Execution algorithms
where innovation is driving demand in FX

William Essex explores which FX buy side sectors are now becoming the biggest users of execution algorithms and in what ways the focus on transaction cost analysis in FX is further stimulating the use of algorithms as a key component of best-execution toolsets.

Everything is back to normal in the FX market – but it's a new normal. All around us, corporates are back to funding their cross-border operations; trading desks are back to taking orders and transacting; retail investors are back to piling in behind every new trend. We've had ten-plus years of upheaval – not just the crash but also the impact of technology on what we do; plus all that wider IT-accelerated social,

political and economic change; lately the worst weather for centuries; all capped off with a European political crisis that mimics 1914 rather too accurately – and yet, behind it all, the FX market is back to moving as it has always moved.

Which is significant. Seven years ago, Credit Suisse launched AES FX. Take-up was sustained, as was competition to dominate the new

space. Evangelos Maniatopoulos, global head of AES FX product and trading, Credit Suisse, says: "When Credit Suisse launched AES FX seven years ago, it represented a new approach to executing FX transactions. At the time, our challenge was to convince our customers that it was a viable alternative to the more traditional means of trading FX – click and deal, voice dealing, et cetera. We strongly

believed that the benefits of this type of product would be appreciated by customers." Then, AES FX was the new game in town. Now, many (most, pretty much all) Tier 1 banks have, or are working to have, an algorithmic execution platform to accompany their more traditional execution capabilities.

The new approach to FX arrived just in time for fragmentation – liquidity became (even more?) problematic – and a fresh regulatory emphasis on transparency, thus TCA; Maniatopoulos comments that work by Credit Suisse to develop pre-trade, real-time and post-trade TCA in the FX space "significantly contributed" to the ongoing adoption of AES FX.

Technology in general, and algorithmic execution in particular, gave us many things over the decade just passed: (ultra) low latency, HFT, the phrase "flash crash", lots of speeches on Capitol Hill, politicians adding their names to copious new legislation. We have access, if we can use it, to

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whatever Big Data is trying to tell us, and we have smart-order routing and various forms of machine intelligence. Algorithms can trade and transact FX faster than we can think about FX, and they can do that effectively as well as (if you're up for re-election) scarily.

But the really attractive characteristic of algos, which makes them so durable, is that they flourish just as easily in a tightly regulated trading environment, as in the relative free-for-all of global FX. Algorithms are good at stealth, but they also provide an unambiguous audit trail. "Algorithmic execution in FX is here to stay," says Maniatopoulos, understandably.

So what's new about the "new normal" in algorithmic execution of FX. The more instructive question is – what's normal about it? The suggestion above, that we're "back" to normal in the FX market, might seem to suggest that all the change of the past decade has been temporary. In fact, the opposite is true. Best evidence of that? Look at who is using FX algos.

BUY-SIDE USERS

So which FX buy side sectors are now becoming the biggest users of execution algorithms? Well first of all we have corporates. They may not be the biggest yet, but they do seem to be getting there. Asif Razaq, global head of FX algo execution at BNP Paribas, says: "We've seen increasing demand in the corporate sector. Corporates are now beginning to see the true benefits of using execution algorithms." This is not a finding unique to BNP Paribas. Giving a strikingly similar answer, Maniatopoulos says: "We have seen a great deal of interest from corporates over the last eighteen
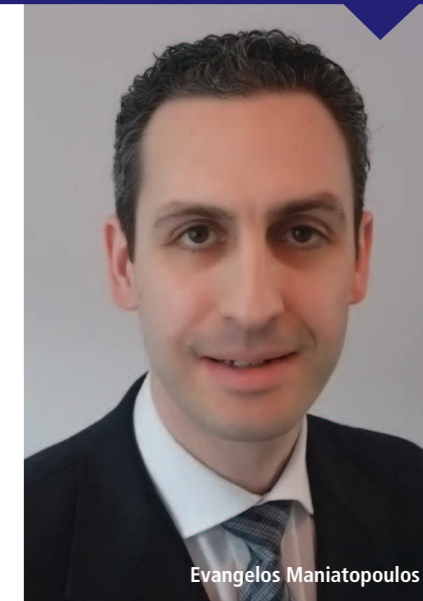
Evangelos Maniatopoulos

months. Certainly, corporates are becoming more accustomed to the concept of execution algorithms."

To judge from these and other replies to the same question, there is a widespread corporate awakening going on, to the benefits of FX-algo execution. Indeed, Paul Downie, head of foreign exchange, Royal Dutch Shell, has described algorithmic execution as the "lynchpin for continuous improvement" in his firm's FX activity (citing transparency and flexibility as key drivers). So what's normal? Corporates have been buying and selling currencies since the very beginning. They've been doing it for operational reasons, and their presence in the market is a large part of what makes it interesting for the rest of us. If corporates are using algos, it follows that algos are normal as well as new.

"There is a second group," Maniatopoulos also says: "where we have seen significant demand for execution algorithms. It has increased over time, and has spanned across a number of

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> "We've seen the biggest growth coming from the corporate sector. Corporates are beginning to see the benefits of using execution algorithms."

Asif Razaq

customer segments. Most active in the space are hedge funds, investment advisers, money managers, pension funds – the real-money community generally." FX-execution algorithms are, as it were, hitting the big time across the market.

Jonathan Wykes, Head of EMEA eFX sales, Bank of America Merrill Lynch, says: "After corporates, we see a lot of activity coming from the real-money community. They're typically either using execution algorithms because they want to execute based on their view and participate in price improvement, or they're looking to exit a trade at a particular level and want to do that quietly and discreetly."

There is a distinction to be made here. Wykes says: "Corporates on the other hand trade in large size and with the aim of exiting risk over a long period of time."

The significance of corporate take-up is what it tells us about the acceptability of algos. They're

no longer seen as "dangerous" in the way that, let's say, certain derivative structures came to be seen as dangerous in the immediate aftermath of what happened a few years back. They may be conducive to HFT, et cetera, and appealing to adventurers, but algorithms are mainstream now. They are no longer exotic.

Why not? Partly because trading desks have been working hard to "normalise" FX algos, not least via innovation at the point of access, and partly because the buy-side has been engaging much more actively with the execution process. There has been regulatory pressure towards greater mutual understanding between the two sides, which has led to a mutual enthusiasm for transparency, oversight and effective TCA (we're coming to that), and among other factors driving clients to take greater care have been all manner of wars, turbulences and natural disasters. Gary Stone, chief strategy officer,

Bloomberg Tradebook, says: "We're seeing a lot of engagement from both sides, from liquidity providers and from hedge funds and the buy-side. In the past, hedge funds and the buy-side were takers; now we're seeing them become makers. They're playing both sides."
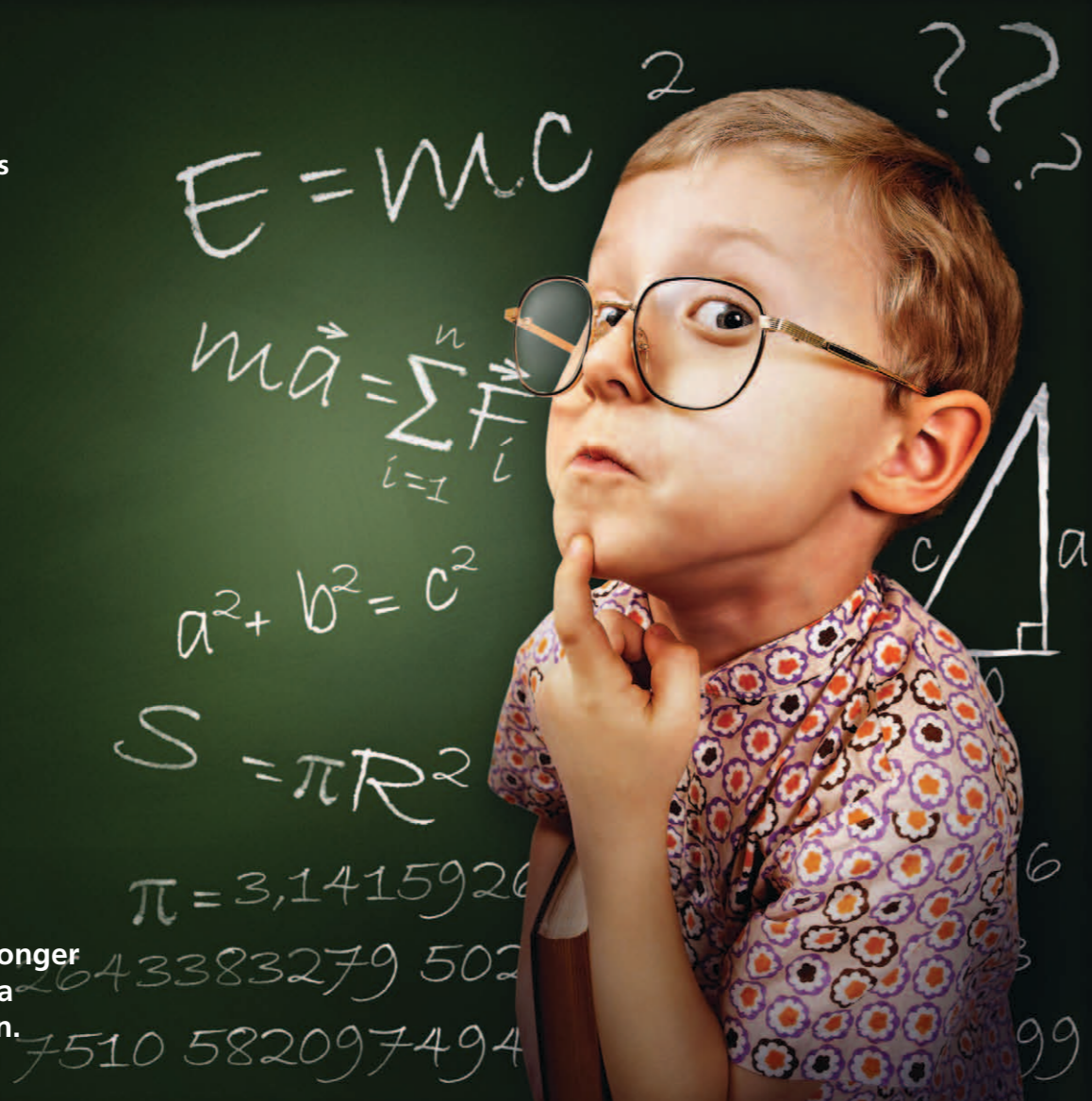
ENGAGING WITH THE OBO TRADER
We're all in this together, in effect. Corporates and the real-money community alike have been incentivised to engage by regulatory pressure and market instability (and the banks' own efforts, no doubt). Peter Bondesen Sales Manager EMEA FlexTrade UK, says: "In general, the market is moving towards smarter execution, either by utilising in-house strategies or broker algos. The biggest push we are seeing is from the asset managers."

Being smart is no longer just an option; it's a fiduciary obligation. To jump ahead of ourselves, Bondesen's idea of "smart" goes beyond order routing. Bondesen says: "I can imagine that in the future, artificial intelligence will be used to read news quickly and make decisions based on the perception of the
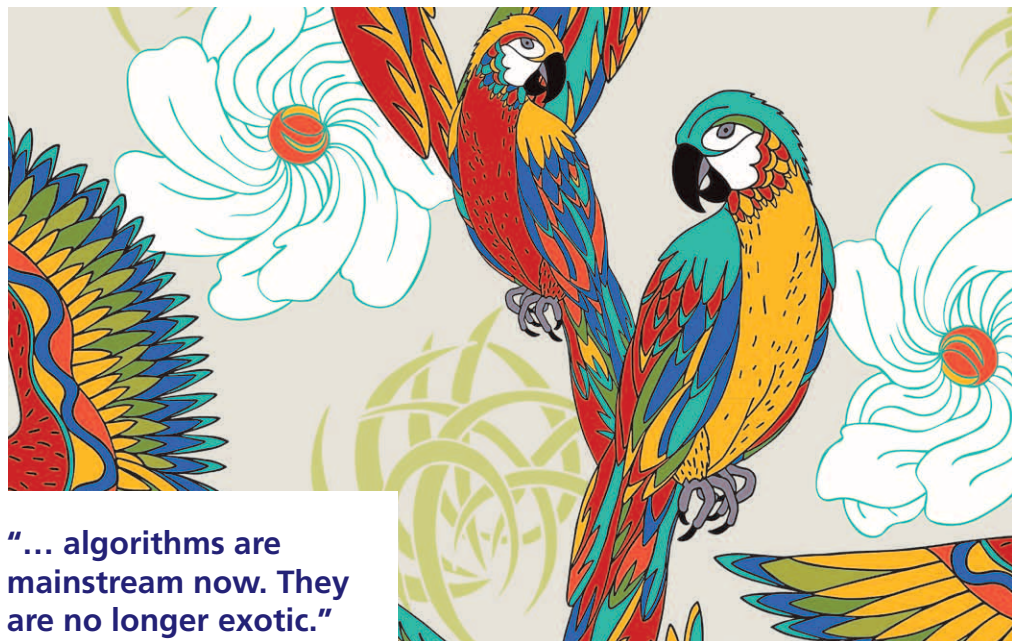
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$$E = mc^2$$

$$m\vec{a} = \sum_{i=1}^{n} \vec{F}_i$$

$$a^2 + b^2 = c^2$$

$$S = \pi R^2$$

$$\pi = 3,14159265358979323846264338327950288419716939937510582097494...$$

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story." We would have to redefine the word "irony" if regulatory pressure from Brussels, say, rather than just brain-power from Silicon Valley, pushed AI to sci-fi levels of usefulness.

But we really are jumping ahead. Engagement is a two-way process, and while the buy-side has been getting to grips with algo execution, trading desks have been coming to meet them half-way, as it were, by re-engaging with more traditional methodologies. Razaq says: "We've seen a rise in OBO [On Behalf Of] trading. For clients who are risk-averse and are apprehensive to invoke an algorithm, they are now simply calling the bank, just as they would call for a voice trade, but instead are requesting, can you buy me €100m on Chameleon?" Note that word: massive. "The salesperson pulls up the algo order ticket, puts in the order on their

behalf, and updates them as the order is executed," says Razaq.

OBO trading means clients picking up the phone. Those of us old enough to remember rotary dials and talking to the operator can still place our orders in the old-fashioned way, and get access to algorithmic execution. Discussing corporate interest in Chameleon (BNP Paribas' passive algo, by contrast with the more aggressive Viper), Razaq says: "Such clients still respect the voice relationship they have with the bank and it is something they would like to maintain. As they get more experienced, they will eventually start submitting the orders themselves." And until they get to that point, they will have the salesperson's running commentary as the order goes through.

If today's range of external factors (regulation, turbulence, et

cetera) represent a push towards engagement, there might be a case for wondering whether there are any pull factors impacting on the buy-side. And of course – there are. The sell-side is giving the buy-side what it wants – not least, a clear audit trail, plus a voice relationship and a GUI (to misuse the term) that looks remarkably like an old-fashioned telephone handset. All of this at the same time as execution itself is becoming a much richer experience.

ALL TCA TOGETHER NOW!
Okay, we can stop talking as though algo execution is something distinct and separate from every other kind of execution, and we can start to give up on the idea that execution itself is just a matter of, well, executing. The buy-side wants more. Steve Aldridge, head of macro esales, EMEA, Credit Suisse, says: "Pre-trade and post-trade;

execution-advisory has always been part of our offering. It's coming more into focus now, and it's something that clients increasingly ask for."

We can assume that those clients recognise their own need to be properly informed. Aldridge says: "It's often the case that a client will come to us with a general question, to which we can provide specific solutions. For example, if I'm an execution trader, how do I demonstrate that I'm doing a good job? How do I demonstrate to the portfolio manager that my execution is better via AES than by just hitting a risk price or using another algo product?"

Meanwhile, Bloomberg Tradebook have recently launched their Execution Consulting service, which is designed "to impact and add value to each phase of a well-crafted trade cycle", as the website rather nicely puts it. Stone continues: "Clients are looking at how their

orders interact with the market. Are they getting the results they are looking for? They're asking: what can we do with different tactical algorithms to achieve the results we are looking for?"

These, again, are clearly well-informed clients, even if what they're informed about is their need for a better understanding of what they're doing. Next question, following on from this: is the focus on transaction cost analysis in FX further stimulating the use of algorithms as a key component of best-execution toolsets? Yes, because TCA by its very nature emphasises the transparency that is so readily achievable via algo usage. Razaq says: "We give clients full transparency on execution, with the Cortex iX post-trade report we break down every single transaction the algo has traded. Furthermore, to support TCA, as a bank we are making ourselves fully auditable to our clients. To satisfy the best-execution requirement, we also give the client a snapshot view of the market, including all prices and venues at the time the algo traded."

Clients can audit trades and trade history, and work out whether they've received best execution. Oh, and algos are also handy for what-if scenarios. On this, Peter Bondesen says: "By comparing the market impact of similar execution algos in the same pairs during similar hours, trading desks

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will over time be able to optimise execution strategies through TCA analysis of the strategies." There's a virtuous circle spinning round here; imagine the content-rich meetings that algos enable. Bondesen, going on to discuss the range of comparisons/analyses available, says: "Whichever algo is being used, the most important variables are the credit facilities of the executing broker, the liquidity sources reached and the code itself, often using a combination of passive and aggressive orders to maximise the likelihood of completing the order within the timeframe without crossing the spread on all orders."

Scope for some really interesting conversations there. But there's more. FX-algo TCA is changing client behaviour. Gary Stone describes a recent past in which hedge funds would use tactical algos, while long-only funds would typically be much more tentative, and contrasts this past with a very different present. Stone says: "We're starting to see both the buy-side and the long-onlys work their order

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in the market, in an aggregator or manual-type fashion. The algos that people are using are reserve, I'll iceberg the order, or I'll peg the order, or I'll do different things in that realm." We've spoken earlier about the increased engagement that algos encourage; TCA is the enabling medium for that engagement.

Note, though, that engagement is as much strategic as tactical. Stone continues: "The innovation which I think is coming is that, in their DMA tactical algo suite, clients are starting more aggressively to think overall about how they want to engage the market. New algos are going to try to mimic some of the behaviour of traders." For Bloomberg Tradebook, as Stone explains, the new emphasis on the quality and nature of the client's market engagement is prompting a new focus on the algo's smart-order router and how it interacts with different liquidity points.

Next question. What work has been done to develop more adaptive

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Jonathan Wykes

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algorithms specifically for the FX market which leave minimal market footprints and which are a significant improvement and refinement on the previous generation of algos?

This is an interesting one, not least because equity algos existed before FX algos, and FX algos tend to be part of wider product suites. "AES is available across a large number of electronic asset classes, including equities, futures, options and of course foreign exchange," says Maniatopoulos. To offer a product suite across all asset classes is not, of course, to overlook asset-class-specific, FX-specific, development. Aldridge says: "What we aim to demonstrate to the client, over the hundreds of thousands of trades that AES FX has executed during the

last seven years, is that on average, they can improve their execution quality, execute inside a spread, or beat their benchmark."

ADAPTIVE ALGORITHMS LEAVE NO FOOTPRINTS

"We only deliver next generation adaptive algorithms," says Asif Razaq. "The algo market is fast-moving and we're constantly developing new tools." One of these is the "feedback loop". Razaq says: "The algorithms talk to the client and give them a view of what they're seeing in the market." Giving the example of a client using Chameleon (passive, stealth) to execute a large order, Razaq says: "While the algorithm is executing, we want to show the clients the very same market signals that the algorithm is utilising." The algo is using nanosecond technology, says Razaq, to work out the shape of the market, where the market's going, what its execution path will be.

There's a dial. And a red button. If Chameleon is executing rapidly in

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a favourable market, the client can use the dial to slow it down (in the expectation of further improvement in the market, say). The red button is coupled to a heat indicator showing liquidity. "The algorithms are designed to run on autopilot, but we want to give clients the option of turning off autopilot and flying the execution themselves," says Razaq. The red button – also known as the "start rapid fill" button – glows red when there's liquidity about. The client hits the button to convert a passive Chameleon into an aggressive Viper, and then hits it again to slow things down. A client with a hyperactive inner child can keep on hitting the button, passive to aggressive and back again, until the button stops glowing red and it's time to come in from the playground.

Having started the conversation talking about "third-generation adaptive algos", by the mid-point Razaq has shifted to describing "fourth-generation interactive algos". The future is here already, and it's answering back.

Jonathan Wykes notes: "One of the key things we've done here is make our algos more attuned to the unique characteristics of a particular currency pair and time of day." This is almost an obvious point to make, although not all algo-designers seem to be aware of it: different currencies trade very differently. Wykes says: "So in the background a user can set currency specific parameters for each algo, or let the algo dynamically adapt to the current market conditions in order to give you the best possible execution. The algo should be able to recognise that, say, EUR:USD might trade every 25 milliseconds but USD:ZAR only trades every 250 to 500 milliseconds, so there's no point in trying to replenish your liquidity in the market as frequently."

Time zones also impact on trading behaviour, says Wykes. "The other point is, the algo's engine has to

recognise which liquidity pools it should be executing, not just on historical data, but based on what's happening in real time." Part of the issue here, of course, is that the choice of liquidity pool can determine market impact. Peter Bondesen develops this point: "Broker algos are using a combination of external and internal liquidity to improve overall execution, and the combination of these multiple pools of liquidity has been optimised in some of the latest algos." What's adaptive here is the size of orders placed in each venue and how that volume is split into multiple smaller trades. Bondesen says: "These slices are disguised as part of the overall flow from the broker thereby not revealing the origin or size of the parent order. By maximising the amount done through passive orders, the direction is hidden from the market."

GETTING IT, MEASURING IT
What about peer-group TCA? Would this, first, reveal the benefits of using execution algorithms,

Steve Aldridge

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and secondly, would it lead to a significantly increased adoption rate? The issue arises because banks, understandably enough, provide their own proprietary forms of TCA. These, although comprehensive in themselves, do not necessarily provide a level playing field for comparison by, say, prospective clients or indeed regulators. Evangelos Maniatopoulos says: "It may be that regulators will require FX to change from OTC to an exchange-traded market. Without agreed rules of engagement and guidelines as to how trades are meant to be executed and reported, and what kind of

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information should be disseminated to the open market, it is difficult to reach the level of transparency that clients are accustomed to in other asset classes."

To answer the questions at the top of this section, and taking into account everything else said so far – almost certainly, and probably. That said, Jonathan Wykes sounds a note of caution. "One of the constraints of peer-group TCA is that while clients may execute similar trades, they could have quite different reasons for entering into them. At the moment, trying to incorporate personal factors into peer-group TCA is virtually impossible to do," he says. "Peer-group TCA also doesn't account for the exact amount of liquidity available at any given time, the underlying volatility or the price action, so its benefits are limited to

giving a 'rough guide'."

Later in the same conversation, Wykes says: "Algorithms do what they're instructed to do. The more you articulate your objectives through the parameters contained within the algos, the better its performance." Which is a thought-provoking observation in itself. It also raises two further questions beyond TCA. To use the right algo at the right time is partly a matter of effective and ongoing pre-trade, real-time and post-trade analysis, but it also requires dialogue. Maniatopoulos refers to the "significant dialogue, communication, education, constant support" that AES FX users can expect to receive, and then takes us straight to the second of our two further questions: getting the thing plugged in properly.

What issues are involved with integrating execution algorithms into buy-side workflows and overcoming the complexities of integration? Maniatopoulos says: When clients request trading access over a new platform, you need to be able to tick all the boxes. You need to be able to manage connectivity, handle trading into single/multiple accounts, offer access to a large number of currency pairs, have STP in place, and of course do all of the above very well." Connectivity is key.

PUSHING THE PARAMETERS
In what ways may the parameterisation of execution algorithms enable changes in their behaviour by clients on-the-fly? Jonathan Wykes says: "We've recently launched an algo called Whisper, which provides direct access to our highly coveted internal-only client liquidity. Key new features of this tool provide traders with the ability to expedite execution, increase customisation and streamline usage. For example, the 'Take Profit' feature follows the market and captures spread while also setting boundaries around how far the algo should go. Similarly the 'Expedite' feature speeds up the fill rate of an order if the market starts going against you. With these enhanced capabilities in mind, we have 'whisperised' our other algos – by taking some of these key parameters and applying them across our strategy suite."

If client engagement is the future, parameterisation is the future. Wykes says: "The clients that perform best are those that have a strong understanding of the different parameters that are available to them and keep an eye on what they're doing." Wykes also makes a very good point about evolution: go back. "So when you create new parameters, you not only apply them to your latest strategies but also see if you can go back and re-tune your pre-existing strategies to work better."