

Interview with a trade surveillance expert

| | | |
|----------|-------|--|
| SPEAKER1 | 00:02 | Recording started. So first off, could you describe your investment firm sector or subsector? |
| SPEAKER2 | 00:17 | So currently execution broker in cash equities |
| SPEAKER1 | 00:24 | Does your firm sort of trade in any other products as well? |
| SPEAKER2 | 00:32 | Yes, it does a little bit in the fixed income, but predominately cash equities. |
| SPEAKER1 | 00:36 | And how would you describe the investment firms' goals? |
| SPEAKER2 | 00:41 | And it would be predominantly to provide liquidity to the market and execution services to institutional and retail brokers. |
| SPEAKER1 | 00:54 | And how would you describe your role in the firm? |
| SPEAKER2 | 00:58 | And my role is within risk in governance. |
| SPEAKER1 | 01:02 | And you look after any specific areas or is it quite generalist? |
| SPEAKER2 | 01:08 | Generalist, but it covers the whole front office. |
| SPEAKER1 | 01:11 | OK. And in the business, the fixed income business is a business. How is that business done? Is that an electronic sort of business or is it a voice brokerage? |
| SPEAKER2 | 01:26 | Is predominantly high touch. So, the majority is my experience, which will probably be more helpful to is that previous firms were often more involved in that. I touch a lot of things. |
| SPEAKER1 | 01:37 | OK, and while maybe in your in your other firms as well, I mean, I'm interested in general, but in the maybe in your previous experiences is that had a lot of involvement with sort of like fixed income products as well? |
| SPEAKER2 | 01:57 | But to a degree, yes. So previous experience again was based on my cash trading skill, but also had some cross up with some sort of, you know, credit products, some exotic derivatives as well. |
| SPEAKER1 | 02:15 | And in your experience, I mean, are what types of algorithms, if any, are deployed in that kind of space? |
| SPEAKER2 | 02:27 | So, in the fixed income space of that time? |
| SPEAKER1 | 02:30 | Yeah, yeah. Any time now and whenever, really. |
| SPEAKER2 | 02:35 | So, again, obviously a space that is developing significantly. I think, again , previously, a lot of it was just more, you know, your very simplistic sort of execution algorithms that were really there just to sort of clear up risk, you know, didn't do anything particularly funky, maybe on the basis that, you know, fixed income markets traditionally haven't been as fragmented as equity markets. So, the kind of execution algorithms is relatively straightforward. So, again, I've really seen in the past has been mainly just |

used purely for execution without adding any sort of wider strategy on the. That is definitely changing now. Obviously, a lot of fixed income, the fixed income world has been brought, you know, sort of an exchange on ETFs. And, you know, because of that, you're seeing the development of fixed income guys, absolute market data getting better as well, that sort of much more readily able to sort of design algorithms that sort of help with execution.

SPEAKER1 03:42 What kind of strategies is predominantly sort of execution management?

SPEAKER2 03:50 From my experience, is what I say....

SPEAKER1 03:53 And., I mean, from what you've seen, are you seeing in that sort of space any sort of trend towards sort of more sort of machine learning? I type Algos more than just sort of the traditional, so basics of rules based on how it goes.

SPEAKER2 04:09 Yeah. So definitely, yes. Again, a lot of I mean, I saw a lot in the fight as well, again, because of the fact that the fixed income vote is coming more. And so, I don't say more transparent because it's making it sound like I'm using the terminology. But since it's come on, exchange a little bit more and there has been more access to market data, a lot of people were doing, you know, were involved in algorithmic development where they were looking at sort of machine learning processes in terms of obviously what opposition are doing , in terms of what predicting market trends. Again, just trying to, you know, again, bring it in line with the equities, what really make them just a little bit smarter. So, you know, they can you know, they can better react or more quickly react to any changes in pricing or participation from, you know, opposition algorithms basically being able to suss out there or not and work out if they're getting gamed.

SPEAKER1 05:10 And what is your I mean, currently or maybe in previous experience, what's the sort of design deployment recalibration process look like? And, you know, what was your sort of involvement in the compliance level?

SPEAKER2 05:27 So, yeah, and again, I'm going to be referring to previous experience, to be honest, not this one, but your previous it's so really what it did was you'd have the business, I mean, going right from start to finish. You'd have obviously the business generally how they came about. You know, they would identify a trend or sort of a deficiency with the with an existing or execution process within the EMTs. And, you know, the guys would take a look at it, sort of figure out what could be developed at that point. You know, they would come up with a sort of a, you know, a strategy, go within the algo itself and compliance go it at that point, which is where I was sitting. And, you know, it was on, you know, trying to determine, OK, what is the strategy goal of this particular algo? What could be the potential impact on the market? What, if any, you know, is this going to be considered a material change so that the definition and we need to notify and exchanges, where is it going to connect? So, a lot of it was around sign-off and understanding, you know, the kind of conduct of the algo, really. And then if that was all sort of agreed, the concept

stage, then go testing. You know, obviously you'd have huge numbers of dev teams doing that on the algo, again recreating test environments to make sure that the algo effectively does what the proposal said it did and then generally came back to the final sign off and one more round of testing and then it was deployed.

- | | | |
|----------|-------|--|
| SPEAKER1 | 07:00 | And you mentioned conduct. Now, what is your understanding of conduct risk, the term conduct risk? |
| SPEAKER2 | 07:08 | So, conduct risk really is I mean, it's especially with the advent of SMCR, the guide, you know, the guidance that the FCA has put out there. It's extremely broad, really. It's not just you know, it's not just down to the individual user of an algorithm that runs right through the lifecycle and development stages of the outcome itself. I mean, you've got that. That's the thing with all of us, to be honest, actually, and especially, I guess something to consider in the fixed income. And you talk about trading conduct, you think of a particular trader executing the strategy all day, taking reasonable steps to not create disorderly impacts on the market or whatever, but with an algo. Now, there's so many different people involved in the development that, you know, you conduct stretches right from, you know, somebody's coding the algorithm to the person getting it signed off or whatever. And that's one of the really the big challenges, I guess, because the scope of individuals involved is so large. And, you know, how do you know how to control functions, understand precisely what the algorithm does. You know, that again, kicks up. The question is, do you need people in control functions that can code, you know, because it's not necessarily just an algorithm would be coded to do something which is particularly or intentionally detrimental to the market. It can be unintentional, disorderly impact as well. I mean, the conduct of the algorithm and the conduct of the people involved in that lifecycle of developing it is huge. And that's really, I think, what the challenges have always been, what it's come to our governance. |
| SPEAKER1 | 08:47 | From current or previous experience, I mean, how do you write this sort of framework that internal firms have put in place maybe to mitigate conduct risk? I mean, firstly, are they there at all? And also, are they actually looking at conduct risk? I think of conduct risk in the context of maybe algorithmic trading specifically, or is it mainly human? |
| SPEAKER2 | 09:11 | I think it's mainly human, to be honest, and I think it's a little bit of a gap. And I think people now know that, realize that. But a lot of the conduct, risk and governance processes around algos are, you know, all compliance involved, all the control functions involved, the right stage of the process, et cetera, et cetera. But again, I guess one of the complex things about it is there's a lot of coding and very complex and technical development that goes into these. You know, really, you should be thinking about how we can, you know, test and conduct. You know, you can have processes in place about how we physically know, you plug the algorithms which on how we know what it's going to be |

doing is in line with the market conduct standards expected of the firm. And, you know, I think until you have more control functions that have, I don't think it's happening. I think people are beginning to upscale in terms of coding knowledge. I mean, I feel like a lot more of the graduates that come through these days all seem to have pleasant experiences, become a thing that, you know, so many of them do. And obviously that will, I think, lead to development and changes in the in the approval process for these algos where, you know, people can better check that the code is doing what it says is doing.

SPEAKER1 10:28 Are you I mean, are you sensing I mean, I mentioned earlier about, you know, the fixed income maybe be moving from a, you know, a higher touch to a lower touch type of environment. I mean, equities obviously were the birthplace of most algorithmic trading. Yeah. Are you noticing? Is there is there a big difference in how algorithms are managed and perceived in each of those sectors, or is that sort of a cross pollination and, you know, this is sort of levelling up between them? Or is it quite siloed and actually wants more sophisticated than the other and it's systems controls framework?

SPEAKER2 11:16 I think you've probably seen a lot of similar in terms of the systems and control framework. You're seeing a lot of, I think, cross over now. I think people are trying to apply the same sort of frameworks purely on the basis that a lot of what we're seeing in the fixed income world, like you say, is levelling up. So what we've seen in equities over the last 10 years and I think, you know, again, when it comes to even though there's obviously structural differences between the fixed income markets and the equity markets, I mean, you think of how fragmented equities has become since MiFID II with, you know, obviously these caps on dark pools. You've now got, you know, periodic auction venues. You've got these conditional venues. The crossing closes. You know, the number of venues from now is absolutely crazy. I mean, you've got this concept as well, has released a report on this not so long ago about the concept of ghost liquidity, where, you know, you've got algos that are paying the same order out to multiple different condition venues and then took all the orders that don't get the bite. Whereas I'm so sorry. You say if they split out five child orders, one gets the other for, you know, a lot of other algorithms are taking into account will actually hang on a sec. Is that being that genuine liquidity or not? So, again, that's you know, that's another aspect of sort of the equities world. You know, you've got to have additional processes in place around your algo. Again, is this ghost liquidity having an impact on the markets? Obviously, there's going to be differences there with fixed income because they don't have the same level of fragmentation. But in terms of the overall approach to governance and controls, I see a levelling up. But again, what's really interesting is that, you know, you've got a lot of these massive algos now and again, this applies in fixed income to the same to equities. You've got these huge algos that acted like a risk in time. And these are really and, you know, people can just throw large orders into these and

just apply them, but, you know, the lower touch, especially, again, you've probably got way more experience in fixed income than I do. But, you know, especially in fixed income market square, it's not as straightforward as it is with the cash. Equity products are far more complex. Are you going to want people that, you know, still need somebody on the end of the phone whilst you've got algorithms used for execution? You're not going to want somebody that you can speak to. You're not going to want that multicolour. The understanding how much of it is going to drive forward versus what we've seen in equities, because realistically, there's still two very different sectors and....

- | | | |
|----------|-------|---|
| SPEAKER1 | 13:55 | I mean, what is your perception or, you know, maybe the perception of your firm as to what the main conduct risks. That exist, which are associated with algorithmic trading even today or maybe in the future. |
| SPEAKER2 | 14:13 | I mean, I would suggest that the main risks come around the use of them. So, again, even though you say they were very bespoke strategies within algorithms, you still have a user using them. So, again, it's I guess one of the main conduct risks that you would consider is how those are being used and how they're being understood, because I think that's another thing as well as our rooms become increasingly complex, it's making sure that there's an educational levelling up of the people that utilize them because again, still effectively the firm's membership ID on these algos. So even there's any consequences, unintentional is still it can be a potential problem. So, I think as these algorithms again become more sophisticated and markets become increasingly fragmented, it's one of the main issues is to understand is the educational side of things internally really making sure people understand how to use them correctly? |
| SPEAKER1 | 15:15 | And how do humans stay abreast of developments relating to this? |
| SPEAKER2 | 15:22 | And again, that comes down, I think, to the governance process internally is making sure there's a linkup between the stress teams or the teams that do make the development to make the tweaks. That needs to be a posting process internally. I mean, you know, again, comes down to what you define, what you define as a material change or even slight tweaks in functionality. You might be making a really, really small change to the code in an algorithm. But, you know, you need to make sure that that's communicated because it could completely change how the trader interacts with the algorithm. And if they're not understanding that slight change that could cause them to conduct issue, they could trade in a certain amount of thinking that it trades one way when it doesn't. And the issue of the exchange could this issue with your ability to manage. So, I think that's something that I've you know, I've always seen as vital and it's not always brilliant in places, is that these small changes, like people think I'll bring you algorithm or a radical overhaul of the investment strategy of the algo. That's when you post. But even tiny tweaks to code to making sure that that's front to back recorded. And I think then |

inventories, a sort of inventories with layman's terms of how it works, are really important as well, perhaps sometimes just them for granted.

SPEAKER1 16:44 How do you rate the current levels of knowledge in, say, different departments, obviously front office, senior management support of maybe algos and the conduct risk they could cause? Do you think it's improving or is it is all that sort of big sort of differences between those different areas?

SPEAKER2 17:08 Again, it totally depends on the quality of algorithms around because, you know, you might have people in really, really, really liquid sectors of the market that, you know, use our guys all day, all day long and very so very excited with work. And then, you know, you might have other people that are in low liquidity areas of the market or in credit driven stocks or whatever, where, you know, algorithms aren't necessarily as useful as utilized so you're obviously not sure you would expect the education to not be as strong, again, free from previous experience. Something that firms always seem to grapple with is the execution capability or the execution performance of algos and low liquidity stocks and sectors of the market. So naturally, you do see a bit of a divergence in in education. I think from senior management perspective, I think is massively, dramatically improved. I just I think a lot of us down to SMCR are like, you know, people realize they've got to have a handle on this stuff because when you're in for a particular area, you've got to you know, you've got to understand, you know, conduct. His conduct is at the top of your agenda list. Right. So, you know, you've got to have a handle on it. So, I think it's massively improved over the last five years and...

SPEAKER1 18:32 Are you aware of any sort of conduct risk incidents involving Algorithm's in the past few years and what maybe other firms or maybe regulators in the sector could learn from that?

SPEAKER2 18:46 I can't really think of any specific to algorithms, to be honest. I mean, I'm sure there's stuff out there. I don't think of any significant conduct issues that have resulted in, you know, an algorithm has been mishandled or poorly signed off. I mean, yes, you've got instances of market abuse and stuff where now guys are being utilized just because it's common in execution rather than it being specifically down to sort of an electronic side of the market. I got to be honest, whenever I think that I'll go conduct my mind the way straight, that it's to Knight Capital, really, because I was kind of the advent of the law. That was the beginning, really, of the governance around our guys, you know, kicked off the ESMA electronic trading rules. And so, you know, that was solidified with all RTS 6 and MiFID II I always think back to that. I mean, it's a classic example of poor governance, isn't it, where, you know, and things obviously moved on dramatically since then. Where, you know, testing and QA wasn't done to the standard should have been and there wasn't that approval process for rolling out. I was just thinking back to that. I can't really think of anything significant. The market I've seen probably overlooking something, to be honest.

| | | |
|----------|-------|--|
| SPEAKER1 | 20:00 | But do you think that the market is not aware of any instance, do you think it's because there's a lack of ability maybe of regulators, maybe exchanges and possibly also surveillance staff to actually identify issues? |
| SPEAKER2 | 20:22 | <p>Exactly. Well, I was about to say, I think it's really, I think, one, it's probably because there is a decent level of governance around this. But I think because to that, it's not reluctance. I think there's a great degree of difficulty on the on the regulatory side to really sort of get a handle on what they're saying. I mean, probably, you know, how do you define conduct issues in the world of algorithms? Maybe that's I mean, you know, there's even the guidance in what sort of demonstrates good and bad conduct just from a human personal perspective has been really you know, it's been really unclear, I think, from the regulators. So, they're probably trying hard but struggling to define. A poll conducted an hour ago wrote, I mean, it's very easy to look at algos, had an impact in terms of what the front office procedures of how you implement and roll that out is hard. I think surveillance systems, again, from what you hear, I think of again, improved dramatically with within regulators and exchanges. I know that from what I've heard, the FBI and the NSA have sort of started implementing new again machine learning software to get a bit of a better handle on all of this, because, again, the level of data that it's probably consumes is real. So maybe we might see something a little bit more as time goes on. But again, I do think a lot of it is down to the fact that the release processes, of course, are better. I mean, you definitely see less in terms of algo and, you know, algo sort of impact on the market that used to feel that way anyway. I think what you probably have even now, if you think about some of the really noxious things that we've seen in the last couple of years, last year and a half, with regards to the pandemic, you know, some of the volatility that we're seeing on some of the major indexes, you know, even though a lot of people probably point out guys and say, well, is probably exasperated by algos, you're still not seeing the kind of spikes that flash crashes that we used to see back in the early noughties . Again, mainly because a lot of these are now a better coded and they know when to pull out of the market or they know when to you know, they've got Kill switch. No Kill Switch is necessary, but they've got some breakers in that, you know, they won't be on the same price because they know they don't want to exasperate a trend. Again, I don't know. It's just a personal feeling. You just feel like you see less of this stuff at the moment that you have done in the past. And we've got a really volatile year and a half of trading. So, it's almost like it's a bit of an acid test for where we currently are with our governance.</p> |
| SPEAKER1 | 23:08 | And I mean, are you seeing any moves by firms to reduce overhead and sort of, you know, cut their staff? |
| SPEAKER2 | 23:20 | I saw it, yeah, I saw it in the previous time. I did. Yeah. That was a larger institution. I think that was a lot of that as well, that automation, a lot of, you know, a lot of it being put into risk engines as well. I think these centralized risks that a lot of these larger banks have now, for example, will probably |

ultimately lead in a reduction in headcount. I mean, but then it's offset by the number of strategies. I mean, you know, the number of strats that you have and the size of these teams and the size of the testing teams and ultimately the size of the validation teams they even have on the back of that, you know, completely offsets any headcount that they lose all the traditional headcounts. In terms of people on the desk sort of thing, it's completely offset by the number of people they take on to actually run.

SPEAKER1 24:14 Do you think that's having an impact on levels and types of conduct risk? I mean, is it all conduct risks, the types of conduct changing as a result of that? Because obviously with human traders, a lot of it's driven by emotion of various description. And then, you know, if you make if you put in a decision in the hands of a computer algorithm, you don't have the same sort of motivations, I suppose, in the agent itself. Or is it just sort of is it really just all the same and there's not really changing much?

SPEAKER2 24:48 So, I think ultimately it's an interesting point, because, yes, you there is a still a degree of emotion that's removed from it, but you've got somebody operating these algorithms, right? And it's generally and from what I've seen, again, it's generally still traders that are utilizing these algorithms that there's still a degree of emotion that goes into it. So, I still think that to a certain extent that, you know, the overall conduct themes are still, you know, completely irrelevant. I just think, like you say, the extent to which we traditionally thought about conduct I some an individual when it comes to algorithms and groups of individuals now with different motives. So, it's not all just down to one particular person picking the button. It's you know, you now have to think about conduct right the way through the chain, like is this particular person exercising skill care and due diligence throughout the process. And, you know, it's not necessarily integrity towards the market. It could be somebody else on the development side. That's a completely different sort of conduct obligation. I guess that's why a lot of larger institutions pour so much time into the conduct trainings and effectively try and make everybody realize that they're responsible for every single part of the lifecycle.

SPEAKER1 26:08 And I mean, do you think like large levels of self-calibration where. You know, an algorithm might originally be conceived and then was taking in new data all the time, and eventually it actually changes its own code to reflect the changing market conditions because things are happening so quickly, and no one wants to lose the competitive edge of having to sort of take action taken out of service. It looks like a pit stop and then put it back in the running. Do you see that? You know, any sizable moves towards that or is not quite limited and, you know, that's not really something which is really on the horizon.

SPEAKER2 26:47 Um, it's a good one. I would suspect that. Good question. So, the question. I think there will always be a move, I think they will move towards that, mainly because, like you say, the rate of development. I mean, you can see it almost

as a secondary stage to the machine learning aspects of algorithms, and they change their behaviour based on what they see in the market at that point, if they feel like they're being gamed or if they are poor performers, you know, algos who pull back or pull out or change their behaviours then so in the way they're reacting to market conditions, that particular point, without anybody having any particular input into that change, I guess there's no difference. Like you say, there's no social changes or whatever. They'll change how firms are going to put a governance process around that. I really don't know. I'd have to really properly think about that one. That's because, again, how can you attest that, you know, your proper obligations towards the market? You know, how can you truly attest that? You know, you fully understand what the algorithm might do at any moment. You know, you can't really.

- | | | |
|----------|-------|---|
| SPEAKER1 | 28:10 | And I mean, he touched on the surveillance tools that are being used currently by the firms do they tend to be in House, built, are they then the build of a T+1 in real time? What sort of stuff? |
| SPEAKER2 | 28:34 | I've seen a complete mixture in four different places. Yes, I've seen some off the shelf. I've seen some majority in House developed plus one. But I have also seen 15 minutes. I mean, I call it real time, 15 minute delayed, surveillance systems as well. But what you're also seeing now, and I think a lot of this is because of electrification and SMCR, you're seeing a lot of roles like my own, where you're embedding a control function within the first line. And there's a lot of real time monitoring done there, separate to the surveillance system where you look more at trading trends than specific market abuse. |
| SPEAKER1 | 29:22 | Interesting. And what do you think motivated firms to sort of develop surveillance tools in-house as opposed to sort of buying them off the shelf? |
| SPEAKER2 | 29:32 | I think a large amount of it is down to costs. I know certainly like some of the big ones like Smartens that you would charge depending on market access, depending on venue you wanted to monitor as well. And I think the costs probably spiral for certainly a lot of the smaller brokers. I mean, some of the big banks probably went down the of well, you know, if this is what the FCA certainly used to and, you know, if we do, that is a very easy to say. Well, yes, automated systems, you know, up to scratch because it's the same one that you used. But I think a large amount of it is down to cost. I think the other thing as well, it's one thing I've noticed is that you get a lot of bottlenecking with the development teams at these firms because they've got multiple clients, you know, whether there's a regulatory change or a certain level that's gone out which talks towards some sort of market activity. You want to develop your surveillances on the on the back of that. You know, different firms have different requirements. And again, you know, they may say, yes, we can do that, but it would take six months to roll it out. If you take control of that in-house, then it's you know, you've sort of got your own development at your fingertips a little bit more. But again, I've also noticed in the past that scrapping for development resources to build out the same system internally |

is not always necessarily the case that surveillance is at the top of people's agendas. And, you know, is there a degree of, well, we have a surveillance system as good as we've got one that's good enough? And how much he's put into actually physically developing them. I've seen the pros and cons, really, because you can buy off the shelf product, which generally has to stay very relevant because otherwise they won't be competitive. But there's obviously just a big cost associated with that.

SPEAKER1 31:22 I mean, I suppose as well, in the firms that you've been associated with, are they deploying algorithms that are sort of off the shelf from sort of vendor ISP platforms or are they developing their own algos internally?

SPEAKER2 31:36 Generally, only times the sort of external algorithms were utilized as if they were using a local broker to execute everything, I normally say it is in-house developed.

SPEAKER1 31:51 So, is there any sort of development of a new algo functionality or platform or where it's embedded in a trading platform that's given out to clients or something? Is that sort of an automatic tie up to surveillance and is there maybe, you know, when they're developing in-house surveillance systems, is that all they customized to the actual trading systems and how those are being developed? Or is it very much like one of two separates?

SPEAKER2 32:20 To what I've seen, very separate, and I think that's half the problem. I mean, I talked earlier about the, you know, the importance of even minor tweaks in algorithmic activity down to the traders. I mean, that's obviously highly important. But again, in experience, you know, it's the number of times that people forget to post surveillance on these sorts of things. It's this is bad because, again, you can think of even the smallest change where they might point to a different venue will execute a different type of order depending on how dynamic and flexible your surveillance systems are a lot of them that I've seen in the past that are highly dependent on sort of manual updates from development teams, know if you're not communicating a small change in your outlook, then you're potentially missing that flow in your surveillance , provide a completely different picture to that that you're actually monitoring for . And, you know, inevitably what happens is you get an inquiry, come through the door from the exchange or from the FCA and the questions always will hang on the surveillance hits on this. And , you know , nine times out of ten when the answer is no is because I'll hang on whether the business made a made a dev change the go three months ago , which meant it pointed to a different venue or point to a different part of the process or when even if you get slightly more technical , the software or the line handler changed . And you know, again, depending on how dependent your surveillance is on certain aspects of your flow, it stops picking it up because it just was recognizing an old line. Again, I think it's something that people are recognizing more and more, though, people are starting to bring them into,

you know, into those changes. It's definitely something that's been overlooked in the past. I can remember it happening a few times in previous experience.

SPEAKER1 34:07 And is the focus really being very much on detective control systems wise, or is part of any moves? Do you see any moves to implement preventative controls?

SPEAKER2 34:18 So, I would say definitely the latter. I mean, obviously, those detective controls, T+1 surveillance have been around for a really, really long time.... Yes, I mean, detective controls have been around for a long time, plus one surveillances and reviews are all pretty well established. But, you know, you're seeing a lot of, like I said, a lot of fun now implementing these first line functions that do real time monitoring. And again, I mean, your preventative controls a lot around you. You pretty control frameworks that you have on your algorithms. You know, you have sort of controls and exposure. You have your kill switches; you have your price aggressive checks. You know, those sorts of things, I think are all very well established and checks that really you wouldn't get signed off without those in place. I think the biggest development I've seen is in the first line and first line monitoring of these processes. It seems to have been based out across the board.

SPEAKER1 35:30 And are you seeing any moves maybe to look at the actual code itself in the sense of actually designing in ethics or designing a good culture? So, I think there was an analogous sort of situation in the States with some of the things that some of the products that say Google have developed where, you know, those products may for example, it may be like a financial adviser product. And so, they that previously, I think they found in earlier iterations they were giving financial advice, making assumptions about people based on their zip codes and stuff like this, and assuming that they were poor, then maybe they weren't. Yeah, they had to go back to the code and actually try and balance the ethics of it to make sure certain people weren't discriminated against. Have you seen or are aware of anything where firms are maybe taking a similar approach in trading?

SPEAKER2 36:26 Yes, I am. So again, that's kind of the point I was making earlier about the region. Traditionally, that has been and, you know, I consider myself in this bracket really that, you know, I've been heavily involved in algorithmic compliance for a lot of my career, but I can't read code. So, let's be completely straight. There's only a degree of how useful when you're trying to attest to the conduct of your algorithm, what it does, you know, it's why I said that it's probably a good thing that you're seeing a lot more people who enter into the into the market now with Python experience. So, you're going to get more people in control functions with that. So, again, I've had direct experience of the third or fourth type, bringing in teams now that

SPEAKER2 37:13 are

SPEAKER2 37:14 sort of controlled checkers with coding and they can read them, and they will go through the output with a fine-tooth comb and effectively make sure that not rather than explicitly just saying that's what, you know, what you're saying is what it does. It's going through each part of the process and saying, OK, well, is that, you know, is that technically what we want it to be doing? What's the impact of that going to be? What will that do to the client order? And like you say, I guess there's a degree of, you know, his conduct, isn't it, really, it's the conduct considerations of the algorithm itself is in line with the you know, with the expectations that we have on the firm in our execution. Firms are definitely up skilling in that area. You know, a lot of firms that don't necessarily have the resources to sort of implement that. It's down to their training is down to their conduct. Training is, again, like ramming these principles home into people's minds so that when they are carrying out that function, when they are writing the code themselves again, they will think about what conduct means to the firm and what it means in financial markets. So that probably be what is done down the smaller end of the market for firms that don't have the capacity or the size. But, you know, again, [REDACTED] here. Yeah. Is they're going to be having teams of people that will be doing this that are based within compliance.

SPEAKER1 38:37 Can you foresee a situation where the regulation of the trading in markets becomes almost black box to black box, so rather than having, you know, just relying on preventatives and detective controls, you actually have the regulator or the exchange deploying algorithms of their own to identify poor conduct in real time or erroneous or something real time and actually exercise almost like a kill switch or something similar or shepherd the trading into a different life? Can you see that?

SPEAKER2 39:19 No, I don't think I can, actually. I think I mean, that's a whole a level of intervention, which I think would be unprecedented. I mean, you could say it's the new age level of circuit breakers, because obviously the LSE as an example has your segment percentage limit. So, if you trade above that segment limit versus the last traded price, it triggers a vol break. So, you have those and obviously some of the other exchanges we know have kill switches in place. But to have something that physically goes in and to use the phrase you use "checks" behaviour. I mean, that's some significant intervention there. I'm not sure I can see that happening. It would have to take a market that was properly bad in a probably really bad oversight from a particular firm. So that's abrogating any kind of traction, I think. I mean, it could be totally wrong. But you look at I mean, even though it's a completely different topic, you look at how the Robin Hood GameStop situation was treated in the US with regards to, you know, you're talking about sort of access and intervention, shutting down the stuff there. I mean, that that caused more than enough political fight back. I mean, you had senators commenting on that sort of thing, started to move towards that level of intervention, I think,

which I mean, it'd be really interesting to see if it does happen, but I can't see it happening anytime soon, though. I could be wrong.

SPEAKER1 40:52 How about, you know, this whole focus on incentivisation, deterrence? Because there was a there was a paper that was published by the EU not that long ago, certainly within the last 18 months. I think it was on possibly it was discussing whether to ascribe agency to ossified artificial intelligence bots so it could be, you know, it could be a what a bot is, you know, it could be a multitude of different things. And obviously, human beings under SMCR have always been the target of things like potential liability, trying to make sure that there are incentives to behave in a certain way. And one of the things that strikes me as a possible area of change and possibly SMCR could even be out of date. Now, as we speak, is that as some of these artificial agents become more intelligence and more self-adjusting, will it be is it you know, is there a possibility that they behave in ways that are not even reasonably foreseeable by their creators? And so therefore, the regulation has to focus more on the or the drive towards conduct, has to focus more on the artificial agent itself, as well as just the designer. And I think a good example of this is where this just happened in general lore is that there was a moral panic in the early 90s about dangerous dogs. And there was an act passed by the Parliament here, the Dangerous Dogs Act, which, of course, put penalties on the owner if the owner had been shown to rear the dog in a bad way and this kind of stuff. But also, it left in there the possibility of destroying the dog as well, which also is almost an admission that the dog is its own agent because you are actually destroying the animal. Yeah. I mean, what do you think to that? I mean, is our human still seeing themselves as the centre of attention or is there a possibility that actually the algorithms become more important?

SPEAKER2 43:11 Yeah, I robot level stuff. Yeah, no, it's a really interesting analogy as well. I mean, it's kind of again, goes to the point I was saying earlier about how algos develop and change depending on known market structural shifts and whatever. And it's a really difficult question for science because, you know, at what point how can you control that? Like you say, SMCR is still very focused on the individuals, because even when you look at governance, it's like, OK, each individual along the chain, how have they acted and what conduct they displayed? I still don't know if that's one that is quite thought-Provoking, and I would love to sort of sit and mull that one over, which I probably will do. But my instant reaction is that. I don't know how would you go about that? How would you go about putting conduct around? The agent, so to speak, how would you do that? I mean, you still got individuals which are deploying it. You still got individuals which can control it. I mean, is the emphasis on them to make sure that it doesn't develop in such a way that it kind of goes beyond the bounds of what it was originally designed to do. But then, like you say, like you said earlier, you then got yourself a competitive disadvantage. And, you know, morally you're going to do that when, you know, the other firms aren't necessarily doing the same thing. Pretty hard, that's a hard one.

| | | |
|----------|-------|---|
| SPEAKER1 | 44:40 | I don't know if you've come across the books, Homo Sapiens and Homo Deus? |
| SPEAKER2 | 44:45 | I have read Sapiens has a great book. |
| SPEAKER1 | 44:48 | He read. I have a guy. Yeah. So, he talks about this kind of stuff in the second book, he talks about the fact that humans have been used to being the most intelligent being on the planet, the last sort of 15, you know, 15 years or whatever. And that obviously it may well be that humans create something that become smarter than they are and getting that conceptually, understanding how that could affect things like liability and who's responsible for, you know, things in everyday life could be quite a difficult one for humans to grasp because the whole systems of governance structure in such a way that we are really centre stage. |
| SPEAKER2 | 45:32 | Exactly the point I had to get to that. Are you going to move towards, and this is your point. Are you going to move towards a point where that's outdated and or are we there already? Because, you know, like you say, you've got systems in and processes in place that are more intelligent, that person, and I was still trying to cling to what I said, are you still trying to cling towards the while? You've still got people that growing them and putting them out there and it's still on that. But then it's down there again. If you great in these processes that are so intelligent and fair to, then expect them to. So, you know the exercise proper control and governance over the process itself is quite a thought-provoking one, actually, and, you know, how are they going to kind of get a handle on it? Maybe that's when the point around having regulatory black boxes makes sense. Like you say, you've got to stop algorithm's running wild in the marketplace and is not really being able to have a proper control over them. Is that when you put in something in the exchange or the regulator has something that's a counter to that and like you say, always keeps activity within. You know what we understand to be? Execution type activity in a financial market to make sure that it doesn't do something that is just so out of the ordinary, and then again, it comes down to the argument of, well, you are stifling change, you are stifling competition, you are stopping the development of what is a free market. That's really interesting. |
| SPEAKER1 | 47:15 | Are you I mean, what's your view on maybe industry sector wide collaboration to maybe examine some of the issues with algorithms and conduct? Is there much collaboration? |
| SPEAKER2 | 47:29 | I think it's fair to say, yeah, I think it's very secretive. I don't think there's enough I think you get you know; I think you get roundtables with Chatham House rules between banks when it comes to change. You know, when they talk about obviously, naturally the impact of some of their processes because of the rate change but conduct discussions around these sorts of processes, I just don't think it really happens very much. It's all very internalized. And I think you say this because there's a high degree of secrecy over it, probably, again, sometimes a lack of understanding, therefore a reluctance to really |

look at it. And so, yeah, say it's not something that is I think that is more needs to be done in that respect to sort of get people openly talking about it. But then I guess it's not necessarily to some people's advantage because they don't want to stifle, you know, commercial development.

- SPEAKER1 48:28 Who do you think should take the lead? And it should be, and should it be a bottom-up civil industry led thing or should it come from legislators and regulators?
- SPEAKER2 48:36 You would like to think it's bottom up. I think it would be difficult for the regulator to, again, sort of enforce that saying I think it's like you said, state needs to take the biggest participants in the market. So, I mean, you have a lot of these seminars and things that go on in the world. And that's, you know, again, it just needs you need people to start organizing that sit down together, because when they do, it tends to be when the best ideas are floated around that these big participants are always the ones that are in the forefront of this stuff. So, I think they need to take greater responsibility.
- SPEAKER1 49:17 You mentioned RTS 6 earlier, are you familiar with the approaches that are being taken, maybe elsewhere in the world, maybe in the States or any other sort of foreign jurisdiction? How would you rate maybe the approach of, say, our regulators and authorities versus those in those countries in terms of how they were approaching these types of issues?
- SPEAKER2 49:37 So, I would say by only I mean, again, previous time I worked for the global firm. I got a bit of exposure into how it's done in the US, and I would actually say that whilst people might argue that aspects of RTS 6 and MIFID are slightly restrictive and not very efficient, I think, in terms of our governance, it's I think it's always felt like it was stronger in Europe than it was in the US. There's a lot more prescribed rules around about algo development.
- SPEAKER1 50:23 Is there much cross pollination between sort of developers in maybe the financial sector, do you think, with other so highly regulated sectors, it could be, you know, the health sector could be defence of a highly regulated sector? And do you think there's much sort of cross pollination in terms of where you've seen maybe examples of good practice, like good safety practices maybe that have been there with the airline industry or something like that? But they're making their way into the thinking in algorithmic sort of development here? Or do you think it's very much separate?
- SPEAKER2 51:02 I still feel like it's quite separate. Whether that changes or not, I don't know. But the only thing I would say is that I have you do see an increase of financial firms pinching people from fintech and pinching people from, you know, the Googles of this world and stuff. So, I think there's a recognition that a lot of the ideas from different sectors are transferable to finance. That's probably the only thing I would say is I think what is obviously happening.
- SPEAKER1 51:36 Finally, what would your principal concerns for the future be?

| | | |
|----------|-------|--|
| SPEAKER2 | 51:45 | Looking in terms of obviously, right? |
| SPEAKER1 | 51:50 | Yeah, yeah. And so, conduct algorithms and how you know, how it might develop and shake the market. |
| SPEAKER2 | 51:56 | I would say, again, awesome ability to have a proper handle on the outcome of the algorithmic trading to fully understand what it's doing and be having appropriate controls in place to make sure that activity is tailored to, you know, the intended outcome. I do think that the upskilling of control side individuals is going to continue. I don't see that necessarily as a huge problem going forward. And it's more just like you say, the rate of development and the way the markets are changing in terms of the structure, certainly in the equities world, and I guess to a lesser extent, the fixed income world, I think keeping a handle on the outcomes of the algorithm, the activity is going to continue to be really difficult. |
| SPEAKER1 | 52:51 | OK, thank you. That concludes the interview, so I'm going to stop the recording. |