of execution, according to pre-set parameters. We’ve seen growing buy side demand to execute a relatively large order at the fix, where there is a concentration of liquidity. We also offer an algorithmic order type known as pegging, which is used when a client wants to execute an order, but to participate over time rather than drive the market. A buyer might want to peg the bid; rather than paying the spread, to earn the spread.”

Discussing past pricing issues around the 4pm London fixing, Rebecca Healey, senior analyst at TABB Group, says: “The challenge in the FX market has always been that there hasn’t been sufficient data, because there hasn’t been enough electronic trading for market participants to be able to establish what was an effective algorithm and what was not.” There is (as Healey observes) a chicken. And there is an egg. Until a critical mass of electronic/algorithmic activity is occurring within an asset class, the scope for effective electronic/algorithmic trading of that asset class cannot be fully realised. No wonder demand was for the simple solutions.

Asif Razaq, global head of FX algo execution at BNP Paribas, says: “When algos first started being used in FX, there was pretty much only the TWAP. The FX algo market is still quite new, so a lot of the new clients coming to the FX market are happy with what the TWAP offers. We also have a set of clients who have been active for a while, and they look for a more advanced set of execution algos.” Demand is, perhaps, evolving at last. Ben Ernest-Jones, product manager for Apama Capital Markets, Progress Software, says: “The algos developed by our buy-side FX customers typically involve discovery of trading opportunities through statistical analysis of market data, sometimes incorporating analytics tools such as R or Matlab. With a global, fragmented market like FX that is still largely unregulated, the potential for finding these anomalies in the market can be far greater than other asset classes.”

Indeed, and that is still one attraction of FX. But if this is an evolution of demand, where’s it taking us? As Ernest-Jones’ comment implies, use of FX algos is beginning to be refined, but how?

“There are several ‘proven’ rules that limit risk. These are used because they conform to the general human mentality: to limit losses, to trail profits, and so on. It is very rare when a developer does proper research and comes to the conclusion that alternative, counter-intuitive methods work better. This is against his psychology.”
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THINKING ENGINES
Much has been said in recent months about the incorporation of predictive functionality into FX algos. The predictive approach has come to us from other asset classes, equities in particular, but it is also a good “fit” with FX. Simon Garland, chief strategist, Kx Systems, says: “People have been doing correlations of currency pairs forever. What has changed is the speed that’s achievable, and the ability to do much more complex correlations of time series.” Discussing algo’s ability to take into account specific historical data as well as just looking at long-term trends, Garland says: “If you just let the algorithm polish itself by running against lots of data, it will explore all the different factors that could have an effect, and adjusting weighting factors, and it will keep on trying against a history to see how good a job it would have done in the past.”

As Garland says, an algo can mine data to depths that would be too frankly boring, as well as impossible, for a human to undertake. The results can be useful. “You can stumble across things that you wouldn’t have had the patience, or perhaps even the luck, to find if you were searching in the old-fashioned way,” says Garland. Alongside boredom and impossibility, there are also cost and efficiency. Vitale agrees saying: “One of the major drivers behind algorithmic trading execution is of course to automate repetitive and systematic actions that were previously handled by execution traders at a loss of time, of productivity and precision.”

But Vitale also says: “In these days where micro volatility is high and when the life of a trade is getting smaller and smaller, execution is truly part of the trading system. It becomes harder and harder to separate the alpha generation core from the execution side.” Which is a very important point; even a perfect execution is not the sole purpose of a transaction. If algo technology enables more complex event processing, it also potentially enables a more complex value-add and by extension a more layered provision.

This is not quite simple. James Dalton says: “The next big thing is looking at how to enhance an execution by incorporating a couple of predictive elements into your order placement. This blurs the line between executing for a client on the basis of having a quality set of execution strategies, and taking on risk on their behalf.” But the line, yes, but not erase it. Clients may move from one side to the other, when if they’re ready, but that has to be their choice.

Dalton says: “You’re talking about the same predictive inputs that are utilised by systematic prop groups being incorporated into execution algorithms. Not all clients are happy to think that prop signals are being incorporated into their execution strategy, so we’re very careful to maintain our suite for people who need a straightforward explanation of what an algo’s doing, be it for their own peace of mind or their own compliance group.”

Not everybody wants an execution to be an adventure; there are perfectly good arguments in favour of just getting the job done - and equally good arguments for offering more to those who want it. Dalton says: “We’ve got other clients who are enthusiastic about using anything we can construct to add an incremental edge to their execution. There’s certainly a place for predictive analytics, but not all people are going to be enthusiastic consumers of that kind of product.”

THE BIG RED <SELL> BUTTON
Predictive analytics aren’t the only evolutionary value-add that can be packaged into an FX algo, but as Dalton suggests above, the key determinant of what works is client choice. This may be a simple principle, but it has significant implications: properly managed, an algo is the “sharp end” of a close relationship between the parties to its use. Nicolas Vitale spoke earlier about the buy-side’s interest in execution quality, in control, and by extension, in on-going involvement. Vitale says: “Execution algorithms need to be fully integrated and adapted to the buy-side strategy. We work closely with our clients to couple the execution algo tightly to the nature of the alpha of the strategy.” This sounds like the teamwork that it needs to be.

But what’s happening here is more than just the sell side issuing “access all areas” passes to the buy side. In a commercial environment largely populated by clients who want control, where the key event – execution – tends to be a somewhat more complex process than, let’s say, just pressing the big red <sell> button and heading out for a celebratory lunch (oh, for the good old days), there’s even a commercial case for involving the client at every stage – and indeed, in breaking out as many stages as is feasible. Today’s most future-proofed FX algorithms – the FX algorithms of tomorrow – may integrate predictive analytics, as many stages as is feasible.
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and they may incorporate all manner of AI, machine learning, heuristic, evolutionary, complicated fiddly stuff, but their absolute core, their defining characteristic, their key element is that there are conducive to client (in fact, all-party) involvement. This is perhaps an overly commercial analysis of the case for participation, and we should acknowledge the various other factors here, not the least of which are, crudely: it’s the client’s money, and the client is (also) accountable. But what we really have here is a highly satisfactory synthesis of interests: using algos to trade FX is a strategy that suits everybody’s needs. Oh, and algos are also flexible enough to ride wild markets. Ben Ernest-Jones says: “We do see things like market and trade execution analysis over time used for the purpose of altering algo behavior in real-time. This could result in a number of different actions as market conditions change, including changing algo parameterization, swapping algos used to trade specific currencies, or even the decision to change the overall portfolio of currencies being traded across a system.”

Which is a pretty significant set of re-prioritisations to be doing in mid-ride. Similarly, Vitale says: “It is important to screen market conditions constantly, to adapt on the fly the execution tactic used, or to enable the user easily to change the parameters of the execution.” Indeed so. Adjusting the parameters as the order moves through is hardly a new idea, but this is FX we’re talking about, and this is wholesale fine-tuning. Note also that the need for effective control of an algo at this level can have a paradoxical impact on the working lives of its human “rivals”. Vitale says: “Keeping human traders in the loop is very important. They are still very useful and often essential to configure the algos to adapt.” (Making a related point, Krishna says: “In my opinion we cannot completely separate algo trading from human trading, as all algos are eventually implementations of the ideas of their respective developers.”)

An algo is just a tool, after all. But a useful one. With the human traders back in the room, let’s talk about the drivers for increased use of FX algos.

THE TIMES - THEY ARE AGGRESSIVE?

Whether or not you invoke social or news media, the internet or smartphones, we’re living in a well-informed world. Information has a value; more so if it is accompanied by guidance on how to use it. James Dalton says: “More and more clients are aware of what’s available from the top tier of algorithmic providers, and they pick and choose algorithms according to what they want to achieve at a given point in time, instead of persistently pushing volumes through one or two strategies. We do spend a lot of time helping clients to get to that level by sharing historical performance data and doing comparisons so that they understand what their peer group are achieving by using algorithms.” [Dalton emphasises that performance and comparison data is generic.]

As clients become more sophisticated in their algo usage, their approach changes. Dalton continues: “People who have historically used passive strategies have diversified 50% or more of their flow to using aggressive strategies. Particularly when you’ve got to focus on the more liquid pairs, you can far more efficiently get rid of a lot of risk by using aggressive strategies.” Parallel to this is a greater willingness to explore a wider range of inputs. Ben Ernest-Jones says: “One of the things people are doing to predict market shifts is to incorporate news feeds into their trading decisions. In FX, economic indicator releases from different geographies can be mapped to corresponding currencies that might be impacted. Many tier 1 institutions are looking for these types of events to anticipate changes in market volatility and react accordingly. Buy-side firms looking at the same news feeds can often predict not just market volatility, but also when to expect widening of spreads from primary liquidity providers.”

We’re getting rather better at this. A further point is that in the context of algo usage, successful adoption breeds further successful adoption in the sense that the “clean” TCA achievable with an algo is itself attractive. We could be forgiven for wanting more of that. Kwiatkowski says: “How do you choose which algorithm to use next? You’ve got a bunch of people telling you how their algorithms work and when is the time to use them. We look at one of our functions as to provide reporting. In equities, you’d call it TCA.”

In FX, we’ll call it TCA as well, although Kwiatkowski goes on to describe a more comprehensive provision under the acronym EQA – Execution Quality Analysis. Similarly, Rebecca Healey says: “There is a combination of factors here. The development in the TCA space has enabled an understanding of what is a good execution. That is pushing forward this initiative towards algos. It’s not just the algos themselves propelling the change, but the analytical tools that go with them.” For Healey, there’s also an influence coming in from the equity experience of algos. Healey says: “The buy-side trading desks themselves have become much more autonomous from their traditional broker relationships through their use of equity algos, and that has given them a much greater incentive to understand their execution.” But that’s not all. This is the regulation age as well as the information age. Doesn’t that have an impact?

REGULATION AND THE FUTURE

Yes, it does. Healey says: “The over-riding reason why people are using algos boils down to economics and regulation. There are greater incentives for them to take ownership over their order flow and the prices they get.”

Regulation makes them much more alert to achieving water-tight best execution.”

MiFID in Europe and Dodd-Frank in the US require transparency and both impose a fiduciary duty to achieve best execution. Both have also been widely summarised; for our purposes, their impact, in short, is to require FX traders to operate in conditions of transparency that are much more readily achievable via the adoption of algorithmic execution and trading coupled with comprehensively plugged-in straight-through processing. Rebecca Healey is the author of the (very interesting) August 2012 TABB Group report FX in Transition: Taking the Quantum Leap, which says in this context: “Increased transparency and scrutiny of dealing prices will only increase in relevance and importance. It will be increasingly difficult for funds to obtain their FX through a non-competitive bidding process, be that through RFQ, aggregated streaming
In the long term, we’re all electronic. Also, we’re all empowered. What’s interesting here is that all the old reasons for trading algorithmically – Nicolas Vitale mentioned cost saving, productivity and speed among others – are being augmented by a new set of motivations: algorithmic trading is conducive to the proper discharge of fiduciary responsibility, not least in that it facilitates the parallel need to be seen to be good (in several senses of that word). But the key gain in going algorithmic is choice. But this isn’t a simple conclusion: choice itself requires management. Asif Razaq says: “If you look at the market today, in terms of how algos are deployed, what a lot of banks have done is, they’ve created multiple strategies designed to cater for different market conditions and different requirements. That can be confusing.”

The solution, for Razaq, is to bring forward the point of decision. Razaq says: “We’re trying to simplify the process. We have a full set of algorithms, and what we ask the client is: do you have time on your hands and do you want to take some market risk; or do you not have time and need to exit the risk quickly?” The client takes that first big decision and then the algo takes all the tactical decisions thereafter.

Razaq’s summary of the process could round up this feature quite neatly, given the overall (possibly slightly paradoxical) theme that FX algos are at the same time taking on the complicated work, and delivering choice. As Razaq puts it: “You choose the algo, and then let the algo decide.”

But the truly up-beat ending, which is completely on-message with everything else here, is this from Rebecca Healey: “There are multiple factors that are coming together to make this the perfect time to start trading FX algorithms.”

If you’re not doing it already – do it now.

“There is an overwhelming amount of real-time data that could be used for refining decisions made by FX algos. CEP in particular has been a widely adopted technology for consuming and filtering this data to generate trade signals in a timely manner.”