

Interview with a senior manager #4

- SPEAKER1 00:02 The interview first is just a bit of background about the firm, what it does, what kind of products it trades, and types of algorithms and stuff that could be deployed. The second part is about emerging conduct risks and the implications for human accountability that come out of that. Then the third part is about possible machine to machine regulation, whether there's any currency in that, possibly because of initiatives to mitigate conduct risks maybe across the sector
- SPEAKER1 00:35 and whether there's any
- SPEAKER1 00:35 potential lessons learned from any sort of major incidents that could have happened either in your firm or the wider market. I think that interviews are pitching in at anything around between 45 minutes. OK, so just to make a start. So, what is your investment firm sector subsector?
- SPEAKER2 01:02 Commodities, fixed income and foreign exchange.
- SPEAKER1 01:08 And what is your role in the investment firm?
- SPEAKER2 01:13 The group compliance officer.
- SPEAKER1 01:16 And how would you describe your investment firm's goals?
- SPEAKER2 01:25 To do well to generate a commission from brokerage predominantly and from our clients to service their needs and physical uses of the market.
- SPEAKER1 01:39 And does the firm deploy any form of trading algorithms?
- SPEAKER2 01:50 Now, the firm does not have clients that do that.
- SPEAKER1 01:57 Does the firm we use or offer any execution type algorithms?
- SPEAKER2 02:03 Yes, quite a few different ones around order execution. Yes.
- SPEAKER1 02:12 And what sort of types?
- SPEAKER2 02:16 So, anything from iceberg orders to stop losses like those types of algorithms.
- SPEAKER1 02:30 You said the firm doesn't usually try to hit the client when your clients deploy any artificial intelligence and machine learning algorithms?
- SPEAKER2 02:45 Not to my knowledge.
- SPEAKER1 02:48 And for the execution algorithms, does the firm have sort of so documented and sort of consistent sort of design, deployment and recalibration process? I mean, and if so, how does that look like?

SPEAKER2 03:06 Yes. So, for any that are managed by independent software vendors, they would manage the change management process and we would assess that on an annual basis to ensure that it met the sort of standards expected on the two at for out. We have an in-house trading system, and for that we have our own change management process and again, that that looks at things from conformance testing, stress testing and those sort of angles before any sort of execution algorithm was deployed or changed. And again, all of that checked on an annual basis by the compliance department.

SPEAKER1 04:00 So, is it just a compliance department or are there other gatekeepers involved in that process?

SPEAKER2 04:06 So, compliance will be the gatekeepers for the roll out and that. It's more self-governed by the development team,

SPEAKER2 04:18 and those

SPEAKER2 04:19 procedures are established by the COO, so ultimately the seller would be responsible for change management control and....

SPEAKER1 04:35 Does the firm have a sort of defined conduct risk framework?

SPEAKER2 04:39 Yes, it does.

SPEAKER1 04:42 And what would be what is the firm's understanding of conduct risk? Because obviously FCA hasn't provided a concrete definition. And so, we expect firms to sort of work that out themselves with their own products and services.

SPEAKER2 05:01 Well, we define conduct risk is as anything that undermines trust and confidence in the markets in which we participate or anything that could cause harm to our clients, the firm's reputation or employees. So, it's really very broad.

SPEAKER1 05:21 And what would be the firm's perception, if any, of conduct risks that are associated with it, with the algorithmic deployment that you've previously described?

SPEAKER2 05:37 Well, I would say the conduct, given that the order management algorithms order execution algorithms as opposed to trading algorithms, the main conduct risk, I would say, would be and disruption to the market, which could also cause harm to clients. And I think it's most likely to be borne out of a lack of understanding from the guys developing these algorithms as to what market abuse could look like. Traditionally, market abuse has been something that training programs have focused very much on the front office and the guys that are developing these algorithms have the potential to have a far greater impact on the market, and it's far enough. Hundreds, thousands of

messages in short succession. It wouldn't need to go wrong for very long to cause significant disruption.

SPEAKER1 06:46 So is market abuse

SPEAKER1 06:48 the only sort

SPEAKER1 06:49 of risk concern or are there others?

SPEAKER2 06:58 So, on the order execution algorithms predominantly market abuse risk, and it's a little different on the on the trading algorithms and but again, I would be looking at market abuses as the primary conduct risk.

SPEAKER1 07:24 Do you see anything on the horizon which makes you think that the conduct risk associated with the algorithms that you've described could increase or decrease in the future?

SPEAKER2 07:41 I think that the controls that were introduced were to specifically under RTS 6 and the requirement for investment firms to actually assess against the standards set out in that regulation. I think they were really important steps. And I do think that one of the more valuable pieces of the regulation that was introduced by Isabel was made and so I think if they can build on that and enhance that so that you can have the guidance around the level of detail that they should be going into with their conformance testing, their stress testing, the kind of due diligence they should be conducting on clients that will all build a stronger control framework. I think it's a good starting point where we are at the moment. But in the markets, you still get a lot of voice trading or certainly the firm that I work for does, and that's going to change over time. So as deployment of algorithms by clients becomes more prevalent in most markets and I would expect the risk to change with that and controls the need to adapt with that. And the due diligence process has to become more robust

SPEAKER2 09:13 to ensure that the

SPEAKER2 09:14 client knows what they're doing when they're rolling these algorithms out.

SPEAKER1 09:20 You mentioned that you offer services across a broad range of FICC markets, so you've got commodities which are predominantly traded on trading venues?

SPEAKER1 09:31 You've got

SPEAKER1 09:32 your foreign exchange, which is obviously quite a decentralised market. And then you've also got fixed income, which is quite a hybrid market with some sort of, you know, membership for certain banks and then some further down the stream there, a little bit more trading with

systematic internalizes and liquidity providers and all the rest of it to try and match clients. Do you perceive, in those each of those sorts of subsectors that your firm's involved in, any real differences in how the algorithms are deployed and what if so, what potential differences there are in the conduct risk for each of those different sectors associated with that?

SPEAKER2 10:20 Had obviously the most of the all the management algorithms that we deploy are designed for it to be deployed on order books, on exchange traded markets or something like an iceberg order, for example, it can't be deployed and wouldn't be deployed in our OTC bilateral markets and so. But I guess the main the main difference would be that we use them significantly more on. Exchange traded markets at the moment and most of our fixed income is voice, so we don't really utilize the management algorithms.

SPEAKER1 11:15 What is it about fixed income that makes it more, in your firm, more geared towards voice than the perhaps electronic sort of means execution?

SPEAKER2 11:31 Well, we certainly don't have the technology infrastructure at the moment to go down a more automated route, I think. I don't think it's necessarily reflective of the market. I don't I don't have experience of how other firms are dealing in fixed income, but certainly the team that we have there was in the...They'll my voice for a long time, and that's their preference. That's what they

SPEAKER2 12:08 like.

SPEAKER2 12:09 And when they joined, we've adopted that. And since then, we haven't. Because of that, we have an enhanced technology to be able to do that electronically. So, I think until the front office said that they needed something right, but it's not something that I would look to develop. So, yeah, I don't know if that is the reason for the difference on the fixed income market, this is specific to the way in which the team we have worked. So, it's more reflective of the market as a whole.

SPEAKER1 12:46 I mean, you mentioned about the desks maybe then coming forward and saying, "well, actually we need a bit more automation", maybe to help them out. I mean, are you aware of any sort of top-down considerations or moves by people within your firm or the wider sector to say, well, actually, you know, these desks are quite a big overhead. You pay big bonuses and all the rest of it. And, you know, there's an opportunity here for us to automate some of that away. And if so, what? What is the potential? Implications for conduct risk

management and doing that from, say, moving away from more human oriented

SPEAKER2 13:29 trading

SPEAKER2 13:30 to electronic trading?

SPEAKER2 13:33 I mean, we come from a risk perspective ghost-writing pounds. The inherent risk of human error and that brokers make mistakes instead of self and they get into the wrong cross, the wrong product, that happens from time to time and where the results in large losses for the business does focus attention on that. And I think the general consensus is that there needs to be a move away from OTC brokerage on certainly on standardized vanilla products. And there's no reason why clients can't trade those electronically themselves. And in theory, it should be Win-Win because it should be more cost effective for the broker to provide those services because they're standardized and they're scalable. And they should be paying a lower commission fee because, again, the cost of servicing the account is smaller. So, yeah, I definitely think that works on the vanilla markets, as I said, the vanilla futures and options markets, and that's something that that would certainly looking to move towards the end where it becomes a bit trickier with the more exotic OTC products that require structuring that more bespoke in nature. I don't really know how we get to a stage where that would be fully automated because ultimately you need somebody to suppress it and you're not going to string prices for every single different type of exotic that somebody might want. And so, yeah, I think. Standardized products, yes, technology is the way forward, certainly, and in terms of how that impacts conduct risk as a study, it removes that risk of human error from the broker or the trader, which is obviously right. However, I suppose it could increase risk in any way. Well. That's an interesting one. Yes. You need somebody, you always need somebody. Somebody monitoring that process, something that something that we do have from time to time, things like system outages and the vendors that use the process around selecting them to ensure that the data service, they deliver a service to their service level agreement, that will become more important, because

SPEAKER2 16:33 if you move

SPEAKER2 16:34 away from a reliance on the voice trading, then you need to be sure that the client can get on electronically and place hat right.

SPEAKER1 16:46 So, calibration, so they I don't know if you recall, but the Bank of England and the FCA, I think it was at the end of 2019, they published a paper about machine learning in the in the financial markets. And it looked at different types of offering, you know, from robo advice down

to sort of actual trading, including execution, trading. And they found it sort of moderate levels of automation or self-calibration that reinforcement learning calibration in the surveys that they conducted with firms. Do you perceive in your subsectors any real possibility of a move towards

- SPEAKER1 17:36 self
- SPEAKER1 17:36 calibrating, recalibrating,
- SPEAKER1 17:39 sort of
- SPEAKER1 17:41 algorithmic technology or is that just a pipe dream?
- SPEAKER2 17:47 No, definitely, and I think it's I think to a certain extent, it's already out there as well. We were always looking at potential surveillance systems and one company in particular that pitched for that was very much focused around machine learning, and it was interesting, and I think is certainly the way that the that the industry will go. It's just a case of probably nobody wants to be the first person to go down that route because it's unproven at this stage. But the kind of offering they had, I think, where it could be particularly useful is around communication, surveillance. So, I think it would be quite easy that or easier there to conduct policy searches on different combinations of suspicious words or phrases. As opposed to the trade surveillance, I can't quite wrap my head around how the machine learning would work on the trade surveillance side, but I'm sure there are people working on that as we speak, that they probably do have ideas around that. But I have no doubt that that's the way the industry is going. It's just a case of how long it takes to get there. And then managing conduct risk from that point becomes that whoever's tweaking the system and adjusting the parameters of the machine learning becomes the most important person from the oversight perspective. So probably see the role of compliance staff certainly challenging when they're monitoring conduct risk, because in a lot more a lot less manual work, but a lot more technical calibration work to ensure that the deal that's being spat out of the surveillance systems are working as they should be.
- SPEAKER1 20:06 And with that sort of potential development on the horizon, what is your perception of the knowledge levels of staff across the business and not just in sort of
- SPEAKER2 20:16 maybe I.T.
- SPEAKER1 20:17 developers, but across the business of senior management, trading
- SPEAKER2 20:21 support

SPEAKER1 20:21 functions like maybe compliance and risk in terms of their levels of knowledge about algorithms and their potential conduct risk impacts? Do you think that that's something which is improving or is it sort of not really going anywhere? I mean, or could it even be declining? And what's your sense of that?

SPEAKER2 20:44 I think the knowledge is siloed at the moment. And for the most part, I think that, you know, very few people outside of the front office and developers would understand in basic terms what each algo did. And, you know, that's a potential problem,

SPEAKER2 21:09 and

SPEAKER2 21:11 we try to get around that by maintaining some good descriptions of our algorithms in layman's terms that everyone can understand on the air, on an algorithm register, but that still requires a certain level of knowledge. So, but I do think that there's a gap there and equally, even from the trading side, I think that a lot of traders will understand what an algorithm does, what the end result is, but they won't necessarily understand how it does it. And that that could be dangerous as well. So, I think there's an education process and they take place around algorithms as they become more prevalent. I mean, how can you expect a sales trader that looks after client that deploys being highly complicated trading algorithms to be able to act as the first line of defence and risk perspective. He doesn't understand what his clients are doing.

SPEAKER1 22:30 And how do you think you bridge that gap and how do you make a training program? Do you think what you think it should look like it's going to

SPEAKER1 22:40 happen if people

SPEAKER1 22:41 aren't really technologically that,

SPEAKER1 22:46 you

SPEAKER1 22:46 know, maybe their technological understanding is not as advanced as maybe some other people? How would you what's the best way to sort of address that?

SPEAKER2 22:56 I think we need to simplify the program as much as possible. But I think the real problem is finding somebody who can bridge the gap between the technical knowledge of the people developing the algorithms and everybody else in the firm, perhaps those that are less technology savvy and presented in a way to understand. But that's definitely the challenge as to and I think there's very few people that are capable of doing that and are good at doing that. it's a rare thing to find

somebody that can take a complicated topic like the one I presented in a way that anyone could understand.

SPEAKER1 23:52 Are you aware of any significant sort of conduct risk incidents involving algorithms in your firm or your subs by the sub sector in the last few years?

SPEAKER2 24:12 No, not in terms of the asset classes that we try to...

SPEAKER1 24:28 Given what you've said about the

SPEAKER2 24:31 maybe some of the

SPEAKER1 24:32 knowledge gaps that exist, how would you rate the ability of maybe people in a support function like compliance to be able to spot conduct risk events that have been caused by algorithmic activity?

SPEAKER2 24:50 So, I think a start from a market-based perspective. I'm confident that it would be it would be spotted because regardless of whether it is being done by click trader or an algorithm, you would still follow a pattern that I would expect our surveillance system to. And the surveillance team on and they would investigate that. And so, the actual fundamental pattern of the abuse would be the same will be most likely and extreme....over a shorter period of time for the algorithm, I thought then and then from a from a control framework perspective. I think that that's where, again, that could be a bit of a gap, because at the moment there's a rough outline for what standard practice should be in assessing due diligence for providing direct electronic access. I mean, the FIA have got their own due diligence questionnaire for members to select for when trying to collect information. But in terms of how you assess your client's suitability. To be to be using algorithms. There's less guidance around that. And it really boils down to something as crude as that, I have experience in it. And just because somebody has experience for an hour ago doesn't mean that they're doing it in the right way. And one of the challenges we have found is trying to ensure that the clients articulate the controls they have when they're using the algorithms because there's obviously quite a bit of sensitivity around particularly trading algorithm , nobody's going to know , no third party is going to tell you exactly what they're trading algorithm does , because that's what holds the value and that's valuable proprietary information to them. So, as a broker, how can you get comfortable with the type of trading that doing the risks they present the firm? If you're not able to interrogate exactly what that algorithm is doing, if you don't even understand what it intends to do.

SPEAKER1 27:39 And with that, I mean, what sort of detective tools are you currently using?

SPEAKER2 27:46 So, we have an automated trade surveillance system. We use Nasdaq Smart and constantly assessing the calibration of that to ensure that it's working as it should be. But again, for the hour, on top of all the usual sorts of market you should look for, and

SPEAKER2 28:11 there are

SPEAKER2 28:12 some specific to our guys such as that looking for if there's a high percentage of cancelled orders, things like that and which an algorithm is more likely to cause market disruption in that way, and because more than anything, it would be incredibly time consuming for a trader to think about.

SPEAKER1 28:38 Is that tool a real time or is that a T+1?

SPEAKER2 28:43 We have both. Last is if I take real time surveillance, we have an in-house system and that that only looks at the rapid increase in order activity. So that's quite a crude surveillance tool, I would say.

SPEAKER1 29:06 And do you see any sort of move towards more sort of machine to machine, so. You know, you have this idea of a kill switch, right, and you can make it to. But at the moment, the kill switch is something which a human being has to solve. They have to make a decision and have to interpret data and make a decision as to whether they allow our activity to continue. Can you see any moves towards firms actually saying, OK, well, we're going to outsource the decision making almost to the algorithms as well, because we're going to have the front desk, some of the front desk decisions made by the are maybe more autonomously. And then we're actually going to have the control done autonomously as well by now with maybe for detecting abusive behaviour and stopping it as it's happening in real time rather than sort of waiting for a post rate decision once they or the problems already occurred.

SPEAKER2 30:13 Yeah, I think that's just a natural progression from something like a cross-border, which is very commonplace at the moment, monitor where you set you calibrate a price limit above or below, which you want to outright reject an order before it reaches the market, and so that that sounds quite similar to what you're describing, albeit slightly less complex, depending on how you calibrate, because that could be something as crude is if content is an order that's more than 10 percent away from the prevailing market price and it's an aggressive order and reject.

SPEAKER1 31:06 OK. OK, but that's like hard limits, really, rather than actual sort of private....

SPEAKER2 31:13 Yes, that their hard limits. So, like so I guess it would be a similar thing to be a pretty tight control. And then they would sit in between the client placing its order and reaching the market that we're running through and said that. What impact is this likely to have on the market if it's going to move in and buy more than X percent or even if the client has already had layered orders on the other side of the order book and then they're trying to try the opposite side and rejects that, I mean, that would be quite dangerous because I think that would bring bringing a different type of risk because it gets very complicated if you had a client who was who was a broker themselves, those orders could be for different clients. So there's a lot of thought that would have to go into that and the firms implementing those controls in that machine learning and all that machine to machine decision making would be taken on the basis that if the client turned around and said, "you prevent a good trade from going in, and we wouldn't expect you to do that", there may be some client complaints as a result .

SPEAKER1 32:50 Can you see any sort of mileage in preventative coding and what I mean by that is obviously that even the most basic algorithms are that there is code, you know, if they do this. I suppose a good analogy I can draw is in the U.S., they've been working on these driverless cars

SPEAKER1 33:18 and

SPEAKER1 33:20 obviously, a driverless car is quite similar to a trading algorithm. Some respects in the sense that

SPEAKER1 33:24 it's trying

SPEAKER1 33:25 to get from point A to point B. It's got an instruction, and it tries to follow it as per the instruction. But what they've had to think about is, is, OK, if that car going down the road and it's got a number of options and it could take a shortcut to get to point B quicker, if that's what

SPEAKER1 33:44 they

SPEAKER1 33:46 think that makes the person who is instructed it happy so then performs no calculations, then it's actually I could take a shortcut by driving over this field here or

SPEAKER1 33:55 by breaking

SPEAKER1 33:57 the speed limit or by running somebody over because that person maybe runs in front of, you know, then maybe they get in front of the car and that is in the car's way and then watch, they'll just carry

SPEAKER1 34:07 on. So, they don't just

SPEAKER1 34:09 think about not just the sort of simple geographical inputs from the GPS system. They've also had to think about the ethical coding as well to actually say, well, actually, if a child or something runs in front of the car, that's more important to stop than to carry on and to fulfil the program's wishes. And I suppose in the financial markets, you could have a situation where, yeah, you could program an

SPEAKER1 34:40 algorithm which says,

SPEAKER1 34:42 OK, well,

SPEAKER1 34:43 algo's

SPEAKER1 34:44 objective is obviously to make the money in some respect or help the client get more efficient execution, which effectively amounts to the same thing. But in doing so, the algorithm realizes actually there's a quicker way. And in doing this, I could front run this order here and make a better return. But you actually put a code in there to say, well, you your objectives are X, Y and

SPEAKER1 35:13 Z subject to it being done in this way, A, B and C to make sure that user.

SPEAKER1 35:14 Do you see any moves like that, or you have the difficulty with that is that the types of market abuse are constantly evolving, and you wouldn't be able to program it to?

SPEAKER2 35:25 So, avoid every possible type of market abuse. It'd be hard for anybody to come up with a definitive list of ways in which you could manipulate the market and so I think to a degree, yes, you can protect the algo against causing specific types of market manipulation or from money. So that but I mean, would now go like that very competitive, right, because to be frank, a lot of the algorithms. That seems to make small amounts of money trading very, very frequently, and that and the common complaint from traders is that they are from the front running toward us. But yeah, that they're not providing them because that they're doing it. And in transparent way. But they have faster connections, so they say I think there's already a healthy debate around whether it's ethical for high frequency traders to have faster access to the market data and to be able to trade. Your average trader and I'm going off on a tangent and so, Alex, what was what was said?

SPEAKER1 37:32 Well, I mean, whatever, you know, I think you'd sort of answer that because it was about the point about whether you see this and if it's foreseeable that preventative coding could be used.

SPEAKER2 37:43 Yeah, I think it's possible that it could for simplistic types of that market abuse. But I think it would be difficult to cover all bases.

SPEAKER1 37:59 Moving up a level what would you say, how would you rate the ability of regulators and exchange markets where you trade on those markets to be able to detect

SPEAKER1 38:12 behaviour

SPEAKER1 38:13 which causes conduct issues in algorithmic trading?

SPEAKER2 38:19 Depends very much on the market the talking about because some are far more advanced in their surveillance capabilities and others. I think that, you know, markets are CME probably as the market leaders in that respect for. I feel like they have a fairly sophisticated surveillance system because they do seem to be able to detect spoofing on a very regular basis and successfully enforced against plans for the.... A lot of the time is that I have seen instances where that weather has been electronic, so yeah, I think they're fairly well equipped, but it depends how much each exchange is invested in their own surveillance resources because you've got other markets like the LME, where a large part of their surveillance resources will be taken out. We're basically having to buy stuff on the on the rim and they have different challenges and as a result, they're not going to have the same resources dedicated to electronic surveillance and some not the same, but the same may make a lot more money from fines. I think that's the way that we could see it going with the European markets, following the American counterparts. Dishing out larger fines when I do detect market abuse and reinvesting that money into the best surveillance to produce more income. That seems to be a natural way in which they could improve surveillance technology.

SPEAKER1 40:28 Ro that point and how would you rate the effectiveness of this sort of UK's approach to maybe something like the US?

SPEAKER2 40:38 Well, the US seem to have a lot more joy out of the enforcement action than if you look at you look at the enforcement, the number of enforcement cases in the US compared to the U.K. there's a stark difference their end.

SPEAKER1 40:58 So did that not also be an example of the failing, though, because they were having to enforce a lot more because maybe the way in which they regulate the market, the way the market is structured over there, is perhaps not as sophisticated as here at...?

SPEAKER2 41:19 Potentially, you could make that argument, but then I would contest that, and I don't think that's the case. I think a lot of the people in the FICC markets that are trading and, you know, the same people will be trading CME as out as I'll show you, the same people will be trading ICE US actually, and why does it stand to reason that they would that they

would manipulate ICE US, but not actually ICE EU? Is it not more likely that the ICE EU is going undetected? Particularly where the products have similar structures, I take the point. I would like to spoof an example on the CME COMEX metal contracts are standardized and more liquid. So perhaps there's more opportunity there than on something like the metal exchange. So, I think you could make that case for some products, but not....

- SPEAKER1 42:30 OK
- SPEAKER1 42:32 in
- SPEAKER1 42:33 the sense of sort of maybe developing kits to sort of help identify
- SPEAKER1 42:39 potential
- SPEAKER1 42:41 risks associated with
- SPEAKER1 42:43 algorithmic
- SPEAKER1 42:44 trading. Do you think firms in your sector and maybe your firm, are
- SPEAKER2 42:50
- SPEAKER1 42:51 building your own kit to do that? Or is it more a case of sort of partnering or buying from somebody else
- SPEAKER1 42:59 in order to
- SPEAKER1 43:00 meet your needs?
- SPEAKER1 43:01 To mitigate the risk?
- SPEAKER1 43:09 Yeah, in the sort of algorithmic trading that you do.
- SPEAKER2 43:12 Um, yeah, I think the majority. Well, we would look to outsource, not outsource, but we would look to third parties to provide the technology predominantly because of the development resource there would need to go into developing a suitable system or framework. But doing that monitoring or have previously been seen firsthand. The resource that goes into building a proprietary surveillance system, and it's not just an upfront resource either, it's constant and every time and new types of you identify new conduct risk. Think about how your system can cope with that. And I just don't think that a company of the size I work for would be willing and able to invest. And that type of product, I think there's a reason that you see that I go back to surveillance systems now central to conduct risk, and
- SPEAKER2 44:41 there's a reason

SPEAKER2 44:42 why you have the top one or two tier one investment banks have in-house systems for absolutely everything. And then the majority of the rest of the market, including some of the lesser tier one investment banks have or use as technology vendors for that. I just think it's more efficient for a technology vendor to roll out one change process for a change in regulation that than 100 clients can benefit from that it is for those 100 clients each to replicate that effort. It's just not efficient.

SPEAKER1 45:23 OK, do you think I mean, at the moment, obviously, remuneration is used a lot by the regulator to try to incentivize good behaviour in people and to try and say, OK, firm, if it detects good conduct to reward that equally, if office, if it's poor conduct penalised maybe with some effect on the variable remuneration. Do you see any possibility of because if you are removing that human involvement from the markets, how the things like remuneration.

SPEAKER1 46:03 Policy...

SPEAKER1 46:04 How do they continue to be relevant and effective? I mean, are we looking at a situation where we need to incentivize machines to behave in a certain way? And how would we do that?

SPEAKER2 46:18 I think the sense was, I don't know how you would incentivize machines. And that's an interesting concept or not. But I would for a logical first step would be to incentivize the humans that are responsible for programs and to do it that way. I realize that that that's our next step of the way because once it's been programmed. Machine then takes on. OK, I'm kind of excited. And how do you reward that behaviour? I'm stumped on that one, so I don't know how you could incentivize anything.

SPEAKER1 47:12 And how about sort of deterring and or punishing them? I mean, can you see I mean, I'll give you an example. I mean, if you if you remember. I know. Well, I remember because I'm old enough. But in the early 90s, there was a moral panic about dangerous dogs and what resulted was something called the Dangerous Dogs Act, and the reason why I referred to this is because the Dangerous Dogs Act looked sort of recognize the dogs as being an agent themselves.

SPEAKER1 47:44 And as a result,

SPEAKER1 47:46 that was a punishment for the dogs, i.e. that they could be put down whilst also recognizing their owners as being potentially a part of the

SPEAKER2 47:56 the issue as

SPEAKER1 47:57 well. And what I mean by that is, is that they, you know, the owners might be fined or imprisoned as well. Could you see any scenarios where

SPEAKER1 48:09 regulation

SPEAKER1 48:10 evolves so that actual algorithms that are in the markets are identified for potential punishment or destruction or whatever, and it's going to be as a result of their behaviour?

SPEAKER2 48:31 Yes. Yeah, definitely see that. I think the fact that each dog already needs to be identified on American markets and so I can certainly see the case where regulator sees issues with a particular algo and instructs that it needs to be terminated.

SPEAKER1 49:04 How do you rate the industry sector wide collaboration, cooperation to maybe in your sort of subsectors to sort of discuss maybe these issues?

SPEAKER2 49:20 Yeah, I don't think there's been much discussion on the conduct risk side of algorithms at all in the market. But the one I mentioned earlier on, the just understanding, the algorithm, the trading algorithms, I think it's a very sensitive subject. And people get quite defensive, especially the crimes that deploy sophisticated algorithms. See them as an asset that proprietary and not proprietary knowledge is not to be shared because it holds value. And I think that that is one of the blockers to better information sharing that probably can be very difficult to get around. Even on the order execution algorithms, as a broker, you know, you're competing with other brokers on the ability to provide the best service to the client if you have an edge, because your order execution algorithm is more efficient than other brokers, then you're not going to want to share details around that and with your peers, but the conduct risk side should be an open discussion. There's no we don't compete on. I don't see competition there between

SPEAKER2 50:51 brokerage

SPEAKER2 50:52 firms conduct risk and obviously, they could lose money, one could lose money as a result of poor controls around that risk and that there may be more cynical, kids may be happy to see them do that. It's more likely that everybody takes a bit of comfort in knowing that we're all dealing with conduct risk, getting in an appropriate way and sharing ideas on that. And then we'll compete where we should be on the commercial side of things. Dominate that discussion needs to develop because at the moment there's no discussion and.

SPEAKER1 51:45 What do you think the merits are of industry versus sort of legislative led solutions, which I think should be top down or bottom up or what do you think t he market should be industry....

SPEAKER2 51:59 I think some of the most successful regulation of some of the most successful controls really have to come from the people that have a deep understanding of the issues, and I thought it has to be balanced, I think. They see everything like the FX Global Code you need practitioners to set out what best practice looks like, and then the FCA can decide whether or not they want to endorse that, if the industry fails in in being able to go in and being able to govern itself to an extent that I to expect the FCA to step in and but... the FCA would probably recognize that you need people that understand the issues to have a stab at that first because they're most likely to come up with the most suitable result or at least a good framework as a starting point, and that that could then be enhanced by the FCA if needed.

SPEAKER1 53:15 Do you think there could be any lessons learned from incidents within the wider trading industry or even maybe instance outside the trading industry, so other sectors which use algorithms in some way know just to make decisions and there's been a number of sorts of quite high-profile cases where things have gone wrong. Is there any that springs to mind where you think of actually this industry, the sector could learn from that?

SPEAKER2 53:52 And well, obviously, in the financial services industry, there is a high-profile case on the front line, not where word algorithm can behave as it should. And what was it? Knight Capital and what a day by the sun. It happened to Chicago, but, yeah, I mean, it worked out more than half of the balance sheet as it should. Now, obviously, I think that highlighted the importance to have controls and restrictions around the damage that an algorithm can potentially, and I haven't seen any so similar cases since then, so I think that was a real wake up call for the industry because it effectively wiped out a decent size. Well, and in terms of other industries, nothing springs to mind but this. Well, I guess, actually, and one thing that you touched on earlier with the self-driving cars, yeah, that the piloting of that concept, one very successfully for months and months, possibly even year over year. And but the minute that there's a crash. It's front-page news and papers that brought know this would never work and thus doesn't think that's the real scary thing about the machine learning is the unknown. I think for someone like me, that isn't. I don't really understand. How far the machine learning can go and that that's a worry, because if it takes on a mind of its own to the extent where it's making decisions that I don't

want it to. That's a scary place to be because of the damage it could cause.

SPEAKER1 56:19 And finally, what are your principal concerns for the future?

SPEAKER2 56:24 Or yeah, exactly that. Well, one concern would be that conduct risk is ported from or transferred from? People and to machines, and if we don't really have any evidence at this stage that that would be any better, any better or worse, but I understand people and I work with people and I feel like an. Spot, the people that pose a more significant conduct risk was that that would be more of a challenge in a world where machines were responsible for a great deal more of the decision making said that the human cost as well. Obviously, if we're saying that more decisions are being made by machines, that's because the machines are paid to make those decisions. What does that mean for employment prospects in financial services when they need it certainly need less traders on which you also need to know a lot you could manage with a lot less people? And does that put more money in the hands of the organizations, but perhaps at the expense of jobs? Potentially, but that that is perhaps not unique to financial services. I think that's something we're seeing happening across all sectors as technology becomes more advanced.

SPEAKER1 58:21 OK, thank you for that. That is all so I'm going to stop the recording.