

CHAPTER 2: WHAT MAKES AN EXCHANGE A UNIQUE INSTITUTION?

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ANDY BROOKS: An exchange throughout history has performed a number of unique functions in the trading of securities. These functions have included finding the opening and closing process; halts; dissemination of news; pending news; dealing with the order of balances, sources of information on supply and demand; aggregation of buyers and sellers; price discovery; transparency; speed; fair and orderly markets; reconciliation; and arbitration. These and much more might have been seen as unique in the past. However, I am not sure that is the case today. I want to start by asking each of our panelists this question: In your view, what makes an exchange unique? Let's start with Al.

ALFRED BERKELEY: It is all about the rules of engagement. Exchanges provide an environment. We have a lot of different exchanges, and they all provide different environments. They compete on that basis. That environment consists of a set of trading rules that professionals coming to an exchange and trading in the markets agree to follow. These become the rules of engagement. It is all about who knows what; when do they know it; and what can they do with this knowledge when they know something. Professor Bill Wilhelm of the University of Virginia wrote a wonderful book called *Information Markets*.¹ He points out three ways in which people cooperate

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¹ *Information Markets* (Harvard Business School Press, 2001), William J. Wilhelm Jr., outlines how advances in information technology are transforming financial markets.

on a satisfactory trade. One is coercion by the government, or an exchange. Thus, the government would say you must do this, or that, and it has the power to enforce its mandate. An exchange, by its rules, takes the same approach once you've agreed to be a participant. The rules coerce you to perform in a particular way under pain of being excluded. Second, and at the other end of the spectrum, is natural cooperation. That's when people are dealing repeatedly with each other and discipline each other through social norms and/or through economic interaction. Third is a middle ground. This is where most exchanges sit. The middle ground involves the intermediation of a human agent, a trusted agent who knows more than one participant, and more than both players in a trade. He knows more because he is constantly dealing with those same people. Actually, he develops a reputation for how he deals with people, and this can be a win-win.

You have these rules of engagement, the human interaction from dealing repeatedly with the same person. This is very difficult to achieve in an anonymous electronic environment where you don't know who you are dealing with over and over again. In that sense, the rules of the exchange have to change to compensate for the lack of personal knowledge.

GARY KATZ: What makes an exchange unique? To me it is similar to the concept of a brand. What makes us look at the logo of a very popular company and instantaneously recognize what that stands for? It is the brand of the company. Exchanges are, in essence, a brand. When we ask what is unique about exchanges, we're really asking what is the brand that you immediately recognize as the characteristic that an exchange represents.

What's unique about all exchanges worldwide are two very important features. One is that they are non-discriminatory. They treat all of their members the same. The second is transparency. That transparency follows from how members are treated. And it also refers to how the assets trading on that exchange are handled on a daily basis. It doesn't matter whether these are commodities; it doesn't matter if they are futures, options or equities. Transparency is the brand that defines an exchange.

WILLIAM O'BRIEN: I think of exchanges as one of the original social media institutions. We talk about the world becoming more social, right? There's Facebook, and a host of other types of social media. But exchanges were one of the original institutions of that nature. In modern times, in financial market regulation, you think about exchanges and compliance as being inextricably interwoven. Exchanges were originally voluntary institutions. Exchanges were user communities coming together under defined yet flexible rules that allowed the participants to move forward, commercially and/or professionally. It also moved forward the lives of the people who mattered to exchange participants, whether these people were customers of

these participants or investors generally. That continues to this day. That is what really makes exchanges unique among the other companies that intermediate the financial markets.

BRETT REDFEARN: In my opinion, the basic function of any exchange (stock or otherwise) is to provide infrastructure, market data, or the price as Bob [Schwartz] would say, and a regulatory environment for the fair and orderly trading of securities. In some cases—and it varies in different locations—an exchange is there for clearing and settlement services.

Today, you also see the provision of technologies either to the members, or to the customers of the exchanges and, in many cases, to competitors as well. However, it is worth noting the evolution of exchanges over time. The answer to this question today would be different than the answer 50 years ago, or even 20 years ago, as exchanges have evolved. The changes include the technology, trading practices, and the regulations that have enabled significant competition for the exchanges from other venues including Electronic Communications Networks, ECNs and Alternative Trading Systems, ATSS.²

ASANI SARKAR: Bob Schwartz, I remember some years ago you had a conference on volatility. That was pretty much right after we had the crash that erupted in 2008!³

(Laughter)

BROOKS: I am certainly glad we are not talking about volatility today!

SARKAR: And then this year we have the topic of exchanges at the same time as we have the Dodd-Frank Act⁴ on the horizon. This act is

² Reg ATS, introduced by the SEC in 1998, aims to protect investors and regulate this type of trading system. The regulation has strict record keeping and reporting requirements on areas such as transparency once an ATS reaches more than 5% of the trading volume in any security. Examples of ATSS include Electronic Communication Networks (ECNs), crossing networks and call markets.

³ The Dow Jones Industrial Average plunged 777.68 points, the most in one single day on September 29, 2008, as the financial crisis that started in 2007, and with its roots in subprime mortgages and toxic debt, sent shock waves through the markets. On October 23, 2008, Baruch College hosted a conference on **Volatility**, organized by **Robert A. Schwartz**, Speiser Professor of Finance at Baruch College's Zicklin School of Business.

⁴ Dodd-Frank Wall Street Reform and Consumer Protection Act, known as Dodd-Frank, was signed into law by President Barack Obama on July 21, 2010. The sweeping consumer protection and regulatory reform law also includes the controversial Volcker Rule that prohibits proprietary trading by depository banks. The final regulations of the Volcker Rule were published in the Federal Register on January 31, 2014, to take affect on April 1, 2014. See, Volcker Rule, OCC Bulletin, 2014-9, March 25, 2014. <http://www.occ.gov/news-issuances/bulletins/2014/bulletin-2014-9.html>.

proposing to move a lot of these over-the-counter derivative securities to exchanges. Once again, the focus of the conference is highly appropriate. I look forward to your conference next year!

For the past year or so I have been working with colleagues at the New York Fed on some very detailed data on credit derivatives swaps, or CDSs.⁵ As you know, these are OTC transactions. They are very different from how exchange-listed securities are traded. We have been looking at the data, trying to see whether these OTC transactions would benefit from the unique characteristics of the exchange.

One unique service the exchange provides is simplicity. Let me explain. A stock exchange provides a product that is highly standardized. For example, shares of IBM are identical to each other, and the terms of the “contract” are highly standardized. You don’t have to worry whether one share of IBM means something different from any other share. All of these products are coded in exactly the same way. If the price of a share is \$100 today and it’s \$101 tomorrow, you don’t have to worry about whether the prices being quoted are different. In this regard, the OTC world is quite different from the stock exchange world. In many respects, the OTC contracts are not standardized. If you buy a share of a CDS from a dealer today, and then you buy a CDS on the same company from a different dealer on another day, there is no guarantee that those two contracts will have identical terms. Nor would they necessarily be quoted in the same way.

The other thing that allows for simplicity on an exchange is the design of the market structure. This goes back to what Al and Gary were saying about the rules of engagement. At an exchange, I don’t have to worry about whom I am trading with, about who my counterparty is. The reason is that my counterparty is really the exchange. I can buy a share of Morgan Stanley today. If I change my mind, I can sell it tomorrow. I have zero economic exposure. I can go into and out of an economic exposure very rapidly without worrying about who my counterparty is. This is very different from an OTC world where transactions are bilateral.⁶ You are always dealing with a specific intermediary.

Basically the point is that in an exchange, you can go into and out of trades very quickly. You don’t have to worry about who you are dealing with; you

⁵ *An Analysis of CDS Transactions: Implications for Public Reporting*. Kathryn Chen, Michael Fleming, John Jackson, Ada Li, Asani Sarkar. Federal Reserve Bank of New York Staff Reports (no. 517), September 2011. http://www.newyorkfed.org/research/staff_reports/sr517.pdf.

⁶ Transactions are conducted directly between two parties, or off-exchange and without the supervision of an exchange.

don't have to worry about the credit worthiness of your counterparty. It's a very simple trade and the product is highly standardized. The products are very simple. This is unique, based on my study of OCT markets. The OTC market is far more complex. There's lots more complexity in doing a trade.

BROOKS: Can for-profit exchanges still be unique? Can they still offer this degree of confidence, investor protection, and fairness that you all alluded to?

BERKELEY: Sure, the strategic issue that exchanges face today is that, by law, they deal with broker dealers. Broker dealers are often larger economic units than the exchanges. They grew up in a non-profit exchange model in which the exchanges were regarded as utilities, they were there for the public good. The question is, where is the value afforded by the entire process as investors interacts with a trading process that involves broker dealers and exchanges? How is the value of these services divided? As exchanges have become public, and as they have developed their own growth imperatives, the benefit of being public is that they now have the capital to invest, to grow, and to modernize. The disadvantage is that the exchanges now have to make more and more money. That is anathema to the broker community or to the dealer community because they want to be the ones who make that money.⁷ So it's a very tough balance of power. We are watching it being fought out in real time.

KATZ: I have lived in both worlds. Twenty-five years ago I worked at an exchange that was then not-for-profit. Later I joined the ISE as a private company that was for-profit.⁸ Then the ISE became a public for-profit company. I can tell you from my experience that the way the exchange competes today as a for-profit firm is night and day different. There is no comparison between a publicly-traded exchange focused on building its business and making money, versus an exchange that is operated as a private utility.

The difference is not just the capital used for new technologies and new products. It is also the mindset of the people who work at each kind of company. The types of people you want to attract into the exchange business today are looking for companies they can grow with, and be compensated

⁷ With the transformation of exchanges into public companies, the broker dealer community in the U.S. is now competing more directly than before with exchanges for order flow and chasing the same profit opportunities as exchanges. "The broker dealer community now effectively disciplines the exchanges by routing orders away from them," noted one trading expert in a research interview for this book.

⁸ Prior to a stint as co-founder and president of K-Square Research, Katz was a managing director at the New York Stock Exchange and worked there from 1986 to 1997.

by. This fight, this balance between the broker dealer and the exchange that you refer to, is real. Yet both of them can win. The broker dealers make money by selling products to their customers, new ETF products or index options, for example. Many of these products are created by the exchanges.

The broker dealers are able to process more trades in which they earn commissions by using technology and systems that the exchanges provide. So there is a healthy balance as they square off against each other, each trying to win a greater piece of the pie. At the same time, the ability of both participants to succeed in this environment has been enhanced by competition. That only happens when the for-profit model is used on both the broker dealer side and the exchange side.

O'BRIEN: I'll echo some of that, and maybe take a slightly different tack. Direct Edge has thought about what an exchange is. We are unique on this panel in that we actively sought and obtained exchange status. We chose to make the transition from operating as an Alternative Trading System to being an exchange.⁹ To go back to my original analogy, I think it all stays rooted in whether or not you continue to focus on your user. If you choose to make the transition to the for-profit status you can manage it quite successfully. I don't think exchanges are different from other for-profit businesses in the sense of having to interact with and serve a user community that has significant market power. Whether you are a for-profit or not, you still need to meet the needs of your customers.

I would say, once again, whether it is all Facebook users combined, or every McDonald's customer combined, the users in every case have a collective power that is greater than that of the institution trying to serve them.

I don't think the transition from acting as a utility to trying to make money is the key issue. Exchanges that are operating in a for-profit status, especially public ones, do need a goal. Perhaps it is not simply to make more money, but to grow in a way that people view as sustainable.

REDFEARN: Can a for-profit exchange still convey that confidence to the market? Absolutely, the answer is "yes." Exchanges are still highly regulated entities. Many of the things that inspire confidence are, in part, created by the regulatory framework.

The for-profit issue is more of an economic issue. Exchanges moved away from being membership-type organizations, or the utilities structure, to the for-profit structure. Now there are different incentives involved, in particular there is a greater emphasis today on the creation of shareholder value. During

⁹ In July 2010 Direct Edge transitioned to full exchange status having obtained regulatory approval earlier in the same year.

their evolution to this for-profit status, you have also seen the arrival of new startup markets, new venues that now provide valuable competition in the market. This competition helps keep the for-profit incentive in check, as too much of a focus on profitability would inevitably result in a loss of market share to these competitive venues. Some of the participants on this panel today are, or have been, examples of new venues that entered the market to provide competition. Bill O'Brien at Direct Edge, Al Berkeley at Pipeline, and Gary Katz at ISE have all been part of this dynamic.

SARKAR: I want to return to the OTC markets. Let's step ask, why are our OTC markets so complex? They are complex because there is a demand from certain users for more customized products. Maybe you are trading a swap or an option, and you want the contract to expire on a certain date for which a standardized contract is not available. I believe that the demand for customization will become ever greater as users' sophistication grows.

As Bill and Brett mentioned, for-profit exchanges have to respond to the needs of their users. That is why you have this proliferation of new markets and new services. For example, there is a venue for someone who wants to trade a large block of shares with a lower market impact, or for someone else who wants to trade very, very quickly. It is difficult for the exchanges to meet these kinds of specialized needs if they keep their traditional product structure and their traditional, simple market structure. That's where there is this tension—exchanges are trying to meet this need without losing their brand. It will be interesting to see how that trade off and tension will play out.

BROOKS: One of the things that we have learned over the years from Bob's conferences is the importance of innovation. Competition certainly stirs innovation. That said, it has also been pointed out by many that bad outcomes often start out as very good ideas. With an often singular focus on promoting competition in this country, we are now up to something on the order of some 13 stock exchanges.¹⁰ I hear there is an exchange opening on South Beach. I am hoping to visit and ring the opening bell. It could be a lot of fun! [Laughter]. Here's my point: In this environment, perhaps this ruthless kind of competition, or whatever you might want to call it, has caused exchanges to lose some of their uniqueness. They have lost some of their brand, and some of the unique attributes and offerings they might otherwise bring to investors.

¹⁰ There were 13 public exchanges and up to 50 dark pools in the U.S. as of writing in September 2013. That total number of exchanges could change with the pending merger of Direct Edge and BATS, as announced in August 2013, to form the second largest exchange in the U.S.

SARKAR: I see some broader tensions. One is within the business model of an exchange. The exchange needs to reach out to a wide variety of users without hurting its brand and harming traditional users that value its simplicity. That is a business decision that each exchange has to make in terms of how far it can go in the direction of satisfying the needs of more specialized users. It is also interesting that some of these non-exchanges, some of these over-the-counter markets, are in ways becoming more like exchanges. There is a proposal in the Dodd-Frank Act to move some of these products—swaps—to exchange-type systems.¹¹ Maybe the different paradigms we have today in the OTC and the exchange worlds are moving towards each other and are becoming less different.

From the regulators' viewpoint, what do these kinds of changes do to the stability of the financial system? Do they lead to too much fragmentation? Does this all lead to a reduction of transparency so that regulators' cannot know where the risks are in the system? This evolving issue will play out in the next few years.¹²

REDFEARN: The beauty of our economic system is that competition thrives. Competition in turn helps to stimulate innovation and competitive pricing. I think of the NYSE, a market that has gone from an 80% market share to 20% or so.¹³ Does that affect the brand of that market? In some respects, yes. But that is the impact of competition. These are good things, right?

We all remember the debates about competition versus fragmentation when Rule 390 was going away.¹⁴ We had to debate the central limit order

¹¹ Title VII of the Dodd-Frank Act requires the trading of swaps to occur on Swap Execution Facilities. <http://www.law.cornell.edu/wex/dodd-franktitlevii>.

¹² It is an evolving issue, explained Sarkar in a subsequent explanation, because the CFTC and SEC must write rules to implement the DFA requirements. "This takes time because the issues are complex and require feedback from industry and the public," he added. "There is a comment period during which anyone can respond/object to aspects of the rules. However, substantial progress has been made, especially with the transparency requirements." See, <http://www.mofo.com/files/Uploads/Images/130411-Dodd-Frank-Title-VII-Recent-Developments.pdf>.

¹³ This refers to market share in the stock trading of NYSE's own listed companies as competition opened up with the enactment of Reg NMS, adopted in 2005, and other regulatory and technological changes.

¹⁴ A former New York Stock Exchange rule that stipulated that, unless exempted by the exchange, members needed permission before trading an exchange-listed security off the exchange floor. Rule 390 was scrapped in 2000 by the NYSE under pressure from the Securities and Exchange Commission.

Source: Wall Street Words: An A to Z Guide to Investment Terms for Today's Investor by David L. Scott.

book back in the day.¹⁵ We needed to move away from a monopolistic environment in order to stimulate competition. Now we are seeing the emergence of more stock exchanges, a large number of dark pools, and liquidity that is far more fragmented today. These are all challenges we are trying to think through.

One could argue that smart order routing,¹⁶ the integration of data feeds, and these sorts of technological innovations have helped to recreate aggregated price discovery and efficient liquidity pools. However, we have to continue to examine the health of our current market structure. Is the level of fragmentation the right level to optimally stimulate innovation and competition? Or, at what point have we taken this competition too far?

O'BRIEN: No, I don't think that competition will impact the ability of exchanges to deliver value to their users. The number of stock exchanges is almost artificial. In fact, Direct Edge, BATS, the NYSE, and NASDAQ account for 99% of all exchange traded bonds in the U.S. The other exchanges operate at the margin. The fact that the larger players operate multiple exchanges is really more a function of market structure regulation because exchanges cannot offer multiple product offerings under a single exchange umbrella.

Our competitors have effectively copied us in a variety of ways. But there is a balance that needs to be struck between the value an individual exchange can provide to its user community, and the collective value that exchanges provide to the financial market community at large. As a group, exchanges need to focus on ensuring investor confidence. That said, market structure regulation does a fairly good job of forcing interaction between the exchanges. For the most part, we are getting better at this.

You may not always get the optimal outcome each time you execute a trade on whatever exchange. But you will get a rational outcome that, at the heart of the market, is the confidence that allows the economy to move forward.

¹⁵ The Central Limit Order Book (CLOB) was a proposal of the National Market Advisory Board (NMAB) in response to the Securities Act amendments of 1975. The NMAB's CLOB would have contained all "declared bids and offers from investors, exchange specialists and over-the-counter market makers, queued and displayed in price-time priority sequence," as part of a national market system. All exchanges were to have been linked to the CLOB, a goal that was later rejected as the Intermarket Trading System (ITS) came into favor.

¹⁶ Smart order routing is the process of electronically routing and obtaining the best available price in trading a security at various liquidity destinations based on price, cost, speed of execution, probability of execution, size and other factors.

KATZ: The growth in the number of exchanges is directly an outcome of exchanges trying to innovate. As Bill correctly pointed out, if an exchange wants to change its matching algorithm, if it wants to change from one model to the next and then have them both at the same time, the only way that's possible for a U.S. exchange is to create an additional exchange. This is why so many exchange groups offer multiple platforms to target different segments of their user community with different pricing and/or market models. The reason behind that is that the SEC does not allow an exchange to have two different rule sets for products they trade. Consequently, you literally have to create another exchange.

By definition, proliferation is because of innovation. Each exchange is trying to adjust its model and test different approaches to pricing. Different market structures help grow the business. There are two different types of innovation. There are new products, and you don't need a new exchange to create a new product. But if you want to tweak your model just a little bit, regulation requires that you need another exchange. This has been good for the customer. In the options industry, we have seen the growth of exchanges. We are now up to nine.¹⁷ Each new exchange has caused the other industry participants to step up their game, to develop better technology, to create better pricing for the customer, along with more transparency and more products. Competition, as measured by the number of exchanges, is an indication that innovation is alive and well.

BERKELEY: Here are some interesting observations from a macroeconomics perspective. There is enough capacity in the exchange business, and in the alternative trading system business, to satisfy all the demands for trading—many, many times over. Innovation needs to be both in the processes and in the selection of the customer base. The fundamental problem that institutional investors face is how to efficiently move large quantities of stock in and out of the marketplace at the best possible prices. This problem has not yet been solved, but it is very close. The innovation is happening because people continue to think that new rules of engagement will allow them to operate more profitably.

We think that the move to predictive analytics¹⁸ is a fundamentally important break in the way services are offered to investors. The introduction

¹⁷ With the introduction of Gemini in August 2013, the U.S. had 12 U.S. options exchanges, according to the Street.com.

¹⁸ “Predictive analytics describes a range of analytical and statistical techniques used for developing models that may be used to predict future events or behaviors. There are different forms of predictive models, which vary based on the event or behavior that is being predicted. Nearly all predictive models produce a score; a higher score indicates that

of predicative analytics forces you to choose between optimizing your exchange for liquidity providers and liquidity users. I strongly agree that competition is good. It is indicative of an effort to innovate. But it is important to recognize that the game continues to change.

BROOKS: Mr. Price, the founder of T Rowe Price, once said that change is an investor's only certainty. That assertion is probably as true today as it was back then. But let's see if we can tone this rhetoric up a touch. You know, depending on the day, you might read that high-frequency trading accounts for 75% of the stock exchange volume, that the average trade execution size is 140 or 200 shares or something.¹⁹ Some institutional volume is certainly being broken up into a million little trades to access the market. There is also, perhaps, a lot of other kinds of trading. Exchanges have multiple constituencies to serve. The challenge is to serve everybody with fairness and with some sense of confidence. How do you do this in an environment where high-frequency trading is potentially that big, and where the incentives to route order flow can be dictated by some perverse economic incentive?²⁰ How do we find some common ground? Or, how do we find balance, if you will?

Many investors feel that their confidence in markets and the pricing process is severely challenged. Many investors don't understand what's going on. And yet volume growth is necessary for the exchanges. They are predicated on growing volume. So where do we find common ground there? What needs to be reasserted to promote what an exchange historically has uniquely offered?

BERKELEY: I would like everybody in the room to blink their eyes. Did everybody blink? Depending on the twitch speed of your muscles, your blink took between 50 and 150 milliseconds. A modern trading system can trade up to five times in that period. Every trade involves several steps: To observe the market conditions; to orient that to a historical database; to decide whether to act or not; to send in the order; and to get the execution. It is very difficult for human beings to compete with that today.

a given event or behavior is very likely to occur. Predictive analytics, along with data mining techniques and predictive models, relies on multivariate analyzing techniques, including time-series or advanced regression models. These techniques allow organizations to decide on relationships and trends and predict future behaviors or events." Source: Techopedia.

¹⁹ See, *Cracks in the Pipeline, Part Two. High Frequency Trading*. Wallace C. Turbeville, *Demos*, March 2013. <http://www.demos.org/publication/cracks-pipeline-part-two-high-frequency-trading>.

²⁰ In a subsequent interview, Brooks included rebates paid to customers for routing their orders to a specific execution venue as a "perverse" economic incentive.

At the same time, I don't think that any of us want to say that we are living back in 1848 when this new unfair technology called the telegraph was introduced. None of us want to say that people who have telegraphs are somehow getting an unfair advantage over people who still use horses! The right answer is to let the rules of engagement evolve. If an advance in technology has an unintended consequence, or if it presents a set of advantages to the people who possess it, then in a modern, free market you can either acquire those capabilities, or you can have an intermediary emerge with rules of engagement that somehow create a more level playing field. You can indeed compete and make it more difficult for a technological advance to take competitive advantage of you.

KATZ: It's funny. When I blinked my eyes, all I could think of was my father banging on the door of the room saying, "When are you going to get off the telephone? You have been on the phone for 4 hours!" I've got four kids. I never bang on their doors anymore because they are on the phone. Instead, they are on the Internet, listening to music, chatting with their friends and using up none of my phone bill.

We are living in a completely different world than what many of us here today grew up in 30 or 40 years ago. It is even so very different than the world we knew 10 years ago. When ISE launched in 2000, the reason we couldn't come to market 2 years before that was because the modem speed was too low.

I am not going to tell you how many trades we can do in 150 milliseconds. You would be shocked. But that's the world that we are living in today. That is the marketplace as we know it today. But let me ask you to blink for a moment and think about the experience you have as a trader today. You get instantaneous executions. You know exactly what your portfolio's value is at any moment in time. You have Internet sites that give you data on options, futures, and stock, instantaneously during the day, 24 h a day, and even over the weekend. By historical standards, you have the lowest commissions that have ever been charged to you as a customer. You have access to products globally because of the structures that have been created. It doesn't mean that you should ever stop trying to find a level playing field.

Change is a continuous process, it is an evolution. It requires regulators who understand the marketplace and are engaged with the exchanges and broker dealers. It is a never ending process. It is one that we should not try to move back from. We need to continue to move forward and embrace the technology that is available to us.

O'BRIEN: I have no plans to ask anyone to blink, first and foremost.
(Laughter)

BROOKS: We do it automatically, actually!

O'BRIEN: Andy, I keep hearing institutions complaining about the decrease in the average trade size. There is a plan in place that if stock prices continue to go down, we are going to get that trade size way up because every stock will be trading for under a dollar per share. Isn't that great! Please, I am only joking! (Laughter)

BROOKS: We were hoping it wouldn't happen that way.

O'BRIEN: I don't think an increase in the average trade size is necessarily reflective of a healthier market. As regards the HFT level playing field, a lot of that criticism is unfair and poorly cast, especially in times of financial markets stress. People have a love-hate relationship with the stock market and financial markets generally.

You can read critical statements about speculators in the New York newspapers back in the 1920's, and in the London newspapers as far back as the 1820's, and in the Dutch newspapers even further back in the 1620's. Only the jargon in each period is different. We can do a better job on some of the things exchanges can uniquely do. One is education. That is a key difference in the role that an exchange as distinct from a trading system can play.

In that sense, options systems are better today than the stock markets—they focus more on product awareness and education. Everyone in this room knows how much better off you are with today's stock market than people were with the stock market 10 or 20 years ago. But that message hasn't been communicated well to the average American.

Exchanges put a lot more effort into investor education today than they did 10–20 years ago. Exchanges need to educate their customers, not with the intention of making them captive to their legacy brands or legacy perceptions, but to make sure that traders and investors know about where every type of market participant fits in global financial markets. That is in everyone's long term interest.

We at Direct Edge are in the middle of this user community. We have a good insight into where participants would like to see the financial markets heading. At Direct Edge, I am honored to talk in a single day with proprietary trading firms such as Goldman Sachs, Fidelity, Scottrade, and the likes of TD Ameritrade. That gives us insight that we need to share in a productive and collaborative way with regulators and other stakeholders. We want to make sure that confidence stays vibrant going forward. Finally, we should never lose sight of the fact that we are also a self-regulatory organization.

That is another thing that makes an exchange unique. We police member conduct. Focusing on conduct more than on capabilities is a much more prudent and, frankly, rational way to go. At Direct Edge we are taking that responsibility very seriously. We are investing more time and talent than we ever have before. If exchanges fill their role in those regards—and maybe if

the indexes go up and assist us a little bit—then some of the things that we are so concerned about today will start to recede.

REDFEARN: If we asked everyone in the audience to define high-frequency trading, you would be amazed at the possible number of answers we would get. I can't necessarily define it, except to say that it would include the activities and the participants who are trying to trade really fast and at a high frequency. These could include our broker algorithmic customer business; statistical arbitrage; electronic market making and other proprietary trading activities in the market. Just about everybody in today's electronic markets is trying to trade fast because it is a very fast market environment.

Some of the numbers being thrown about in terms of the HFT percentage of the market are fairly suspect. Certainly, it is hard to give an exact number when we can't exactly define what we are giving a number for. Regardless, I don't know of another category of trader that is so widely scapegoated for so many of today's markets ills.

What are we trying to understand about the markets today? That's what we should ask. And some of those questions are: What are the different sources of order flow that are causing volatility in the markets? Is it the participants, for example, the high-frequency traders; is it the type of strategy, for example, opportunistic and/or, is it certain types of products that are traded in the marketplace, for example, leveraged ETFs?

What is the short-term liquidity provision model that we have today? We don't have the New York Stock Exchange specialists as we did before the introduction of Reg NMS in 2005.²¹ With its new technology and its new rules, the NASDAQ market maker world has changed completely. And here is another question: How should we slow down or stop the markets when volatility gets out of control, when things are moving too fast? Some of the regulatory responses to that include single stock circuit breakers, limit up, limit down,²² or things like that. In my view, focusing on fundamental questions and issues is far more important than coming up with an ill-defined category like HFT and then trying to figure out what they are doing that is creating all these problems.

²¹ See, Final rules and amendments to joint industry plans, <http://www.sec.gov/rules/final/34-51808.pdf>.

²² As of September 2013, the limit-up/limit-down system had replaced the circuit breakers which would temporary halt or pause trading based on certain price range parameters. The limit-up/limit down system was advanced by regulators in response to wild swings in securities, in particular the May 2010 Flash Crash that briefly sent the Dow Jones Industrial Average tumbling down almost 1,000 points.

SARKAR: High-frequency trading is a set of innovations that responded to the apparent need of certain users for very, very rapid trading. If you are in a competitive marketplace, it's very difficult to say I want this set of innovations but I don't want this other type of innovation. So, in that sense, high-frequency trading is here, and the question is, how do we understand it? How do we deal with it? And the most important question about high-frequency trading, or any other type of innovation, is what are the natural effects of these innovations? What are the effects of the innovations that make some people feel uncomfortable? How is HFT affecting the more regular types of trading?

If you look at what some of these high-frequency trading firms are doing, some of these activities are indeed hard to understand. We have these very rapid cancellations. We have these computers that are sending out very high-frequency orders that are being cancelled in milliseconds. What is the purpose of that? What's going on here? I haven't seen anything that explains the purpose of these strategies. It goes back to something that Bill and Brett were saying- education is very important. First, there is education in terms of research to understand what these high-frequency traders are doing. Second, when these HFT guys trade, how does it impact the marketplace in general? We need to look at the interaction between the market price and these orders, and when these orders are coming into the marketplace; what's happening with liquidity, price impact, and volatility, etc.? It is hard to recommend any kind of policy or enforcement. Frankly, we do not have a good understanding at all of what high-frequency trading is, and of what its impact on the market is.

BROOKS: You all touched on two things that are most interesting. One is the concept of education; and the other is the concept of enforcement. If we don't understand some of the things happening in the marketplace today, then clearly exchanges and others have an obligation to educate investors on the different products, on the good things that come from them, and perhaps on the things that need to be addressed.

Then we come to the enforcement side. There is the issue of huge cancellation rates, and seemingly not only rebate arbitrage but market data arbitrage on top of that! ²³ That leads people to feel that perhaps the game isn't fair because someone is getting an edge—not because of hard work, but because of something else. How do we address that? How do we say, gee, you know we have done this, but it's not very fair. Let's pull back a bit. Any

²³ What to Do about High-Frequency Trading. Rodney Sullivan, CFA. *CFA Institute*, 24 April, 2013) <http://blogs.cfainstitute.org/investor/2013/04/24/what-to-do-about-high-frequency-trading/>.

thoughts on what we might be able to do as an industry to help educate the public and the regulators? The regulators certainly need to understand what's happening in this market as well.

REDFEARN: Why are there so many order cancellations, and why is everything moving so fast in the market? Let me mention a recent and interesting speech made at the SIFMA conference in 2011 by Gregg Berman who is at the SEC's Division of Trading and Markets.²⁴ Gregg talked about various forms of arbitrage in the market. In particular, he noted how ETFs are a very significant percentage of the market today, especially SPDRS and the triple Q.²⁵ Think about the pricing of an underlying ETF. When your aunt or uncle is buying an ETF, he or she would like to be confident that they are buying at the right price. The way that pricing happens for an exchange traded fund is often based upon an arbitrage that exists with the underlying basket of securities that make up that EFT, as well as the related futures product. The participants who are engaging in these index arbitrage practices—consequently, the ones who are keeping the prices of the ETF in line—are effectively doing many of the actions well understood to be HFT, in particular very fast trading with frequent order cancellations. This is what Gregg Berman was talking about. Let me be clear: a market participant engaging in index arbitrage may be trading in an underlying basket of stocks, and the related product in the futures market, removing pricing inefficiencies and thereby ensuring that the ETF is priced accurately. So that when your Aunt and Uncle go out and buy SPY,²⁶ they're getting the right price. I am not saying that all market participants who have extremely low order-to-trade ratios—that is, are cancelling many orders per trade—are adding necessary efficiencies to the marketplace. But with fast trading and high cancellation rates, it is important that we do not start with an assumption that, in and of itself, these practices are bad for today's marketplace.

O'BRIEN: I always struggle with the notion of fairness. I segment concerns into fair and unfair concerns. The unfair concerns today are usually from people such as some market structure critics who are not directly

²⁴ Market Structure: What we Know, and What we Need to Know. Presented by Gregg E. Berman 12th Annual SIFMA Market Structure Conference September 21, 2011, New York. Berman was a Senior Advisor to the Director, Division of Trading and Markets at the SEC.

See, http://www.sifma.org/uploadedfiles/events/2011/market_structure/berman-remarks.pdf?n=38285.

²⁵ SPDR funds are a family of exchange-traded funds (ETFs) managed by State Street Global Advisors. QQQ's, or Triple Q's are an ETF, enabling an investor to purchase the entire NASDAQ 100 Index via a single security.

²⁶ SPDR S&P 500 Trust ETF (SPY).

affiliated with an exchange. They think a lot of things aren't fair. I don't think they are worried about whether or not someone is trading. They have a much broader sense of fairness concerns, and they may or may not be valid. They are really not talking about high-frequency trading. But fairness has to start with an understanding, and it's driven by the conduct of market participants more so than their capabilities.

The average retail investor is not looking to arb the futures versus the underlying. It's not a matter of, so and so has a higher-speed line, or they're collocated, so they beat me to the punch.²⁷ Usually those people are interacting on other sides of the trade when you are buying the SPY to hold for a relatively long period of time. You are interacting with a short-term trader, and that interaction is not one where you are a winner or a loser. You are both beneficiaries.

Once again, this is what makes exchanges unique. Bringing buyers and seller together in a way that benefits both parties. The fact that they have different objectives and different capabilities is not fundamentally unfair. I don't understand anyone who implies that it is. That said, it is true that the transformation of how trades take place on exchanges means that we have a similar responsibility to advance our capabilities to understand what is happening on exchanges.

BROOKS: I agree.

O'BRIEN: You see a host of initiatives that, although perhaps a bit overdue, are advancing our marketplace for the better. These initiatives include the consolidated audit trail, and Large Trader Reporting.²⁸ I am not commenting or wholeheartedly endorsing the fine details of each of these initiatives. I think their spirit and the focus is appropriate, so that we match

²⁷ O'Brien is referring to how Wall Street trading firms place, or co-locate, their trading computers in the same data centers as an exchange's for the purposes of having the fastest possible access to exchange market data. This practice gives trading firms an edge over other investors who access the same data at slower speeds from a consolidated feed of data, critics contend.

²⁸ On July 11, 2012, the U.S. Securities and Exchange Commission adopted Rule 613 under Regulation NMS requiring the national securities exchanges and national securities associations to submit a plan to the SEC to create, implement, and maintain the consolidated audit trail (CAT). The system would not be introduced as early as initially scheduled as exchanges and industry regulator, the Securities Industry and Financial Markets Association, said they would submit their plans by December 2013, a full 8 months later than originally scheduled.

For more on CAT and Large Trader Reporting, which was approved in 2011. See, *Sifma Urges End to Some Data Systems as Audit Trail Nears*. Nina Mehta, *Bloomberg*, March 28, 2013. <http://www.bloomberg.com/news/2013-03-28/sifma-urges-end-to-some-data-systems-as-audit-trail-approaches.html>.

our technological and product innovation with our regulatory innovation, and keep pace in that regard. If you do that, you can start to prosecute people who are using new technologies to effectuate what are probably some of the oldest schemes in the book. Then the fairness concerns, or at least the rational ones, start to fall away.

BROOKS: Some questions from the attendees?

GEORGE SELINSKY (Baruch College MBA student): Will there ever be a need for a 24-h equities market like we have in the currency market?

BROOKS: No and No! (Laughter): Just a selfish response, sorry. Anyone?

O'BRIEN: If users want it yes. If they don't, no. Our trading system at Direct Edge is so flexible that we can keep it open all day. Why don't we just do it? Will people come?

REDFEARN: I frequently travel around the country and speak to institutional money managers. I remember when the NYSE was talking about extending the trading day by opening the market an hour earlier. When I would discuss this possibility with clients in San Francisco and LA, they looked at me cross-eyed. Of course, meetings with West Coast clients were often held around 5:00 AM Pacific time. Given the 3 h time difference between the East and West Coasts, clients on the West Coast would look at me and say, "Please don't let them ever do that because that's just not going to work here."

In the equity markets, for a trade to occur, two or more orders need to meet at the same price and in the same place. The reason why we have big prints and so much trading around the open and close is that liquidity aggregates during those points in time in particular. When I talk about fragmentation, I think of fragmentation in three dimensions: place, price and time. When we went to decimal pricing, we fragmented price. With so many exchanges and over 40 dark pools, we've fragmented place. And when markets were automated, we fragmented time.

At the NYSE less than 10 years ago, the turnaround time for the execution of a market order was often over a minute. As markets automated, trading speeds went to seconds, then sub-seconds, milliseconds, and now microseconds. With that we fragmented time. Today, the ability for orders to aggregate and for liquidity to meet at the same point in time is actually more challenging. This also helps to explain why we have such lower market depth and smaller trade sizes than we once did. With the significant increase in the speed of the market and the fragmentation of time, we effectively expanded the trading day because we exponentially increased the number of possible increments of time during which a trade could take place.

BOB O'BRIEN: (KCI Technologies): Since you have hinted that a lot of the trading is virtual trading, how do you separate the regulation of virtual trading from the regulation of real trading so that you can better monitor the market?

BROOKS: What do you mean by virtual market?

BOB O'BRIEN: You said that a lot of trades get busted.

BROOKS: Do you mean that quotes get canceled?

BOB O'BRIEN: Yes, I call it virtual trading. It is not real trading. So separate that from the real trading. How do you go after virtual trading from a regulatory perspective?

SARKAR: As I mentioned earlier, it is hard to say what to do about that if you don't understand why these things are being done. What is the real purpose behind the people who are doing this? We first have to understand the logic behind this and the impact that this is having on the market. Only then can you talk about whether it's necessary to regulate.

REDFEARN: There is obviously a lot of concern with the amount of message traffic that's in the market. A bit earlier I provided an example of where certain market participants with high order-to trade ratios contribute to efficient price discovery. But that example doesn't mean that all participants with high cancellation rates are contributing to market efficiencies and are playing by the rules. For instance, we have rules against "spoofing" the market, and regulations prohibiting "layering" strategies.²⁹ Both of these strategies can utilize opportunistic quoting techniques where quotes that are being placed in the market are not reflective of the prices at which the quoting participant actually wants to trade. If someone is using trading strategies that violate existing regulations, then by all means let's hope that the regulators are seeing this and are properly enforcing against these activities.

The key is that there are some cases where there are legitimate strategies that fall under the category of HFT. There are some cases where trading is based on paired securities or multiple securities that tend to move in relationship to one another, in a statistically defined manner. Some of these trading strategies cancel a lot simply due to the speed at which the prices of the related securities are changing, and these strategies may provide pricing efficiencies to the market. Then, there are other strategies that may

²⁹ Layering is the practice by traders of placing multiple, often large, orders that are not intended to be executed and which are then quickly cancelled. The idea is to create artificial levels of supply and demand, driving the price of stock artificially up or down, at which point "legitimate" orders are completed to make money from the inflated or reduced price. Spoofing is where traders also place multiple, non-legitimate orders to create false selling or buying interest in stocks to garner advantageous prices.

be manipulative or in violation of some rule. In this case, it is important that existing regulations be enforced to curtail inappropriate behaviors. We need to understand these variations among types of HFT participants before we rush to impose new regulations on anything HFT.

BERKELEY: It is also worth pointing out that the lifespan of an order is one of those rules of engagement that could be offered in a different way through innovation. You would have to see whether people would like to go to a market that had a required life of an order.³⁰ Right now you can cancel an order as fast as you want.

BROOKS: As you can tell from this excellent discussion, we need to demystify some of the things in the market. We have to encourage enforcement. We need to encourage education and reaffirm that sense of fairness that all of our markets and all of our business frankly depend on. Please join me in thanking this wonderful panel!

³⁰ Berkeley was referring to the idea of having orders that are available for a specific period of time, say 5 s or 2 s, rather than mere microseconds as is the case today with a market structure that permits flickering quotes and traders to cancel an order as fast as they are practically able. As of this writing, this is a matter that the Securities and Exchange Commission was watching with an eye towards extending the lifespan of an order.

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