

## MEMORANDUM

TO: File No. S7-02-10  
File No. S7-10-00  
SR-BATS-2010-014  
SR-BX-2010-037  
SR-NASDAQ-2010-061  
SR-NSX-2010-05  
SR-NYSE-2010-39  
SR-NYSEArca-2010-41  
SR-NYSEAmex- 2010-46  
SR-ISE-2010-48  
SR-EDGA-2010-01  
SR-EDGX-2010-01  
SR-CBOE-2010-047  
SR-CHX-2010-10  
SR-FINRA-2010-025

FROM: Alicia F. Goldin  
Office of Commissioner Elisse B. Walter

DATE: July 19, 2010

On June 30, 2010, Commissioner Elisse B. Walter, along with her counsels, Alicia F. Goldin and Christian L. Broadbent, met with the following individuals representing the Managed Funds Association ("MFA"):

Darcy Bradbury, the D. E. Shaw Group  
Steve Kessler, S.A.C. Capital Advisors, LP  
Michael Mendelson, AQR Capital Management  
John Nagel, Citadel Investment Group  
John Oliva, Highbridge Capital Management, LLC  
Stuart Kaswell, MFA  
Jennifer Han, MFA  
Carlotta King, MFA

The discussion included, among other things, the matters associated with the file numbers referenced above. The MFA also provided the attached materials.



**Meeting with Managed Funds Association  
June 30, 2010**

**MFA Attendees:**

Darcy Bradbury, the D. E. Shaw Group  
Steve Kessler, S.A.C. Capital Advisors, LP  
Michael Mendelson, AQR Capital Management  
John Nagel, Citadel Investment Group  
John Oliva, Highbridge Capital Management, LLC  
Stuart Kaswell, Managed Funds Association  
Jennifer Han, Managed Funds Association  
Carlotta King, Managed Funds Association

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**Agenda**

1. Introduction
2. Equity Market Structure Concept Release
3. Evolution of Algorithmic Trading/May 6 “Flash Crash”
4. Rulemakings Related to Hedge Fund Adviser Legislation/Executive Compensation
5. Rulemakings Related to OTC Derivatives Legislation
6. EU Regulatory Issues
7. Systemic Risk Survey

**Materials**

- Comment Letter on Equity Market Structure Concept Release
- Comment Letter on Stock-By-Stock Circuit Breaker Proposed Rules
- Comment Letter on CESR Consultation Paper on Pan-European Short Selling Disclosure
- Commentary: How High Frequency Trading Benefits All Investors
- Article on Equity Trading in the 21<sup>st</sup> Century



May 7, 2010

**Via Electronic Mail:** [rule-comments@sec.gov](mailto:rule-comments@sec.gov)

Ms. Elizabeth M. Murphy  
Secretary  
U.S. Securities and Exchange Commission  
100 F Street, NE  
Washington, DC 20549-1090

**Re: Concept Release on Equity Market Structure; File No. S7-02-10**

Dear Ms. Murphy:

Managed Funds Association (“MFA”)<sup>1</sup> welcomes the opportunity to provide comments on the Securities and Exchange Commission’s (“Commission” or the “SEC”) concept release on Equity Market Structure (the “Release”).<sup>2</sup> We appreciate the Commission’s review, evaluation and continued efforts to further improve the U.S. equity market structure, and in turn, the efficacy of capital formation in this country.

## **I. INTRODUCTION**

The Commission’s successful, well-designed market regulations, including implementation of the Order Handling Rules, Regulation ATS, decimalization and Regulation NMS, have reshaped the equity markets by removing anticompetitive barriers and promoting fair access to markets and market information. In doing so, the Commission’s regulations have fostered innovations in technology that have revolutionized investing in our equity markets, and promoted greater competition among marketplaces, to the benefit of investors. Most notably, the advancements in technology have empowered investors, both institutional and retail, with more sophisticated and efficient methods to access the markets and execute their investment strategies globally. In the process, these equity market developments have led to greater market liquidity and depth, tighter bid-ask spreads and lower transaction costs. These changes lower the cost of capital and enhance economic growth.

We also recognize, however, that—the regulations and technological and market innovations—in reshaping the equity market structure also raise new regulatory concerns that the Commission should evaluate. The Commission has already identified some of these issues, such as the regulation of non-public trading interest and risk management controls for broker-dealers

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<sup>1</sup> MFA is the voice of the global alternative investment industry. Its members are professionals in hedge funds, funds of funds and managed futures funds, as well as industry service providers. Established in 1991, MFA is the primary source of information for policy makers and the media and the leading advocate for sound business practices and industry growth. MFA members include the vast majority of the largest hedge fund groups in the world who manage a substantial portion of the approximately \$1.5 trillion invested in absolute return strategies. MFA is headquartered in Washington, D.C., with an office in New York.

<sup>2</sup> Securities Exchange Act Release No. 61358; 75 FR 3594 (Jan. 21, 2010).

with market access.<sup>3</sup> MFA submitted comments on the latter proposal and agrees that broker-dealers should have appropriate and pragmatic controls to prevent trading errors and to ensure compliance with applicable regulatory requirements; and that these controls should apply to both proprietary and customer business.<sup>4</sup> We believe such measures would contribute to safeguarding our markets. Overall we commend the Commission for its thoughtful rulemaking in furtherance of a national market system, and support the Commission's efforts to review our rapidly developing market structure and to collect data to assist in its evaluation.

Congress historically has directed the Commission to focus on efficient capital formation, fair access to markets and timely dissemination of critical market data.<sup>5</sup> In this respect, the Commission in its rulemaking should ensure that its regulations do not provide certain participants with competitive advantages over others. As long as regulations treat similarly situated participants the same, the success of individual participants should become a matter of competition, not regulatory advantage. The Securities Exchange Act of 1934 ("Exchange Act") does not support a distinction between long-term investors and short-term traders. Moreover, we believe the empirical data demonstrates the mutuality of interests that exists between market participants, whether they are short or long term investors. For these reasons, we believe that in evaluating market structure, the Commission should continue to focus on capital formation, price discovery and liquidity.

MFA represents the views of institutional investors, including registered investment advisers and private investment pools, whose investors include pensions, endowments, foundations and insurance companies. As investors, we believe that all market participants have greatly benefited from the competitive and technological advancements discussed further herein. Accordingly, we respectfully urge that any proposed rulemaking that results from the Release be supported by empirical data.<sup>6</sup> Without empirical data to support changes, any rule-making that follows the Release could become a vehicle for costly, unintended detrimental consequences, and could reverse the global leadership status that the United States has earned over the past decade as

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<sup>3</sup> Securities Exchange Release No. 60997; 74 FR 61208 (Nov. 23, 2009). Securities Exchange Release No. 61379; 75 FR 4007 (Jan. 26, 2010) (hereinafter "Broker-Dealer Risk Management Controls Proposal").

<sup>4</sup> Securities Exchange Act Release No. 61379; 75 FR 4007 (Jan. 26, 2010). The Commission recognizes that the "proliferation of sophisticated, high-speed trading technology has changed the way broker-dealers trade for their own accounts and as agent for their customers" and has given rise to increased use and reliance on "direct market access" or "sponsored access" arrangements. Through these arrangements, sophisticated customers are able to use technological tools to place orders and trade on markets with little intermediation by their broker-dealers. *Id.* at 4008. See letter to Elizabeth M. Murphy, Secretary, SEC, from Stuart J. Kaswell, Executive Vice President and Managing Director, Managed Funds Association on March 29, 2010 (providing comments on the Commission's proposed new Rule 15c3-5 under the Exchange Act regarding risk management controls for broker-dealers with market access) available at: <http://www.managedfunds.org/downloads/MFA%20Comments%20on%20BD%20Risk%20Mgmt.3.29.10.pdf>.

<sup>5</sup> Exchange Act; H.R. Rep. No. 1383, 73<sup>rd</sup> Cong., 2d Sess. (1934); and S. Rep. No. 84-75, 94<sup>th</sup> Cong., (1975); H.R. Rep. No. 94-123, 94<sup>th</sup> Cong., 1<sup>st</sup> Sess. 50 (1975).

<sup>6</sup> We also note that under Section 3(f) of the Exchange Act, in considering or determining whether an action is necessary or appropriate in the public interest, the Commission must consider, in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation.

a result of tighter bid-ask spreads, reduced commissions and transaction costs, faster execution speeds, more democratic access, greater liquidity and increased market depth.<sup>7</sup>

## II. EXECUTIVE SUMMARY

The Commission's regulations, including the Order Handling rules, Regulation ATS, decimalization and Regulation NMS, promoted equal regulation and fair competition among markets, and eliminated many unfair advantages among market participants. These regulatory advances democratized the markets and ignited technological innovation and competition, allowing for the growth of a widely used set of a set of technological tools and trading methods based on low latency technology. High frequency trading methods and low latency technology have delivered important benefits to investors and to our markets. They have lowered transaction costs for investors, increased the capacity of our markets, and created more competitive markets. Advancements in technology have empowered investors to better implement their investment strategies through the use of automated trading programs and high frequency trading execution techniques. As a result of market structure changes, many aspects of our equity markets—spreads, fees, execution speed, efficiency, and pricing transparency/reliability—have steadily and drastically improved over the last several years to the benefit of investors. Investors now receive better service from financial intermediaries and have lower-cost options for accessing markets and executing orders.

In responding to the Release's questions on market structure, we make the following observations:

- Long-term investors and short-term traders have a mutually beneficial relationship; each needs and benefits from the trading activity of the other. Initiatives to restrict short-term trading are likely to harm long-term investors through higher costs, decreased market efficiency, and reduced investor confidence.
- The Commission should focus on market liquidity and the resulting benefits in assessing the effectiveness of the equity market structure. As a direct result of past regulatory improvements and the technological advancements they encouraged, average daily trading volume has more than doubled since Reg NMS was implemented, which has led to narrower spreads, lower transaction costs and a lower cost of capital. Within just one decade, U.S. transaction costs went from being among the most expensive in the world to the cheapest.
- The increased volume of orders and order cancellations seen in today's markets is largely derived from the replacement of traditional market maker and specialist quotes with the indications of a willingness to transact by a large number of competing market participants, who rely on electronic execution methods to indicate their willingness to transact. A large segment of investors, including those using algorithmic or quantitative strategies, have been empowered by technology to design their own execution programs to respond quickly to price movements in our decimalized market by canceling stale orders. This increase in the volume of placed, cancelled and replaced orders is a sign of a competitive, well functioning, highly efficient electronic market with tight bid-ask spreads. This activity is not an indication of market abuse.

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<sup>7</sup> See discussion *infra* Sections III and IV.

- The soundness of our equity market structure was successfully tested during the Financial Crisis of 2008, when our equity markets performed remarkably well, in contrast to other markets. We do not see a need to place an affirmative and negative obligation on proprietary traders, and are concerned that doing so would raise costs for other investors and reduce market competition without providing any additional benefit. Moreover, Section 11A(a)(1)(C)(v) of the Exchange Act finds that it is in the public interest and appropriate for the protection of investors and the maintenance of fair and orderly markets and other goals to assure an opportunity, consistent with efficiency and best execution, for investors' orders to be executed without the participation of a dealer.
- For investors, the current market structure is fairer than it has ever been as it has fewer preferences for particular market intermediaries over other market participants in terms of providing and accessing liquidity.
- We strongly condemn trading on misappropriated information and applaud the Commission for highlighting the distinction between "frontrunning" and what the Commission describes as "order anticipation", which involves trading on public information. Trading is the process of attempting to profit by anticipating future prices of equities. We submit that order anticipation strategies based on publicly available information are an inherent and healthy part of the fabric of our markets and should be encouraged and not constrained.
- We do not believe there is a current market issue regarding what the Commission terms "momentum ignition" strategies. From our experience, we are unconvinced that such strategies are feasible or viable in today's highly efficient markets.
- Dark pools have greatly contributed to market innovations and competition, and are important avenues for investors to use in seeking best execution. Dark pools also have become an important component of the U.S. equity markets, and as such, we believe it's appropriate for the Commission to review dark pools as part of its overall review of the U.S. equity market structure.
- We do believe that additional information will help both policymakers and investors make better decisions. In that regard, we offer the Commission the following recommendations, which we believe will further strengthen the national market system, investor protection and the integrity of our capital markets:
  - We recommend that the Commission's Office of Economic Analysis develop and employ objective criteria to evaluate the effectiveness of the U.S. equity market structure for capital formation, including the impact of post-trade execution timing/location transparency for dark pools.
  - We recommend that the Commission require broker-dealers and connectivity vendors to establish timing standards in order execution latency and to disclose such standards to all current and prospective clients in order to insure that clients understand the level of order execution latency they are receiving, particularly how it compares to the connectivity provided to the broker-dealer's own proprietary or market making business lines.
  - We recommend that the Commission require broker-dealers and connectivity vendors to provide written disclosure to clients if they will use (or will provide to others who, in turn, will use) information based on the flow of a customer's investment activity in connection with a firm's proprietary or market making businesses.

- We recommend that the Commission require market centers to provide written disclosure when they or third-parties provide co-location services on a priority basis other than first available.

### III. BACKGROUND AND MARKET OVERVIEW

#### A. Background

As noted in the Release, a primary driver of the transformation of equity trading has been the continual evolution of technological advancements and competition in the equity markets. The Commission's regulatory initiatives to implement and facilitate the development of a national market system for securities pursuant to its Congressional mandate has played an equally significant role in the transformation and democratization of the U.S. securities markets.<sup>8</sup> To fully understand and appreciate the benefits of some of the market changes for investors, we believe it may be helpful to provide some background and identify some key regulatory actions, which have strengthened our markets.

In enacting Section 11A of the Exchange Act for a national market system, Congress stated that "the evolutionary process has been stunted and distorted by various rules and practices which, operating under the banner of regulatory need, have unnecessarily erected barriers to competition, insulated markets, and resulted in misallocations of capital, widespread inefficiencies, and potentially harmful fragmentation of trading markets."<sup>9</sup> Section 11A directs the Commission in maintaining fair and orderly markets to assure: (1) Economically efficient execution of securities transactions; (2) Fair competition among brokers and dealers, among exchange markets, and between exchange markets and markets other than exchange markets; (3) The availability to brokers, dealers, and investors of information with respect to quotations and transactions in securities; (4) The practicability of brokers executing investors' orders in the best market; and (5) An opportunity, consistent with efficiency and best execution, for investors' orders to be executed without the participation of a dealer.

Pursuant to Section 11A of the Exchange Act, in 1996, the SEC adopted the Order Handling Rules to address the two-tiered markets that had developed from market makers publishing quotes in private electronic communication networks ("ECNs") that were better than the quotes they posted in the public markets.<sup>10</sup> The Order Handling Rules narrowed bid-ask

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<sup>8</sup> See Section 11A of the Securities Exchange Act of 1934 ("Exchange Act"). In mandating a national securities market system through the passage of the 1975 amendments to the Exchange Act, Congress stated its objective was to "enhance competition and to allow economic forces, interacting within a fair regulatory field, to arrive at appropriate variations of practices and services" and that "[m]arket centers should compete and evolve according to their own natural genius and all actions to compel uniformity must be measured and justified as necessary to accomplish the salient purposes of the Securities Exchange Act". H.R. Report 94-123, 94<sup>th</sup> Cong., 1<sup>st</sup> Sess. 50 (1975).

<sup>9</sup> H.R. Rep. No. 94-123, 94<sup>th</sup> Cong., 1<sup>st</sup> Sess. 50 (1975).

<sup>10</sup> Securities Exchange Act Release No. 37619A; 61 FR 48290 (Sept. 12, 1996). The Commission also required market makers and specialists to display customer limit orders that were priced better than their quote or that added to the size associated with such quote.

spreads by as much as 30 to 40% and resulted in significant cost savings for investors.<sup>11</sup> Likewise, the regulatory change to decimalization led to narrower bid-ask spreads and had an immediate and direct impact on transaction costs for investors.<sup>12</sup>

In recognizing the growing significance of ECNs and the substantial benefits they provide to investors through more efficient and lower cost services than traditional intermediaries, in 1998 the Commission adopted Regulation ATS (“Reg ATS”).<sup>13</sup> Reg ATS further encouraged innovation and competition of alternative trading systems (“ATSS”) with traditional market intermediaries, such as market makers and specialists. Nevertheless, under the Intermarket Trading System (“ITS”) Plan,<sup>14</sup> best execution standards, such as the ITS trade-through rule, prevented ATS systems from gaining meaningful market share from the primary listing markets. The trade-through rule prevented electronic systems from trading through manual quotes. Trading on primary listing markets continued to be dominated by market makers and specialists.

With the development of electronic markets, new communications and computing technologies evolved, making algorithmic and quantitative trading techniques more readily available to investors. The advent of new technology enabled all types of investors to trade more efficiently, to minimize transaction costs and to help address problems facing large traders, such as front-running and quote matching. Market developments included increased use of ATSS for large block traders; greater use of algorithms by buy-side traders to break up large orders and decrease the market impact of trading; and the increased use by investors and proprietary traders of automated computer programs and high frequency order execution techniques to implement

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<sup>11</sup> SEC Division of Market Regulation, Special Study: Electronic Communication Networks and After-Hours Trading, June 2000, at note 22 and related text, *available at*: <http://www.sec.gov/news/studies/ecnafter.htm>.

<sup>12</sup> In 2000, the Commission ordered U.S. markets to develop and implement a decimal implementation plan. Order Directing the Exchanges and the National Association of Securities Dealers, Inc. to Submit a Decimalization Implementation Plan Pursuant to Section 11A(a)(3)(B) of the Securities Exchange Act of 1934, Securities Exchange Act Release No. 42360, 65 FR 5003 (Feb. 2, 2000).

<sup>13</sup> Securities Exchange Act Release No. 40760, 63 FR 70844 (Dec. 22, 1998) (hereinafter “Reg ATS Adopting Release”). As part of the National Securities Markets Improvement Act of 1996, Congress granted the Commission broad authority to exempt any person from provisions of the Exchange Act. *Id.* at 70846. The Commission wisely used this authority in promulgating Reg ATS and sought to close certain regulatory gaps that resulted from ATSS being regulated as broker-dealers, while encouraging innovative new markets. Regulation ATS fosters innovation in new markets by providing an ATS with flexibility in registering as either a market participant or as a market—which can be especially important for new market entrants.

<sup>14</sup> In 1978, the Commission approved the “Plan for the Purpose of Creating and Operating an Intermarket Communications Linkage”, the ITS Plan, filed by various exchanges for purposes of working toward a national market system. Securities Exchange Act Release No. 14661; 43 FR 17419 (Apr. 24, 1978). *See also* Securities Exchange Act Release No. 42212; 64 FR 70297 (Dec. 16, 1999) (providing a history of ITS).

The ITS Plan restrictions prevented market participants from trading through quoted prices at the floor based exchanges, and effectively limited ECN growth in listed securities. Securities Exchange Act Release No. 51808; 70 FR 37496 at 37501 (June 29, 2005) (herein “Reg NMS Adopting Release”). *See also* James J. Angel et al., *Equity Trading in the 21<sup>st</sup> Century*, February 23, 2010, at p. 33, *available at*: <http://www.knight.com/newsroom/pdfs/EquityTradinginthe21stCentury.pdf> (hereinafter “Angel et al.”).

their investment strategies.<sup>15</sup> The benefit of these developments was evident in the substantially cheaper cost of trading Nasdaq-listed stocks and was duly noted by regulators.<sup>16</sup>

In 2005, the SEC adopted Regulation NMS ("Reg NMS"), which replaced the ITS trade-through provision that had protected manual quotes with an "order protection rule" to prevent trade-throughs of electronically accessible quotes.<sup>17</sup> By promoting equal regulation and fair competition among markets, Reg NMS eliminated the advantage that the ITS trade-through provisions provided specialists and market-makers. It effectively forced marketplaces to switch from a floor broker system to an automated exchange system. Reg NMS democratized the markets and fostered technological innovation and competition. Investors, who a decade earlier had little choice but to send their orders to Nasdaq market makers and NYSE specialists, now have several markets from which to choose to send their orders and many more market participants with whom to trade.<sup>18</sup>

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<sup>15</sup> See Angel et al. at 32-39; and Cameron Smith, "Commentary: How High Frequency Trading Benefits All Investors", *Traders Magazine Online News*, March 17, 2010 at <http://www.tradersmagazine.com/news/high-frequency-trading-benefits-105365-1.html>.

<sup>16</sup> Angel et al.

<sup>17</sup> Reg NMS Adopting Release.

<sup>18</sup> Two notable enforcement cases, which may have further encouraged the development of new electronic markets, include the Nasdaq market maker price fixing and New York Stock Exchange ("NYSE") specialist interpositioning cases. During the time of these occurrences, investors had little choice but to send their orders to Nasdaq and the NYSE.

In 1996, the U.S. Department of Justice and the SEC found that Nasdaq market makers engaged in a long-standing anti-competitive quoting convention by quoting only in quarter increments (25¢). By fixing transaction costs, market makers artificially inflated price spreads and forced higher transaction costs onto investors. See *In the Matter of National Association of Securities Dealers, Inc.*, Administrative Proceeding File No. 3-9056, Securities Exchange Act Release No. 37538 (Aug. 8, 1996); and U.S. Department of Justice, "Justice Department Charges 24 Major Nasdaq Securities Firms with Fixing Transaction Costs for Investors", July 17, 1996, available at: [http://www.justice.gov/atr/public/press\\_releases/1996/228403.htm](http://www.justice.gov/atr/public/press_releases/1996/228403.htm).

In 2004, the SEC reached an enforcement settlement of more than \$240 million in penalties and disgorgement with five NYSE specialist firms for executing orders for their dealer accounts ahead of public customer orders and thus, breaching their duty to customers, between 1999 and 2003. SEC, "Settlement Reached With Five Specialist Firms For Violating Federal Securities Laws and NYSE Regulations; Firms Will Pay More Than \$240 Million in Penalties and Disgorgement", March 30, 2004 available at: <http://www.sec.gov/news/press/2004-42.htm#att>. SEC, "Settlement Reached With Five Specialist Firms For Violating Federal Securities Laws and NYSE Regulations; Firms Will Pay More Than \$240 Million in Penalties and Disgorgement", March 30, 2004 available at: <http://www.sec.gov/news/press/2004-42.htm#att>. See SEC, "Settlement Reached With Five Specialist Firms For Violating Federal Securities Laws and NYSE Regulations; Firms Will Pay More Than \$240 Million in Penalties and Disgorgement", March 30, 2004 available at: <http://www.sec.gov/news/press/2004-42.htm#att>.



Source: Thomson Transaction Analytics<sup>19</sup>

Note: All NYSE stocks, All market centers, All executed market order shares (605-reported, 100-9999 shares)

<sup>19</sup> Provided by Citadel Investment Group, LLC.



Source: Thomson Transaction Analytics<sup>20</sup>

Note: All NYSE stocks, All market centers, All executed market order shares (605-reported, 100-9999 shares) (Spread measured in pennies.)

VIX ®	Change in Quoted Spread from 2002-2006 to April 2007-July 2009				Change in Percent			
	All NYSE	NYSE 100	All Nasdaq	Nasdaq 100	All NYSE	NYSE 100	All Nasdaq	Nasdaq 100
<15%	-\$0.0176	-\$0.0035	-\$0.0494	-\$0.0135	-11.0%	-19.9%	-31.6%	-48.4%
15-25%	\$0.0314	-\$0.0016	-\$0.0094	-\$0.0087	17.4%	-7.5%	-5.5%	-28.0%
25-35%	\$0.0450	-\$0.0088	\$0.0361	-\$0.0015	23.9%	-29.0%	25.4%	-6.1%
35-45%	\$0.0419	-\$0.0174	\$0.0350	-\$0.0019	22.5%	-46.4%	23.3%	-10.4%

Source: NYSE Euronext

## B. High Frequency Trading

The Commission's regulations to promote competition and reduce costs for investors were successful. The Order Handling Rules and Regulation ATS fostered the development of new electronic markets and enabled investors to use more sophisticated automated computer programs to trade. This environment presented increased competition for the major market centers, competition that fostered improvements in their technology and forced expansion of their capacity as market activity increased. These changes were significant factors that led to the reduction in trading costs. With the adoption of Reg NMS, trading costs fell even further as the market structure monopolies were eliminated and the timely flow of trade data was made available to all investors.

<sup>20</sup> Provided by Citadel Investment Group, LLC.

These market structure advances effectively enabled the growth of high frequency trading, a set of technological tools and trading methods based on low latency technology that were first developed in the early 1990's. Over time, high frequency trading (or "HFT") has found new applications that go beyond its early roots in proprietary trading. Investors of all types, regardless of their investment time horizons, broadly use HFT methods for efficient execution. Indeed, low latency execution methods have quickly become the standard execution platform offered by most broker-dealers. Today's traditional and newer liquidity providers also largely depend on HFT methods and either access the markets directly as broker-dealers or through an agency broker via sponsored access.<sup>21</sup> Broker, exchange and investor trading technology all have become reliant on low latency technology.

The Release lists a number of characteristics attributed to HFT in an attempt to define it, such as high trade count, the use of high-speed and sophisticated computer programs, the use of co-location, short holding periods, high cancellation rates, and ending the trading day in a flat position.<sup>22</sup> With the wide breadth of users of HFT methods and low latency technology, these characteristics are not shared by all of them. To obtain a true appreciation for HFT it is necessary to separate HFT into two applications: (1) the use of algorithms first devised by quantitatively-oriented traders for the purpose of execution of orders for all types of investors (*i.e.*, algorithmic trading); and (2) HFT proprietary strategies, including electronic market making, that require low latency technology and quantitative methods, and are intended to generate trading profits. Both groups use the same tools, the same types of orders, the same multiple market venues. HFT methods and low latency technology have delivered important benefits to investors and to our markets. They have lowered transaction costs for most investors, increased the capacity of our markets, and created more competition.

### **1. Algorithmic Trading**

Beginning in the late 1990's, investors of all types adopted computer execution algorithms. This change constituted a great shift from largely manual trading methods to more efficient, lower cost algorithmic execution methods. These algorithmic trading capabilities enabled broker-dealers and investors to break up large orders to minimize market impact into more flexibly traded, lower profile, smaller orders; replaced expensive manual operations on both the investor and broker sides with more streamlined electronic trading desks; and generally lowered costs for most investors. While early quantitatively-oriented traders pioneered these methods, algorithmic trading is most commonly used today by investors to execute orders with maximum efficiency, lowest information leakage, minimum market impact and in the most cost-effective manner (*i.e.*, lowest level of commission costs).

### **2. High Frequency Trading Strategies**

High frequency trading is commonly employed by investors and traders who seek to profit through the use of strategies that require algorithms and low latency technology. Trading techniques are the tactics or tools that investors with very different underlying investment strategies may use. There are many types of high frequency trading strategies, but in terms of the Commission's list of characteristics, we believe that

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<sup>21</sup> Broker-Dealer Risk Management Controls Proposal. *See supra* note 4.

<sup>22</sup> Release at 3606.

by far the most common are electronic market making methods. To a large extent, these market makers have replaced more expensive, more centralized manual market makers of years past. However, it is important to bear in mind that the economic principles they employ – managing inventory risk to earn profits from providing liquidity – are identical. Other strategies include inter-market arbitrage where small price discrepancies are eliminated by market participants using ultra low-latency technology. These strategies provide increased liquidity and more timely/accurate price discovery for investors and traders alike.

Not all high frequency traders are pursuing the same investment strategies, nor do their strategies operate on the same time scale or require the fastest technology. Strategy holding periods can vary greatly, from seconds to seasons, with the shorter horizon strategies being more likely driven by fleeting arbitrage opportunities or market making, and the longer horizon strategies by forecasts of stock returns. While these strategies—and the skills needed to implement them—can vary widely, there is often much similarity in order placement methods and certain features of the transaction history trail. One similarity is that high order cancellation rates are common across many types of high frequency trading strategies.

While there are many types of high frequency trading strategies and investor demand for low latency technology, we do not believe that “harmful” strategies are prevalent but would welcome the opportunity to work with the Commission to help identify any strategies or practices that are detrimental to capital formation and liquidity.

With respect to market share, HFT market share or volume is estimated at 50% or more of total U.S. equities trading volume.<sup>23</sup> While the media latched onto these estimates to suggest radical changes had overcome the markets, we believe those conclusions are false. Again, it is important to recognize that these figures, if accurate, represent the volume of shares executed using low latency technology to carry out investment or trading strategies, including algorithmic trading, and not the volume of shares from a single strategy or type of trader. To put the estimated HFT market share in context, we believe it’s helpful to compare it to the Nasdaq market maker market share in past decades. Prior to the recent market structure evolution, where all Nasdaq traded securities were traded through Nasdaq market makers, the market maker market share necessarily was greater than 50% of total volume as there was a Nasdaq market maker on at least one side of every trade, and frequently on both sides. Today, electronic traders using HFT methods and low latency technology have largely replaced the more traditional (expensive and less efficient) market makers of the past and the market share figures merely reflect that reality.

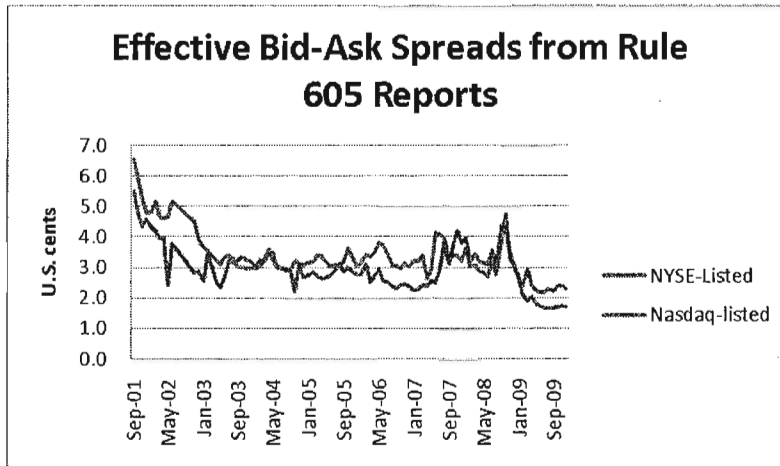
#### **IV. CURRENT MARKET STRUCTURE**

As a result of market structure changes, many aspects of our equity markets—spreads, fees, execution speed, market depth, efficiency, transparency and pricing reliability, for example—have steadily and drastically improved over the last several years to the benefit of the investing public (*see* charts below). Investors have measurably benefited from technological and regulatory changes and financial intermediaries now offer better service and more low-cost options for accessing markets and executing orders. Many assert that those benefiting most from

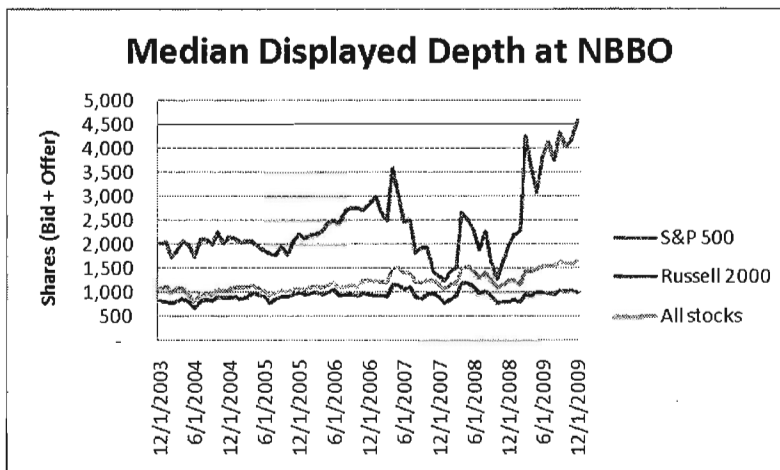
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<sup>23</sup> Release at 3606.

these changes are, in fact, long-term investors—precisely the investor base on which the Commission is most focused.



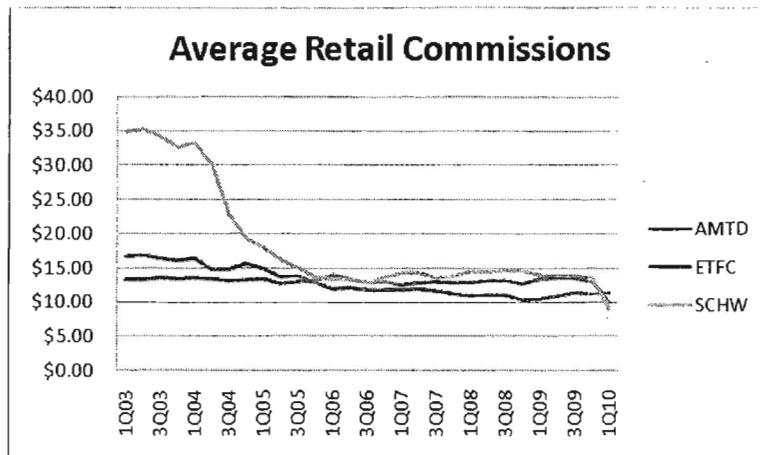
Source: Public Rule 605 Reports from Thomson, Market orders 100-9999 shares<sup>24</sup>



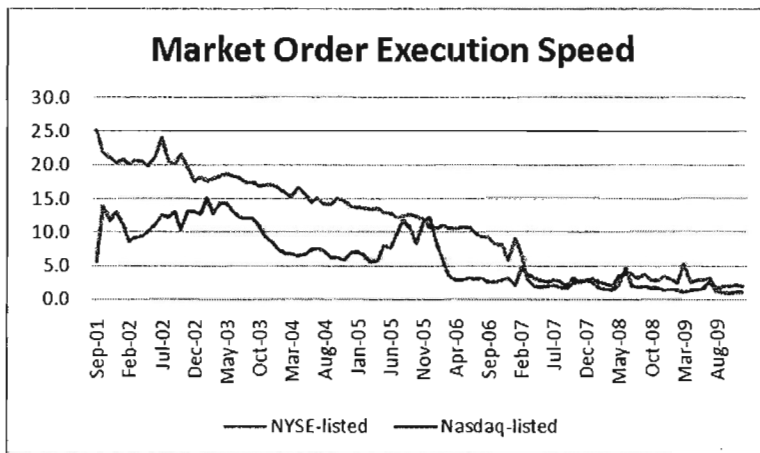
Source: Knight Capital Group<sup>25</sup>

<sup>24</sup> As cited by Angel et al. at 10.

<sup>25</sup> As cited by Angel et al. at 14.



Source: Barclays Capital Equity Research<sup>26</sup>



Source: Rule 605 data from Thomson for all eligible market orders (100-9999 shares)<sup>27</sup>

Under the current market structure, market intermediaries have been forced to compete more and thus charge less, both in terms of explicit fees and implicit costs.<sup>28</sup> From 2001 to 2008,

<sup>26</sup> As cited by Angel et al. at 18.

<sup>27</sup> As cited by Angel et al. at 22.

<sup>28</sup> We believe the success of the current equity market structure in lowering direct and indirect transaction costs paid by all investors is also evidenced by the drastic drop in the market value of equity market intermediaries. Ten years ago, these intermediaries were extraordinarily profitable because they were able to extract large spreads from investors. For example, in June 2000, Merrill Lynch paid \$1 billion for Herzog Heine Geduld, a leading Nasdaq market maker. Three months later, Goldman Sachs paid \$6.5 billion for Spear, Leeds & Kellogg, a leading New York Stock Exchange floor specialist, Nasdaq market maker, and options specialist and market maker. In January 2010, LaBranche, one of five remaining specialists at the NYSE, agreed to sell its market-making operation for \$25 million to Barclays Plc. The NYSE specialist operation was the core part of the LaBranche business. LaBranche's stock price is down more than 90% from its peak in 2001. Another example is Knight Capital Group, which operates a leading market making business. Knight's stock peaked at over \$76 per share in 1999 and is worth less than \$15 today.

the average cost of trading NYSE-listed securities fell by 43%; dropping from among the costliest of the large markets (Japan, Germany, the UK and France) to the cheapest.<sup>29</sup> Similarly, from 2001 to 2008, the average cost of trading Nasdaq-listed securities fell by 45% from the most expensive to the second lowest in the world in terms of trading costs.<sup>30</sup> (See chart below.) HFT execution techniques have enabled investors and traders to supply the markets with liquidity and have in large part replaced the need for or role of traditional market makers. Significantly, users of HFT have replaced manual market-making by trading much more efficiently and at lower profit margins as evidenced by the lower total market-making spread that exists to provide liquidity to investors. These market participants' use of scalable technology has driven net revenue per share to a very small fraction of a penny; thus, even at today's higher trading volumes, the total spread captured is less than the amount captured by human market makers a decade ago. Gross revenue for an electronic market maker using HFT is estimated at \$0.001 and \$0.002 per share, or \$100,000 in gross revenue per day (100 million shares a day at \$0.001), while net revenue would be less after costs such as clearing, regulatory fees, technology, and related transactions used to hedge risk.<sup>31</sup> Simply sitting in a privileged position and collecting wide spreads is no longer a viable business strategy for market makers in the U.S. equity markets.

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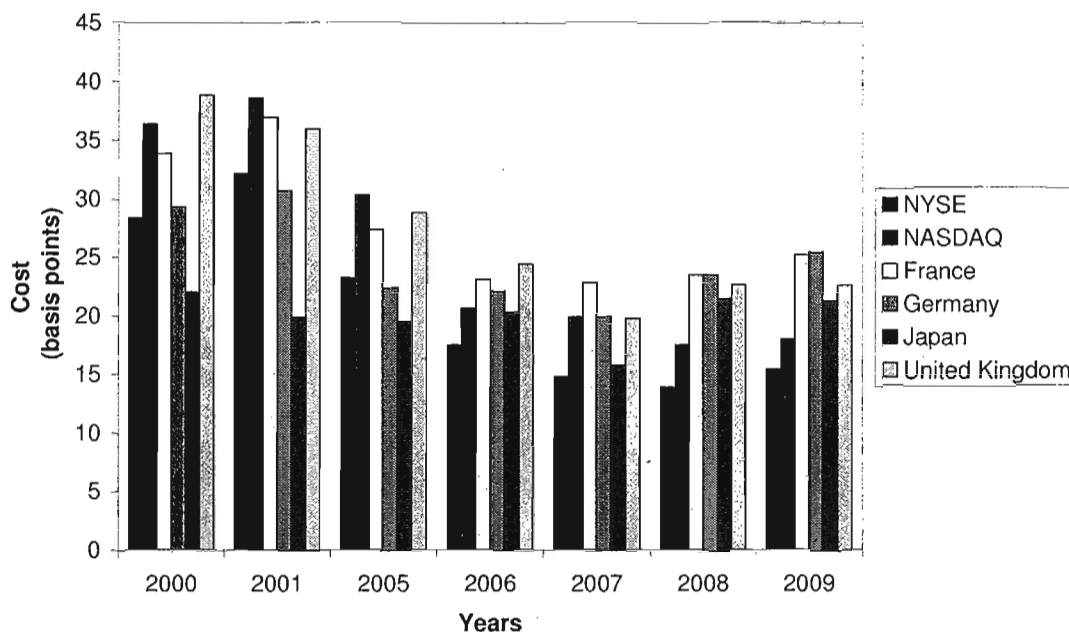
<sup>29</sup> Elkins/McSherry, Institutional Investor.

<sup>30</sup> *Id.* Remarkably, costs for trading NYSE and Nasdaq-listed securities continued to decline in 2008 when trading costs around the world increased. *Id.*

<sup>31</sup> Rosenblatt Securities Inc., Market Structure Analysis & Trading Strategy: An In-Depth Look at High Frequency Trading, September 30, 2009, (hereinafter "Rosenblatt Securities"). Rosenblatt Securities coins the term "electronic market-making" to reference HFT market participants that are making markets electronically.

Rosenblatt Securities also compares the annual revenue for GETCO, likely the world's biggest HFT firm, at \$400 million in 2008 to an estimated \$1.63 billion in gross Nasdaq dealer revenues for the month of June in 1997. Rosenblatt Securities at 28.

### Average Cost of Executing Trades



Source: *Elkins/McSherry, Institutional Investor*

Further, despite the severe Financial Crisis of 2008 and the steep decline in equity prices, the U.S. equity markets operated remarkably well. Market participants using HFT methods and low latency technology remained in the markets to trade with other market participants and were responsible for providing the equity markets with liquidity during times of market stress, including the failure of Lehman Brothers, the bailouts of AIG, Fannie and Freddie, the failure of Washington Mutual, and the rescue of Merrill Lynch.<sup>32</sup> The equity trading systems handled the volatility and trade volumes without system problems unlike the Market Crash of 1987, where the slower, less developed trading systems used at the time were quickly overwhelmed by trading volume and market makers would not answer the phone because they lacked the capacity to execute orders.<sup>33</sup> More significantly, though, the equity markets did not freeze because liquidity in these markets is provided by a broad and diverse group of market participants, who are separately capitalized and less interconnected to the broader financial system than traditional dealers. This proved to be extremely important when the major dealers, who are highly interconnected in markets of a variety of asset classes, experienced firm-wide liquidity issues, which impaired their ability to provide liquidity to these markets. Accordingly, the proliferation of trading venues and market participants prevented the equity markets from suffering from a lack of dealer participation that impaired, or effectively froze, the markets of other asset classes, such as the credit, fixed income and over-the-counter derivatives markets.

<sup>32</sup> Rosenblatt Securities at 29.

<sup>33</sup> See Angel et al.; Rosenblatt Securities at 29.

The Release requests comment on metrics for measuring the current market structure, the impact on various market participants and other aspects of the market structure in evaluating whether the regulations in place are in the public interest and the need for additional rulemaking.<sup>34</sup> Below, we respond to specific issues raised in the Release, and as discussed further, we believe the specific metric the Commission should focus on measuring the quality of markets is liquidity.

#### **A. Long-Term Investors versus Short-Term Traders**

The Release repeatedly raises the issue of the interest of long-term investors and raises questions with respect to differentiating between the interests of long-term investors and those of short-term professional traders in assessing market structure issues.<sup>35</sup> In the words of the Commission, we believe that “it is important to avoid the false dichotomies between the interests of short-term traders and long-term investors, and that many difficult line-drawing issues potentially can arise in precisely defining the differences between the two terms.”<sup>36</sup> Moreover, the concept of promoting long-term investor interests over other market participants is not supported by the Exchange Act.<sup>37</sup> Congress stated that the basic goals of the Exchange Act are “to provide fair and honest mechanisms for the pricing of securities, to assure that dealing in securities is fair and without undue preferences or advantages among investors, to ensure that securities can be purchased and sold at economically efficient transaction costs, and to provide . . . markets that are open and orderly.”<sup>38</sup> MFA represents both long-term investors and short-term traders. In our view and from our experience, the relationship between long-term investors and short-term traders is mutually beneficial for the reasons explained below.

##### **1. Long-Term Investors Benefit from Short-Term Traders**

We do not believe that the long-term investor and short-term trader distinction or construct is useful in evaluating the effectiveness of the current market structure. The role of the markets is to connect buyers and sellers. In mandating a national market system, Congress stated that “[i]nvestors must be assured that they are participants in a system which maximizes the opportunities for the most willing seller to meet the most willing buyer” and that the NMS should “embrace the principles of competition in which all buying and selling interests are able to participate and be represented”.<sup>39</sup> The work of the Commission in recent years has made the markets more efficient by reducing market fragmentation that would otherwise prevent sellers in one location from connecting with buyers in another location. However, market liquidity is not only spread across location, but also across time—a long-term investor may need to raise capital

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<sup>34</sup> Release at 3604.

<sup>35</sup> Release at 3603.

<sup>36</sup> Reg NMS Adopting Release at 37500.

<sup>37</sup> Neither the Exchange Act nor the legislative history provides the Commission with a basis for discriminating among investors based on their investment time horizon. The SEC’s role is the protection of investors. See H.R. Rep. No. 73-1383, 73<sup>rd</sup> Cong., 2d Sess. (1934). Moreover, with respect to capital formation, there is no reason to believe that long-term investors are better at facilitating capital formation than short-term investors. Both are essential to the process.

<sup>38</sup> S. Rep. No. 94-75, 94<sup>th</sup> Cong., 1<sup>st</sup> Sess. (1975).

<sup>39</sup> H.R. Rep. No. 94-123, 94<sup>th</sup> Cong., 1<sup>st</sup> Sess. 50 (1975).

by selling a position today, but there may not be buyers with long-term holding interest until tomorrow.

Short-term traders act to alleviate the short-term lack of liquidity by stepping in to buy from the long-term investor today, with the goal of selling to a different long-term investor or short-term trader tomorrow. While the short-term trader hopes to make a profit for providing liquidity and taking the risk of the position (the risk that the price may change or that another investor may not come tomorrow), ultimately the long-term investor receives a better price for the trades he needs to execute today. Without the liquidity from short-term traders, the long-term seller would experience additional uncertainty with respect to price impact to find buyers today (if he can find buyers at all).

Ultimately, there is a continuum of investors with different investment time horizons participating in markets, each with a role in making the market efficient. Indeed, some long-term investors invest or engage in short-term strategies, similar to those of short-term traders. Regardless of investment time horizon, all investors by the mere act of trading provide additional liquidity, improve price discovery, and allow for more efficient capital allocation. In today's efficient U.S. markets, short-term traders play a crucial role in this process. Long-term investors need and benefit from the trading activity of other investors and traders. Initiatives to restrict short-term trading are likely to harm long-term investors through higher costs, decreased market efficiency, and lower market confidence. Thus, we believe the Commission should focus less on nomenclature and more on the impact of particular kinds of trading activity on liquidity and capital formation.

## **2. Distinguishing Between Long-Term Investors and Short-Term Traders**

While we disagree with the utility of, or basis for, focusing on long-term investors over other market participants, we make the following two observations. First, many long-term investors utilize advanced execution algorithms offered by brokers or execution technology firms which draw on the same kinds of tactics as proprietary trading desks. So, orders sent into the markets to establish or liquidate a large position may look and "act" similar to short-term trading even if the ultimate goal for the investor is to adjust or to enter or exit a large long-term position. For example, a passive, indexed mutual fund that offers daily liquidity to its retail clients will likely need to adjust its holdings of securities each day as investors enter or exit the fund or relative prices of securities in the index change. To serve their investors, such fund needs to avail itself of the most effective order execution strategies. Accordingly, any restrictions on short-term trading may also negatively impact a long-term investor's ability to enter and exit a position with minimal market impact.

Second, the ultimate beneficiaries of short-term trading are long-term investors in the sense that many long-term investors, such as pension funds and other institutional investors invest or engage in short-term investment/trading strategies. Often, the beneficiaries of an entity that enters and exits positions within seconds, minutes, days or months at the level of a trading desk have in fact committed their capital to the entity for the long-term. Regulations that distort investment incentives could negatively impact capital formation and the broader benefits associated with capital formation to the detriment of all investors.

## **B. Liquidity and Market Quality**

The role of the U.S. equity markets is to promote capital formation. In this respect, a more effective assessment of market structure would be for the Commission to focus on market liquidity, which has a direct correlation to capital formation. As the Commission recognizes “[i]nvestors are more willing to own a stock if it can be readily traded in the secondary market with low transaction costs. The greater the willingness of investors to own a stock, the higher its price will be, thereby reducing the issuer’s cost of capital.”<sup>40</sup>

### **1. The Role of Liquidity**

Liquidity promotes capital formation, irrespective of the investment time horizons of the investor/trader. Liquidity plays a critical role in maintaining the confidence of investors globally and promoting the efficient functioning and high-level of innovation in our capital markets. In the equity markets, liquidity is provided by many sources; however it relies heavily on transactions initiated by investors with shorter-term investment horizons and short-term traders. In essence, transactions are completely fungible and indifferent to the buyers’/sellers’ holding periods. To the extent that liquidity reduces the costs of investing and provides investors with an increased likelihood of finding a ready buyer or seller, then capital market formation is enhanced by measures that improve market liquidity.

### **2. Market Structure and Liquidity**

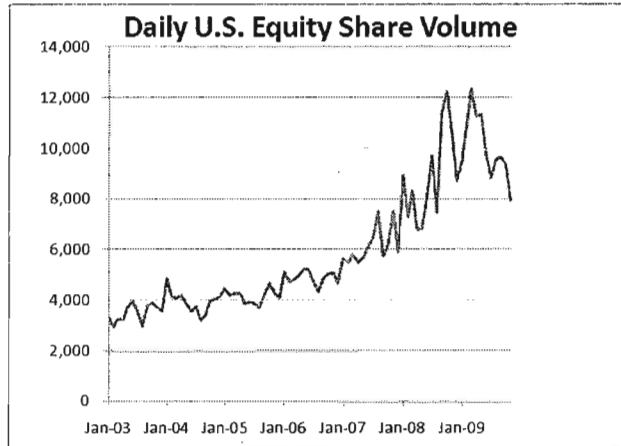
The U.S. equity market structure pre-Reg NMS created significant market inefficiencies through the restriction of price data. For example, liquidity in IBM was provided primarily by the IBM specialist on the floor of the New York Stock Exchange. The specialist, being in a privileged position as a result of market rules, including protection by the ITS trade-through rule, did not have incentives to share timely price data to the investing public.<sup>41</sup> Rather, the specialist was able to take advantage of the market structure inefficiency and profit significantly at the expense of investors. Such market structure created a disincentive for specialists to provide timely price data to the public, frustrated price discovery, limited liquidity, led to price inefficiencies and stifled technological innovation.

The Commission’s regulatory reforms, discussed above, promoted technological developments, competition and innovation in the equity markets to the great benefit of investors. Reg NMS eliminated existing competitive barriers and encouraged greater participation and competition in the markets among market participants. As a result, the average daily trading volume has more than doubled since Reg NMS was implemented. The enhanced liquidity has led to narrower spreads, lower transaction costs and a lower cost of capital.

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<sup>40</sup> Reg NMS Adopting Release, at note 15.

<sup>41</sup> Specialists benefited from this advantage, even with the existence of the consolidated tape and last sale reporting. *See e.g.*, Securities Exchange Act Release No. 58845 (SR-NYSE-2008-46).



Source: Barclays Capital Equity Research<sup>42</sup>

### **3. Comparison with Other Markets**

To illustrate the impact of liquidity on transaction costs in the equity markets, we believe it's helpful to compare the equity markets to other markets, even one of the most liquid markets in the world, the market in U.S. Treasury bonds. In an example provided in "Equity Trading in the 21<sup>st</sup> Century" by Angel, Harris & Spatt, the authors show the difference in spread between two similar products—a U.S. Treasury Bond and a Treasury ETF. The authors found an online retail quote from a large brokerage firm for the November 2039 4.375% long bond, which was 97.30 bid and 98.75 offered, with a spread of 145 basis points (1.45%) of the bond's par value.<sup>43</sup> Whereas, the authors found that the bid-ask spread on a Treasury ETF such as iShares Barclays 20+ Year Treasury Bond (TLT) was typically one or two basis points (1-2¢) on a \$92 stock.<sup>44</sup> The high-level of competition and liquidity in the equity markets have directly benefited retail investors through tighter bid-ask spreads and lower transaction costs as evidenced in the Treasury ETF example. We note, however, that spreads for institutional investors in fixed income are generally better than for retail investors (for Treasury bonds it is about 3 basis points). Unfortunately, retail investors in other markets, such as fixed income, do not benefit from the same level of liquidity as the U.S. equity retail investors.

### **4. Comparing Liquidity in Large Cap and Small Cap Stocks**

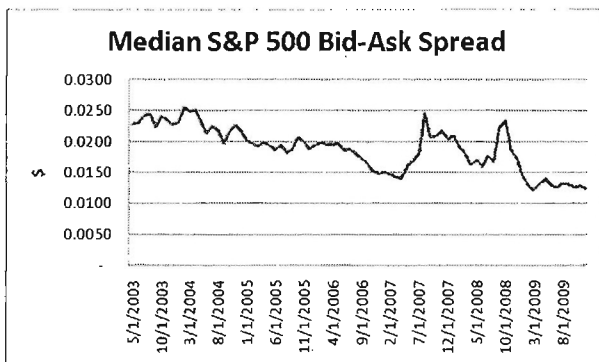
The benefits of liquidity are most notable in large cap stocks, where automated/electronic/HFT strategies are most prevalent and trading volumes have increased the most. Small cap stocks, in comparison, have experienced less improvement in market quality metrics. The difference in market quality between large cap and small cap stocks is also a helpful metric in showing the role liquidity plays in spreads, costs and market efficiency.

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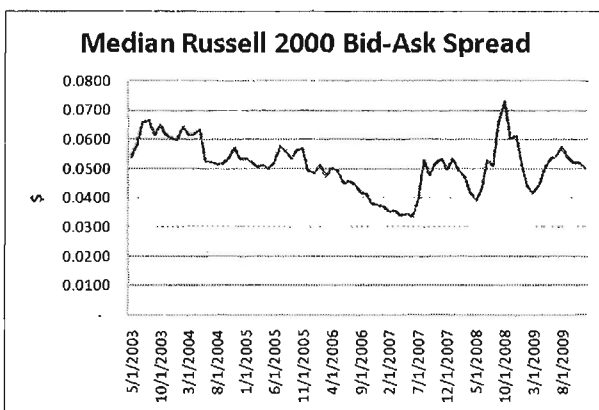
<sup>42</sup> As cited by Angel et al. at 7.

<sup>43</sup> Angel et al. at 41.

<sup>44</sup> *Id.*



Source: Knight Capital Group<sup>45</sup>



Source: Knight Capital Group<sup>46</sup>

With respect to small cap stocks, the Release requests comment on how the market structure performs for smaller companies and whether it supports the capital-raising function for them.<sup>47</sup> In our view, the two most significant differences between large companies and small companies are liquidity and research coverage. Large cap companies typically benefit from greater natural liquidity (greater quantities of outstanding shares), increased research coverage that further begets liquidity, and securities lending programs that allow short-selling (which promotes liquidity). Large cap companies also tend to benefit from having many more distinct shareholders than do small cap companies. These holders, including short-term investors and short-term traders, supply liquidity in the security. Small cap companies, on the other hand, have fewer outstanding shares or less natural liquidity, attract less research coverage, are not included in securities lending programs, and tend to have more passive investors. As a consequence, small cap companies have less liquidity and are less attractive to large investors who want to be able to enter and exit a large position without undue market impact.

Capital formation for smaller companies may be enhanced through greater market liquidity—investors would be more willing to own a small-cap security that has a reasonably

<sup>45</sup> As cited by Angel et al. at 11.

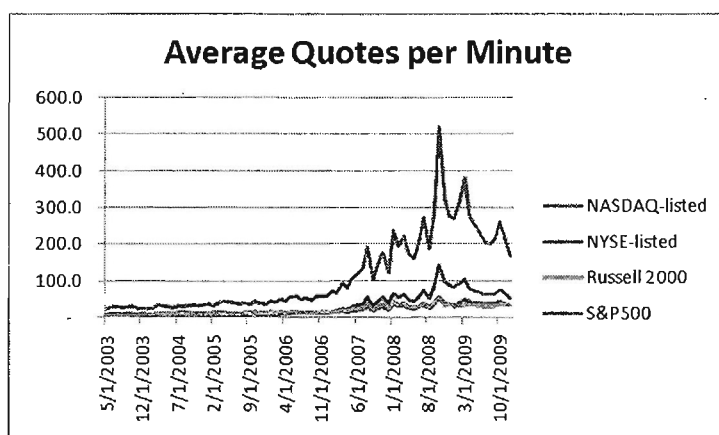
<sup>46</sup> As cited by Angel et al. at 12.

<sup>47</sup> Release at 3604.

deep and liquid market. To enhance market liquidity and thereby, the capital-raising function for smaller companies, we encourage the Commission to consider ways to facilitate liquidity providers to these markets regardless of their investment time horizon and to create incentives to encourage greater research coverage or stock-lending programs for smaller companies.

### C. Quote Flickering and Order Cancellations

As illustrated in the above graphs on daily trade volume and market depth (an indicator of liquidity), liquidity has steadily increased post-Reg NMS. In fact, one phenomenon of greater liquidity has been quote flickering—an indication of how quickly and efficiently market prices reflect new information. This is also consistent with the trend of higher trading volumes and smaller trade sizes.<sup>48</sup>



Source: Knight Capital Group<sup>49</sup>

The Release asks about the brief duration of many orders, characterized as “phantom liquidity”, and whether it detracts from the quality of liquidity in the current market structure.<sup>50</sup> “Phantom liquidity” is an inaccurate characterization of orders of brief duration as it implies that these orders were never marketable and that such orders are somehow knowingly cancelled immediately before they are about to be executed. Order flow may be more accurately viewed as continuous liquidity that constantly adjusts for current market conditions or an indication by market participants of their “willingness to trade”. It is the equivalent of the quoting activity by traditional market makers; market participants or intermediaries using HFT execution methods in providing market liquidity constantly re-adjust their orders/quotes in response to market movements.

Many research firms have concluded, and from our experience we agree, that high frequency traders are liquidity providers.<sup>51</sup> To the extent the Commission is concerned that these market participants are liquidity takers rather than providers, we believe the Commission’s Office

<sup>48</sup> *Id.* at 20. See also chart *supra* Section III showing upward trend of median displayed depth at NBBO.

<sup>49</sup> *Id.* at 21.

<sup>50</sup> Release at 3608.

<sup>51</sup> See e.g., Rosenblatt Securities Inc., Tabb Group, and Woodbine Associates Inc.

of Economic Analysis should conduct an empirical study to determine if high frequency traders—or more specifically certain HFT strategies—are in fact liquidity providers. This could be performed by surveying trading platforms for whether such traders take liquidity or provide liquidity.

For investors to receive best execution, liquidity providers need to provide competitive, tradable quotes, and in today's high volume, decimalized market—with distributed market centers—this requires frequent quote revisions, which appear as high cancellation rates. These market participant orders that are submitted and often subsequently cancelled are limit orders—the very type of orders the Commission intended to encourage through Reg NMS's Order Protection Rule.<sup>52</sup> Indeed, the Commission stated that “strengthened protection of displayed limit orders would help reward market participants for displaying their trading interest and thereby promote fairer and more vigorous competition among orders seeking to supply liquidity.”<sup>53</sup> The simple example below shows how a general movement up or down in market levels creates order cancellations and new orders.

**Quote for an S&P 500 Security**

	<b>Bid</b>	<b>-</b>	<b>Ask</b>
<b>Market</b>	<b>25.00</b>		<b>25.01</b>
<i>Order</i>	25.00		25.01
<b>Market moves by 1/10 of 1% (2.5¢)</b>			
<b>Market</b>	<b>25.02</b>		<b>25.03</b>
<i>Cancel</i>	25.00		25.01
<i>Replace</i>	25.02		25.03

Market makers have always cancelled and refreshed their quotes in response to market movements. With today's more democratic access to markets, liquidity providers working on very thin margins and empowered by low latency technology can respond quickly to changing circumstances. No longer at the mercy of specialists or an oligopoly of human market makers, market participants, including a large segment of investors, can now receive immediate cancellations and just as quickly enter new orders. In particular, this is an essential requirement for market participants engaged in electronic market making strategies to be able to offer tight bid-ask spreads and provide liquidity at low margins.

If the Commission were to limit cancellations in any way, market participants would be more reluctant to post limit orders, which would likely result in a widening of spreads and a decrease in liquidity. Also, such policy could significantly harm the execution quality that investors receive, as many rely on the same technology and their own ability to cancel stale orders in order to minimize their transaction costs. While many orders may be short in duration, from our experience, these orders contribute to more liquid and efficient markets.

<sup>52</sup> Reg NMS Adopting Release at 37501.

<sup>53</sup> *Id.*

#### **D. Trading Obligations**

The Release requests comments on whether proprietary firms that have replaced the role of specialists and market makers should have an affirmative or negative obligation.<sup>54</sup> We do not see a need to place an affirmative or negative obligation on proprietary traders and are concerned that doing so would raise costs for investors without providing any additional benefit. Moreover, Section 11A of the Exchange Act provides that the Commission should provide an opportunity, consistent with efficiency and best execution, for investors' orders to be executed without the participation of a dealer.

Competition in the U.S. equity markets is robust and there is plenty of natural buying and selling interest. Indeed, the proof of the soundness of our capital market structure was borne out during the Financial Crisis of 2008. (See introduction of Section III for a more extensive discussion on market participants that use HFT methods and low latency technology and the Financial Crisis of 2008.) HFT market participants that engage in certain arbitrage or market-making strategies are naturally incentivized to take market risk and provide liquidity during times of market stress as trading can be most profitable when markets are volatile, spreads widen and prices change rapidly. The activity of such market participants provides a stabilizing effect, helps maintain orderly markets and benefits other market participants by providing market liquidity.

Imposing affirmative or negative obligations on market participants would likely have the effect of raising barriers to entry, cause market consolidation, and induce some firms to exit the market, all of which would decrease competition and raise costs—to the detriment of investors. We believe the better approach would be to allow competition to flourish, which will lead to tighter spreads, lower transaction costs and more efficient markets for investors. Further, it would be unfair for the Commission to impose affirmative and negative obligations on today's liquidity providers as they are not receiving special trading privileges, such as registered specialists in the past and market makers who in return are required to maintain continuous two-sided displayed quotes.<sup>55</sup>

To the extent the Commission seeks greater information on large-volume market participants we believe the Large Trader reporting proposal may be able to accomplish this objective.<sup>56</sup> Otherwise, we believe that the securities laws and regulations fully address fraudulent and manipulative activity and that current trading activity of market participants is well regulated and surveilled by the Commission, the exchanges and broker-dealers.

Finally, we note that the only time market participants reduced equity trading during the Financial Crisis of 2008 was in response to the Commission's emergency ban on short selling

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<sup>54</sup> Release at 3607.

<sup>55</sup> See e.g., 17 CFR 240.11b-1; Securities Exchange Act Release No. 58845 (File No. SR-NYSE-2008-46); Securities Exchange Act Release No. 61724 (File No. SR-NYSE-2010-25); and 17 CFR 204.203. The NYSE phased out its specialist system to adopt a "Designated Market Maker" structure, without a negative obligation, as it recognized that the increase in electronic executions and the use of smart routing engines by market participants reduced the advantages once enjoyed by specialists.

<sup>56</sup> Securities Exchange Act Release No. 61908; 75 FR 21456 (Apr. 23, 2010).

financial securities.<sup>57</sup> Subsequent studies show that the SEC emergency ban on short selling financial securities severely degraded the market quality of the subject securities as it:

- Significantly decreased trading volume and market liquidity;
- Increased bid-ask spreads from a “normal” average of 17 basis points in 2008 to 60 basis points by October 8, 2008;
- Increased volatility;
- Decreased market efficiency.<sup>58</sup>

The general conclusion has been that the SEC emergency ban on short selling financial securities was more harmful in restricting beneficial short-selling than beneficial in restricting alleged abusive short selling.<sup>59</sup> We highlight this as it serves as a cautionary tale of the potential for negative unintended consequences that are so prevalent when market structure rules are changed. We urge the Commission to carefully consider this significant potential before undertaking any rulemaking.

#### **E. Fairness Issues and Access to Technology**

The Release asks about the fairness of the market structure.<sup>60</sup> The U.S. equity market structure is fair in that it treats similarly situated market participants in a consistent manner and provides all market participants with equal opportunity to compete and access markets. In fact, in our opinion the current market structure is fairer than it has ever been as it no longer preferences particular market intermediaries over other market participants in terms of providing and accessing liquidity (*e.g.*, specialists in specific stocks). Low latency tools and techniques are available to all market participants. We believe additional disclosures (referenced in our recommendations section) will make the evaluation, selection and utilization of these market innovations much simpler for all investors.

#### **1. Congressional Mandate**

Congress directed the Commission to focus on efficient capital formation, fair access to markets and timely dissemination of market information.<sup>61</sup> In this respect, the Commission should assure that its regulations do not provide certain participants with competitive advantages over others. As long as regulations treat similarly situated participants the same, the success of

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<sup>57</sup> SEC Order Halting Short Selling in Financial Stocks, SEC Release No. 34-58592 (Sept. 18, 2008), 73 FR 55169 (Sept. 24, 2008). The Commission amended this Order in SEC Release No. 34-58611 (Sept. 21, 2008), 73 FR 55556 (Sept. 25, 2008).

<sup>58</sup> See Shorting Financial Stocks Should Resume; Shackling Short Sellers: The 2008 Shorting Ban, Boehmer, Jones and Zhang, November 18, 2008; The Undesirable Effects of Banning Short Sales, Abraham Lioui, EDHEC Business School, Risk and Asset Management Research Centre, April 2009; The Blame Game: What Caused Spreads to Widen, AES Analysis, Credit Suisse, Nov. 12, 2008; The Effect of Short-selling Restrictions on Liquidity: Evidence from the London Stock Exchange, Matthew Clifton and Mark Snape, Capital Markets Cooperative Research Centre, Dec. 12, 2008; and Examining the Wake of the Short Sale Restriction, AES, Credit Suisse, October 13, 2008.

<sup>59</sup> See also Angel et al. at 40.

<sup>60</sup> Release at 3605.

<sup>61</sup> See *supra* note 5.

individual participants should become a matter of competition. It would be anticompetitive, impractical and against the intention of Congress in establishing a national market system for the Commission to attempt to prevent competitive advantages gained from a market participant's investment in technology and human resources. Congress stated the objective of creating a national market system was "to enhance competition and to allow economic forces, interacting within a fair regulatory field, to arrive at appropriate variations of practices and services."<sup>62</sup> Moreover, it has been through their brokers' investment in technology and competition that retail investors have been able to benefit from greater market access and (online) trade executions for as little as \$7 a trade (as compared to around \$45 per 100 shares ten years ago)<sup>63</sup> or the fixed commission rates that existed prior to May 1, 1975.

Similarly, we believe proposals such as a requirement establishing a minimum duration of orders would be anticompetitive and in conflict with the intention of Congress in establishing a national market system. We believe such proposal would limit and stifle competition similar to the ITS trade-through rule by establishing a ceiling on execution speed to benefit certain market participants. Further, such a proposal would likely harm institutional investors trying to manage large order information by making them more vulnerable to information leakage and the actions of other market participants.

## **2. The Availability of Technology to All**

The Commission also asks whether the current market structure has become so complex that only the largest institutions can afford to deploy their own highly sophisticated trading tools.<sup>64</sup> This has not been our experience, either for retail investors or professional market participants. Much of the success of the current equity market structure and its resiliency in the face of the Financial Crisis of 2008 are due to the widespread ability of small firms, including proprietary firms and private investment firms, to access markets on a competitive basis. Many notable electronic market makers and users of low latency trading technology are small and successful firms that did not exist ten years ago. In fact, regulatory and technical changes of the past 15 years have largely eliminated the advantages formerly held by the large institutions. Regulation should encourage the participation of market participants of all sizes and strategies to provide liquidity to the markets and to reduce the concentration of, or reliance on, only a few firms to provide liquidity.

All investors have benefited greatly from the advancements in technology in the financial markets, including retail investors. Retail investors are able to access or benefit from sophisticated trading tools in a few ways. First, through technological developments, retail broker-dealers, such as Schwab, E-Trade, Fidelity and TD Ameritrade, are able to offer retail investors advanced trading tools, real-time market data, lower trading costs and greater market access than ever before. Second, retail investors may trade through an intermediary that deploys sophisticated trading tools. Third, retail investors may invest in mutual funds or pension funds that will deploy sophisticated technology to execute trading strategies. Even investors generally considered "passive" or "long-term", such as mutual funds, rely on sophisticated trading tools, such as algorithms, to actively buy and sell securities on a daily basis at the best price in order to

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<sup>62</sup> *Id.*

<sup>63</sup> Angel et al. at 19.

<sup>64</sup> Release at 3605.

offer continuous liquidity to its investors. Accordingly, retail investors are able to access technology through these structures.

With respect to institutional investors, many choose not to invest and build proprietary trading tools from a cost-benefit perspective, but to hire service providers (*e.g.*, executing brokers or third-party vendors) with the best technology, and resources to trade at high speed and with the highest degrees of sophistication. Many investors, including MFA members, access the markets through a broker-dealer via direct market access or sponsored access and use algorithms supplied by buy-side brokers. From our experience, sophisticated trading tools are available to all investors. Nevertheless, investors should be aware and receive disclosure if a connectivity provider provides its proprietary desks different, more sophisticated or lower latency trading tools or any form of customer information. In these respects, we believe it would be helpful to investors if broker-dealers and connectivity vendors provide greater disclosure on connectivity offerings and the utilization of customer information.

Currently, it is very challenging for investors to compare low latency technology across firms. We believe investors would benefit if counterparts and vendors use an industry-wide benchmarking approach to measure connectivity services and low-latency technology. In addition, firms offering execution connectivity to customers should disclose if the firm is utilizing the same connectivity platform or if more advanced execution technology for proprietary activity exists, and whether there are any systematic or programmed preferences between the order entry and execution process for client and proprietary orders.

Further, to the extent that a broker-dealer or vendor providing connectivity uses, packages, redistributes, or sells information based on the flow of a customer's investment activity—such as information on market color, trends, volumes, sector change or other market commentary or metrics—we believe the firm should provide written disclosure to current and prospective connectivity customers. Customers should be aware of how and under what terms their information is being used. Disclosures with respect to execution connectivity and customer order flow information, like Rules 605 and 606, would assist investors in assessing execution quality and possible conflicts of interest.<sup>65</sup>

### **3. Co-Location**

Finally, the fact that certain investors and traders may be willing to incur greater costs to develop more sophisticated trading tools does not make their possession of those tools inherently unfair. The use of co-location or advanced execution algorithms does not provide similar time-and-place advantages, in terms of access to information and executions, as a seat on the floor of a physical exchange offered previously. Co-location demands are the natural and positive result of competition among electronic market-makers attempting to be first to provide liquidity to investors. This competition lowers investor costs and improves the availability of liquidity. It is not a mechanism to disadvantage investors; it is a mechanism to compete to provide a service to investors.

Co-location allows an investor or trader to react more rapidly to news and market conditions than another non-co-located investor or trader. However, we note that the co-located trader still must have the correct market analysis to benefit financially from the advantage co-

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<sup>65</sup> Securities Exchange Act Release No. 43590; 65 FR 75414 (Dec. 1, 2000).

location provides, and that the HFT-space is highly competitive, which means that profit and arbitrage opportunities are difficult and expensive to discover. Co-location is particularly critical to market participants whose strategies include reacting to fast, short-term price swings. Co-location is a link in the low latency technology chain, not a latency solution. Many investors with longer-term investment horizons, however, also value and rely on the ability to co-locate. As long as co-location is available to investors, traders and larger brokers on an equal basis, the secondary market for such services to smaller customers from their brokers should be competitive and thus, fairly priced. Accordingly, we believe market centers should disclose if they or third parties offer co-location services on a priority basis other than first available.

## **F. Directional Strategies**

MFA shares the Commission's objectives to eradicate illegal and improper investment activities from our markets. In the Release, the Commission discusses two potential trading strategies, which it believes should be evaluated for their appropriateness: order anticipation and momentum ignition. We provide the following views:

### **1. Order Anticipation**

We strongly condemn trading on misappropriated information and applaud the Commission for highlighting the distinction between "frontrunning"—trading on misappropriated information—and what the Commission describes as "order anticipation", which involves trading on publicly accessible information. We fully support the Commission's recent Division of Enforcement reform efforts to better combat fraud, manipulation and misconduct, such as frontrunning. Illegal market behavior reduces investor confidence in the markets and threatens liquidity to the detriment of all.

The Commission requests comment on whether order anticipation strategies harm the market.<sup>66</sup> We submit that order anticipation strategies based on publicly accessible information are an inherent and healthy part of the fabric of our markets and should be encouraged and not constrained. All investors attempt to buy and sell at the most favorable prices. In doing so, investors try to execute their orders without revealing their trading, while trying to determine the current and future trading interest of other participants. As a result, most investors directly or indirectly rely on some form of anticipation strategy for entering and exiting the market. For example, many institutional investors pay higher commissions to brokers to "work" orders into the markets while attempting to minimize impact on the supply/demand curve. This activity occurs at all time horizons and creates market efficiency as long as the trading is based on publicly accessible information. Trading based on low latency technology execution methods is no different. These strategies improve market efficiency for all market participants by revealing changes in trading interest to the public, by quickly moving prices toward equilibrium (more quickly than manual trading) and creating prices that are more reflective of the changes in supply or demand for participants on both sides of market transactions.

The next logical question to be raised with respect to order anticipation would be: whether it's appropriate for a market participant to use tools or techniques to hide an order to avoid influencing supply and demand? Herein lies the conundrum—if anticipation strategies based on publicly available data are not appropriate, then concealing any part of an order also

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<sup>66</sup> Release at 3609.

must not be appropriate since both are trying to impact the change in the supply and demand equation. We believe this activity boils down to the essence of trading as buyers and sellers strategize to obtain the best possible price.

The Release also discusses pinging as a form of order anticipation.<sup>67</sup> Pinging is an important and legitimate trading tool for market participants (*e.g.*, institutional investors) seeking hidden liquidity and contributes to price transparency and market efficiency. When the ‘pinger’ places an order, say a sell order, the only information he receives is whether or not there was interest in executing at a particular amount and price. If there is interest, then the order would be filled. If it was filled, the ‘pinger’ has learned only that at the time he placed his order there was a limit order waiting to be filled. He does not learn anything about the depth of book, how many other limit orders there may have been, or whether there were also limit sell orders at the same time. Accordingly, it is incorrect to think of a ‘pinging’ strategy as determining what quantity of a particular security is available at a particular price. Pinging only provides a participant with an indication of whether there is some liquidity at a particular venue at a particular price at a particular time. Moreover, the same information is available to any other market participant who sends an order to the same venue.

## **2. Momentum Ignition**

The Release describes ‘momentum ignition’ strategies to imply that there are strategies which exist to probe order books to determine if there are order types that could be easily triggered.<sup>68</sup> This activity would then potentially create a price move resulting in a domino effect, as more such orders get triggered. Effectively this would make trading in these stocks profitable as triggering events occur. It is unclear if this type of strategy is possible without the disclosure of information regarding the depth of book at any given liquidity center. With the advent of execution algorithms and special order types, we are skeptical that these triggering strategies referred to as ‘momentum ignition’ are feasible and believe that they are more a shot in the dark than a strategy. To the extent that a proprietary firm illegally spreads false rumors in the marketplace in connection with its orders and trades, MFA fully supports legal action against such a firm for engaging in manipulative and deceptive devices under the securities laws.

### **G. Undisplayed Liquidity**

We appreciate the Commission’s review of regulations concerning undisplayed liquidity pools, including its recently proposed Regulation of Non-Public Trading Interest (“Dark Pools Proposal”).<sup>69</sup> There will always be a balance between the desire of investors or markets to protect proprietary information about an investment strategy and the goal of dissemination of key market information that broad transparency promotes. We remind the Commission that transparency is not a goal in and of itself, however; it is a tool that can enhance price discovery and promote competition and fairness among market participants so long as anonymity is preserved. We believe the dissemination of timely and uniform transaction information is an important pillar to a fair, competitive and efficient national market system.

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<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> Securities Exchange Act Release No. 60997, 74 FR 61208 (Nov. 23, 2009).

The advent of ATSs has greatly contributed to market innovation and competition. ATSs and undisplayed liquidity pools are important avenues for investors to use in seeking best execution. ATSs compete with traditional exchanges, and this competition has led to improvements in technology and execution costs that benefit equity investors of every size, from individuals to the largest and most sophisticated institutional investors. There has always been and probably always will be undisplayed or dark liquidity in the markets, such as the upstairs market in listed stocks. The significant difference, however, is that Reg ATS establishes a fair, efficient and open system for market participants with respect to dark liquidity and as such, enhances fairness in our national market system.

At the adoption of Reg ATS, ATSs were required to include in the consolidated quotation system any quotes distributed to more than one person in a security in which it had 20% or more of the volume and to adopt fair-access procedures.<sup>70</sup> Reg NMS lowered these thresholds to 5% or more of the volume of a security.<sup>71</sup> Since the adoption of Reg NMS, ongoing technological advancements have again reshaped the trading landscape, which make it appropriate and timely for the Commission to reexamine the impact of certain Reg ATS provisions. We believe it is important for the Commission to study the effect of post-trade transparency for ATSs in order to strike an appropriate balance between increasing transparency, improving price discovery, and ultimately liquidity, through ATS identifiers and ensuring adequate investor protection.

## **V. RECOMMENDATIONS AND CONCLUSION**

We commend the Commission for fostering a national market system that promotes innovation and competition, and appreciate its continual efforts to review the U.S. equity market structure in a holistic manner for the benefit and protection of investors. In doing so, the Commission should continue to focus on the principles set by Congress to promote efficient capital formation, and fair access to markets and market information. As investors, we think the current market structure is extremely efficient and robust, and has proven to withstand even the most volatile of crises as experienced during the Financial Crisis of 2008. Our markets are the most liquid, efficient and investor-friendly in the world, as well as the most successful in promoting capital formation.

As a general matter, the current market structure works well for investors and we are generally pleased with the market regime and the protection it offers investors. We respectfully urge the Commission in considering any market structure proposals to proceed cautiously as we are concerned that unintended consequences could negatively impact investors by decreasing market liquidity, depth and efficiency while raising transaction costs. We recommend that the Commission's Office of Economic Analysis develop and employ objective criteria to evaluate the effectiveness of the U.S. equity market structure for capital formation, including the impact of post-trade execution timing/location transparency for dark pools.

Given the highly technological nature of today's markets, we believe that investors should benefit from some additional disclosures. In this respect, we recommend that the Commission:

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<sup>70</sup> Reg ATS Adopting Release.

<sup>71</sup> Reg NMS Adopting Release, at 207.

- Require broker-dealers and connectivity vendors to establish timing standards in order execution latency and to disclose such standards to all current and prospective clients in order to ensure that clients understand the level of order execution latency they are receiving, particularly how it compares to the connectivity provided to the broker-dealer's own proprietary or market making business lines.
- Require broker-dealers and connectivity vendors to provide written disclosure to clients if they will use (or will provide to others who, in turn, will use) information based on the flow of a customer's investment activity in connection with a firm's proprietary or market making businesses.
- Require market centers to provide written disclosure when they or third-parties provide co-location services on a priority basis other than first available.

We strongly believe these recommendations will further strengthen the U.S. equity market structure, improve investor protection and enhance the integrity of our capital markets. MFA appreciates the opportunity to provide comments on the Release and would be pleased to meet with the Commission or its staff to further discuss our comments. If the staff has questions or comments, please do not hesitate to call Jennifer Han or the undersigned at (202) 367-1140.

Respectfully submitted,

/s/ Stuart J. Kaswell

Stuart J. Kaswell  
Executive Vice President and  
Managing Director, General Counsel

CC: The Hon. Mary Schapiro, Chairman  
The Hon. Kathleen L. Casey, Commissioner  
The Hon. Elisse B. Walter, Commissioner  
The Hon. Luis A. Aguilar, Commissioner  
The Hon. Troy A. Paredes, Commissioner  
Robert W. Cook, Director  
Division of Trading and Markets  
James Brigagliano, Deputy Director  
Division of Trading and Markets  
David Shillman, Associate Director  
Division of Trading and Markets

# MANAGED FUNDS ASSOCIATION

The Voice of the Global Alternative Investment Industry

WASHINGTON, DC | NEW YORK



June 9, 2010

**Via Electronic Mail:** [rule-comments@sec.gov](mailto:rule-comments@sec.gov)

Elizabeth M. Murphy  
Secretary  
U.S. Securities and Exchange Commission  
100 F Street, NE  
Washington, DC 20549-1090

**Re: File Numbers: SR-BATS-2010-014, SR-BX-2010-037, SR-NASDAQ-2010-061, SR-NSX-2010-05, SR-NYSE-2010-39, SR-NYSEArca-2010-41, SR-NYSEAmex-2010-46, SR-ISE-2010-48, SR-EDGA-2010-01, SR-EDGX-2010-01, SR-CBOE-2010-047, SR-CHX-2010-10, SR-FINRA-2010-025**

Dear Ms. Murphy:

Managed Funds Association (“MFA”)<sup>1</sup> welcomes the opportunity to comment on the rule proposals (each, a “Proposal”) from the applicable self-regulatory organizations (each, an “SRO”) that would impose circuit breakers to halt trading in any individual security on the S&P 500® Index in the event that the price of such security moves ten percent (10%) or more from a sale in a preceding five-minute period (each, a “Circuit Breaker”). MFA fully supports the Proposals and the imposition of the stock-by-stock Circuit Breakers as a measure that will help to prevent market disruptions and restore confidence in the markets. As investors, MFA’s members have a strong interest in liquid and deep markets that operate efficiently. In addition, MFA applauds the coordinated effort by the SROs to reach consensus and provide a uniform market-wide standard.

In particular, MFA supports the SROs’ proposal to implement the Circuit Breakers for a pilot period beginning on June 7, 2010 and ending on December 10, 2010 (the “Pilot Period”) in order to enable each SRO to assess the effect of the Circuit Breakers on the market. MFA believes that employing a Pilot Period is an intelligent approach to balancing the need to be responsive to the market events of May 6, 2010 and the need to ensure that the SROs periodically re-evaluate these measures to determine their efficacy and ability to meet the demands of the market. To the extent that the SROs consider implementing any changes to the Circuit Breakers during the Pilot Period, MFA respectfully recommends that the SROs exercise caution if the changes contemplated are in response to market events. In such case, the SROs should ensure that any such changes are the result of the SROs having had a meaningful opportunity to analyze and evaluate the cause of any such events and determine the most appropriate course of action.

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<sup>1</sup> MFA is the voice of the global alternative investment industry. Its members are professionals in hedge funds, funds of funds and managed futures funds, as well as industry service providers. Established in 1991, MFA is the primary source of information for policy makers and the media and the leading advocate for sound business practices and industry growth. MFA members include the vast majority of the largest hedge fund groups in the world who manage a substantial portion of the approximately \$1.5 trillion invested in absolute return strategies. MFA is headquartered in Washington, D.C., with an office in New York.

Ms. Elizabeth Murphy  
June 4, 2010  
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MFA supports the Proposals and believes that the responsive and coordinated effort of the SROs will help to restore confidence in the markets. As investors, MFA's members have a strong interest in liquid and deep markets that operate efficiently. We, therefore, hope we can continue to work with the Commission and its staff to address issues related to the "flash crash" of May 6, 2010 and to market structure more generally. If the Commission or its staff has questions or comments on the foregoing, please do not hesitate to call Carlotta King or the undersigned at (202) 367-1140.

Respectfully submitted,

/s/ Stuart J. Kaswell

Stuart J. Kaswell  
Executive Vice President, Managing Director &  
General Counsel

CC: The Hon. Mary Schapiro, Chairman  
The Hon. Kathleen L. Casey, Commissioner  
The Hon. Elisse B. Walter, Commissioner  
The Hon. Luis A. Aguilar, Commissioner  
The Hon. Troy A. Paredes, Commissioner



October 1, 2009

Via email

Mr. Kurt Pribil  
Chair CESR-Pol  
Committee of European Securities Regulators  
11-13 Avenue de Friedland  
75008 Paris, France

**Re: CESR Proposal for a Pan-European Short Selling Disclosure Regime**

Dear Mr. Pribil:

The Managed Funds Association (“MFA”) welcomes the opportunity to provide comments to the Committee of European Securities Regulators (“CESR”) in response to its Consultation Paper, CESR Proposal for a Pan-European Short Selling Disclosure Regime (the “Consultation Paper”).

MFA is the voice of the global alternative investment industry. Its members are professional alternative investment managers, including managers of hedge funds, funds of funds, hybrid funds (such as 130/30 funds) and managed futures funds, as well as industry service providers. Established in 1991, MFA is a key source of information for policy makers and the media about the alternative investment industry and a leading advocate for sound business practices and industry growth. MFA members include the vast majority of the largest hedge fund groups in the world who manage a substantial portion of the approximately \$1.5 trillion invested in absolute return strategies. MFA members use a broad variety of different investment strategies and techniques, including short selling. Many MFA members actively trade in European markets and have considerable personnel and resources located in Europe. MFA is headquartered in Washington, D.C., with an office in New York.

## **EXECUTIVE SUMMARY**

MFA and its members share CESR’s concerns about the crisis in the global financial markets and strongly support efforts to prevent, detect and punish manipulative conduct. In the aftermath of this volatile period, it is important that policy makers adopt measured responses that will enhance market confidence and lead to greater market stability. We strongly believe market confidence and stability are best promoted by regulatory measures that are based on rigorous economic analysis that demonstrates the benefits to the markets and fully takes into

account the risk of adverse behavioural changes. Therefore, we strongly urge CESR members to make public their own analyses of the impact of the measures introduced last year requiring public disclosure of short positions in financial stocks.

As described below, while we support the goal of increasing the level of information on short selling available to regulators on a confidential basis, we are concerned that the public disclosure of short positions could increase market volatility, restrict price discovery and preclude investors from performing critical risk management functions. In particular, we consider that a requirement for individual investors to publicly disclose their short positions would have a significant adverse effect. Additionally, the general consensus is that last year's unusual volatility with respect to financial stocks was due primarily to investors with net long positions selling off their long positions to reduce their exposure, out of concern about the increasingly negative financial news regarding the financial services sector.

We suggest modifications to the disclosure proposals that would provide CESR members with more useful short sale information while mitigating undue burdens to individual investors. Specifically, we recommend, among other things:

- Any proposed rules should require that reporting to a CESR member be non-public and fully protect the confidentiality of the information. Public disclosure of information would result in adverse consequences to investors, issuers and other market participants.
- Any proposed rules should be based on a de minimis reporting threshold for private reporting to regulators of at least 0.5%. Short positions below 0.5% are not significant and investors should not have to report that information. Moreover, limiting disclosure to more significant positions permits a regulator to more accurately assess risks rather than being inundated with data.
- If there is evidence available to CESR showing that public disclosure is necessary and beneficial, any proposed rules should only require regulators to make available to the public aggregated anonymised data on short selling using the information privately reported to them. However, if the cost of producing aggregated anonymised data is too high, CESR should consider recommending that regulators publicly disclose anonymised versions of individual private reports of short positions, but at a higher threshold (such as 2%). Such anonymised disclosure would mitigate some of the risks associated with disclosures that identify individual investors, although many of those risks would still remain.
- Any proposed rules should harmonise the timeframe for reporting with reporting timeframes required under the Transparency Directive to reduce reporting costs and

technological burdens imposed on investors and to concentrate reporting to statistically more meaningful data.

- Any proposed rules should require that reporting of short positions in companies undertaking rights issues be consistent with other short position reporting requirements.

## INTRODUCTION

The negative impacts of short selling bans on global equity markets has been well documented and supported by a range of parties including market participants and academics. For example, bans on selling short financial stocks in the US and UK last fall had materially negative impacts on liquidity and bid-ask spreads while failing to have meaningfully positive impacts on price declines and volatility.

The available data also indicates that requirements for public disclosure have also had materially negative impacts. For example, in the period after short selling bans the US regulatory regime did not include a provision for public disclosure of short interest in financial stocks while the UK regime did include such a provision. In this same period, the metrics of market efficiency and stability in the US performed significantly better than they did in the UK. Liquidity in affected stocks was better in the US and bid-ask spreads were significantly tighter. While there are other variables that would affect the relative performance of such metrics we believe that the less efficient and stable markets in the UK were to a large part as a result of diminished market participation by short sellers. While increased information flow is important for regulators to be able to ensure market stability any short selling disclosure regime should be designed such that it does not implicitly discourage participation in equity markets.

We attach some information which provides further background on these points.

## RESPONSES TO CESR'S QUESTIONS

<p><b>1. Do you agree that enhanced transparency of short selling should be pursued?</b></p>
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We support the goal of increasing the level of information on short selling available to regulators. However, we are concerned that a requirement for individual investors to publicly disclose their short positions could instead increase market volatility and preclude investors, such as MFA members, from performing critical risk management functions.

CESR should require private reporting of short positions to regulators on a confidential basis (we discuss in our response to question 5 below the possibility of regulators using information privately reported to them to provide public disclosure of anonymised data about short selling). Public disclosure of short position information that identifies individual investors and their short positions may be misinterpreted by other market participants,

increase market volatility and harm the trading strategies developed by investment managers and analysts to serve their investors. We encourage CESR to disclose any abusive short selling practices which it has identified that would be effectively addressed by public disclosure.

***Public disclosure of short positions likely to be misinterpreted by investors.*** We believe public disclosure disadvantages those issuers whose stock is shorted and the investors who are long in that stock. Public disclosure of short positions is likely to be misinterpreted, as investors frequently short a stock for portfolio risk management purposes rather than because they have taken a negative view on a particular issuer. For example, an investor that is primarily long in stocks in a particular industry sector may consider that one issuer's stock is likely to outperform another and may express that view by going long the first and short the second stock. Under CESR's proposals, investors engaging in these strategies would not be able to net their long positions in one issuer's stock against their short sales in another stock. Therefore, the investing public could mistakenly interpret disclosure of the information on the short sale as an absolute negative view on that issuer's prospects. Misinterpretation of this information is likely to have a greater impact on those industry sectors which are vulnerable to negative public sentiment, in particular financial institutions.

***Public disclosure leads to "herding" and increased volatility.*** Public disclosure of market participants' short positions may lead to an increase in shorting of stocks as other market participants seek to execute trades which follow firms' publicized short positions. This would increase market volatility. There are examples of situations in recent years where the behaviour of a high profile investor is likely to have influenced the activity of other market participants. This is a particular concern for MFA members, many of whom have well established market reputations.

***Public disclosure has market effects that result in increased costs for all investors.*** All equity market participants would realize increased costs associated with trading equities under regulatory regimes that require public disclosure of short positions. Institutional and retail investors alike would also experience increased transaction costs (i.e. wider bid-ask spreads) and longer times to fill orders. Short selling is critical for price discovery, and market participants gain confidence when both positive and negative views are expressed in the market. In addition, short selling can impose a useful discipline on many issuers who do not provide the requisite transparency to investors regarding their financial condition.

***Public disclosure may cause issuers to react adversely to short sellers.*** Public disclosure of short positions would also have harmful consequences to investors. A number of issuers have indicated that if they can identify which firms have been shorting their securities, they will cease or limit communications with analysts of those firms and exclude them from information sessions. Such a result would have a negative impact on capital markets by limiting the free flow of information essential for informed investments and effective price discovery. We are concerned that the public disclosure of detailed short positions would

have long lasting negative effects on European markets by having a chilling effect on the information and disclosure provided by issuers, as well as harming the relationship between investors and issuers. This is a particular concern for MFA members, who believe that it is necessary to have equal access to information from issuers to better serve their own investors by pursuing properly informed investment strategies.

***Adverse publicity arising from public disclosure may avert investors from benefiting from alternative investment classes.*** In addition, a number of pension, endowment and foundation investors in the U.S. have indicated to our members that because of risks of adverse publicity resulting from public misunderstanding of the function of short selling, they would likely withdraw their investments from investment vehicles engaged in short selling if they were required to publicly disclose short positions. European investors with our members are likely to react in a similar manner. In the long-term, such investors would forego diversification and risk management benefits provided by alternative investment vehicles.

***Adverse publicity associated with public disclosure may discourage use of hedging strategies.*** Public disclosure of short position information could have unintended consequences to hedging strategies of investors. Hedging strategies are a critical risk management tool of investors and enable them to make investments on the long side of the market. Short selling is an essential component of a wide range of bona fide hedging strategies by which investors provide liquidity to the financial markets. Because of concerns about adverse publicity, public disclosure of short positions may discourage investors from engaging in short sale transactions for hedging purposes, reducing investors' ability to manage risk, and decreasing market liquidity and capital formation. While these concerns would be reduced if an investor's net short position for a particular security remains below the disclosure threshold, investors, such as MFA members, frequently hedge risk through short sales of different issuers with highly correlated share prices (e.g., companies in the same industry sector).

With the reduced usage of hedging strategies there may also be unanticipated secondary effects. Certain investment strategies use short equity positions to hedge exposures in other products. Convertible arbitrage, for example, relies on short equity positions to hedge exposure in convertible bonds. Were alternative investment managers and other investors to lose the ability to hedge these risks there is a possibility that their appetite for products such as convertible bonds could diminish. As convertible bonds represent a cheaper source of funding than traditional bond issuance short selling disclosure could have real impacts on the financing ability of companies whose equity is subject to regulation. There are many MFA members that pursue these strategies and are significant investors in primary offerings of convertible securities.

***Public disclosure exposes investors to risks of short squeezes.*** In addition, public disclosure of short positions may expose market participants to the risk of a short squeeze<sup>1</sup>, which again may deter investors from engaging in short selling. As CESR notes, there has been no study which can confirm that these risks are not significant.

***Public disclosure reduces incentives to develop trading strategies that use short selling.*** Public disclosure of information could permit other market participants to unfairly reverse engineer the trading strategies of an investor. Public disclosure would likely cause harm to the trading strategies of investment managers, and by direct implication the billions of dollars invested in those strategies by investors through vehicles such as pensions, endowments and foundations, as competitors will be able to use the publicly disclosed information not only to profit in the short term from the known positions, but also to reverse engineer the trading strategies themselves.

***Policy grounds for public disclosure of long positions are fundamentally different.*** In addition, requirements for individual investors to publicly disclose their short positions need to be based on fundamentally different policy grounds than requirements on holders of long positions publicly to disclose their individual positions. Public disclosure of long equity positions is justified because investors and other stakeholders have a legitimate interest in knowing who controls the voting rights attached to shares and the size of their stakes. There is no corresponding need for investors or other stakeholders to know the identity of holders of short positions, as holders of short positions do not exercise any voting rights. Secondly, holders of long equity positions have a relatively lower degree of exposure to loss as a result of disclosure of their positions. Holders of short positions are exposed to unlimited loss in the event of stock prices increasing before they can unwind their position and are also exposed to potential squeezes as a result of public disclosure as it is clear that they will be required to unwind their position at some point.

***Experience since the crisis provides insufficient evidence to support public disclosure.*** While CESR acknowledges that public disclosure could have adverse consequences of the kind outlined above, it takes comfort from the experience of CESR members who have operated public short position disclosure rules during the financial crisis, which suggests that those adverse consequences have not materialised in a significant way. However, those rules have only applied to a narrow range of financial stocks, for a relatively short period and in exceptional market conditions. It is difficult to extrapolate from this experience reliably to confirm the absence of likely adverse effects from extending the regime more broadly.

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<sup>1</sup> A short squeeze occurs where the price of a security rises as a result of increased demand and limited supply, causing investors to purchase shares to close out their short positions, creating a further increase in demand for securities which are already in limited supply, triggering a further rise in price.

However, as stated above, the US regulatory regime did not provide for public disclosure of short interest in financial stocks, while the UK regime did include such a provision. Liquidity in the affected stocks was better over this period in the US, and bid-ask spreads were significantly tighter. We know that some MFA members have reduced their participation in the markets as a result of the introduction of public disclosure regimes for short selling.

Given the costs to investors and markets generally caused by public disclosure of short position information, we believe that CESR has not clearly demonstrated that public disclosure would provide any benefits to capital markets. It is important that CESR members disclose their market studies of the impact of short selling restrictions and disclosure requirements, in addition to disclosing the extent to which long sales rather than short sales contributed to the volatility in the financial services sector.

In the Consultation Paper, CESR asserts only two benefits from public disclosure: (i) improved pricing efficiency, and (ii) a potential constraint on aggressive large-scale short selling.<sup>2</sup>

***Public disclosure is likely to reduce the efficiency of price discovery.*** Specifically, CESR explains in the Consultation Paper that public disclosure provides information about the identity of significant short sellers, and, if the information is interpreted correctly by the market, would provide insight into short sellers' price movement expectations and could improve pricing efficiency.<sup>3</sup> We strongly believe that public disclosure would, in fact, have the opposite result and reduce pricing efficiency.

First, as noted above, we believe that in many cases, information on short positions is likely to be misinterpreted if publicly disclosed and may lead to "copycat" investor behaviour which itself exacerbates pricing volatility.

Secondly, as the Consultation Paper acknowledges, public disclosure of short positions will cause potential short sellers to either refrain from engaging in short sales entirely, or to reduce their short sale transactions to avoid triggering the public disclosure requirements. This reduction in short selling activity will adversely affect pricing efficiency. Academic studies on the effects of short selling, most notably those examining the effects of recent short selling prohibitions, strongly support the view that short selling contributes to pricing efficiency.<sup>4</sup> If a public disclosure requirement causes investors to artificially reduce their

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<sup>2</sup> Pages 6 and 15.

<sup>3</sup> We are not aware of any analysis supporting this view. In its Discussion Paper DP09/1, the FSA explains that it did not find any "literature specifically assessing the effects of requirements to disclose individual short positions" on pricing efficiency. FSA Discussion Paper DP09/1, Annex 1.

<sup>4</sup> See e.g., Boehmer, E., Jones, C. M., Zhang, X., Shackling Short Sellers: The 2008 Shorting Ban, 2008a, preliminary draft, [www2.gsb.columbia.edu/faculty/cjones/ShortingBan.pdf](http://www2.gsb.columbia.edu/faculty/cjones/ShortingBan.pdf); Bris, A., Goetzmann, W. N., Zhu,

level of short selling to remain below the disclosure threshold, as anticipated, the disclosure requirement would lead to diminished pricing efficiency in European markets.

We recommend that CESR and its members conduct and publish the results of research demonstrating that any current public disclosure requirements, such as those adopted in the U.K., have in fact resulted in improvements in pricing efficiency before assuming that such benefits exist.

***CESR should identify how public disclosure will address its specific concerns with short selling.*** In the Consultation Paper, CESR suggests that public disclosure would provide a potential constraint on aggressive large-scale short selling. Given CESR's acknowledgement of the substantial market benefits of short selling, we urge CESR and its members to more explicitly identify their concerns with short selling and the precise manner in which public disclosure could address these concerns.

***No evidence that short selling leads to extreme market conditions.*** CESR's main concern may be that large scale short selling activity may lead to extreme market conditions. For example, during the market turmoil, the price of shares in many financial companies experienced significant declines in a relatively short time period. We are not aware, however, of any evidence of a relationship between short selling and extreme market conditions. Recent academic literature has concluded instead that short sales do not affect the frequency of extreme negative returns. Similarly, studies of the effects of the recent short selling bans confirm that long sales, rather than short sales, were the primary cause of price declines in certain financial stocks.<sup>5</sup> In researching the effect of short selling on capital markets for its Discussion Paper, the UK Financial Services Authority ("FSA") likewise found no correlation between negative stock returns and increased levels of stock lending in its analysis of the effects of its short selling ban. Accordingly, even if public disclosure were to act as a constraint on short selling, the potential for a recurrence of extreme market conditions would not be reduced.

***Enforcement action is more appropriate means to address manipulative conduct.*** Alternatively, CESR may be concerned that aggressive large-scale short selling may involve manipulative conduct. MFA strongly supports efforts to prevent, detect and punish manipulative conduct. CESR and its members should disclose publicly any potential manipulation of securities prices through spreading of false information, instances of manipulative "naked" short selling or other related market abuses which they have identified.<sup>6</sup>

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N., Efficiency and the Bear: Short Sales and Markets Around the World, 2007, Journal of Finance, Vol. 59, No. 4.

<sup>5</sup> Credit Suisse, Examining the Wake of the Short Selling Restriction, Market Commentary, Oct. 13, 2008.

<sup>6</sup> MFA submitted a comment letter to a rule proposal by FINRA relating to the spreading of rumors. See letter from Stuart J. Kaswell, Executive Vice President, Managed Funds Association, to Marcia E. Asquith,

If regulators identify such abusive conduct, CESR and its members should consider taking actions more directly applicable to the specific type of manipulation.<sup>7</sup> Imposing a public disclosure obligation applicable to short sales of all companies is a disproportionately broad response to potential manipulative conduct that has not been sufficiently identified.

***Public disclosure will not enhance market stability.*** As noted above, we remain deeply concerned about the ongoing crisis within global financial markets. A public disclosure requirement, however, would discourage investors from taking short positions exceeding the disclosure threshold during times of market stability. If the disclosure requirement effectively acted as a restraint on short selling, as proposed in the Consultation Paper, it would have pernicious effects for market efficiency, liquidity and price discovery similar to those of a short selling prohibition, and would discourage investors from fully implementing risk management strategies or taking directional short positions based on proprietary research. When investors with capital at risk engage in short selling, markets are more efficient, investors are able to better manage their risk, and securities' prices are more accurate. For these reasons, we believe a public disclosure requirement would provide only limited benefits, if any, and would not enhance market stability.

***Private reporting will provide useful information without the harmful effects of public disclosure.*** As discussed below, private reporting of short selling information to regulators would provide relevant, useful information to CESR members while mitigating the harmful consequences of public disclosure. Private reporting would meet the objectives described in the Consultation Paper for regulators to receive information to allow them to identify significant short positions and to conduct further investigation into whether short selling may lead to disorderly markets. We also discuss in our response to question 5 below the possibility of regulators using information privately reported to them to provide public disclosure of anonymised data about short selling to the market.

2. **Do you agree with CESR's analysis of the pros and cons of flagging short sales versus short positions reporting?**
3. **Do you agree that, on balance, transparency is better achieved through a short position disclosure regime rather than through a 'flagging' requirement?**

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FINRA, dated Dec. 18, 2008, ("MFA Letter to FINRA") available at: <http://www.managedfunds.org/downloads/MFA%20Comments%20FINRA%20R.2030.12.18.08.pdf>.

<sup>7</sup> For example, Rule 105 of U.S. Regulation M is designed to address specifically the concerns of potential manipulation in connection with short sales of a security that is the subject of a public offering

In general, we consider that a flagging regime is a more focused and efficient way of gathering information about short positions. Investment firms executing transactions in equities could be required to mark orders long and / or short and report the data to regulators without incurring disproportionate costs in setting up the required systems, particularly as they already use similar systems in certain markets.

In particular a flagging regime can provide regulators with real time information, as well as aggregate information to the market, covering all short transactions (including those that might otherwise fall below a disclosure threshold). A flagging regime can also require investment firms to provide information to regulators on short over-the-counter transactions, as well as those through an exchange or trading platform. By providing information on physical short sales transactions it provides information that indicates where settlement issues might arise (which is potentially not readily visible where regulators only receive information on larger economic net short positions). If required, regulators can use that information to investigate further and identify holders of large economic net short positions through follow up enquiries through investment firms.

In addition, such a regime is likely to be more efficient as it likely to be easier and less costly for investment firms (or exchanges or trading platforms) to build the necessary systems to capture information on short transactions. Imposing a reporting burden on every investor worldwide that has any form of short interest in an EEA stock seems likely to lead to greater overall costs. A flagging regime results in regulators receiving reports from fewer market participants through fewer channels than under CESR's proposals. A flagging system also overcomes some of the enforcement issues that arise with CESR's proposals, which would apply extraterritorially to investors all around the world. In contrast, a flagging regime relies on centralised infrastructure within the EU to handle reporting.

In any event, we consider that CESR has significantly underestimated the costs of implementing its reporting and disclosure system. Many investors will have to build entirely new systems to be able to handle the calculation of net economic short positions in the many thousands of EEA equities in which they might conceivably be short. This is a significantly more demanding task than calculating disclosures in the relatively small number of financial stocks to which the temporary, emergency measures applied, where it was possible to rely on manual processes.

<p><b>4. Do you have any comments on CESR's proposals as regards the scope of the disclosure regime?</b></p>
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We do not agree that there is a case for requiring public disclosure of individual economic net short positions in every EEA equity, as outlined in CESR's proposals. For the reasons outlined above, we consider that this would have adverse effects on investors and market efficiency. Nor would we agree that it is necessary or desirable to require investors to report

to regulators individual economic net short positions in every EEA equity at the low (0.10%) threshold proposed by CESR. We discuss below recommendations for raising the minimum threshold for reporting short positions to regulators (on a confidential basis) with a view to minimising that cost.

5. **Do you agree with the two tier disclosure model CESR is proposing? If you do not support this model, please explain why you do not and what alternative(s) you would suggest. For example, should regulators be required to make some form of anonymised public disclosure based on the information they receive as a result of the first trigger threshold (these disclosures would be in addition to public disclosures of individual short positions at the higher threshold)?**

***Only private reporting should be required.*** For the reasons set out above, we do not agree that the regime should require public disclosure of individual short positions. We consider that the regime should only require investors to report short positions to regulators (on a confidential basis). As the Consultation Paper states, private reporting would “provide regulators with early warning signs of a build up of large short positions” to allow them to identify market abuse, and would help regulators identify whether short selling activity potentially leads to price amplification effects and disorderly markets.<sup>8</sup> Private reporting would protect investors’ trading and risk management strategies and avoid a chilling effect on the benefits short selling provides to European markets, including enhancing liquidity, increasing market efficiency and facilitating price formation.

***Require publication of aggregate anonymised data if supported by evidence.*** If there is evidence available to CESR showing that public reporting is necessary and beneficial, any proposed rules should only require regulators to make available to the public aggregated anonymised data on short selling using the information privately reported to them. We think that there should be extensive analysis and market testing to determine which aggregate and anonymised data are actually useful to investors, combined with careful analysis with respect to the content and timing of any disclosures to ensure that the data provided is not liable to be misinterpreted and does not itself create the possibility of short squeezes.

***If the cost of producing such data is too high, regulators may publicly disclose anonymised data at a higher threshold (such as 2%).*** If the cost of producing aggregate anonymised data for public disclosure is too high, CESR should consider recommending that regulators publicly disclose anonymised versions of individual private reports of short positions, but at a higher threshold (such as 2%). A system in which regulators make public the information about individual net short positions privately reported to them, after having removed the name of the investor and any other information that would identify the investor, is likely to be

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<sup>8</sup> Page 15.

less costly for regulators to operate and may mitigate some of the risks arising from disclosures that identify individual investors, such as the risk of adverse issuer reaction to a particular investor. However, even such anonymised information is still (even if only disclosed at a higher threshold) likely to be misinterpreted by investors, to cause some market participants to refrain from performing critical risk management functions and to result in increased volatility and the risk of short squeezes.

***Privately reported data should be kept confidential.*** In order to ensure that privately reported information remains non-public, the EU legislation implementing the reporting requirement should ensure that the competent authorities receiving this information will be subject to the duties of professional secrecy and confidentiality set out in article 54 of the Markets in Financial Instruments Directive. The legislation should ensure that the information is not subject to national or EU freedom of information or similar rules.

6. **Do you agree that uniform pan-European disclosure thresholds should be set for both public and private disclosure? If not, what alternatives would you suggest and why?**

We agree that it is desirable to adopt uniform pan-European thresholds for private reporting to the regulator. We believe that it would be beneficial for investors to have a harmonised, pan-European regime for short position reporting.

7. **Do you agree with the thresholds for public and private disclosure proposed by CESR? If not, what alternatives would you suggest and why?**

We believe a reporting threshold of 0.10% of the issued capital of a company does not strike an appropriate balance between providing information to regulators that is both comprehensive and relevant.

***A threshold of 0.10% will place a disproportionate burden on investors.*** A reporting threshold of 0.10% would impose material constraints on investors who do not engage in significant short selling activity. If an investor does not have the resources to invest in the necessary systems to identify net economic short positions, then it would have to refrain from any trading activity that might generate even small transitory short positions in relation to European equities that might exceed the 0.10% threshold.

We believe that it is disproportionately burdensome to require all investors to build systems to cope with this extensive and complex reporting requirement for the many thousand EEA stocks within the scope of the proposed regime merely because they might, on an occasional basis, create small transitory short positions. Reporting should only be required where the information is clearly material and relevant. Regulators already have transaction reporting data and other means to help identify abusive behaviours where necessary.

*A threshold of 0.5% for private reporting will provide more useful information to regulators.* We believe that it would be more efficient and meaningful only to require reporting to regulators where a net short position exceeds 0.5% of an issuer's securities issued and outstanding. Particularly for large issuers, short sales and short positions below this threshold are not significant to the market, and should be considered de minimis. Moreover, limiting reporting to more significant positions permits a regulator to more accurately assess risks rather than being inundated with data.

*We do not support public disclosure of individual short positions.* As noted above, we do not agree that the regime should require public disclosure of individual short positions. If there is evidence available to CESR showing that public reporting is necessary and beneficial, the rules should only require regulators to make available to the public aggregated anonymised data on short selling using the information privately reported to them. As previously mentioned, if the cost of producing aggregated anonymised data is too high, CESR should consider recommending that regulators publicly disclose anonymised versions of individual private reports of short positions, but at a higher threshold (such as 2%).

8. **Do you agree that more stringent public disclosure requirements should be applied in cases where companies are undertaking significant capital raisings through share issues?**
9. **If so, do you agree that the trigger threshold for public disclosures in such circumstances should be 0.25%?**

As indicated above, we consider that public disclosure of an individual investor's short position in a company, including in a company undergoing a significant capital raising, may increase market volatility, potentially be misinterpreted by investors, and harm the trading strategies of investment managers and their investors.

*No requirement for a different threshold for reporting short selling during rights issues.* However, if CESR intends to proceed with requiring individual public disclosure of economic net short positions, then we consider that there should not be a lower threshold for disclosure during rights issues. Similarly, we do not consider that there should be a different threshold for private reporting to regulators during rights issues.

First, there is no evidence that indicates that short positions reaching the 0.25% threshold are more likely to be problematic during a capital raisings than in other times. In the absence of evidence, there should be a uniform threshold for disclosures/reporting.

Secondly, setting a different threshold in relation to capital raisings requires investors that engage in short selling to create additional systems to identify capital raisings as they are announced for every European listed stock and to determine whether and when they trigger the disclosure/reporting requirement at the lower threshold. Investors may have net short

positions in a range of companies, not because of a particular negative view on those companies, but as a result of a hedging strategy or because of an incidental position arising out of an index or basket trade. There are many thousand relevant European stocks that would need to be monitored. These issuers may raise capital in different ways or announce their intentions to do so in local languages and with varying degrees of firmness of purpose. Few investors would have the resources to keep track of these and make the relevant determinations with the speed that is required for complete compliance. It would also be necessary for CESR to mandate the creation of some centralised service in order to help investors identify relevant issues.

If CESR is to recommend a different disclosure or reporting threshold for short positions in companies undertaking rights issues, it should seek to minimise the burden of that different threshold by only requiring disclosure or reporting (at the lower threshold) of short positions entered into after the date of the announcement of the rights issue and short positions entered into during some short (e.g. 5 trading days) period before the announcement. There is no justification for imposing public disclosure or reporting at a lower threshold on someone who acquired the short position otherwise than during or directly in anticipation of the offering.

**10. Do you believe that there are other circumstances in which more stringent standards should apply and, if so, what standards and in what other circumstances?**

In general, we do not consider that there are other circumstances which would merit application of more stringent standards. However, where regulators identify extreme market conditions in relation to particular stocks it may be useful for them to be able to have the power temporarily to reduce the threshold for private reporting to regulators, to enable them to gather more information on short selling activity in that particular stock.

To avoid uncertainty, there should be clearly defined limits on any such power. The change in threshold should be temporary, to allow regulators to gather additional information over a period of particular concern, and regulators should give sufficient notice before any change in threshold comes into force.

Giving regulators this power will enable them to apply the reporting regime to their jurisdiction in a more flexible manner, allowing them to monitor the markets for situations which cause concern and adapt the reporting requirement appropriately, rather than having CESR prescribe the situations in which lower thresholds should apply.

**11. Do you have any comments on CESR's proposals concerning how short positions should be calculated? Should CESR consider any alternative method of calculation?**

***Short positions should be calculated by reference to an investor's net economic short position.*** We agree that any individual reporting or disclosure on the basis of the investor's net economic short position is likely to be more meaningful to regulators than information on net or gross physical short positions. Information on net economic short positions (rather than net physical short positions) will assist regulators in assessing whether an investor is genuinely short, particularly in markets where a high volume of trading is conducted in instruments such as contracts for differences rather than in physical securities. The information will be more meaningful if the report or disclosure eliminates those cases where there is an offsetting long position of whatever form.

***The default position should require reporting at the level of the legal entity or asset management company, but there should be flexibility where this information could be misleading.*** As regards the level of reporting to the regulator, we agree that the focus should be on where the investment decision is taken and that, therefore, the starting point is that disclosure should be at the level of the decision making entity. This will be the legal entity or, in relation to asset managers, the asset management company (rather than the individual fund).

However, there is a real danger that one size will not fit all, in particular because asset management companies will frequently act for clients representing a wide variety of investment strategies. Reporting net positions across several different strategies could be unhelpful. Therefore there ought to be the flexibility for investors to select larger or smaller reporting units where this would provide more meaningful information. CESR should establish criteria to determine situations where different reporting units may be appropriate (for example, where a unit of an investment manager acts independently of other units, so that aggregating its interests with those of other units would be misleading). We also consider that individual regulators should have some flexibility to allow aggregation or disaggregation on different bases to ensure that data is more meaningful and less costly to prepare.

***All relevant issuers should publish information on their issued share capital.*** It would also be necessary to require issuers not currently subject to the Transparency Directive requirements to publish information on their issued share capital, as the denominator of the calculation. Where a capital raising is announced, investors should be able to include in the calculation of the net short position any economically fungible positions in new shares being issued and to take into account the new shares being issued in the denominator when calculating the size of the position.

<p>12. <b>Do you have any comments on CESR's proposals for the mechanics of the private and public disclosure?</b></p>
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We agree that reporting to regulators should be to the competent authority of the most relevant market as defined under the Markets in Financial Instruments Directive. If there is to

be public disclosure, the national regulator should then take responsibility for dissemination of any required disclosure to the market.

CESR should consider whether it could provide a centralised facility for receiving reports and distributing them to its members.

If investors are to report individually, we consider that reporting by email to the regulator would only be workable if there is a small number of disclosures, which argues for a higher threshold, such as the 0.5% threshold proposed above.

**13. Do you consider that the content of the disclosures should include more details? If yes, please indicate what details (e.g. a breakdown between the physical and synthetic elements of a position).**

We agree that the disclosures should be limited to the identity of the reporting party, the issuer, the size of the position and the date on which the relevant position was created or no longer held. Investors should not be required to provide greater breakdowns of positions. Investors should be able to report in English and should not be required to provide reports in local languages, which create particular challenges for international investors, such as MFA members, who are active across all European markets.

**14. Do you have any comments on CESR's proposals concerning the timeframe for disclosures?**

*A longer timeframe for reporting short positions would be more practical.* CESR proposes reporting to the regulator (and public disclosure to the market) on the trading day following the day on which the disclosure obligation is triggered (T+1), by reference to end of day data.

CESR suggests that the experience of the temporary disclosure obligations is that systems can cope with calculating (and then disclosing) short positions on this timeframe. However, these temporary disclosure obligations only affected a limited number of financial issuers and investors and other market participants have been able to manage their disclosure obligations by restricting trading in these stocks and using a high degree of manual intervention. The proposed disclosure obligation would cover the entire range of European issuers in a way which is not necessarily aligned with firms' existing risk or other management systems. It would be necessary for firms to develop automated systems but on any basis, given the complexity of the calculation, significant manual intervention is still likely to be necessary.

Therefore, we do not consider that T+1 reporting is practical. If CESR is to require individual reporting (or disclosure) by investors we would recommend a longer timeframe for reporting. These filing requirements are burdensome for individual investors, especially smaller investors with less sophisticated information technology systems. For a firm to establish its

net economic exposure in a company's issued share capital, as required, it must perform complex calculations across all derivative positions in the company on a delta adjusted basis. These calculations can be extremely challenging for firms, and in some instances may pose burdens that cannot be met with existing personnel and resources. Any extension of reporting obligations beyond stocks of financial companies would compound the complexity of determining a firm's net economic exposure, and would significantly increase the burden to comply with the disclosure obligation.

*The timeframe should be harmonised with other reporting timeframes to reduce the burden on investors.* Investors already are subject to a substantial number of reporting requirements for long positions throughout many European jurisdictions. Additional daily short selling reporting requirements would add to the already significant cumulative compliance costs faced by investors that participate in the global capital markets.

We suggest that the timeframe for reporting short positions be aligned with the timeframe set out in Article 12 of the Transparency Directive for disclosure of long positions, and Member States should be required to implement this requirement consistently with their implementation of Article 12 of the Transparency Directive. As investors will use the same data to make their reports under any short selling regime as they do to make their reports under the Transparency Directive, and are likely to make the reports simultaneously, there will be less of an administrative and operational burden on investors if the reporting periods are the same for both reports.

*Extended transitional period necessary.* Given the degree of investment likely to be required, it will be necessary for there to be an extended transitional period before any new requirement comes into force.

15. **Do you agree, as a matter of principle, that market makers should be exempt from disclosure obligations in respect of their market making activities?**
16. **If so, should they be exempt from disclosure to the regulator?**
17. **Should CESR consider any other exemptions?**

We consider that, if there are to be any exemptions for market making or liquidity providing activity, in framing the scope of the exemptions CESR should take into account the effect of advances in technology and changing market structures which have led to a growing range of types of entity and roles within the market which act to improve liquidity and aid price discovery and the potential competitive advantage given to those who benefit from the exemption over other market participants.

18. **Do you agree that EEA securities regulators should be given explicit, stand-alone powers to require disclosure in respect of short selling? If so, do you agree that**

**these powers should stem from European legislation, in the form of a new Directive or Regulation?**

If obligations are to be placed directly on individual investors, there should be a fully harmonised European regime. Divergent national rules would create significant costs for international investors. However, even if the regime is based on a directly effective EU regulation, there would be an important role for CESR in coordinating answers to frequently asked questions by market participants to provide practical guidance and avoid differing national interpretations.

## **CONCLUSION**

Along with policy makers, MFA and its members remain deeply concerned about the ongoing crisis within global financial markets and support timely and targeted initiatives aimed at preventing the crisis from worsening by restoring market integrity and confidence and encouraging investors to return to a more normal market environment. A primary cause of this crisis has been the inadequate risk management practices of global financial institutions. Investors, including alternative investment funds, should not be penalised for accurately predicting that the share prices of poorly managed firms were likely to decline and for making investment decisions based on those predictions, including the reduction of long exposure or short selling for hedging purposes. It is widely acknowledged that short selling plays an integral role in the proper functioning of markets, as it contributes to efficient price discovery, increases market liquidity, and promotes capital formation, among other benefits.

MFA welcomes the opportunity to participate in this important debate and looks forward to an ongoing dialogue with CESR and its members. MFA would also be pleased to respond to any additional inquiries as CESR considers the appropriate short selling regime.

If you have any questions or comments on this submission, in the first instance please contact Stuart J. Kaswell, Executive Vice President and General Counsel, at +1 (202) 367-1140 ([stuart@managedfunds.org](mailto:stuart@managedfunds.org)).

Yours truly,

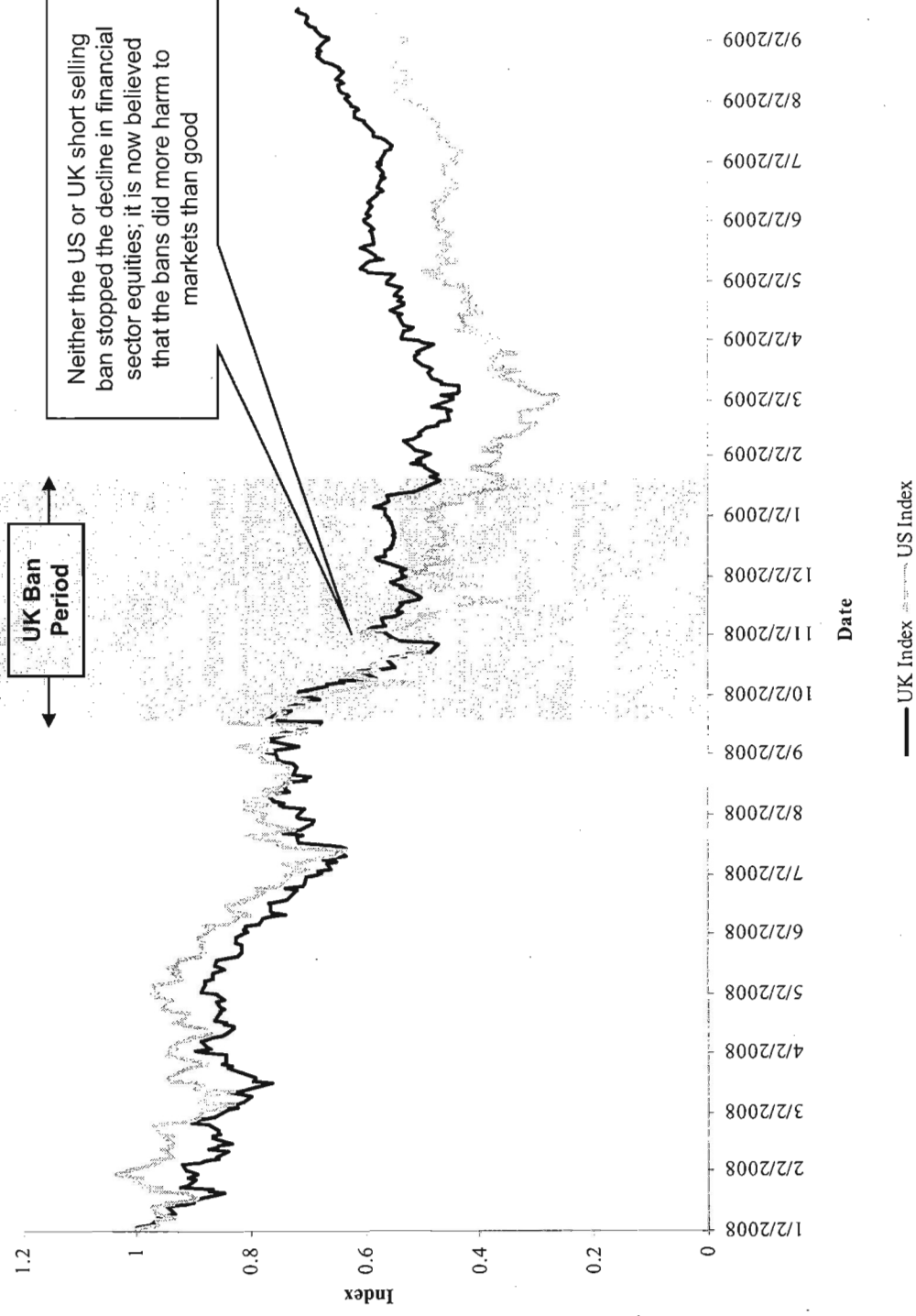
/s/ Richard H. Baker

**Richard H. Baker**  
**President and Chief Executive Officer**

/s/ John G. Gaine

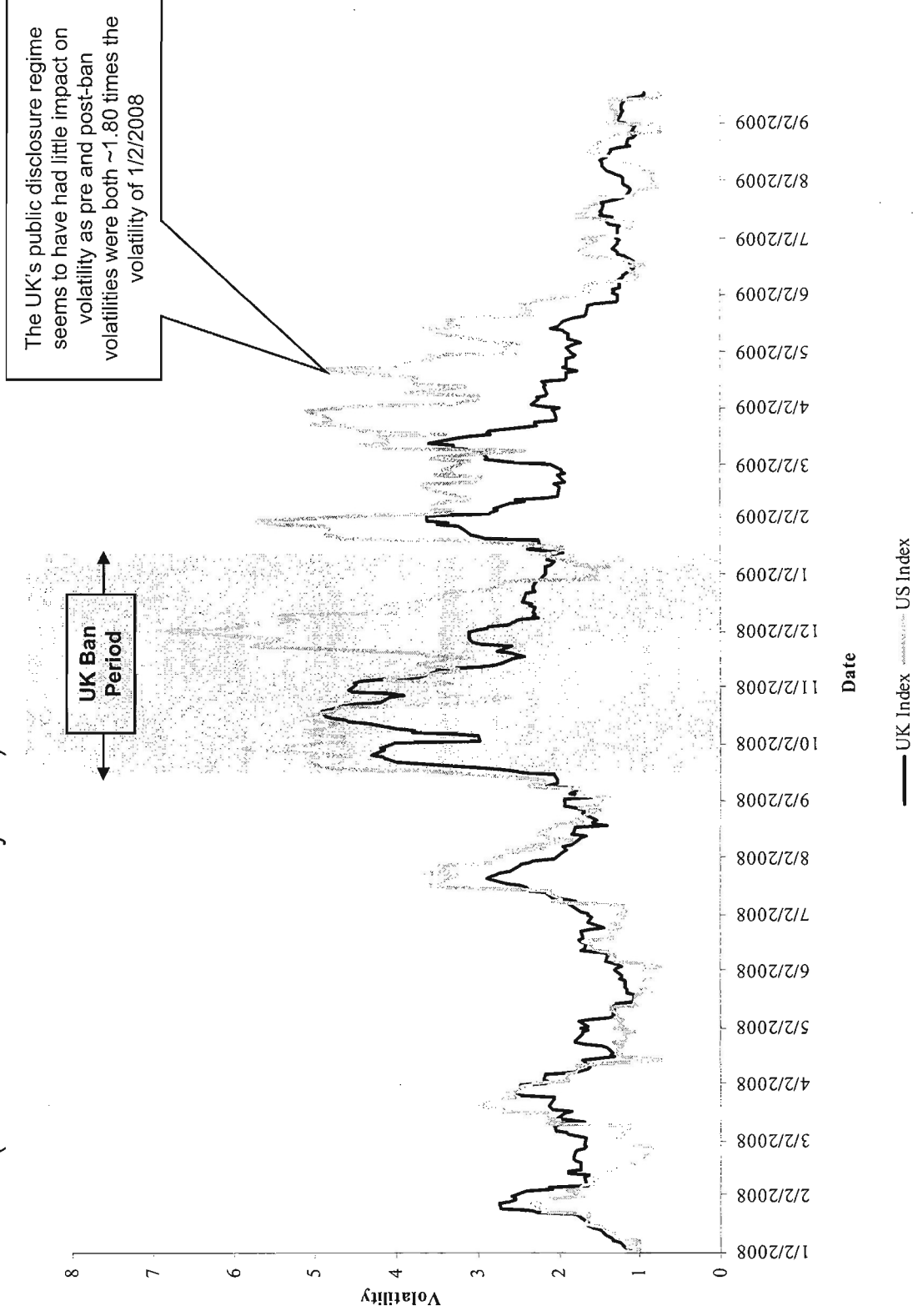
**John G. Gaine**  
**President Emeritus and Special Counsel, International Affairs**

# US Financials Index vs. UK Financials Index 2008-Present (Base 1.0 set to January 2008)



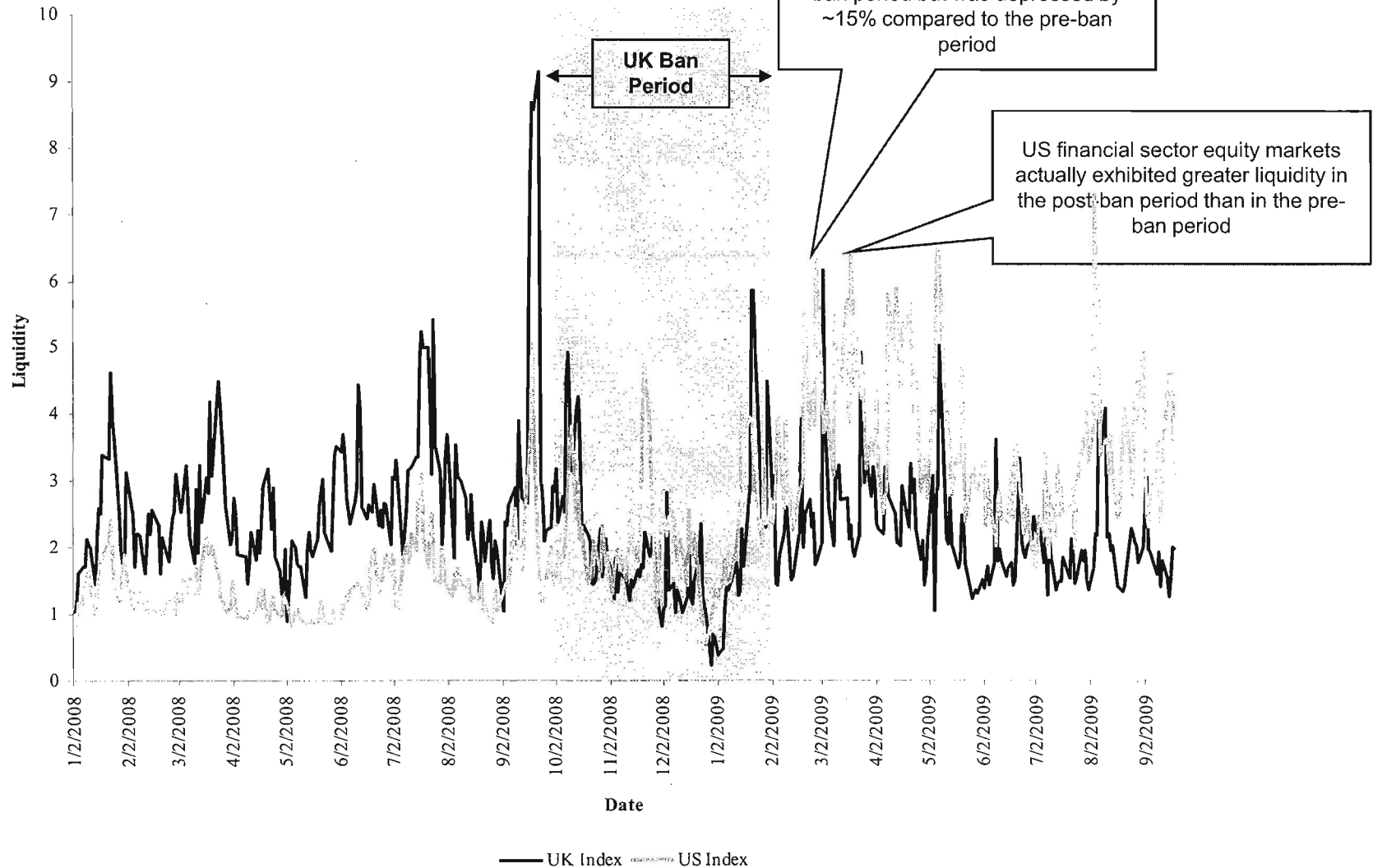
Source: Bloomberg

# **US Financials Index vs. UK Financials Index** 2008-Present (Base 1.0 set to January 2008)



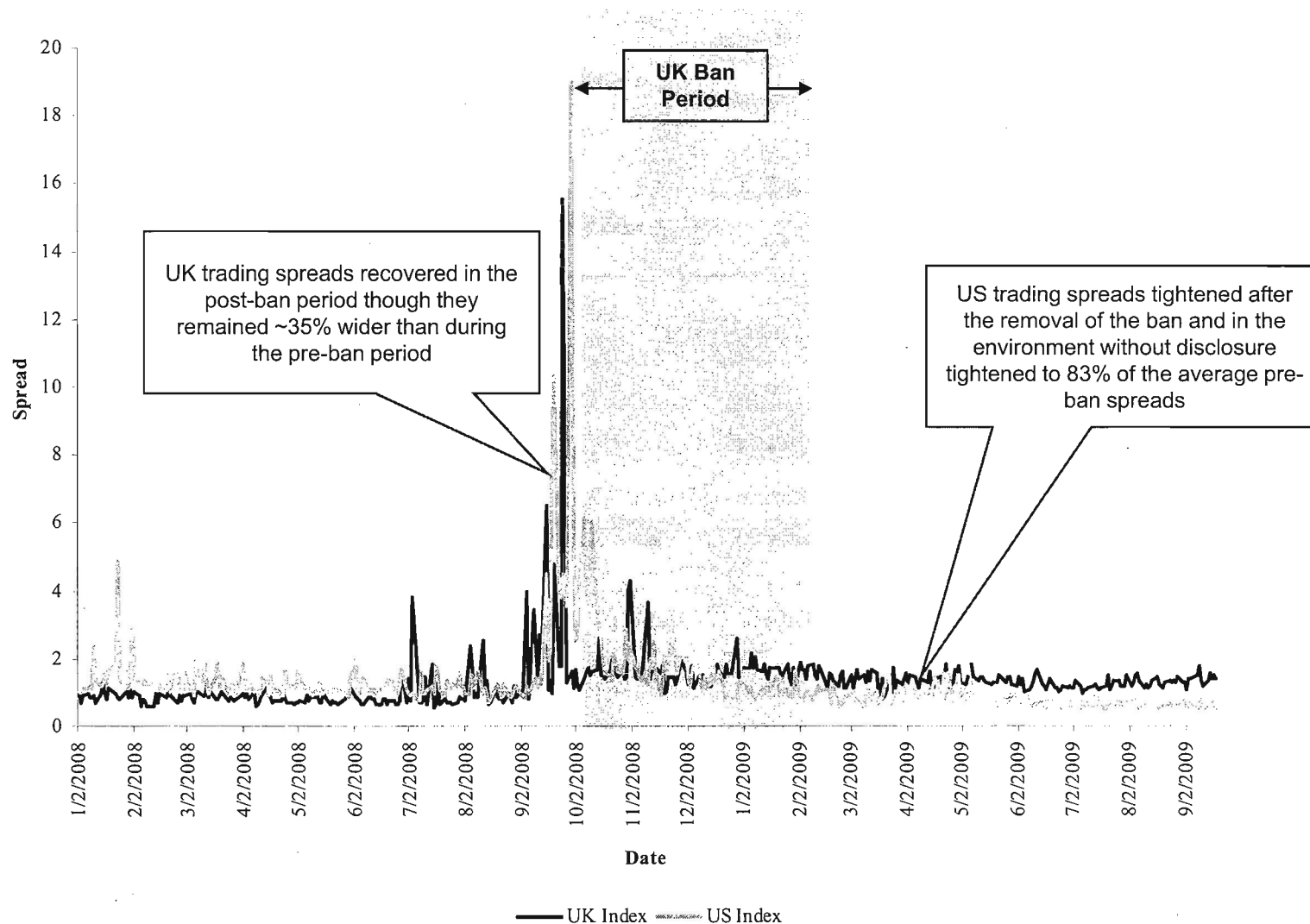
Source: Bloomberg

# **US Financials Index vs. UK Financials Index** 2008-Present (Base 1.0 set to January 2008)



Source: Bloomberg

## US Financials Index vs. UK Financials Index 2008-Present (Base 1.0 set to January 2008)



Source: Bloomberg

# Commentary: How High Frequency Trading Benefits All Investors

Traders Magazine Online News, March 17, 2010

Cameron Smith

Winston Churchill once famously commented that his critics reminded him of a story about a sailor who jumped into a dockside bay to rescue a small boy from drowning. About a week later this sailor was accosted by a woman who asked, "Are you the man who picked my son out of the water the other night?" The sailor replied modestly that he was. "Ah," said the woman, "you are the man I am looking for. Where is his cap?"

Like the boy's mother failing to appreciate the actions of the sailor, the critics of high frequency trading fail to appreciate the major contribution that traders employing high frequency strategies have made towards ensuring that our nation's equity markets are the world's most fair, transparent, resilient and lowest cost.

Specifically, a chorus of critics have recently begun asserting that so-called "high frequency" traders, which now make up approximately 60 percent of trading volumes in the United States equities markets and provide critical liquidity to all investors, are harming the market with unfair, speculative trading that causes stock prices to needlessly fluctuate to the detriment of investors.

Variations of this concern have been raised by some very educated and well-intentioned market observers, causing the Securities Exchange Commission and some Congressional staff to begin a more thorough examination that could lead to actions designed to reduce, eliminate or inhibit the use of high frequency trading strategies.

Ironically, acting on the critics' concerns and inhibiting high frequency trading would actually create the type of market reactions that the critics profess to be concerned about, causing considerable economic harm to individual investors, large institutions and, ultimately, to our nation's economy.

## Historical Background

To understand high frequency trading and the criticisms of it, it is first useful to review some recent equity market history. In 1996, the Justice Department found that 24 major Nasdaq market makers engaged in "an industry-wide practice that fixe[d] transaction costs" and "anti-competitive conduct which resulted in higher trading costs for individual investors and institutions who bought or sold stocks."

Similarly, in 2003 the Securities and Exchange Commission reached a settlement with five New York Stock Exchange specialists for violating federal securities laws and exchange rules by executing orders for their own dealer accounts ahead of executable public customer orders.

Even CALPERS, the largest public pension plan, filed suit against the specialists for employing "artifices to defraud" and arguing "that NYSE orders were not filled at the best available prices" and, instead, were executed in a way that "financially advantaged" the specialists. In the wake of these scandals, the SEC adopted regulations that fostered competition with the traditional market makers and specialists which had dominated Wall Street for generations.

One of the key SEC changes required market makers or specialists to publicly display the best priced limit orders to buy or sell, regardless of whether the order was entered by an individual or an institution. No longer did the market maker or specialist control investor access to the pricing information that is critical to a fair marketplace. During the same time period, another important set of SEC regulations fostered the creation and growth of all-electronic alternative trading systems (known as "ATs").

These two reforms complemented each other as the technologically advanced ATs facilitated the immediate public display of the best priced limit orders, reducing the opportunity for the type of wrongdoing that led to the previous scandals.

These two key SEC reforms fostered the emergence of a new breed of professional trader that began competing with the traditional Wall Street market makers and specialists by using automated computer programs to enter orders directly into the market. These traders who came to be known as "high frequency traders" relied on technology and detailed analysis to provide better prices to investors.

Instead of being clustered in lower Manhattan, they were spread out all over the country. Where the old guard had one trader pecking away at a keyboard and covering 15-20 stocks, these nimble and efficient high frequency traders could use computers to trade thousands of stocks simultaneously.

The efficiency of these automated systems allowed the high frequency traders to earn profits even when eking out razor thin margins of just fractions of a penny per share rather than the 5 or 10 cents per share traditional Wall Street traders were accustomed to making.

The overnight change in the trading patterns of the Nasdaq 100 Index in 2001 highlights the competitive impacts of the SEC reforms and foreshadowed the dominance of the high frequency traders and all-electronic marketplaces. At the time, the ETF for the Nasdaq 100 Index (then known as the QQQ) was the most actively traded security and was primarily traded on the American Stock Exchange which utilized a manual floor-based specialist system. Using ATs, the high frequency traders began using their efficient automated trading systems to narrow the quoted spreads in the QQQ from several pennies down to tenths of a penny, saving investors millions in the process.

Within months, investors voted with their feet and made the electronic markets that featured the liquidity and narrower spreads of the high frequency traders the dominant venues for the QQQ. Investors never looked back. Ultimately, the NYSE and the Nasdaq Stock Market were compelled to purchase these electronic markets that catered to high frequency traders (Archipelago was purchased by the NYSE and INET by the Nasdaq Stock Market). The traditional, uncompetitive Wall Street market maker model was replaced and the exchanges were transformed to open, fair and transparent electronic marketplaces.

### **Addressing How Investors Benefit & Critics**

Lowering Trading Costs: Investors have reaped the benefits of the SEC reforms that led to the rise of high frequency traders and electronic markets. The most obvious direct benefits to investors are reflected in the dramatic reductions in trading costs and spreads over the past 10 years.

Thanks to the increased competition and efficiency, commissions paid per transaction by individual investors dropped from hundreds of dollars to just a few dollars. Similarly, execution quality as measured by the difference between the highest bid and lowest offer (known as the "spread") has compressed to levels unthinkable prior to the reforms, meaning that investors have less money taken out of their accounts to cover trading costs when buying and selling.

### **Greater Liquidity Benefits**

In addition to these often mentioned benefits, less direct but substantial benefits have also been realized by investors and, indeed, our overall economy from the improved efficiency of the markets brought about by the emergence of both competitive electronic markets and high frequency traders. One invaluable benefit to investors is the dramatic increase in trading volume, which makes it easier for investors to cheaply buy and sell securities.

Some critics contend that the rise in trading volume and the substantial market share of high frequency traders is evidence that the markets have become tools for speculation. But what these critics misunderstand is that professional traders have always been a large percentage of the volume.

These intermediaries bridge the fluctuations between supply and demand that occur throughout the trading day. If only long-term investors were trading securities, there would not be adequate liquidity to keep markets stable and spreads narrow. Therefore, market intermediaries, whether traditional market makers and specialists or today's high frequency traders, are essential.

Further, the overall increase in trading volume is not solely attributable to high frequency trading but is due to an increase in trading by all types of investors. Simply put, when something gets cheaper and easier, people tend to do it more. The substantial increase in passenger miles following airline deregulation in the 1980s provides an instructive analogy. Air travel didn't increase because people suddenly had more relatives or vacation time but because, as ticket prices dropped and flights became more plentiful, demand for air travel increased. Similarly, the rise in trading volumes is because of the elimination of unnecessary barriers to trading, such as the manual intervention of a specialist, wide spreads, and high commissions have made trading more affordable.

High frequency traders do not create the increased demand to trade. Instead, like the airlines adding flights to satisfy growing demand, the growth in high frequency trading volume is in response to increased investor demand.

The increased liquidity (i.e. the ability to easily buy or sell a stock without significant price impact) provided, in part, by high frequency traders means that fund managers can now more easily adjust their portfolios to

reflect their fundamentally based views on company performance rather than being prevented from buying or selling a particular company's stock because of high trading costs due to a lack of trading volume.

Consider a stock of a well-managed mid-cap company that prior to the regulatory reforms and the participation of high frequency traders had an average daily volume of 200,000 shares. With this relatively small trading volume, any attempt by a fund manager to reward the good management of the company and purchase the stock would have a relatively large impact on the share price.

If purchasing a significant number of shares, the fund manager would need to spread purchases out over days or weeks, which discouraged the purchase of the company's shares in the first place. And even if the fund manager decided to purchase the stock, the insufficient trading volume could make it too difficult to sell quickly if the company's prospects changed.

In contrast, if the same stock now trades 2 million shares per day, it is easier for a fund manager to efficiently allocate capital and reward management for its performance by purchasing the company's stock.

The fund manager can comfortably add shares to his fund knowing both that his purchases will have a smaller impact on the market and that it will be less costly to sell the stock should it become necessary. In short, the critics are hard pressed to explain how the investor buying or selling a company's stock would be better off with fewer high frequency traders providing liquidity any more than a consumer in need of gas would be better off if there were fewer gas stations.

### **Accelerating Price Discovery Benefits All Investors**

Some critics, however, still maintain that, while greater liquidity is valuable in theory, market participants with large orders (and the individual investors they often are representing) are nevertheless harmed by high frequency trading. In simple terms, these critics assert that when, for example, they try to purchase a large quantity of IBM shares, high frequency traders detect the buying interest and cause the price of IBM to rise before they can finish purchasing all the shares they desire.

The critics admit that the high frequency traders do this by statistically analyzing the same information available to every investor and not through any inappropriate or illegal source. Nevertheless, they claim that since this may increase their execution costs, it is bad for them and the investors that they often represent.

A closer look, however, reveals that these critics are actually arguing in favor of inefficient markets. A healthy market is supposed to reflect all known information about a stock, including supply and demand. The fact that an investor is buying a large number of IBM shares obviously impacts demand and should, in an efficient market, trigger a rise in the stock price.

The critics of high frequency trading, however, are essentially saying that the market should stop following the laws of supply and demand when they want to buy or sell so they can get a better price than they otherwise should. The logical conclusion of their claims is effectively that, when market participants, including high frequency traders, forecast a probable price change in a stock, they should nevertheless treat that information like one treats a young child during a game of hide and seek. Namely, these critics want

everyone else to pretend that they don't detect a change in supply or demand even though they can see the figurative leg sticking out from behind the couch!

What the critics don't explain, however, is how an investor's desire to buy large quantities of stock without causing the price to increase helps anyone else in the market. If market participants must ignore the increasing demand, then what happens to the individual investor or institution that wants to sell during the period when basic economic principles are suspended?

Specifically, keeping the price of IBM artificially low to facilitate the large buy order would, by definition, disadvantage every seller of IBM at that time. Those disadvantaged sellers could include an institution (trading for individuals) or individual investors directly. In essence, some market participants that enter large orders want other market participants to subsidize their trading.

Putting this concern in another analogous context lays bare the self-interest of this argument. Consider a developer of a shopping mall that needs to buy the land of existing homeowners. The developer would not want the homeowners to know of its plans since the homeowners would almost certainly increase their asking price. Consequently, the developer may try to surreptitiously buy the land from the homeowners to avoid any information leakage.

While acquiring the land cheaply benefits the developer and his shareholders, the same cannot be said about the homeowners. The homeowners would realize a considerable gain if the market immediately reflected all information affecting the market value of their homes. Should rules be adopted that favor developers over homeowners?

The investor with a large order is no different than the developer in its desire to purchase or sell stocks without having a market impact. But this desire should not come at the expense of another investor.

Markets operate far better when they reflect all information instantaneously. High frequency traders play an important role in that process by accelerating the reflection of all information to the broader market. So while there is no empirical evidence showing that market impact of large orders has really increased due to high frequency trading (in fact, studies from Hendershott and Riordan in 2009 as well as the Board of Governors of the Federal Reserve System suggest that high frequency trading lowers volatility), the real question is why an increase which reflects the acceleration in the dissemination of information is a bad thing. In other words, why would we want to artificially constrain stock prices so they fail to reflect all available information when the net effect is to benefit one market participant to the detriment of others?

### **Reducing Market Volatility**

Other critics may agree that accelerating price discovery is useful, but they argue that high frequency traders cause an unhealthy increase in market volatility, "whipsawing" prices around to benefit themselves at the expense of investors. These critics buttress this argument by pointing to the perceived increase in high frequency trading firms in the past year and assert that these new entrants can only profit by causing needless price swings and at the expense of long-term investors.

These critics don't have a leg to stand on. The principal way that academics and market participants evaluate the relative rate at which a stock price moves up or down is through a concept known as volatility. Higher volatility is associated with greater price movements and lower volatility would signal more stable prices. No serious market observer disputes the claim that volatility would not be higher without the liquidity provided by high frequency traders.

The volatility reducing effect of high frequency trading was highlighted during the recent ban on short selling. When all short sales in financial stocks were suddenly banned, high frequency traders either reduced or stopped trading the impacted financial stocks. The result? A substantial increase in volatility and spreads, increasing trading costs for all investors.

The curbing of high frequency trading didn't stop the stock prices of those companies from continuing to plummet; in fact, the declines accelerated. But when the short sale ban was rescinded and the high frequency trading volume fully returned, volatility and spreads improved meaningfully.

Despite the experience with short sales, the critics continue, nevertheless, to assert that high frequency traders are adding damaging short-term volatility. Using the shopping mall developer example, the critics assert that if the current value of the land is \$20 per square foot but the developer was willing to pay \$100 per square foot, that the high frequency trader would briefly push the price past fair value to \$120 per square foot before it settled on the new fair value of \$100.

But this conclusion is not supported by the evidence. In fact, the few studies that are based on data sets that enable a detailed analysis of high frequency trading activity relative to all other market participants (including one by the Board of Governors of the Federal Reserve System) found that high frequency traders actually lowered short-term volatility and that high frequency traders were more likely than the rest of the market to push stock prices towards fair value.

Further, like the other criticisms, this assertion can also be evaluated logically. High frequency traders can only trade profitably when their trades push a stock price towards fair value. If a stock price were truly "overreacting" to a large buy order or were otherwise needlessly pushed around by high frequency traders then another high frequency trader would detect this "overreaction" in the stock price and quickly push the price back down to fair value.

As a result, any high frequency trading strategy that consistently pushed a stock price beyond its fair equilibrium price would, over time, lose money. The overreaction argument fails to take into account that there are scores of high frequency traders aggressively competing to ensure stocks trade at their fair equilibrium price. The main impact of the increase in high frequency trading firms is more competition, lower profit margins for high frequency traders, and lower transaction costs for investors. In short, allegations that high frequency trading adds volatility are not supported by academic research or common sense.

### **The Benefits of Short-Term Professional Traders**

The final bogeyman raised by critics is that high frequency traders are simply the latest speculators on Wall Street and that we have to deal with the "short-termism" of the high frequency traders before they cause

another bubble and subsequent crash. While some kinds of risky speculation are real concerns and should be taken seriously, speculation has nothing to do with high frequency trading.

The kinds of dangerous speculation that lead to the recent financial crisis involved the making of large bets by taking large, risky illiquid positions. The recent experiences of banks that held large illiquid portfolios of mortgage backed securities highlights the risks associated with that type of long-term speculation.

In contrast, in fulfilling their role of providing liquidity to investors and accelerating the price discovery process, high frequency traders trade in and out of positions and have holding periods that often can be measured in seconds or minutes. Further, high frequency traders are market neutral and generally don't carry any positions overnight. In so doing, high frequency traders actually are taking very calculated and narrow market risks. Viewed in this light, high frequency trading is the "polar opposite" of speculation.

Further, "short-termism" is not a negative but, rather, is an important positive attribute of a high frequency trader. When considering other professional intermediaries (think grocery stores, gas stations and car dealers) in our economy, it is immediately apparent that all of them are in some sense short-term investors. Just as nobody would fault a grocery store or gas station owner for not being in the business of investing for the long-term in food or gas, it is similarly nonsensical to fault a high frequency trader for not "investing" in stocks.

High frequency traders are not in the business of stock investing but are service providers, providing liquidity and transparent price discovery to all investors. Without high frequency traders, trading costs would go up for all investors, making our capital markets a less attractive alternative for capital raising and pushing companies into overseas markets or into issuing debt.

## **Conclusion**

As the past regulatory actions against the traditional Wall Street traders and the rapid emergence of electronic markets demonstrate, investors prefer a fair and transparent trading environment to one that favors a select group over other market participants. Accordingly, any debate about electronic markets and the role of high frequency traders must be viewed in light of the un-controvertible fact that our nation's equity markets are far fairer, more efficient, more liquid and have lower transaction costs for investors than ever before.

And it must be further recognized that high frequency traders, as the heir to the roles played by the traditional market makers and specialists, are responsible for a significant portion of this dramatic improvement along with the Securities and Exchange Commission which worked to create and nurture the fair, transparent and efficient environment we enjoy today. So while there is always room improvement, let's not fail to appreciate - like the mother in Churchill's story - why our equity markets are the envy of the world by focusing on the equivalent of the boy's cap.

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# Equity Trading in the 21<sup>st</sup> Century

February 23, 2010

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## 1. Introduction<sup>1</sup>

Trading in financial markets changed substantially with the growth of new information processing and communications technologies over the last 25 years. Electronic technologies profoundly altered how exchanges, brokers, and dealers arrange most trades. In some cases, innovative trading systems are so different from traditional ones that many political leaders and regulators do not fully appreciate how they work and the many benefits that they offer to investors and to the economy as a whole.

In the face of incomplete knowledge about this evolving environment, some policymakers now question whether these innovations are in the public interest. Technical jargon such as “dark liquidity pools,” “hidden orders,” “flickering quotes,” and “flash orders” appear ominous to those not familiar with the objects being described. While professional traders measure system performance in milliseconds, others wonder what possible difference seconds—much less milliseconds—could have on capital formation within our economy. The ubiquitous role of computers in trading systems makes many people nervous, and especially those who remember the 1987 Stock Market Crash and how the failure of exchange trading systems exacerbated problems caused by traders following computer-generated trading strategies. Strikingly, the mechanics of the equity markets functioned very well during the financial crisis, despite the widespread use of computerized trading. Indeed, much of the focus of computerized trading during the financial crisis has been on offering liquidity (“market-making”) and shifting liquidity (“arbitrage”) rather than as in 1987 in consuming the market’s liquidity (“portfolio insurance”).

This paper discusses recent innovations in trading systems and their effects on the markets. Using non-technical language, we show that investor demands for better solutions to the trading problems that they have traditionally faced—and will always face—largely drove the innovations. The introduction of computerized trading systems and high-speed communications networks allowed exchanges, brokers, and dealers to better serve and attract clients. With these innovations, transaction costs dropped substantially over the years, and the market structure changed dramatically.

The winners first and foremost have been the investors who now obtain better service at a lower cost from financial intermediaries than previously. Secondary winners have been the exchanges, brokers, and dealers who embraced electronic trading technologies and whose skills allowed them to profitably implement them. The big losers have been those intermediaries who did not innovate as successfully, and, as a consequence, became less competitive, and ultimately less relevant.

Not all developments in financial market trading have been in the public interest. We identify several problems that regulators should consider addressing to ensure that our markets continue to serve well both investors and the corporations that use them for raising capital. For example, systemic risks can arise because poorly capitalized broker-dealers allow electronic traders to

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<sup>1</sup>To better inform parties interested in understanding innovations in market structures, Knight Capital Group, Inc. commissioned the authors to write a paper describing new market structures and the resulting effects on the markets. This article presents our analyses and opinions only and does not necessarily represent the opinions of the sponsor of this project. The authors retained full editorial control over the content and conclusions of this report.

access the market in their name with insufficient real-time risk management controls on their trading. While exchanges and clearinghouses can alleviate this problem by better regulating their members, we support the recent SEC rule proposal on this issue. Front-running across markets also concerns us. To some extent, well-informed traders or their agents can control this problem through careful transaction cost analyses, but the SEC and CFTC should write and enforce new regulations that prevent agents from front-running client orders in correlated instruments. Finally, transparency and fairness problems arise when trading systems employing make-or-take pricing schemes compete against exchanges that charge traditional transaction fees and against dealers who cannot charge access fees. The SEC could solve this problem with a simple modification to Regulation NMS.

While the markets could potentially benefit from some specific regulatory changes, regulators must be sensitive to the “unintended consequences” of poorly considered responses to concerns now being raised about recent changes in the trading environment, many of which are not universally understood. Technological innovations have led to the emergence of electronic liquidity suppliers who have outcompeted— and thus supplanted—most traditional dealers by lowering the costs of trading to investors. If poorly conceived regulations were to handicap electronic liquidity providers, a significant degradation in market quality would be the likely unintended consequence.

An executive summary of our report appears in the next section. The following section provides empirical evidence of how markets have changed in recent years, and in particular, how they have become more liquid over time. We then discuss the main trading problems that traders must solve and how traders traditionally solved those problems. We next discuss several of the innovative systems that exchanges, brokers, and dealers have created to help investors address these problems, and we explain how they benefit the economy. We then offer brief comments about the market’s performance during the financial crisis and contrast the equity markets with other market structures. We conclude by discussing concerns about specific aspects of electronic trading.

## **2. Executive Summary**

The U.S. equity market changed dramatically in recent years. Automation gradually transformed the market from a human-intermediated market to a computer-intermediated market with little human interaction or real-time oversight. Regulation also changed. The 1997 order-handling rules and the 2001 decimalization led to dramatic reduction in transactions costs. Regulation NMS cleared regulatory impediments to electronic trading and thereby led to increased competition between market centers. Dozens of new trading platforms emerged, including some with very different models from the old exchanges. This study examines the impact of these changes on market quality. Our major findings follow.

### **2.1 Trading problems remain unchanged**

- Traders still face the same challenges as before: Minimize total trading costs including commissions, bid/ask spreads, and market impact.
- Large traders remain very careful about exposing their trading interest.
- New technologies allow traders to implement traditional strategies more effectively.

Traders today face the same challenges they have always faced. All traders seek to minimize their transactions costs, which include commissions, bid-ask spreads, and market impact. Buyers and sellers must find each other and agree upon a price. They must avoid trading with better-informed traders to avoid losses from being on the wrong side of a transaction.

Large institutional traders cannot widely publicize their interest in trading large blocks. Indiscriminant dissemination of such information increases the costs of their trades by scaring away counterparties, by attracting front-runners and other traders who can trade to profit from this information at the expense of the large traders.

Traders used to solve these problems on exchange floors. New communications and computing technologies now allow them to solve these problems in electronic trading systems at substantially lower cost.

For example, large traders once used floor brokers to hide the full sizes of their orders. The brokers displayed size only to traders that they trusted would not unfairly exploit the information. Now large traders use the hidden order facilities of electronic exchanges and dark pools to control the exposure of their orders. These facilities generally are more reliable than floor brokers and much less costly to use. The traditional NYSE floor was the forerunner of today's electronic "dark pools" that only disseminate information to trusted traders.

### **2.2 The market changed**

- Liquidity increased as volumes grew substantially.
- Average trade size fell as electronic systems allowed traders to easily divide orders to obtain better executions.
- Quote traffic increased substantially.
- Competition among exchanges intensified.

We document many changes that have occurred in recent years. U.S. average daily reported trading volume increased dramatically in recent years, from about 3 billion shares per day in 2003 to nearly 10 billion shares per day in 2009. Over this period, the share of trading reported by traditional exchanges fell substantially. The market share of the NYSE in its listed stocks fell from 80% of all volume in January 2003 to 25.8% in December 2009.

The nature of trading changed as “high frequency” and “algorithmic” trading grew to dominate trading volumes. Average trade size fell substantially as computers made slicing large blocks into small pieces a cost effective means of limiting adverse costs of trading large positions. Automated traders began providing liquidity, supplementing and displacing traditional liquidity suppliers. The number of quote updates per trade, as well as the number of orders cancelled per executed trade, increased dramatically as traders employed new electronic strategies for offering and searching for liquidity.

### **2.3 Market quality improved dramatically**

- Execution speeds fell.
- Bid-ask spreads fell and remain low.
- Commissions fell.
- Market depth increased.
- Volatility continues to fluctuate.

These changes substantially improved market quality. Virtually every dimension of U.S. equity market quality is now better than ever. Execution speeds have fallen, which greatly facilitates monitoring execution quality by retail investors. Retail commissions have fallen substantially and continue to fall. Bid-ask spreads have fallen substantially and remain low, although they spiked upward during the financial crisis as volatility increased. Market depth has marched steadily upward. Studies of institutional transactions costs continue to find U.S. costs among the lowest in the world.

Volatility spiked in 2008 during the financial crisis. However, unlike during the Crash of 1987, the U.S. equity market mechanism handled the increase in trading volume and volatility without disruption. However, the selling ban increased trading costs by frustrating the implementation of liquidity providing and shifting strategies by active traders who often must sell short to offer liquidity or manage the risks of their trading.

The quality of the U.S. equity market is especially notable in comparison to markets in other instruments and countries. For example, U.S. retail customers pay much higher transactions costs when trading U.S. Treasuries in comparison to fixed income ETFs that contain the same Treasuries.

#### **2.4 Some improvements can be made**

- “Make or take” pricing causes problems.
- Direct access requires appropriate risk management supervision.
- Front running orders in correlated securities should be banned.

Electronic trading raises some concerns that should be addressed. In particular, the “make or take” model for pricing exchange services has led to perverse outcomes. In the make or take model, trading platforms charge access fees to traders who “take” liquidity with marketable orders and pay rebates to limit order traders that “make” liquidity by placing standing limit orders. Current best execution standards require brokers to take the “best” price without regard to the access fees. We recommend that the SEC require that all brokers pass through the fees and liquidity rebates to their clients. The SEC also should indicate clearly that the principles of best execution apply to net prices and not to quoted prices. Alternatively, the SEC simply could ban access fees.

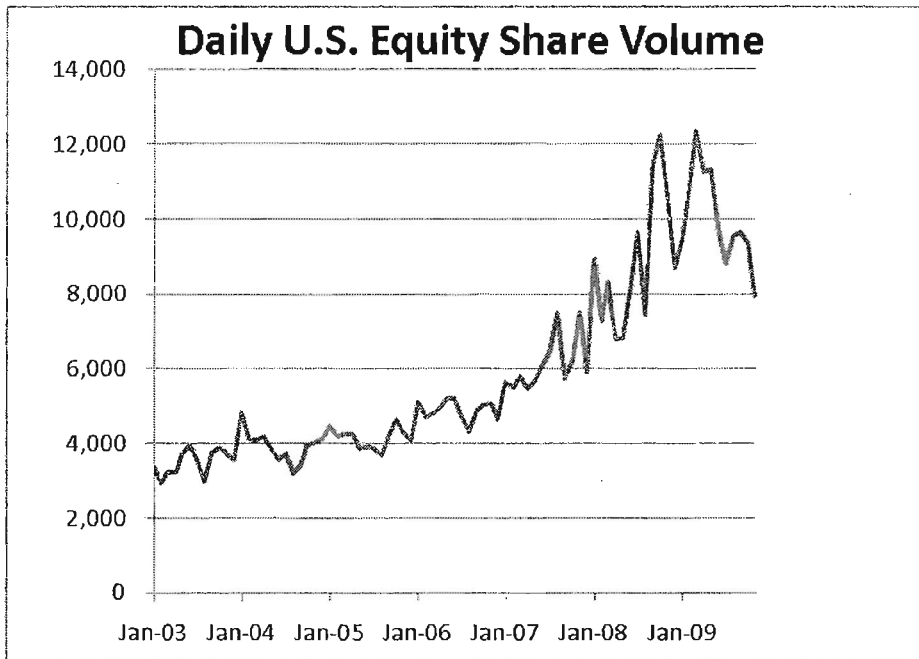
Concerns over the risk management practices of brokerage firms that provide “naked access” are legitimate. We support the proposed SEC rules that would require such firms to have appropriate risk management policies in place to prevent a catastrophic trading meltdown. At the same time, however, we note that no market-wide risk management systems are in place that would deal with a computer-generated meltdown in real-time. Regulators should give careful consideration to the question of what real-time controls could prevent a major computer malfunction from instantly throwing the market into chaos.

Although front-running a customer’s order in the same instrument is illegal, we are concerned about front running in correlated instruments. For example, buying S&P 500 futures contracts while holding a large open customer buy order in an S&P 500 ETF (to profit from the expected price impact of the customer order) should be illegal since arbitrageurs will quickly shift the price impact of the broker’s order in the futures market to the ETF market where it will increase the cost of filling the customer’s order.

### 3. An Empirical Profile of Recent Changes in Markets

Innovations in electronic trading have produced new trading platforms and order types. Market participants now use better and faster tools, and the markets changed as a result. This section characterizes how various measures of market activity and liquidity changed in recent years.

#### 3.1 Trading volumes increased



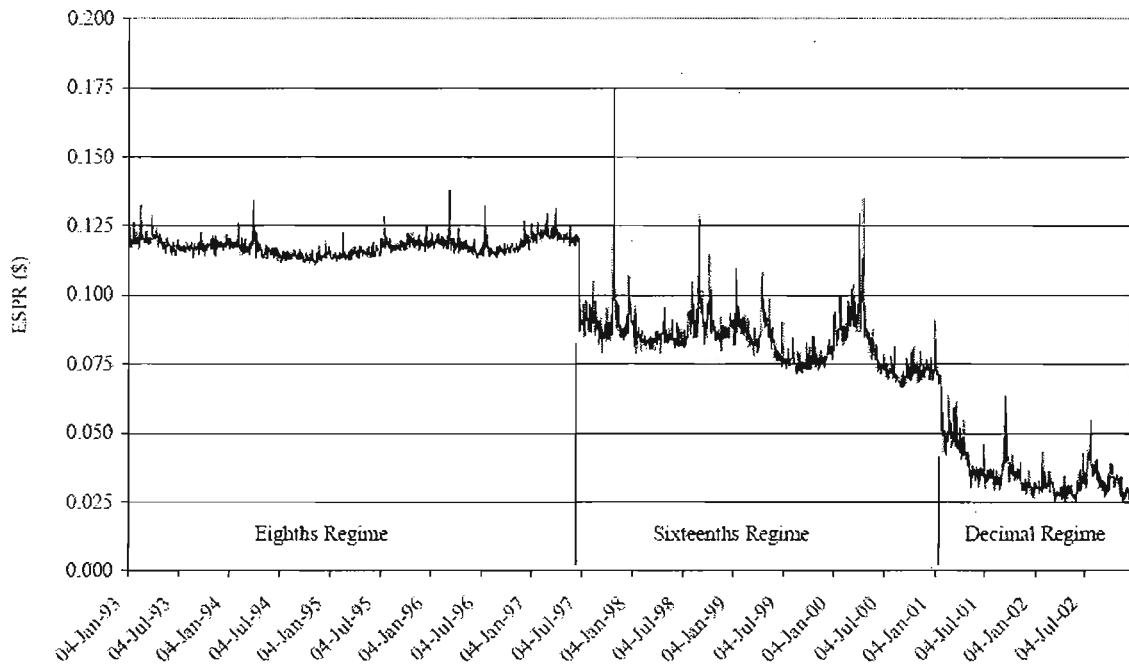
Source: Barclays Capital Equity Research

Reported equity trading volumes tripled in the last nine years. Several factors produced this outcome. The direct costs of trading fell substantially, making it economically feasible to implement strategies that would have been uneconomic at higher costs. The increase in derivative products also increased the amount of trading as arbitrage activity keeps derivatives prices linked with prices in the underlying cash markets. The growth in the number of exchange-traded funds (ETFs) also contributed to the increase in trading volume.

## 3.2 Bid-ask spreads fell and remain small

### 3.2.1 NYSE bid-ask spreads since 1993

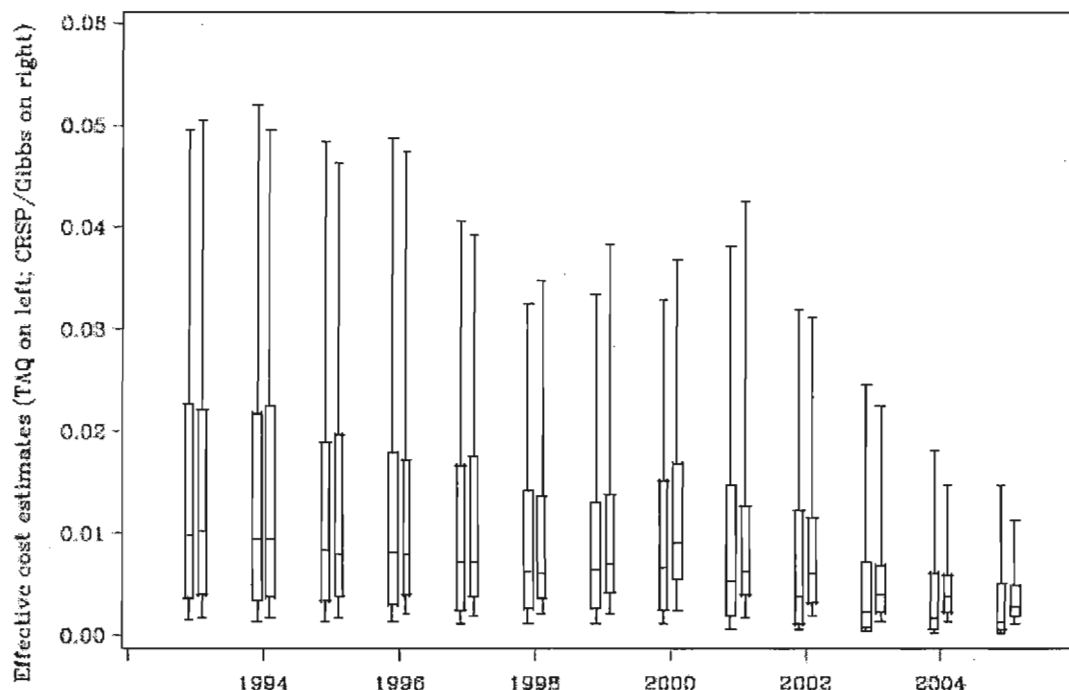
Figure 2. Value-Weighted Daily Average Effective Spread, NYSE, 1993-2002



Source: Chordia, Tarun, Richard Roll and Avanidhar Subrahmanyam, 2008, *Liquidity and Market Efficiency*, *Journal of Financial Economics* 87:2, 256, as published.

This chart tracks the fall in quoted bid-ask spreads on the NYSE following the reduction of the minimum price variation (tick size) from one-eighth to one-sixteenth and then to one cent.

### 3.2.2 NASDAQ bid-ask spreads since 1993

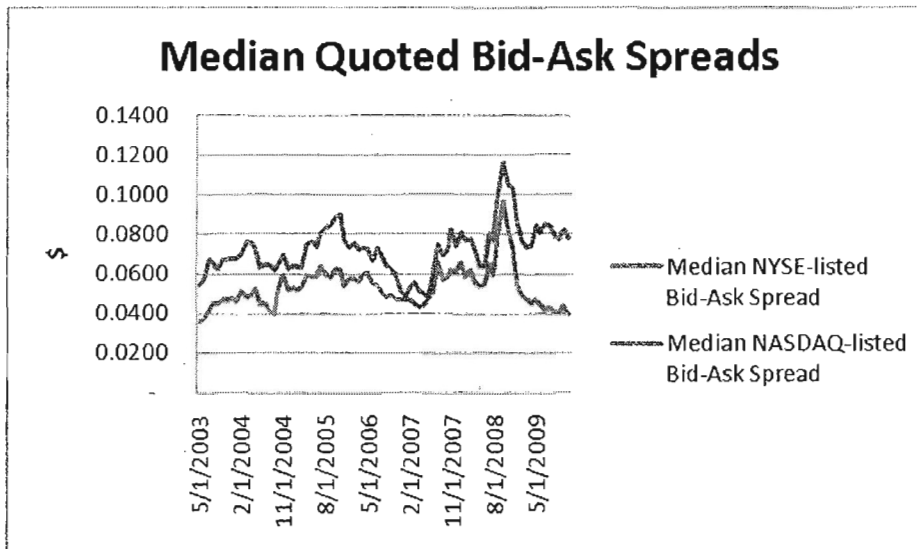


**Figure 2. TAQ and CRSP/Gibbs estimates of effective cost in the comparison sample.** The comparison sample consists of approximately 150 NASDAQ firms and 150 NYSE/Amex firms selected in a capitalization-stratified random draw in each of the years 1993 to 2005. For each firm in each year, the effective cost is estimated from TAQ data and from CRSP daily data using the Gibbs procedure. The figure depicts the cross-sectional distributions for these estimates year-by-year, with TAQ estimates on the left and Gibbs estimates on the right. The upper and lower ranges of the box-and-whisker figures demarcate the 5<sup>th</sup> and 95<sup>th</sup> percentiles; the upper and lower edges of the boxes correspond to the 25<sup>th</sup> and 75<sup>th</sup> percentiles; the line drawn across the box indicates the median.

Source: Hasbrouck, Joel, 2009, *Trading Costs and Returns for U.S. Equities: Estimating Effective Costs from Daily Data*, *Journal of Finance* 64:3, 1457, as published

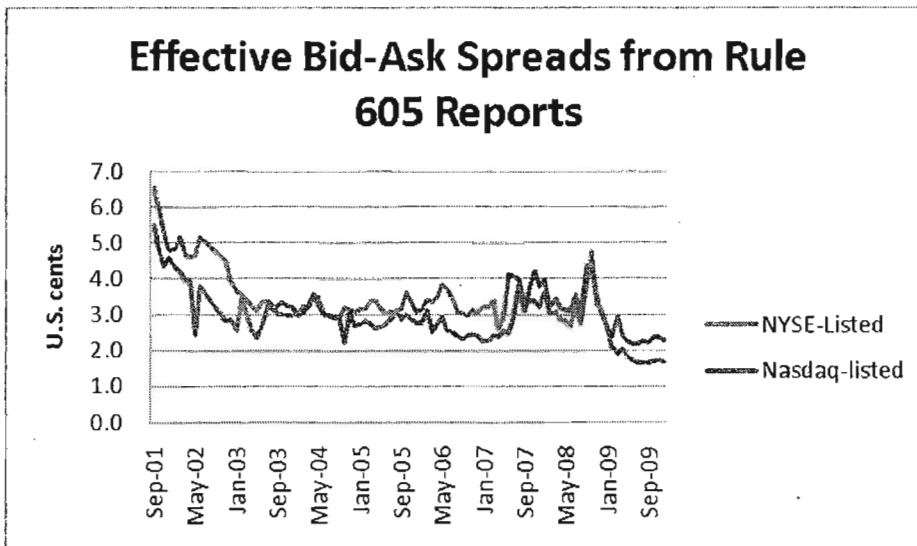
Decimalization, along with the SEC's order handling rules, led to a large decline in bid-ask spreads on NASDAQ as well as the NYSE.

### 3.2.3 Quoted and effective NYSE and NASDAQ bid-ask spreads since 2003



Source: Knight Capital Group

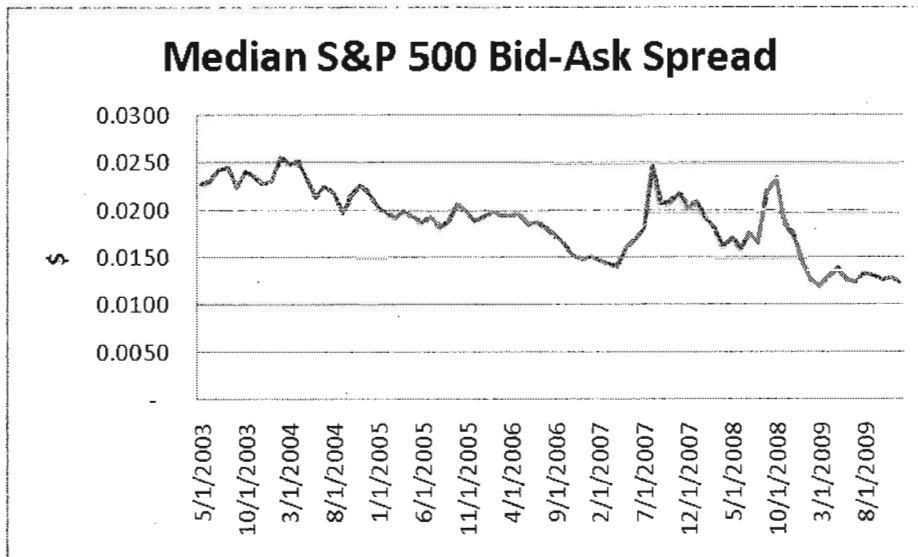
This chart displays the median quoted bid-ask spreads for NYSE- and NASDAQ-listed stocks.



Source: Public Rule 605 Reports from Thomson, Market orders 100-9999 shares

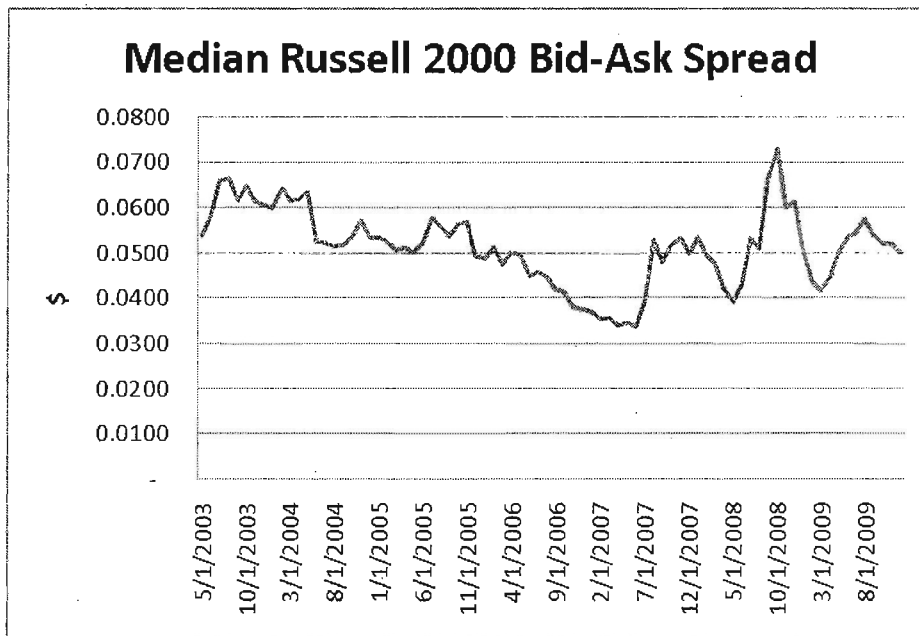
This chart displays the average effective bid-ask spreads obtained from the Rule 605 reports for eligible market orders. The effective bid-ask spread estimates spreads that investors actually pay. It is twice the difference between the actual trade price and the midpoint of the quoted NBBO at the time of order receipt. Once again, we see that the general trend on spreads has been downward, interrupted by an upward spike during the recent turbulence.

### 3.2.4 Quoted bid-ask spreads for index stocks since 2003



Source: Knight Capital Group

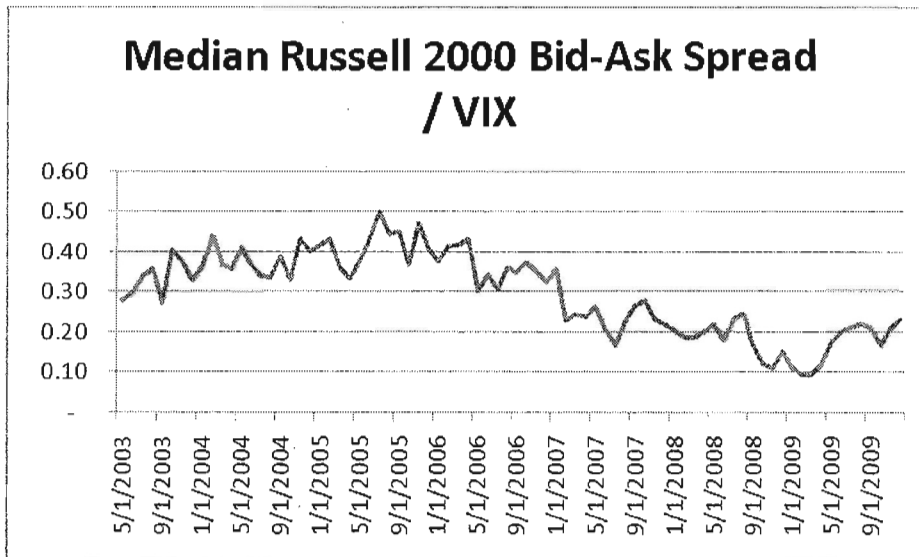
This chart presents the median bid-ask spread for S&P 500 stocks. The spread on many high volume stocks is now often only a penny or two.



Source: Knight Capital Group

This chart shows the median quoted bid-ask spreads for the Russell 2000 Index. The downward trend in spreads, which is so visible for the larger stocks, has not been as uniform for smaller stocks.

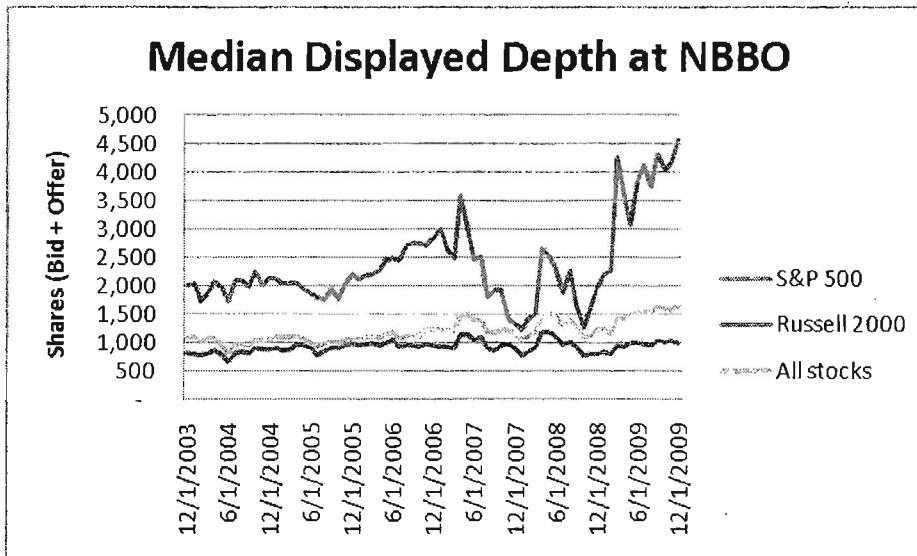
### 3.2.5 Quoted Russell 2000 bid-ask spreads relative to VIX since 2003



Source: Knight Capital Group

Most spreads spiked up during the financial crisis because high volatility increases risks for market makers. Dividing the reported spread by the VIX index of volatility shows that liquidity adjusted for volatility has been dropping. VIX measures the implied volatility of S&P500 options traded on the CBOE.

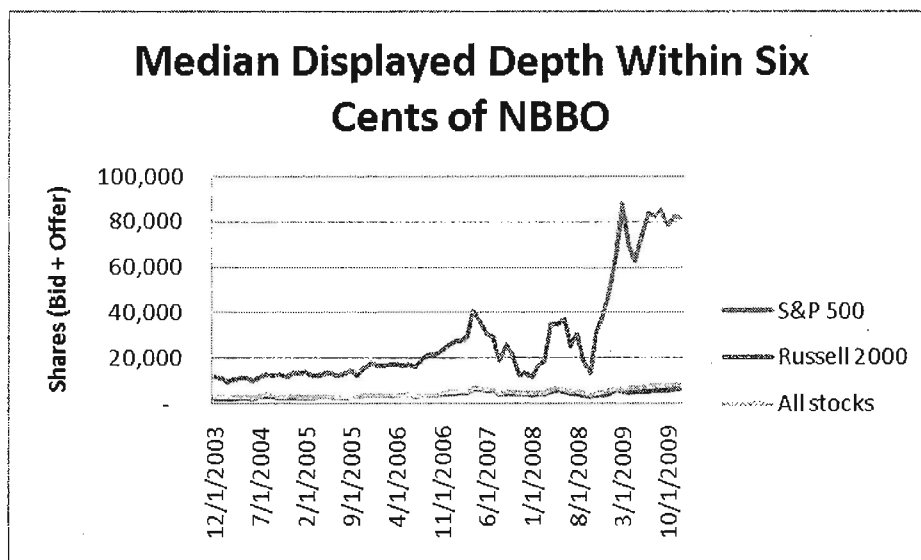
### 3.3 Market depth increased since 2003



Source: Knight Capital Group

Market depth is an indicator of liquidity. This chart shows the median number of shares (both bid and offer) displayed at the NBBO in the exchanges and ECNs. We see a steady upward trend over the last several years, an indicator of increased liquidity. Deeper markets imply lower price impacts for investors.

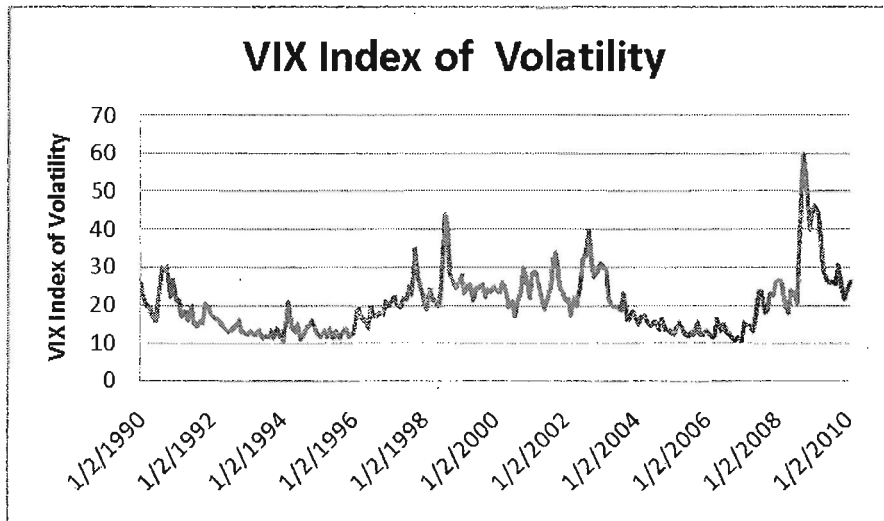
### 3.3.1 Displayed depth behind the NBBO since 2003



Source: Knight Capital Group

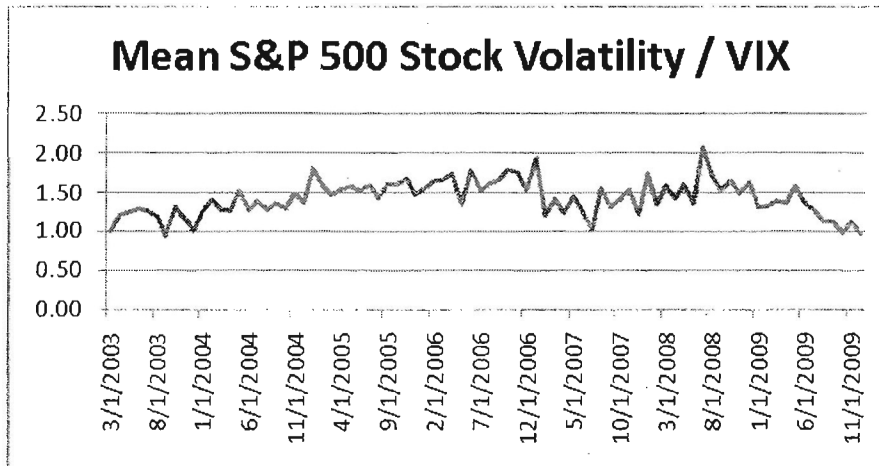
Depth increased substantially not just at the NBBO but also behind it. This chart shows the depth of book for various groups of stocks such as the S&P 500 and the Russell 2000 at the NBBO as well as within six cents of the NBBO.

### 3.4 Market volatility fluctuated



Source: Knight Capital Group

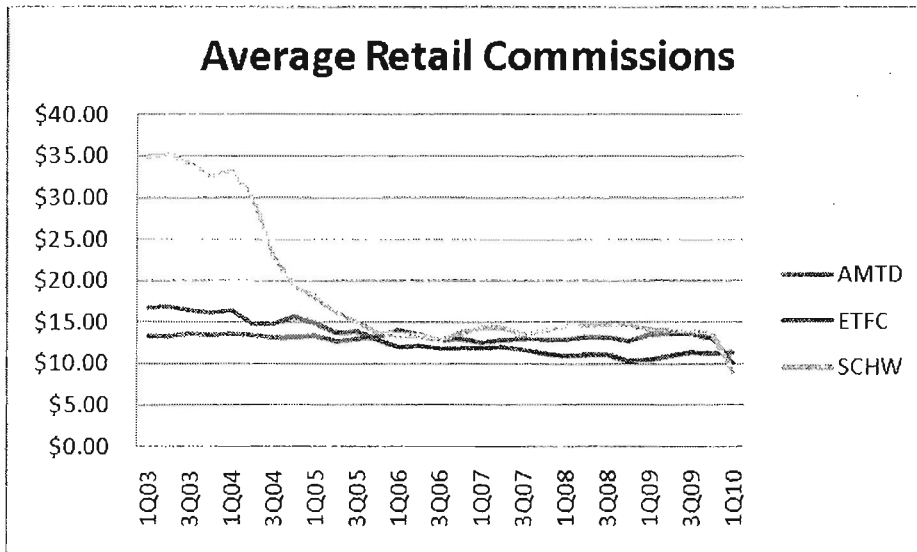
Volatility has always fluctuated in the U.S. equity markets, reflecting the changing levels of uncertainty in the overall economy. The 1930s and the early 1970s were periods of high volatility. Volatility also increased during the recent financial crisis. The VIX index, which is based on the implied volatility of S&P 500 options, was unusually low in 2006 but rose to record levels in the fall of 2008. It has since fallen to more normal levels. Volatility for the market as a whole is a poor measure for characterizing the impact of changes in market technology on the trading of individual stocks. We thus need to correct for overall market volatility.



Source: Knight Capital Group

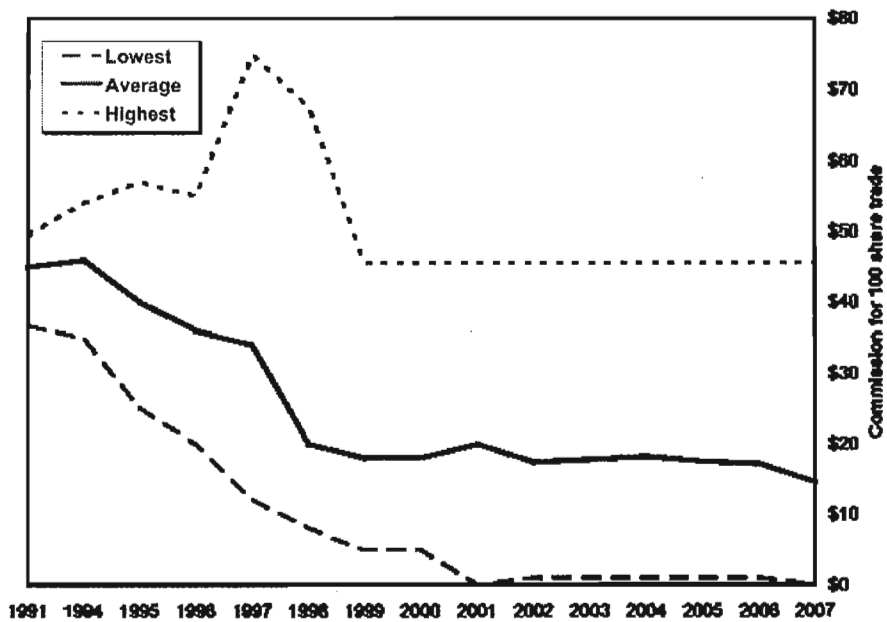
One simple way to correct for overall market volatility is to look that the total volatility of individual stocks relative to the VIX. This chart displays the average actual monthly intraday volatility of various groups of the stocks divided by the VIX. This measure has fluctuated in much the same range in recent years, indicating no overall increase in the volatility in excess of the VIX.

### 3.5 Retail commissions fell and remain low



Source: Barclays Capital Equity Research

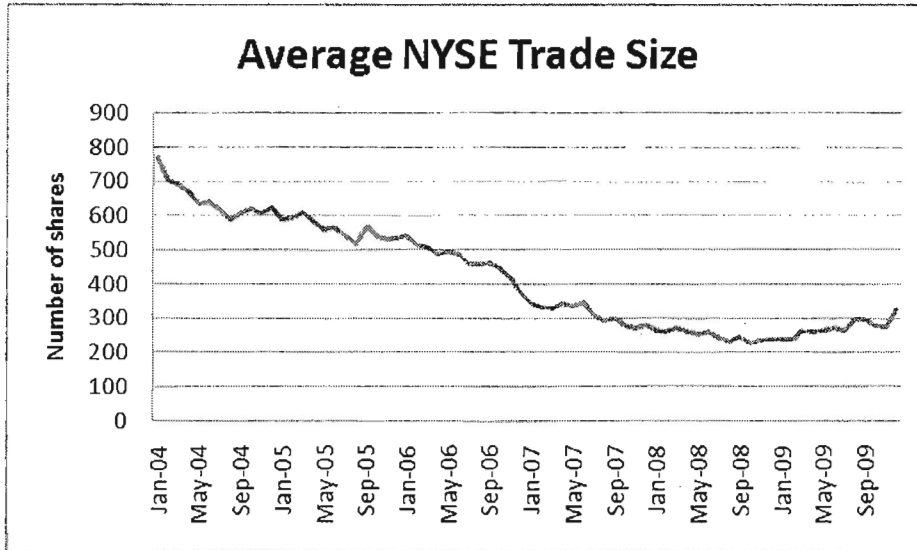
With small bid-ask spreads, commissions remain a significant component of total transactions costs paid by retail investors. This chart shows the average commissions charged by three of the largest online brokerage firms. Price competition intensified recently with prices dropping even further in last few months.



Source: AAIJ Journal, Discount Broker Guide, February 2007 at <http://www.aaai.com/journal/200702/guide.pdf>, as published.

This chart from the American Association of Individual Investors documents the steep drop in commissions among all the firms in its sample over the 27 years ending in 2007.

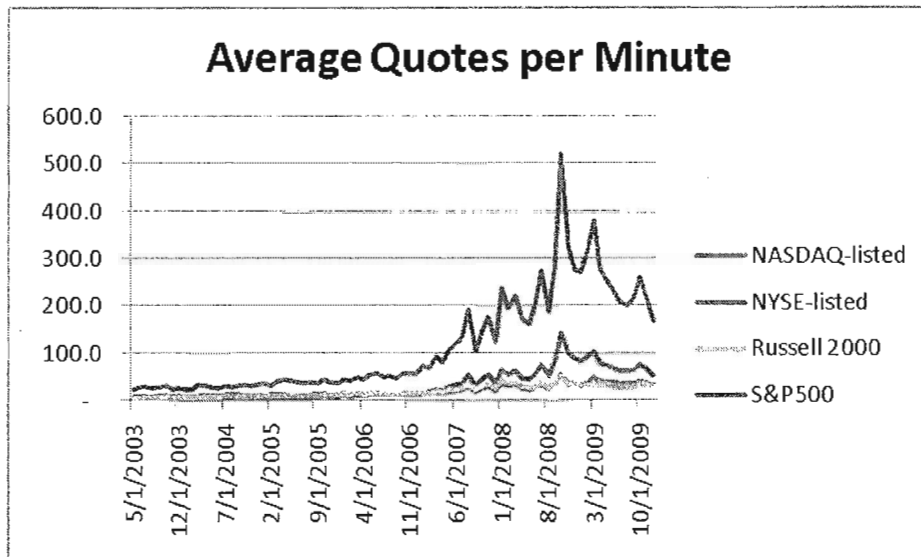
### 3.6 Average trade size fell



Source: NYSE-Euronext, [nyx.com](http://nyx.com)

The average size of reported trades has fallen significantly in the last decade. Average trade size on the NYSE by the end of 2009 was approximately 300 shares, half of what it was five years earlier. Traders have always chopped large orders into smaller ones to minimize market impact. Automation and lower trading costs now allow traders to economically slice orders into even smaller slices through what is known as “algorithmic” trading.

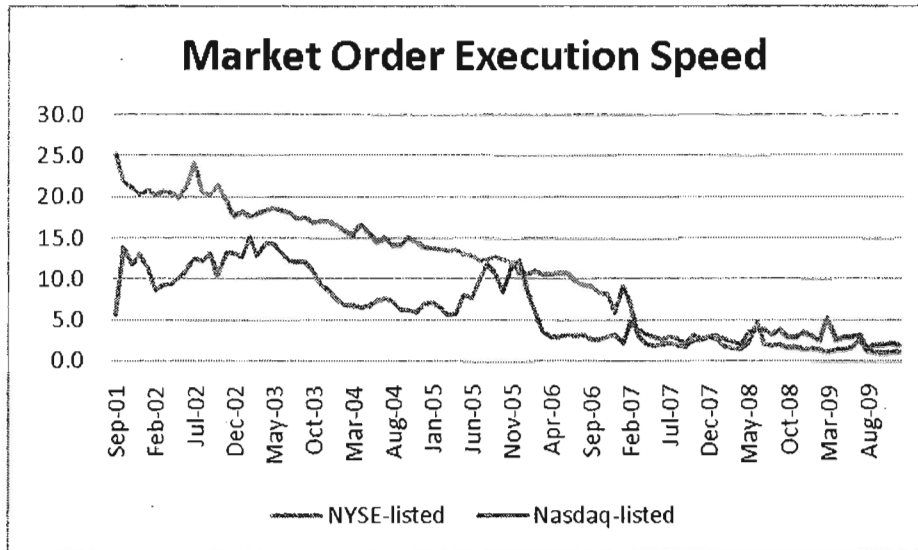
### 3.7 Quote frequency increased



Source: Knight Capital Group

This chart displays the average number of quote updates per minute for various groups of stocks. The frequency of quote updates increased dramatically in recent years, with a spike during the period of intense volatility and volume associated with the recent financial crisis. The increasing frequency of quote updates is consistent with higher trading volumes and the increased use of algorithmic trading strategies that break large orders into many smaller ones.

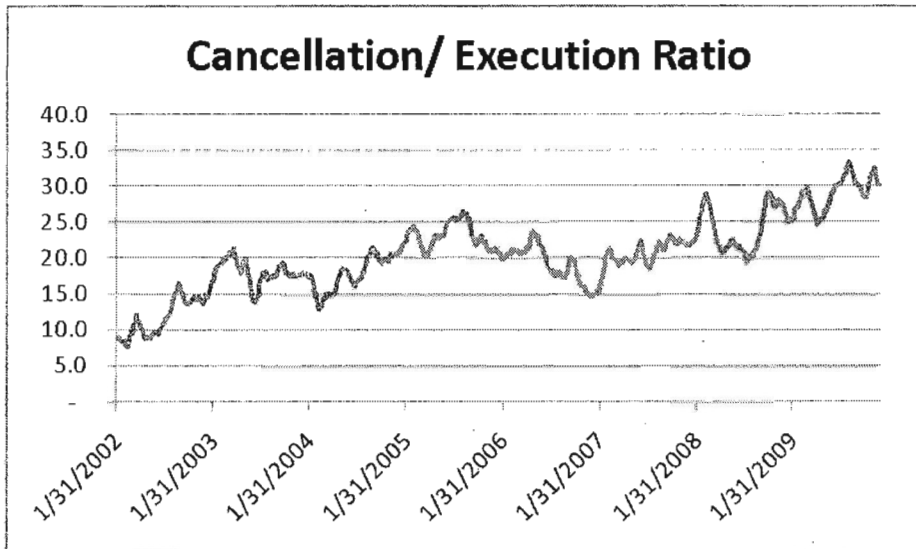
### 3.8 Execution times fell



Source: Rule 605 data from Thomson for all eligible market orders (100-9999 shares)

Increasing automation led to a market wide decrease in the speed of execution for small market orders.

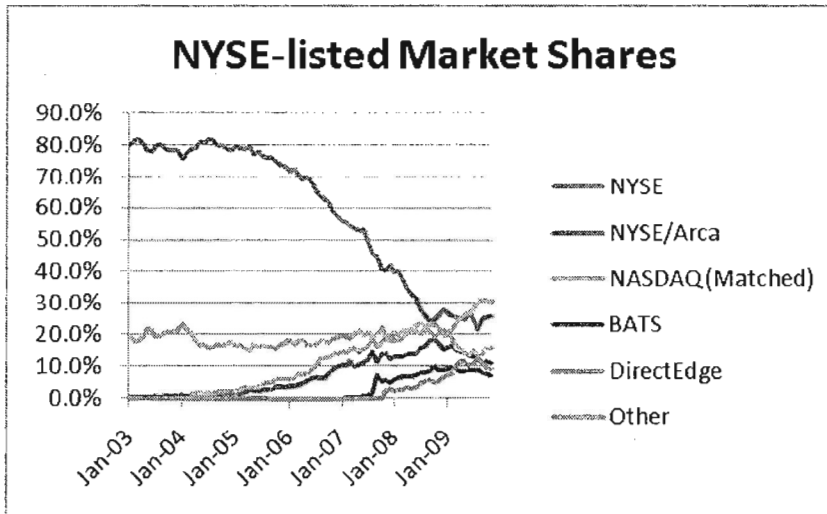
### 3.9 Order cancellations relative to executions increased



Source: NASDAQ ITCH data provided by Knight Capital Group

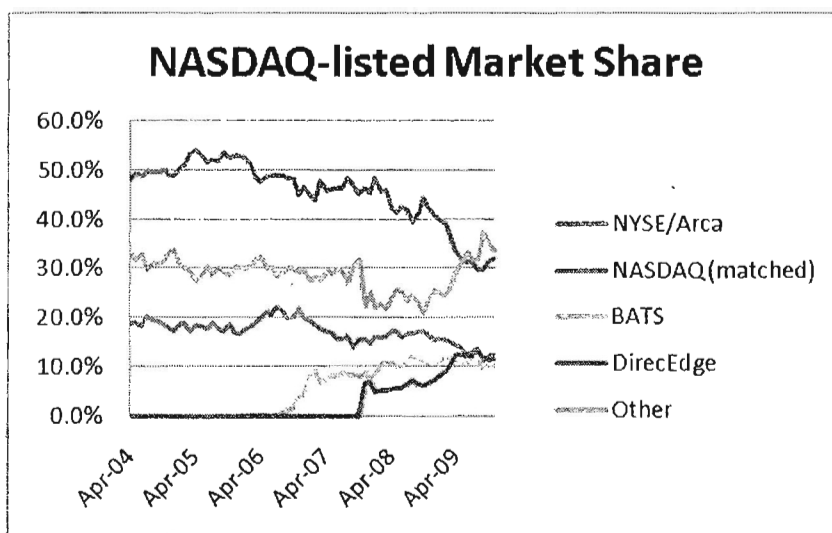
The ratio of orders cancelled to orders executed more than tripled in recent years, from under 10 at the beginning of 2002 to over 30 by the end of 2009. This graph presents the ratio of order cancellations per execution from NASDAQ ITCH data. Many trading strategies require the cancellation of an order. For example, an electronic market maker who wants to update a quote will first cancel the previous quote in the system. As trading volume increases and average trade size decreases, one expects many more quote updates.

### 3.10 Market shares at traditional markets fell



Source: Barclays Capital Equity Research

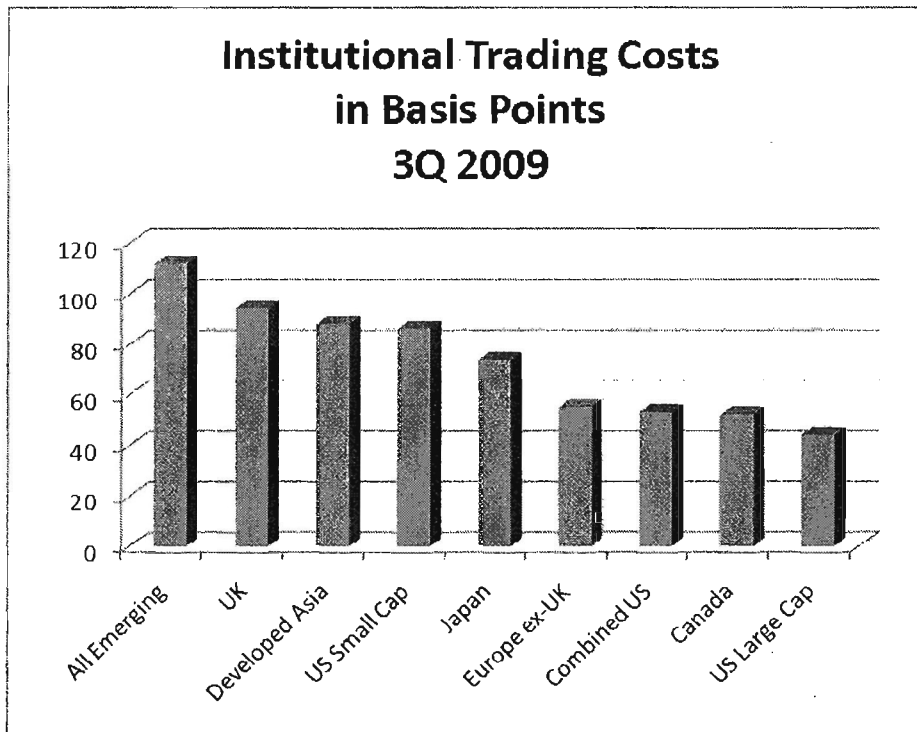
Regulation NMS (2005) freed electronic trading platforms to compete with the NYSE. Subsequently, new entrants gained significant market share. The NYSE market share of volume in its listed stocks fell from 80% at the beginning of 2003 to 25% by the end of 2009. NASDAQ matched share volume also increased, but it later fell as volume traded through new entrants such as BATS and DirectEdge increased. The “other” category, which includes both internalization by dealers as well as “dark pool” trading systems, also increased.



Source: Barclays Capital Equity Research

NASDAQ market share fell in recent years as other competitors gained ground. The old NASDAQ did not actually match trades, but relied on a dealer network for order execution. NASDAQ later added its own matching engine, SuperMontage, and acquired ECNs such as INET.

### 3.11 U.S. transactions costs are among the lowest in the world



Source: Investment Technology Group, Inc., ITG Global Trading Cost Review<sup>2</sup>

ITG, Inc. regularly reviews institutional trading costs around the world. The above chart shows that trading costs in the U.S. are among the lowest in the world. Care must be taken in using their data, as ITG does not correct for differences in the sizes of companies in different markets.

<sup>2</sup> [http://www.itg.com/news\\_events/papers/ITG\\_GlobalTradingCostReview\\_2009Q3.pdf](http://www.itg.com/news_events/papers/ITG_GlobalTradingCostReview_2009Q3.pdf)

## **4. Classical Trading Problems and Their Traditional Solutions**

Three problems complicate trading. First, and most obviously, buyers must find sellers and sellers must find buyers. Second, traders are anxious not to trade with informed traders to avoid the losses typically associated with such trades. Finally, traders seeking to execute large orders must address several problems to ensure that they obtain the best prices for their trades. This section describes these problems and discusses the market structures that traders traditionally used to solve them. The following section discusses how recent advances in electronic communications and information processing technologies have substantially changed trading practices, and in particular, have provided innovative solutions to these problems.

### **4.1 The search for liquidity**

Trades result only when willing buyers and sellers can meet and negotiate terms. Traditionally, traders came to exchanges where they or their brokers could locate one another and arrange trades. By providing a common meeting place and time, exchanges greatly decreased the cost of searching for liquidity.

Arranging trades at exchanges works well when buyers and sellers are both present. However, when securities are infrequently traded, or when traders seek to trade much more size than is typically available at an exchange, trading often moves away from traditional exchanges.

Finding a buyer or a seller in an infrequently traded security is often quite difficult. In such securities, investors will often trade with dealers. Dealers have an advantage in these markets as suppliers of liquidity because they often are more patient searchers than their clients. They also may have an advantage if traders widely recognize that they specialize in trading such securities, so that traders approach them when they want to trade. Since dealers generally are easy to find, they can conduct their businesses away from exchanges.

When traders seek to trade much more size than is typically available at an exchange, finding a willing counterparty often is particularly difficult. If the desired trade size is not too large, a block dealer might facilitate the transaction. But dealers often are not willing or able to arrange very large trades. To arrange such trades, traders seek the services of a block broker.

Block brokers specialize in knowing who would want to trade if presented with a suitable opportunity. Often such traders are not even aware of their interest since many traders who ultimately are willing to trade do not consider whether they would trade until asked. Economists call such traders latent liquidity suppliers. Block brokers identify such traders by keeping track of who owns large blocks of securities that they might sell and of who might be interested in purchasing large blocks of securities. Of course, the information that they collect and communicate rarely appears on exchange floors or in exchange trading systems. Many investment banks run large off-exchange block brokerage operations, as do some firms that have specialized in block brokerage, such as Jones Trading, whose operations were the original “dark pools.”

Some information providers such as Autex offer systems that allow traders to post indications of interest (IOI) designed to help other large traders find them. An IOI is a message that effectively

says, "I'm interested in buying XYZ—give me a call." These messages are similar to those that appear on Craigslist in the sense that they help direct people to potential matches. Like those on Craigslist, they also can be potentially dangerous. Many brokers post IOIs with the hope of obtaining clients, many traders call upon IOIs with the hope of identifying trading interest that they can exploit, and many traders can post false IOIs with the hope of influencing the markets. These problems ensure that the flow of IOIs may not be particularly informative.

#### **4.2 Informed trading**

All traders would prefer to avoid trading with well-informed traders, who have superior information about future price levels. They buy when they expect prices to rise and sell when they expect prices to decline. Since well-informed traders are correct more often than not, they tend to profit. Those traders who trade against them tend to lose when they buy, or lose the opportunity to profit if they sell. Either way, they often will regret that they had traded. Accordingly, traders try to avoid trading with well-informed traders or on the side opposite from which well-informed traders are trading.

Concerns about informed trading make trading large blocks difficult. Most traders presume that large traders are well informed because well-informed traders tend to trade large orders and because large traders generally can afford the research necessary to become well informed. Indeed, empirical findings show that large trades tend to reflect more information than small trades. The risk of trading with a well-informed trader makes dealers and other traders wary of filling the orders of large traders. Large traders thus must convince other traders that they are not well informed to fill their orders at the best possible prices.

Dealers who know their clients well generally know who are well informed and who trade for other reasons. The dealers tend to provide better prices to those traders whom they believe trade for other reasons and try to avoid trading much, if at all, with well-informed traders.

When dealers do not know whether they are trading with informed traders, for example when they trade with anonymous traders, they widen their spreads to recover from uninformed traders what they lose on average to well-informed traders. Since traders transact anonymously at exchanges, exchange bid-ask spreads depend on the degree to which informed traders participate in the exchange markets.

Brokers who know their clients well also can help them obtain better prices by telling potential counterparties that their clients are trading for reasons other than information. They stake their reputations on the quality of this representation. If other traders suspect that the brokers have been disingenuous, they will avoid trading with them in the future.

Although exchange floor brokers generally cannot tell other traders that their clients are well informed, they can tell them they are not well informed. Those who honestly represent the nature of their clients' motives can obtain better prices for their uninformed clients. Many dealers specialize in filling retail orders. Since retail traders are not as informed on average as are institutional traders, dealers can offer better prices to them. To capture the benefits associated with largely uninformed order flow, brokers preference (route) their retail orders to correspondent dealers. Best execution standards require that the dealers execute the orders at the National Best Bid or Offer (NBBO) or at better prices, and the brokers demand certain levels of price improvement. Dealers receiving preferenced orders often pay the brokers for the order

flow. Since brokers cannot obtain these payments if they do not have retail orders, competition forces the brokers to return much, if not all, of these payments to their clients in the form of lower commissions or better services, both of which attract retail clients and their orders.

Many broker-dealers internalize their retail orders for the same reasons that brokers may preference the orders to certain dealers. Acting as dealers, these broker-dealers often provide price improvement to their customers. Trading this informed order flow can produce excess dealing profits, especially if the NBBO reflects the costs of dealing to many well-informed traders. However, since internalizing broker-dealers cannot obtain these payments if they do not have retail orders, competition forces them to offer lower commissions or better services to attract retail clients and their largely uninformed orders. In recent years, retail commissions of some electronic brokers became very small.

The ability of dealers to price discriminate based upon their perception of how well informed their clients are allows them to offer better execution to investors who they believe are not well informed. When dealing was strictly face-to-face or phone-to-phone, dealers would quote different prices based on their perception of the risks of trading with each client.

Dealers now trade over electronic systems. Many dealers continue to discriminate by offer better prices and large quantities to those traders who they trust will not cause them losses. In many cases, they do this by sending out actionable indications of interest. Lately, the SEC has become concerned about IOIs because they are not available to all traders.

If regulations required dealers to disclose firm quotes to all traders, uninformed investors would be harmed. Dealers would widen their spreads and withdraw liquidity to take into account the greater access to their quote by informed investors. Although the dealers could still discriminate in favor of their less informed (mostly retail) clients by offering them improved prices, dealers would not be able to attract their order flow by bidding aggressively with IOIs directed only to them (or their brokers). A prohibition on IOIs in this context thus would have the unintended consequence of reducing the relevant quote information available to less informed traders, and thereby reduce price competition for their order flow.

#### **4.3 Problems Associated with Large Traders**

Large traders face—and cause—special trading problems. Other traders may front-run their marketable orders or employ quote-matching strategies to extract option values from their standing orders. Both strategies increase their transaction costs. In contrast, large traders try to price discriminate among liquidity suppliers to reduce the costs of filling their orders. This behavior causes liquidity suppliers to withdraw from the market.

Attempts to solve these problems account for much of the innovation in market structure. This section introduces these problems and explains how traders traditionally solved them.

##### **4.3.1 Front-running**

Traders generally like to expose their orders to help traders on the other side locate them. However, exposing orders produces undesirable consequences, especially for large traders.

Traders who fill large orders often must move prices substantially to encourage other traders to trade with them. These price concessions are especially large when other traders believe that the

large traders are well informed, but they may still be quite significant even when the large traders are not informed.

Expectations of these price changes make filling large orders problematic. If other traders become aware of a large buy order, some may immediately buy in front of the order in an effort to profit from the expected price change. They likewise may sell in front of large sell orders. Such trades increase the ultimate costs of filling large orders.

Also, traders who have posted limit orders or quotes will try to cancel their orders and quotes if they become aware that they could trade with large traders. They replace their orders and quotes with new orders and quotes placed further from the market so that they do not lose as the large traders put pressure on prices. If these trades can fade from the market, the large traders will pay more to fill their orders.

Both problems—front-running by traders on the same side and fading by traders on the opposite side make large traders very reluctant to disclose the sizes of their orders. Traders traditionally address this problem by giving their orders to floor brokers and upstairs brokers who expose the orders only to traders that the brokers trust will not front-run the large orders. However, information leakage often occurs because brokers cannot effectively conceal their orders, even assuming that they do not favor others.

Many buy-side traders believe that floor brokers are unable or unwilling to effectively conceal the information in the orders entrusted to them. At best, the brokers simply cannot keep a straight face. At worst, the brokers may tip off others to gain other advantages. The clients try to identify these problems by measuring their transaction costs to identify the quality of the service that they obtain from their brokers. However, transaction costs are notoriously difficult to measure, and measurement is not useful if all brokers suffer the same failings. Accordingly, many buy-side traders have enthusiastically supported innovative hidden order and dark pool trading systems that address this problem.

#### **4.3.2 Quote-matching**

Large traders who expose their limit orders risk that other traders will employ a strategy called quote-matching against them. The quote-matching strategy increases transaction costs for large traders. An example can help introduce the quote-matching strategy. Suppose that a large trader places a limit order to buy at 30. A clever trader who sees this order could immediately try to buy ahead of it, perhaps by placing an order at 30 at another exchange, or by placing an order at a tick better at the same exchange. If the clever trader's order fills, the clever trader will have a valuable position in the market. If prices subsequently rise, the trader will profit to the extent of the rise. But if values appear to be falling, perhaps because the prices of correlated stocks or indices are falling, the clever trader will try to sell to the large trader at 30. If the clever trader can trade faster than the large trader can revise or cancel his order, and faster than can other traders competing to fill the large trader's order, the clever trader can limit his losses. The clever trader thus profits if prices rise, but loses little otherwise. The large trader has the opposite position: If prices rise, he may fail to trade and wish that he had. If prices fall, he may trade and wish that he had not. The profits that the clever trader makes are lost profit opportunities to the large trader.

The quote-matching strategy is profitable when very fast traders can extract option values from limit orders. Orders have option values because they give other traders rights to trade at fixed prices. For example, a standing limit sell order represents a call option struck at the limit price granted to the market as whole. The first trader who wants to buy at the limit price exercises this option.

Large traders traditionally have avoided quote-matching losses by limiting the exposure of their orders. On floor-based exchanges, large traders trust their orders to floor brokers with the understanding that the brokers will only display the orders to traders whom the brokers expect will fill the orders and who the brokers trust will not front-run the orders. Off-floor brokers likewise carefully manage the exposure of the orders entrusted to them.

Large traders who do not trust their brokers may break their orders into small pieces so that they do not expose the whole order all at once. However, by breaking up their orders, they increase the number of trades taking place on the same side of the market. Dealers and other traders who see such trading patterns often conclude that well-informed traders are in the market, which makes it difficult for the large traders to fill their orders at a low cost. Concerns about the quote-matching problem have caused many buy-side traders to enthusiastically support innovative trading systems that help them solve this problem.

#### **4.3.3 Price discrimination**

Large traders often try to break their large orders into smaller pieces so that can fill the first pieces at the best available prices and then only fill the remaining sizes at inferior prices. Since traders who offer liquidity are aware of this problem, they tend not to post much size at the best quoted prices. Those who do post significant size too often fail to earn the price concessions that large traders typically pay to fill an order.

Large traders may avoid this problem to some extent by using the services of block dealers or brokers. These traders try to determine the full size of their large clients' orders so that they can properly price them. They keep their clients honest by paying close attention to their clients' subsequent trades and by refusing to arrange trades again for clients who prove to be dishonest. Those traders who can credibly convince others that they will not price discriminate often obtain better average prices for their orders than they would if they tried to price discriminate.

## **5. Innovative Solutions to the Classical Trading Problems**

New communications and computing technologies have allowed exchanges, brokers, dealers, and alternative trading systems to create innovative solutions to the traditional trading problems described above.

### **5.1 Order routing to exchanges**

Perhaps most notably, innovations in electronic communications and computing technologies have greatly reduced the costs of searching for liquidity at exchanges and in other trading systems.

The first benefit that new technologies provided was remote access. Traders who were far from an exchange could quickly send their orders to the exchange over telegraphs, then telephones, and now over computer linkages. These communications technologies have allowed investors off the floor of an exchange to easily participate in the search for liquidity and quickly learn about executions of their orders.

The introduction of ticker tapes, and later quotation feeds, allowed remote traders to determine whether brokers and dealers were handling their orders fairly on the floors of the exchanges to which they routed their orders. With this information, traders could send orders to distant exchanges without worrying too much about being cheated.

These advances in telecommunications technologies substantially decreased the number of exchanges as investors increasingly sent their orders to larger markets where the probability of finding contra-side interest was greatest. Transaction costs decreased and trading volumes increased as buyers and sellers could more easily find each other by sending orders to brokers and dealers on exchange floors. Order flows consolidated substantially to the point that exchanges such as the New York Stock Exchange and the American Stock Exchange obtained market shares of 90 percent or more in their listed securities. Regional exchanges merged to form larger exchanges, but never competed very successfully. Many small exchanges failed.

As information technologies continued to improve, consolidated quote feeds mandated by the SEC and sold by various data vendors allowed remote traders to know almost instantly the quotes posted by exchange specialists, and later, all order sizes at the best bid and offer. With these feeds, traders could easily determine which markets posted the best current trading opportunities.

At first glance, the availability of these quote feeds should have promoted competition from secondary exchanges because traders could easily route their orders to the best trading opportunities. However, these feeds did not adequately represent all relevant information about trading opportunities at an exchange, and in particular, at the dominant exchanges. Quote information was incomplete in two respects. First, only the best bid and offer were reported whereas traders on the floor of an exchange often could see trading interest behind the best prices. Second, many traders did not post orders that the exchange could disseminate. Instead, for reasons discussed in the previous section, larger traders typically gave their orders to floor brokers who revealed them to other traders on the floor of the exchange on a selective basis. As a result, for most traders searching for liquidity, the primary exchanges remained the destinations

of choice as those exchanges continued to be the most productive places to search for counterparties.

The SEC designed the ITS order routing systems to connect exchanges in the National Market System (NMS) to each other. In conjunction with a rule prohibiting trading through the quotes of a NMS exchange, the ITS system was supposed to facilitate the search for best price while promoting competition among exchanges. In practice, the system did not meet its objectives because it operated too slowly (operators entered orders manually) and because specialist dealers receiving orders did not have to respond immediately. These problems with the ITS system ensured that most traders continued to route their orders to the primary listing markets.

In the OTC markets where unlisted securities traded, dealers would contact each other over the phone when they wanted to trade with each other. The NASD created NASDAQ as an automated quotation system to help the dealers identify who was offering the best price. Over time this system eventually evolved to become an exchange system that maintained order books and automatically executed trades.

## **5.2 ECNs**

Innovative brokerage systems such as Instinet and Island created alternative trading systems called Electronic Communication Networks ("ECNs") to collect and match their client orders automatically. The ECNs initially did not take much trade from the primary listed markets because too much order information in these floor-based markets remained on the floor. Traders were unwilling to trade in the electronic systems because more trading opportunities were available on the floor. Without traders posting orders in these systems, the systems never became liquid and therefore never posed any significant challenges to the traditional listing exchanges until Regulation NMS became effective.

Best execution standards that prevented brokers from arranging or accepting trades at prices inferior to those quoted in the National Market System also limited the ECN growth in listed securities. These restrictions prevented them from trading through quoted prices at the floor-based exchanges.

As a purely electronic system, NASDAQ was always a fast system, and latency (the amount of time needed to respond to a message) decreased substantially with technological innovations in communications networks and in processing systems. The low latency allowed traders to submit marketable orders and quickly receive confirmation that their orders executed. Low latency also allowed the traders to submit order cancellation instructions and quickly receive confirmation that their orders were cancelled or already had been filled.

The low latency in NASDAQ allowed the ECNs to compete very successfully in NASDAQ-listed stocks. The ECNs solicited order flow for their systems by making the following proposition to their brokerage clients: If you post an order with us, we will post a copy of that order in the NASDAQ quote montage. If the order executes at NASDAQ, you will obtain the execution. While the order is sitting at NASDAQ, if an incoming marketable order arrives in our system, we will hold the marketable order, cancel the standing NASDAQ order, and then fill your order. If we arrange the trade for you, we will charge you less than other NASDAQ dealers.

This proposition ensured that brokers would obtain the benefit of any liquidity offered in the NASDAQ system, while still posting orders in the ECN. The ECN could offer this proposition only because it could cancel and confirm cancellation of its NASDAQ quote very quickly. Without that facility, the ECN could not hold up the execution of the incoming marketable order. With this facility in place, trading in the ECNs grew very substantially in NASDAQ-listed stocks.

Likewise, the low latency of the NASDAQ system allowed ECNs to accept orders that were not marketable in their systems, but which were marketable against other NASDAQ dealer's quotes. They submitted these orders through NASDAQ, received quick confirmations of their executions, and then continued to process any remaining size in their systems if possible. The ECNs thus were able to avoid trading through the NASDAQ quotes, while conducting their operations.

The ECNs could not offer these facilities for listed stocks because they could not quickly obtain confirmed executions and order cancellations from the floor-based exchanges where latency was often greater than 15 seconds. Their slow floor markets of the primary listing exchanges thus protected them from ECN competition. To obey the trade through rules, the ECNs would have had to halt their system while waiting for the NYSE floor to respond to their orders.

### **5.3 Hidden order size**

To help protect order flow information, many exchanges and ECNs created hidden order facilities. These facilities allow traders to submit orders to their execution systems that limit the exposure of their sizes. Depending on the order type, traders may completely hide size (hidden orders), partially reveal size (reserve orders), or reveal size in whole or part at prices away from the market (discretionary orders). Traders use these orders to offer liquidity without revealing information about the full sizes of their orders. They thereby hope to avoid front-running and quote-matching problems.

Traders who seek liquidity discover hidden order sizes at a given price by submitting orders to trade at that price. If hidden size is present, a larger trade will result than displayed quantities would indicate. The price of discovering the hidden size is a binding commitment to trade with it.

Although these systems only reveal hidden size to the extent of the size of the marketable orders, some proprietary traders "ping" the market repeatedly with small orders to discover whether hidden sizes are present. They can only be sure about the size that they discover, but they often infer additional size when their orders repeatedly fill. At some exchanges and dark pools, large traders who want to prevent such discoveries of their orders can place minimum fill quantities restrictions on their orders. The availability of such restrictions obviates regulations that might prevent ping.

Large traders who seek liquidity generally are as unwilling to display their searches, as are the large traders whose hidden orders they seek. To prevent discovery of the remaining sizes of their orders, large traders submit immediate or cancel orders (IOC) when seeking hidden liquidity.

IOC orders are by far the most commonly submitted orders. Brokers use them to sweep across trading venues at progressively more aggressive prices to discover hidden liquidity. Most do not execute, but those that do provide executions at improved prices and augmented sizes. These tactics are feasible because latency at many exchange trading systems is now under a millisecond.

#### **5.4 Alternative trading systems for large block traders (dark pools)**

Brokers and others have developed many alternative trading systems to help large traders arrange trades and enhance liquidity provision, while protecting these traders from front-running and quote-matching problems that arise when information about their orders is widely known. Large traders are anxious to protect the intellectual property and privacy of their trading plans. In a trading floor context, these traders previously used floor brokers who worked their orders based on their experience. Now many large traders use dark pools instead. Space constraints prohibit description of all of these systems, or even all of the most significant of these systems. Here we discuss two of the most innovative systems.

##### **5.4.1 POSIT**

Brokers created alternative trading systems specifically designed to solve search problems for large traders. The first such system that enjoyed wide popularity was POSIT. POSIT conducts a call market that appeals to large traders who do not wish to expose their orders to the market. Traders submit orders to POSIT, which does not display the orders to anyone. At the time of the call, POSIT matches the buy orders to the sell orders. Generally, all orders on the side with the smaller total size are filled. The orders on the other side are filled on a pro-rata basis. Once so matched, the trades take place at the midpoint of the bid and ask quotes at the primary listing market for the security.

Since many POSIT orders are extremely large, very large order imbalances are common when one side is present, but the other is not. Since the POSIT order imbalance is not displayed, imbalances in POSIT cannot attract balancing size. Accordingly, most POSIT calls trade only a small fraction of the total order size submitted.

Despite the low fill probability, buy-side traders use POSIT because the prices for the trades that they do obtain are very favorable. When large traders meet on opposite sides in POSIT, they both obtain executions with no price impact that are much better than they would otherwise expect to obtain if they traded in the market. By calling traders to a single point in time, the POSIT market increases the probability that both sides will be present. Moreover, they obtain this service without revealing information about their orders to the market. In particular, their orders are not revealed when they fail to trade.

The POSIT system is not perfect, however. Traders whose orders fill partially can estimate the total size submitted on their side of the market from knowing the total POSIT fill, which is public information, and the portion of their order that filled, which only they and other participants on their side know. Buy-side traders are aware of the leakage of this information and many use other alternative trading systems, at least in part, due to concerns about this issue.

##### **5.4.2 Liquidnet**

Liquidnet is another innovative alternative trading system that large buy-side traders use widely. Subscribers allow Liquidnet's computers to see the orders in their order management systems. These are the orders that the portfolio managers give to their buy-side traders to fill. The buy-side traders then try to fill these orders by negotiating with dealers or by submitting orders to block brokers, to exchanges, or to alternative trading systems. When Liquidnet sees that a buyer and a seller are both interested in the same security, it sends a message to the two buy-side traders that indicates that they may be able to arrange a trade. The message does not reveal trader

identities. The traders then negotiate with each other to arrive at a price and size for their trade. The resulting trades are often very large.

To help guard the order information, Liquidnet rates traders by their propensity to conclude deals suggested to them. To avoid front-running and quote-matching problems, traders can indicate that they do not want information about their orders to be shared with traders who have low completion rates. Liquidnet thus ensures that only traders who have a high probability of arranging trades obtain information about future trades.

Liquidnet also allows clients to indicate traders and classes of traders with whom they do not want to trade. For example, clients generally do not want to trade with traders that they perceive to be better informed than themselves.

#### **5.4.3 Dark pools and retail orders**

Many brokers have arranged to pass marketable order flow through dark pools with the hope of obtaining better executions than they would if they were sent to other venues. Institutional traders generally welcome the opportunity to trade with retail order flow because retail traders are largely uninformed. If they trade, the retail traders obtain better executions and the institutional traders obtain more size. Using dark pools benefits both sides, but not informed traders who these pools try to exclude.

#### **5.5 Indications of interest and actionable indications of interest**

Dark pools only work when traders are willing to express their interests in trading as orders and then make those orders available to the alternative trading system. If only one side to a potential trade expresses its interest as an order, no trades can be arranged or proposed.

Traders sometimes can attract contra-side interest by showing that a trading opportunity is available. Traders thus have an interest in displaying their orders because such displays may attract other orders. However, as noted above, order display can often lead to front-running and quote-matching problems.

An IOI represents a middle strategy in the search for liquidity between displaying an order and hiding an order. Since IOIs are not firm, traders who might try to exploit the information in them may find that the order is not available to them.

IOIs are most valuable when they are displayed by traders widely recognized to be reliable, and when they are received only by traders who will not engage in exploitive trading strategies. When an IOI truly represents a real opportunity to trade, and when the recipient can be trusted not to exploit the information, both traders have an interest in ensuring that they can act upon the IOI at minimum cost to produce a trade.

To this end, many dark pools have systems for disseminating actionable IOIs to trustworthy entities. These actionable IOIs inform the entity that a trade is possible. For example, a retail broker may receive an IOI from a dark pool. If the broker has an order that would help fill the interest, the broker then could route to the dark pool and obtain a better execution at lower cost for its client.

Without actionable IOIs, the broker would have to use an IOC order to probe the dark pool for liquidity when looking to fill an order. Since such probes usually produce fruitless results and thereby waste time while in flight, brokers may choose not to probe the dark pool when trying to fill their orders. Alternatively, they may only probe the pool late in their sweep sequences so that they can probe first other trading venues that generally produce better results.

The actionable IOI differs from a firm quote because dark pools offer them only to certain market participants based on the degree to which they trust them not to exploit the information that they convey. Firm quotes that are displayed to all traders are much riskier.

Dealers also publish actionable IOIs to brokers for whom they are willing to fill their clients' orders. These brokers typically represent traders whose orders the dealers do not fear, either because the traders are uninformed, or because the dealers are confident that they can layoff their positions before the information in an informed traders order moves the market. The actionable IOI allows the dealer to advise the broker that liquidity is available so that the broker can quickly route to it if it represents the best available trading opportunity.

As noted above, the actionable IOI allows the dealer to offer better prices and more size to certain clients. While this discrimination against well-informed traders might seem to be unfair, allowing it lowers transaction costs for retail clients and many institutional investors. If regulations prevented the use of actionable IOIs, dealers would offer less liquidity as they faced greater losses from being picked off by informed traders. Banning the use of actionable IOIs by dealers would much more likely discourage liquidity provision than dramatically increase their use of firm quotes.

A continuum of investors trade in our marketplace, ranging from well informed to uninformed. The use of a range of order types by those prepared to commit capital to liquidity provision enhances the liquidity process by allowing them to risk their capital when they want to and avoid doing so otherwise.

The use of actionable IOIs reflects the evolving nature of trading technology. They allow dealers to efficiently communicate with potential customers and for the customers to respond. Although other traders do not share the same opportunities, post-trade reporting requirements ensure that all traders share in the information produced in trades arising from actionable IOIs.

## **5.6 Algorithms**

To avoid displaying information about the full sizes of their orders, large traders often break their trades into smaller pieces to fill them over time. This trading strategy also allows markets to recover over time from the effects of order imbalances so that the price impacts of large orders may be reduced. Practitioners call strategies for breaking up orders and for submitting them to markets algorithms.

Algorithms differ according to whether they offer liquidity or take it. Many do both. For example, some algorithms immediately take liquidity upon starting up. They then post limit orders to obtain better fill prices. While posting liquidity, they may often cancel their orders to obfuscate their presence and thereby frustrate traders who would try to exploit information in their orders. As a trader-imposed deadline approaches, the algorithm may then take liquidity, if necessary, to finish filling the order.

Computerized trading systems implement algorithms based on information available to them from trade and quotation feeds. Many algorithmic strategies are based on substantial statistical analyses into how orders execute on average and in specific situations.

Algorithmic trading has substantially reduced workloads for buy-side traders and for the brokers who serve them. Although the costs of developing and maintaining algorithms are high, the cost savings from using them often greatly cheapen the overall costs of trading, especially for routine trades.

### **5.7 Proprietary trading**

By providing very fast and inexpensive systems, today's electronic markets allow nontraditional dealers to offer liquidity using electronic proprietary trading systems. These traders use various high frequency trading strategies to provide liquidity. They could act as dealers who commit capital to connect buyers to sellers who arrive at different times, or they could act as arbitrageurs who connect buyers in one market to sellers in another correlated market.

These electronic proprietary traders have substantial advantages over traditional dealers who cannot see as much information, process as much information, or react as quickly to new information as can computers. As they competed with traditional dealers and with each other, they substantially decreased bid-ask spreads while making prices more informative and more resilient to transitory displacements caused by unexpected demands for liquidity.

### **5.8 Co-location**

When many traders seek to take advantage of the same trading opportunities, the fastest traders are the most successful. Accordingly, algorithmic traders and proprietary traders seek every speed advantage that they can obtain. They try to employ the fastest computers, write the fastest software, and obtain market data before others, often through direct links to exchanges. Communications latencies are due to time lost as messages travel at the speed of light and to delays caused by passing messages through routers. To speed their communications, high frequency traders co-locate their servers as close as possible to the exchange servers that produce market information and collect orders.

Co-location is no different than the traditional practice of locating brokerage firms close to the stock exchange to reduce the time and expense of filling an order. If the practice of co-location were banned, traders would merely seek to locate their servers in the closest piece of real estate to the exchange data centers, with far less oversight than is possible within the exchange data centers.

### **5.9 Effects on listed exchanges**

Combined efficiencies from high frequency proprietary trading and from the operation of the low-cost electronic ECNs substantially decreased the costs of trading NASDAQ stocks. Practitioners and regulators observed similar decreases in transaction costs in Canada, Europe, and Asia, where different regulatory environments allowed electronic exchanges to flourish earlier than in the United States.

In response to these observations, regulators at the SEC adopted Regulation NMS in 2005. That regulation removed the ITS trade-through rule and substituted a rule that prohibited trade-throughs of electronically accessible quotes. As a result, floor-based trading systems lost their

primacy to electronic systems. The listed exchanges (NYSE and AMEX) started to offer electronic trading, but their systems were too slow and too expensive, and they quickly lost market share to faster electronic competitors. At the same time, floor brokerage at the listed exchanges has become less important as buy-side traders increasingly use dark pools to arrange their trades with less information leakage. As illustrated earlier, the New York Stock Exchange now only trades 25% of the volume in its listed stocks.

## 6. Market Performance during the Panic of 2008

The financial markets experienced a severe financial crisis in 2008. During this period, equity trading systems handled the extreme volatility and volumes without system problems. Their performance stands in sharp contrast to the system problems experienced during the Crash of 1987, which led to serious delays in executing orders. The trading systems then used could not, or would not, handle the trading volume. For example, the printers that generated order tickets on the NYSE floor could not print out the orders fast enough, and NASDAQ market makers would not pick up the phone. These glitches in the trading system added to confusion and uncertainty, as investors could not be certain of the status of their orders or of current market conditions.<sup>3</sup>

Some commentators would like to blame the recent drop in stock prices on short selling or other practices in the equity market such as computerized trading. We believe that stock prices fell for fundamental reasons as investors began to recognize the extent of valuation and risk management problems on various balance sheets. Indeed, the approximately 50% drop in equity prices is comparable to the experience of other recessions such as in 1974 and 2001, at which times no significant concerns were expressed about short selling or computerized trading.

We note that short sellers and computerized traders did not induce lenders to make loans to millions of borrowers who could not pay them back. Short sellers did not package those loans into securities that were then sold to investors, nor did short sellers get the rating agencies to stamp AAA on securities that should not have been rated AAA. Neither did computerized traders force entities such as Fannie Mae, Freddie Mac, or Lehman Brothers to purchase tens of billions of dollars worth of what were later called “toxic” securities.

Concerns over short selling led to various restrictions on the practice in the U.S. and other markets during the panic in 2008. Beber and Pagano, among others, have analyzed these restrictions and found that they were detrimental to market liquidity and failed to support market prices.<sup>4</sup> These findings are reasonable because much, if not the majority, of short selling does not consist of directional bets on the value of a security. Instead, short selling helps markets operate more smoothly in areas such as market making, arbitrage, and statistical arbitrage. Categorical restrictions on short selling do more to reduce such beneficial short selling than to prevent any alleged abusive short selling.

Restrictions on short selling also frustrate the trading of well-informed traders who recognize that companies are overvalued. Overvaluation generally is a more serious problem in public markets than is undervaluation. When securities are overvalued, capital gets wasted as companies sell securities to fund poor projects, and investors lose money when prices fall. When securities are undervalued, companies often find capital from other sources, and long-term investors do not experience losses if they hold until prices regain their true values.

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<sup>3</sup> For more information on the Crash of 1987, see *Presidential Task Force on Market Mechanisms, 1988, Report of the Presidential Task Force on Market Mechanisms, Nicholas Brady (Chairman), U.S. Government Printing Office.*

<sup>4</sup> See Beber, Alessandro and Pagano, Marco, *Short-Selling Bans Around the World: Evidence from the 2007-09 Crisis* (November 2009). CEPR Discussion Paper No. DP7557. Available at SSRN: <http://ssrn.com/abstract=1533163>. See also Kolasinski, Adam C. Reed, Adam V. and Thornock, Jacob R., *Prohibitions versus Constraints: The 2008 Short Sales Regulations* (October 5, 2009). AFA 2010 Atlanta Meetings Paper. Available at SSRN: <http://ssrn.com/abstract=1365037>.

## **7. Comparison with Other Markets**

No examination of the U.S. equity market would be complete without a comparison with markets in other financial instruments and with other equity markets around the world.

### **7.1 Other equity markets**

The U.S. equity market is characterized by its open architecture, which makes it easy for those with innovative ideas to enter the market. This intense competition has led to a dramatic fall in execution costs. Many other countries are behind the United States; especially those that accepted exchange monopolies. Europe has moved quickly toward a competitive exchange structure, and many of the same trends of declining legacy exchange market share seen in the U.S. are visible there as well. However, trade reporting in Europe generally lags behind the United States, and no equivalent official NBBO exists there. We note once more the ITG results that show U.S. transactions costs are among the lowest in the world.

### **7.2 Other financial markets: U.S. fixed Income**

In the U.S. fixed income world, no definitive source for price information exists that is comparable to the National Best Bid and Offer (NBBO) and last sale for equities. Brokerage firms typically trade as principals against their retail customers, and retail customers often cannot easily determine the quality of their executions.

For example, U.S. Treasury bonds are considered to be among the safest and most liquid securities in the world. Treasury bonds have characteristics that should make their transactions cost among the lowest in the world: huge trading volumes, large supply, and virtually no traders who possess better information than the dealers. Published quotations in the Wall Street Journal's online edition typically show institutional spreads of about 1/32nd of 1%, about 3 basis points. Yet retail investors typically face much wider spreads, on top of which they pay commissions as well. For example, a recent online retail quote for the November 2039 4.375% long bond from one of the largest brokerage firms was 97.30 bid and 98.75 offered, or a bid-ask spread of 145 basis points (1.45%) of the bond's par value. In contrast, the bid-ask spread on a Treasury ETF such as the iShares Barclays 20+ Year Treasury Bond (TLT) is typically only one or two cents on a \$92 stock, or around one or two basis points. It is clear that the present U.S. equity markets deliver far lower trading costs to retail investors than do the fixed-income markets.

## 8. Recommendations for SEC Rulemaking

### 8.1 Make-or-take pricing

Make-or-take pricing has significantly distorted trading in the National Market System in which best execution standards and mandated order routing determine execution venues and execution prices. The distortions arise because orders are priced on different bases in different markets. The problem is large and growing larger as bid-ask spreads and commissions decrease. It has distorted order routing decisions, aggravated agency problems among brokers and their clients, unlevelled the playing field among dealers and exchange trading systems, produced fraudulent trades, and produced quoted spreads that do not represent actual trading costs.

In the make-or-take pricing model, exchanges (and some alternative trading systems) charge an access fee for executing marketable orders that fill against (take) standing orders and provides a liquidity rebate for executed standing orders that make markets. The difference between the access fee and the liquidity rebate is the net fee that the make-or-take exchanges earn for arranging trades. In contrast, exchanges that charge a transaction fee for arranging trades simply charge the buyer, the seller, or the member trader a fee for executed trades. The transaction fee and the net fee earned by make-or-take exchanges are of similar magnitudes so that access fees are generally greater than transaction fees. (On rare occasions, the relationship has been inverted when an exchange runs a promotion.)

At first glance, the make-or-take pricing model appears attractive because it seems to reward makers for good behavior—offering liquidity. To earn the liquidity rebate, makers tend to compete to offer better prices, which reduces bid-ask spreads on average. However, in competitive markets, the access fee offsets the narrower average quoted spreads so that takers are no better or worse off on average. Likewise, the liquidity rebate offsets the narrower quoted spreads so that makers also are no better or worse off on average. The actual economic bid-ask spread at these exchanges is the quoted bid-ask spread plus twice the access fee. (This sum is the total cost of simultaneously buying and selling using marketable orders.) In competitive markets, the actual spread will not depend on how high the access fees and liquidity rebates are, so long as the difference between them is constant. Traders simply adjust their quoted prices so that the net prices that they pay or receive are the same on average. The make-or-take pricing model thus would appear to accomplish nothing besides reducing quoted spreads and thereby obfuscating true economic spreads, which are the net spreads inclusive of the access fees and liquidity rebates.<sup>5</sup> The obfuscation makes it more difficult for traders to recognize the true costs of their trading.

The obfuscation problem may be best understood by considering its analog in retail commerce conducted over the Internet. Some retailers quote low prices for their products so that search engines rank their offers high. They then charge high shipping and handling fees so that their net prices are as high as or higher than their competitors. Variation in shipping and handling fees that is unrelated to actual costs creates substantial price confusion and can lead to poor decisions by

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<sup>5</sup> In some markets, the minimum price variation—the tick size—sets a binding floor on the bid-ask spread. In those markets, makers offer more size at make-or-take exchanges than they would at traditional transaction fee exchanges to increase the probability that an order will be routed to them. The additional size will expose them to greater losses to information traders, and the greater losses offset the liquidity rebates that they obtain.

uninformed shoppers. Some Internet search engines attempt to solve this problem by ranking offers by net price rather than quoted price.

Unfortunately, make-or-take pricing has effects on order routing decisions that are substantially more significant than simple obfuscation of true spreads. Brokers make most order routing decisions based on the quoted prices that their clients will receive, and not the true net prices of the trades. They typically route customer limit orders that they cannot immediately execute to make-or-take exchanges where the broker will receive a rebate—which usually is not passed on to the customer—for the order execution. They route marketable orders to exchanges, and alternative trading systems if they have the same prices, but do not charge access fees. They also may route marketable orders to internalizing dealers who promise to fill orders at the National Best Bid or Offer (NBBO).

These routing decisions ensure that makers at make-or-take exchanges receive later executions than they otherwise would receive. At a given price, the standing orders of such makers execute only after no size remains at that price at venues that do not charge access fees. Since brokers route marketable retail orders to internalizing dealers to avoid access fees, the traders who pay the access fees at make-or-take exchanges typically are proprietary and institutional traders whose orders internalizing dealers will not accept. These traders tend to be well-informed traders. The retail orders routed to make-or-take exchanges thus always execute when prices move against them, but they may not execute as often as they would otherwise execute when prices move in their favor. The problem results because retail customers usually do not receive the liquidity rebates, and because standards for best representation of limit orders are primitive in comparison to standards for best execution of marketable orders.

Make-or-take pricing also affects the competition between internalizing dealers and exchanges. Best execution principles require that dealers who internalize retail order flow match the National Best Bid or Offer (NBBO) when trading. The artificially decreased quoted bid-ask spreads that result when make-or-take pricing hurt internalizing dealers because they must trade at tighter spreads on average, but they cannot charge access fees to their customers, and they do not receive liquidity rebates when they trade. As a result, this pricing model ensures that internalizing dealers compete at a disadvantage with make-or-take exchanges. The problem is exacerbated by the fact that make-or-take pricing distorts brokerage order routing decisions so that internalizing dealers fill most retail orders.

The make-or-take pricing model forces dealers into organized markets where they can receive liquidity rebates. Unfortunately, they cannot provide better prices on a selective basis to largely uninformed retail traders in such markets as they can and do when filling retail order flows.

Make-or-take pricing also affects the competition between the make-or-take exchanges and the transaction fee exchanges. Regulation NMS trade-through rules require that exchanges must route marketable orders to other exchanges that provide better prices. When the other exchanges are make-or-take exchanges, the routing exchange must pay the destination exchange the access fee. Some exchanges absorb the loss while others pass the access fee along to their customers. Those that accept the loss clearly are hurt. Moreover, they are exposed to customers who strategically route orders through them to avoid the take fee. Those exchanges that pass the fee along to their customers force their customers to pay fees that they generally do not expect and could only avoid by adding immediate-or-cancel instructions to their orders.

To avoid these problems, many exchanges have created flash trading facilities. These facilities help them find traders who are willing to match or improve the prices at the make-or-take exchanges, so that the transaction fee exchange can retain the execution and thereby avoid the access fee. In this sense, flash trading can be viewed as a way to limit the “unintended consequences” of the “make-or-take” pricing framework under the current regulatory system.

The distortions induced by make-or-take pricing perhaps are illustrated best with an explanation of how proprietary traders can exploit — and we understand are exploiting — the current market structure. Suppose a proprietary trader can post orders at a make-or-take exchange and receive a liquidity rebate of 0.3 cents/share when their standing orders execute. Suppose further that they can trade through one of several Internet brokers that allow their customers to trade unlimited size at a commission of \$9.99 per trade. To exploit the make-or-take problem, the proprietary trader will post an aggressively priced buy (or sell) order at the make-or-take exchange in a low price stock for which the bid-ask spread is wider than the minimum price variation, and thereby improve the NBBO in that stock. The trader then immediately will submit a marketable sell (or buy) order at the same price to the Internet broker. If the Internet broker routes the order to the make-or-take exchange, the liquidity rebate will be greater than the \$9.99 if the trade is for more than 3330 shares. If the order is sufficiently large, the proprietary trader will profit and the broker will lose the take fee. Alternatively, if the Internet broker routes the order to an internalizing dealer, the internalizing dealer will fill the order at the NBBO and then very likely immediately cover his position by taking the order at the make-or-take exchange for his own account. Again, the proprietary trader will profit (if the order is sufficiently large) and the dealer will lose the take fee. Brokers tell us that they believe this abuse is already taking place. Although trading this strategy is potentially illegal, clever traders certainly would be able to accomplish its objective through the coordinated use of seemingly unrelated accounts. Alternatively, Incorporation of a slight modification of this strategy into an otherwise profitable proprietary dealing strategy substantially increases the profits that could be made.

The make-or-take pricing problem is growing larger as bid-ask spreads and commissions decrease. When Regulation NMS limited access fees to 0.3 cents per share, spreads, commission, and dealer trading profits per share were much larger than they are presently. The growth of electronic trading, better order routing systems, and proprietary trading has substantially decreased spreads commissions and per share dealer profits, while substantially increasing trading volumes. The constant access fee consequently has become a relatively larger determinant of routing decisions, and ultimately of transaction costs.

The SEC could solve these make-or-take problems by requiring that all brokers pass through access fees and liquidity rebates to their clients. Presently, some brokers do this voluntarily or upon request by their clients. However, the practice is complex and therefore confusing to most customers. Most retail brokers provide single fee commissions because this single fee pricing appeals most to their customers.

We recommend that the SEC require that all brokers pass through the fees and liquidity rebates to their clients. Doing so would ensure that the customers receive and pay the actual net prices associated with filling their orders. The SEC also should clearly indicate that the principles of best execution apply to net prices and not to quoted prices. These changes would ensure that brokers route all orders to best serve their clients, rather than to enrich themselves. With these

changes, we expect that make-or-take exchanges would quickly change to transaction fee exchanges so that little confusion would actually result.

Alternatively, we recommend that the SEC eliminate access fees. This change would offer a common pricing standard for exchange services and thereby ensure that price quotes are comparable across exchanges.

The elimination of access fees would also cause securities markets to conform to common agency law. Common law generally prevents agents from collecting fees from people seeking to do business with their clients. Such fees are prohibited because they inevitably reduce the value of the business that the clients receive. Oddly, these fees have been accepted in securities markets where exchanges act as agents for the traders that post orders on their books and where brokers act as agents for their clients. Exchanges should not be allowed to require that traders pay them to trade with their clients; neither should brokers be allowed to receive liquidity rebates for routing client limit orders to make-or-take exchanges. In other contexts, these payments would be recognized as illegal kickbacks.

## **8.2 Naked sponsored access**

Proprietary high frequency trading can expose markets to systemic risks if an electronic trader's trading system submits orders that lead to trades that the trader cannot settle. Such settlement failures may arise when a programming error or an unanticipated response to erroneous data causes a trading system to go out of control and issue unintended orders. Settlement failures may also arise when traders who know that they are bankrupt continue to trade with the hope that subsequent events may reverse their fortunes before anyone becomes aware of their financial problems.

The trades that result in either of these events can be very costly to other traders when they fail to settle. The failures may result because the exchange breaks (nullifies) the trades, or because the initiating trader is financially unable to settle the trades. Both processes are disruptive at best, and often quite costly to other traders.

Exchanges generally break trades if the trades obviously were mistakenly ordered. The contra-side traders whose trades occurred at unreasonably high or low prices are disappointed, but they can hardly be surprised when they learn their trades turned out to be too good to be true. The costs of broken orders are incurred by traders who rationally believed that their trades were good and relied upon their confirmations. For example, brokers representing customers to whom they have already reported the trades must either break the trades with their customers or make the trades good on their own accounts. In either event, the brokers lose through degradation in their client relationships or through trading losses that they must place in their error accounts.

Other losses from broken trades arise when traders arrange related trades before learning that the broken trades will be broken. For example, following the sale of one stock, proprietary traders commonly buy a correlated stock to responsibly manage their portfolio risks. When the first trade is broken, they are still left with the second trade, which will become un-hedged. If prices in the second security have changed to their disadvantage, they will lose. Since the second security is correlated with the first security, any reversal in the price of the first security will likely also appear in the second security so that the proprietary trader will far more likely realize a loss rather than a gain in the second position. When exchanges break trades to reverse errors, they make

good on trading losses in related securities. The risk of such events thus is systemic. These considerations make exchanges and other regulators very reluctant to break trades.

Similar problems arise when traders are financially unable to settle their trades. In that case, the trader's broker must settle the trades. Any losses that the broker suffers are due to the broker's failure to adequately monitor and regulate the client's trading. If the broker lacks the capital to settle the trades, the trades must be settled by the clearing member through whom the broker clears trades. Any losses that the clearing member suffers are due to the clearing member's failure to adequately monitor and regulate the introducing broker's business practices and customer's trading. If the clearing member lacks the capital to settle the trades, the clearinghouse must settle the trade, which imposes a cost upon all other clearing members. Aside from creating substantial disruption, the failure of brokers, clearing members, and potentially clearinghouse may cause many other problems as these entities are all bound together through various contractual relationships that may fail in the event of a bankruptcy.

To avoid these problems, governmental regulators, clearinghouses, clearing members, and brokers impose capital requirements designed to ensure that those responsible for settling trades can do so. They also oversee and regulate the trades of those traders whose trades they guarantee. To this end, most brokers examine and approve customer orders before they permit them to interact with the market.

Proprietary electronic trading is most profitable when traders can route their orders for execution as quickly as possible. To avoid the time spent confirming that a trader's orders are acceptable, some brokers have been allowing their clients to submit orders for which the brokers will guarantee execution without first examining and approving those orders. This arrangement is called "naked sponsored access." For the reasons discussed above, this practice introduces systemic risk into the markets if the broker lacks sufficient capital to make good on the clients' trades, should the client be unable to settle those trades.

The SEC recently proposed to prohibit naked access. In principle, the clearinghouse and clearing members introducing trades for brokers who provide sponsored access to their customers should regulate associated risks themselves. However, we believe that the right to interact directly with the markets comes with certain responsibilities, and that these rights and responsibilities should be bound together in a common regulatory framework. Accordingly, all traders who seek direct access to the markets should be registered as broker-dealers. We thus support the proposed rule.

In its rule proposal, the SEC expressed concern about the problem of identifying the origins of proprietary order flow directly routed to the markets in naked sponsored access arrangements. These concerns can involve only issues about which real-time decisions must be made since all order flows ultimately are adequately identified in audit trails. The concern arises if a sponsoring broker permits many traders to route orders in its name. If the order flow proves to be problematic, exchanges or regulators may want to shut it off without shutting off all other order flows routed through that broker and without relying upon the sponsoring broker. We believe that the concerns expressed above provide sufficient basis for restricting naked access. Brokers who fail to manage their clients' trades should risk losing the privilege to introduce orders from all sources. We believe that this risk undoubtedly will encourage brokers to be more effective regulators than they would be if they knew that regulators could shut off access only to identified sources of their order flow.

### 8.3 Misfiring algorithms

In a related area, we are also concerned that, even without naked access, the risk control procedures at a brokerage firm may fail to react in a timely manner when a trading system malfunctions. In the worst case scenario, a computerized trading system at a large brokerage firm sends a large number of erroneous sell orders in a large number of stocks, creating a positive feedback loop through the triggering of stop orders, option replication strategies, and margin liquidations. In the minutes it takes humans at the exchanges to react to the situation, billions of dollars of damage may be done.

Currently our exchanges have no automatic systems that would halt trading in a particular stock or for the entire market during extraordinary events.<sup>6</sup> It is our understanding that the circuit breakers instituted after the Crash of 1987 would be manually implemented, which could take several minutes.<sup>7</sup> These circuit breakers are triggered only by changes in the Dow Jones Industrial average, so severe damage could be done to other groups of stocks, and the circuit breakers would not kick in. Also, a misfiring algorithm could also create a “melt-up” as well. We recommend that the exchanges and clearinghouses examine the risk and take appropriate actions. Perhaps the issue most simply could be addressed by requiring that all computer systems that submit orders pass their orders through an independent box that quickly counts them and their sizes to ensure that they do not collectively violate preset activity parameters.

### 8.4 Flash Orders

The SEC should ensure the use of flash trading facilities remains voluntary. Whether the flash order instruction is an opt-in instruction or an opt-out instruction is not important. If traders or their brokers regularly measure and act to control their transaction costs, they will determine whether flash orders are in their interest and act accordingly.

With two exceptions, the SEC should make it illegal for flash order participants to take liquidity on the same side at a price equal or better than the price of a flash order that they have seen within one second of seeing that order. Flash participants should be exempt from this restriction if they filled the flash order or when they are trading to fill another flash order.

The SEC should encourage exchanges to conduct a sealed-bid auction among the flash participants during the flash period to allocate the flash order to the participant offering the best price, rather than to the participant who is first to respond. Since the bids will be sealed, they should not be subject to any minimum price variation.

### 8.5 Front-running orders in correlated markets

Common law, regulation, and basic fiduciary principles prohibit broker-dealers from trading ahead of their clients. In particular, the Manning decision restricts brokers-dealers buying or

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<sup>6</sup> The exchanges do have some pre-trade filters designed to catch bad orders based on criteria such as size and frequency of submission. The NYSE has a procedure to slow down trading when Liquidity Replenishment Points (LRP) are hit, but this procedure only applies to the traditional NYSE system. We understand that this LRP mechanism does not apply to NYSEArca or to other exchanges, which would continue with their normal automated trading.

<sup>7</sup> The circuit breakers are activated at various levels of decline in the Dow Jones Industrial Average, and vary with the time of day when they are activated. If a 10% drop occurs before 2:00 pm, then trading is halted for one hour, but would have no effect after 2:30pm. A 30% drop at any time would halt trading for the remainder of the day. See <http://www.sec.gov/answers/circuit.htm> and <http://www.nyse.com/press/1254305776282.html> for more details on the circuit breakers.

selling a security when they hold an open order for that security. Broker-dealers cannot buy (or sell) for their house accounts before filling their customer buy (or sell) market orders, and they can only buy (or sell) for their house accounts at prices one penny or higher (or lower) than the prices of their customers' open limit buy (or sell) orders. These restrictions prevent brokers-dealers from profiting by front-running the price effects of their customers' orders, and from taking for themselves liquidity that should go to their clients.

We are concerned that with the growth in proprietary high frequency trading by brokers and dealers who also have access to information about open client orders, some brokers-dealers may engage in a proprietary trading strategy that uses information in customer orders to profit by trading securities and contracts whose prices are correlated with the prices of the securities and contracts for which their customers have submitted orders. In particular, we believe that broker-dealers could profit from the following strategy at the expense of their customers:

1. Based on information in the client order flows that the broker-dealer sees, extract predictions for future price changes.
2. Trade on these predictions in securities for which you are not presently holding open client orders.

We are not aware of any broker-dealers who presently are engaged in such trading, but we know that the expertise, infrastructure, and data necessary to profitably conduct such proprietary trading are widely available. Indeed, given the very small bid-ask spreads that characterize most markets, dealing is only profitable to the extent that dealers can anticipate future price changes. We know that electronic proprietary traders employ models that predict future price changes from publicly available information. Imagining that broker-dealers might try to predict future prices using information about their customers' orders is not farfetched.

Although broker-dealers conducting such trades would not trade in the same securities in which they hold orders, the effect of their trading could hurt their clients. For example suppose that a broker-dealer holds a large order to buy the homebuilder Pulte Homes that will certainly require that the stock price rise to completely fill the order. The broker-dealer could profit by buying other homebuilders such as D R Horton or Lennar since the prices of their stocks are highly correlated with the price of Pulte's stock. When the execution of the Pulte purchase causes the Pulte stock price to rise, the price of other homebuilder will rise as arbitrageurs buy the other homebuilders and sell Pulte, and as dealers and other traders in the other homebuilders adjust their quotes and orders to reflect the information that they may infer from the Pulte price rise. The harm to the broker-dealer's client come from the reverse effect: As the broker-dealer buys other homebuilders and pushes up their stock price up, or simply lifts liquidity so that traders become aware that their prices are more likely to rise than fall in the near future, the price of Pulte stock will also rise, which will harm the client. We are not aware of specific rules that prohibit these activities.

FINRA released a rule proposal in December 2008 on a related topic.<sup>8</sup> FINRA proposes to prohibit brokers from front-running a client block order in a security, security future on that

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<sup>8</sup> FINRA Release 08-83 at

<http://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p117629.pdf>. The comment period ended Feb 27, 2009 with only three comments submitted. No action appears to have been taken.

security, or option on that security in any of the other two instruments (“all related financial instruments”). The proposed rule is limited to block orders and clearly limited to “related financial instruments,” where the relation is legal/contractual and not based on correlation. The fact that FINRA is considering this rule indicates to us that the correlated security front-running issue is an open legal issue. However, in the request for comment FINRA notes, “... FINRA believes that this type of trading would generally violate existing FINRA rules, such as FINRA Rule 2010 (Standards of Commercial Honor and Principles of Trade) ...” It appears to us that FINRA believes the rule is necessary because it cannot effectively enforce Rule 2010 without the proposed rule.

We are concerned about the potential abuses that would result if broker-dealers could employ the front-running strategy we outline. Those broker-dealers that use this strategy would have a significant advantage over those who do not: Competition among broker-dealers who exploit their order flow this way would tighten spreads and lower commissions as they compete to fill their orders and compete to obtain the order flows necessary to make their inferences. Moreover, since the value of exploiting order flow information increases with the total order flow processed, permitting broker-dealers to pursue such proprietary trading would be anticompetitive because greatest advantage would go to the largest firms, which then would grow larger.

We recommend that the SEC specifically prohibit the use of information gleaned from open client orders in proprietary trading strategies. Definitive evidence of any rule violations would be found by examining computer codes.

## **8.6 Sub-penny pricing**

The minimum price variation was a full eighth of a dollar at the start of the 1990s. It decreased to a sixteenth and finally to a penny when markets completed decimalization in 2001. With each of these decreases, bid-ask spreads dropped, but so too did displayed order sizes.

The decrease in spreads was due to competition among traders to provide better prices, much of which had been frustrated by the binding constraint that a formerly large minimum price variation placed on bid-ask spreads. These smaller spreads benefit retail traders who submit small marketable orders that typically execute without price impact.

The decrease in displayed order sizes occurred because traders will not quote for significant size when they are exposed to trading losses that they incur when trading with informed traders or with large uninformed traders whose orders move prices significantly. Displayed sizes also decreased because smaller tick sizes reduced the incentives to place orders early and because small tick sizes facilitate parasitic quote-matching trading strategies designed to extract option values from standing orders.

Bid-ask spreads for many actively traded stocks are now often just one cent for the reasons described above and also due to the recent drop in stock prices of many actively traded stocks. For stocks trading above one dollar, Regulation NMS’s prohibition on sub-penny quotes sets a binding lower bound of one cent on their spreads. However, trades can be—and often are—executed on smaller increments.

Some market participants recently have called for a further decrease in the minimum price variation, perhaps to a mil. This decrease would further lower bid-ask spreads for stocks where spreads are commonly one penny, and it would further lower displayed sizes in those stocks.

A decrease in tick size would have the beneficial effect of reducing the minimum price variation to the same order of magnitude as the access fees and liquidity rebates that make-or-take trading systems charge and pay their customers. Regulation NMS currently caps access fees at three mills per share. With a one-mil price increment, the SEC could easily require that quoted prices reflect access fees.<sup>9</sup> We believe that this change would quickly eliminate the make-or-take pricing model and the problems associated with it.

Despite these benefits, we do not recommend that the minimum price variation be decreased further. We are particularly concerned about the effect of a small minimum price variation on order display and on transaction costs of large traders, most of whom represent pensions, endowments, and mutual funds. Dark pools and hidden order exist because large traders are reluctant to reveal their orders. Their reluctance in large part is due the losses they suffer from traders who step in front of their orders to extract their option values—the so-called “penny strategy” that we identified above as quote-matching. The decrease in tick sizes over the last two decades is responsible for much of the growth in dark venues.

As discussed above, the SEC can solve make-or-take problem by simply requiring that access fees and liquidity rebates be passed along to clients. Alternatively, the SEC could establish a single pricing standard for exchange fee pricing by further reducing the maximum permitted access fee.

Sub-penny pricing also would be burdensome to the market information systems that deliver information to trader’s screens. The primary burden would not be transmission capacity, but rather screen real estate. An additional digit would further clutter screen displays. The data vendors would have to substantially modify their systems to present sub-penny prices, and users would see more data but less information.

Sub-penny pricing also would further exacerbate the Manning penny problem that dealers face. When dealers hold a client buy order at priced at 20.00, if they buy from another client at any price below 20.01, they must give the fill to their customer at 20.00. The dealers lose the difference while providing price improvement to their clients—an untenable proposition in the long run. A change in the tick size thus would require some change in the Manning rule. However, that rule sensibly protects clients from strategies that dealer might deliberately take to disadvantage their clients without their knowledge. The rule probably should be modified to exempt trades that dealers make when compelled to by reasonable business models.

Finally, we note that issuers concerned about the one cent binding constraint upon bid-ask spreads in their low priced stocks can reverse split their stocks. Companies do not like to engage in such transactions because they are costly and disruptive, and because they draw attention to their poor financial performance. The SEC might remove some of the stigma by suggesting that all companies interested in conducting reverse splits do their splits on the same day.

#### **8.7 Rules 605 and 606 and consumer disclosures of broker quality**

SEC Rule 605 requires market centers to reveal information about the quality of their executions. Rule 606 requires brokerage firms to disclose information about order routing and payment for

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<sup>9</sup> Quantity discounts in access fees would complicate such a rule.

order flow practices. The intent of these rules was to focus attention on execution quality. The rules should be updated with the intent of providing information usable to consumers about the execution quality delivered by the brokerage firms. For example, a brokerage firm could provide statistics giving execution times along with the percentages of orders filled at the quote, better than the quote, and worse than the quote, for different size buckets including odd lots.

## 9. Conclusion

Equity markets have evolved quickly over the last decade. The U.S. equity market is now an open architecture market in which entrants with innovative technology can compete effectively. This freedom has led to a decline in market shares for previously dominant exchanges. The character of trading has also changed. We have moved from a market in which humans manually traded to one in which computers execute the bulk of trades without human intermediation. Volume is higher. Trade size has become smaller as it is now cheaper for institutions to divide orders up into smaller slices to reduce their market impact.

Many innovations in market structure help investors do what they have always done, only in more advanced ways. For example, so-called dark pools permit investors to trade while limiting the dissemination of their trading information. Traders have always limited the display of their orders by using the upstairs block market or through instructions given to floor brokers on NYSE and AMEX trading floors.

Transactions costs have fallen to very low levels, and trading volumes have increased, as basic economics predicts. The increased liquidity reduces corporate costs of capital because investors will pay more for investments that are not costly to enter and exit.

Lower transactions costs also allow computerized investors to provide cost effective market improving services. For example, arbitrageurs ensure that the prices of related instruments, such as a stock and its derivatives, are in the proper alignment. Thus, when retail investors purchase S&P500 ETFs, they depend on the arbitrageurs ensure that the ETF price reflects the prices of the constituent stocks in the ETF.

The ability to trade at low cost allows high-speed traders to provide great liquidity to the markets. Their willingness to devote capital to buy when others desire to sell and vice versa smoothes out the price effects of order imbalances and further reduces transactions costs for end investors.

Although U.S. equity market structures are operating very efficiently, some changes can produce further improvement. The requirement that brokers ignore exchange access fees when seeking “best execution” defies economic rationalization and leads to market distortions. Front running orders through trades in correlated instruments can harm brokerage customers and should be banned. Markets and clearinghouses also should consider how to best protect our high-speed markets from a high-speed meltdown caused by programming mistakes.

Electronic traders now provide most liquidity in U.S. equity markets. Their greater efficiencies allowed them to largely displace traditional dealers. Although the resulting markets are more liquid than they have ever been, the unintended consequences of new regulations could easily damage them. For example, even a small transactions tax on trading would seriously reduce liquidity because the margins on which electronic traders operate are so small. Accordingly, regulators must carefully consider all implications of proposed regulations lest they accidentally harm our markets and thereby retard or reverse the economic recovery we presently are experiencing.

## **Author Biographies**

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Professor Angel specializes in the structure and regulation of financial markets around the world, and he has visited over 50 financial exchanges around the world. His current research focuses on short selling and regulation. He teaches undergraduate, MBA, and executive courses, including Financial Crises: Past Present and Future. Other courses include World Equity Markets and Regulation in Financial Markets. Professor Angel began his professional career as a rate engineer at Pacific Gas and Electric, and then BARRA (now part of Morgan Stanley) where he developed equity risk models. He has also served as a Visiting Academic Fellow in residence at the National Association of Securities Dealers (NASD – now FINRA) and also as a visiting economist at the Shanghai Stock Exchange. He has also been chairman of the Nasdaq Economic Advisory Board and a member of the OTC Bulletin Board Advisory Committee.

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Professor Harris's research, teaching, and consulting address regulatory and practitioner issues in trading and investment management. Chairman Harvey Pitt appointed Dr. Harris to serve as Chief Economist of the U.S. Securities and Exchange Commission in July 2002 where he continued to serve under Chairman William Donaldson through June 2004. As Chief Economist, Harris was the primary advisor to the Commission on all economic issues. He contributed extensively to the development of regulations implementing Sarbanes-Oxley, the resolution of the mutual fund timing crisis, the specification of Regulation NMS (National Market System), the promotion of bond price transparency, and numerous legal cases. Professor Harris currently serves on the boards of Interactive Brokers, Inc., the Clipper Fund, Inc., and CFALA, the Los Angeles Society of Financial Analysts. Other professional service has included year-long assignments to the U.S. Securities and Exchange Commission and to the New York Stock Exchange immediately following the Stock Market Crash of 1987. Dr. Harris received his Ph.D. in Economics from the University of Chicago in 1982.

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Professor Spatt is a well-known scholar studying financial economics with broad interests in financial markets. He has extensively analyzed market structure, pricing and valuation, and the impact of information in the marketplace. His co-authored 2004 paper in the Journal of Finance on asset location won TIAA-CREF's Paul Samuelson Award for the Best Publication on Lifelong Financial Security. In the past, he served as Chief Economist of the U.S. Securities and Exchange Commission and Director of its Office of Economic Analysis from July 2004 through July 2007. Additionally, he has served as Executive Editor and one of the founding editors of the Review of Financial Studies, President and a member of the Founding Committee of the Society for Financial Studies, President of the Western Finance Association, and is currently an Associate Editor of several finance journals. He earned his Ph.D. in economics from the University of Pennsylvania and received his undergraduate degree from Princeton University.