Lessons from the Flash Crash for the Regulation of High-Frequency Traders

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Abstract

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KEYWORDS: Flash Crash, High-Frequency Traders, Regulation, Law, Business, Corporate, Equity, Markets, Traders, SEC, Securities and Exchange Commission

*An earlier version of this Note was the first place winner in the 2011 student writing competition sponsored by the Association of Securities and Exchange Commission Alumni, Inc., as well as the second place winner in the 2011 Mendes Hershman Student Writing Contest, sponsored by the American Bar Association Business Law Section. J.D. Candidate 2012, Fordham University School of Law; B.A. 1999, Amherst College. First and foremost, I am grateful to my wife Kate for her patience and support. I am indebted to Professor Richard Squire for his insights and helpful comments on earlier drafts, and to Professor James Jalil, Nick Baker and Eric Hess for their help in developing this Note.
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Are equity markets vulnerable to a sudden collapse if the traders who account for about half of the volume have no regulatory obligations to stabilize prices? After the “Flash Crash” of May 6, 2010, policymakers have resoundingly answered this question in the affirmative. During the worst of the crash, some of the so-called high-frequency trading firms that dominate equity markets stopped trading and prices collapsed, momentarily wiping out almost $1 trillion in market value. In response, the U.S. Securities and Exchange Commission is considering whether high-frequency trading firms should be required to act as the traders of last resort. This Note argues that the regulation under consideration would likely result in higher transaction costs without ensuring market liquidity or stability. This Note proposes instead that the largest high-frequency traders be subject to heightened regulatory oversight to ensure fair dealing.

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INTRODUCTION

In twenty minutes on May 6, 2010, stock market investors lost about $862 billion.¹ Fifteen minutes later, the market had surged back to recover almost all of its losses.² It was the worst intraday point drop on

record for the 114-year-old Dow Jones Industrial Average. Individual investors who sold their stock during the worst of the panic may have lost more than $200 million relative to the closing price for the day. The so-called “Flash Crash” rattled investor confidence, sparking eight consecutive months of withdrawals from U.S. stock mutual funds for a total of almost $90 billion. Regulators and investors alike concluded that equity markets had simply failed.

Exchanges are supposed to reduce the cost of searching for the best price by establishing a venue where buyers and sellers meet and

3. See Tom Lauricella & Peter A. McKay, Dow Takes 1,010.14-Point Trip—Biggest Point Fall, Before a Snapback; Glitch to Blame?, WALL ST. J., May 7, 2010, at C1.

4. The figure represents “a very conservative estimate” of the losses that individual investors would have incurred if they sold their stock during the worst of the Flash Crash. See Mary L. Schapiro, Chairman, SEC, Remarks at the Economic Club of New York: Strengthening Our Equity Market Structure (Sept. 7, 2010) [hereinafter Schapiro, Strengthening Structure], available at http://sec.gov/news/speech/2010/spch090710mls.htm. The plunge in stock prices starting at 2:30 p.m. triggered more than $2 billion in individual investor stop-loss orders, which are orders that instruct a broker to sell a certain number of shares at the prevailing market value if the stock’s price drops below a specified threshold. See id. Most of those sales were executed at prices significantly below the closing price, reflecting a loss for the day.


compete for trades. A single meeting place for traders helps develop prices that reflect the relevant information about the underlying economic value of a security. Yet when needed most on May 6, exchanges failed to provide liquidity at a fair price. More than 20,000 trades for some 300 securities were cancelled on May 6 because they were executed at “clearly erroneous” prices. Since May 6, there have also been periodic reports of similarly sudden breakdowns in the markets for certain securities. Such extreme volatility hinders capital formation by raising the cost of equity capital for companies. As noted by one executive of a company whose shares plummeted on May 6, events like the Flash Crash deter investments in otherwise strong

9. The notion of liquidity at a fair price is a hallmark of market regulation throughout the SEC’s history. See, e.g., SEC. & EXCH. COMM’N, REPORT ON THE FEASIBILITY AND ADVISABILITY OF THE COMPLETE SEGREGATION OF THE FUNCTIONS OF DEALER AND BROKER 98 (1936) [hereinafter SEGREGATION STUDY] (“Liquidity means convertibility into money, but the concept is not to be restricted merely to that quality. . . [I]t connotes that the price at which conversion can be made is a price not out of line with that deemed appropriate for the commodity.”).
12. The volatility of a company’s stock relative to the rest of the market is a key factor in the Capital Asset Pricing Model, which is “the most well-accepted, conceptually pure, method for calculating the cost of equity.” William Allen, Reiner Kraakman & Guhan Subramanian, Commentaries and Cases on the Law of Business Organizations 128 (3d ed. 2009). The model is used to calculate the minimum rate of return an investor demands to hold a company’s stock. In general, an investor demands a higher return for taking the risk of holding a stock that is more volatile than the rest of the market. See generally Jeffrey C. Hooke, Security Analysis on Wall Street 225 (1998) (discussing the Capital Asset Pricing Model).
businesses merely because their shares are vulnerable to a market malfunction.13

This Note analyzes some of the proposals aimed at preventing another Flash Crash in equity markets. In particular, it examines whether the Securities and Exchange Commission (the “SEC,” or the “Commission”) should require high-frequency trading firms (“HFTs”) to act as the buyers or sellers of last resort.14 This could entail two kinds of requirements: an affirmative obligation to stand continuously ready to buy and sell a stock, and a negative obligation to refrain from trading in certain circumstances. Currently, only market makers have such obligations.15

The Commission first suggested these obligations in January 2010, when it issued the Concept Release on Equity Market Structure with three dozen proposals to address issues arising from the growth of electronic trading.16 The SEC noted that although HFTs dominate equity trading, they can withdraw from the market at any moment since they are not subject to the same obligations as market makers.17 The SEC also stated that some HFT strategies fuel volatility and may even border on illegal manipulation.18 Public comments in response to the Concept Release focused on the SEC’s far-reaching proposals to regulate HFTs.19


14. The CFTC and SEC define high-frequency trading firms as hedge funds or broker-dealers that trade for their own account, relying on high-speed computer systems to submit large numbers of orders. Although they pursue a variety of strategies, HFTs generally cancel orders shortly after submission. HFTs also tend to hold investments for very short time frames and finish the day with no economic risk, since they liquidate all positions or establish a hedge. See FINAL FINDINGS, supra note 10, at 45; PRELIMINARY FINDINGS, supra note 6, app. at A-11.

15. See infra Part I.A and B.


17. Id. at 3608.

18. Id. at 3608-10.

The Flash Crash greatly intensified the political pressure on the SEC to rein in HFTs.20

Proponents of imposing market maker obligations on HFTs claim that they would stabilize the market in times of stress.21 The proponents also argue that a regime of quoting obligations would subject HFTs to the regulatory supervision they deserve as dominant players in equity markets.22 Critics, however, suggest that the obligations will likely result in higher transaction costs for investors.23 The debate has now extended to U.S. futures markets and European equity markets as regulators grapple with increased activity by HFTs.24


22. See, e.g., Mary L. Schapiro, Chairman, SEC, Remarks Before the Security Traders Association (Sept. 22, 2010) [hereinafter Schapiro, Security Traders], available at http://www.sec.gov/news/speech/2010/ spch092210mls.htm (“[H]igh frequency trading firms have a tremendous capacity to affect the stability and integrity of the equity markets. Currently, however, high frequency trading firms are subject to very little in the way of obligations . . . to refrain from exacerbating price volatility.”).


24. See, e.g., Graham Bowley, Clamping Down on Rapid Trades in Stock Market, N.Y. TIMES, Oct. 8, 2011, at A1 (reporting on U.S. and European regulatory efforts to rein in HFTs); Jim Brunsden, High-Frequency Trades May Face Tougher Regulation in EU Market-Abuse Rules, BLOOMBERG, Sept. 13, 2011 (reporting that that the European
This Note argues that the SEC should refrain from imposing market maker obligations on HFTs. An affirmative obligation is unwarranted as a means to ensure market liquidity and would likely result in higher trading costs for investors. Imposing such duties would also raise questions of fairness, as these obligations have historically been accompanied with special privileges for market markers. Since the Flash Crash, regulators have taken meaningful steps to protect investors in situations of extraordinary volatility. This Note argues that regulators should now focus on ensuring fair dealing by HFTs, instead of on market stability.

Compared with the prior commentary in legal journals, this Note is the first to analyze HFTs in the context of historical trading regulations that for a century have ensured that investors can trade almost whenever they want. Part I of this Note traces the evolution of these rules, starting with specialists at the New York Stock Exchange, followed by market makers on the Nasdaq Stock Market. Part I concludes with a detailed analysis of the regulatory obligations and incentives that HFTs have to provide liquidity.

Part II provides an account of the Flash Crash and the SEC’s remedial rulemaking since May 6, 2010. This Note differs with prior commentary in suggesting that the SEC has taken bold and effective

http://www.cftc.gov/PressRoom/SpeechesTestimony/opachilton-50 (arguing that the CFTC should examine HFTs’ trading strategies to curb market abuses and address “mini flash crashes” in markets such as silver and natural gas).

25. See infra Part II.B. The SEC has also implemented rules that aim to enhance its ability to police for improper trading and to analyze large-scale market disruptions like the Flash Crash. See Large Trader Reporting, Exchange Act Release No. 64,976, 76 Fed. Reg. 46,960, 46,963 (Aug. 3, 2011) (noting that the Large Trader obligations will allow the SEC to obtain trading information for HFTs and other significant market participants).

steps to safeguard investors. Part III is largely based on the comment letters that brokerages and investment firms submitted to the SEC in response to the Concept Release on Equity Market Structure. This Part analyzes three proposed regimes for quoting obligations and argues for an alternative approach focused on ensuring fair dealing by HFTs.

I. THE PLAYERS AND RULES ON MAY 5, 2010

The Flash Crash exposed a weakness in the current structure of equity markets: no one has a strong obligation to buy or sell shares in times of market stress. This section examines the obligations and incentives at work for the two types of traders who could provide such a backstop: market makers and HFTs.

In the 10 years leading up to the Flash Crash, exchange rulebooks had evolved to require very little from market makers. They were obliged to make regularly an offer to buy and sell shares, but the price of those bids and offers could be far removed from the prevailing market. In essence, market makers were only nominally required to provide liquidity. Instead, exchanges came to rely on incentives of fractions of a cent to draw a steady stream of bids and offers from market makers, brokerages, and HFTs alike. This system of lax obligations on market makers and incentives available to all worked well enough to handle record volumes during the financial crisis of 2007-2008. Yet, on May 6, 2010, it broke down.

This section proceeds in rough chronological order, looking at different regulatory efforts to ensure market liquidity—defined generally as providing buyers and sellers the opportunity to trade

27. See, e.g., Justin Sandler, The Invisible Power of Machines; Revisiting the Proposed Flash Order Ban in the Wake of the Flash Crash, 3 DUKE L. & TECH. REV. ¶¶ 28-32 (2011) (arguing that the SEC’s measures have failed to address HFTs’ unfair trading advantage over other investors); David M. Serritella, Recent Development: High Speed Trading Begets High Speed Regulation: SEC to Flash Crash, Rash, 2010 U. ILL. J.L. TECH. & POL’Y 433, 442-3 (arguing that the SEC should have conducted further research before adopting measures to halt trading in situations of extreme volatility).

28. See infra notes 122-126 and accompanying text.

29. See Concept Release, supra note 16, at 3611 (“The [SEC] notes that, from an operational standpoint, the equity markets performed well during the world-wide financial crisis in the Autumn of 2008 when volume and volatility spiked to record highs.”).
whenever they want. Part A focuses on NYSE specialist traders, the precursors to modern-day market makers. Part B examines market makers and suggests reasons why regulators consistently imposed weaker obligations on market makers than on specialists. Part C provides an overview of HFTs and their incentives to provide liquidity. Part D shows the extent to which exchange incentives, instead of regulatory obligations, ensure market liquidity today.

A. SPECIALISTS

Although specialists no longer play a role in equities trading, they represent an essential piece in the current debate over market makers and HFTs. Regulators have explicitly noted that principles behind the regulation of specialists may be applicable to HFTs. As the first class of traders required to risk their own capital for the sake of maintaining a stable market, specialists provide a helpful model.

1. From Early Idlers to Specialists

For at least the first 30 years of what is now the NYSE, investors had little expectation of liquidity. Trading volumes were so low before the 1820s that most brokers had to supplement their income by selling lotteries or groceries. Someone who only traded securities was considered “an idler or a fool.” By 1830, however, a class of

30. HARRIS, supra note 7, at 32. This general definition glosses over three key characteristics of liquidity: the difference in price between bids to buy and offers to sell; the number of shares available for trading at the best bid or offer, which is commonly known as depth; and how quickly a change in prices attracts new bids and offers. See ROBERT A. SCHWARTZ & RETO FRANCIONI, EQUITY MARKETS IN ACTION: THE FUNDAMENTALS OF LIQUIDITY, MARKET STRUCTURE & TRADING 60-61 (2004).

31. See Schapiro, Strengthening Structure, supra note 4 (“We should consider the relevance today of a basic premise of the old specialist obligations—that the professional trading firms with the best access to the markets . . . should be subject to obligations to trade in ways that support the stability and fairness of the markets.”); Concept Release, supra note 16, at 3607, 3610 (seeking comment on whether specialist obligations should apply to HFTs).


33. Id. at 25; see also Jerry W. Markham & Daniel J. Harty, For Whom the Bell Tolls: The Demise of Exchange Trading Floors and the Growth of ECNs, 33 IOWA J. CORP. L. 865, 869 (2008) (“Average trading volume in 1821 was 300 shares, rising to
professional traders had emerged, in part due to the speculative furor over railroad and canal company stocks. Even then, an investor essentially had three options to trade: wait for the twice-daily auctions at the New York Stock & Exchange Board, with no guarantee that buyers or sellers would show; search Broad and Hanover streets in lower Manhattan for a dealer, with no guarantee of a fair price; or, get an invitation to the evening trading sessions at various New York hotels, where stocks traded into the night.

Investors developed a different expectation for liquidity by the 1860s. In 1863, traders organized the Open Board of Stock Brokers, which eschewed the daily auctions in favor of continuous trading. From 8:30 a.m. to 5 p.m., traders could meet at specified places in the “Long Room” to buy and sell specific securities. The Open Board soon rivaled the then-recently renamed NYSE, and the two markets merged in 1869. Within a year, the importance of the daily auctions waned as most volume was handled at the trading posts in the “Long Room.” Traders who developed an expertise in a stock by hovering around a certain post became known as “specialists.” Now, an investor could avoid some of the sharp practices of the dealers on Broad and Hanover without having to wait for the twice-daily auctions.

1,300 shares a day in 1824 and then declining to an average of 100 shares per day in 1827.”).  
34. Sobel, supra note 32, at 40.  
35. See Charles R. Geisst, Wall Street: A History 30 (Oxford Univ. Press 1999) (noting that only 31 shares changed hands at the NYS&EB on March 6, 1830); Sobel, supra note 32, at 44 (noting that even in 1836, at the height of speculation in railroad stocks, trading in some of the NYS&EB’s 98 listed stocks was “irregular”).  
36. See Sobel, supra note 32, at 40.  
37. Id. at 60.  
38. Id. at 77.  
39. Id. at 85-86.  
40. The auctions were discontinued in 1882. Id. at 86.  
41. Wall Street lore traces the first specialty back to 1875, when a trader named Boyd broke his leg and remained seated at the post for shares of Western Union, focusing exclusively in that stock. See Harris, supra note 7, at 509 (citing Robert Sharp, The Lore and Legends of Wall Street 139 (Dow Jones-Irwin 1989). But see Sec. & Exch. Comm’n, Report of Special Study of the Securities Markets of the Securities and Exchange Commission pt. 2, 61 (1963) [hereinafter Special Study] (tracing the origin of specialists to the NYSE’s adoption of continuous trading in 1869, although the exact time is unknown).
Specialists were subject to some manner of regulation at least as early as 1910. The regulation arose because specialists had inherently conflicting roles. Specialists served three functions: maintaining, for a particular stock, the book of all pending orders, which they used to pair off buyers and sellers; acting as a broker for other brokers who entrusted them with a customer’s order; and trading for their own account. This combination enabled a specialist to use his knowledge of pending orders to execute profitable trades at the expense of customer orders. For example, a specialist could, upon receiving a large order to buy a stock, step ahead of that order and purchase the stock for his own account first. As a result, the specialist would stand to profit when the execution of the large order pushed up the price of the stock. One recent SEC chairman bluntly described the “built-in advantage” of specialists in the following way: “It’s like being in a card game in which only one of the players gets to see everyone else’s hand. Specialists exploit that advantage.” Protecting investors from such abuses has been a central preoccupation of the SEC since its founding.

42. See George T. Simon & Kathryn M. Trkla, The Regulation of Specialists and Implications for the Future, 61 BUS. LAW. 217, 230 (2005) (noting that in 1910 the NYSE barred specialists from trading for their own account against a customer’s order without the customer’s prior consent).

43. See id. at 230-31.


45. See Harris, supra note 7, at 496-514; Louis Loss, Joel Seligman & Troy A. PareDES, Securities Regulation vol. 5, 514 (4th ed. 2010) (both noting that specialists served as auctioneer, broker, and dealer).

46. Prior to the Exchange Act, there was “ample evidence” of specialists’ manipulative trading. Segregation Study, supra note 9, at 86.


48. Id.

2. Stringent Curbs and Affirmative Obligations

Congressional hearings leading up to the Securities Exchange Act of 1934[^50] dwelled on allegations that specialists exploited their knowledge of the order book to trade for their own accounts.[^51] The initial draft of the Exchange Act prohibited specialists from trading for their own accounts altogether.[^52] The final Exchange Act was only a little more forgiving. Congress instructed the newly founded SEC to establish rules that would limit a specialist’s trading for his own account to situations where it was “reasonably necessary to permit him to maintain a fair and orderly market.”[^53] This provision, the SEC explained in 1936, subjected a specialist to “stringent control” and allowed him “only sufficient latitude in his personal trading” to engage in those activities that provide “a useful service to the market.”[^54]

These restrictions show that the Exchange Act was premised on the idea that fair dealing was more important than liquidity. Congress and the SEC imposed a negative obligation precisely because it would crimp specialist trading.[^55] Indeed, the SEC explicitly interpreted Section 11(b) of the Exchange Act to require that each trade be justified as necessary to maintain an orderly market.[^56] This construction, known as the Saperstein Interpretation, is noteworthy since it was adopted despite SEC findings a year earlier that specialists helped mitigate price swings


[^51]: See Simon & Trkla, supra note 42, at 232-238 (describing the findings of congressional reports); Joel Seligman, The Transformation of Wall Street 74 (3d ed. 2003) [hereinafter Seligman, Transformation] (“Throughout the Pecora Hearings, allegations were made repeatedly that specialists . . . exploited their knowledge of the specialist books in trading for their own accounts.”).

[^52]: See Seligman, Transformation, supra note 51, at 86.

[^53]: Pub. L. No. 73-291, §11 (b), 48 Stat. 881 (1934) (codified as amended at 15 U.S.C. § 78k (2006)). Although the SEC never adopted such rules, it pushed the exchanges to amend their rulebooks. See Segregation Study, supra note 9, at 60-64 (describing 16 exchange rules that were originally formulated by the SEC).

[^54]: Segregation Study, supra note 9, at 63.

[^55]: See id. at 101 (“[O]veremphasis upon liquidity in our stock markets is fraught with grave dangers to our economic system; . . . a certain amount of speculative activity contributes to liquidity, but an excessive amount may precipitate results which militate against . . . stability.”).

and played a pivotal role in providing liquidity in less active stocks.\textsuperscript{57} Despite the benefits of specialists’ dealing, SEC regulation was at first solely an obligation to refrain from trading.

The SEC only formally came to recognize specialists’ affirmative obligation to trade in 1964, with the adoption of Rule 11b-1.\textsuperscript{58} The rule mandates specialists to “assist in the maintenance, so far as practicable, of a fair and orderly market,” among other requirements.\textsuperscript{59} At first, the rule only applied to the NYSE and the American Stock Exchange, leaving exempt the eight other smaller exchanges in operation at the time.\textsuperscript{60} Whereas the Saperstein Interpretation imposed a restriction out of concern for trading abuses, Rule 11b-1 conscripted specialists to maintain an orderly market by requiring them to risk their own capital as the price for their otherwise privileged position.

The SEC justified the shift on three factors. First, specialists now effectively enjoyed a monopoly compared to 1933, when a third of NYSE-listed stocks had more than one specialist.\textsuperscript{61} In the past, specialists vied for business from brokers by standing ready to trade at all times and providing competitive prices.\textsuperscript{62} Without competition,

\textsuperscript{57} See \textit{Segregation Study}, supra note 9, at 41-42. The interpretation is named after its author David Saperstein, then-director of the Division of Markets and Trading. The Segregation Study—written by Saperstein as well—also found that exchange rules adopted in 1934 had curbed abusive trading by specialists. \textit{Id.} at 86.

\textsuperscript{58} See Simon & Trkla, supra note 42, at 298-300 (describing the history of Rule 11b-1).


\textsuperscript{60} See \textit{Regulation of Specialists}, Exchange Act Release No. 7465, 29 Fed. Reg. 15,862, 15,863 (Nov. 26, 1964). In 1981, the SEC applied the rule to the exempt markets, but only for trading in the few stocks that were listed at those markets. See \textit{Final Rules on Regulation of Specialists}, Exchange Act Release No. 17,574, 46 Fed. Reg. 15,134 (Mar. 4, 1981). Rule 11b-1 is, therefore, of limited applicability to exchanges other than the NYSE and Amex.


\textsuperscript{62} See \textit{id.; Special Study}, supra note 41, pt. 2 at 62 (“[T]he cornerstone of the conventional argument that the specialist has an economic incentive to deal for his own account is that, by providing a liquid market and preventing unreasonable price fluctuations, the specialist will be favored with increased commission business.”).
however, specialists had fewer incentives to provide aggressive quotes.\(^63\) The lack of competition allowed them to trade profitably for their own account 87.9% of the time.\(^64\)

Second, specialist trading had come to exhibit none of the salutary qualities identified in prior SEC studies.\(^65\) By the time Rule 11b-1 was adopted, specialists used most of their capital to trade only active issues.\(^66\) For inactive stocks, specialists often posted only nominal quotes with prices far away from the prevailing market.\(^67\) To address this, the SEC forced the NYSE to amend its rulebook to require that quotes be “reasonable.”\(^68\)

Third, it had become clear that the Saperstein Interpretation was inadequate to foster market stability.\(^69\) The Interpretation generally allowed specialists to trade in two situations: if it would minimize temporary disparities between supply and demand for a stock; or if it would promote price continuity, meaning that it would reduce the difference in price between successive transactions.\(^70\) Prior to 1964, the NYSE deemed that a specialist had fulfilled his obligation if he had responded to an imbalance with successively priced quotes, each for a small number of shares.\(^71\) The problem with this approach was illustrated during the Market Break of 1962, when the Dow average had what at the time was its second-worst point drop in one day.\(^72\) During the Market Break, the small trades that specialists provided under their price continuity obligations failed to absorb the wave of orders to sell.\(^73\)

As a result of Rule 11b-1, the NYSE amended its rulebook to require

\(^{63}\) SPECIAL STUDY, supra note 41, pt. 2 at 87.

\(^{64}\) Id. at 83.

\(^{65}\) See id. at 61-64.

\(^{66}\) Id.

\(^{67}\) Id. at 86-87.


\(^{69}\) See SPECIAL STUDY, supra note 41, pt. 2 at 163.

\(^{70}\) See Saperstein Interpretation, supra note 56, at *4.

\(^{71}\) See Notice of Proposed Rule Making Related to Securities Specialists, supra note 68, at 13,778.

\(^{72}\) See generally SPECIAL STUDY, supra note 41, pt. 2 at 110-65 (evaluating specialists performance during the Market Break).

\(^{73}\) See id. at 164 (“During the May 1962 market-break, specialists as a group did not have a significant stabilizing effect on the market . . . .”).
that specialists provide quotes for a reasonable number of shares. In essence, the NYSE was required to add quote size as a third element to the Saperstein conception of an orderly market, which was originally based on small imbalances and price continuity.

With Rule 11b-1, the SEC moved specialist regulation beyond its original proscriptive stance. In the 1930s, regulators had assumed that specialists would provide liquidity to earn a profit, and instead focused on protecting investors from abusive practices. In contrast, Rule 11b-1 was predicated on the recognition that the incentives of specialists were skewed by their monopoly in a stock, which allowed them to earn a consistent profit without taking on much risk. In exchange for this privileged position, Rule 11b-1 imposed on specialists an obligation to maintain a stable and orderly market.

This broad principle behind Rule 11b-1 informs current calls to regulate HFTs. For example, SEC Chairman Mary Schapiro has suggested that since HFTs have “the best access” to the market, they should also be required to trade in a way that fosters market stability. I examine whether the analogy between specialists and HFTs is appropriate in Part C, after first reviewing regulations for market makers, the successors to specialists in providing liquidity.

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75. Quote size is sometimes referred to as market depth. *See, e.g., Van der Moolen Specialists USA, Exchange Act Release No. 49,502, 2004 WL 626564, at *2 (Mar. 30, 2004)* (“An orderly market is characterized by regular reliable operations, with price continuity and depth in which price movements are accompanied by appropriate volume, and unreasonable price variations between sales are avoided.”).

76. *See SPECIAL STUDY, supra* note 41, pt. 2 at 126. In justifying the quote depth requirement, the SEC noted:

There is no doubt that by providing depth in both good markets and bad, the specialist is more likely to . . . increase his risk. However, the business of the specialist is not an unrewarding one. A responsibility to provide continuity with depth is the reasonable concomitant to the many privileges specialists enjoy.

*Id.*

77. *Id.* at 127-28 (“[T]he privileges enjoyed by the specialist are compatible with the statutory scheme only if his duties to the public investor are not terminable at will but continue reasonably through good markets and bad, through profitable and unprofitable periods.”).

B. MARKET MAKERS

The SEC recently observed that HFTs have largely replaced specialists and market makers as liquidity providers, but without the same regulatory obligations. Although correct, the statement suggests a misleadingly simple regulatory response, namely to impose the traditional market maker obligations on the HFTs who now perform that function. The difficulty is that market makers historically have had only a minimal duty to assist in maintaining a stable market.

This section provides a historical overview of the development of market maker regulation. From the 1930s and to this day, the SEC has imposed significantly looser obligations on market makers than on specialists. The SEC has consistently reasoned that there is a smaller need for stringent regulation because market makers lack the special privileges of specialists. As a result, market makers have never been required to inject their trading interest to help damp price swings. Indeed, by May 5, 2010, market makers were hardly required to stand always ready to trade. Thus, extending the market maker obligations in force on May 5 to HFTs would be insufficient to safeguard liquidity in times of market stress.

1. Market Makers Before and After Nasdaq

In general, market makers are firms that announce their willingness to both buy and sell a security for their own account by regularly providing quotes. Starting in 1911 and continuing through the 1960s, market makers submitted their quotes to the National Quotation Bureau, a private company that published a daily booklet known simply as “The Sheets” with quotes from 1000 to 1300 firms. The Sheets were the only comprehensive source of information on prices for securities traded in the over-the-counter market. In the SEC’s opinion, market makers...
played a “particularly important” role in this setting because they risked their own capital to provide liquidity in securities that might otherwise trade infrequently, particularly in times of market stress. 83 Through the 1960s, market makers had broad discretion over which securities they quoted and the prices of those quotes. 84

In 1971, the National Association of Securities Dealers (“NASD”) 85 displaced The Sheets with its own electronic service to collect and disseminate quotes. The NASD, which regulated the OTC market, initially aimed to police against fraudulent quotes. 86 The immediate effect, however, was to fuel a rise in trading volume since the NASD’s Automated Quotation service (“Nasdaq”) provided more timely quotes than The Sheets. 87 Prices also became more competitive as easier access to quotes made market makers more responsive. 88

The NASD eventually used its control of the quotation service to impose, in effect, affirmative obligations on market makers. The Nasdaq required market makers to maintain quotes to both buy and sell a security at a price that was “reasonably related to the market.” 89 In addition, the bid price to buy a stock had to be within a certain range of the price of the offer to sell. 90 Although the range was quite wide by

makers). In 1935, OTC volume represented 14% of trading on all exchanges. By 1961, OTC volume had grown to about 61% of exchange volume. See id. at 547.

83. See id. at 554.
84. Id. at 563 (“Broker-dealers have complete freedom to commence or terminate making an over-the-counter market for any security, including any security listed on an exchange, for any reason and regardless of their relationship to the issue or the issuer.”).


86. The National Quotation Service had no authority over brokerages and took minimal steps to ensure the integrity of the published quotes. In 1963, the SEC found that The Sheets included “case after case” of quotations submitted with the purpose of manipulating prices. See SPECIAL STUDY, supra note 41, pt. 2 at 663–64.

87. See Simon & Trkla, supra note 42, at 306.
88. Id.
90. Id.
current standards, it represented a significant change from the 1960s, when the difference would often exceed 20%.

In addition, with the 1975 Amendments to the Exchange Act, market makers were required to provide a “regular or continuous” quote. Two years later, SEC Rule 11Ac1-1 required quotes to be “firm,” meaning that market makers had to stand willing to execute the trade at the quoted price or better. Taken as a whole, the Nasdaq requirements and the 1975 Amendments meant that market makers had to stand ready to buy and sell a stock at a price reasonably related to the market at all times.

This affirmative obligation pales in comparison with that on specialists, who had a duty, on a trade-by-trade basis, to minimize order imbalances, provide price continuity, and submit quotes of a reasonable size. Whereas specialists had an obligation to respond to conditions that would lead to sudden price swings, market makers had only a general responsibility to remain in the market.

The SEC has repeatedly justified the different regulatory regimes for specialists and market makers on the ground that the latter had no special privileges. Whereas specialists maintained the order book, market makers viewed quotes on equal terms with other broker-dealers. While specialists enjoyed a monopoly, market makers had to

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91. In 1961, the typical OTC stock had a price of $3-$10 and a spread in the range of 5% to 7.5%. However, stocks priced under $3 had, on average, a spread of between 20% to 40%. By 1986, the maximum allowable spread on Nasdaq for a stock under $3 could be as low as 8.4%. See SPECIAL STUDY, supra note 41, pt. 2 at 680; NASD, Notice to Members 86-55, Request for Comments on Proposed Revisions to Schedule D (July 30, 1986).


93. 15 U.S.C. § 78c(a)(38) (2006) (defining a market maker as any person who “holds himself out (by entering quotations in an inter-dealer communications system or otherwise) as being willing to buy and sell such security for his own account on a regular or continuous basis.”).

94. 17 C.F.R. § 240.11Ac1-1 (c)(2) (2011).

95. See supra notes 58-75 and accompanying text.

compete to trade their specialty stocks. In the SEC’s view, competition among market makers served as a deterrent for abusive practices and spurred market makers to provide better prices. Stringent regulation was unnecessary since market makers who regularly failed to provide the best prices would lose business. Thus, Rule 11b-1 did not apply to market makers, meaning they were not required to inject their trading interest to help damp price swings.

2. Intermediate Trading Obligations

As the OTC market grew to rival exchange trading in the 1980s, regulators adopted a more restrictive approach. Ultimately, market makers ended up with an intermediate set of obligations: more demanding than the pre-Nasdaq regime, but not as stringent as Rule 11b-1. This model most closely resembles the regulatory framework for market makers on U.S. stock exchanges today.

Increased investor participation on Nasdaq during the 1980s and 1990s made the SEC sensitive to market maker conflicts of interest. Firms were both trading for their own account and handling customer orders with few regulatory safeguards. Worse still, a 1994 investigation showed that market makers colluded to set artificially wide spreads for stocks.

As a result, the SEC imposed negative obligations on market makers in a series of rules adopted between 1994 and 1996. The first, known as the Manning Rule, bars market makers from trading ahead of...
certain customer orders. 103 The rule stemmed from a complaint against a brokerage firm by an investor named William Manning. 104 Manning had submitted a “limit order” that instructed the firm to sell a stock for a minimum price. 105 But when the sale opportunity presented itself, the broker instead sold shares from its own account, and was unable to execute Manning’s trade before the stock price fell. 106 The NASD held that the broker’s conduct was inconsistent with NASD rules of fair practice. 107 The NASD reasoned that the firm, as a fiduciary, was required to subordinate its interests to those of its customers, unless its self-interest was fully disclosed. 108

The SEC eventually extended this protection to all investor limit orders, not just those that a firm handled on behalf of its customers. 109 The SEC noted that federal securities laws afforded investors greater protections than the typical fiduciary relationship. 110 In the SEC’s view, “a stricter duty may be imposed where, as here, the principals are investors and the agents control access to the trading markets.” 111 Accordingly, market makers have an obligation to refrain from executing a trade that would deprive investors of the opportunity to buy or sell a stock at their specified price. 112 In short, market makers have to yield to all investor limit orders.

The Order Handling Rules of 1996 went a step further in an effort to remedy the findings of the price-fixing investigation. 113 Typically, market makers held customer orders for a few seconds while they

103. See NASD IM-2110-2(a) (superseded in September 2011 by FINRA R. 5320); Nasdaq R. IM-2110-2.
105. A limit order instructs a broker to trade at the best price available, but only if it is no worse than a specified limit price. In contrast, a market order instructs the broker to trade at the best price available. HARRIS, supra note 7, at 11; E.F. Hutton, 49 S.E.C. at 830.
106. See E.F. Hutton, 49 S.E.C. at 830.
107. Id. at 835.
108. See id. at 836 (David S. Ruder, Chairman, SEC, concurring).
110. See id. at 28,000.
111. Id.
112. Id.
113. 17 C.F.R. §§ 240.11Ac1-1, 11Ac1-4(b) (2011) (describing the requirements imposed on specialists and OTC market makers to publish bids or offers immediately).
assessed whether to execute the trade from their own inventory.\textsuperscript{114} If the trade would be unprofitable for the firm, it would publish the customer’s order to other market makers who might complete it.\textsuperscript{115} The Order Handling Rules eliminated that valuable moment of consideration by requiring in some instances that market makers display customers’ limit orders immediately upon receipt.\textsuperscript{116} In essence, a market maker lost the opportunity to trade with its customers unless it was already offering them a better price than the customers sought.\textsuperscript{117}

In adopting the Order Handling Rules, the SEC aimed to introduce a new element of competition into Nasdaq. Market makers were now competing against investors’ limit orders instead of only against other market makers, which reduced the chances of another price-fixing scandal.\textsuperscript{118} If in the 1960s, the SEC viewed market makers as important intermediaries for illiquid stocks, by the 1990s, the SEC recognized a need to restrict their dealings to protect investors.

The key point here, though, is that the SEC’s approach was decidedly modest. Although the Manning and Order Handling Rules were originally aimed at narrowing the difference between specialists and market makers obligations,\textsuperscript{119} the SEC did not force market makers to abide by the strictures of the Saperstein Interpretation. Market makers were not required to limit their dealings to transactions that were necessary to provide price continuity, minimize imbalances, or create market depth.\textsuperscript{120} Rather, they were largely allowed to trade so long as investors were not harmed.\textsuperscript{121}

\textsuperscript{115} Id. This practice, the SEC noted, “often results in inferior or missed executions” for customers. Id. at 48,295.
\textsuperscript{116} See id. at 48,302.
\textsuperscript{117} Customers’ limit orders have to be displayed if the limit price is better or equal to the market maker’s quote, or if the limit price is at the national best bid or offer and for a significantly larger number of shares than currently quoted. Id.
\textsuperscript{118} Id. at 48,295 (“Market makers will not only be competing amongst themselves, but also against customer limit orders represented in the quote. The Commission believes that this result will reduce the possibility of certain trading behavior on Nasdaq that was recently the subject of a Commission investigation.”).
\textsuperscript{120} But cf. Saperstein Interpretation, supra note 56 (“[A] transaction cannot be deemed reasonably necessary for the maintenance of a fair and orderly market within
More importantly, the SEC allowed these minimal obligations to erode over the past 10 years. Starting in 2001, small regional exchanges revised their rulebooks to establish looser market maker obligations than those imposed by Nasdaq.  

122 Then in 2007, Nasdaq followed suit and scrapped the requirement that quotes be “reasonably related” to the prevailing market price.  

123 Nasdaq argued that this rule change was necessary to put it on equal footing with rivals that merely required market makers to provide a “continuous” offer to buy and sell a stock without regard for price.  

124 The SEC approved the change, noting that the Exchange Act demands nothing more.  

This change essentially gutted market makers’ affirmative obligations. A rule adopted by another exchange shortly thereafter illustrates this point. The rule provided that market makers could fulfill their obligations with so-called stub quotes—i.e., offers to buy shares at $0.01 and sell them for $999,999.99.  

126 With a quote so far removed from the prevailing price, a firm could effectively withdraw from the market. Worse still, as the Flash Crash would reveal, stub quotes left open the possibility of trades at prices that regulators would later come

the meaning of the rule if it is not reasonably calculated to contribute to the maintenance of price continuity and to the minimizing of the effects of temporary disparity between supply and demand.”).

121 But cf. id. (“[C]ompliance with the rule cannot be evidenced by a mere showing that a transaction by a specialist for his own account had no undesirable effect, or even no discernible effect, upon the market.”).


124 Id. at 64,103.

125 See id. at 64,102.

to view as “ridiculous.” In any event, the fine for non-compliance with the quoting requirement was as low as $100.

In sum, the regulatory pattern since the Exchange Act has been to impose less demanding obligations on market makers than on specialists. Market makers have had a limited duty to stand ready to trade and some significant restrictions on handling customer orders. However, they have never been obligated to risk their own capital to promote market stability. The suggestion that imposing market maker obligations on HFTs would help prevent another Flash Crash misunderstands this long-standing framework.

C. HIGH-FREQUENCY TRADERS

In the most general terms, HFTs are firms that, while risking their own capital, use high-speed computer systems to buy and sell stocks quickly and in high volumes. Although they represent only 2% of the 20,000 firms that trade stocks, they nonetheless dominate U.S. equity markets. HFTs buy and sell a stock within seconds, and account for about half of daily volume. Their influence on the market is magnified

128. See, e.g., Bats R. 8.15.01(e). At NYSE Arca, the fine could range from $250 to $1,000 depending on the number of prior offenses. Arca R. 10.12(g)(3). At the NSX the fine could range from $500 to $2,500, again depending on the number of prior offenses. NSX R. 8.15.01(a).
129. See Final Findings, supra note 10, at 45; Preliminary Findings, supra note 6, app. at A-11.
130. See Concept Release, supra note 16, at 3606 (“By any measure, HFT is a dominant component of the current market structure and is likely to affect nearly all aspects of its performance.”); see generally Larry Tabb, Robert Itai & Adam Sussman, U.S. Equity High Frequency Trading: Strategies, Sizing and Market Structure (2009) (describing the firms’ characteristics and trading strategies).
132. The industry convention is to calculate volume for participants as a proportion of twice the actual number of shares that change hands. This gives credit to the buyer and the seller of each trade. The estimate, therefore, reflects that HFT firms represent one side of almost every trade. See Schapiro, Security Traders, supra note 22.
because they typically submit more than nine orders per trade. They provide an offer to buy or sell shares whenever an investor wants to trade, even though they have none of the obligations of specialists or market makers. Instead, they voluntarily provide liquidity as a result of two features of current exchange regulation: Rule 611 of Regulation NMS and exchange rebates.

This section describes HFTs in detail and explains how these two features create powerful incentives for HFTs to provide liquidity. It also returns to the notion that HFTs should be regulated like market makers or like the specialists of old. Proponents of this idea argue that HFTs play a dominant role in the market with scant regulatory oversight. Contrary to some commentators’ contentions, however, the evidence suggests that the vast majority of HFTs are already SEC-regulated entities.

About 48% of the trading volume generated by HFTs comes from SEC-registered broker-dealers that trade exclusively with their own capital. There are an estimated 100 to 300 of these so-called

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135. See, e.g., Letter from Kurt N. Schacht & Linda Rittenhouse, CFA Institute, to Elizabeth M. Murphy, Secretary, SEC (June 22, 2010) (noting that HFTs are “relatively unregulated” entities); Letter from Kimberly Unger, Exec. Dir., Sec. Traders Ass’n of New York, to Elizabeth M. Murphy, Secretary, SEC (Apr. 30, 2010) (noting that HFTs are unregulated); Matthew Phillips, Fast, Loose, and Out of Control, NEWSWEEK, May 31, 2010 (quoting Sen. Kaufman as saying: “We’re dealing with something highly complex and completely unregulated.”).

proprietary trading firms. Since they don’t have customers, the Order Handling Rules do not apply.

An additional 46% of HFTs’ volume comes from special units of approximately 20 large brokerages. These brokerages have outside clients, but the HFT unit has been lawfully structured to trade only for the firm’s account. These arrangements may be affected by the so-called Volcker Rule, included in the Dodd-Frank Wall Street Reform and Consumer Protection Act enacted in July 2010. The Volcker rule, in part, prohibits banks and their affiliates from engaging in proprietary trading, unless it is in connection with underwriting, market-making or hedging activities.

The remaining 6% of HFTs’ volume comes from roughly 20 hedge fund managers, which oversee private pools of capital that by law

137. See McEachern Gibbs, supra note 136.
138. The Manning and Order Handling Rules cover only “customer” orders, meaning orders from non-broker-dealers. See 17 C.F.R. § 240.11Ac1-1(a)(26 ) (2011) (“The term customer means any person that is not a registered broker-dealer.”).
139. See McEachern Gibbs, supra note 136. For example, Goldman Sachs Group Inc. is an NYSE designated market maker and also makes “many millions of dollars in annual profits” from high-frequency trading. See United States v. Alevnikov, No. 10 Cr. 96, 2010 U.S. Dist. LEXIS 92101, at *15 (S.D.N.Y. Sept. 3, 2010). The quantitative trading strategies of Morgan Stanley’s Process Driven Trading unit are “the most successful . . . on Wall Street in terms of consistency, longevity, and profitability.” Scott Patterson, The Quants: How a New Breed of Math Whizzes Conquered Wall Street and Nearly Destroyed It 126 (Crown Bus. 2010).
140. Firms, for example, are required to establish information barriers between the HFT unit and the division handling customer orders. See FINRA Rules 3010, 2110, IM-2110-2, IM-2110-5.
143. See McEachern Gibbs, supra note 136.
have broad flexibility in their investment strategies. This group only includes hedge fund managers that have not created their own broker-dealers and rely instead on third-party brokerages to access the exchanges. This arrangement is somewhat rare among HFTs because connecting to a third-party brokerage may introduce a delay in processing orders.

The first two categories closely resemble market makers; indeed, a handful of HFTs are registered with exchanges to make markets in particular stocks. For example, GetCo LLC, which one commentator has characterized as “likely the world’s biggest HFT firm,” was registered to make markets in 4 of the 11 stock exchanges operating in the U.S. as of June 2011. Other HFTs including EWT LLC, Jane Street Capital LLC, Hudson River Trading LLC, and Virtu Financial LLC were among the 170 registered Nasdaq market makers in October 2010. Similarly, Sun Trading LLC was registered to make markets in more than 4800

144. See Troy A. Paredes, On The Decision to Regulate Hedge Funds: The SEC’s Regulatory Philosophy, Style, and Mission, 2006 U. ILL. L. REV. 975, 976 (“Hedge funds have simply been structured in an open and aboveboard fashion to take advantage of the exclusions that Congress has seen fit to build into the securities law regime.”).

145. Typically, the funds pay brokerages for speedy access to the exchanges’ computer systems. Although technically not members of an exchange, the funds are still required to abide by exchange rules. See, e.g., Bats R. 11.3(b)(2)(C); EDGA R. 11.3(b)(2)(C); Nasdaq R. 4611(d)(2)(C); NYSE R. 123B.03(c)(2)(C). See generally Nina Mehta, Gloves Off: Industry Fights Over Sponsored Access to Markets, TRADERS MAG., Apr. 2009 (noting that about 15% of Nasdaq volume comes through such sponsored access arrangements).


149. See Peter Chapman & James Ramage, In Search of Market Makers, TRADERS MAG., Nov. 2010 (listing examples of HFTs among Nasdaq’s 170 registered market makers in 2010). But see Nina Mehta, NYSE Tweaks Pricing to Appeal to High Frequency Firms, BLOOMBERG, Dec. 22, 2010 (reporting that Nasdaq had a total of 136 market makers in November 2010).
At least for HFTs that are registered as market makers, there is significant regulatory supervision.\textsuperscript{151} In contrast, hedge fund HFTs are ineligible to become exchange members and thus never register as market makers.\textsuperscript{152} They are, therefore, unique in avoiding the regulatory burdens imposed on brokerages or market makers. The Dodd-Frank Act may narrow this gap somewhat by subjecting hedge fund managers with more than $150 million in assets to regulatory examinations pursuant to the Investment Advisers Act of 1940.\textsuperscript{153} Nevertheless, hedge fund managers have an important advantage over market makers because of the Manning and Order Handling Rules.\textsuperscript{154} Hedge fund limit orders are protected under the Manning and Order Handling Rules, meaning that market makers must often yield to allow the hedge fund to trade at its specified price.\textsuperscript{155}

The simple point here is that the vast majority of HFTs are regulated by the SEC as broker-dealers. Only a small set of hedge fund HFTs enjoy less stringent oversight and capitalize on rules designed to protect investors from unfair market maker practices. I turn now to two key elements that spurred the growth of HFTs.

1. \textit{Rule 611 of Regulation NMS}

HFTs came to prominence due to a regulatory regime that favored electronic trading. In adopting Regulation NMS ("Reg NMS") in


\textsuperscript{151} See THOMAS LEE HAZEN, 5 TREATISE ON THE LAW OF SECURITIES REGULATION 319 (6th ed. 2009) ("[M]arket making activities are closely scrutinized by the SEC and FINRA.").

\textsuperscript{152} See, e.g., Nasdaq R. 1002; NYSE R. 2(b) (both defining members as SEC-registered brokers or dealers).

\textsuperscript{153} The funds will be subject to periodic examinations and must report to the SEC, among other things, their trading practices and investment procedures. See Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 § 404, 124 Stat. 1376 (2010).

\textsuperscript{154} See supra notes 103-118 and accompanying text.

\textsuperscript{155} The Manning and Order Handling Rules cover "customer" orders, meaning orders from non-broker-dealers. See 17 C.F.R. § 240.11Ac1-1(a)(26 ) (2011) ("The term customer means any person that is not a registered broker-dealer."); NASD R. 0120(g) ("The term ‘customer’ shall not include a broker or dealer."). Accordingly, hedge fund HFTs are covered by the rules, whereas a broker-dealer trading for its own account is not.
2005, the SEC distinguished for the first time between automated and manual quotes. The former are displayed electronically and are immediately actionable, while the latter are quotes uttered by a floor trader. In the SEC’s view, automated quotes provide investors some assurance that their order will be completed at the specified price. In contrast, manual quotes are “maybe” quotations subject to a trader’s determination of whether to honor them. This view was likely informed by contemporaneous SEC investigations into improper trading by specialists at 27 firms, which resulted in $359 million in fines and disgorgement of illegal profits.

Reg NMS protects automated quotes. Rule 611 of Reg NMS requires that brokers and exchanges give priority to the electronic order that sets the best price, meaning the highest bid to buy or the lowest offer to sell. Brokers may ignore a manual quote, even if better priced. The SEC hoped that Rule 611 would foster investor confidence by sidelining “maybe” manual quotes, which often resulted in a transaction at a price inferior to an investor’s electronically displayed quote. With greater protection, the SEC reasoned, investors would be less likely to hide their trading interest and more inclined to submit orders, creating a deeper and more stable market.

158. Id. at 37,527.
159. Id.
160. Id.
163. Regulation NMS, supra note 157, at 37,504 (“Rule 611 does not require market participants to route orders to access manual quotations, which generally entail a much slower speed of response than automated quotations.”).
164. Id. at 37,579.
165. Id. at 37,498.
The immediate consequence of Reg NMS was a significant expansion of electronic trading.\textsuperscript{166} HFTs thrived as exchanges—notably the NYSE—overhauled their trading systems.\textsuperscript{167} At the NYSE, automatic executions that did not require the intervention of specialists accounted for more than 80\% of volume in 2007, compared with 11.4\% in 2005.\textsuperscript{168} Transactions were processed in less than a second instead of 10.\textsuperscript{169} Many HFTs sought to trade even faster and placed their computers near the exchanges’ servers to minimize the time it took for an order to travel between the two systems.\textsuperscript{170} Many exchanges now provide co-location services, renting space in their data centers for fees starting at about $5,000 per month.\textsuperscript{171}

Reg NMS also enabled upstart markets to compete against entrenched incumbents.\textsuperscript{172} Rule 611 effectively forced brokerages to stop sending orders to floor brokers and instead submit them electronically to the exchange with the best price.\textsuperscript{173} New markets made quick inroads by catering to HFTs and giving them incentives to set

\begin{itemize}
\item 167. See Aaron Lucchetti, \textit{The NYSE: Faster (and Lonelier)}, \textit{Wall St. J.}, Jan. 24, 2007, at C1 (noting that the overhaul was the biggest change to the way that stocks traded at the NYSE since its founding).
\item 168. NYSE Group, Inc., Annual Report (Form 10-K), at 12 (Mar. 27, 2007); NYSE Group, Inc., Annual Report (Form 10-K), at 6 (Mar. 31, 2006).
\item 170. See Aaron Lucchetti, \textit{Firms Seek Edge Through Speed as Computer Trading Expands}, \textit{Wall St. J.}, Dec. 15, 2006, at A1 (describing competition among HFTs to reduce the time it takes to complete a trade to 0.02 seconds).
\item 172. See, e.g., Jeff Kearns & Edgar Ortega, \textit{NYSE Trading Falls to 7-Year Low as U.S. Volume Rises}, \textit{Bloomberg}, May 23, 2008 (quoting the Chief Executive Officer of NYSE Euronext as saying: “The bottom line is that it’s very easy to get started and compete with us. The barriers to entry for someone to get a license and compete with us are lower than they have ever been.”).
\item 173. See Mathisson, \textit{supra} note 166, at 64-67.
\end{itemize}
competitive prices. The NYSE’s market share of trading in its listed stocks plummeted to as low as 25.8% in December 2009 from 80% in January 2003.

To remain competitive, the NYSE eliminated specialists in 2008. Having adapted to new technologies for more than 135 years, specialists were too constrained by Rule 11b-1 to compete after Reg NMS. In 2007, specialists were either the buyer or the seller of shares representing 3.2% of total volume at the NYSE, down from 15.2% in 2001. The exchange replaced specialists with so-called Designated Market Makers (“DMMs”), which had greater freedom to trade. Since DMMs no longer had special access to the order book, they were not bound by Rule 11b-1.

In sum, Rule 611 served as a catalyst for automated trading, a prerequisite for the growth of HFTs. It also placed a premium on speed, since setting the best price requires being the first to deliver an order. Within two years of the implementation of Reg NMS, HFTs had come to dominate equity markets, and specialists had vanished.
2. Exchange Rebates

Rebates are a controversial yet crucial inducement that exchanges use to draw in business. Although rebates are available to any trader, this section shows how rebates are uniquely suited as an incentive for HFTs. In fact, rebates are the main mechanism through which exchanges ensure there is an offer to buy or sell a stock whenever an investor wants to trade.181

In general, stock exchange fee schedules involve collecting a fee from one party to a trade and making a smaller payment to the other party.182 The payment is meant to reward the party who first took the risk of displaying its interest in trading at a certain price. The fee is paid by the party who benefited from the certainty of finding a willing buyer or seller already in the market. Although exchanges have used rebates since at least 1990 as a way to attract business,183 rebates are particularly well suited as an incentive for HFTs.

HFTs execute thousands of trades a day with the hope of earning a small profit by predicting price movements in a stock over short time intervals.184 One popular strategy involves buying after a price declines, or selling after a price increases, with the expectation that the price trend

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181. See supra notes 122-128 and accompanying text for a discussion on the weakening of market maker obligations.

182. Fee schedules are complex and vary widely among exchanges. For the sake of clarity, I limit the discussion here to the general outlines of what has come to be known as the maker-taker pricing model. In December 2010, there were four exchanges, executing about 7% of daily volume, that used a different model than the one described here. These exchanges charged a fee to the party who first submitted an order, and paid a rebate to the party who responded second. See Nina Mehta, NYSE Tweaks Pricing to Appeal to High Frequency Firms, BLOOMBERG, Dec. 21, 2010 (describing fee schedules for the Bats BYX, CBSX, EDGA, Nasdaq BX exchanges). As of October 2011, only three exchanges maintained a so-called inverted fee schedule, with a collective market share of about 4.8%. See Bats BYX Fee Schedule, available at http://batstrading.com/FeeSchedule/ (last visited Oct. 2, 2011); CBSX Fees Schedule, available at http://www.cboe.com/publish/cbsxfeeschedule/cbsxfeeschedule.pdf (last visited Oct. 2, 2011); Nasdaq BX R. 7018.


will reverse. HFTs might also engage in arbitrage strategies that seek to capitalize on price discrepancies between related markets; or they might develop strategies for anticipating large orders from other traders in hopes of profiting from the price movement that typically occurs when a large order is executed.

In any case, HFTs make an average profit of about $0.001 per share, so the typical rebate of $0.002 is significant. If an HFT systematically earns rebates, the benefits quickly add up. Indeed, one commentator estimates that exchanges paid $3.7 billion to HFTs in rebates in 2009. As a reference, HFT profits on trading stocks, options, futures, and currencies were an estimated $8 billion in 2008 and $7.2 billion in 2009. Profits from equities alone may range from $2 billion to $4.1 billion. In 2010, as volatility subsided and trading volumes fell, overall profits for HFTs dropped to about $5.7 billion. Although these are general estimates without rigorous validation, they suggest that rebates are a major source of profits for HFTs.


187. See Kambiz Foroohar, *Speed Geeks*, BLOOMBERG MKTS., Oct. 6, 2010, available at http://www.bloomberg.com/news/2010-10-06/speed-geeks.html (reporting HFTs earn between 0.1 cent and 0.2 cent per share); Letter from Manoj Narang, Chief Exec. Officer, Tradeworx Inc., to Elizabeth M. Murphy, Secretary, SEC (Apr., 21, 2010) [hereinafter Narang Letter], available at http://www.sec.gov/comments/s7-02-10/s70210-129.pdf (estimating HFTs earn about 0.1 cent per share); Brogaard, supra note 185, at 16 (estimating profits of between 0.03 and 0.07 cent per $100 traded).


189. Schack & Gawronski, supra note 147.

190. See Foroohar, supra note 187 (reporting estimated profits for 2009); TABB ET AL., supra note 130 (estimating profits for 2008).

191. See Brogaard, supra note 185, at 17-18 (estimating annual profits of between $4.1 billion to $2.8 billion); Narang Letter, supra note 187 (estimating annual profits of about $2 billion).

In theory, both parties to a trade can benefit from rebates. For example, imagine that stock XYZ is offered for sale at $10.02, but bids to buy are only as high as $10.00. Then, Firm A submits a bid to buy at $10.01, relying on the Rule 611 assurance that its order will be protected because it sets the best price. That bid draws a willing seller. As a result, Firm A gets the XYZ stock and the rebate. The seller receives a penny more for the shares than the previous best bid, and in return pays the exchange fee. Two exchanges recently tried to foster this sort of mutually beneficial dynamic by introducing special rebates for traders who submit orders that set a new national best bid or offer.\footnote{The Bats Y-Exchange started the program in April 2011, followed three months later by the Bats Exchange. See Notice of Filing and Immediate Effectiveness of Proposed Rule Change Related to Fees for Use of Bats Exchange, Exchange Act Release No. 64,847, 76 Fed. Reg. 41,546, 41,547 (July 14, 2011); Notice of Filing and Immediate Effectiveness of Proposed Rule Change Related to Fees for Use of Bats Y-Exchange, Exchange Act Release No. 64,429, 76 Fed. Reg. 27,694, 27,695 (May 12, 2011).}

In practice, however, rebates have long been criticized as unfair and conducive to improper conduct.\footnote{See, e.g., Proposed Rule on Payment for Order Flow, Exchange Act Release No. 33,026, 58 Fed. Reg. 52,934, 52,938-40 (Oct. 13, 1993) (describing criticisms of payment for order flow, including exchange rebates).} With the increased trading by HFTs, the complaints have grown louder. Critics contend that rebates unfairly force one party to a trade to shoulder the full cost of its execution.\footnote{See Letter from Ann Vlcek, Managing Dir., Sec. Indus. & Fin. Mkts. Ass’n (“SIFMA”), to Elizabeth M. Murphy, Secretary, SEC (Apr. 29, 2010) [hereinafter SIFMA Letter I] (“A high rebate often implies a higher taker charge, which is in turn paid by long-term investors either directly, or indirectly through increased costs on their executing broker-dealers that, ultimately, are passed through to them.”).} They claim that investors are “paying a toll” to HFTs since their transaction fees go to fund rebates.\footnote{See Letter from executives at Se. Asset Mgmt. Inc. to Elizabeth M. Murphy, Secretary, SEC, at 4-6 (Apr. 28, 2010).}

Rebates might also induce a brokerage to handle customer orders in a way that runs counter to its obligation to get the best trade for customers.\footnote{Whereas Rule 611 requires exchanges to execute trades at the best price, brokers owe a duty to their clients of best execution and must consider other relevant factors in addition to price, such as the speed of execution and the difficulty of executing an order in a particular market. See Newton v. Merrill, Lynch, Pierce, Fenner & Smith, Inc., 135 F.3d 266, 270 n. 2 (3d Cir. 1998).} Exchanges pay the rebate to the brokerage, instead of to the stock owner who ultimately initiated the trade. Critics argue that
rebates create a “perverse incentive” for brokers to send orders to the exchange that will pay the most, even if this could result in an unfavorable trade for the customer.\(^\text{198}\) In addition, critics fault rebates for providing an incentive to execute transactions with little economic value.\(^\text{199}\) They claim that HFTs that instantly buy and sell shares at the same price solely to collect the two rebates are merely standing in between natural buyers and sellers who would have otherwise traded with each other.\(^\text{200}\) Worse still, rebates distort prices. Critics argue that since quotes reflect only the price of a stock, they underestimate the actual economic value of the trade to the party who received the rebate, and overstate the value to the party who paid the exchange fee.\(^\text{201}\)

The SEC has tried to address these criticisms over the past 15 years. Under Reg NMS, the SEC capped exchange fees at $0.003 per share for stocks priced above $1.\(^\text{202}\) In the SEC’s view, the cap ensured

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\(^{198}\) See, e.g., Letter from Se. Asset Mgmt., supra note 196; Angel, Harris & Spatt, supra note 175, at 43.

\(^{199}\) This has led some commentators to conclude that high-frequency trading is mere noise in the market. See, e.g., Jonathan Spicer, Globally, the Flash Crash is No Flash in the Pan, Reuters, Oct. 15, 2010, available at http://www.reuters.com/assets/print?aid=USTRE69E1Q520101015 (quoting Nobel laureate Joseph Stiglitz, who is a member of the joint CFTC-SEC advisory panel studying the implications of the Flash Crash, as saying: “[A] number of us are coming to the view that this high-frequency trading has negative social value . . . . They’re playing games. They’re trying to extract information from informed traders, people who are doing the research.”); Paul Krugman, Op-Ed., Rewarding Bad Actors, N.Y. Times, Aug. 2, 2009, at A21, available at http://www.nytimes.com/2009/08/03/opinion/03krugman.html?_r=0 (describing high-frequency trading as “worthless if not destructive from a social point of view”). See generally Andrei Shleifer & Lawrence H. Summers, The Noise Trader Approach to Finance, 4 J. Econ. Persp. 19, 22 (Spring 1990) (distinguishing between arbitrageurs and noise traders who irrationally respond to factors that have no effect on a stock’s fundamental value based on expected future cash flows).

\(^{200}\) See Kaufman Letter, supra note 20 (“Such strategies are of little value to the market place and should be eliminated where possible.”); Letter from Karrie McMillan, Gen. Counsel, Inv. Co. Inst. (“ICI”), to Elizabeth M. Murphy, Secretary, SEC (Apr. 21, 2010) [hereinafter ICI Letter] (“[I]t is unclear what benefits liquidity rebates provide to investors.”).

\(^{201}\) See Kaufman Letter, supra note 20; SIFMA Letter I, supra note 195; Letter from Greg Tusar & Matthew Lavicka, Managing Dirs., Goldman Sachs Grp. Inc., to Elizabeth M. Murphy, Secretary, SEC (June 25, 2010) [hereinafter Goldman Sachs Letter].

\(^{202}\) See 17 C.F.R. § 242.610(c) (2011).
that exchange fees would not impose an unfair burden on investors.\footnote{See Regulation NMS, supra note 157, at 37,502.} Moreover, the cap was low enough to assure investors that “prices are, within a limited range, true prices.”\footnote{Id.} Importantly, the SEC considered and rejected a proposal to cap fees at $0.001 per share on the ground that it would be too disruptive for business practices at the exchanges.\footnote{Id.} Such a cap would represent a greater challenge now than in 2005, because rebates have gained wider acceptance among stock and options exchanges.

The SEC also tackled the issue of a broker’s conflicts of interest with a set of disclosure requirements. Under Rule 10b-10, a brokerage must disclose to customers with each trade confirmation whether it received any payment for routing the order to a particular exchange.\footnote{17 C.F.R. § 240.10b-10 (2011).} Rule 11Ac1-3 requires brokers to inform investors regularly about their policies regarding the receipt of any exchange rebates.\footnote{Id. § 240.11Ac1-3.} In adopting the rules, the SEC noted that disclosure was an adequate means to resolve the conflicts of interest since investors were unlikely to be harmed by a broker submitting an order to an exchange where there would be a meaningful opportunity to get a better price.\footnote{Final Rule on Payment for Order Flow, Exchange Act Release No. 34,902, 59 Fed. Reg. 55,006, 55,012 (Nov. 2, 1994).}

SEC rulemaking should, therefore, focus on whether the cap-and-disclose approach has become ineffective in addressing conflicts of interest. Since Reg NMS, exchange rebates have become more widespread, so perhaps the sheer amount paid in rebates is cause for new rules. An equally important factor to consider, however, is that rebates are a powerful incentive for HFTs to provide liquidity.

D. THE RULES ON MAY 5, 2010

Prior to the Flash Crash, the majority of exchanges required no more of market makers than the statutory minimum, namely that they provide a continuous offer to buy and sell shares without regard for price.\footnote{See Bats R. 11.8(a)(1); Nasdaq R. 4613(a)(1); Nasdaq BX R. 4613(a)(1); NSX R. 11.8(a)(1); NYSE Arca R. 7.23(a)(1).} The NYSE was the noteworthy exception, since its DMMs

\footnotesize{203. See Regulation NMS, supra note 157, at 37,502.}
\footnotesize{204. Id.}
\footnotesize{205. Id.}
\footnotesize{206. 17 C.F.R. § 240.10b-10 (2011).}
\footnotesize{207. Id. § 240.11Ac1-3.}
\footnotesize{209. See Bats R. 11.8(a)(1); Nasdaq R. 4613(a)(1); Nasdaq BX R. 4613(a)(1); NSX R. 11.8(a)(1); NYSE Arca R. 7.23(a)(1).}
retained aspects of the specialists’ regulatory framework. This section contrasts the two regimes to illustrate the tradeoffs that regulators should consider in developing new regulation. Imposing robust affirmative obligations would likely require granting equally meaningful privileges.210

Exchanges that executed 46% of daily volume during April 2010 imposed only minimal affirmative obligations.211 Direct Edge ECN LLC, an electronic market that was not yet an SEC-registered exchange, executed another 10.9% even though it had no market makers.212 At these markets, rebates and the Rule 611 protection for electronically displayed limit orders were the main mechanisms to ensure liquidity.

To be sure, the rulebooks at these markets included a nod to Rule 11b-1 by requiring market makers to “assist in the maintenance, insofar as reasonably practicable, of fair and orderly markets.”213 Yet none of the exchanges included the particularized provisions that the SEC required the NYSE to adopt in the wake of Rule 11b-1 regarding price continuity, order imbalances, and market depth.214 In fact, by 2008, these exchanges allowed market makers to fulfill their obligations with stub quotes at prices far removed from the market.215

In contrast, the NYSE had retained by May 2010 aspects of the old specialist obligations. NYSE Rule 104 provided that DMMs must

210. Lawrence E. Harris, the SEC’s chief economist from 2002 to 2004, crisply summed up the problem as follows: “Efforts to compel dealers to offer more liquidity must somehow increase their profits or lower their perceived risk. Otherwise the dealers will simply quit.” Onnig H. Dombalagian, Demythologizing the Stock Exchange: Reconciling Self-Regulation and the National Market System, 39 U. RICH. L. REV. 1069, 1110, n. 197 (quoting Lawrence E. Harris, Liquidity, Trading Rules, and Electronic Trading Systems, in MONOGRAPH SERIES IN FINANCE AND ECONOMICS 1990-4, at 8 (1991)).

211. In April 2010, Nasdaq had a market share of 18.3%; NYSE Arca was at 13.7%; Bats was at 9.5%; Nasdaq BX was at 3.9%; and the NSX had 0.5%. The market share figures are based on Bats data available at http://www.batstrading.com/market_summary/.


213. See Bats R. 11.8(a); Nasdaq R. 4613(a); Nasdaq BX R. 4613(a); NSX R. 11.8(a); NYSE Arca R. 7.23(a).

214. See supra notes 58-75 and accompanying text.

215. See supra notes 122-128 and accompanying text.
minimize the effects of temporary discrepancies between supply and demand for a stock, and maintain price continuity with reasonable depth. Moreover, DMMs were required to submit quotes at the national best bid or offer for 10% of the day if the security traded more than 1 million shares a day, or 15% if daily volume was lower. For a regular six-and-a-half-hour trading day, that amounted to a 39-minute obligation for high-volume stocks, and just short of an hour for stocks with lower volume. The NYSE encouraged compliance by paying DMMs a rebate at least 85% higher than that paid to regular members.

DMMs had other privileges beyond higher rebates. The NYSE’s seven DMMs had the exclusive right to trade a security for their own accounts on parity with other brokerages. This allowed DMMs to participate in a trade even if they were not the first to establish the best price. For example, imagine that Firm A offered to buy 200 shares of XYZ for $10.00. An instant later, the DMM offered to buy 100 shares at the same price. When the exchange received an order to sell 200 shares, only a portion of the trade would go to Firm A, while the DMM would receive the remainder.

In contrast, nearly all other exchanges operated (and continue to operate) under a rule that allocates trades on a strict price-time priority, meaning that orders are ranked first by price, and then by arrival time, to determine the sequence of execution. Under price-time priority, the 200 shares would go solely to Firm A. This scheme rewards the first

216. See NYSE R. 104(f)(ii). The NYSE also incentivizes DMMs to post quotes that are at least 15% of the average size of the bids or offers for any given security. See NYSE, Price List 2011, available at http://www.nyse.com/pdfs/nyse_equities_price_list.pdf.

217. See NYSE R. 104(a)(1)(A).

218. DMMs can earn a rebate of 0.35 cent per 100 shares for low-volume stocks, and 0.25 cent per 100 shares for high-volume stocks. Regular members can earn a rebate of 0.13 cent per 100 shares. See NYSE Price List 2011, available at http://www.nyse.com/pdfs/nyse_equities_pricelist.pdf.

219. The Bats Exchange, the Chicago Stock Exchange (CHX), the Nasdaq Stock Market, and the National Stock Exchange (NSX) provide no regulatory privileges to market makers. See Bats R. 11.5-11.8; CHX Article 16; Nasdaq R. 4600-4631; NSX R. 11.5-11.8.

220. See NYSE R. 72(c).

221. The exact allocation of shares may vary depending on circumstances established by prior trades. This example is based on NYSE R. 72(c)(viii)(A)-(C).

222. See Bats R. 11.12; CHX Article 20, R. 8(b); Nasdaq R. 4757; NSX R. 11.14; NYSE Arca R. 7.36.
trader who narrows the spread between offers to buy and sell a stock, whereas the NYSE rules make speed less important for DMMs.

The two regimes illustrate the tradeoffs between obligations and fairness. Imposing heightened affirmative obligations like those of NYSE Rule 104 would likely require granting offsetting privileges to a handful of firms. On the other hand, a regime like Nasdaq that relies on rebates to draw in liquidity might be fair insofar as the rebates are available to all traders on equal terms, but then the system is vulnerable to a sudden shock like that on May 6.

II. THE FLASH CRASH AND REGULATORY RESPONSES

A. MAY 6, 2010

For the first part of the day on May 6, 2010, equity trading was mostly unremarkable. Volatility caused by concern that Greece would default on its debt was relatively confined to the currency and debt markets. If Wall Street had closed at 2 p.m., the Dow average’s 1.6% decline would not have even ranked among the five biggest daily losses for the year. The final two hours of stock trading, however, were unprecedented.

Starting at 2:30 p.m., the selloff accelerated as a mutual fund company tried to hedge its stock portfolio by selling $4.1 billion worth of futures contracts tied to the Standard & Poor’s 500 Index. That order was so large that it depleted the outstanding orders to buy the contract, causing a rapid drop in its price and in the prices of the underlying stocks. By 2:42 p.m., the Dow had lost 3.9% for the day.

From 2:42 p.m. to 2:45 p.m., the Dow plunged 5.5%. Shares of Procter & Gamble Co., which posted the biggest decline among stocks

224. All times are EDT, in accordance with the SEC-CFTC reports on the Flash Crash.
225. Trading information included in this section that is not directly attributed is based on Bloomberg data on file with author.
226. FINAL FINDINGS, supra note 10, at 2.
227. Id. at 3.
228. House Hearing, supra note 2 (testimony of Mary L. Schapiro, Chairman, SEC).
229. Id. at app. A.
in the Dow, tumbled 36% from their 2:40 p.m. price.\textsuperscript{230} Many smaller companies fared worse; some 320 stocks lost more than half their market value between 2:40 p.m. and 3 p.m.\textsuperscript{231} Shares of the consulting firm Accenture Plc plunged in seven seconds from $30 to 1 cent.\textsuperscript{232} The avalanche of orders strained the systems of two major exchanges, resulting in delays for processing and reporting trades.\textsuperscript{233} At its worst, the Dow lost 9.2%, or 1010 points, from the prior day’s close—the benchmark’s largest intraday drop since it was created in 1896.\textsuperscript{234}

The sudden price drop triggered automatic alerts for many HFTs.\textsuperscript{235} Their systems are often programmed to pause trading if the risk of incurring losses exceeds a specified threshold.\textsuperscript{236} Thus, two of the 12 largest HFTs decided to pull out of the market at about 2:47 p.m., four others curtailed their trading for a short period, and the remaining six chose to resume trading.\textsuperscript{237} The HFTs that remained in the market significantly increased their trading activity and were “aggressive sellers” as the decline in the Dow worsened.\textsuperscript{238}

The rebound, beginning at 2:48 p.m., was just as startling. In about eight minutes, the Dow recouped all its losses. Procter & Gamble shares bounced back in a minute.\textsuperscript{239} Accenture shares jumped from 1 cent to

\textsuperscript{230} PRELIMINARY FINDINGS, supra note 6, at 21.
\textsuperscript{231} Id. at 16 (citing examples). Some of these transactions were later voided as clearly erroneous trades. In total, the exchanges voided 20,761 trades executed between 2:40 p.m. and 3 p.m. Id. at 31.
\textsuperscript{232} Id. at 35.
\textsuperscript{233} See FINAL FINDINGS, supra note 10, at 75-79 (detailing delays in order processing at NYSE Arca and delays in the dissemination of market data from the NYSE).
\textsuperscript{234} Lauricella & McKay, supra note 3.
\textsuperscript{235} See FINAL FINDINGS, supra note 10, at 4-5.
\textsuperscript{236} See id. at 36.
\textsuperscript{237} See id. at 45; see also Scott Patterson, Did Shutdowns Make Plunge Worse?, WALL ST. J., May 7, 2010, at C1 (reporting that Tradebot Systems Inc., which accounts for about 5% of daily volume, stopped trading); Julie Creswell, Speedy New Traders Make Waves Far From Wall St., N.Y. TIMES, May 17, 2010, at A1 (reporting that Tradeworx Inc., which trades about 80 million shares a day, pulled out of the market).
\textsuperscript{238} Final FINDINGS, supra note 10, at 45-48. A portion of this selling could be attributable to HFTs buying futures contracts on the S&P 500 Index and selling stocks to lock in a profit from the arbitrage. Id. at 47.
\textsuperscript{239} See PRELIMINARY FINDINGS, supra note 6, at 51.
$39 in four seconds, and closed for the day at $41.09. The Dow closed 0.7% above its 2:42 p.m. level.

Regulators scrambled to determine the root cause of the sudden plunge and swift recovery. The SEC and the Commodity Futures Trading Commission promised to review trading and make public any recommendations deemed appropriate to protect investors. Members of Congress immediately zeroed in on electronic trading and urged safeguards to prevent such extreme volatility. By the evening of May 6, a subcommittee of the House Financial Services Committee had scheduled a hearing with the heads of both agencies.

At the hearing, CFTC Chairman Gary Gensler said the agency was reviewing whether HFTs enjoy unfair advantages. SEC Chairman Schapiro believed the Flash Crash exposed deficiencies at the core of the Commission’s policy objective of creating fair and orderly markets. The episode crystallized the SEC’s concern that HFTs could destabilize the market.

240. Id. at 35.
241. See Senate Hearing, supra note 79 (testimony of Mary L. Schapiro, Chairman, SEC).
245. PRELIMINARY FINDINGS, supra note 6, at 8 (describing the CFTC’s planned response to the Flash Crash).
246. See House Hearing, supra note 2 (testimony of Mary L. Schapiro, Chairman, SEC) (“The sudden evaporation of meaningful prices for many major exchange-listed stocks in the middle of a trading day is unacceptable and clearly contrary to the vital policy objective of maintaining fair and orderly financial markets.”).
247. See Schapiro, Strengthening Structure, supra note 4 (“[T]he stocks with broken trades on May 6 highlight the fact that the order book liquidity in those stocks..."
Although the agencies have identified multiple factors that led to the Flash Crash, only two pertain directly to equity market makers.248 First, some market makers nominally satisfied their regulatory obligations by posting bids and offers at unrealistically low prices.249 Stub quotes, for example, were responsible for the 1-cent trades in shares of Accenture.250 Second, the withdrawal of some HFTs from the market exacerbated the “severe mismatch”251 between offers and bids and led to a “liquidity crisis.”252 In response, the SEC affirmed its willingness to consider imposing some sort of quoting obligation on HFTs.253 Before analyzing different proposals in Part III, the following section reviews the SEC’s remedial rulemaking since May 6.

B. RULEMAKING AFTER MAY 6, 2010

The SEC’s initial focus was on aberrant trades and stub quotes, or as Chairman Schapiro once noted, on addressing the symptoms of the crash, not the root cause.254 This section analyzes the three major areas of rulemaking in direct response to the Flash Crash and argues that the SEC has implemented meaningful safeguards for situations of extreme volatility.

248. The SEC noted that it plans to review the reliability of market data, the disparate trading rules between futures exchanges and securities markets, as well as the use of automated trading tools to execute large trades. See FINAL FINDINGS, supra note 10, at 6-8.
249. PRELIMINARY FINDINGS, supra note 6, at 5.
250. Id. at 34.
251. Id. at 2; see also FINAL FINDINGS, supra note 10, at 35-39.
252. See FINAL FINDINGS, supra note 10, at 4.
253. See Schapiro, Strengthening Structure, supra note 4; PRELIMINARY FINDINGS, supra note 6, at 7.
254. See Memorandum from Jennifer B. McHugh, Counsel to SEC Chairman, regarding a meeting with representatives of the Financial Services Forum (Oct. 6, 2010), available at http://sec.gov/comments/4-606/4606-2806.pdf (noting a talking point for Chairman Schapiro that stated: “The devastating impact of May 6 on the psyche of American investors really required that we take immediate steps to address the symptoms even before we clearly understood what the disease was.”).
1. Clearly Erroneous Trades

The Flash Crash revealed shortcomings in the exchanges’ procedures to cancel aberrant trades. Generally, traders may contest a transaction within 30 minutes of execution if the price was so far removed from the prevailing market that it could only have been the result of an error. Since 2009, the exchanges have used uniform thresholds to determine these so-called clearly erroneous trades, ensuring a speedy resolution of contested transactions in a consistent manner. Nonetheless, under the exchanges’ uniform rules, officials had discretion to cancel trades in situations of “extraordinary market conditions.” Thus, on May 6, 2010, exchange officials were faced with hundreds of claims arising from unprecedented market conditions and no clear standard for how to address them. Ultimately, officials determined that trades completed at prices 60% above or below the immediately preceding transactions would be cancelled. As a result, 20,761 trades were cancelled, compared with a daily average of about 118 in the month prior.

In the wake of the Flash Crash, exchange officials came to believe that the uniform rules’ ambiguity for what constituted “extraordinary market conditions” may have added an element of uncertainty on May 6. The exchanges’ spur-of-the-moment decision was also widely criticized as arbitrary. In June 2010, the exchanges proposed an

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255. See, e.g., Nasdaq R. 11890; NYSE R. 128.
257. See PRELIMINARY FINDINGS, supra note 6, at 29.
258. Id. at 29-30.
260. See, e.g., DAVE CLIFF & LINDA NORTHROP, U.K. DEP’T OF BUS., INNOVATION & SKILLS, THE GLOBAL FINANCIAL MARKETS: AN ULTRA-LARGE-SCALE SYSTEMS PERSPECTIVE (2010), available at http://www.bis.gov.uk/assets/bispartners/foresight/docs/computer-trading/11-1223-dr4-global-financial-markets-systems-perspective.pdf (“[T]he means by which trades were selected for busting was argued by many to be arbitrary, after-the-fact rule-making. Some traders who had lost large amounts of money did not have their trades busted; some who had made handsome profits found
amendment to specifically address events of widespread errors.261 Drafted in consultation with the SEC, the amendment left no room for discretion in extraordinary situations and established as a threshold a 30% change in price.262 If there were another Flash Crash, investors would now have a clear indication of which trades would stand and which would be cancelled as “clearly erroneous.”

2. Circuit Breakers and Trade Limits

Within a week of the Flash Crash, the SEC was working to implement circuit breakers for individual stocks that experience rapid price swings. The SEC brokered a pact among exchanges to pause trading in stocks included in the S&P 500 Index whose price rose or fell 10% or more within five minutes.263 The pause would give traders five minutes to replenish the book with new orders. The goal was to bolster investor confidence by limiting short-term volatility.264 Thus far, however, the circuit breakers generally have been triggered by single trades that were subsequently canceled as clearly erroneous.265

262. The rules require exchanges to cancel trades resulting from events that spark executions in more than 20 securities within a period of 5 minutes at prices that are 30% away from the reference price. See id. at 56,617.
According to some critics, this shows that the circuit breakers needlessly halt trading when a stock does not exhibit the extreme volatility that the rule was meant to address. Critics also fault the circuit breakers for failing to prevent aberrant trades from occurring in the first place.

The SEC has been ambivalent about the effectiveness of the circuit breakers, simultaneously expanding the program to cover more securities while working to develop an alternative safeguard. Within three weeks of the initial implementation of the circuit breakers, the Commission sought to more than double the number of securities covered by the program to 1344 securities. In June 2011, the SEC further expanded the circuit breakers to cover all the other U.S.-listed stocks—primarily some 6000 companies with smaller capitalizations. To account for the more volatile trading of these smaller companies, the halt trigger was set at 30% for those with stocks priced over $1 and 50% for those priced under $1.

All along, however, the SEC has worked on replacing the circuit breakers with so-called trading limits that would preclude executions outside a certain price range, without necessarily halting trading
altogether.\textsuperscript{271} To some commentators, trading limits represent a solution to the problem of aberrant trades.\textsuperscript{272} As proposed in April 2011, all stock exchanges would have to implement policies and procedures reasonably designed to prevent executions outside of a certain price range, which would likely eliminate almost all “clearly erroneous” transactions.\textsuperscript{273}

In fact, the trading limit proposal goes further than the circuit breakers to prevent extreme volatility. Under the trading limit proposal, the allowable price range for transactions would be 5% for the largest 1000 companies and 290 ETFs, compared with 10% under the circuit breakers.\textsuperscript{274} For shares of smaller companies trading above $1, the limit range would be 10%, compared with 30% under the circuit breakers.\textsuperscript{275} Notably, the range in each plan is calculated using a different reference point. Under the trading limit proposal, the range is generally calculated based on the average price of the stock in the preceding five minutes.\textsuperscript{276} In contrast, the circuit breaker thresholds are set at the lowest- and highest-priced trades in the preceding five minutes.\textsuperscript{277} As a result of the different reference point and narrower range, the proposed trading limits likely will be more restrictive than the circuit breakers.

Nonetheless, the limit proposal is designed to avoid unnecessary trading halts. Under the proposal, any best bid or offer for a security that was suddenly outside of the allowable range would trigger a so-called limit state for that security.\textsuperscript{278} The triggering quote would be flagged and disseminated to all market participants to draw interest from potential counterparties.\textsuperscript{279} Trading would continue as normal provided that, within 15 seconds, the triggering quote was either cancelled or executed.

\begin{footnotes}
\item[272] See, e.g., Letter from Gus Sauter, Chief Inv. Officer, Vanguard Grp., to Elizabeth Murphy, Secretary, SEC (June 22, 2011), available at http://sec.gov/comments/4-631/4631-4.pdf (“We believe that a structure that prevents erroneous trades is better than a structure in which an error by one market participant can halt trading for all participants.”).
\item[274] See id. at 31,653.
\item[275] See id.
\item[276] See id. at 31,651.
\item[277] See NYSE R. 80C(c).
\item[278] See Trading Limit Proposal, supra note 273, at 31,652.
\item[279] See id.
\end{footnotes}
in full as a result of new counterparty interest.\textsuperscript{280} If, after 15 seconds, neither event occurred, trading would be halted for five minutes.\textsuperscript{281} Simply put, the limit proposal is designed so that a trader’s mistaken order or a fleeting lack of market liquidity is unlikely to result in a trading halt. Some commentators say this mechanism will be less disruptive than the circuit breakers.\textsuperscript{282}

With the limit proposal, the SEC hopes to strengthen safeguards against market volatility while avoiding unwarranted trading interruptions.\textsuperscript{283} While the proposal has many supporters,\textsuperscript{284} the SEC has delayed its approval.\textsuperscript{285} Some commentators have criticized the plan for being so complex that it is likely to frustrate individual investors.\textsuperscript{286}

\textsuperscript{280} See id.

\textsuperscript{281} See id.

\textsuperscript{282} See, e.g., Letter from Ann L. Vlcek, Managing Dir., SIFMA, to Elizabeth M. Murphy, Secretary, SEC (June 22, 2011), available at http://sec.gov/comments/4-631/4631-10.pdf (noting that, in the “vast majority” of cases, trading will be resumed within 5 seconds).

\textsuperscript{283} See Press Release, SEC, SEC Announces Filing of Limit Up-Limit Down Proposal to Address Extraordinary Market Volatility (Apr. 5, 2011) (quoting Chairman Schapiro as saying: “Upgrading our trading parameters will help our markets retain the confidence of investors and companies.”).


\textsuperscript{286} See, e.g., Letters to Elizabeth M. Murphy, Secretary, SEC, from Leonard J. Amoruso, Gen. Counsel, Knight Capital Grp. Inc. (June 22, 2011), available at http://sec.gov/comments/4-631/4631-9.pdf (arguing that the plan could actually erode confidence in the markets as individual investors try to execute trades during a Limit State without fully understanding the plan); Sal Arnuk, Joe Saluzzi & Paul Zajac, Themis Trading LLC (June 22, 2011), available at http://sec.gov/comments/4-631/4631-18.pdf (arguing that the calculation of the price bands should be as simple as possible to enhance investor confidence).
Others suggest that the 15-second limit state is too short for most investors to respond and instead caters to HFTs with high-speed trading systems. Neither the exchanges nor the SEC have indicated if the proposed plan will be altered to address these concerns. For now, trading limits are unlikely to be fully implemented across all stocks before September 2012.

To further complicate matters, the SEC is also considering amending the market-wide circuit breaker that traces its roots to the 1987 Stock Market Crash. As currently codified in NYSE Rule 80B, the market-wide circuit breaker halts trading in all U.S.-listed stocks for at least 30 minutes if, before 2:30 p.m. Eastern Standard Time, the Dow average drops about 10% or more from the previous day’s close. Before an amendment in 1998, the rule set the trigger price range at approximately 4%. In approving the 1998 amendment widening the price range, the Commission stated that the market-wide circuit breaker should only be triggered in extreme circumstances, such as “those rare

287. See, e.g., Letters to Elizabeth M. Murphy, Secretary, SEC, from Peter J. Driscoll, a former chairman of the Sec. Traders Ass’n, (June 17, 2011), available at http://sec.gov/comments/4-631/4631-2.pdf (“This extremely short non-executable quote condition period would allow only the fastest of trading participants to participate, providing them another advantage over more traditional participants.”); Karrie McMillan, Gen. Counsel, Inv. Co. Ins. (June 22, 2011), available at http://sec.gov/comments/4-631/4631-5.pdf (suggesting that the period be extended to 30 seconds because the plan, as proposed, fails to give “most investors” sufficient time to respond to a limit state).

288. As proposed, the limit plan would be implemented in two phases over the course of 10 months. The first phase, covering shares of the largest companies, would be implemented four months after approval. The second phase would be implemented six months later. If the SEC approves the plan as proposed by the end of November, full implementation would not be completed until September 2012. See Trading Limit Proposal, supra note 273, at 31,648.


290. See NYSE R. 80B(a). The other exchanges have rules that merely reference the NYSE’s Rule. See, e.g., Nasdaq R. 4121.

291. Technically, under the old NYSE 80B Rule, the market-wide circuit breaker was triggered if the Dow average fell 350 points from the previous day’s close, which represented about 4% of the 8000-point level of the Dow average when the threshold was set in April 1998. See Order Granting Approval to Modifications to the Market-Wide Circuit Breaker Provisions, Exchange Act Release No. 39,846, 63 Fed. Reg. 18,477, 18,479 (Apr. 15, 1998).
occasions when the market decline is of historic proportions and, as a result, the markets and supporting technology face broad disorder. The 10% range set in 1998 has never been triggered.

By contrast, the SEC is now considering a plan that would effectively narrow the trigger price range. Under the plan, trading in all stocks would be halted for 15 minutes if the S&P 500 Index fell 7% from the previous day’s close. The proposed circuit breaker would be in effect until 3:25 p.m. to provide protection for a longer part of the trading session than the current rule. In proposing the amendment, the NYSE noted that the Flash Crash showed that the old trigger price range was too wide.

Yet the plan represents more than a recalibration of the size of the decline that would qualify as “historic proportions.” In light of the Commission’s rulemaking with regard to single-stock circuit breakers and the trading limit proposal, the plan is emblematic of the SEC’s willingness to slow down, if not halt, trading. For single stocks, under the circuit breakers or the trading limit proposal, the pauses come at the first sign of trouble. For the market overall, the new plan would have halted trading as many as eight times during the worst of the 2008 financial crisis, including on some less notable days when the market’s drop was attributed to monthly government reports indicating that the economy had suddenly slowed.

292. Id.
294. See id.
295. Extending the period in which the circuit breaker is in effect can be very powerful. Under the current rule, after 2:30 p.m., the Dow average has to drop 20% to trigger a trading halt. In contrast, under the proposal, a halt would be triggered with a 7% decline in the S&P 500 Index prior to 3:26 p.m. Id.
296. See id.
297. The S&P 500 Index had an intra-day drop of more than 7% from the previous day’s close on eight occasions, according to Bloomberg data on file with author. The data does not indicate when the index reached its low for the day and it is therefore possible that the drop would have come too late to trigger a trading halt.
298. See, e.g., Lynn Thomasson, U.S. Stocks Drop, Ending 5-Day Rally; GE, JPMorgan Shares Fall, BLOOMBERG, Dec. 1, 2008 (attributing drop to a report showing that manufacturing contracted at the fastest pace in 26 years); Elizabeth Stanton, U.S. Stocks Tumble, S&P 500 Drops to Lowest Level Since 2003, BLOOMBERG, Oct. 22, 2008 (attributing drop to concern of a worsening global economic slump as oil prices tumbled).
Finally, the SEC pushed the exchanges to ban market makers’ use of stub quotes. Market makers are now required to maintain quotes that are within a certain percentage of the national best bid or offer.\footnote{See Order Granting Accelerated Approval to Proposed Rule Changes to Enhance Quotation Standards for Market Makers, Exchange Act Release No. 63,255, 75 Fed. Reg. 69,484 (Nov. 12, 2010).} For large-company stocks, the percentage is generally set at 9.5%.\footnote{See Bats R. 11.8(d)(2)(E); Nasdaq R. 4613(a)(2)(E); Nasdaq BX R. 4613(a)(2)(E); NSX R. 11.8(a)(1)(B)(v)); NYSE Arca R. 7.23(a)(1)(B)(iv); NYSE R. 104(a)(1)(B)(iv).} For small company stocks, the threshold is 29.5%.\footnote{See Bats R. 11.8(d)(2)(E); Nasdaq R. 4613(a)(2)(E); Nasdaq BX R. 4613(a)(2)(E); NSX R. 11.8(a)(1)(B)(v)); NYSE Arca R. 7.23(a)(1)(B)(iv); NYSE R. 104(a)(1)(B)(iv).} Put differently, the ranges are set just marginally narrower than those used for the single-stock circuit breakers.

The elimination of stub quotes represents the SEC’s first effort to revamp market makers’ affirmative obligations, after their substantial erosion in the past 10 years.\footnote{See supra notes 122-128 and accompanying text.} The SEC took a markedly modest approach, however. The exchanges were not forced to resuscitate the old Nasdaq requirement that prices be “reasonably related to the prevailing market.” Nor did they require market makers to provide quotes at the best bid or offer a certain percent of the time, which was reportedly under consideration at one point.\footnote{See James Ramage, With Stub Quote Elimination, New Sticks and Carrots an Issue for Market Makers, TRADERS MAG. ONLINE NEWS, July 14, 2010, http://www.tradersmagazine.com/news/stub-quote-market-maker-sec-fnra-circuit-breaker-106073-1.html?zkPrintable=true (reporting other elements considered). It seems the SEC settled for the lowest common denominator among exchanges since Nasdaq decided to provide its market makers a system to facilitate compliance with the rule that automatically updates quotes to a tighter range of 4%. See Order Granting Approval to Enhance Quotation Standards, supra note 299, at 69,485.} Neither does the new rule require market makers to minimize order imbalances or provide price continuity, as NYSE Rule 104 demands.\footnote{See supra notes 216-7 and accompanying text.} In fact, the new quoting obligations do not even ensure against “clearly erroneous” trades.\footnote{At most, market makers are required to maintain a quote within a 9.5% range from a security’s lowest- and highest-priced trade in the preceding five minutes. By}
Notwithstanding the shortcomings of the new quoting rules, the SEC’s remedial measures taken as a whole provide significant safeguards against extreme volatility. If the circuit breakers had been in place on May 6, 2010, the worst of the declines in shares of Procter & Gamble could have been avoided, along with the steepest losses in another three of the Dow’s 30 stocks. Trading in many widely held stocks such as Apple Inc., Amazon.com Inc., Costco Wholesale Corp., and Philip Morris International Inc. would have likely been halted because their prices fell more than 60% between 2:40 p.m. and 3 p.m. Trading in shares of another 37 companies in the S&P 500 Index might have been halted as well, since they fell more than 15% from their opening price. Although only a rough guide, the data suggest that the single-stock circuit breakers could have prevented some of the more dramatic declines on May 6.

By interrupting trading, the single-stock circuit breakers provide investors with a clear notice of the lack of liquidity in a given security. This can help traders and investors make informed decisions on whether to continue trading during times of market stress. The interruptions also avoid triggering stop-loss orders, which are commonly used by retail investors. Stop-loss orders instruct a broker to sell certain shares at the prevailing market value if the stock’s price drops below a specified threshold. In the Flash Crash, this type of order resulted in about $200 million in losses for retail investors once the market recovered.

Nevertheless, the trading limit proposal would likely to be more effective than the single-stock circuit breakers since the permissible range of prices under the limit proposal would be more restrictive.

contrast, a move of as little as 3% from the preceding trade can be deemed a clearly erroneous trade. Compare Nasdaq R. 4613(a) with Nasdaq R. 11890(c).

306. See Preliminary Findings, supra note 6, at 21. Procter & Gamble, 3M Co., Hewlett-Packard Co., and General Electric Co. all fell more than 10% between 2:40 p.m. and 2:47 p.m. Id.

307. See Preliminary Findings, supra note 6, at 49.

308. The estimate is based on Bloomberg data on file with the author. Among the largest companies in the group are Avon Products Inc., Dow Chemical Corp., and Ford Motor Co., according to Bloomberg data. The data here excludes the clearly erroneous trades that were subsequently voided, because such trades are almost immediately expunged from the consolidate market data provided by the exchanges. As a result, the data here understates the number of stocks that might have been halted. See generally Alpert & Stryjewski, supra note 265 (reporting on the difficulty of testing the efficacy of the circuit breakers using historical data).

309. See supra note 4 and accompanying text.
Based on May 6, 2010, data that exclude the most egregious pricing anomalies, the proposed limits would have been triggered 143 times for stocks in the Russell 1000 Index and 535 times for the market overall. The data suggests that the proposed limits would provide a clear alert to investors about the generalized lack of liquidity.

In any case, the proposed market-wide circuit breaker would have halted trading for 15 minutes. The halt would have provided the exchanges’ systems a needed respite from the surge in volume. The halt would have also avoided the worst of the panic on May 6—although it might also have precluded the quick recovery starting at 2:48 p.m. While it is impossible to determine the exact effect of all these different safeguards, it is clear that if there were another Flash Crash, it would be slower and, for many stocks at least, less extreme.

One line of criticism might fault the reforms for addressing merely the symptoms, instead of fostering market stability. Nonetheless, given that no two market crashes will be alike, mitigating the impact of extreme volatility seems worthwhile. The next section considers whether proposals from regulators and market participants could go further and foster a more resilient market.

III. TOWARD A NEW MARKET (MAKER)

A. PROPOSALS FOR HEIGHTENED MARKET MAKER OBLIGATIONS

Three general proposals to amend market maker rules emerge from regulators’ remarks and the more than 340 comment letters filed with the SEC since January 2010, when the SEC published its Concept Release announcing a broad review of trading regulation. As

310. See Alpert & Stryjewski, supra note 265.
311. Id.
explained in detail below, Proposal 1 would extend market maker obligations to HFTs on the ground that they enjoy an unfair advantage over other investors. Proposal 2 would significantly increase quoting obligations on market makers to ensure market stability. Proposal 3 would slow trading and limit rebates to rein in predatory tactics by HFTs.

As characterized here, these proposals are merely heuristic composites based on the comment letters and do not represent concrete plans that the SEC could adopt in whole. The point is to illustrate how certain proposals risk unwelcome results. In general, this paper argues that the proposals would likely raise transaction costs for investors without providing a meaningful safeguard against extraordinary volatility. I suggest an alternative approach in Part C that avoids these pitfalls.

1. Proposal 1: Requiring All HFTs to Register as Market Makers

In her public remarks since the Flash Crash, SEC Chairman Schapiro has outlined a general plan that would impose affirmative and negative obligations on HFTs. The animating principle, which she has called “a basic premise” behind exchange regulation, is that “professional trading firms with the best access to the markets . . . should be subject to obligations to trade in ways that support the stability and fairness of the markets.” Although her remarks do not specify what “best access” would mean, the SEC’s Concept Release suggests the term could be construed to mean access to an exchange through the use of co-location services, which give users a split-second advantage over non-users.

This proposal would break with the common framework of market maker regulation by imposing obligations based on the use of a popular exchange service. Under prior regimes, such obligations typically


313. The SEC has yet to issue a concrete proposal, although it convened a roundtable in June 2010 to discuss the topic.


316. In 2010, the NYSE built a $250 million, 400,000-square-foot facility to house its data servers and accommodate customer demand for co-location services. The sheer
applied only to firms that voluntarily registered as market makers with an exchange. In contrast, Proposal 1 would force any firm that trades for its own account and uses co-location to be subject to the obligations of market makers.

Under this proposal, HFTs would be under a general mandate to provide liquidity in times of market stress. Such an obligation is of a piece with the Exchange Act’s requirement that market makers provide a “regular or continuous” quotation to buy and sell a stock. Chairman Schapiro would go a step further, however, with a mandate to provide price continuity, meaning that HFTs would be required to risk their capital to minimize, as far as reasonably practicable, the difference in price between successive trades. This traces back to the Saperstein Interpretation and has only previously applied to NYSE specialists, and now to DMMs.

In addition, HFTs would have a negative obligation to refrain from “trading in ways that would exacerbate price moves—such as aggressively taking out bids during a price decline and thereby driving prices even lower.” Stated differently, exchanges would be able to restrict the use of certain trading tactics when market prices have climbed or dropped more than a specified percentage.

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317. See, e.g., Bats R. 11.7 (providing that members may register as market makers) (emphasis added); CBSX R. 50.3 (defining market makers as a firm that agrees to fulfill certain obligations) (emphasis added); NYSE Arca R. 7.22(e) (providing that a firm may voluntarily withdraw its registration as a market maker with a one-day notice) (emphasis added).

318. See Schapiro, Strengthening Structure, supra note 4 (“The issue . . . is whether the firms that effectively act as market makers during normal times should have any obligation to support the market in reasonable ways in tough times.”).


320. See Schapiro, Security Traders, supra note 22 (“[H]igh frequency trading firms are subject to very little in the way of obligations either to protect that stability by promoting reasonable price continuity in tough times, or to refrain from exacerbating price volatility.”).

321. See supra notes 56, 70-75, 216-7 and accompanying text.

The second proposal is based largely on suggestions made to the SEC by five of the largest market makers and two influential senators. These commentators correctly note that most exchanges establish only minimal obligations on market makers, and they argue that heightened obligations would bolster investor confidence.

Under this proposal, market makers would have to maintain offers to buy and sell a stock at levels that meet various price and size thresholds. In particular, market makers would have to (a) quote at the best price a certain percentage of the time; (b) submit quotes at prices within a certain percentage from the national best bid or offer; (c) quote with a minimum size and at multiple prices; and (d) make markets in a minimum number of stocks. Market makers would also have to meet higher capital requirements, since they would be required to take on greater trading risks in order to comply with these four elements.
Unlike Proposal 1, this plan would not require HFTs to register as market makers. Rather, the proposal implies that some firms would be willing to comply with these obligations in return for an appropriate set of benefits.\(^{329}\) Although the proposal is not specific, these could take the form of higher rebates or lower fees, exemptions from certain prohibitions on executing short sales,\(^{330}\) or even benefits in the priority of trade execution, as DMMs at the NYSE now enjoy.\(^{331}\) Proponents of Proposal 2, in essence, urge the SEC to devise a new mix of incentives and obligations to ensure market makers continue to provide liquidity in times of market stress.\(^{332}\)

3. **Proposal 3: Slow Down Markets and Give Rebates to Investors**

Finally, Proposal 3 emerges mostly from institutional and retail investor complaints about HFTs and exchange rebate policies. In the opinions of these investors, HFTs provide flickering quotes that are either too fleeting to be useful for an institution trying to gauge supply and demand for a stock,\(^{333}\) or are frustrating for the retail investor who is

\(^{329}\) Id. (noting that the heightened obligations should be accompanied by “appropriate economic and market structure benefits”); Ramage, supra note 303 (quoting Leonard Amoruso, general counsel of Knight Capital Group, as saying: “If you require market makers to have a maximum quoted spread . . . you are asking them to take on additional risk and liability. . . . It’s hard to have that conversation without having a parallel conversation related to benefits.”).

\(^{330}\) For example, market makers have greater flexibility to effect short sales, which are sales of borrowed shares with the obligation to deliver the loan within a certain period of time. See 17 C.F.R. § 242.203(b)(2)(iii) (2011) (exempting market maker from locate requirement); id. § 242.204(a)(3) (granting market makers two more days than regular traders to deliver the borrowed shares).

\(^{331}\) See supra notes 216-22 and accompanying text.

\(^{332}\) See, e.g., Levin Letter, supra note 323 (“The SEC and CFTC should work together with their regulated entities to develop potential incentives for firms to stay in the markets during times of peak stress.”); Joint CFTC-SEC Advisory Comm. on Emerging Regulatory Issues, supra note 326 (“[T]he Commission should consider encouraging, through incentives or regulation, persons who regularly implement marker [sic] maker strategies to maintain best buy and sell quotations which are ‘reasonably related to the market.’”).

\(^{333}\) See, e.g., Kevin Cronin, Global Head of Equity Trading, Invesco Ltd., Statement Before SEC Market Structure Roundtable (June 2, 2010), available at http://www.sec.gov/comments/4-602/4602-11.pdf (“We are concerned that much of the order flow from these types of orders only provide ‘noise’ to the markets and can
unable to execute a trade at the displayed price. 334 More importantly, these investors claim that HFTs prey upon them by detecting their orders and quickly trading ahead of them. 335

Instead of a strict regime of affirmative or negative obligations, these commentators argue that markets should be restructured to facilitate trading by institutions and retail investors. 336 In particular, these commentators urge the SEC to require that orders stay in effect for a minimum period. 337 Although this requirement would apply to all market participants, it would have the biggest impact on HFTs, who would be forced to abandon their rapid-fire trading strategies. According to proponents, the benefit would be greater protection for institutional and retail investors against HFTs’ predatory strategies. 338

In addition, multiple commentators urge the SEC to reexamine rebate policies. 339 Most of these commentators stop short of calling for a lower cap on the fees used to fund rebates, let alone a ban on rebates. 340 Instead, a common proposal is for brokerages to pass on the rebates they receive to customers. 341 In theory, this change would mitigate conflicts provide a confusing and disjointed indication of the current [national best bid or offer].”).

334. See, e.g., Joint Letter from Christopher Nagy, Managing Dir., John S. Markle, Gen. Counsel, TD Ameritrade Holding Corp., to Elizabeth M. Murphy, Secretary, SEC (Apr. 21, 2010) [hereinafter TD Ameritrade Letter], available at http://sec.gov/ comments/s7-02-10/s70210-124.pdf (“[T]he rapid order placement and high cancellation rates have only exacerbated flickering quotations, which undermine retail investor confidence in the execution quality they obtain.”).

335. See, e.g., Joint Letter from Sal L. Arnuk & Joseph Saluzzi, Founders, Themis Trading LLC, to Elizabeth M. Murphy, Secretary, SEC (Apr. 21, 2010) http://sec.gov/ comments/s7-02-10/s70210-131.pdf (“HFT firms . . . detect [signs of a large order] and interposition themselves with the help of their lightning fast technology . . . .”); see also Concept Release, supra note 16, at 3608 (discussing “parasitic” order anticipation strategies).

336. See, e.g., Letter from Se. Asset Mgmt., supra note 196 (“Current market structure is flawed because unfair structural advantages permit short-term professional traders to insert themselves between long-term buyers and sellers.”).

337. See id. (urging a 1 second duration); TD Ameritrade Letter, supra note 334.

338. See, e.g., Cronin, supra note 333 (discussing the use of pinging strategies to detect large orders).


340. See, e.g., ICI Letter, supra note 200 (“The Institute does not recommend that liquidity rebates be prohibited at this time, as more should be learned about the effects of this practice.”).

341. See, e.g., Goldman Sachs Letter, supra note 201; Letter from Se. Asset Mgmt., supra note 196.
of interest between brokers and their clients. In practice, however, it would likely cause exchanges to reconsider their use of rebates in ways that, as discussed below, are likely to undermine the intent of Proposal 3.

**B. EVALUATION OF THE THREE PROPOSALS**

The Exchange Act establishes a range of policy considerations to guide the Commission’s rulemaking, including protecting investors and the public interest, promoting fair competition, and fostering efficient markets and capital formation. These considerations are often in tension with each other, making it difficult to evaluate a proposed rule. To simplify the analysis, I consider the three proposals through the prism of the Flash Crash. The guiding question is whether a proposal would foster an efficient market that provides investors an assurance of liquidity at a fair price. Not only is this question of a piece with the goals of the Exchange Act, but it goes to bedrock notions of an exchange as a central venue where buyers and sellers gather and compete to trade.

Viewed in this light, the three proposals are ill-advised. Although each has merit, the proposals would likely either raise transaction costs or award a unique advantage to a specific segment of traders.

1. **Proposal 1: Mandatory Registration for All HFTs Will Raise Transaction Costs**

The first proposal favors market stability to the detriment of other goals established by the Exchange Act. It first conscripts any firm that uses co-location and trades for its own account as a market maker, and

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342. See 15 U.S.C. § 77b(b) (2006) (mandating that the SEC consider, “in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation.”).


344. See supra notes 7-9 and accompanying text; HARRIS, supra note 7, at 5-6 (“Trading is a search problem. Buyers must find sellers, and sellers must find buyers. Every trader wants to trade at a good price. . . . Exchanges . . . design markets to minimize the search costs of trading.”).
then redefines market maker obligations to focus on minimizing price swings. For the first time, market makers would be required to provide price continuity and to refrain from trading in ways that exacerbate volatility. With dozens more firms required to risk their capital to damp volatility, the proposal aims to foster market stability and buttress investor confidence.345

The proposal, however, would likely result in significant costs or distortions to competition. First, there is the possibility that some HFTs will find substitutes to avoid triggering the obligations. After all, even the current voluntary market maker programs with minimal obligations are not popular. The ranks at Nasdaq have shrunk to 170 from 300 in 2007, and no more than 20 market makers are registered on any of the other four exchanges that disclose their rosters.346 The risk is that HFTs would shift away from the exchanges’ co-location services and instead use unregulated third-party services. A similar problem arises with a senator’s recommendation that HFTs be required to register if they make markets in more than 25 stocks.347 In that case, HFTs would shift their trading to other markets to avoid triggering the requirement, particularly given the stringent obligations of Proposal 1. As a result, liquidity on stock exchanges might actually decrease as HFTs withdraw from the market altogether.348

345. See Schapiro, Strengthening Structure, supra note 4 (noting that the goal of imposing market maker obligations on HFTs is to promote investor confidence in the integrity and stability of the markets).


348. SEC Commissioner Troy A. Paredes alluded to this scenario during a speech in September 2010 with the following remarks:

It would be unfortunate for investors if, as a result of burdening a wide swath of liquidity providers with new obligations, the quality of our markets actually deteriorated during the overwhelming majority of trading days when liquidity would be plentiful in the absence of expanded market maker obligations.

Second, the HFTs that do accept the obligations will seek to offset the costs of compliance. One likely scenario, given HFTs clout with the exchanges as major providers of order flow, is that HFTs would push for higher rebates. Alternatively, HFTs might seek larger trading profits by submitting buy and sell orders that are further apart in price. Ultimately, investors bear the cost, either through higher trading fees to fund rebates or through wider spreads. As SEC Commissioner Troy Paredes has noted, these are costs that investors would have to pay daily, even when liquidity might otherwise be plentiful.\footnote{See id. ("During periods of stability, the value of subjecting high frequency traders to market maker obligations is not self-evident.").}

Another difficulty with this proposal is that it relies on a flawed analogy between specialists and HFTs. As noted in Part I.A, specialists used to maintain the book of pending orders to buy and sell a stock, and were therefore aware of shifts in demand and supply before other traders.\footnote{See supra notes 44-49 and accompanying text.} Specialists were also in a position to capitalize upon that information immediately. Drawing an implicit analogy with specialists, the SEC has noted that HFTs have an advantage over investors because they can afford high-speed computer systems, data feeds that provide trade information faster than the SEC-regulated consolidated quotation feed, and co-location services that allow almost instantaneous executions.\footnote{See Concept Release, supra note 16, at 3606-11.}

Nonetheless, specialists had their privileges by dint of exchange rules, whereas HFTs acquired their advantages by paying for exchange services that, under Section 6 of the Exchange Act, have to be made available to the public on non-discriminatory terms.\footnote{See 15 U.S.C. § 78f(b)(4)-(5) (2006) (requiring exchanges to provide services in a manner that is not unfairly discriminatory, and requiring fees to be allocated in an equitable and reasonable manner).} The SEC has repeatedly approved the exchanges’ plans to sell data feeds and co-location services after ensuring that they do not confer an unfair advantage.\footnote{See, e.g., Order Approving Proposed Rule Change Relating to NYSE Arca Data, Exchange Act Release No. 59,039, 73 Fed. Reg. 74,770 (Dec. 9, 2008) ("The Commission . . . believes that the existence of significant competition [for the sale of market data] provides a substantial basis for finding that the terms of an exchange’s fee proposal are equitable, fair, reasonable, and not unreasonably or unfairly discriminatory."); Order Approving a Proposed NYSE Rule Change to Reflect Fees Charged for Co-Location Services, Exchange Act Release No. 62,960, 75 Fed. Reg.} These reviews of exchange products and services are the
proper forum for the Commission to address any perceived unfairness. By addressing them indirectly through HFT regulation, the Commission risks increasing transaction costs for investors.

2. Proposal 2: Greater Privileges Create Unfair Advantages

The second proposal would greatly increase market maker obligations at the risk of needlessly awarding special privileges for a class of traders. Under the plan, market makers would have to submit sizable quotes at the best price for a certain amount of time. They would also have to make markets in a minimum number of stocks and hold more capital to ensure that they can provide liquidity during times of stress. In return, they would receive commensurate economic or regulatory benefits.

There are two main lines of criticism for this proposal. First, the privileges needed to offset the stringent obligations are likely to raise transaction costs for investors.354 Second, Proposal 2 is inconsistent with other policy goals established by the Exchange Act, in particular the requirement that the SEC promote fair competition among brokerages and among exchanges.355

The first line of criticism is very similar to objections raised to Proposal 1, discussed above. As with Proposal 1, investors would ultimately bear the costs of market makers’ new obligations and privileges in the form of higher trading fees or wider spreads. Critics also caution against providing softer, non-monetary benefits such as

59,310, 59,311 (Sept. 27, 2010) ("[T]he Commission believes that [the services] . . . are not unfairly discriminatory because NYSE makes the co-location services uniformly available to all Users who voluntarily request them and pay the fees as detailed in the proposal.").

354. See, e.g., Paredes, supra note 348.

355. Section 11A of the Exchange Act states in relevant part:

It is in the public interest and appropriate for the protection of investors and the maintenance of fair and orderly markets to assure . . . fair competition among brokers and dealers, among exchange markets, and between exchange markets and markets other than exchange markets.

exemptions from certain trading restrictions. They contend that those privileges often lead to abuses and degrade competition.

The issue is whether these costs are justified by the potential benefit of having a more stable market. Many commentators note that equity markets are sufficiently liquid to handle events like the financial crisis of 2007-2008. In light of the liquidity already present in equity markets, increasing incentives for market makers as Proposal 2 suggests seems unwarranted.

The costs would also be unjustified if Proposal 2 were akin to an insurance policy that required upfront payments for protection against a sudden catastrophic event in the future. Many commentators note that virtually no combination of privileges or obligations would ensure that market makers remain in the market in times of extreme volatility.

356. See, e.g., HFTs’ Letter, supra note 23.

357. Peter Chapman, Exchanges Balk at Forcing Market Maker Obligations on HFTs, TRADERS MAG. ONLINE NEWS, Oct. 29, 2010, available at http://www.tradersmagazine.com/news/high-frequency-trading-market-maker-nyse-nasdaq-106601- 1.html (quoting the CEO of Nasdaq OMX Group Inc. as saying: “As we know from the past, where there are privileges, bad things can happen to markets.”).

358. See HFTs’ Letter, supra note 23; Donna Kardos Yesalavich & Kristina Peterson, Keeping Traders in the Market Could Prove Challenging, WSJ.COM, Sept. 27, 2010, available at http://online.wsj.com/article/SB100014240527487045236045755 12110316790130.html (quoting the CEO of an HFT as saying: “What it really would do is pick winners between certain classes of market participants. . . . It would provide benefits to some but hurt competition overall.”).

359. See, e.g., Letter from Eric W. Hess, Gen. Counsel, Direct Edge Holdings LLC, to Elizabeth M. Murphy, Secretary, SEC (Apr. 28, 2010) (“[E]quities markets performed admirably during the recent financial crisis, and are operating at record levels of efficiency . . . .”); Letter from Eric Swanson, Gen. Counsel, Bats Exch. Inc., to Elizabeth M. Murphy, Secretary, SEC (Apr. 21, 2010) (“[T]he equity markets remained open, liquid, transparent and efficient day in and day out during one of the most stressful periods in the history of our capital markets.”); ANGEL, HARRIS, & SPATT, supra note 175, at 40 (“[E]quity 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.”).

360. See Hal Weitzman, Need for Consistent Market Structure to Avoid ‘Flash Crash’, FIN. TIMES, Nov. 4, 2010 (quoting the head two exchanges saying that market makers will avoid their obligations in a sharply falling market); Steve Wunsch, Market Maker Obligations for High-Frequency Traders Are Not the Answer, ADVANCED TRADING, Oct. 19, 2010 (noting that even a regime that ensures compliance 90% of the time would allow market makers to withdraw for an event of the same duration as the Flash Crash); Paredes, supra note 348 (questioning whether any set of obligations would keep a firm providing liquidity from withdrawing from the market because of
Firms would rather pay the fine of as much as $2,500 for shirking their obligations, than risk insolvency. As one commentator put it, Proposal 2 will make trading more expensive every second of every day, without achieving any meaningful protection in times of extraordinary volatility.

The second objection to Proposal 2 is that it invites the SEC to make an unwarranted intervention in the competitive struggle between market makers and HFTs. Market makers claim that they are at a disadvantage because HFTs are subject to fewer regulatory obligations and are free to withdraw from the market at any time. From the market makers’ point of view, Proposal 2 would restore some balance by providing them with regulatory or economic benefits. On the other hand, HFTs argue that Proposal 2 would provide a subsidy to market makers and inhibit competition.

Prior to the Flash Crash, the exchanges accommodated the two sides. Thus, the NYSE established a robust regime of obligations and privileges for DMMs, while other exchanges, including the NYSE’s sister Arca market, operated with a regime of no privileges and minimal obligations. Thus, market makers and HFTs were able to voluntarily assume or avoid regulatory obligations by registering with the exchange of their choice.

By adopting Proposal 2, the SEC would short-circuit this competitive balance. It would foreclose exchange competition and limit the choices for market makers and HFTs. This would be inconsistent with the Exchange Act’s mandate that the SEC promote competition among brokerages and among exchanges. Historically, the SEC has fulfilled this mandate by setting only minimum requirements for market maker regulation, instead of optimal targets. For example, although Rule 11b-1 was adopted in response to the 1962 Market Break, the SEC

extraordinary market volatility); HFTs’ Letter, supra note 23 (“None of the proposed market maker obligations would force market makers to . . . buy in the face of overwhelming selling.”); Market Makers’ Letter, supra note 323 (noting that no market maker rules could have prevented the Flash Crash).

361. See supra note 128 and accompanying text.
363. See, e.g., Goldman Sachs Letter, supra note 201.
364. See, e.g., HFTs’ Letter, supra note 23.
365. See supra Part I.D.
allowed room for competition by exempting eight of the ten exchanges operating at the time.\textsuperscript{367} By adopting Proposal 2, the SEC would significantly reduce the exchanges’ ability to provide competing regulatory regimes for market makers and HFTs.


In the name of investor protection, Proposal 3 would likely result in higher trading costs and reduce liquidity. This proposal would slow down markets by establishing minimum quote duration periods and would require brokerages to pass on rebates to their customers. Although at first these changes would seem to benefit investors, this section argues that Proposal 3 would likely make it more expensive for investors to trade and award HFTs with greater benefits.

Proposal 3 aims to ensure fair dealings and deter fraud—core tenets of the Exchange Act\textsuperscript{368}—by eradicating flickering quotes. A minimum quote duration period would certainly make it easier for investors to determine the best price. It would also ensure that quotes reflect bona fide trading interests, which would be a welcome result given that recent disciplinary actions suggest that brokerages can use fleeting quotes to manipulate prices. In one recent case, a firm placed a low bid to buy a stock, and then placed multiple, sizable sell orders to create the false impression of selling pressure on the stock.\textsuperscript{369} As soon as the firm lured an investor into trading at the “illegitimately” low bid, it canceled the

\textsuperscript{367} See supra note 60 and accompanying text. See generally Simon & Trkla, supra note 42, at 298-300 (describing the history that led to the adoption of Rule 11b-1).


sell orders.370 The strategy, repeated some 46,000 times over the course of three months, generated a profit of approximately $576,000.371 Proposal 3 would make it harder to pull off such gambits, which regulators suggest are widespread.372

Nevertheless, a minimum quote duration period would also reduce the frequency of trading. This has long been regarded as a fundamental variable of trading costs: the less frequent the trading, the higher the costs.373 Put more concretely, market makers and HFTs would experience greater risk when submitting an order because they would be unable to adjust it quickly in response to new information.374 They would compensate for this added risk by widening the spread between their offers to buy and sell shares.

Alternatively, HFTs might submit their orders to off-exchange trading venues that do not disseminate quotes to the public.375 In these

370. Id.
373. See Harold Demsetz, The Costs of Transacting, 82 Q. J. OF ECON. 33, 41 (1968) (“The fundamental force working to reduce the spread is the time rate of transactions.”).
374. See Letters to Elizabeth M. Murphy, Secretary, SEC, from Suhas Daftuar, Managing Dir., Hudson River Trading LLC (Apr. 30, 2010) (“The ability to adjust or cancel orders leads to lower spreads; market participants are more willing to enter aggressive orders if they can cancel or adjust them in the event that market conditions change.”); Steve Gaston, Chief Compliance Officer, IMC Fin. (Apr. 21, 2010) (“[A] firm’s exposure when the market moves is measured by the length of time that it takes to react and update its quotes. Introducing a minimum requirement on the duration of quotes would immediately increase systemic risk for liquidity providers.”).
375. These “Dark Pools” accounted for 12.1% of volume in September 2010, up from about 7.9% a year earlier. See Nina Mehta, Dark Pool U.S. Market Share Rose in September, Rosenblatt Says, BLOOMBERG, Nov. 8, 2010; Concept Release, supra note 16, at 3598.
“dark” venues, the risk of exposing an offer is lower since it is not displayed to the marketplace. The difficulty here, as the SEC has repeatedly noted, is that the public display of orders is an important means of assuring competitive prices. In this case, the ultimate result again would be higher trading costs for investors.

More generally, quote duration rules would erode the benefits of Reg NMS, which resulted in narrower bid-ask spreads and deeper markets. As exchanges automated in response to Reg NMS, HFTs were able to submit more aggressive prices because the risk of holding securities declined with faster trading. Depth increased as traders submitted limit orders to multiple exchanges since traders were assured by Rule 611 that they would receive an execution at the best price against the next willing buyer or seller. The SEC should be cautious in adopting rules that risk eroding the verifiable and real benefits achieved through Reg NMS.

Proposal 3 could also lead to counterproductive changes in the use of rebates. A requirement that brokerages pass on rebates to their customers would concentrate rebates in the hands of investors and HFTs. For investors, the payments are likely to be marginal since they trade infrequently. On the other hand, rebates represent an important source of earnings for HFTs.

376. See, e.g., Proposed Rule on Non-Public Trading Interest, Exchange Act Rel. No. 60,997, 74 Fed. Reg. 61,208 (Nov. 23, 2009) (“In general, the Commission has sought over the years to promote the public display of trading interest by attempting to provide positive incentives for display, but has never sought to prohibit trading venues from offering dark liquidity services to investors.”).

377. See Angel, Harris & Spatt, supra note 175, at 10-15; Letter from Gus Sauter, Chief Investment Officer, Vanguard Grp. Inc., to Elizabeth M. Murphy, Secretary, SEC (Apr. 21, 2010), available at http://sec.gov/comments/s7-02-10/s70210-122.pdf (noting that transaction costs for long-term investors have declined by 0.5% in the past decade); Peter Chapman, Reg NMS is a Winner, SEC Says, TRADERS MAG., Mar. 2008, available at http://www.tradersmagazine.com/issues/20_278/100330-1.html?zkPrintable=true.

378. See Demsetz, supra note 373 (“The greater the frequency of transacting, the lower will be the cost of waiting in a trading queue . . . and, therefore, the lower will be the spreads that traders are willing to submit to preempt positions in the trading queue.”).

379. See Angel, Harris & Spatt, supra note 175, at 14; see also supra notes 156-65 and accompanying text (discussing Rule 611 as an incentive for firms to send quotes to multiple venues).

380. See supra notes 184-92 and accompanying text.
Since competition among the 13 equity exchanges pushes them to maximize order flow, the exchanges are likely to reduce rebate payments to investors and shift them toward HFTs, where the payments have proven to draw business. The exchanges could do this by raising their volume thresholds for preferential pricing, a practice that the SEC has consistently approved. This aspect of Proposal 3, therefore, would likely give HFTs a greater trading advantage relative to other investors.

In summary, although Proposal 3 aims to increase investor protection and reduce the advantages that HFTs enjoy over institutional investors, it would likely result in higher transaction costs, a reduction in market depth, and a less equitable distribution of transaction fees.

C. AN ALTERNATIVE APPROACH

An alternative strategy would aim to regulate HFTs outside the context of market maker obligations. This strategy is premised on the idea that HFTs already provide sufficient liquidity without a regime of special duties and privileges. In fact, HFTs have turned out to be a relatively steady source of liquidity through the recent financial crisis and again during the Flash Crash, with limited exceptions. There is, however, a need to assure investors that HFTs trade on fair terms.

This alternative approach can be encapsulated in three general propositions. First, the SEC should let the exchanges compete to develop their own regulatory regimes for market makers. Exchanges are in a better position to gauge the proper balance of trading obligations and incentives, since they actively monitor the execution quality of their own markets. Letting exchanges compete is more likely to result in rules that foster liquidity, without raising transaction costs for investors. Accordingly, the SEC should refrain from adopting market maker rules like those contained in Proposals 1 and 2.

381. See Regulation NMS, supra note 157, at 37540 (“Fees with volume-based discounts or fees that are reasonably based on the cost of providing a service will be permitted, so long as they do not vary based on the non-member status of a person obtaining indirect access to quotations.”).

382. See supra notes 235-238 and accompanying text; see also Nina Mehta, Traders Say No Signs of Liquidity Withdrawal as Stocks Fall the Most Since 2008, BLOOMBERG, Aug. 8, 2011 (reporting that traders saw no generalized liquidity failures after Standard & Poor’s cut its rating on U.S. government debt); Nina Mehta, High-Frequency Firms Tripled Trades in Stock Rout, Wedbush Says, BLOOMBERG, Aug. 12, 2011 (reporting that HFTs increased their activity as equity markets tumbled in the wake of S&P’s downgrade of U.S. government debt).
Second, the SEC should require that users of the exchanges’ co-location services register as broker-dealers. This would bring the full spectrum of HFTs under SEC oversight, by forcing hedge fund HFTs to create broker-dealers that would handle their trades. The affiliate would, of course, be subject to the regulatory requirements of all broker-dealers, including the obligation to retain for five years trading records and all correspondence made or received in its course of business. The affiliate would have to meet net capital requirements, file monthly financial reports, and be subject to SEC inspections. These requirements would go some way toward addressing concerns that HFTs are subject to few regulatory obligations and have an unfair advantage over other market participants.

Third, the SEC should consider requiring the largest HFTs to register with an exchange as market makers. The goal would not be to ensure liquidity, but rather to identify large traders that should abide by rules of fair dealing given their market dominance. The specific rule might provide, for example, that any dealer that holds itself out as regularly willing to buy and sell more than 1000 securities must register with an exchange as a market maker.

To be sure, some HFTs are likely to avoid triggering this obligation by limiting their trading to 999 securities. The high threshold, however, does not raise the same issues as Proposal 1, which could cause HFTs to withdraw from the equity market altogether. In fact, the high threshold would make the obligations relatively less burdensome because they would only affect HFTs with sufficient scale to shoulder the added regulatory costs.

Under this approach, registration would provide a helpful focus for regulatory surveillance, given that billions of orders shuttle across Wall Street daily. Registration would become a seal of assurance instead of a means of requiring firms to risk their own capital to stabilize the market. Mandatory registration for the largest HFTs would address some of the concerns motivating Proposal 3 and would be wholly consistent with the Exchange Act’s mandate to protect investors.

383. See supra notes 136-155 and accompanying text.
386. See id. § 240.17a-5.
CONCLUSION

The Flash Crash greatly intensified pressure on the SEC to grapple with the complex role that HFTs play in the market. Unfortunately, the Flash Crash also makes certain counterproductive proposals very appealing. The temptation is to devise rules that directly ensure market stability under the theory that it is better to be safe than sorry.

Until now, the SEC has wisely focused on systemic safeguards that essentially stop trading under situations of extreme volatility. Going the further step, however, of regulating HFTs by imposing heightened market maker obligations would be ill-advised. Encouraging liquidity through special obligations and privileges would only aggravate investor perception of an unfair market. The costs and consequences of such a move argue for an alternative approach. The SEC should focus on assuring investors that HFTs provide liquidity on fair terms. A focus on fair dealing can inspire investor confidence and encourage liquidity.