

***Interview with a senior manager at an electronic market maker***

- SPEAKER1 00:08 Right. So, to start off, so what sector is your investment firm involved in? What does it do?
- SPEAKER2 00:19 We are a nonbank market making firm across multiple asset classes. So, equities, commodities, foreign exchange futures and small amounts of fixed income and crypto.
- SPEAKER1 00:35 And how would you describe the firm's goals?
- SPEAKER2 00:41 To make money is pretty, pretty straightforward to make to make profit, I mean, it's research led organization offering making markets in order to run the proprietary book of risk.
- SPEAKER1 00:56 And what is your role in the firm?
- SPEAKER2 00:59 So, my role is I run distribution. So, we have an in addition to our trading on own account, we also offer market making services directly to clients. And that's my role. So, my role is to make sure that we can effectively interact successfully with a client base and build a client franchise so that we can distribute our prices and our risk capital to and clients, if you like, or end users within the market.
- SPEAKER1 01:31 And does your firm deploy any algorithms?
- SPEAKER2 01:37 Everything is algorithmic. So, we only trade electronically. We don't trade voice at all, and we don't trade through voice brokers or anything like that. So, we only we only enter and exit risk electronically. So effectively everything is done through an algorithm. There are two elements to what we do algorithmically. I would say so. And I my tendency is to break algorithmic trading down into two component parts. One is algorithmic trading, which is really the manufacture of prices and making promises to customers and then trading out them based on computerized decision making, based on computer made decisions. And then the other is algorithmic execution, which is when we take orders from clients, and we look to execute those orders in an algorithmic fashion in line with their instructions. And the two things are slightly different. So, I hope that's reasonably clear. But I consider the two things to be slightly different.
- SPEAKER1 02:41 And I mean, does that also go towards the of types of strategies that you might deploy on the on the proprietary side? I mean, do you have a range of different strategies or are you or is it all overusing a sort of similar type of strategy?

SPEAKER2 03:00 Typically we have one major strategy. So, we don't run distinct models in asset classes. So, we try not to do a lot of bespoke research. So, what we're trying to do is say that we look through, so we have a database which has about 10 years' worth of tech history within markets for all of the instruments that we trade. And what we do is we look for relationships within that data. So, we look to see that as something that instrument, a tick's and then X number of ticks later Instrument B ticks. And if we think that there is a statistically significant relationship between Instrument A, B, after examining the data for a period of time, then we look to build a model around it because that helps us to predict better what the price of Instrument B is going to be at some stage in the future. So, what we're trying to do therefore, is create our own predictive value made view of all of the instruments that we try. So, to some extent, there is only one model around that. There are then essentially really three different strategies that we deploy around that. The first is we would run an if we if the market that we calculate is inside the bid offer spread within the market, then we run the making strategy and we look to improve the top. A book on one side or the other, depending on which side we have a particular view on or a particular skew towards, if you like. If that fair value made that we create is outside of the existing bid or for within the market, then we just take from the market because we believe the market price is fundamentally wrong and we think the market is incorrectly pricing that instrument. So that's a pure taking strategy. And then we have a third strategy which is relatively recently deployed, which is a sort of portfolio trading strategy, which has a much longer-term horizon to it. So, our market making strategies are typically measured in an alpha horizon which runs from probably at the short end about so to, you know, 30 to 90 seconds out to sort of, let's say. Probably hours, three, four, five hours, and then we now have a portfolio model, which is a more medium-term strategy, and we would consider that strategy to run for potentially days' time. So, in other words, we're taking positions that we would then hold for hours, today's first minutes to hours. So those are the three main strategies we run, are making and taking strategy based on what we would call a high frequency signal, albeit that's not high frequency, the way we would term high frequency and then a portfolio trading model, which really runs to a much more medium term sort of time horizon or alpha horizon, if that makes sense.

SPEAKER1 06:07 Yeah, yeah. And amongst these the algorithms that you're using and how many sort of as a percentage or sort of rough estimate,

how much of that is done by sort of artificial intelligence or machine learning style algorithms?

SPEAKER2 06:23 So, everything and all of the research that we do is uses machine learning to extract the relationships within the data. If you imagine that you have a data base at sort of ten thousand instruments, for example, and 10 years' worth of tech history, you believe the instruments could be correlated across that entire base of instruments. You've clearly got a massive, big data problem. Right. And the question is, how do you sort through all of that to find relationships within that data? And the only way of doing that is using machine learning. It's not possible really to do that without using machine learning in this day and age. So, we use machine learning predominantly for that, for the identification of relationships, et cetera. And then we have typically two models that we use to create the models themselves, which then underlie the price making or the price construction, the way that we rely on or the drives the models. The first is we use traditional stochastic methods of modelling and that is obviously computer assisted, but essentially quant driven. So, it's essentially driven by a human being and those tend to work in instruments where there is a bit less data and typically where, for example, spreads are much tighter, et cetera, et cetera. And there's a very high level of kind of. Sort of there's a high level of other factors from the market which kick in to how you would implement a strategy. So, for example, you know, in something like eFX, there's probably not enough data to run a full I type model. So, you tend to run a more sort of machine learning lead and then stochastic modelling kind of regime and framework in order to ascertain the fair value made in FX. Whereas in equities, because of the way the correlations work and the number of data points, et cetera, et cetera, it's much easier to use pure artificial intelligence and to use therefore neuro networking, I would say across. Probably 70 to 80 percent of our models across futures, equities and commodities are now run by neural networks. So, they are full AI models and then they sort of remained in sort of slightly fewer liquid stocks, et cetera. And things like effects are still run by a combination of machine learning and stochastic modelling.

SPEAKER1 09:19 And how would you describe the outline of the design deployment and sort of recalibration process sort of up from a high level?

SPEAKER2 09:31 Yeah. So, calibration happens once a week. So obviously what we're doing is we have an enormous research cluster, which is in Iceland, which is sort of there for cheap electricity. And because it's cool and obviously you've got a huge number of boxes and all of that kind of stuff. So, the data itself is run by the machines in Iceland, et

cetera, et cetera. Now, clearly, you're not in a position where you're able to run all of that data, deploy an AI neural networking type model and actually make prices in any kind of efficient way into the market. There's just too much computational time required to generate those fair value bids versus the way the market infrastructure works. Your pricing would simply be so slow that any benefit you gained from the data research that you do, et cetera, et cetera, would be more than wiped out by the by your lack of speed within the market. So typically, what we're doing is that process is running on a kind of weekly basis. And then once a week we run a complete recalibration of the models. And typically, we look at about three months' worth of trailing data. So, we're typically only really, although we're looking obviously at sort of long run correlations, as I said, over a 10-year period. And things like that are really the main correlations are looking at a three-month kind of rolling basis and calibration around that happens once a week. The actual calculations that the pricing models are then utilizing is using that calibrated data in real time based on the observed market data in that real time and is then using those that that calibrated data in order to construct that fair value bid price in real time. And of course, that has to happen then, you know, sub that that computational time has to happen, and it has to be measured in microseconds and effective.

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| SPEAKER1 | 11:40 | What is your understanding of conduct risk and what does your firm have a sort of internal framework for sort of identifying and mitigating conduct risk?  |
| SPEAKER2 | 11:52 | Oh, yeah, so we've got so conduct risk obviously comes in many different forms, you know, one thing we don't have, obviously, which is good, is we don't have people sitting making proprietary decisions based on client data and things like that. So, we avoid one conflict massively from that. So that's very helpful. We don't have that risk at all because we only do things electronically and we don't take positions off the back of what our clients do or don't do, et cetera, et cetera. So that's that removes one whole layer of conduct risk. But the conduct risk that we have, which is very sort of substantial, if you like, is the risk that we enter into strategies around spoofing, layering, you know, wash trades, et cetera, et cetera. And we run a whole series of controls and checks against that to make sure that we don't do that and make sure that that doesn't happen. So, we have an internally built piece of work, partially internally built, partially externally imported in. But we have a platform called [REDACTED] which essentially runs a whole number of scenarios and looks at, you know, picking up trades that |

could be considered by exchanges or other venues to be categorized as spoofing , layering or a number of different scenarios that we run according to those which are highlighted by regulators and exchanges themselves about a surveillance system .

SPEAKER1 13:34 Is it?

SPEAKER2 13:35 Yes, that's a trade surveillance system, operates both at point of trade and trade. So, you have a lot of surveillance around. We have a lot of surveillance around those things and obviously what you get is a lot of false negatives or false positives, sorry, depending on your viewpoint of what's positive or negative. But we have a lot of sorts of reported incidents and then those get checked to make sure that they are coincidences rather than anything which happens to be built into our systems. We're very hot, I think, on conduct risk in the sense that as a firm, we stand for very ethically high standards. So, I would say it's even more important to us than it probably is to some other proprietary trading firms because we maintain an extremely public stance on strong ethics and morals within the market. And so, I think the damage to our reputation would be even larger for us than it is for would be for other market makers, simply because we are we made a very public stance around something. So, you know, as around the globe behaving the right way and having the right ethics within the market and, you know, fair and efficient markets is in our mission statement.

SPEAKER1 15:00 So, do you see conduct risk as markets become more and more....? I mean, I've been sort of speaking to other firms, which have got a lot of the sort of old voice trading that you're talking about. But they're sort of in a transitional period where they're grappling with the fact that more and more flow is being handled almost purely electronically. And that's a cultural shift.

SPEAKER2 15:26 It creates a cultural shift. I mean, I think it definitely creates a cultural shift. I mean, I've worked in banks where there was a lot of conduct risk and I've seen it. You know, at its worst, if you like. I don't think the electronics market is immune from that risk in any way, shape or form. I think, in fact, this is. In some ways, it's heightened because it can be done, because if you do decide to behave badly, it can be done systematically, which means it can be done unbelievably with incredible regularity, whereas I think human combat risk is almost by definition, somewhat more limited. So probably what you get is, you know, in human conduct risk more limited numbers of events, but each event is larger and so nature of its own nature. So as materiality is larger in electronic markets, what you get is a lot more systemically bad behaviour, and each

individual event would not be viewed as material, but when you look at the events in totality, they become quite material or very material impact. And that's a major issue. I would suggest, for the markets going forward, and particularly because there are certain elements were. Regulators, in my opinion, are running a long way behind the curve. So, the market is in its evolution is outstripping regulators and their understanding and knowledge of markets and how they operate today.

SPEAKER1 17:04 Why is that do you think?

SPEAKER2 17:07 I think it's partly a reflection of the speed of technological progress and the speed of technological update, you know, this kind of lure, if you like, of geometric change. And I think that's harder for any kind of you know, I think if I might say, I think our regulation is somewhat analogy in vs. a sort of digital revolution, if you like, or geometric versus arithmetic kind of evolution. Right. So, you're seeing a geometric level of kind of progress on trading and innovation and trading activities. And regulation is moving at a kind of a dramatic pace. And I think partly that's probably also driven by just the lack of understanding within regulators of how to make things work. And it's partly because the best talents are in our industry are deployed in trading and in making money, not in regulation. And so, you know, like anything like any walk of life where the best minds and brains are deployed, and skills are deployed in the commission of the act. And the regulators or lawmakers that follow on behind are almost by definition, always playing catch up. And I'm not really sure I see that changing at any particular point, at any particular point in time. And I think, you know, there's the ability for lots of behaviour to be bad within the market electronically. You know, HFT, quote unquote, high frequency trading is a very poor. Piece of terminology, right, because there is some element of the strategies that are deployed by high frequency traders, again using inverted commas to. That is that is, depending on your view of how market rules should operate, is entirely legitimate and couldn't be construed as bad behaviour. So, for example, if you wanted to run a strategy which relies on you having passed a physical networking than anyone else in the market. So, witness all of these, you know, stories around people building microwave towers next to the Arrau matching engine of the CME. Right. To give yourself a kind of nano second level speed advantage in a market which is which has a nanosecond level of determinism around speed. And you can see the price up day in New York and get to the market in Chicago before anybody else has seen the market move, then that is an entirely legitimate

trading practice. It may not be particularly good for the market. It may not be a particularly positive outcome for end users of the market and for people who actually need the financial instruments that they're trading, et cetera. But it's an entirely legitimate, lawful practice. It's not something, by the way, that we do at all, but it's an entirely legitimate practice vs. layering the whole book, for example, with orders, with an expectation that you are actually going to cancel the vast majority of those orders as soon as something gets touched within the market. Now, that is a questionable and dubious practice, which is, to all intents and purposes, should be outlawed by regulation and by exchange rules, et cetera, but still goes on. It still happens daily.

SPEAKER1      20:57      How do you sort of see, I mean, in terms of sort of possibilities for sort of self-calibration or self-recalibration? So, you described the process earlier about, you know, how you do calibration your firm. I mean, can you see a scenario where even in firms like yourselves, things move to a position where it becomes even more and more machine, so much so that, you know, human beings, even in those firms, become quite marginalized and only playing in a very specific role.

SPEAKER2      21:27      Well, I think the human beings are absolutely fundamentally critical in writing the parameters that the eye can work within. Right. And I think that's probably what you're sort of touching in a way. Right. In that if you allowed the machines to just do what is logically moneymaking, they will do things regardless of what the conduct rules are. Right. Because they will just say, well, this is a good way to make money. Let's do X, right. And things like layering and spoofing and things like that would be regarded as entirely sensible things by machines to do right. Because they are mathematically sound and sensible strategies to run. However, we are determined as an industry that these are things which are considered poor conduct and considered to be bad for the overall good of the market and the overall good of all of the users who use the market, so there's a huge requirement for highly skilled human beings to write the parameters within which they apply applications work in order to make sure that they are playing within the rules of the market and playing within the rules of regulation and importantly, within rules that you might choose to set yourselves as a as an actually stronger set of conduct rules. Right. Because I would say we choose, for example, to set a higher level of behaviour and integrity within the market than even the regulations or the exchange rules allow. Right. So, we go further, we go beyond. And so, we actually are involved with running our own, making sure that

our own algorithms work within those boundaries that we set for it. And I think you know, what it tells you is, for example, that we are today a team with about as a business. We have probably about 10 percent of our company quants. About 15 people are quants. Probably you need about five going forward because the traditional quants will gradually disappear from the from the market because they're so stochastic modelling, et cetera, et cetera, will become less and less relevant in the future, which is where coding is actually done directly by machines. And of course, developers will become gradually less important. What will be important is that you have some. Incredibly high-quality human beings who are running the whole infrastructure, but they'll be lesser in number if I'm making any sense.

SPEAKER1 24:08 Yeah, no, no, no, that it does make sense. I mean, in terms of the coding, like you said, setting parameters to make sure that you stay within the bounds or even go beyond the boundaries of what the regulator or even maybe the sort of soft softer regulation of market regulation stuff. Are you being your coders or developers or anyone? Are they actually going as far as designing in certain ethical standards enter into code? Because I mean, there's been sort of analogous situations in other industries. You know, so take I think I was reading something about Google and there, they're sort of driverless cars where, you know, obviously, like you said, there's a mathematical formula behind everything and they could take a shortcut because actually that will get me to the airport the quickest way possible. But actually, in doing so they run over a mother in that kid crossing the road or something and doesn't slow down for it. And they and apparently, they've been sort of doing things with they've been trying to design ethics in, and it's seen similar situations in some courts in America where they've been trying to use sort of algos to varying degrees of success. And often there's been a comment that, you know, the designer is actually designing in their own ethical standards and therefore, you know, who actually really owns the ethics, you know, whose culture's ethics really get the priority and all this kind of stuff. Is that something which your sector is doing or is that sort of a bit fantastical?

SPEAKER2 25:42 I think at the moment that's a little fantastical. We don't do that right now. So, what we're kind of relying on, if you like, is that we you know, there is code and there is code review and we all have a sort of, you know, and we all have an understanding of what is acceptable. Market practice was not acceptable market practice as defined by us, which is regulation plus an exchange rule plus. But



it's so what we're really doing is writing code, which is within those parameters rather than coding in the parameters themselves, if you know what I mean. Right. But I do think that when it comes to things like the neural networking, that is absolutely an area which we will have to go to. Right. Which is coding in those parameters and sort of like hard coding, certain stops and boundaries that prevent us and prevent the machines from going beyond a certain ethical point. But I wouldn't say we're at the point yet where we're coding in ethics. We're kind of still coding in market rules and regulations and things like that. So, we don't allow the machines to go beyond market rules and regulations, but we don't equally at the same time sort of, you know, ask it to do any kind of social good or anything like that. I think that's probably a step too far at this stage, but I could absolutely see that being the case in the future. And I think that would be a good honestly, I think that would be a good thing for the market to have that.

SPEAKER1      27:14    Are you seeing any sort of new conduct risks emerging? Because you mentioned layering, spoofing and again, in my sort of reading there's quite a number of commentators that say, well, actually, these are these types of abuses that have been around for years. But there's just that electronic...

SPEAKER2      27:34    Yeah, I mean, they are I mean, it seems like spoofing. Spoofing is one of the first things that I learned about when markets were pre-electronic, if you like, in the sort of mid 90s. I mean, there was some element of electronic trading within the market at that point. But at the same time, it was very you know, there was a lot of spoofing would go on through voice brokers and stuff like that. Right. Like you'd be, you know, bidding through a particular price level within the market and then hitting the offer somewhere. Right....through a different broker or something like that. And that sort of thing went on routinely and regularly within the market. And it was always frowned upon as kind of bad behaviour. But there was never any real sanction around that. And it wasn't systematic. It was done when people sort of like felt they needed to or kind of you know, were PNL challenged at a particular moment in time. And so, they looked to try and behave badly just to sort of get their PNL back on track. And in general terms, I would say if you look at a lot of the conduct risk that has existed in in markets, a lot of the conduct risk that you've seen over recent years, particularly if I look at the ASX market conduct risk, an awful lot of it has been driven by banks and dealers engaging in practices which are essentially at their heart loss making. Right. And therefore, trying to find ways to make those losses smaller or indeed mitigate them

completely and turn them into a profit. So, I'll give you a couple of examples. One is, for example, if you're executing required to execute stop loss orders for a client, in effect, then you're required basically to try to keep the client in as close to the stock level as you possibly can do, if not actually execute them at stock level, but you can't begin executing the order until the stock level is actually touched. Well, there's a clear dichotomy there right where you are. If you have to build the client one 20 for 30 and the market's coming down and it's one 20, 40, one 24, 30, 50, 120 for 30. And then you have to start executing in the market to give the client there 10 million or 20 million filled by the time it's finished. By the time you've got them all, they're the markets, you know. I mean, what I said the rate was, by the way. But anyway, one twenty-four twenty-eight or whatever it was, you know, and it's already well below the level that you were required to fill the client. Then all you've got as a trader is a guaranteed loss on your book. Right. Because any slippage is accruing to you and a lot of the time in the market, that's how the market had evolved to work. And the reason the market evolved to work like that was because if I agreed to execute stop loss orders for you in this way, then you would agree to give me other business so you don't give me a look at your options, business or other good business limit orders or at best orders or other orders that allowed me to kind of make money in the round. And so, we would. Yeah, and they said there was this kind of cross-subsidization, if you like, a relationship. And that still exists in the market today. And that is a major, major problem and a major source of conduct risk. So, when people started to front run stop loss orders, it wasn't because they are that particular trader was like trying to be really badly behaved or whatever, but it was because they knew they were going to suffer this this this loss on their book. And they were trying to mitigate it by saying, well, actually, I'm going to trade slightly ahead of the write hitting this level, so I'm going to start trading it when it's one twenty-four thirty-one, but it's been 20 for 30, 50, etc. You know, simply because I just want to try and get some an advantageous rate because I know it's going through the level. And then my average bill might be roughly where I'm killing the client. And that might happen because that that particular spot trader, for example. Well, it's all very well that that client's going to show the more options business. But he's not quoting them options. He's not running an options book. He's running a spot book. So, he has a loss in his book. The Options Guy has a profit in his book that the two don't get off right or aren't netted off by the institution. Right. And so, you, get this kind of conduct risk. If you think about things like the

fix as the second example, the stakes, you know, again, a similar sort of issue, you were required under the way the fix operated to essentially fulfil all client orders at the fixed rate was by definition a mid-right within the market. So, if you get any exposure at the rates, you are going to make a loss. Basically, it's like a guaranteed loss that you're going to make, right, because you're getting them admitted rather than on the bid or the offer, depending, obviously, on whether you're a buyer, a seller. So, by definition, you've got you've literally getting it at the point of zero P&L. Once you hedge it, you're a guaranteed loss. Right. So what did they do when they started saying, well, actually, if I have a lot of risk to cover and I'm going to take off effectively a big loss because I'm trying to cover, say, six hundred million quid of cable or something like that at 4pm fixed, I'm going to call around my mates and see if anyone's got the other side of that trade and if they happen to have the other side of that trade will now with each other. So, someone else has to sell 600 million at the fixed rate. We net off with each other. We both fill the clients at a fixed rate. And, you know, no one wins. No one loses, no one cries. Right. And it's all sort of good. But of course, what happens is that you phone around the other institutions you find, well, hang on a minute. I'm long. Six hundred six. Oh, so am I. Oh well I'm long four hundred. I'm long yarded FX and then all of a sudden everyone's going to hang on a minute. There's an awful lot going to be going through it fixed. Right. There's an awful lot of buyers at the fixed right. And so that's sort of like, well where do you think the market's going to go when all of that's been executed? Right. Obviously go a lot a lot higher. Right. So you're then where you're given information, which is obviously going to tell you should take some action and at the absolute least worst case, if you like, if you can imagine that you knew that there were buyers of two yards of cable at the Fix and your short cable in your book, what are you going to do? What would any trader do at that point in time? They'd go, oh, shit, I know I've got a short position is going to this thing is going to run away from me like crazy as soon as the fix starts happening. I'll square my position up before the fix. Now I'm guilty of frontrunning, right? And probably rightly guilty from running as well, right? But the problem is, you know, it's always the case or not always. That's wrong. Sorry, but it's often the case that these kinds of bad behaviours are predicated on things which otherwise would be loss making. Right. And so, people behave badly in a way to avoid losses. Right. And that's kind of an opportunistic thing that happens. The problem is, once you get into electronic markets, you start to get what I would call routinely and systematic bad behaviour. And the example I would use around

that, which is growing in the market, not shrinking, is the use of techniques like last look right there. Last look is really badly defined term. And here's why. Last Look is really saying as a market maker in any OTC market maker, in any OTC market, I should be the last person to look at a trade and say whether the trade is done or not. I should be the contracted term. And that's correct. Right. In my opinion, that's absolutely the correct thing. This is not an exchange where the exchange determines when a trade is formed and when the contract is made. This is a trade where you are a market maker putting your risk capital at risk to make a price, someone they're saying, I'd like to deal on that price. And you're saying yes or no to that, to accepting that risk. And it's right that you have that right to potentially reject the transaction. What if I made you a price now and you came back to me in three hours' time and said, I'd like to deal on that price? You wouldn't expect me to stand behind that price, right? That would be ridiculous. So, if you sent me that electronically, you'd expect me to have a right to reject it, right. So, the right of the market maker to be the contract determinant is absolutely crucial in any OTC market and particularly in any OTC Electronic market, where there is potential for electronic latency, different levels of latency, Internet speeds and all sort of stuff. However, again, what has happened is as the market has evolved, people developed this technique of utilizing that last look as a way to essentially cherry pick the transactions that they wanted. Right. So, they used it began to use it as a methodology for managing market impact and for avoidance of adverse selection. So, if I've got an offer in my price, because I think I know where the price is going to go, the way that we think we know where the price is going to go, that's my tool and that's my mechanism for avoidance of adverse selection is I've got an informed price. But if I didn't have an informed price, I could use the technique of last look and say, well, I've got a particularly good price to where I'm going to do it. And I'm going to give you the extreme example where I will turn around and say, you know what? I'm going to make you a choice price all day long and make your choice price. And when you try to trade on my price, I'm going to tell you after some artificial hold period. Right, whether or not I'm going to accept that trade or not. Right. And this is what people are doing. So what people are doing is essentially making prices and then say, when I received back that request a deal and they're going to hold it for some artificial period of time. And that period of time is then going to vary by client. It's going to vary by connection, and it can vary by any factor that I determine. Right. And that's this is the way that a lot of banks', terms and conditions and nonbanks' terms and conditions are

written. Right. We can choose any fact that we want in order to determine whether to hold you for ten milliseconds or three hundred milliseconds or 400 milliseconds right now. You might think, well, if someone holds it 200 milliseconds, who cares, right? Does it really make any difference? 200 milliseconds, about time it takes for your eye to blink. But if you think about the market today, there are typically roughly something in the order of the 200-millisecond window, probably something in Eurodollars something like 50 price updates. Right. At a minimum, a maximum. There might be two hundred price updates within that 200-millisecond window. Right. So this becomes if I can see lots of price updates immediately after you're trying to trade with me, then I can see exactly the direction in which the market is evolving and I can tell you which trades are going to be winners and which trades are going to be losers with a much higher level of its accuracy. It's asymmetric completely. And I have like in this raised recently written a paper on this, and I liken it to this is like a bookmaker only accepting your bet at the end of the race. So, this is a bookmaker, waits, sees the end of the race and then goes, yes, I'll take you. Because your horse lost. Right. And you say, well, that's ridiculous, you can't possibly be like that, right? So, then I'll say to you but make it OK. Fair enough. That's ridiculous. What about if I just see the first three furlongs or the first two furlongs and then it becomes, you know, any debate where there is a sort of an acceptable artificial holding period of quote or of trade acceptance or rejection is just systematic bad behaviour systematically loading the market in your favour against clients? And this is what's going on today systematically by the world's largest banks.

SPEAKER1 39:56 And that's really a new practice?

SPEAKER2 40:00 An electronic thing? That's not true. I think so. So, the analogy, which is interesting from a voice point of view is this has always existed. So last look has always existed in the voice market because as a trader, the way the process would have worked is, as you'd have been on the phone to your salesperson as a client and you would have said, give me a price in like I want to buy 200 million euros. Right. And the salesperson would have said two hundred million euros. I'm a buyer of 200 million euros. And the trader would have given you a price back and you would have given the suspect me to giving you the price. And before you said done, the trader might set off that. Right. Or then when you said done that price, the trader might say change and he could effectively say, no, I'm not going to take the trade. Right. And that's the way the market always operated. So, there was always an element of last

look, but it was very rarely used. Right. Because obviously, guess what, as a client of that bank, if that bank kept doing that to you systematically, right over boys, you would eventually just turn around and say, OK, forget this. Right. Because, you know, you only ever want to take my order when you accept my trade, when the market sort of immediately starts moving in your favour. Right. You know, and so on. And, you know, and this is kind of move from a periodically used kind of control mechanism, if you like. The bank traders and others used to protect themselves right into a systematic money making, profit maximizing tool. And banks and others will use terms like, well, this is to avoid the toxic flow. Right? Well, you know, the reality is there is a way to avoid toxic flow, and that is to charge different price for it. Right. You know, and so rather than apply some artificial thing after the event. Right. This would be like giving you again, back to my bookmaker analogy. I give you fantastic odds, better odds than you could get on any of the horses in the race than any other bookmaker. Right. But only then accepting that the bet at the end of the race. Yeah. And so it doesn't matter to you that it was a better price because at the end of the day, you couldn't actually hit it right now, of course, that's not to say that banks will always reject every trade that goes against them, but it's a question of systematically, you know, picking an optimal portfolio right where I keep you running as a client because you're not so pissed off that the that you'll actually walk from my liquidity because maybe my recent rate is five percent or whatever. But if I could make my reaching right. The five per cent of absolute worse trades, then I can make tighter prices going forward and I can crowd out the other competitors. Right. So, it's really bad, really systemically bad behaviour. And one of the big problems is other OTC markets are becoming electronic now. So, there's has been electronic or largely electronic for quite a while. This practice goes on systematically and there is absolutely no reason that a fixed income markets and corporate credit markets and interest rate swap markets will become more and more electronic. There's absolutely no reason to suppose that the same things won't happen in those markets as well, because exactly the same logical process of evolution will follow. And worse, it's even starting to happen in equity markets because guess what? Equity markets are starting to look more and more like a fragmented, more and more business is happening, OTC and away from the exchanges, etc. And indeed, if you look at it, there are now new order types that that the banks, brokers and dealers are offering to clients. Things like Goldman Sachs recently launched a thing called a conditional order. Conditional order is essentially an order with

landslip. Right. So, you can start see this, then there's this risk starting to happen in all markets, right? And obviously this is on top of what I would guess you would call things like spoofing and layering and things like that, which potentially could always have happened in the voice brokers, et cetera, but had almost a defined limit to them because they were human driven. Once the thing becomes systematically driven, the machines will just do it all day long. Right. And in a way, it becomes almost more egregious because what you can do is effectively set the individual gains that you make from strategies to be very, very small. Right. So, the amount that you made on every single trade is relatively small. But once you aggregate it up across that huge numbers of trades, you've suddenly made a lot of money. Right. And you can make millions, tens of millions, even hundreds of millions engaging in these kinds of practices.

SPEAKER1      45:09      How should regulators or firms.... obviously, you've seen things like FX Global Code, right? Which has got some points in about this type of activities.

SPEAKER2      45:21      It does. And yet this practice goes on all the time in markets. And I think that I mean, we're actually on the cusp of calling for a full on regulation within the FX market because I think the fact that this behaviour is so prevalent within the market is indicative of a market which is incapable of self-regulation, know if things like the FX, global things like self-regulation should happen, where industries are prepared to set a very high level benchmark for themselves, a failure. The FX Global Code tries to never be prescriptive around any behaviours. So, we ask them, for example, of the triennial review of the code, which is going on at the moment, to say that the avoidance of adverse selection in the management of market impact are not legitimate uses of last look. And they wouldn't do it. In fact, in their initial working group paper on that, which is not public, they actually include it specifically the ability of people to use it for those to use it for the purposes of managing those risks. Right. Which we think is just incredible, frankly. And that was coming, by the way, from some of the world's biggest banks, biggest commercial banks. So, I personally think that my gut feel is the market has broadly forfeited its right to self-regulation. And I think it should lose it. And I say that as a long-standing industry participant, but I think. You know, I also say as a sort of, you know, if you like, principled veteran of the market, right, with a relatively what I would consider a high ethical bar and a high moral bar around doing business the right way for any business, which, by the way, is in the business of just making money out of money. Right.

So, you know, all things are relative. Right. But, you know, in my opinion, the markets exist and operate for the customers that use those markets. Market makers are putting capital to work. And to the extent that they are putting their capital at risk, they deserve to get compensated for that. But that doesn't give them a right to distort free and fair competition within the market.

SPEAKER1      47:48    So, you've got no confidence in the ability of the industry led solutions to find the way forward is going to be a legislative solution, as...?

SPEAKER2      47:59    I believe it has to be a let legislated by regulators, legislated by a lawmaking bodies, as in parliaments, is nearly always misplaced and poorly constructed. Right. And I think that that is just that, by the way, is my personal view. I think you look at things like to be too awful piece of regulation. Dodd-Frank is a terrible botch up piece of regulation. And no one will convince me that the markets are safer today as a result of Dodd-Frank or the existence of swap execution facilities or anything like that. You know, we still live in a world where FX forward contracts don't clear. Therefore, there is systemic correlated credit risk within the market. That is exactly what brings markets to a halt, brings them to a grinding stop and threatens their whole existence and the existence of the firms within those markets. If you look at what happened in 2008, which obviously started in 2007, really. Right. But if you look at what happened in 2008 when really the crisis came to a head, exactly the same thing happened as it happened in nineteen ninety eight in the emerging markets crisis of September 1998 , long term and all of that, which is the banks no longer trusted each other from a credit perspective to deliver on the contracts that they had. Therefore, they stopped dealing with each other. Right. And as they stopped dealing with each other, obviously the prices to end users blow out enormously and the ability of end users to get liquidity in the market exactly at the point when they need it is really sort of, you know, destroyed. Right. For want of a better description is extremely limited. Right. And that's exactly what we saw happen in 2008. And that's exactly what started to happen during the crisis of the pandemic in 2020. Right. In March 2020, which is that people started to get concerned about the bilateral credit risk between institutions and forward foreign exchange market swap markets, et cetera, started to basically come up completely. Fixed income markets gummed up completely because everybody was concerned about bilateral credit risks and the lack of dollars for funding, which is really a reputation, if you like, of a bilateral credit risk is do you trust in everybody's ability to be able to get the dollars to fund? And the



market only kind of relaxed to some degree. When the Fed came in and said, you know, yours, the world dollars, right. And just gave dollars to the entire world and said there's no end to the supply of dollars. Right. At which point the world kind of relaxed a little bit to a couple of deep breaths and kind of carried on. Right. But, you know, without having central banks backstopping permanently the market, we haven't solved any of the systemic risks that we had in 2008 or indeed that we had in 1998. And yet the legislation numbering thousands and thousands of pages. Right. And we send data up the kazoo to data repositories all over the place with hundreds of thousands or hundreds of millions, billions of floats and trades done that no one ever looks at. Yeah, well what is the point, what is the point in any of that? And, you know, I when the central problem was, can we just get clearing working or could we start building digital currencies, you know, like not crypto but digital currencies in the form of digital pounds, digital dollars. Why aren't we doing that? Why isn't that front and centre and everything we're doing and saying this is a great way to get rid of credit risk within the market and get rid of that systemic risk, but we don't do it. And, you know, all too often I think that. When this gets into the hands of politicians, it becomes about headline grabbing and about sort of talking about protecting mums and pops and the grandmothers and grandfathers of Bavaria and whatever else, pension holders in the Netherlands and so on and so forth. And this is what MPs, and their MEPs and others like to stand for and say they stand up for. But the reality is that the gap between that rhetoric and the quality of the legislation that they actually pass is unfortunately "casnick".

SPEAKER1      52:57      Do you think that something which is unique to the UK or in Europe?

SPEAKER2      53:03      I actually think the UK is slightly better, has a slightly better approach in general, because I think broadly speaking, I think politicians in the UK understand that they're not very good at doing this stuff and they tend to leave it up to the regulators to do it and central bank to do it, which I think is far more sensible. I think in Europe there's a university to allowing regulators to do it and there is a desire for interventionism within markets. I mean, this partly touches on what we were talking about before we started the interview. But, you know, there's that there is a sort of, I think, a broad brush of interventionism across Europe and the desire for interventionism across Europe. I mean, a good example of this is post two thousand and post the 2009 G20 summit and everything like the French government. And I guess it was Ireland at that time,

right under. They put in place the stamp duty in order to stop high frequency traders from kind of transacting within the market, considering that high frequency traders were responsible for speculation against the euro, for speculation against banking stocks, for the ills of the market. In 2008, of course, HFT had absolutely nothing to do with any of that. You may not like HFT, but they had absolutely nothing to do with any of that. And they put in place a stamp duty specifically designed to tax HFT, which completely missed the point because HFT is, of course, never beneficial ownership of the stock that they trade. Stamp duty was completely and utterly the wrong tool to ever stop high frequency traders from participating in European equity markets. And when we spoke when I was at [REDACTED] at the time and when I spoke to the Treasurer about it and I said, well, I don't really understand this because this doesn't really seem to me to make sense. They said, no, of course, it makes no sense whatsoever. We're just doing it because this is what the government wants to do. Any thought? Well, is this all about you know, and I can remember, for example, having conversations with the European Commission again post 2008, my time with Sterling and having conversations with the European Commission know so with technocrats who work for the European Commission who were involved in this sort of framing of one. You know, one of the legislations that became referred to and, you know, because you've got this, you know, this trip dialogue process, right. Where three different elements put their two pennies worth into the market. And I think that, you know, I remember having conversations with them where the guy was talking to me about efficient market hypothesis, efficient price formation within markets that wouldn't it be a good idea if everything was just traded on an exchange? And I was sort of saying, well, no, not really, because some products don't trade well on exchanges because they're not liquid enough or they don't you know, they don't have characteristics that really suit central order trading. You might trade them on an exchange, but in a more sort of market maker driven way or whatever, that would be OK, but not just putting them on a club. And this guy sort of he must have been three years out of college, sort of turning around to me and saying, yes. But efficient market hypothesis tells you the most efficient form of price formation is the things that happen on a central order. OK, we've got you. What do you think the first thing the root is, the group says, is a desire to do the right thing, right, without the market expertise, knowledge or experience? And I would include now within that the technological experience as well, to be able to understand the implications of what all of the legislation that you're

putting in place and the impact and the likely impact of the rules that you're putting in place. And unfortunately, in our markets, the laws of unintended consequence of very, very strong right. And particularly in a world where the market practitioners are extremely skilled, working within the regulations, but in such a way as to gain an optimal outcome for themselves. Right. And that is the barrier, if you like, between the ethical standards that we were talking about earlier and the pure regulatory standards that...

SPEAKER1      57:33      The UK has sort of operated, the sort of principles based on common law based almost sort of approach, albeit it's had to import a number of EU regulations when it was a member of the EU. But typically speaking, that's been the UK's approach versus you say, you know, the US have got a very broad-based approach. And that's what I call armies of sort of lawyers poring for everything to see where the loopholes are. And I think, you know, with Europe, is it perhaps an issue with the fact that their markets are perhaps not as prominent as they are in London and some other big financial centres, maybe Singapore, New York, as well as that? It is an experience thing.

SPEAKER2      58:14      It's an experience thing. And it's also the fact that, you know, if you look at market prices, the best market practitioners from the continent mostly end up in London because, you know, it's like, you know, there are other also true developers, for example, right now, the best developers in Europe are all in London. Right. They're not in the best will in the world. You know, people can tell, you know, this is why I really genuinely felt that within the Brexit debate, the whole debate was when it was focused on financial services was completely wrong. Like, you know, I just felt that financial services were actually sort of, in some respects, yesterday's game. Right. Today's game is technology. Right. And look at it all. The best developers want to live in London. You know, they don't want to live in Milan or Paris or Madrid or elsewhere. They want to be in London. They want to be where the businesses are, where Google has its headquarters, where Amazon has its headquarters, where, you know, Palantir has its headquarters, where Apple has its European development headquarters. You know, this is where they want to be, right? They want to be where the market is. Missile, again, comes down to something we were talking about earlier about, you know, educational powerhouses around industries and where industries grouped together, et cetera, et cetera. But the attraction for European people, particularly young people, to want to live and build their lives and their careers, is in a place like London. And, of course, also the reality is that the language of

development and the language of financial markets is English, you know, and you can sort of like that or not like it doesn't really matter. It's just a fact. Right. And so, if you look at, for example, the legal framework that underpins most of our market, most of our sort of industries, etc., its English law, you know, and that's true in the US as much as it is true in the UK and across Europe. There's so much already sort of built in. It attracts the best people from Europe to London. And therefore, there isn't there just isn't the level of expertise or understanding within European centres. And then I think there is also a philosophical and ideological difference. Right. And the ideological difference, I think, is just one where, you know, there is I think, if I might say, in in the UK, a slightly more mercantile approach to things, including regulation. And so, I think when I talk to regulators, there's a sort of, OK, how do we get business done? They get business done in the sort of safe and, you know, well controlled manner. Right. Whereas when I talk to European regulators, it's about how do we get business done in accordance with the first level legislation, that MIFID II laid down? Right. You know, and that's what they're interested in pursuing. Whereas in the UK they're interested in pursuing, OK, how do we do something that promotes the business, makes a better market, a bigger market and better for the end users, but do it in a kind of safe way. Now, it doesn't always work, right? Just to be clear. Neither model is perfect, but I think I would always towards that UK type of model than the than the European type of model, but what we do need within is a much stronger ethical framework around it. So, one of the things I'd love to see is more of a code for professionals who work within a market to sign up to say that they are, you know, displaying the right level of ethical behaviour market. And to some extent, that has happened with the senior managers regime. But I think it could go a lot further than that.

SPEAKER1     01:02:06   Do you think those professionals have your sense that their knowledge of conduct risk as it may, may apply in this sector specifically around sort of algo driven trading? Do you think that their knowledge is as strong as they could be able to recognise what that looks like? Or is that improving? Is that something else that needs to be worked on?

SPEAKER2     01:02:31   Yeah, I think that gap's getting larger. So, I think the regulators have always run behind market evolution, as we mentioned earlier. And I think that, you know, as I mentioned, that geometric progression of innovation within markets now, because they are so technologically driven, outstrips the kind of arithmetic level of progression that you see in regulation. And it will continue to do so, and it will continue

to get further ahead of it. And that's probably precisely why you need some much higher level of ethical standards within the market and an agreement from people to live up to those standards. And that if they get caught not living up to those standards, to just never work in the industry again, you know,

SPEAKER1 01:03:21 I would have that sort of the youngsters who are coming in and maybe they've come out of, I don't know, Imperial College or something. They go and work in a firm like yours. And, you know, they are very bright. And I might be with kids within a mathematical sense or something like this. How do they I mean, how do they become familiar with what poor conduct might look like in their particular sector?

SPEAKER2 01:03:45 Well, it's partly cultural. So, it's about creating within your own firm the culture of the strongest ethical standards, and that comes always from the top of the firm. So, it comes from your CEOs, et cetera, et cetera. Right. And I think in financial trading firms like SGX, that's easier to do than it is in a bank. Right. And I say that because I don't think there are many bank CEOs who have a good understanding of technology based trading and electronic trading. And I just I think they're too far removed from the detail of what goes on in those markets to really inculcate that type of culture into the market, into their organisations. And it can happen from sort of head of markets, et cetera, et cetera, that even they're often the head of markets doesn't really understand it. Right. It's very rare, by the way, that the head of markets ever comes from an electronic trading background. They almost always come from a fixed income structured products type background. Right. The people who make the most PNL in organisations. Right. So that's typically the background that they come from. Right. And so, you don't get the level of seniority related to these kinds of activities that creates that kind of culture and makes it pervasive through the organisation in a proprietary trading firm. You can absolutely create that culture and you can also create the anti-culture just as just as easily. Right. I could you know, we're not going to name names, but I would say this is a great example of a culturally very strong organisation which has a very high level of ethical standards. I could name you half a dozen proprietary trading firms where the anti-culture exists. And it's made money however you can, within the rules, play by the rules. But whatever the rules are, look for the loopholes, look the ways to exploit the rules the way they are. Look for anything you can do, which is illegal activity to make money, right? Absolutely.

SPEAKER1 01:05:58 Is there much sort of collaboration between yourself, you know, your firm and your peers, or is that sort of is very secretive?

SPEAKER2 01:06:07 Yeah, it's quite secretive. I mean, we have good relations, I would say. So, I definitely have collaborations with people at banks, less with people at nonbanks. I do have some with people at nonbanks banks, but I have more collaboration with people of banks. But then again, people are banks are amongst the worst behaved in the market. So, there's no guarantee that simply because people work in the banks that there will. Some of them are amongst the worst behaved. I know, and one of the difficulties around stronger collaboration and I believe stronger self-regulation, if you like, is the fact that people are in the industry are very scared of talking to one another lest they be accused of operating a cartel, because there's been so much focus on cartels, whether it's around the fix or LIBOR or so many other things. Right. Where communication between traders or communication between individuals or organizations is considered to be collusive or, you know, legalistic. Right. And that that is very, very strong in people. Right. Because you go to jail for that. Right. So, whereas you don't go to jail for abuse last look. Right. Because it's allowed. Right. It's legal. Right. So, you don't go to jail for that. And you can make a lot of money and you can make yourself very wealthy personally by doing it right and abusing it. But it's legal. Whereas if you get caught. You know, doing something that even looks or smells like price fixing, you've got a pretty high propensity to go to jail. By the way, probably regardless of whether you're guilty or not. But, you know, that's probably more of a statement about the judicial system than anything else. But, you know, no one's there. Very few people I know who obviously there are people in markets who commit fraud and things like that who, you know, are prepared to commit criminal acts. But most of the people that I'm talking about from a conduct perspective are not going out of their way to commit criminal acts. They're actually trying to do things which are allowed by regulation or allowed by laws, but actually good market practice.

SPEAKER1 01:08:32 Are you aware of any sort of significant incidents, conduct risk incidents that happened in your sort of subsector in the last few years? And maybe how what lessons can firm like yourselves have taken away from that?

SPEAKER2 01:08:50 I mean, last look is obviously the biggest one. Right. Which I was mentioning earlier. That's the biggest, I think the biggest and worst kind of conduct risk that I've seen. There's also pre hedging quite a lot of what I would call pre hedging or what people would call pre hedging, but front running, which also exists within the market, you

know, we have policies enacted to prevent us from even ever being having any sniff of doing those things. So, for example, around last look, that we have no ability to put an artificial whole time around clients. So, we get clients and an immediate response. I mean, we can't be completely immediate, but within 30 to 40 microseconds, we send a response to a client saying whether that trade is accepted or not accepted. Right. So, we don't have any capability within 30 microseconds to do anything nefarious with the information or the client order or anything like that. But if you hold a client order for two hundred milliseconds, regardless of whether you accept it or you reject it, you've got opportunity to be active within the market on the basis of a trade you haven't yet accepted. Right. And that is obviously nefarious behaviour. We do not. But by the way, again, is not outlawed by the code. Right. And we think that, again, that's something which should be explicitly outlawed. Right. Same thing with information used on things like RFQs like, you know, if you ask five banks for a price or five LPs for a price, and while that they're all making you a price, they know that someone out there is about to go and buy 50 billion euros of euro dollar or whatever. Right. And so they'll start frontrunning or pre hedging or trading the risk, depending on how you want to call it, without even knowing whether they've won the trade yet or not or whether the clients actually do help. And so, there's all kinds of bad practices and behaviours that go on within the market. And just it affects in equities. We report stuff and in futures we report stuff on a frequent basis. I think we report suspicious transaction reports, stars to the regulator. Double digit numbers per week, really. And yeah, and the response we broadly get is zero. So, there's something not right in the framework of how these things are investigated and look, that there's bad behaviour all over the place in the market. I mean, and that's bad behaviour. Things that I would consider. They're not it's not illegal. Some of it I mean, some of it could be illegal. Some of it could be scooping and layering and things like they are market abuse, and they are legal. Right. But other bits, things like the abuse of last look, et cetera, et cetera, those things are not illegal. And they are permitted within the market, although they are theoretically frowned upon. You know, in my opinion, they are systematically egregious and employed for the benefit of LPs against clients. And that is fundamentally, ethically wrong within markets and should be against people's, you know, general standards of conduct within the market. For whatever reason, it just didn't come.

SPEAKER1 01:12:15 I mean, obviously, algorithms are very, very prevalent in other walks of life, as well as other highly regulated sectors. You know,

medicine uses them in certain places now that we can talk about sort of GPs, which sort of, you know, you might not even go and a GP anymore, you might have a sort of remote in. And, you know, you put in your details, and you get the answer that way. Do you think there's any lessons learned from any other sort of sectors that are very high tech regulated, which could be used to improve the functioning of the financial market conduct?

SPEAKER2 01:13:00 Not ask a question, actually, I mean, I am. It's very difficult to say that I can't think of any obvious kind of, you know, analogies. I mean, the only thing I would say is one thing I believe in very, very strongly is I don't believe it's good enough to just trust organizations anymore or individuals. So, I believe that all organizations should work to a standard of trust and verify. So, of course, to trust you say this to all of my employees, etc cetera, of course I trust you, but I am going to check what you do right. And I am going to change your behaviour. Right. That's just the way it is. Right. You know, and that's the way it needs to be, you know? So of course, I trust, but I also verify. And to that extent, I think the one thing that would create a lot more. Belief, if you like, in the standards applied in financial markets would be transparency. So just have a lot more data and a lot more transparency of data for people to be able to make judgment calls on the behaviour of individuals and liquidity providers within the market. And that would be a good step towards holding people to account. If you had to publish the things that you did, you had to publish reports on what you did and publish data, clear data on what you did, et cetera, et cetera, then I think things would be more in the light. And I think that if you look at all of the companies or many of the companies or people that are badly behaved, it's usually done with as much darkness and opacity around it as possible. Right. And when things are done in the light, people don't like it and they will shy away from doing it. I think it was the guy at Tower Research that said I don't feel the need to sign up to the global FX code because I don't have any clients. So, because I don't have any clients in the ethics market, I should just be allowed to do whatever the hell I like. You know, and I think that's, you know, as long as it's legal and that that, by the way, is very much the US approach to everything, right. If it's legal, it's fair game. Yeah. And I think in Europe we have a different view of the world than that. And I think in the U.K. where the bridge between the two, you know, in a way, you know, I think the Europe is too prescriptive from a regulatory point of view and often misses the mark because of that, because I think that the you know, the UK tries to apply that kind of principles based balance and to have certain levels of morals and



conduct behaviour , et cetera , that is that is sort of should apply within markets . But it's very difficult in any kind of global situation for one set of rules to dominate over another. And, you know, the behaviour of individual groups, teams, businesses, companies, et cetera, in a global market is very difficult to legislate for a time when regulators and legislators are not aligned with one another.

SPEAKER1     01:16:20 Can you ever see a scenario where, you know, maybe the algorithms themselves almost treated like agents, autonomous agents, and are subject to some form of discipline themselves? So, I mean, a good analogy is back in the early 90s, you might have might remember the moral panic around the Dangerous Dogs Act. And, yeah, it was it was widely criticized as a very poor piece of legislation. But effectively, what came out of it was the human owner of the misbehaving dog risks, you know, risks, prison sentence fines, all sorts of things like that. But also, the dog itself risk getting put down. And you could argue, well, you know, it's the human who trained the dog. But equally, you know, it could be that that the breed of the dog itself is such that, you know, even a human who was pretty reasonably well behaved, that the dog may go and then behave in ways that perhaps were not, you know, maybe, you know, maybe foreseeable, but maybe not anticipated or maybe not reasonably foreseeable. Do you see any mileage in that?

SPEAKER2     01:17:29 I think that could be an approach that you could take. Yes. Like you could create a scenario where you know, for example, a good example of this would be like we were talking about earlier with like HFT and stuff where you have, you know, now nanosecond levels of precision with virtually no jitter, you know, the ordering of market data like within the order book. So, in other words, your ability to place orders is measured in nanoseconds, so you have the ability to be on the top row. Top of book is almost instantaneously. Right. And you can if you're a nanosecond quicker than someone else, you'll be there first. It would be entirely feasible for market operators under a right, under the right regulatory or legislative regime, for example, to turn around and say, well, actually, we're putting a restriction on that. And we're saying, you know what? All orders received within, let's say, a, you know, five or ten millisecond windows are randomized and have to be randomized by the exchange by law. Right. And that would prevent this kind of latency arbitrage type behaviours. Right. And you would essentially get rid of a whole level of froth, if you like, within the market and the whole level of behaviour by algorithms. Right. Because you would remove the ability of exchanges to facilitate this kind of regional

latency arbitrage or cross menu latency arbitrage. And a whole layer of business would be taken out of the market and the whole layer of the business, which does not benefit end users. And whenever I hear high frequency traders say what we're doing is making price formation more efficient, and I like what you're making price formation more efficient by making two billion dollars a year and taking it out of the market. Yes, that's definitely making price discovery much more efficient for people that they discovered that there's lots of prices they can't trade on at least. Right. So you could easily create sets of overarching rules that would basically eliminate whole layers of algorithmic techniques and try to ensure that the only people that were engaged in trading strategies with those that had genuine risk capital to put up and to put at risk with a genuine interest to trade and to, you know, to try to make money out of their view on the market or their propensity to put risk capital up rather than by trying to load the dice completely in their own favour or through bad behaviour. And I think it's it would be entirely possible to put in frameworks around that which then got rid of whole swathes of algorithms and whole swathes of types of strategy and also slowed down the arms race, right. To some degree and to some extent, I think that would be entirely feasible to do. The difficulty is doing in any kind of aligned way globally and particularly it's the. Absolutely. The antithesis of the United States, right, where, you know, I mean, one of one of the guys that I used to work with, Morgan Stanley, used to have an old pit trading jacket. I'm sure, you know, I'm talking about pit trading jackets. And on the back of it, it said free markets for free men, you know, and that's the that, in my opinion, encapsulated entirely the kind of us libertarian view of non-intervention in markets. Right. And. The difficulty the regulators and legislators have all of the time in financial markets is how much to intervene, at what level to intervene and how to do it without unintended consequences. And the only people who are capable of probably creating that structure or structure that would work from that perspective are people who either have no interest in being involved on that side of the fence, on the on the gamekeeper side of the fence, or that people the very people running the firms that are poaching. So, you know, that's the dichotomy that you've got. And I guess that's not just true in financial markets. That's probably true in a lot of different areas of walks of life these days. Right. But it's very, very difficult to get to get people who have oversight of these markets to be anywhere near as good as the people who actually operate the markets and operate within them. But I think it would be entirely feasible to create a structure which could do that and could if you

got the framework right, take out huge amounts of potential conduct risk within the market. But whether that would actually ever happen, I'm extremely sceptical because of the difficulty of the fact the markets are global by definition and they are always innovative. The difference between, you know, the geometric and arithmetic progression of innovation, I was talking about innovation versus regulation that was talked about earlier and then the different philosophical and ideological viewpoints of regulators and governments across different major markets. Right. And therefore, I think it's a that's an incredibly difficult problem to solve. Right. And there was probably an opportunity to do it in 2008. And obviously it was botched completely and utterly. You know, the US went its own way. Europe went its own way. Other countries went, oh, my God, what the hell do we do now? And there was a lot of I mean, even if you read if you read the G20 communique from 2009, it's I mean, even now I read it. And I think what a farcical communique that actually was. That was a year after the financial crisis really blew up. And it's still when you read that communique, you think of this is terrible. You know, like, you know, talks about trades happening. It sorts of talks about clearing, for example. Right. Well, how much clearing, how much more clearing is there in the world today than there was back then? There's a bit in interest rate swaps. Does anybody really think that the world is fundamentally safer because interest rate swaps clear?

SPEAKER1    01:24:15    Well, I mean, it's the worst thing. The worst legislation's always done reactively.

SPEAKER2    01:24:21    So, I just you know, there was an opportunity there, though, for the world to come together and say this is a world-based problem. But no, you know, individual markets have to go their own way, do their own thing for their own political reasons and know the United States has ended up giving themselves an advantage in a head start. Their reaction to the financial markets crisis was much, much better than Europe's. They forced their banks to recapitalize and to do it quickly, which is why they now the dominant banking institutions globally in Europe and the United Kingdom. We fixated on punishing banks for the excesses which we had allowed and permitted to happen, which I agree were wrong. But, you know, the classic example of where the medicine is as painful, if not more painful than the disease, you know. And so, we, you know, limped along with undercapitalized banks, not recognizing their losses from 2008. And still, as a result, almost all European banks trade a point five of their book value, you know, 10, 13 years after the financial crisis. Right. I mean, like the market tells you that these institutions

are worth more broken up and sold, sold for their individual component parts and they are as ongoing businesses. How frightening is that? You know, and that's a direct consequence of the inability of European regulators and the UK regulators and politicians to see beyond the sorts of headlines. Right. And to actually create a genuinely better market for the future. And I very firmly believe, by the way, that the best way to do this, they actually had it right initially, which was split these things up. Right, split these things up fundamentally and properly have commercial banks whose job it is to lend money and give people retail banking functionality, et cetera, et cetera, and who operate on a, you know, 10 10x leverage level. Right. And who you will give explicit government support to in the event that they get into financial trouble and bankruptcy and then have investment banks whose job it is to trade financial products and move capital around the world, et cetera, et cetera. And they can be private institutions that have no government support, therefore, would have, by the way, shit credit ratings. Right. And would therefore be required essentially to clear everything, et cetera, because if they didn't clear things, they would never get bilateral credit with one another and they would be forced into a world where they could actually operate effectively and be properly ring fenced and insulated and isolated from government support. And that could have been achieved, absolutely could have been achieved. But politicians and otherwise unfortunately fell foul to lobbying and other forms of kind of manipulation that essentially let people off the hook. Right. And so today, we don't have banks that look fundamentally that different to the way they looked, you know, at the time, the financial crisis. Yes, they got less leverage, but on the other hand, they've got less leverage. But in a world of free money, so, you know, they're not incentivized to be sort of, you know, riskless organizations on the lending and commercial lending and retail banking side. And, so if they went bust today, they'd still have to be bailed out by governments. And woe betide, in my opinion, the next chancellor of the exchequer who stands up and says, I'm bailing out NatWest, you know. Yeah, but we've missed the trick. Competition is way too late now to come back and try and effect change around these things. The only good legislation I've seen realistically coming out of the financial crisis has been Basel three and four, which I think have been decent pieces of legislation. Excluding that, I think everything else has been pretty shocking. MiFID it is a really bad piece of legislation in the US. What did they do? They took because Gary Gensler and the CFTC took futures market regulation, which he was familiar with and overlaid over the top of OT, fixed income and

equity markets, completely the wrong thing to do in Europe, but an incredible shortcut if you want to just get it done the next stage left, which is why he wants to do right. And in Europe, what we did was, well, no one really understood fixed income markets amongst the regulators. So, we took equity market regulation and overlaid that over the top of fixed income markets. Doesn't work. Right. And that's why you've got a lot of the problems you've got with MiFID today, which is an insane overhead on people's lives and has not made the markets any better for users at all. You know, anyway, I rant.

- SPEAKER1 01:29:32 I've I have to go to a meeting at work, but it's been them. Fascinating. I really appreciate your time.
- SPEAKER2 01:29:40 You're very welcome at any time and any time we want to talk about football. You're also welcome.
- SPEAKER1 01:29:47 Yeah, I mean, I might, if possible, if I might tap you up for a few more contacts, if possible,
- SPEAKER2 01:29:56 if you don't mind the market. Yeah, yeah. Yeah, of course. Yeah. No, absolutely. Happy to say. Just let me know if you have specific subject you want to talk about, and I'll put you in contact with people. Or indeed if you have any follow up questions, just let me know and I'll, I'll try to answer them.
- SPEAKER1 01:30:10 That would be great. I mean, I'll be looking I mean, if possible, it would be great to speak to a couple more people in your firm, like on the maybe in compliance or, yeah, one of the sorts of quanti I.T. type people or something. That would be that would be interesting. Um, yeah, yeah, yeah. That's the biggest struggle. That's the biggest struggle with this project is because a lot of people just assume that because it's algos I'm talking about that I'm sort of after that code or something like this one on one. Yeah. I'm not as you can see.
- SPEAKER2 01:30:41 And believe me, there's nothing I mean like that. I mean, no would never give away that information anyway, obviously. I mean, the pain of that from the CEO for that quite rightly to you, by the way, is his entire business. So, you know, but, you know, always happy to talk about these things. And I'm always quite happy to sort of give you my opinion, not just as an employee of the X, but also my opinion as a market participant. You know, and a lot of these views are just used that I've come to over a large number of years as a market practitioner, right? Yes. You know, I'm actually really as a as

an industry participant, I'm frequently disappointed by the standards of failure in the market.

SPEAKER1 01:31:24 It's really been really interesting and, yeah, I will definitely take you up on that offer next time. Saints are losing to Tottenham, which we seem to do that every year was quite bad.

SPEAKER2 01:31:41 Usually. Yeah, usually in some farcical way as well.

SPEAKER1 01:31:44 Yeah. Well, you know, we've had a Daniel Levy is not one of the Saints fans favourites. But I think it's fair to say...

SPEAKER2 01:31:54 I think that that's been the way for a long time, for quite a long time. Hasn't happened to....