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# Technology's Latest Market Manipulator - High Frequency Trading: The Strategies, Tools, Risks, and Responses

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**TECHNOLOGY'S LATEST MARKET MANIPULATOR? HIGH  
FREQUENCY TRADING: THE STRATEGIES, TOOLS, RISKS, AND  
RESPONSES**

*Tara Bhupathi*<sup>\*</sup>

*The development of high frequency trading technology has created significant controversy in the financial markets, especially in light of the increased use of tools such as naked access, flash orders, and co-location. This recent development argues that the SEC is correct in both banning naked access, because it increases risk of market detriment, as well as eliminating flash orders, due to their potential to aid in market manipulation. Further, the SEC's lack of regulatory response to high frequency trading and co-location should be maintained. Since neither mechanism presents a risk of market detriment or manipulation on its own, and both seem to be criticized solely because they break from traditional market fundamentals, it would unnecessarily stifle technological development to insist on banning or minimizing the use of these strategies.*

**I. INTRODUCTION**

It's the summer of 1945, and Luise, a college student, interns for the New York Stock Exchange. Her job is to answer the telephone and handwrite the caller's trade requests. This information is then passed, via messenger, to a trader who eventually completes the transaction. Sixty-five years later, Bill, a software engineer with a Ph.D. in computer science, works for a small hedge fund that specializes in United States equity trading. His job entails figuring out how to decrease the amount of time it takes his trades to confirm—in microseconds.

Luise and Bill's contrasting experiences offer a historied perspective of technology's impact on financial markets. Rapid technological advances have affected every aspect of society, causing the legal world to either choose to judicially adapt old laws and policies to the new digital situations or to legislatively create

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new doctrines to deal with unforeseen challenges.<sup>1</sup> This Recent Development studies the decision of whether to create new regulations as the current “technological arms race”<sup>2</sup> rages in the financial markets, creating innovative trading strategies and tools. Some fear a continued lack of regulation will allow for market manipulation, an unfair advantage for those with enhanced technology, and potential doomsday.<sup>3</sup> While these concerns are legitimate with respect to strategies which side-step necessary risk management oversight, more information is needed before regulations are warranted on the other newly developed methods and mechanisms which do not present imminent market risk.

This Recent Development focuses on the two major effects technology has historically had on the markets: (1) increased risk of market detriment and (2) erosion of the fundamental principles of the market system. Part I provides a historical background of the relationship of technology with the financial markets and the relevant regulations. Part II serves as an introduction to current controversial strategies and tools: high frequency trading, flash orders, naked access, and co-location. Part III discusses the legal issues associated with these developments and the response of the Securities Exchange Commission (“SEC”) and individual exchanges. Finally, Part IV argues that regulatory responses to new strategies and tools should vary depending on the perceived

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<sup>1</sup> See generally ORIN S. KERR, *COMPUTER CRIME LAW* 25–26 (West 2d ed. 2009) (comparing the view that “‘computer-specific’ . . . criminal statutes [would be] unnecessary, imprecise, clumsy, over-inclusive, or ineffective” with the view that new statutes should be created to “minimize the risk of an overly expansive law that could chill innovation and technological development”).

<sup>2</sup> Laurence Fletcher, *BlueCrest Spends Big on Rapid-Trading “Arms Race”* REUTERS, Dec. 2, 2009, <http://www.reuters.com/article/idUSTRE5B112120091202> (on file with the North Carolina Journal of Law & Technology).

<sup>3</sup> See Edward Kaufman, *Preventing a Horror Movie Ending in the US Markets*, FINANCIAL TIMES, Oct. 16, 2009, <http://www.ft.com/cms/s/0/9d234948-ba31-11de-9dd7-00144feab49a.html> (on file with the North Carolina Journal of Law & Technology); see also Charles Duhigg, *Stock Traders Find Speed Pays, in Milliseconds*, N.Y. TIMES, July 24, 2009, at A1 & A17, available at <http://www.nytimes.com/2009/07/24/business/24trading.html> (noting that Senator Kaufman, a staunch critic of the various technologies that have developed recently, has urged the SEC to, at the very least, monitor the growth and begin proposing regulations).

impact on the market. Specifically, while immediate bans are warranted to prohibit technology that increases risk of market failure, regulation of mechanisms that aid in market manipulation or that negatively impact liquidity and efficiency must first be justified through comprehensive and conclusive evidence of causation. Further, technology charged with affecting market fundamentals, such as long-term investor primacy<sup>4</sup> or the specialist system,<sup>5</sup> must not be restricted merely due to the traditionalists' desire to stunt market evolution in an increasingly technologically advanced world.

## II. BACKGROUND

On January 21, 2010, the SEC issued a concept release<sup>6</sup> seeking comments and suggestions from the public regarding equity market structure.<sup>7</sup> One major concern highlighted in the release is high frequency trading,<sup>8</sup> with the SEC seeking information on the new trading strategy, the tools associated with it, and the perceived risks involved with its use.<sup>9</sup> Before further discussing high frequency trading, it is helpful to provide a focused look into technology's impact on the securities market since the

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<sup>4</sup> Long-term investors are "market participants who provide capital investment and are willing to accept the risk of ownership in listed companies for an extended period of time." Concept Release on Equity Market Structure, Exchange Act Release No. 34.613.58, 75 Fed. Reg. 3594, 3603 (Jan. 21, 2010) [hereinafter Concept Release] (noting that the SEC "particularly focuses on the interests on long-term investors").

<sup>5</sup> The specialist system refers to the traditional "manual trading floors and [over-the-counter] market makers that trade directly with customers." *Id.* at 3607.

<sup>6</sup> The concept release is a request for "public comment on a wide range of market structure issues, including high frequency trading . . . . The Commission intends to use the public's comments to help determine whether regulatory initiatives to improve the current equity market structure are needed and, if so, the specific nature of such initiatives." *Id.* at 3594.

<sup>7</sup> *Id.*

<sup>8</sup> See *infra* Part III.A.

<sup>9</sup> Concept Release, *supra* note 4, at 3606–12.

Securities Exchange Act of 1934 ("Exchange Act")<sup>10</sup> created the SEC,<sup>11</sup> and secondary market regulation commenced.

A. *Evolution of Market Technology*

Historically, the purpose of securities regulation has been to form effective, fair, and honest markets.<sup>12</sup> In line with these values, two developments since the Exchange Act have had a significant impact on the evolution of today's technologically advanced markets. First, Congress directed the SEC to create and maintain a national market system through the 1975 Amendments to the Exchange Act ("the 1975 Amendments").<sup>13</sup> The purpose of the centralized system was to "foster efficiency, enhance competition, increase the information available to brokers, dealers, and investors, facilitate the offsetting of investors' orders, and contribute to [the] best execution of such orders."<sup>14</sup> The 1975 Amendments included a continuing obligation to evaluate and revise market framework and update regulations.<sup>15</sup>

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<sup>10</sup> 15 U.S.C. § 78(a-ii) (2006).

<sup>11</sup> *Id.* at § 78(b). The purpose of the SEC's rule promulgation is to protect the national public interest in securities markets, "remov[ing] impediments . . . impos[ing] requirements [and] . . . insur[ing] the maintenance of fair and honest markets." *Id.* The Commission was created based upon Congress finding that exchange of securities across the country and abroad has a great impact on interstate commerce, the federal tax system, national credit, and the banking system. *Id.* This link was found due to the enormous volume of transactions, the market's susceptibility to manipulation, and the immediate action required due to the severe impact a national emergency can have on markets, requiring immediate action. *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> 15 U.S.C. § 78k-1 (2006) (stating that since "[t]he securities markets are an important national asset which must be preserved and strengthened [and] [n]ew data processing and communications techniques create the opportunity for more efficient and effective market operations [and] [i]t is in the public interest and appropriate for the protection of investors and the maintenance of fair and orderly markets . . . [and] [t]he linking of all markets for qualified securities through communication and data processing facilities," the creation of a national market system is in the nation's best interest).

<sup>14</sup> *Id.* § 78k-1(a)(1)(D). Congress explicitly directed the SEC to create and maintain the national market system. *Id.* at (a)(2).

<sup>15</sup> *Id.* § 78k-1(a)(3)(c) (calling for studies, recommendations, and modifications to the national market system).

Second, in 2005 the SEC enacted Regulation National Market System (“Reg NMS”),<sup>16</sup> which was “designed to modernize and strengthen the regulatory structure of the U.S. Equity Markets” for the purpose of “achiev[ing] the objectives of efficient, competitive, fair, and orderly markets that are in the public interest and protect investors.”<sup>17</sup> With Reg NMS, the SEC revised the national market system rules due to drastic changes which had occurred since the 1975 Amendments, including the expansive use of advanced trading technologies.<sup>18</sup> One example of the effect of Reg NMS on market structure was that it enabled the New York Stock Exchange (“NYSE”) to implement automated trading alongside manual trading, marking the end of a 214-year tradition of trading exclusively on the “famed floor.”<sup>19</sup> Today, automated trading comprises the majority of overall market activity.<sup>20</sup>

With the assistance of the 1975 Amendments, Reg NMS and other revisions to market framework,<sup>21</sup> the “continual evolution of

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<sup>16</sup> 17 C.F.R. § 242 (2005).

<sup>17</sup> Regulation NMS, Exchange Act Release No. 34,518.08, 70 Fed. Reg. 37496, 37497 (Aug. 29, 2005). The key tenet of Reg NMS is top of book protection. *Id.* This means that every broker dealer and market center was required to upgrade its technology so that the best bids and offers were protected quotes. *Id.* (introducing the “Order Protection Rule”).

<sup>18</sup> *Id.* at 37497.

<sup>19</sup> Concept Release, *supra* note 4, at 3595 n.6 (citing Pierre Paulden, *Keep the Change*, INSTITUTIONAL INVESTOR (December 19, 2006) (“Friday, October 6 [2006], was a momentous day for the New York Stock Exchange. That morning the [New York Stock Exchange] broke with 214 years of tradition when it began phasing in a new hybrid market structure that can execute trades electronically, bypassing face-to-face auctions on its famed floor.”).

<sup>20</sup> *Id.* at 3594.

<sup>21</sup> For example, in 1998 the SEC adopted the Regulation of Exchanges and Alternative Trading Systems (“Reg ATS”) allowing the rise of electronic exchanges. *See* Regulation of Exchanges and Alternative Trading Systems, Exchange Act Release No. 34,407.60, 63 Fed. Reg. 70844 (Dec. 22, 1998). The purpose of the regulation was to revise current market framework to better accommodate the developments due to rapid technological growth. *Id.* at 70845. The implementation of Reg ATS led to companies increasing their investments in the development of technology in order to compete in the newly created markets. *See also* Laura Unger, Commissioner, Securities and Exchange Comm’n, *Speech by SEC Commissioner: Regulation of U.S. Equity Markets: Implications for Innovation, Competition, & Efficiency* (Mar. 17, 1999),

technologies for generating, routing, and executing orders . . . . [D]ramatically improved the speed, capacity, and sophistication of the trading functions that are available to market participants.”<sup>22</sup> This rapid development in technology allowed for faster market data analysis, dispersal, and trade implementation—which led the SEC to request comment on “market structure issues, including high frequency trading,” in January, 2010.<sup>23</sup>

Prior to high frequency trading, the SEC faced technology-generated issues such as program trading<sup>24</sup> and front-running.<sup>25</sup> These trading strategies were considered suspect at the time of their development, with the former raising issues of increased risk of market detriment<sup>26</sup> and the latter perceived as inconsistent with the fundamental framework and purposes of the market system.<sup>27</sup> Today, these same concerns surround high frequency trading, naked access, flash orders and co-location.<sup>28</sup> A brief discussion of how these issues were handled gives insight into how a regulatory response should be structured today.

#### B. *Examples of Technology Raising Concerns*

Program trading is the “buying and selling of a large number of stocks . . . simultaneously . . . requir[ing] complex computer analyses.”<sup>29</sup> Due to “improvements in communications and data

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<http://www.sec.gov/news/speech/speecharchive/1999/spch260.htm> (on file with the North Carolina Journal of Law & Technology) (noting that one of the three principles that guide the SEC’s equity market regulations is “promoting the use of technology to foster competition and innovation” in a speech about the impact of Reg ATS).

<sup>22</sup> Concept Release, *supra* note 4, at 3594.

<sup>23</sup> *Id.* “The review includes an evaluation of equity market structure performance in recent years and an assessment of whether market structure rules have kept pace with, among other thing, changes in trading technology and practices.” *Id.*

<sup>24</sup> See *infra* Part II.B.

<sup>25</sup> See *id.*

<sup>26</sup> See *infra* notes 31–33 and accompanying text.

<sup>27</sup> See *infra* notes 40–41 and accompanying text.

<sup>28</sup> See *infra* Part III.

<sup>29</sup> Lewis Solomon, et al., *The Crash of 1987: A Legal and Public Policy Analysis*, 57 FORDHAM L. REV. 191, 205 (1988). See also Richard A. Booth, *The Uncertain Case for Regulating Program Trading*, 1994 COLUM. BUS. L. REV. 1,

processing technologies” in the late 1980s, traders were able to make these large transactions at an increasingly rapid pace.<sup>30</sup> Program trading was frequently cited as a major aggravating factor that led to Black Monday in 1987.<sup>31</sup> The automatic programs continued to perform large trades based on the occurrence of triggering events, without human intervention, and without regard for the unusual circumstance of a rapidly falling market.<sup>32</sup> As a result, the market drop was accelerated as the programs continued to react.<sup>33</sup> In response to these allegations, the SEC, along with the NYSE, implemented rules “restricting program trading in a falling market.”<sup>34</sup> These so-called “collars” were set to limit or completely stop program trading once the market falls by a certain percentage.<sup>35</sup> The quick and decisive regulatory response of both the SEC and NYSE when presented with somewhat weak evidence linking program trading to Black Monday<sup>36</sup> signals a policy of

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1–2 (1994) (defining program trading as “the use of computer-aided trading strategies designed to exploit discrepancies between the prices of various derivative instruments and the underlying stock.”).

<sup>30</sup> Solomon, *supra* note 29, at 205.

<sup>31</sup> *Id.* at 191 (“In the aftermath of the crash of 1987, several studies and hearings were conducted to investigate its cause . . . . These efforts have produced conflicting conclusions. Nevertheless, it is clear that the existence of derivative instruments . . . and the use of program trading strategies contributed to the market ‘break.’”). See also Booth, *supra* note 29, at 1–2 (1994) (“When the stock market collapsed in October of 1987 many suspected that the mysterious practice of ‘program trading’ . . . was at fault.”).

<sup>32</sup> Solomon, *supra* note 29, at 288 (“Program trading affected the depth and speed of [the 1987 crash].”). This was due to the automated nature of the programs. *Id.* When the market began to fall, the programs continued operating as usual, buying and selling according to normal market conditions. *Id.*

<sup>33</sup> Steven Thel, *\$850,000 in Six Minutes—The Mechanics of Securities Manipulation*, 79 CORNELL L. REV. 219, 298 (1994).

<sup>34</sup> Booth, *supra* note 29, at 4.

<sup>35</sup> *Id.* at 9.

<sup>36</sup> *Id.* (arguing that program trading was not the cause of Black Monday); Thomas Lee Hazen, *The Short-Term/Long-Term Dichotomy and Investment Theory: Implications for Securities Market Regulation and for Corporate Law*, 70 N.C. L. REV. 137, 167 (1991) (noting that while some claim that program trading increases market volatility, “[o]thers reject this notion, denying the existence of any causal connection between increased volatility and derivative investments and claiming that other factors are to blame”).



immediate action when market stability is in question. Further, later relaxation of the restrictions on the mechanism contributed to the conclusion that program trading was not at fault.<sup>37</sup> In fact, today, program trading is widely used and no longer considered a risk due to enhanced market technology.<sup>38</sup>

Front-running is a second technology that raises market stability concerns. Front-running refers to the strategy of “trading on the basis of nonpublic market information, regarding impending market transactions, by broker-dealers or investment advisors.”<sup>39</sup> Part of the concern over front-running was the use of the mechanism to trade ahead of customer orders.<sup>40</sup> Although this practice raises issues of creating a two-tiered market and destroying consumer confidence, it did not lead to any direct regulation.<sup>41</sup> Instead, the SEC left it to the individual exchanges to implement rules as each deemed necessary,<sup>42</sup> requesting comments on the strategy and performing studies on the mechanism’s impact on the markets.<sup>43</sup> One major reason for the SEC’s lack of immediate reaction was that it found current law could be used to

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<sup>37</sup> For example, in 1999 the NYSE lessened the restrictive rule adopted to limit program trading. Self-Regulatory Organizations; New York Stock Exchange, Inc.; Order Approving Proposed Rule Change by the New York Stock Exchange, Inc. Relating to Amendments to Rule 80A, Exchange Act Release No. 34-40141, 64 Fed. Reg. 8424 (Feb. 19, 1999).

<sup>38</sup> Jerry W. Markham & Daniel J. Harty, *For Whom the Bell Tolls: The Demise of Exchange Trading Floors and the Growth of ECNs*, 33 J. CORP. L. 865, 882 (2007–2008) (“The circuit breakers proved to be unpopular and were discarded in 2007. . . . They were . . . no longer needed . . . because the NYSE has massively increased its capacity to deal with large volume trading that might trigger those limits. In 1987, the NYSE could handle only about 95 electronic messages per second, but by 2007 it was able to handle 38,000 messages per second as a result of computer enhancements.”).

<sup>39</sup> Roberta S. Karmel, *Outsider Trading on Confidential Information—A Breach in Search of a Duty*, 20 CARDOZO L. REV. 83, 102 (1998).

<sup>40</sup> Jerry W. Markham, “Front-Running”—*Insider Trading Under the Commodity Exchange Act*, 38 CATH. U.L. REV. 69, 71 (1988).

<sup>41</sup> *Id.* at 127. See also *infra* Part III.B (discussing flash orders, a modern version of front-running).

<sup>42</sup> Markham, *supra* note 40, at 83.

<sup>43</sup> *Id.* at 81–92.

litigate issues arising from the use of front-running, thereby eliminating the need for new rules.<sup>44</sup>

Comparing the response to program trading with that of front-running, it is apparent that a risk of harm due to market instability is dealt with swiftly, even without conclusive evidence. Conversely, issues concerning market manipulation and dilution of market fundamentals are met with a more reasoned and patient response. This is relevant given the striking similarity between the issues previously raised concerning program trading and front-running, and the current controversy concerning high frequency trading, naked access, flash orders, and co-location.

### III. THE CONTROVERSIAL TECHNOLOGY OF MODERN MARKETS

#### A. *High Frequency Trading*

Within the national market system, 63.8% of share volume is executed via registered exchanges including the NASDAQ, NYSE and Better Alternative Trading System ("BATS").<sup>45</sup> Due to the 1975 Amendments and Reg NMS modernizing market framework, technology has had a major impact on the manner in which trades are executed on these exchanges.<sup>46</sup> Specifically, registered exchanges have "adopted highly automated trading systems that can offer extremely high-speed, or 'low-latency,' order responses and executions."<sup>47</sup> This has led to the average response time being "reduced to less than 1 millisecond."<sup>48</sup> The development of this technology, combined with the exchanges offering "liquidity rebates,"<sup>49</sup> led to the development of high frequency trading.<sup>50</sup>

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<sup>44</sup> *Id.* (pointing to extensive law in the area of market manipulation that could adapt to form a cause of action for injuries realized due to the new strategy).

<sup>45</sup> Concept Release, *supra* note 4, at 3597.

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> *Id.* (citing BATS Exchange and NASDAQ releases and noting that the average latency on their exchanges is 320 microseconds and 294 microseconds, respectively).

<sup>49</sup> *Id.* at 3599. Liquidity rebates are given for any "resting orders that offer (make) liquidity" if executed. *Id.* On the other hand, orders that take liquidity are "charged an access fee." *Id.* The minimum access fee is set by Regulation

High frequency trading refers to “professional traders acting in a proprietary capacity”<sup>51</sup> to use “low-latency system[s]”<sup>52</sup> in running large numbers of liquidity providing non-marketable orders electronically, most of which are subsequently cancelled.<sup>53</sup> When this strategy is used numerous times a day, on a tremendous number of orders, the liquidity rebates add up to a significant profit.<sup>54</sup>

Today, high frequency trading comprises over 50% of market volume.<sup>55</sup> Developing an efficient algorithm which operates with

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NMS as 0.3 cents per share. *Id.* By setting their access fees slightly higher, exchanges are able to shell out the difference as a liquidity rebate. *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> *Id.* at 3606. See also *supra* notes 39–44 and accompanying text (discussing a similar strategy called front-running in which insiders used non-public information to trade in their own capacity for profit). Both mechanisms are viewed to produce a two-tiered market to the detriment of individual and institutional investors. See *supra* note 41, 98–99 and accompanying text.

<sup>52</sup> Concept Release, *supra* note 4, at 3599. Latency is the delay that occurs in transmitting buy or sell orders. Jennifer Kwan, *Modern Trader's Clock: Micro, Nano and Picoseconds*, REUTERS, Dec. 2, 2009, <http://hft.thomsonreuters.com/2009/11/23/hft-factbox/> (on file with the North Carolina Journal of Law & Technology) (noting that while “[a] fast trader can type and submit five trades in a minute, high frequency traders will soon be able to do sixty million trades in the same amount of time); see also Phil Wahba et al., *Geeks Trump Alpha Males as Algos Dominate Wall Street*, REUTERS, Dec. 2, 2009, <http://www.reuters.com/article/idUSN1641435720091202> (on file with the North Carolina Journal of Law & Technology) (“The essence of algorithmic trading . . . is to avoid a bad price. Traders get the most control possible . . .”).

<sup>53</sup> Concept Release, *supra* note 4, at 3607 (discussing the “four broad types of trading strategies that often are associated with [high frequency trading]—passive market making, arbitrage, structural, and directional”). The release further notes that the trading strategies listed “are not new. What is new is the technology that allows . . . firms to better identify and execute trading strategies.” *Id.*

<sup>54</sup> *Id.* (noting that “the primary sources of profits are from earning the spread by buying at the bid and selling at the offer and capturing any liquidity rebates offered”).

<sup>55</sup> Concept Release, *supra* note 4, at 3606 (noting that high frequency trading “is a dominant component of the current market structure and is likely to affect nearly all aspects of its performance”).

the lowest latency technology can provide is paramount to this strategy.<sup>56</sup> As noted in the SEC's Concept Release:

Many proprietary firm strategies are highly dependent upon speed — speed of market data delivery from trading center serves to serves of the proprietary firm; speed of decision processing of trading engines of the proprietary firm; speed of access to trading center serves by servers of the proprietary firm; and speed of order execution and response by trading centers. Speed matters both in the absolute sense of achieving very small latencies and in the relative sense of being faster than competitors, even if only by a microsecond.<sup>57</sup>

Awareness and mastery of the variables affecting speed, “such as distance, traffic load, bandwidth and processing capacity,” are vital.<sup>58</sup> The tools used by high frequency traders to achieve low latency vary among firms and are rarely disclosed.<sup>59</sup> Lack of

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<sup>56</sup> See Kwan, *supra* note 52; see also Citadel Investment Group, LLC. v. Teza Technologies, LLC, 2009 WL 3416124 (D.I.L. 2009) (“High speed computer infrastructure is critical to the high frequency business because processing and execution speed are extremely important to successful high frequency trading.”). In this case, Citadel, an “alternative investments, investment banking, and technology related products and services” firm alleged that two former employees “breached their non-compete agreements” when they formed Teza, a high frequency trading firm. *Id.* In its court papers, the firm “detailed the extraordinary steps it takes to protect its software. . . . [These include] encrypti[on and] . . . discourag[ing] employees from writing down details about them. Its offices have cameras and guards and there are. secure rooms that require special codes to enter.” Alex Berenson, *Arrest Over Trading Software Illuminates a Secret of Wall St.*, N.Y. TIMES, Aug. 24, 2009, at A1.

<sup>57</sup> Concept Release, *supra* note 4, at 3610.

<sup>58</sup> Kwan, *supra* note 52. For an excellent and in depth analysis of the technology and mathematics involved in algorithm development, see William Bertram, *Analytic Solutions for Optimal Statistical Arbitrage Trading*, 398 PHYSICA A: STATISTICAL MECHANICS AND ITS APPLICATIONS 11, 2234–2243 (June 2010) (“In this paper we derive analytic formulae for statistical arbitrage trading . . . we derive expressions for the mean and variance of trade length and return.”).

<sup>59</sup> The Tabb Group, *US Equity High Frequency Trading: Strategies, Sizing and Market Structure*, 1 (2009), [http://hft.thomsonreuters.com/files/2009/11/TABB\\_ReutersInsider-TV-on-HFT-final.doc](http://hft.thomsonreuters.com/files/2009/11/TABB_ReutersInsider-TV-on-HFT-final.doc) (on file with the North Carolina Journal of Law & Technology). The Tabb report discusses the frequent misconception that high frequency traders utilize controversial tools such as naked access and flash orders, urging that “direct association with each other should not be assumed without further clarification.” *Id.* However, it also notes that “the defense of high frequency trading cannot free those firms from

knowledge and understanding of high frequency trading is problematic since a disproportionate level of latency among market participants raises issues concerning superior access, creating a two-tiered market, and risk management.<sup>60</sup> Three controversial tools associated with the race to obtain the lowest possible latency—flash orders,<sup>61</sup> naked access,<sup>62</sup> and co-location,<sup>63</sup>—are discussed below.

### B. *Flash Orders*

Flash orders allow traders with faster and more expensive data feeds to learn about trade order information approximately thirty milliseconds before the general public.<sup>64</sup> Under Reg NMS, exchanges are required to disclose all “best bids and offers” to the public.<sup>65</sup> However, flash orders operate under an exception<sup>66</sup> to this rule which allows exchanges to “exclude[] bids and offers communicated on an exchange that either are executed immediately after communication or cancelled or withdrawn if not executed immediately after communication.”<sup>67</sup> This allows the

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accepting a degree of blame for the suspicion occasionally leveled against them [due to being] . . . so secretive they make hedge funds look like carnival barkers.”). *Id.* See also Concept Release, *supra* note 4, at 3607 (Jan. 21.2010) (requesting general comments on “the strategies employed by proprietary firms” including “technology tools and other market structure components”).

<sup>60</sup> See generally Concept Release on Equity Market Structure, Exchange Act Release No. 34.613.58, 75 Fed. Reg. 3594 (Jan. 21.2010).

<sup>61</sup> See *infra* Part III.B

<sup>62</sup> See *infra* Part III.C

<sup>63</sup> See *infra* Part III.D

<sup>64</sup> Duhigg, *supra* note 3. For example, if an order is put into a mutual fund at 9:31 A.M., a high frequency trader who receives flash orders would get a preview of that order and be able to execute an order for all available shares of the stock before the mutual fund is able to execute the order submitted by the investor. *Id.*

<sup>65</sup> Elimination of Flash Order Exception from Rule 602 of Regulation NMS, Exchange Act Release No. 34.606.84, 74 Fed. Reg. 48632, 48632 (Sept. 23, 2009).

<sup>66</sup> “The exception was intended to facilitate manual trading in the crowd on exchange floors by excluding quotations that then were considered ‘ephemeral’ and impractical to include in the consolidated quotation data.” *Id.*

<sup>67</sup> *Id.* See also Sal L. Arnuk & Joseph Saluzzi, *What Ails Us About High Frequency Trading*, THEMIS TRADING (2009), <http://www.themistrading>

exchanges to display the flash orders only to members of the particular exchange, or in some cases, just to members of the particular exchange who pay a fee to receive the information.<sup>68</sup> Further, since the orders only exist for a number of milliseconds, the only investors capable of making use of the flashes are those who have invested significantly in technology.<sup>69</sup> This is because once these investors are flashed the order information, they must “respond with their own order to execute against the flashed order . . . [and] only market participants with pre-programmed systems capable of responding very rapidly” are capable of successfully responding.<sup>70</sup> Therefore, the availability of flash orders raises issues of enhanced access creating a two-tiered market and improper information dissemination.<sup>71</sup> This is mainly because traders who receive the order information before the public markets or general public use the information to trade ahead of the signaled orders.<sup>72</sup>

### C. *Naked Access*

Exchange members are called broker-dealers, and they have exclusive access to their respective markets through market

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.com/article\_files/0000/0508/What\_Ails\_Us\_About\_High\_Frequency\_Trading\_--\_Final\_2\_10-5-09.pdf (on file with the North Carolina Journal of Law & Technology) (analogizing flash orders with overhearing trades before they hit the tape on the old exchange floor).

<sup>68</sup> Charles Duhigg, *S.E.C. Starts Crackdown on “Flash” Trading*, N.Y. TIMES, Aug. 5, 2009, at B1 available at <http://www.nytimes.com/2009/08/05/business/05flash.html> (noting that the practice is unfair, even when the market charges a fee, since only those with the technology to act on data within milliseconds stand to gain).

<sup>69</sup> *Id.*

<sup>70</sup> Elimination of Flash Order Exception From Rule 602 of Regulation NMS, Exchange Act Release No. 34,606,84, 74 Fed. Reg. 48632, 48634 (Sept. 23, 2009).

<sup>71</sup> *Id.* See also Charles Duhigg, *Senator Wants Restrictions on High-Speed Trading*, N.Y. TIMES, July 25, 2009, at B6, available at <http://www.nytimes.com/2009/07/25/business/25trading.html> (claiming that this is a loophole that attacks the fundamental transparency of markets by not showing trade orders to everyone simultaneously).

<sup>72</sup> See *infra* note 123 and accompanying text. See also *supra* notes 39–44 and accompanying text (discussing front-running).

participant identifiers (“MPIDs”).<sup>73</sup> However, customers can borrow broker-dealer MPIDs to gain access to markets.<sup>74</sup> As opposed to “direct market access,” in which “the customer’s orders flow through the broker-dealer’s systems before passing into the markets,” and “sponsored access,” in which “the customer’s orders flow directly into the markets without first passing through the broker-dealer’s systems,” but still go through pre-trade filters, naked access refers to a “subset of sponsored access where pre-trade filters . . . are not applied to orders before such orders are submitted to an exchange.”<sup>75</sup> Therefore, naked access allows the customer to bypass both the broker-dealer’s pre-trade filters and the pass through review. This practice decreases latency, allows traders to operate anonymously, and enables them to participate without obtaining costly membership to exchanges.<sup>76</sup> Therefore, naked access “reduce[s] latencies and facilitate[s] more rapid trading . . . preserv[ing] the confidentiality of sophisticated, proprietary trading strategies, and reduc[ing] trading costs by lowering operational costs, commissions, and exchange fees.”<sup>77</sup> At the same time, the mechanism raises issues of risk management, calling the “integrity of the broker-dealer, the markets, and the financial system” into question.<sup>78</sup>

#### D. Co-Location

Basic physics dictates that time equals distance divided by speed. Therefore, as distance decreases so does time. Co-location refers to the “service offered by trading centers . . . [which] rent

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<sup>73</sup> Risk Management Controls for Brokers or Dealers With Market Access, Exchange Act Release No. 34,613, 75 Fed. Reg. 4007, 4008 (Jan. 26, 2010) [hereinafter Risk Management Controls].

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> *Id.* (“Certain market participants may find the wide range of access arrangements beneficial . . . [because they] may reduce latencies and facilitate more rapid trading . . .”).

<sup>77</sup> *Id.* n.7.

<sup>78</sup> *Id.* at 4008 (“[O]rder placement rates can exceed 1,000 orders per second with the use of high-speed, automated algorithms,” and pointing out that if one of the programs malfunctioned, there would be no pre-trade risk assessment to catch the error). *Id.* at 4009.

rack space to market participants that enables them to place their servers in close physical proximity to a trading center's matching engine."<sup>79</sup> Placing their computers as physically close to the exchange servers as possible allows traders to decrease latency. However, only those market participants who heavily invest in technology are able to take advantage of the millisecond gain, raising issues of enhanced market access and creation of a two-tiered market framework.<sup>80</sup>

#### IV. LEGAL ISSUES AND REGULATORY RESPONSES

The two main issues associated with high frequency trading are increased risk of market instability and detriment to the fundamental values of the market system.

##### A. *Risk of Market Instability*

Historically, the SEC has reacted to known threats to market stability swiftly, aiming to mitigate the perceived harm through the use of safety mechanisms.<sup>81</sup> Although the Commission's reaction to general fears concerning high frequency trading was passive,<sup>82</sup> the SEC acted without hesitation with respect to naked access.<sup>83</sup>

As a general matter, high frequency trading strategies could lead to significant market-wide harm.<sup>84</sup> For example, since trading is automated, and based on programs that analyze market data and act on pre-set triggers, it is possible for several programs to come to the same conclusion simultaneously, leading to tremendous market volatility.<sup>85</sup> This perceived harm, however, is based on

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<sup>79</sup> Concept Release, *supra* note 4, at 3610.

<sup>80</sup> Duhigg, *supra* note 68.

<sup>81</sup> See *supra* notes 29–38 and accompanying text (discussing program trading).

<sup>82</sup> See *supra* notes 6–9 and accompanying text (introducing the SEC's *Concept Release*).

<sup>83</sup> Risk Management Controls, *supra* note 73.

<sup>84</sup> Concept Release, *supra* note 4, at 3611 (asking whether “the high speed and enormous message traffic of automated trading systems threaten the integrity of trading center operations . . . [or] lead to more widespread financial distress”).

<sup>85</sup> *Id.* (“[M]any proprietary firms potentially could engage in similar or connected trading strategies that, in such strategies generated significant losses



speculation. Further, most high frequency firms are “flat” at the end of the day, which mean that they have no overnight risk.<sup>86</sup> This too makes the strategy less susceptible to causing major market meltdown. Consequently, although the SEC has acknowledged the general risk of high frequency trading increasing market volatility, it also noted that “the equity markets performed well during the worldwide financial crises in the Autumn of 2008 when volume and volatility spiked to record highs,”<sup>87</sup> and did not propose a rule to deal with the anticipated negative effect.<sup>88</sup>

Conversely, risks associated with the use of naked access in conjunction with high frequency trading are seen as more imminently threatening. The problems associated with permitting traders to bypass all risk management review prior to trade execution is intensified by the speed and volume of trades which take place utilizing high frequency trading.<sup>89</sup> The immediate and probable nature of this harm led the SEC to propose a rule<sup>90</sup> prohibiting any type of sponsored access in which the customer is able to bypass pre-trade filters,<sup>91</sup> effectively banning naked access in January 2010.<sup>92</sup> The SEC’s proposed Rule 15c3-5 notes four

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at the same time, could cause many proprietary firms to become financially distressed and lead to large fluctuations in market price.”).

<sup>86</sup> The Tabb Group, *supra* note 59 (noting that “the majority of HFT strategies attempt to be market-neutral or closed out by the end of each day”).

<sup>87</sup> Concept Release, *supra* note 4, at 3611 (suggesting that the added liquidity supplied by high frequency trading offset any negative effects of increased volatility).

<sup>88</sup> In comparison, the SEC has proposed a rule to ban both naked access and flash orders. *See infra* note 90 and accompanying text (discussing proposed ban on naked access); *infra* note 100 and accompanying text (discussing proposed ban on flash orders).

<sup>89</sup> Risk Management Controls, *supra* note 73, at 4007.

<sup>90</sup> “Proposed Rule 15c3-5 would require a broker or dealer that has market access, or that provides a customer or any other person with access to an exchange or ATS through use of its MPID or otherwise, to establish, document, and maintain a system of risk management controls and supervisory procedures reasonably designed to manage the financial, regulatory, and other risks, such as legal and operational risks, related to such market access.” *Id.* at 4011.

<sup>91</sup> *Id.* at 4009.

<sup>92</sup> *Id.* at 4008 n.4. “It has been reported that ‘unfiltered access accounts for an estimated 38 percent of the average daily volume on the U.S. stock market.’” *Id.*

risks that can be avoided with simple risk management controls: “potential breach of a credit or capital limit, the submission of erroneous orders as a result of computer malfunction or human error, the failure to comply with SEC or exchange trading rules, [and] the failure to detect illegal conduct.”<sup>93</sup> Further, when naked access is used together with high frequency trading, “the potential impact of a trading error or a rapid series of errors . . . [is] more severe,”<sup>94</sup> and places the burden on the broker-dealers rather than the customers borrowing their MPIDs.<sup>95</sup> The proposal also includes an interest in uniformity since the rule will be in effect for all exchanges, rather than leaving the establishment of a rule to the discretion of each exchange.<sup>96</sup> The desire for consistency here, in contrast to co-location, about which the SEC allows each exchange to develop its own policy, signifies greater interest in protecting market stability versus traditional market framework.

The SEC’s response to the risks associated with naked access is in line with the SEC’s reaction to program trading after Black Monday in 1987.<sup>97</sup> Perceiving a risk of potential market destruction, the SEC is proposing a safety feature, mandatory risk management, which it believes will mitigate the potential harm. In light of the current economic downturn, it is not surprising that risk management is a high priority.

#### B. *Detriment to Market Fundamentals*

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at n. 10 (citing Scott Patterson, *Big Slice of Market is Going “Naked,”* WALL ST. J. (Dec. 14, 2009)).

<sup>93</sup> Risk Management Controls, *supra* note 73, at 4011. “Incidents involving algorithmic or other trading errors in connection with market access occur with some regularity.” *Id.* at 4009.

<sup>94</sup> *Id.*

<sup>95</sup> *Id.*

<sup>96</sup> *Id.* at 4010 (noting that “establishing a single set of broker-dealer obligations . . . would provide uniform standards that would be interpreted and enforced in a consistent manner”).

<sup>97</sup> See Booth, *supra* note 29, at 9 (discussing the reaction to program trading during which “markets instituted a system of circuit breakers that would, in the event of dramatic price movements, (1) limit access to computerized execution of stock trades for program trading purposes, and (2) would limit or half trading in the stock and futures markets for short periods”).

High frequency trading and the associated tools most threaten two market fundamentals: traditional long-term investor primacy<sup>98</sup> and the maintenance of a one-tiered market framework.<sup>99</sup> Despite these threats to the traditional structure, the SEC has not taken direct action against high frequency trading and co-location. However, the Commission has acted to propose the elimination of flash orders because, beyond enhanced access, the tool has the potential to aid in market manipulation.<sup>100</sup>

High frequency trading is at odds with the traditional purpose of securities regulations which is the primary protection of long-term investors.<sup>101</sup> For example, when using the strategy to obtain tenths or hundredths of a penny liquidity rebates on each of millions of trades, high frequency traders are not concerned with the long-term value of the investments they make.<sup>102</sup> In fact, in the

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<sup>98</sup> See Concept Release, *supra* note 4. See also Regulation NMS, Exchange Act Release no. 34.518.08, 70 Fed. Reg. 37496, 37501 (June 29, 2005) (“In the years since 1934, the priority placed by Congress on the interests of long-term investors has grown more and more significant.”).

<sup>99</sup> In the spirit of fair markets, the SEC seeks to maintain a level playing field in which all information is equally accessible to all market participants. See *supra* notes 12–14 and accompanying text. For example, the SEC is concerned about flash orders because they “could lead to a two-tiered market in which the public does not have access . . . to information about the best available prices for U.S.-listed securities that is available to some market participants through proprietary data feeds.” Elimination of Flash Order Exception from Rule 602 of Regulation NMS, Exchange Act Release No. 34.606.84, 74 Fed. Reg. 48632, 48633 (Sept. 23, 2009).

<sup>100</sup> Elimination of Flash Order Exception from Rule 602 of Regulation NMS, Exchange Act Release No. 34.606.84, 74 Fed. Reg. 48632, 48637 (Sept. 23, 2009) (noting that there is a “risk that recipients of the information could act in ways that disadvantage the flashed order . . . those market participants with the fastest systems are able to react to information in a shorter time frame than the length of the flash order exposures”).

<sup>101</sup> See *supra* notes 4, 98. See also Regulation NMS, Exchange Act Release No. 34.518.08, 70 Fed. Reg. 37496, 37500 (Aug. 29, 2005) (“[W]hen the interests of long-term investors and short-term traders conflict, the Commission believes that its clear responsibility is to uphold the interests of long-term investors. Indeed, the core concern for the welfare of long-term investors . . . was first expressed in the foundation documents of the Exchange Act itself.”).

<sup>102</sup> Concept Release, *supra* note 4, at 3608 (questioning whether high frequency firms employing “passive market making strategies” for the sole

majority of cases, high frequency traders cancel orders prior to execution.<sup>103</sup> Although “the interests of investors and professional traders may at times be aligned”<sup>104</sup> and evidence suggests that high frequency trading increases liquidity and narrows spreads,<sup>105</sup> volatility created due to the large orders bought and sold at a rapid pace may lead to long-term investor detriment.<sup>106</sup>

Besides strategy focused on short-term gains, high frequency trading contributes to traditional investor confusion and decreased confidence due to secrecy surrounding the technology.<sup>107</sup> Moreover, with the incidence of high frequency trading continuing to increase, the face of the actual traders is also changing from “alpha male” types who found success on the old trading floor to PhDs in computer science.<sup>108</sup> In fact, individual exchanges have noticed the increased prevalence of high frequency trading and have developed options to entice the speedy traders, such as flash orders and co-location.<sup>109</sup> In fact, Luise’s former place of business, the NYSE, recently opened a state of the art data center in Mahwah, New Jersey, for the purpose of courting the high

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purpose of gaining liquidity rebates operate to the detriment of long-term investors).

<sup>103</sup> *Id.* at 3599 (noting that high frequency trading firms “often cancel[] a very high percentage” of their orders).

<sup>104</sup> *Id.* at 3603.

<sup>105</sup> *Id.*

<sup>106</sup> *Id.*

<sup>107</sup> See Kaufman, *supra* note 3 (noting that “high frequency trading strategies” can cause the “average investor to lose[] confidence in the integrity of our markets”); Duhigg, *supra* note 3, at A17 (“High-frequency traders often confound other investors by issuing and then canceling orders almost simultaneously.”).

<sup>108</sup> Wahba, *supra* note 52 (noting that “[w]hile street smarts and an ability to socialize were crucial to successful floor traders, today’s trader needs math and computer science, and quite possibly a PhD”). The article goes on to discuss how “[t]raditional floor trading ‘really is an alpha male activity’ . . . . It’s like being in a locker room. In contrast, computer programmers are almost like a think tank . . . . They are introverts, some are socially awkward, and they don’t seek publicity. They are the type of guys you would see at a Star Wars convention.” *Id.*

<sup>109</sup> See Duhigg, *supra* note 3, at A17 (“High-frequency traders also benefit from competition among the various exchanges.”).

frequency trading community.<sup>110</sup> Despite voicing concern with the movement, the SEC has reacted mildly with simple requests for comment and further study, similar to its position on front-running.

Whereas detriment to long-term investors is threatened through the general use of high frequency trading strategies, the risk of creating a two-tiered market is frequently cited as the principal complaint associated with flash orders,<sup>111</sup> co-location,<sup>112</sup> and high frequency trading.<sup>113</sup> On its own, high frequency trading raises issues of a two-tiered market system because the sophisticated technology employed by the traders is not universally available.<sup>114</sup> Questions arise regarding the possibility that traditional investors will be forced to invest in the technology in order to remain viable, and whether the current market structure allows for both types of trading to occur simultaneously on the same exchanges, without

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<sup>110</sup> See Scott Patterson & Serena Ng, *NYSE's Fast-Trade Hub Rises Up in New Jersey*, WALL ST. J., July 30, 2009, at C1.

<sup>111</sup> "The flashing of order information could lead to a two-tiered market in which the public does not have access . . . to information about the best available prices . . . that is available to some market participants through proprietary data feeds." Elimination of Flash Order Exception from Rule 602 of Regulation NMS, Exchange Act Release No. 34,606.84, 74 Fed. Reg. 48632, 48633 (Sept. 23, 2009). See also *supra* Part III.B.

<sup>112</sup> See Concept Release, *supra* note 4, at 3610 (questioning the "fairness of Co-location Services"). For example, the Commission asks whether some market participants have superior access due to their heavy investment in technology. *Id.* See also *supra* Part III.D.

<sup>113</sup> Duhigg, *supra* note 71 (quoting Senator Schumer's view of high frequency trading: "The hallmark of our markets are that they are open and above board and the little guys has as much of a chance as the big guy. . . . This takes a dagger to the heart of that concept.").

<sup>114</sup> For example, firms must invest significant sums of money into developing high frequency trading programs. In a lawsuit against a former Goldman Sachs employee who is charged with stealing "32 megabytes of Goldman proprietary code, a small fraction of the overall programs, which is 1,224 megabytes," US prosecutor, Joseph Facciponti, notes that "[t]he bank itself stands to lose its entire investment in creating this software . . . which is millions upon millions of dollars." Alex Berenson, *Arrest Over Trading Software Illuminates a Secret of Wall St.*, N.Y. TIMES, Aug. 24, 2009, at A1 (noting that Citadel paid "tens of millions to two top programmers in the last seven years").

detriment to traditional investors.<sup>115</sup> More complex concerns arise when high frequency trading is evaluated alongside co-location or flash orders.<sup>116</sup> Both tools allow high frequency traders to increase the efficiency and speed of their transactions.<sup>117</sup> However, since both tools are useful only to traders who have already invested in technology to such an extent that microseconds make a significant difference, the existence of these options is evidence of exchanges favoring a certain faction of traders.<sup>118</sup>

As noted earlier, with respect to high frequency trading, the SEC has not taken any action beyond requesting comments and suggestions regarding possible future regulation.<sup>119</sup> The same is true of co-location.<sup>120</sup> However, on September 18, 2009, the SEC proposed the “Elimination of Flash Order Exception from Rule 602 of Regulation NMS” in order to remedy the unfair discrepancy in market information disclosure based on technological capability.<sup>121</sup> This was due to concerns of a two-tiered market in which one tier was obtaining the benefit of enhanced information due to superior market access.<sup>122</sup> Compared to high frequency trading and co-location, which simply amplify a trader’s speed, flash orders present a direct threat of misuse and market manipulation.<sup>123</sup>

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<sup>115</sup> See, e.g., Concept Release, *supra* note 4, at 3605 (questioning if it is “unfair for market participants to obtain a competitive advantage by investing in technology and human resources that enable them to trade more effectively and profitably than others”).

<sup>116</sup> See *supra* Parts III.B, III.D (discussing how flash orders and co-location enhance market access for some participants).

<sup>117</sup> *Id.*

<sup>118</sup> *Id.*

<sup>119</sup> See generally Concept Release on Equity Market Structure, Exchange Act Release No. 34.613.58, 75 Fed. Reg. 3594.

<sup>120</sup> *Id.*

<sup>121</sup> Elimination of Flash Order Exception from Rule 602 of Regulation NMS, Exchange Act Release No. 34.606.84, 74 Fed. Reg. 48632 (Sept. 23, 2009).

<sup>122</sup> *Id.* at 48636.

<sup>123</sup> *Id.* at 48637 (“[T]he flashing of orders to many market participants creates a risk that recipients of the information could act in ways that disadvantage the flashed order.”). See also Duhigg, *supra* note 71 (noting that flash orders could be used to “trade ahead of other market participants, pushing prices up or down”).

Presented with concerns of the dilution of market framework fundamentals, it appears that the SEC has taken a more reasoned and patient approach to imposing regulations than when confronted with risks to market stability.<sup>124</sup> Comparable to front-running, when faced with general fears of injuring long-term investors or providing a certain class of traders with enhanced access, the SEC sought comments and requested more information on the effects of this new phenomenon.<sup>125</sup> However, because orders go a step beyond adding to trader's low latency and add the potential for misuse and manipulation,<sup>126</sup> the SEC used its authority to respond with regulation designed to mitigate the potential for harm.<sup>127</sup>

## V. EVALUATION AND ANALYSIS

The SEC should finalize the proposals to ban naked access and flash orders but continue to seek information and comments regarding high frequency trading. These regulatory responses illustrate a policy of immediately protecting against probable risk of market detriment and manipulation, while allowing seemingly benign uses of enhanced technology to operate unfettered as more extensive reporting is done on the effects of the strategies and tools.

The case for immediate reaction to potential market risk is simple. A policy of quick regulation, rather than waiting and watching to see if the harm will in fact materialize, is more sound. Further, a policy of limiting the use of mechanisms that may foreseeably foster market manipulation is also prudent. While the ban on flash orders comes five years after the implementation of Reg NMS and the exception of Rule 602, only recently did the

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<sup>124</sup> See *supra* notes 82–83 and accompanying text (showing that the SEC responded with an immediate proposal to ban naked access, but only a concept release for suggestions and more information when confronted with HFT and co-location). This was also exhibited *supra* Part II.B (comparing the response to front-running versus program trading).

<sup>125</sup> Concept Release on Equity Market Structure, Exchange Act Release No. 34.613.58, 75 Fed. Reg. 3594 (seeking comment on high frequency trading).

<sup>126</sup> See *supra* note 123 and accompanying text.

<sup>127</sup> Elimination of Flash Order Exception from Rule 602 of Regulation NMS, Exchange Act Release No. 34.606.84, 74 Fed. Reg. 48632 (Sept. 23, 2009).

potential for misuse come to light.<sup>128</sup> Therefore, with respect to these two harms, the SEC's quick response was warranted, and the policy of continuing to react swiftly to similar threats should be maintained.

Moreover, the SEC's practice of carefully studying the effects of high frequency trading and co-location, before implementing any type of regulation, is also reasonable. In comparison to flash orders, which give technologically advanced market participants the ability to obtain information unavailable to other participants, co-location and high frequency trading only promote faster and more efficient transactions. By way of analogy, in the sports world, flash orders and naked access would be similar to performance enhancing drugs. Steroids give athletes a competitive edge, but in so doing, they threaten to harm the integrity of their sports, other participants, and potentially, even themselves.<sup>129</sup> Similarly, through enhanced market access to improper information dispersal, flash orders and naked access increase the risk of market manipulation and instability to the detriment of all market participants.<sup>130</sup> Comparatively, as opposed to steroids, co-location and high frequency trading would parallel new training techniques discovered after investing in extensive sports science and nutrition studies. These methods of obtaining a competitive edge should not be second-guessed merely because traditional traders do not know of the techniques or have not invested in researching the disciplines.

The policy of extensively evaluating the effects of new technology prior to instituting regulations should be continued,

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<sup>128</sup> *Id.* at 48632 ("The Securities and Exchange Commission . . . is concerned that the exception for flash orders . . . which originated in the context of manual trading floors for quotations that were considered 'ephemeral,' is no longer necessary or appropriate in today's highly automated trading environment.").

<sup>129</sup> See, e.g., Jim Thurston, *Chemical Warfare: Battling Steroids in Athletics*, 1 MARQ. SPORTS L.J. 93, 94 (1990-1991) ("The introduction of performance-enhancing drugs has threatened both the integrity of the Olympic Games, and professional sports in general.").

<sup>130</sup> See *supra* notes 89, 111, and 122 and accompanying text (explaining how naked access allows direct market access without risk management controls, and flash orders allow some market participants with market information not available to other participants).



even if studies show that the emerging tools and strategies are changing the fundamental framework of the market system. In fact, whenever technology develops in other fields, creating more efficient mechanisms to complete tasks, regulations banning the inventions are rarely pondered.<sup>131</sup> For example, the idea of banning the online use of LexisNexis and Westlaw because of the detriment associated with moving away from traditional texts was never seriously considered. In short, technology should not be stifled just to pander to traditionalists. This is not the way our society has behaved in other fields, and should not be the way our markets react today.

## VI. CONCLUSION

Technology's impact on the financial markets continues to increase as traders develop complex strategies and tools. High frequency trading, flash orders, naked access, and co-location are the most recent mechanisms being evaluated by the SEC and all other interested parties. While naked access threatens market stability and flash orders have the potential to lead to market manipulation, high frequency trading and co-location, on their own, seem merely to raise concerns of changing traditional market framework. Therefore, whereas it is necessary to act swiftly to eliminate naked access and flash orders, even without conclusive evidence of their negative effects, it is not necessary to act decisively with respect to high frequency trading and co-location.

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<sup>131</sup> For example, the automobile was not dismissed in favor of the horse and buggy, light bulbs easily replaced candles, and email is quickly diminishing the use of postal service.