Adaptive FX algorithms – giving control back to clients

William Essex

What, do you suppose, is the opposite of "adaptive"? Rigidly inflexible, perhaps? Incapable of adapting to changed market conditions? To suggest that we trade/execute in FX with rigidly inflexible algorithms would be ridiculous. But if we're talking about adaptive capability (adaptiveness) in the context of the microstructure and dynamics of the FX market, there's a surprising amount more to be said than just: let's be as adaptive as we can. FX is big, liquid, complex, changeable, unpredictable, and a lot of other adjectives as well. To maximise the adaptiveness of your FX-algo suite is a good idea. To believe that this will always be a simple process – no

To define terms at the outset, adaptiveness might be flexibility; it might be agility; it might encompass low latency and HFT functionality. Ideally, it delivers closer control. In the real world, FX-adaptiveness also necessarily crosses boundaries between asset classes. BNP Paribas' Cortex iX FX spot algorithmic execution service, for example, may be a "tool in the toolbox" for FX execution, as Asif Razaq, global head of FX algo execution at BNP Paribas has described it, but it also plugs into the overall Cortex "cross-asset electronic trading, market intelligence and post-trade service".

Discussing adaptiveness, Razaq says: "Cortex iX is third generation, in that it is able to take signals from the market and adapt its execution strategy mid-execution as a function of what it sees going on in the marketplace."

The previous generation would just press on with its execution order, following its pre-set execution rules, regardless of price actions, liquidity bursts, flash crashes, volcano eruptions, sovereign-debt cancellations, et cetera. Any stop would be pre-set. This might once have been enough for a back-office FX trade (hedging an equity position, perhaps), but the advent of adaptive algos coincides with FX's decisive move into the front office. Razaq says: "What we're looking to do with adaptive capability is have the algorithm mould itself into current market conditions and use the appropriate set of execution rules to work the order into the market." Razaq describes an AI-driven learning process that culminates in the choice of the appropriate ruleset for the situation.

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Shelf life

Note that this is ideally an ongoing and cumulative process. The machines may never have to pass the Turing test (as in: convince the counterparty that they're human), but the shelf-life of an artificially intelligent FX algo is notionally extensible if it is, in effect, informed by its own past and current experience – assuming quality real-enough-time analytics! Also, to the (significant) extent that shelf-life is a function of market "invisibility", it is tempting to suggest: the more rulesets, the better.

Michael J Levas, founder, managing principal and director of trading at Olympian Capital Management, says: "FX algos do have a shelf life. The algos that do exist are being maintained and being used by various participants for a variety of reasons." One reason: invisibility. Levas says: "Developments in the algorithmic space for FX will be about leaving less of a footprint so that predatory algorithms cannot get in there and expose what each participant is trying to do within their trading position or portfolio." Yes, but – so far, so familiar: not leaving a big fat footprint is hardly a new preoccupation.

The value of adaptive FX algos goes further than that. Peter Bondesen, sales manager for FX, EMEA, FlexTrade, says: "There are several enhancements going on in the FX algo space. Some are about simplifying the logic; others involve multiple layers of calculation using complex-event processing (CEP). The new generation of algorithms is about aligning business requirements with complex trading logic."

And thereby meeting those requirements more effectively – after having identified what they are, of course. Challenging one preconception, Bondesen says: "I'm not sure to what extent best execution is seen as a key driver in FX. It's something that everyone is trying to do; they're trying to be as efficient as they can. Certain people will look at best execution one way; others will see an FX-hedging trade that they just need to get out of the way before they can get back to their equity strategy or futures strategy."

Learning process

Multiple players, multiple priorities. If this implies a need for a learning process – well, that's all part of being adaptive. Gary Stone, Chief Strategy Officer,
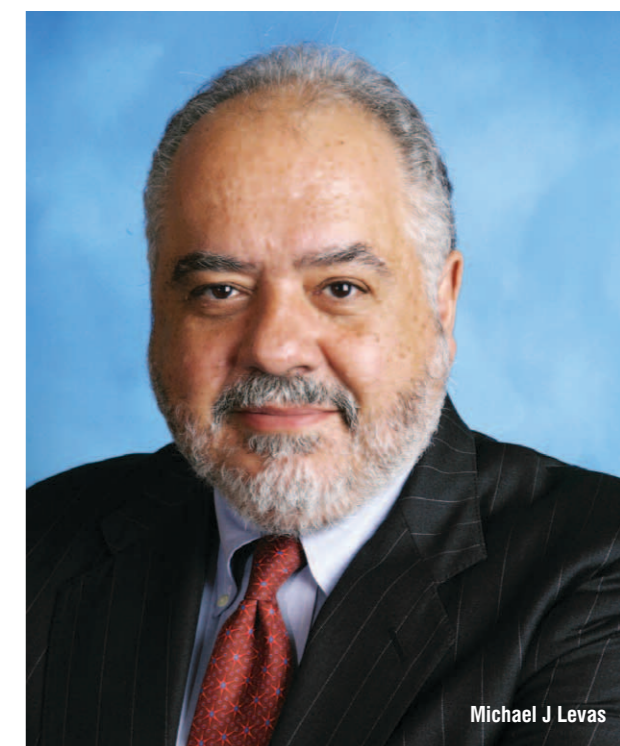
Michael J Levas

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Bloomberg Tradebook, says: "You need adaptive algorithms that will learn from themselves, learn what is going on in the marketplace and understand the liquidity with which they're interacting, so that they can maximise liquidity capture. That's the adaptive part of it."

The necessary learning capacity is extensive. Stone illustrates his point with the example of what it takes to understand liquidity in Asian equity markets, where trading is heavily manual. In such a trading environment, says Stone, algos can trade too fast. Therefore, there's a case for following up an aggressive move with a pause, to allow the market to react. Stone says: "What that means is, you need an adaptive algo. The point for FX is, different liquidity providers will respond in different ways to what you do, depending on how their algos are set up, so you need statistics in the background that tell you,

for example, if you respond to this liquidity provider, chances are they'll come back with something more for you." [Note, again, the wider variety of liquidity providers in FX.]

Existing adaptive FX algos are also being maintained because there aren't enough of them – yet – to meet demand. Levas says: "There's going to be a pretty big increase going through 2013 and 2014. We'll see new algos coming out, and I think we'll continue to see development. We're nowhere near saturation. That could happen eventually, with consolidation among vendors, but we're not seeing it right now."

Next generation functionality

Early movers in the race to develop the next generation in FX-algo functionality include Deutsche Bank, where a "next-generation FX trading platform" is now accessible through the bank's Autobahn electronic access point. Speaking in advance of the phased roll-out of the new platform (begun July 2012), Zar Amrolia, global head of foreign exchange at Deutsche Bank, said: "This represents a quantum leap forward for the FX market at a time when volumes continue to increase." A virtuous circle indeed.

In passing, it is a pleasing sign of the times that Deutsche Bank's new FX platform may be described as an "app", in that the bank's modular approach to electronic provision enables a neat brand name: search the Autobahn App Market for further information. But Deutsche Bank is not alone at the cutting edge of FX-algo technology. Others competing to fulfil Michael J Levas' forecast of a big increase in FX-algo provision include Citi, with CitiFX Velocity, another 2012 launch (building on an existing product suite). [The Citi Velocity Mobile app is among various banks' research tools available on iTunes.] UBS announced its 2013 move into FX algo trading in October 2012. But we're getting ahead of ourselves. Adaptiveness is fast by definition, because change happens quickly; it is also necessarily "smart-fast", not least in the sense that FX is such a wonderfully unpredictable asset class (key feature of the UBS launch: smart-order routing

Peter Bondesen

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based on regulatory compliance, of which more later). But there is also beginning to be talk of another aspect of this challenge: the mindset.

Stone says: "I think now what's happening is that the machines are a complement to the person. The market structure is very complicated, and therefore, you need algorithms to source liquidity, but a good algorithm with a good trader can give you an excellent result. It's not that the machines are taking over the world; it's that they're working with us."

Liquidity

So much for all those Terminator analogies. Effective execution requires good-quality liquidity, and we can imagine a model in which the algo finds the liquidity to which the human trader may or may not choose to bring an extra layer of creativity. Gary Stone's observation is not revolutionary, and of course, nor is it a proposal to build subjectivity back into the equation. But is there perhaps a detectable attitude shift here?

Stone says: "In the past, there used to be the approach: I get an order, I put it in an algo, I try to get that benchmark. Now what we see happening is, the trader is coming from a different mindset: I'm amassing a position in a certain currency, I'm going to put some of it in an algo, I'm going to pick my spots and when opportunities arise, I'm going to buy at those levels and overweight it to get a better average."

Similarly, Levas is talking about traders not quants when he says: "To me, the algo is only as good as the person behind the algo."

And in the course of an exchange about machines, humans and adaptiveness in general, Alex Krishtop, management consultant and trading systems designer, EdgeSense Solutions, says: "I have always been in opposition to adepts of pure science, as I believe that financial markets are not much different from, for example, oriental bazaars, and if we're going to profit from them we need to understand their participants' psychology first."

Wow! Alex Krishtop goes on to reference "trading psychology and its successful exploitation by mechanical traders", and in the context of FX in particular, with its wide range of participants with their various motivations to trade, we might infer that an acknowledgement of the presence of human traders can add value to a trading strategy on more than one level. This is a shift of emphasis rather than a wholesale reconfiguration of the front office, but you don't develop adaptiveness by sticking to yesterday's processes. Simplistic, no doubt, and while we're discussing the human element, it has even been suggested that the FX market's equivalent of that chaos-theory butterfly is a world traveller with a corporate credit card. But back to the subject at hand. If we're talking about mindset we're talking about openness, and that by definition is symptomatic of a capacity to adapt to complexity.

It's also a refreshing change. The old-style conversation about FX algos typically circled around their translation from equity markets. But the third (and no doubt fourth, and fifth) generations tend to be discussed in terms of finding their place in a complex environment. They're "FX algos", yes, but that doesn't make them stand-alone, one-trick applications. They're part of the team. Levas, from his multi-asset, macro perspective, says: "This to me is the real use of algorithms. If you're very busy, or you're in a particular sector or currency pair, or you're in something where there's a lack of liquidity and you want this algorithm to work very hard for you without you having to focus in on what it's doing ... this is where algos are perfect."

Combining ingredients

We've lost the Terminator analogies, but can we still use the line about algos fixing the coffee one day? If we're discussing the ways in which addressing the microstructure dynamics of the FX market can help providers to engineer better algorithmic execution solutions for their clients, we might conclude that such a micro-focus is fundamental to addressing complexity. But if we go on to ask how the coming (and existing third) generation of FX algos will combine the "ingredients" of adaptiveness – more sophisticated logic using better data to learn – to help clients take greater responsibility for their FX-trading activity, we get into very interesting territory.

Discussing transparency, Stone says: "FX traders need to understand pre-trade and the working trade; they also need post-trade to reflect upon what's happened. It's not just machine learning; it's human learning at the same time."

Thought-provoking, yes? Not just in terms of the basic human:machine interaction either. Consider this. FX is complex. Yeah, right, got that. FX algos have the capacity to enable, leverage, enhance a two-way information flow. And if we push this out a few generations, we'll have human and algo finding a way to high-five each other.

Yeah, sure. If there's a blue-sky part to this, it's that some day, all algos will work this way. We're using the term "FX algo" and the term "adaptive algo", and already, they're almost synonymous with each other. For a multi-asset strategist like Michael J Levas, an adaptive algo is already part of the team; maybe the future holds multiple/single-asset algos developed from the evolving FX/adaptive ranges. Adaptive is also responsive, and not just to markets.

Drivers

But none of this is happening in isolation. We have ahead of us the prospect of derivatives reform, swap-execution facilities (SEFs), assorted new venues and venue types, ongoing debate about regulation, China gradually opening up a whole "new" reserve currency; and with all that we're embroiled in an ongoing industry re-organisation led in large part by democratically accountable politicians. These are interesting times. Bondesen says: "With the potential for a powerful regulatory regime looming over FX, based on perhaps Dodd-Frank or MiFID, there could be a future where FX could be traded with different reporting requirements and indeed best-execution requirements."

The irony, given Bondesen's comment earlier about best execution as only one of the possible drivers in FX, is that clients could, so to speak, be forced to want it. This could make regulation a driver towards increased algo trading of FX. Bondesen says: "Proving best execution is much easier when an algo has been

working the order for you on the main venues or with major banks and brokers."

Regulation: key driver of the future. It's not exactly counter-intuitive, but certainly striking, that micro-focused and adaptive FX algos should be playing a part in delivering the simplicity – via transparency – that regulation demands. But what of the impact of the current and ongoing, substantially (increasingly?) regulation-driven upheaval in the finance industry generally that we see all around us?

Chris Cruden, CEO, Insch Capital, says: "Anything that increases liquidity and transparency is a good thing for any market. That said, markets tend to take on the personalities of their participants. If those participants are inexperienced, easily spooked, over-leveraged, this makes a market less safe and probably negates the benefits of increased liquidity."

Interestingly, Gary Stone speaks of a shift in the participant demographic in FX, but not in those terms. Stone says: "Because of the restructuring that's going on in the marketplace, FX coming up from the back office to the front office, front-office traders having experience as sell-side market-makers, you're starting to see a very different way of looking at algos and looking at usage and workflow."

Traders are looking at algos as part of a toolkit, Stone explains, that makes the picking of a spot much more valuable and easy. Stone says: "We're starting to see the sell-side arrive on the buy-side. At the same time there is a shift toward all traders taking greater control over their orders. Just like when a sell-side trader takes an order, he takes control of the order and he owns it as well."

Alex Krishtop

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Influencing the market

As to whether adaptive algos can themselves influence the "personality" of the FX market, Cruden says: "Algorithmic trading is simply systematic decision-making. Anybody I've ever met who's successful is systematic, although they may not have encoded their decision-making." Human traders should aspire to the condition of algorithms, maybe? If it is reasonable to assume that market participants, including regulators, are easily "spooked" these days, given everything that's happened over the past (say) six years, maybe it is a good idea to bring adaptive algos onto the team. If "spooked" is the mindset, "spooked about algos" is an obvious subset, but what if the term "adaptive" embraces an ability to step back before plunging into another flash crash? Oh, and rogue traders are all too human, really, aren't they?

In the long run, we can reasonably adopt the view that adaptive algos will potentially deliver an extra measure of stability to FX markets. This may not yet be widely appreciated yet, but they are "regulator-friendly", in the sense that their thought processes can be tracked back and their decision-making relatively

easily audited. Key point here – again, not as widely appreciated as it might be, at least among politicians – is that algorithmic trading is not synonymous with high-frequency trading. Cruden says: "We would take the view that trading less frequently is better than trading more frequently. When you put trading into an ever more complex, more frequent technology environment, it seems to me you increase the risk." Cruden goes on to explain that his definition of risk here is the simple, broad and colloquial possibility that "things can go wrong".

Changing relationships

So much of this discussion has centred around the potential for an enhanced relationship between the human trader and the adaptive algo. But that isn't the only relationship that might be changing. Courtney Gibson, vice president, trading, OANDA, says: "There's a growing base of traders who are using micro models to analyse their brokers for short-term strategies. The same approaches can be turned around to analyse client flows. From our perspective, this is an ethical issue that both clients and market-makers need to acknowledge." It is an interesting dilemma. Gibson says: "We're finding that clients are very interested in algorithms that look at micro-dynamics to try to anticipate movements, but there's the flip side: brokers might be trying to do

Courtney Gibson

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It's a valid point, but the positive flip side is, surely, that it's possible. The enhanced capacity to measure patterns of behaviour, and indeed to conduct analysis of the kind Gibson cites, is suggestive of an enhanced form of what we might as well call a "know your client", or indeed "know your broker" process. The key features of adaptive algos extend to embrace AI-driven learning, agility, the capacity for HFT, an enhanced form of what we've called relationship-building, and a positive impact on the overall toolkit of which the algo is a tool.

But let's give the last question to Peter Bondesen, whose answer is reassuringly traditional. What have become the dominant factors influencing how FX-trading firms choose the most appropriate FX algorithms to deploy for their own specific strategies and trade-execution requirements? Bondesen says: "The classic efficiencies: latency, slippage, market impact. Trading desks need different ways to handle different types of trades, which makes understanding what type of liquidity providers dominate certain marketplaces an essential piece of the puzzle."

Chris Cruden

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