TUESDAY 22 JULY 2014

2.30 pm

Witness: Brad Katsuyama

Members present

Lord Hollick (Chairman)
Lord Carrington of Fulham
Lord Lawson of Blaby
Lord McFall of Alcluith
Lord Monks
Lord Rowe-Beddoe
Lord Shipley
Lord Smith of Clifton

Examination of Witness

Brad Katsuyama, President and Chief Executive Office, IEX Group
Q1 The Chairman: Mr Katsuyama, welcome to this hearing of the House of Lords Economic Affairs Committee. Thank you very much for joining us by video link today. First, can you hear us loud and clear?

Brad Katsuyama: Yes I can hear you.

The Chairman: As you will know, the publication of the book Flash Boys by Michael Lewis has sparked considerable interest in high-frequency trading and has led regulators on both sides of the Atlantic to look at it afresh and to see whether it represents challenges to market stability and increases volatility and, broadly speaking, who are the winners and who are the losers. In this session we would like to explore some of these issues and get you to guide us through them, because you were a central character in the book, you are very experienced in the field and indeed you have now set up your own enterprise. We would like to cover some or all of those issues.

Perhaps I can start by asking you to give us a bit of guidance on the difference between high-frequency trading, computer-based trading and algorithmic trading, although I notice that you recently said that “high-frequency trading” should be eliminated from the vocabulary, so it would be interesting to hear your thoughts on that. Also, what sort of firms use high-frequency trading? If you could pick those questions up, we would be most grateful.

Brad Katsuyama: Sure. I think that “high-frequency trading”, “computerised trading” and “algorithmic trading” are all used interchangeably. In the United States, when people say that 50% or more of the volume in the United States is high-frequency trading, I would say that they are encompassing a very broad definition that includes a number of different strategies, some of them productive to the stock market and some of them very predatory to the stock market and its participants. The vagueness of the definition has let people get away with some of the predatory behaviour because they can just claim, “I’m just part of this
broader structure”, and can lay claim to the benefits that computerised trading and technology have brought without really answering any questions about their own specific strategies and whether they may be predatory. Included in this broad definition of high-frequency trading are things such as electronic market-making and statistical and index arbitrage. Those things we believe to be productive forms of high-frequency trading. More predatory types of high-frequency trading strategies are latency arbitrage, which is racing between venues, and market data arbitrage, which is arbitraging the differences between how market data is disseminated and received by different participants. We view those to be more structural inefficiencies, which predatory high-frequency traders take advantage of.

The interesting part from where we sit is that everyone likes to call themselves a market-maker or a provider of liquidity. Through our research, and through launching our market, we have found that there are distinct types of strategies that do not provide liquidity but consume it. They look to get ahead of client orders and they ultimately increase volatility in the market. The fact that the definition is broad allows the industry to talk in circles and allows some people who are predatory to claim that they are not. This is probably why five years later we are still talking about the same things. We hope to drill in more specifically to say, “Let’s talk about predatory tactics and what they need to succeed”. Our market, IEX, has taken those things away.

The Chairman: Your comment about predatory trading leads us neatly into the next question.

Q2 Lord Smith of Clifton: Mr Katsuyama, what are the benefits of computer-based trading? Has the advent of high-frequency trading enhanced those benefits?

Brad Katsuyama: The benefits of computerised trading are that trading is now faster and cheaper, and the bid-ask spreads have compressed. All those three things have happened.
Ascribing the benefit to high-frequency trading or giving it the credit for those things is a little erroneous; those things were inevitable as technology reshaped the way in which markets operated. Technology is the reason why trades are faster. From a cheaper-trading standpoint, yes, it is cheaper to trade today than it was, say, 20 years ago; I quite often hear the argument that people can now trade for $8 a trade. A *Harvard Business Review* paper entitled *How to Win a Price War* talked about the cost for retail trades going from $30 to $15 to $8. The paper was written in 2000, 14 years ago, but people are still waving that around as a justification for some of the things that we see in the markets. I think that technology was inevitably going to deliver these benefits, and ascribing them to high-frequency trading is not necessarily the right way to look at the benefits and why today’s market is better than 20 years ago. There is no question that today’s market is faster and cheaper to trade in, but the reasons for that do not really have a lot to do with high-frequency trading.

**Lord Smith of Clifton:** That is very interesting, thank you. One of the arguments often put forward in favour of high-frequency trading is that it provides greater liquidity. Do investors benefit from this increased liquidity?

**Brad Katsuyama:** There are electronic market-making strategies doing the same thing as the market-makers of old, trying to manage risk across a large number of assets, and equities being included in that. Those strategies provide liquidity. However, we have also found, documented and researched a number of high-frequency strategies that absolutely do not provide liquidity; they are takers of liquidity. In events such as the flash crash in the United States, I would say that we faced a liquidity vacuum. Those who we relied on to provide liquidity backed away, and the strategies designed to perpetuate volatile moves perpetuated a pretty significant volatile move. There are certain segments of high-frequency trading that provide liquidity while others take it away. To give you a cleaner example, 17% of the volume of IEX, which I am CEO and president of, is high-frequency trading. It is not the 50%
that you see in the United States overall, and I have heard that some other markets are as high as 70% HFT, but our HFT participation is 17%. Those participants on our market are market-makers. At IEX we have slowed down the ability of HFT to interact with our market; we have put them 45 miles or so away from our market. It is the opposite of co-location: we have slowed them down. Certain high-frequency trading firms—market-makers—did not care; others cared a lot and refused to connect with us. The interesting part is that the market-makers on the IEX venue, the HFT market-makers, are having a very good experience because the HFT predators are not showing up on our market. The feedback that we commonly get is, "We don't get picked off as much when we make markets on IEX", which incentivises them to provide that liquidity. We found that feedback very interesting. There was also a very interesting white paper written by Albert Menkveld and Marius Zoican called Need for Speed? that talks about the Nordic exchanges and the tenfold increase in the speed of that market; it went from matching trades in 2.5 milliseconds to 250 microseconds, so the speed of the exchange was increased 10 times. They found that the bid-offer spreads from market-makers in those markets widened by 32% after the speed increase. We have been conditioned to think, and a lot of people have said, that speed led to HFT and that has led to narrower spreads, but here is documented evidence that a tenfold increase in exchange speed has widened spreads by 32%. It widened because when the market was slower there were high-frequency market-makers in the Nordic exchanges. When the market became 10 times faster, the authors say that a new entrant of market participant came in—what they call “high-frequency bandits”. They came into the new and faster market and started to trade at high speeds, picking off not only traditional investors but also the market-makers. In a really odd way, HFT is racing with each other: between market-makers adjusting their quotes and predators picking off those same quotes. The market-makers' response to getting picked off was to widen their spreads. In a very
interesting way, at IEX we have allowed high-frequency traders to define themselves. Whether or not they tell us that they are market-makers is of no relevance to us; we say, “Here is how our market is designed and here are the advantages that you don’t have”, and to us their determination to show up classifies them as market-makers. The absence of the predatory HFTs is leading to a good experience for all our participants, including the market-makers. There is sound documented evidence through our own experience and through some of the papers that we have seen that have said that there are different classes of HFTs and they have contrary needs from a market—one provides value and liquidity and the other absolutely does not.

Q3 Lord Monks: You have already referred to predators and predatory practice, and of course high-frequency trading has been criticised for creating opportunities for predatory trading. Could you explain to us something about the types of predatory practice that you have come across?

Brad Katsuyama: I would not say that it is just high-frequency traders who have created this opportunity. They have worked with the system, so it is partly the result of some of the deregulation that has happened, partly exchanges and dark pools working with high-frequency traders, and partly high-frequency trading’s influence on how the markets have been set up.

One of the examples that is pretty well documented in the book but I can speak to you about first-hand is the notion of latency arbitrage. My prior background before IEX, before I even got into electronic trading, is that I was a trader; I ran the cash trading operation at the Royal Bank of Canada. I would see 50,000 Intel on offer at $21 on my screen and I would try to buy them. I would send an order to buy 50,000 Intel and would get back, “You bought 22,500”. The rest of the stock would disappear, a little would trade outside of me and the stock would immediately tick higher. This would leave me with a choice: to pay a higher
price for the 27,500 that I did not buy, or to wait. The bottom line is that I saw 50,000 but
got filled on only a fraction of that. As it turns out, what was happening was that the 50,000
that I saw were spread out across as many as 11 different exchanges across the United
States, which meant that I would send multiple orders to many exchanges to access 50,000
shares in total. Exchanges have created an environment where they are selling technology to
any firm that will buy it—namely, high-frequency traders. Co-location allows high-frequency
traders to put their servers containing their strategies physically right next to the exchange's
matching engine, so within a giant data centre you have the exchange where they match
trades and you have high-frequency traders putting their computers right next to the
exchange. This gives high-frequency traders the ability to detect what they believe to be a
signal at one venue and essentially race to other venues. Back to the example where I am
trying to buy 50,000 but end up buying only 22,500: what we believe to be one immediate
atomic action across the markets is actually a timed series of events measured in
microseconds, where HFT, while my order is being executed, can race ahead of me and
cancel or buy stock in front of me. That is a pretty significant problem and we believe that
that structural inefficiency has been created in two parts: one part is that the exchanges are
selling technology to high-frequency traders, and the other part is that high-frequency
traders are able to use this technology essentially to get in front of client orders as they are
being executed. There is still evidence of that exact practice happening today, so it still exists
in the marketplace.

Lord Monks: In principle, is that really any different from the 19th century practice that
Nathan Rothschild and others used of having faster horses with shorter legs to run from the
scene of the battle to the exchanges and get there first? In principle, is there any difference
in those things? Maybe you could also say something about flash orders and whether they
are an issue on your markets and on the US exchanges.
Brad Katsuyama: To take the first point, there will always be someone who is the fastest and someone who is the slowest. That race between participants will always be there, and those who use computers will obviously trade faster than those trading manually. The biggest issue in the market today from where we see it is that the race is not really between high-frequency trading participants and slow manual traders; it is between high-frequency trading and the market centres themselves. When a high-frequency trader is faster than the market, they are able to trade with information that the market does not have. As prices are changing and high-frequency traders are the first to realise that they have changed, it gives them the ability to turn around and place trades, essentially placing bets against stale prices because the rest of the market does not know yet. The issue between fast and slow will always exist, but now you have an extreme situation where the fastest participants are faster than the New York Stock Exchange, NASDAQ and so on. We introduced 45 miles of cable between all our participants in IEX to ensure that no participant on IEX could trade on information that we did not already have. It is a battle of microseconds. That is the difference. People also say, “Well, there’s this specialist system on the New York Stock Exchange. The specialists existed and high-frequency traders are the new form of specialists”. Technology in many ways eliminated the need for a unnecessary middleman. That has been done across many industries, so historical precedent is not necessarily a justification for what exists today. Technology should have been the great equaliser, but instead in our market it has done something a little different.

That was the answer to your first question. Could you please repeat the second?

Lord Monks: It was about the extent to which flash orders are an issue today on the US exchanges.

Brad Katsuyama: My first research project that led me to high-frequency trading was an exchange in the US called Direct Edge, which had a program that offered what are called
flash orders, which showed orders to a group of participants and gave them the option to trade against that or not before it went on to do something else. Flash orders create a two-step process to execution. They also create latency gaps where that information can be used against the person whose order is being flashed. It is a pretty significant problem. It exists in various markets in the United States, and as the transparency of our market becomes greater and as more people are forced to disclose exactly how their markets operate, practices like that should probably come to an end.

**Q4 Lord McFall of Alcluith:** Brad, in Michael Lewis’s book he states that you rebuffed an offer from Intercontinental Exchange to buy your company for hundreds of millions of dollars. Why were you acting as Robin Hood?

**Brad Katsuyama:** The figure quoted in the book might have been slightly higher than what it was. The situation that he is describing happened before IEX actually launched our market. It took us 18 months to build our market, and this was leading up to the launch, so we had still not traded our first share on IEX. We have a lot of respect for the people at ICE and I personally have a lot of respect for Jeff Sprecher. We took a lot of personal and professional risks to quit our jobs and start our market, and we had to open it. We had to see for ourselves what it was.

**Lord McFall of Alcluith:** Okay. Is it not a façade, and is it not a fact that the market is interconnected and rigged? There is an old mental picture of the Stock Exchange that is comforting, but the culture of finance really is closed and secretive. As Michael Lewis said, investors have no hope of knowing even the little that they need to know because it is the financial middlemen, the intermediaries, who still rule like kings in this market. How do you ensure that we get a market that is fair and transparent and that everyone gets a chance?

**Brad Katsuyama:** A lot of it comes down to incentives. People respond to incentives, and unfortunately the way the markets are set up today is that the incentive is not necessarily to
cater to the end investor; the incentive is to try to maximise short-term wealth, and what affords the opportunities to do that is to cater to the largest participant currently in the market, which is high-frequency trading. To answer your previous question, many of the largest banks have high-frequency trading divisions within them, so some of the large banks are fiduciary for a client but also represent proprietary trading interests, some of which look and act like high-frequency trading firms, so the market has become very conflicted in how it is set up. With IEX we set off first and foremost to act as a mobilising agent for the buy side. The asset managers who are giving orders to brokers need to exert greater control over how their orders are handled. Many of these clients have asked for data on how their orders are being handled but have not been able to get it. That is a significant problem and we are pushing the SEC for greater disclosure on information. To give you an example, if I am a broker and I route an order, I flash an order to markets one, two, three and four, and then in the fifth market I get an execution. If the client asks me where they traded, I will say to them, “You traded in market number five”. If they ask me, “Where did you route my order before market five?”, it is very hard to get that information. There is a significant lack of transparency in the market, but at IEX, first and foremost, we are owned by mutual funds, hedge funds and family offices—traditional investors. Our motivation is to create a market that is fair for all participants but represents their interests. We only have broker-subscribers, which means that no one who owns our market can trade in our market and no one who trades in our market owns it. We have tried to align the incentives of the client and the brokers who are representing client orders. It is still early stages but we have some pretty significant support from some very large brokers, and the conversations between us, the brokers and the clients are starting to go much better than the ones that were occurring in the book; I do not know whether you have read the book, but we had some pretty nasty
run-ins with some brokers. The long-term goal is to align the incentives of brokers and their clients, and the market will become much healthier as a result.

Lord McFall of Alcluith: But to come back to the previous question about the flash-order scandal, if I am correct, the scandal is that high-frequency traders are allowed by exchanges to see others’ orders before anyone else, with no obligation to trade against them. That supports what Michael Lewis is saying: the market is rigged. The 350-microsecond delay that your company has introduced is equivalent to one-thousandth of the blink of an eye, so you could say that investors are being screwed because they do not understand a microsecond. That does not seem to be a fair market that everyone has a chance in. People therefore have to do something about this.

Brad Katsuyama: I would agree that the markets are unfair. I think we have lost track. The best analogy I can give is that when two teams are playing, you realise that the different teams will have different sets of talent, they will have better or worse players and they will have access to training, but when those teams play you hope that the referee is not biased; you hope that the referee is neutral and that the better team ends up winning. When investor orders come together in the marketplace, you realise that they will have different access to technology and different amounts of information, but when the buyer and seller meet, the only thing that we should expect from the exchanges is that the conditions for those trades are fair and that the exchange is neutral and has no bias. That was possibly the case at some point but, as technology evolved, a certain player—“high-frequency traders” being the broad, encompassing phrase—found a way to harness that technology and use it to trade at faster speed with faster information. That “edge” is capitalism. The problem became that the exchanges themselves instead of saying, “Technology has evolved. How do I use technology to maintain neutrality and fairness?”, turned around and started selling technology, primarily to high-frequency trading firms. Whether or not exchanges will admit
it, ultimately when you start to sell technology you automatically become biased towards a
certain outcome. You are no longer neutral; your bias becomes that you want the person
buying your technology to win more than they lose. As a result of that shift in priorities,
here is where we have ended up. The best way to create a fair marketplace is to use
technology to maintain fair conditions for trading. That is exactly what IEX has done; we
have designed and built a technology platform to keep everyone on the same field, especially
IEX itself, by ensuring that no participant can trade with information that we do not already
have. If we do not have all the information, the referee cannot keep up with the play and no
one knows what is happening. We ensure that we always have a full view of the market and
no one can trade with information that we do not have. That is the way to create a fair
market. The problem is that an entire infrastructure has been built around unfair trading.
We have a lot of enemies. There is a lot of resistance, and our job and our goal is to
continue to push things forward and educate the end users of this market about how things
should change.

Lord McFall of Alcluith: To sum up, there is a long way ahead to ensure that we have a
fair market.

Brad Katsuyama: There is a long road ahead. It will not happen immediately, but we
continue to gain traction with asset managers, brokers and the general public. We feel
confident that this problem can be solved, but it will take time because the interests in
maintaining the status quo are very powerful and they have a lot more money than we do.

Q5 Lord Rowe-Beddoe: Before you joined us, Brad, I was rudely put down by my
colleagues because I was intending to state for proprietary reasons that I have a potential
interest in this area. As I have listened to you, I have realised that the greatest change in the
past 35 years since I developed one of the first computer-based trading technologies in
conjunction with Morgan Stanley in 1980 is speed. It is remarkable to hear your thought
processes, but all of it is down to these millionths of a second. Anyway, having said that, do you believe that high-frequency trading has increased volatility in financial markets?

**Brad Katsuyama:** I believe that predatory high-frequency traders, based on the principle of how they trade, have increased volatility. If your goal is to identify buyers and sellers in the market and profit from their existence, you insert yourself as a buyer when another buyer is present. You will sell a little to gain that information and then you will start buying stock. Ultimately, from a trader’s perspective, the price will move more when there are two buyers rather than just one. If you multiply that strategy across many different people looking for the same signal, it will tend to create more buyers in an up-move and more sellers in a down-move. The goal is to go home flat. My prior job was as market-maker at the Royal Bank of Canada. If you are willing to hold the risk for a longer period of time and you have a longer-term view, you can take a contrarian view and dampen volatility. If there are five sellers in the market I can buy at a depressed price, hold on to that stock and exit over the next couple of weeks. If my holding period is measured in seconds or fractions of a section, I cannot conceivably come up with a profitable way to do that and to not compete with order flow and increased volatility. At the same time, there are certain high-frequency strategies, such as ETF arbitrage. If you are trading a basket of securities against the ETF, you are creating liquidity in those securities and hedging it against the ETF or you are creating liquidity in the ETF and hedging it against the underlying securities. You are taking liquidity from across products and representing it in different asset buckets. I would say that that would dampen volatility because you are using technology and a multitude of products to create strategies that provide liquidity across many markets. Now, you charge for that liquidity, but I would say that it is valuable to end participants. Part of the reason why people keep the definition of HFT so broad is that they can say that HFT dampens volatility, when in certain cases that would be true. I say that it is a narrower discussion because we know that
definitively in other cases it is not true. I would say that it is both true and false. I am sorry to give an answer like that.

Q6 Lord Rowe-Beddoe: No, it is fair enough; that is your answer.

Staying with HFT, do you think that it has any implications for financial stability in general? Then let us go to the 2010 flash crash and its implications.

Brad Katsuyama: The things that high-frequency trading requires out of a market are different from those who are buying and holding over the long term—things such as complex order types. Some exchanges have dozens or hundreds of order types. They are consistently encouraging the exchange to go faster, so you have an increased amount of complexity in a system and you are encouraging that system to go faster. Then at times the regulators are asking a more complicated, faster system to change at frequent intervals. That is a high-level recipe for disaster. When you look at some of the complications that are introduced into the system, you always measure it against the benefit to the end investor—does this help the investor or the issuer? Many times the answer to that is no. When we started IEX, we listed on a couple of whiteboards the hundreds of order types that exist in the United States and went through each one to decide whether there was a particular order type that served a broader purpose. We ended up with four order types on our market. Many of these order types serve no purpose to someone who is looking to buy or sell stocks; they serve some other purpose that offloads computing power from certain firms on to the exchange. I would definitely say that the stability of the market has been hurt in many ways as the markets have shifted priorities and have introduced things into the market that do not really serve the market’s purposes. In Goldman Sachs’s op-ed written by its president, Gary Cohn, he lays out pretty specifically that even a firm as large and sophisticated as Goldman has concerns for the stability of the market, and I completely agree with him.
Lord Rowe-Beddoe: Thank you. You mentioned that you have 17% HFT. How about your computer-based technology and algorithmic trading, percentage-wise?

Brad Katsuyama: Seventeen per cent would be classified as firms that trade only for their own account, which would encompass HFT. I would say that even a lot of client business—mutual fund and hedge-fund business—is executed algorithmically today, so they are coming to you through different bank-offered algorithms. I would say that roughly 60% of our volume is coming from full-service brokers, the large investment banks, with much of that directed by the buy-side client, and then the rest, let us call it 23% or so, is coming from agency brokers. Even when I was a high-touch trader at the Royal Bank of Canada, the majority of my order flow was being executed algorithmically, based on the tools that I had at my disposal as a manual trader.

Q7 Lord Shipley: You referred earlier to co-location. I was not sure whether you knew that in the UK the Financial Conduct Authority has launched a review of competition in the whole securities market. It will examine the practice of co-location, and the FCA has said that the practice could be seen as a natural consequence of innovation and the evolution of the markets, but it also said that competition concerns could arise if the availability or the cost of co-location created a barrier to entry for new market participants. Do you agree and could you comment on its view?

Brad Katsuyama: The justification for co-location is that it is available for purchase by anyone. The cost of it doing it is very high, so I agree with the statement that it is a barrier to entry. Co-location will be very difficult to regulate; if you say, “Okay, you cannot sell space next to your matching engine in this building”, that will create a cottage industry of data-centred carriers around the building that will just try to lob a cable over the fence and be the next closest thing to the matching engine. How do you necessarily regulate the speed or the proximity that one can be from a matching engine? It has to be a conscious choice.
Part of why IEX has built an anti-co-location model, where we force everyone a minimum distance away from each other, is that we believe that this provides greater value and fairness to all our participants. The distance that we have selected is customised for IEX. It will not necessarily be suitable for other markets to say, “Okay, we’re going to put everyone 45 miles or so away from the market”, so it is a customised solution, but it should be within each market’s right to design the market however they want so long as they are transparent about it. Then, with full information, investors and brokers can make decisions on the best places to send their orders. If certain markets out there want to cater very specifically to computerised trading or high-frequency trading, they should have a right to do so, but right now that is happening in a very opaque form and people do not know the exact differences between markets. Forced disclosure would help but it will be very difficult to regulate practices such as co-location. I do not necessarily know what the unintended consequences of regulating technology would be.

Q8 Lord Shipley: Can we shift to the US? What regulatory action, if any, do you think the US authorities should take? Is it nothing, or would you introduce some reforms?

Brad Katsuyama: We definitely think that some reforms are necessary but we are very careful about prescribing what those reforms should be. One thing to point out right off the top is that, as IEX stands today, everything that we built fits within the current regulatory structure. We did not ask them to change any rules prior to our launch; we took the rule set and the spirit of the rules as they stood and tried to build a different kind of marketplace, so all the controversy that we have created, funnily enough, has happened within the rules. I think that that says a lot more about the players in the game than about its rules. The thing that we pushed for the most from a regulatory standpoint is disclosure. It is about forcing participants, first, to standardise how they calculate metrics, and then forcing the disclosure of certain metrics. The education and understanding of the end investors—the mutual funds
and the hedge funds—have increased dramatically over the past five years; they can make very good decisions if presented with the right information. The problem is that the system wants to obfuscate that information because they do not want the right decisions to be made. We think that there is low-hanging fruit for the regulators to address as it relates to the disclosure of information, rules and pricing. That is the best place to start. I do not think that any rule that has an increment of time in it will help the market. It may help in the short term but in the longer term the market will continue to evolve quicker than any type of regulation around technology.

**Q9 Lord Shipley:** I want to ask you about the transparency of dark-pool operations. A few weeks ago the US Securities and Exchange Commission announced that it was going to push for new rules to increase the transparency of dark-pool operations so that more information would be publicly available. Is it right to have said that?

**Brad Katsuyama:** Absolutely, yes. There are 45 ATSs or dark pools in the US. A very small number of them have made publicly available their rules, their pricing and how the market operates. Billions of shares are traded every day in markets with little to no public documentation. That should be a very scary thing for people to hear. Part of being a dark pool is that you do not have to publish a displayed quote, but that should not mean that you have no obligation to publish how your market works. The standard reporting in dark pools right now is quite low. Raising the bar will only help the quality of the market.

**Lord Carrington of Fulham:** From what you are saying, I think you are suggesting that these markets are capable of being rigged. Am I right in suggesting that?

**Brad Katsuyama:** The way that the markets have been designed means that certain players in them are definitively disadvantaged, so “rigged” is probably one of many words that can be used to describe that situation.
Lord Carrington of Fulham: If that is the case, even though markets are clearly designed to avoid market manipulation and front-running, which as I understand it is a particular issue around high-frequency trading, are they capable of regulation at all?

Brad Katsuyama: We at IEX are trying to create an initiative for the market in turn to try to correct itself. There has really been no attempt by the market to self-regulate as things have evolved, and this is definitely a step in the right direction. Our market share continues to grow—we traded 106 million shares on a single day last Thursday, which was a record—so, in a way, the market is getting behind a market-based solution. If IEX is successful, you will have many other IEX-lookalike types of market. We welcome the competition and think that it will be good for the end investors for markets to be competing for their interests as opposed to others. We think that if people are incentivised the right way, markets can respond positively and some of this can be fixed for itself.

Lord Carrington of Fulham: I understand that, and I understand that your exchange is capable of doing that. I am not terribly clear how any government-established regulator could possibly get close enough to these markets with a sufficient amount of information to be able to take action quickly enough to stop the markets acting in a way that is against the interests of the overall market as opposed to various market participants. Is there a way of doing that?

Brad Katsuyama: The regulators are definitely in a position where they are on the outside looking in. We hear certain things, such as “kill switches”, and we have just recently implemented one at IEX. Are there ways to stop the markets from a catastrophic cascade? Certain things, such as circuit-breakers, have been put in. If the flash crash happens again, it will be in a different form that we have not seen, so it is hard to prevent things from happening. Every prevention technique really addresses the problem that just happened, not necessarily one that may happen in the future. The regulators are definitely in a tougher spot
when it comes to regulating things dynamically. Regulators forcing a greater amount of disclosure and transparency will inevitably stop some of the practices that we see. It will inevitably stop some of the bad decisions that have been made, and a lot of things that we have seen come up since the book was published have been a result of people acting in a certain way because they felt that no one was watching. Every time the regulators want to discover something, they first have to search out the information and then go out and prove whether or not something happened. Disclosure forces the brokers in the market to provide this information, which makes it a lot easier to say, “Here’s what you say is happening; let’s see what’s really happening”. It makes the discovery process a lot easier. The regulators can make it easier for them to detect problems by forcing the market to be more transparent and disclose more data. That is definitely a step in the right direction, but I agree with you that regulating this in a dynamic fashion will be very difficult.

**Lord Carrington of Fulham:** So you are saying that they are going to be able to regulate it only by looking at what went wrong in previous trades to stop future trades being operated in the same way and then, presumably, prosecuting the people who had behaved in what, one hopes, was a criminal manner. Is that correct—that it would always be closing the stable door after the horse had bolted, in the hope that you could stop any other horses getting out?

**Brad Katsuyama:** That seems to be the trend that we are seeing, yes.

**Q10 Lord Lawson of Blaby:** I will just follow up on that before going on to what seems to me to be the main issue. You have said that the only significant regulatory change that you feel would be useful would be greater disclosure and transparency. You also said that, although a lot of unfair and undesirable things have happened, the main disadvantage that comes from high-frequency trading and these other forms of trading is increased volatility.
Do you think that if you had more disclosure that would significantly reduce the risk of greater volatility?

**Brad Katsuyama:** Yes. I think it would happen indirectly, but greater disclosure would have reduced the opportunities for predatory trading behaviour, and by reducing those opportunities you are naturally removing participants from the market who contribute to greater volatility. So I would say that the answer to that question is yes.

**Lord Lawson of Blaby:** Thank you. That suggests to me that the major issue at the back of all this is a cultural one. If one thinks back to the appalling banking meltdown and crisis of 2008, it is quite clear to most people who observed it that the banks got into big trouble because of a deterioration in banking culture. That is certainly the view, for example, of Paul Volcker, whose main practical remedy was to say that there is a cultural distinction between trading for clients and proprietary trading, and he therefore sought to separate those out completely. I believe that that was a correct diagnosis. However, you have said, accurately, that high-frequency trading and predatory trading is proprietary trading, not, for the most part, trading on behalf of clients. Yet there are banks doing it, as you have made clear in your evidence. Do you feel that perhaps an even more important regulatory change than disclosure—I am not saying that disclosure is not a good idea; I am sure it is—would be to forbid banks from engaging in high-frequency trading at all? Others are already making high-frequency trading illegal, but would you say that it is something that the banks should not be permitted to do?

**Brad Katsuyama:** I think the way it is described within banks is market-making. The regulators would need to go into each bank and discover exactly what their strategies were designed to do. Having worked at a bank myself, I see a lot of value in banks using their capital to facilitate client order flow. If a seller wants to sell 1 million shares of stock, being able to buy that stock from them at a specific price, there is value in that, and many banks
engage in that type of principled trading activity when it is facilitating client orders. As you indicated, there is a conflict of interest when a bank is trading solely for its own use and, at times, the client is on the other side of that trade. There is a tremendous amount of validity in what you say. The masking of some of this trading activity has been designed to facilitate client order flow. That is where the line gets grey, and it is not something I can necessarily comment on.

**Lord Lawson of Blaby:** This is not a new issue. It came up when the Parliamentary Commission on Banking Standards in this country, of which I was a member, took evidence from Paul Volcker. Exactly the same point was put to him: how do you distinguish between market-making and pure proprietary trading? He said that the traders know perfectly well what they are doing. The distinction may be rough and ready but surely it should be possible for regulators, albeit in a semi-arbitrary way, to be able to distinguish between genuine market-making and what is undoubtedly proprietary trading. Would you agree?

**Brad Katsuyama:** I agree that there is a distinct difference. How that difference is discovered, though, is something that the regulator has to work with each individual firm to find out. But, having worked as a bank market-maker, having run risk trading at a large bank and now working at IEX and understanding what pure principled trading looks like, I think there is a noticeable difference. It comes down to the strategies, which is why that is something that would have to be discovered on a case-by-case basis.

**Lord Lawson of Blaby:** Right, and the regulators clearly have to raise their game. I have one last quick question about your outfit. You have said that you are planning to convert into a public exchange. How soon can you do that? More significantly, what practical difference will it make?

**Brad Katsuyama:** We believe that the regulatory process, given historical precedent, will most likely take between nine and 12 months after we file, so it will be at some point next
year, around this time, or possibly earlier or later. There are a variety of reasons to become an exchange, but the most important one for us is that the exchanges contributed to price discovery. We want there to be a displayed component to IEX, meaning that we want to contribute a quote on the bid and offer. The only reason right now that we are an ATS or a dark pool is that as a start-up we did not raise enough money to be an exchange. Now that we are in a position to do that, it has always been our intention to be an exchange and compete directly with the New York Stock Exchange and NASDAQ as the premier market centres in the United States. That is our intention and I hope it will happen next year.

Q11 The Chairman: On your website you say that IEX is a market that works for investors. Is that view shared by investors, and how do investors generally now see high-frequency trading in light of all the revelations that have been made in Michael Lewis’s book? Are they taking action to penalise, or not deal with, those people who they feel are involved in predatory trading?

Brad Katsuyama: I believe so. We have a fairly large following from the buy-side community—asset managers, hedge funds and so on. We are owned by buy-side firms, so our intention right from the beginning was to represent the interests of traditional investors. That comes down to ensuring that we have a simple, small number of order types. We have simple pricing and we have designed our technology in a way that we believe creates the fairest possible trading conditions for those investors. As our market share grows, we believe that more and more traditional investors are taking greater control of how their orders are handled. For many people, the revelations in the book were things that they had already been hearing from us for several years, so a significant number of buy-side firms that were pretty far up the curve were pushing their brokers for greater transparency and taking greater steps to ensure that their orders were protected. The challenge is that high-frequency trading is a very, very large part of the market; it is 17% of the volume in our
market and 50% overall. There is a pretty significant proportion of volume that we believe to be predatory, and it is hard for clients to avoid interacting with these types of firms, especially when a lot of clients are paying and trading with multiple brokers. Each of their brokers has different interests in how it routes client order flow, some of it to enhance the market share of its own dark pool and some of it to maximise rebate capture from exchanges. All these different conflicts that brokers are faced with have an impact on how client orders are executed and handled. It is a long and arduous process for buy-side clients to go through to ensure that they are getting the best execution, but a large number of them are taking those steps. We have had no shortage of meeting requests since the book came out, and we look forward to meeting more and more buy-side firms to continue to educate them about what is happening in the market.

Q12 The Chairman: You made the point earlier on that there is a significant investment in infrastructure in order to allow firms to participate in high-frequency trading. What are the returns on that investment? A newspaper report suggested that the profit in 2009 from high-frequency trading—obviously it did not distinguish between predatory and, shall we say, non-predatory trading—was $5 billion, and that high-frequency trading accounted for some two-thirds of market activity, whereas by 2012 profitability had dropped to $1.5 billion and the share that high-frequency trading had of the market was 50%. I do not know where those figures have come from, but could you just give us a glimpse into the dark pool? How much money is being made by high-frequency traders? How much of that is made by predatory strategies? In a sense, that is the amount of money that is being lost by investors.

Brad Katsuyama: The number is in the billions. I have seen estimates from $20 billion or so down to single-digit billions. It is really hard; most of those are just guesses, to be honest. One figure that I saw solidified certain things for me: a TABB Group report said that $2.2 billion in technology and infrastructure spend occurred in 2010. That gives you an idea of the
amount of money that is being spent per year on the infrastructure. Everyone is in business to make money so it will be some multiple of that, on top of paying people et cetera, where that money is being made. Look at the microwave towers that are being built and the low-latency technology that people are spending a lot of money on that shaves nanoseconds off their times. No one would buy a microwave tower if there were no value and use in having it. No one would pay for co-location if there were no use in being closer and getting that signal quicker. You hope that by taking away some of those advantages and eliminating some of these predatory strategies, there might not be a need to be a reason to pay for a microwave tower. If there is not, then the microwave tower never gets built. However, I would say that the microwave towers are being paid for by end investors who have absolutely no need for a microwave tower to be sending signals back and forth between exchanges. The infrastructure spend is in the billions, so I would argue that some multiple of that is the amount being taken out of the market. Again, there are some services that deserve to be paid for. If you are providing liquidity in an ETF, you are hedging out that ETF and you are able to make some money in doing that, I would say that that was legitimate. If there is an ADR listed in the United States for a UK-based company, at times, given the FX rate, a big buyer pushes the stock up on the LSE and you can sell that and buy it in the US, and then it normalises. Money being made from arbitraging inter-listed securities and ADRs is also perfectly rational, but a large part of the money is being made for completely irrational and unnecessary reasons. It is really hard to determine what that number is, which is why no newspaper has published a report saying, “This is the amount”. It is just very hard to determine.

**The Chairman:** Is there still evidence that significant additional investment is being made to exploit these time differences? To what extent is investment being made in following the path that you are on, which is to provide a level playing field?
**Brad Katsuyama:** I would say that a lot more investment is being made in figuring out how to exploit market inefficiencies than in trying to correct them. One of the interesting questions I get asked all the time is, "Were you the first person to discover that this latency arbitrage exists?", and my answer is always, "No way in hell was I the first person to discover what was going on". People do not have the incentive to try to stop the problem if they are making a significant amount of money from the existence of the problem. We do not see a lot of IEX competitors out there. If we are successful then we expect to, but at this point in time there are very few people who are trying to do what we are doing. It has not made us very popular so it is a hard thing to do.

**The Chairman:** Thank you very much. It has been a most interesting session, and thank you for granting us your time.

**Brad Katsuyama:** Thanks so much for having me.