Meeting Market Structure Challenges Where They Are

Hester Peirce*

There was a young lady named Bright,
Whose speed was far faster than light;
She set out one day
In a relative way,
And returned home the previous night.
Arthur Henry Reginald Buller[1]

*I appreciate the insights of J.W. Verret, Brian Knight, and Stephen Matteo Miller and the participants at the Journal of Corporation Law Symposium. This Article was written before I was confirmed to be a commissioner of the Securities and Exchange Commission. It does not necessarily reflect the views of the Securities and Exchange Commission or its commissioners.

1. PUNCH (Dec. 19, 1923).

I. INTRODUCTION

Equity market structure discussions are full of good stories—stories of power struggles, fortunes gained and lost, and careers ruined and redeemed along the way. Michael Lewis and Scott Patterson capture some of the most fascinating of these stories in their recent books about how high-speed, algorithmic, and now artificial intelligence-driven, equity markets have replaced the human-dominated trading floors that still fill our imaginations and rulebooks.[2] Today's stories feature the unfathomable speed of high frequency traders who operate across a complex array of trading venues through a growing mix of order types. Government regulation features more heavily in modern market structure stories than the private regulation that loomed large in the slower, but equally enthralling early market structure stories.[3] Regulation—sometimes subtly and sometimes quite obviously—shapes the actions of other characters in the narrative.

It is tempting to allow the rich stories about market structure to drive regulatory outcomes. Tales of high speed, algorithmic duels, and dark pools nudge many well-intentioned observers to reach for the government rulebook. More careful deliberation is needed. Before writing rules, regulators need to identify the problems they are trying to solve. Is it a market failure or a government failure? If it is the latter, how can existing rules be removed, reformed, or better enforced to address it? If it is a market failure, will changing technology and new competitors fix it, or is regulatory intervention necessary? If regulation is necessary, should it be state regulation, federal regulation, self-regulation, (which can mean many things) private regulation, or a combination? What should regulation look like, and how should regulators approach the task? This Article does not undertake to answer all these questions across the range of equity market structure issues, but it seeks to lay out a general framework for approaching these questions.

The Article proceeds as follows. Part II introduces two of the key distinctive features of today's equity market structure—high frequency trading (HFT) and dark pools. Part III describes recent regulatory actions related to equity market structure. Part IV lays out an approach for confronting a number of trouble spots in today's equity market structure. Part V concludes.

II. KEY PLAYERS IN TODAY'S MARKET STRUCTURE STORY: HIGH FREQUENCY TRADING AND DARK POOLS

Well-functioning secondary equity markets—the infrastructure within which companies' shares trade after companies initially sell them—serve investors and the broader economy. An investor is more likely to invest her money in a company if she knows that she can sell the shares when she needs the money for another purpose. A well-functioning market offers accurate prices and liquidity.[4] An asset's liquidity turns on direct

2. *See generally* MICHAEL LEWIS, FLASH BOYS: A WALL STREET REVOLT (W.W. Norton & Company, Inc. 2014); *see generally* SCOTT PATTERSON, DARK POOLS: THE RISE OF THE MACHINE TRADERS AND THE RIGGING OF THE U.S. STOCK MARKET (Crown Business 2012) [hereinafter PATTERSON, DARK POOLS].

3. *See* Edward Stringham, *The Past and Future of Exchanges as Regulators*, *in* REFRAMING FINANCIAL REGULATION: ENHANCING STABILITY AND PROTECTING CONSUMERS 226 (Hester Peirce & Ben Klutsey, eds. 2016) (explaining that "if one looks at the history of all the world's first successful stock markets one can see that they were regulated in a very different way—privately").

4. Merritt B. Fox et al., *The New Stock Market; Sense and Nonsense*, 65 DUKE L. J. 191, 222 (2015) (the market's "most important characteristics are share price accuracy and liquidity"). The authors provide an excellent

transaction costs, the price impact of a transaction, and the time it takes to sell the asset.[5] These determinants of liquidity are in turn influenced by characteristics of the stock (such as analyst and market maker coverage) and the market in which it trades. Liquidity affects share prices; a stock that is hard to sell is worth less.[6] When stock is more valuable, it is easier for companies to raise money to make investments.[7] As a result, investors, companies, and the economy benefit from a stock market that works well.

Equity market structure has changed dramatically in its more than two hundred years of documented history in the United States. In general, the equity markets work well, but there is room to improve the way they serve investors and issuers. Much of the impassioned discussion about market structure turns on HFT and dark pools. HFT firms dominate equity trading,[8] and off-exchange trading accounts for approximately 38% of total equity volume.[9] Today's "teched-up" market structure is partly the product of the same progress that has brought us smarter phones and self-driving cars. As the Securities and Exchange Commission (SEC) has acknowledged, however, our market structure "also reflect[s] the markets' response to regulatory actions . . . as well as enforcement actions."[10]

A. High Frequency Trading

HFT, which is now pervasive in the markets, lacks a simple definition. HFT firms and their trading strategies are not uniform.[11] The SEC, acknowledging the definitional ambiguity,[12] proposes the following definition of HFT: "professional traders acting in a proprietary capacity that engage in strategies that generate a large number of trades on a daily basis."[13] The SEC identifies the following typical characteristics of HFT firms:

> (1) The use of extraordinarily high speed and sophisticated computer programs for generating, routing, and executing orders;

---

overview of how these characteristics interact to support capital allocation and risk management. *Id*. at 222–25.

5. *See* Charles M. Jones, *What Do We Know about High-Frequency Trading* 11, (Columbia Bus. Sch., Research Paper No. 13-11, 2013), https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2236201 (explaining that "there are three dimensions to liquidity: price, size, and time").

6. *See id*. at 14 (explaining that "share prices should be reduced by the present value of all expected future transaction costs").

7. *Id*. at 51.

8. *See, e.g.*, Tabb Group, High Turnover Quantitative Trading Statistics: High Turnover/High Frequency Trading as a % of Equity ADV (average daily share volume) Traded (undated), on file with author (estimating that HFT makes up 53% of volume in 2017).

9. *January 2017 Equity Liquidity Matrix*, TABB GROUP 3 (Feb. 17, 2017), http://tabbforum.com/liquidity-matrix. Approximately 14 to 16% of total volume is attributable to dark pools. *See* HEALTHY MARKETS, THE DARK SIDE OF THE POOLS: WHAT INVESTORS SHOULD LEARN FROM REGULATORS ACTIONS 6 (Sept. 15, 2015). Internalizing brokers are an important source of off-exchange liquidity. *See, e.g.*, John McCrank, *Citadel Tops List of Private U.S. Trading Venues: Report*, REUTERS (Apr. 25, 2016, 7:50PM), http://www.reuters.com/article/us-usa-stocks-citadel-report-idUSKCN0XM28U (reporting that in one week in April 2016, Citadel executed more than 1.1 billion shares, which means that "if Citadel was a public stock exchange, it would be the seventh-largest out of 13").

10. Concept Release on Equity Market Structure, 75 Fed. Reg. 3594, 3594 (Jan. 21, 2010) (to be codified at 17 C.F.R. pt. 242).

11. *See, e.g.*, Jones, *supra* note 5, at 6–10 (describing a number of HFT strategies, including market-making, relative value and arbitrage trading, and directional trading).

12. Concept Release on Equity Market Structure, 75 Fed. Reg. at 3607 ("The lack of a clear definition of HFT, however, complicates the Commission's broader review of market structure issues.").

13. *Id.* at 3606.

> (2) use of co-location services and individual data feeds offered by exchanges and others to minimize network and other types of latencies;
>
> (3) very short time-frames for establishing and liquidating positions;
>
> (4) the submission of numerous orders that are cancelled shortly after submission; and
>
> (5) ending the trading day in as close to a flat position as possible (that is, not carrying significant, unhedged positions overnight).[14]

The SEC's HFT list highlights characteristics—technological, informational, and geographic advantages over other traders and staggering order (and cancellation) volume—that worry many market participants and observers.[15] Others argue that these same characteristics allow HFT firms to keep markets liquid—serving as ready buyers and sellers.[16]

HFT is a key aspect of today's markets, even though the number of active HFT firms is relatively small.[17] Recognizing that definitional haziness makes precise quantification of HFT difficult, the SEC estimated that HFT made up 50% of equity market volume in 2010.[18] According to a Tabb Group estimate, the 2017 percentage was fifty-three percent, compared to thirty-five percent ten years ago and fifty-one percent five years ago.[19]

B. Dark Pools

U.S. equity markets include not only traditional exchanges[20] (which no longer look very traditional) and a large number of non-exchange trading venues. The registered equity exchanges require regulatory approval to operate, serve as self-regulatory organizations (SROs), obtain SEC approval for rule changes, make extensive public disclosures, and offer fair access. Exchanges have certain privileges: they can list stocks, are protected by legal immunity for certain of their activities, are entitled to a share of the revenues from market data sales, and enjoy trade-through protection for their best bids and offers.

Greatly outnumbering registered exchanges, alternative trading systems (ATSs) also

---

14. *Id.*

15. For a discussion of many of these concerns, see Frank Pasquale, *Law's Acceleration of Finance: Redefining the Problem of High-Frequency Trading*, 36 CARDOZO L. REV. 2085 *passim* (2015).

16. *See, e.g.*, HFT = Cheaper Trading = More Money in Retirement Accounts, MOD. MKTS. INITIATIVE, https://modernmarketsinitiative.org/hft-101/saving-investors-money/ (last visited Jan. 19, 2018) ("Since the adoption of HFT, which continuously surveils the market and aligns pricing across venues, this difference has become much smaller, saving large and small investors alike hundreds of millions of dollars for their retirement and other savings accounts.").

17. *See, e.g.*, Charles R. Korsmo, *High Frequency Trading: A Regulatory Strategy*, 48 U. RICH. L. REV. 523, 542 (2014) (explaining that HFT firms, notwithstanding their small ranks and modest profitability, have "had an outsized impact on trading in U.S. equity markets").

18. Concept Release on Equity Market Structure, 75 Fed. Reg. at 3606.

19. Tabb Group, High Turnover Quantitative Trading Statistics: High Turnover/High Frequency Trading as a Percentage of Equity ADV (Average Daily Share Volume) Traded (undated) (on file with author).

20. There are twenty-one national securities exchanges registered with the SEC, approximately half of which trade equities. *See Fast Answers: National Securities Exchanges*, SEC, https://www.sec.gov/fast-answers/divisionsmarketregmrexchangesshtml.html (last visited Jan. 19, 2017) (listing exchanges registered with the SEC under Section 6(a) of the Securities Exchange Act as national securities exchanges); *U.S. Equities Market Volume Summary*, CBOE, https://markets.cboe.com/us/equities/market_share/ (last visited Jan. 19, 2018) (showing equities market volume by market operator).

match buyers and sellers of stock. In 2015, the approximately forty dark pools accounted for approximately fifteen percent of trading in stocks listed on NASDAQ and the New York Stock Exchange.[21] ATSs register as broker-dealers, become members of the Financial Industry Regulatory Authority (FINRA), and comply with other elements of the SEC's Regulation ATS.[22] Unlike exchanges, the SEC does not preapprove ATS rules and fees. ATSs also tend to be less publicly transparent than exchanges about their fees, their operations, and their potential conflicts of interest.

ATSs include a variety of trading venues. A subset of ATSs—so-called electronic communication networks (ECNs)—publicly post their best bids and offers just as exchanges do.[23] The remaining ATSs offer dark liquidity. Unless trading volume reaches five percent of average daily volume for a particular stock, these "dark pools" do not have to publicly post their bids and offers before trades occur or offer fair access.[24] For most stocks, dark pools only provide post-trade information. Dark pools offer a valuable service to institutional investors—the ability to trade without drawing instantaneous unwanted, costly, price-moving attention to the trades. Traders in dark pools also typically incur lower direct transaction costs than they would on exchanges.[25]

Most retail trades do not take place on exchanges or on ATSs. Instead, they occur in another dark part of the market; they are "internalized" by over-the-counter market makers or wholesalers, who generally do not publish their best bids and offers. Internalizers provide price improvement over the published best bid or offer and make post-trade reports. Internalizers often pay the retail customer's broker for directing customer order flow to them.[26]

III. ANOTHER KEY PLAYER IN THE MARKET STRUCTURE STORY: REGULATION

The structural complexity of U.S. equity markets is driven in part by the regulation that shapes the markets. This regulation comes through multiple avenues. The following sections describe some of the most important ones.

A. Federal Government Market Structure Reform Efforts

Congress gave the SEC a broad mandate over equity market structure. Section 11A, which was added to the Securities Exchange Act in 1975, directs the SEC:

> having due regard for the public interest, the protection of investors, and the

21. Regulation of NMS Stock Alternative Trading Systems, 80 Fed. Reg. 80,997, 81,113, (Dec. 28, 2015) (to be codified at 17 C.F.R. pts. 240, 242, 249).

22. Regulation of Exchanges and Alternative Trading Systems, 63 Fed. Reg. 70,844 (Dec. 22, 1998) (to be codified at 17 C.F.R. pts. 240, 242, 249).

23. *ECNs/Alternative Trading Systems*, SEC, https://www.sec.gov/divisions/marketreg/mrecn.shtml (last visited Jan. 19, 2018).

24. *See* Regulation of NMS Stock Alternative Trading Systems, 80 Fed. Reg. at 81006 (detailing these requirements).

25. GARY SHORTER & RENA S. MILLER, CONG. RESEARCH SERV., R43739, DARK POOLS IN EQUITY TRADING: POLICY CONCERNS AND RECENT DEVELOPMENTS 5 (Sept. 26, 2014).

26. If the market is competitive, retail brokers pass most of this payment on to customers in some form. *See* James J. Angel et al., *Equity Trading in the 21st Century: An Update*, 5 Q.J. FIN. 1550002, 1550002-21 (2015) ("[E]vidence exists that suggests that competition among brokers to obtain customer order flow has driven a significant portion of these payments back to retail customers. . . . . However, we also recognize that these markets for order flow are not perfectly competitive in practice . . . .").

> maintenance of fair and orderly markets, to use its authority under this chapter to facilitate the establishment of a national market system for securities (which may include subsystems for particular types of securities with unique trading characteristics) . . .[27]

Congress based this mandate on several findings, including that "[t]he securities markets are an important national asset which must be preserved and strengthened."[28]

The SEC has undertaken a number of important rulemaking efforts in fulfillment of this mandate. The Order Handling Rules in 1996 were intended to ensure that market makers and specialists were not charging retail customers a higher price than they charged their counterparties on ECNs.[29] In 1998, the SEC adopted Regulation ATS, which provided a streamlined regulatory framework for non-exchange trading venues.[30] The SEC oversaw the phased implementation of decimal quoting by the exchanges that was completed in 2001.[31]

A major change to market structure came with the adoption in 2005, after a contentious debate, of Regulation NMS.[32] The lengthy regulation made several important rule changes, inspired substantial technology investments, and changed the structure of U.S. equity markets. Regulation NMS included the so-called "order protection" or "trade-through" rule, a prohibition on sub-penny pricing, a rule requiring fair and nondiscriminatory access to quotations, and changes to market data plan governance and the allocation of market data revenues.[33] The trade-through rule prohibits "the execution of trades on one venue at prices that are inferior to publicly displayed quotations on another venue."[34] Two of the SEC's five commissioners dissented from the adoption of Regulation NMS with a particular emphasis on the trade-through rule.[35]

The SEC has opened the door to reconsidering Regulation NMS and other elements of market structure regulation. In 2010, the SEC issued a concept release to solicit regulatory suggestions.[36] More recently, the SEC formed an Equity Market Structure Advisory Committee (EMSAC), which is composed largely of industry representatives and academics.[37] The EMSAC has looked at a wide range of market structure issues and made

---

27. Securities Act § 11A(a)(2) [15 U.S.C. § 78k-1(a)(2) (2016)].

28. Securities Act § 11A(a)(1)(A) [15 U.S.C. § 78k-1(a)(1)(A) (2016)].

29. Order Execution Obligations, 61 Fed. Reg. 48,290 (Sept. 12, 1996) (to be codified at 17 C.F.R. pt. 240).

30. Regulation of Exchanges and Alternative Trading Systems, 63 Fed. Reg. at 70844.

31. *See, e.g.*, Laura S. Unger, Acting Chairman, SEC, Remarks before the Exchequer Club: New Millennium, New Market, (July 18, 2001), https://www.sec.gov/news/speech/spch509.htm (explaining that the goals of decimalization, which was completed in April 2001, were to "(1) maintain our market's competitive position globally, (2) offer simplicity and clarity to retail investors, (3) increase competition among market participants, and finally, (4) bring about narrower quotation spreads – potentially reducing costs to investors").

32. Regulation NMS, 70 Fed. Reg. 37,496 (June 29, 2005) (to be codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270).

33. For a summary of Regulation NMS, *see* Memorandum from the Div. of Trading and Mkts., SEC to the SEC Mkt. Structure Advisory Comm. (Apr. 30, 2015), https://www.sec.gov/spotlight/emsac/memo-rule-611-regulation-nms.pdf [hereinafter Staff Regulation NMS Memo].

34. Staff Regulation NMS Memo, *supra* note 33, at 2.

35. Dissent to the Adoption of Regulation NMS, 70 Fed. Reg. 37632, 37633 (June 29, 2005) (to be codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270).

36. Concept Release on Equity Market Structure, 75 Fed. Reg. 3594, 3594 (Jan. 21, 2010) (to be codified at 17 C.F.R. pt. 242).

37. Notice of Federal Advisory Committee Establishment; Equity Market Structure Advisory Committee, Exchange Act Release No. 34-74092, 80 Fed. Reg. 3673 (Jan. 23, 2015). The EMSAC had a two-year tenure, but

recommendations related to market quality, execution quality and order handling disclosures, Regulation NMS Plan governance, and a market access fee pilot program.[38] Separately, the SEC has proposed sweeping changes to Regulation ATS, which would include mandatory public disclosures.[39]

The SEC also shapes market structure through enforcement actions. In 1996, for example, it brought a seminal action against the National Association of Securities Dealers (NASD), the predecessor to FINRA, and the Nasdaq Market related to allegedly anticompetitive and abusive practices by Nasdaq market makers.[40] More recently, the SEC has brought enforcement actions against HFT firms,[41] exchanges,[42] and dark pools.[43] Figure 1, which shows some of the recent enforcement actions against dark pools, reflects the SEC's interest in the issue.

---

the SEC extended the EMSAC for six months in 2017. Equity Market Structure Advisory Committee, Exchange Act Release No. 34-79992, 82 Fed. Reg. 10,611 (Feb. 14, 2017).

38. *SEC Spotlight: Equity Market Structure Advisory Committee*, SEC, https://www.sec.gov/spotlight/equity-market-structure-advisory-committee.shtml (last visited Jan. 19, 2018).

39. Regulation ATS Proposal, *supra* note 21.

40. SEC, Report Pursuant to Section 21(a) of the Securities Exchange Act of 1934 Regarding the NASD and the NASDAQ Market (Aug. 8, 1996), https://www.sec.gov/litigation/investreport/nd21a-report.txt. *See also* John Polise, *A Bridge Too Far: A Critical Analysis of the Securities and Exchange Commission's Approach to Equity Market Regulation*, 11 BROOK. J. CORP. FIN. & COM. L. 285, 311-314 (2017) (discussing significance of this SEC action).

41. *See, e.g.*, *In re* Athena Capital Research, LLC, Exchange Act Release No. 73369, 2014 WL 5282074 (Oct. 16, 2014) (alleging that HFT firm manipulated the closing prices of numerous stocks by "using high-powered computers, complex algorithms, and rapid-fire trades"); *In re* Briargate Trading, LLC and Eric Oscher, Securities Act Release No. 9959 (Oct. 8, 2015) (alleging that proprietary trading firm engaged in spoofing scheme that violated antifraud laws).

42. *See, e.g.*, *In re* EDGA Exchange, Inc., Exchange Act Release No. 74032, 2015 WL 137640 (Jan. 12, 2015) (alleging, among other things, that an exchange "caused some members to have information about Exchange order types and order handling procedures that other members did not have"); *In re* the New York Stock Exchange LLC et al., Exchange Act Release No. 72065, 2014 WL 1712113 (May 1, 2014) (alleging, among other things, that the New York Stock Exchange did not offer co-location to members on equal terms and gave floor brokers "an informational advantage of which other market participants and the public were not aware").

43. *See, e.g.*, *In re* Credit Suisse Securities (USA), LLC, Securities Act Release No. 10014, 2016 WL 683553 (Jan. 31, 2016) (settling an administrative proceeding based on alleged misrepresentations about the manner in which a tool designed to identify "opportunistic" users of the dark pool operated and alleged failures to execute orders matched with displayed quotes); *In re* Credit Suisse Securities (USA), LLC, Securities Act Release No. 10013, 2016 WL 537942 (Jan. 31, 2016) (settling an administrative proceeding based on alleged misconduct related to Credit Suisse's dark pool, Crossfinder, including subpenny violations, misuse of confidential subscriber information, non-uniform disclosure to subscribers about system functionalities, misrepresentations about subscriber categorization and order routing, and Form ATS disclosure lapses); *In re* ITG Inc. and Alternet Securities Inc., Exchange Act Release No. 75672, 2015 WL 4748216 (Aug. 12, 2015) (settling an administrative proceeding related primarily to alleged use of confidential information from ITG's dark pool by ITG's proprietary trading desk); *In re* UBS Securities LLC, Exchange Act Release No. 74060, 2015 WL 179551 (Jan. 15, 2015) (settling an administrative proceeding based, among other things, on alleged subpenny violations and alleged failure to let users of dark pool know about a feature to screen out HFT firms); *In re* Lavaflow, Inc., Exchange Act Release No. 72673, 2014 WL 3695100 (July 25, 2014) (settling an administrative proceeding related in part to allegedly misusing subscriber information); *In re* Liquidnet , Inc., Exchange Act Release No. 72339, 2014 WL 2547522 (June 6, 2014) (settling an administrative proceeding related to alleged misuse of subscriber information and inaccurate disclosures); *In re* eBX, LLC, Exchange Act Release No. 67969, 2012 WL 4580151 (Oct. 3, 2012) (settling an administrative proceeding related to alleged misuse of subscriber information); *In re* Pipeline Trading Systems LLC, Exchange Act Release No. 9271, 2011 WL 5039038 (Oct. 24, 2011) (settling an administrative proceeding related to alleged misuse of subscriber information and inaccurate disclosures).

Figure 1[44]

The Department of Justice (DOJ) also has the ability to shape market structure. Media reports suggest that the DOJ is also looking at HFT firms that pay for retail order flow.[45] The DOJ has successfully exercised its criminal authority under the Commodity Exchange Act.[46] Although the DOJ's statutory authority with respect to the securities markets is

44. Press Release, SEC, Barclays, Credit Suisse Charged with Dark Pool Violations (Jan. 31, 2016), https://www.sec.gov/news/pressrelease/2016-16.html.

45. Charles Levison, *Exclusive: U.S. Investigates Market-Making Operations of Citadel, KCG*, REUTERS (May 10, 2016, 4:20 PM), http://www.reuters.com/article/us-usa-stocks-probe-exclusive-idUSKCN0Y11CJ.

46. *See, e.g.*, Press Release, Dep't of Justice, High-Frequency Trader Sentenced to Three Years in Prison for Disrupting Futures Market in First Federal Prosecution of "Spoofing" (July 13, 2016), https://www.justice.gov/usao-ndil/pr/high-frequency-trader-sentenced-three-years-prison-disrupting-futures-

different,[47] criminal cases are likely to have at least some de facto regulatory effect for HFT firms trading in all markets.

B. New York's Attorney General's Market Structure Reform Efforts

The New York Attorney General (NYAG) also has expressed an interest in market structure regulation.[48] The Martin Act, New York's financial fraud statute, is the statutory device upon which the NYAG relies.[49] New York prosecutors first began using the Martin Act—which criminalizes a wide range of behavior and offers limited due process protections—expansively in the early 2000s—eight decades after it became law.[50] In a 2014 speech, NYAG Eric Schneiderman warned that his state's Martin Act "empowers my office . . . to investigate pretty much any fraudulent or deceptive practice in financial dealings."[51]

Cloaked with the Martin Act's broad mantle, New York turned its attention to high frequency trading activities, which "are not really investing strategies."[52] Schneiderman explained that HFT firms instead "look for arbitrage opportunities between and among the various exchanges" and "move on price and order information before the rest of the market really sees it or is able to digest it—all in order to capture momentary differences in stock prices."[53] The NYAG targeted co-location, the practice by HFT firms of buying the privilege of having their computer servers on-site (co-located) near trading venues' matching engines. Schneiderman notes that HFT firms are the only ones who pay for the advantage because "[m]ost of us try to invest for something like a long-term effort to build value in a company."[54]

The NYAG also has focused on HFT firms' informational advantages over other traders. To this end, the NYAG secured an agreement from Thomson Reuters to stop providing to HFT firms the results of the University of Michigan consumer sentiment survey two seconds ahead of everyone else.[55] HFT firms paid for this advanced access,

---

market-first (alleging that the HFT trader manipulated the futures markets through spoofing, which involves placing many subsequently cancelled quotes to create the impression of liquidity in the market).

47. *See* Robert Houck et. al., *Comparing SEC and CFTC Market Abuse Regimes*, LAW360 (Mar. 1, 2016, 10:56 AM), https://www.law360.com/articles/765248/comparing-sec-and-cftc-market-abuse-regimes ("[W]hile Congress has recently made some attempts at harmonization of the respective agencies' enforcement regimes—most notably as part of the Dodd-Frank Act—counsel for market participants should not assume those regimes operate identically").

48. *See infra* notes 50-63 and accompanying text.

49. N.Y. Gen. Bus. Law Art. 23-A (2017).

50. *See* Robert A. McTamaney, *New York's Martin Act: Expanding Enforcement in an Era of Federal Securities Regulation*, WASH. LEGAL FOUND.: LEGAL BACKGROUNDER (Feb. 28, 2003), http://www.wlf.org/upload/022803LBMctamaney.pdf (describing NYAGs' increased use of the Martin Act and the Act's relationship to federal securities legislation); Walter Olson, *Devil's Bargain: Wall St. & the Martin Act*, N.Y. POST (Aug. 3, 2011, 4:00 AM), http://nypost.com/2011/08/30/devils-bargain-wall-st-the-martin-act/ (describing the expanding use of the Martin Act).

51. Eric Schneiderman, N.Y. Attorney Gen., Remarks on High-Frequency Trading & Insider Trading before the New York Law School Panel on "Insider Trading 2.0—A New Initiative to Crack Down on Predatory Practices," (Mar. 18, 2014), https://ag.ny.gov/pdfs/HFT_and_market_structure.pdf [hereinafter Schneiderman New York Law School Speech].

52. *Id.*

53. *Id.* at 8.

54. *Id.* at 9.

55. Press Release, N.Y. State Office of the Attorney. Gen., A.G. Schneiderman Secures Agreement By

which Schneiderman characterized as "an "unfair timing advantage[]." In his view, "The securities markets should be a level playing field for all investors and the early release of market-moving survey data undermines fair play in the markets."[56] Business Wire, with encouragement from the NYAG, similarly agreed to stop allowing HFT firms access to press releases simultaneously with the news aggregators, from which other traders obtained access to the news.[57]

Schneiderman also objected to trading venues' "catering to high-frequency traders."[58] The NYAG sued Credit Suisse and Barclays for failing to properly disclose to participants how their dark pools worked. The suits alleged misrepresentations to users of the dark pools about the way these dark pools handled HFT. Both of these dark pool operators eventually settled.[59]

Barclays, in its attempt to have the case thrown out, raised questions about the NYAG's role in policing market structure. Barclays defended its marketing practices and argued, among other things, that the application of the Martin Act to the alleged dark pool violations conflicted with Congress's intent to leave this type of market structure regulation to the SEC.[60] Barclays also argued that the Martin Act by its own terms does not apply as it reaches fraud in connection with securities transactions, not fraud related to the marketing of a dark pool.[61] Additionally, Barclays faulted the NYAG for failing to name "a single investor in New York who was materially misled" or to allege "that any investor was injured."[62] Allowing the case to go forward, the judge conceded that Barclays' arguments were "not entirely unreasonable," but held that "if it is a close call, the Martin Act should be held to apply" because "New York, the center of the financial universe, benefits from having powerful blue sky laws."[63]

In addition to enforcement actions and pressuring firms not to sell privileges to HFT firms, the NYAG's efforts to change market structure have included recommending major changes to market structure. Schneiderman, aiming to "help catch and cap the

---

Thomson Reuters To Stop Offering Early Access To Market-Moving Information (July 8, 2013), https://ag.ny.gov/press-release/ag-schneiderman-secures-agreement-thomson-reuters-stop-offering-early-access-market.

56. *Id.*

57. Press Release, N.Y. State Office of the Att'y. Gen., A.G. Schneiderman Applauds Decision By Business Wire To Prohibit High-Frequency Traders From Purchasing Direct News Feed (Feb. 20, 2014), https://ag.ny.gov/press-release/ag-schneiderman-applauds-decision-business-wire-prohibit-high-frequency-traders ("Business Wire's decision to voluntarily step forward and stop selling its clients' information directly to high-speed traders is a tremendous victory for our effort to eliminate advance trading on market-moving information and a demonstration of Business Wire's commitment to being a responsible industry leader.").

58. Schneiderman New York Law School Speech, *supra* note 51, at 7.

59. Press Release, N.Y. State Office of the Att'y. Gen., A.G. Schneiderman Announces Landmark Resolutions with Barclays and Credit Suisse for Fraudulent Operations of Dark Pools; Combined Penalties and Disgorgement to State of New York and SEC of Over $154 Million (Feb. 1, 2016).

60. Barclays' Memorandum of Law in Support of its Motion to Dismiss the Complaint at 12–16, People v. Barclays Capital Inc., No. 14-45139, slip op. (N.Y. Sup. Ct. 2015) https://www.home.barclays/content/dam/barclayspublic/docs/BarclaysNews/2014/7.%20July/240714_mtd.pdf

61. *Id.* at 9–12.

62. *Id.* at 29.

63. People v. Barclays Capital Inc., 1 N.Y.S.3d 910, 917 (N.Y. Sup. Ct. 2015). The judge, however, reprimanded the NYAG for attempting to base its claim on draft marketing materials and "impermissibly vague descriptions and sheer puffery," rather than "what a reasonable, sophisticated trader, trading millions of dollars, actually would consider material." *Id.* at 913–14.

supercomputer arms race now underway," endorsed an academic proposal to replace continuous markets with periodic batch auctions.[64]

C. Non-governmental Market Structure Reform Efforts

In addition to government regulators, self-regulation and potentially private litigation can affect market structure. FINRA, the non-governmental frontline regulator of broker-dealers, for example, regulates both dark pools and HFTs. ATSs, as members of FINRA, are subject to FINRA regulation, supervision, and enforcement.[65] The SEC has proposed a rule that would subject many proprietary HFT firms to FINRA oversight.[66] FINRA recently began requiring developers of algorithmic trading strategies and their supervisors to register as Securities Traders.[67] FINRA also collects and makes public dark pool trading data.[68] As noted above, the exchanges themselves are SROs with regulatory authority over their markets and members. They write rules for their markets and members and bring disciplinary actions.[69] Many exchanges, however, have contracted with FINRA to perform some of these SRO responsibilities.[70] Exchanges, under the SEC's supervision, coordinate in market data dissemination and the ongoing development of the Consolidated Audit Trail (CAT), an effort to create a comprehensive trade database.[71]

Regulation of market structure also may come through private litigation. In the last several years, private plaintiffs, including pension funds, have brought a number of lawsuits against trading venues base on their allegedly improper accommodation of HFT.[72]

---

64. Schneiderman New York Law School Speech, *supra* note 51, at 10 (citing proposal described in Eric Budish et al., *The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response*, 130 Q.J. ECON. 1547 (2015)).

65. Regulation of NMS Stock Alternative Trading Systems, 80 Fed. Reg. 80,997, 81,001, (Dec. 28, 2015) (to be codified at 17 C.F.R. pts. 240, 242, 249). ("Regulation ATS includes the requirement that, as an alternative to registering as a national securities exchange, an ATS must register as a broker-dealer with the Commission, which entails becoming a member of an SRO, such as the Financial Industry Regulatory Authority ('FINRA')") (footnote omitted).

66. Exemption for Certain Exchange Members, 80 Fed. Reg. 18,035, 18,036 (Apr. 2, 2015) (to be codified at 17 C.F.R. pt. 240).

67. *Qualification and Registration of Associated Persons Related to Algorithmic Trading*, FINRA (June 2016), http://www.finra.org/sites/default/files/Regulatory-Notice-16-21.pdf.

68. *OTC (ATS and non-ATS) Transparency*, FINRA, http://www.finra.org/industry/otc-transparency (last visited Jan. 19, 2018) ("FINRA publishes over-the-counter (OTC) trading information on a delayed basis for each alternative trading system (ATS) . . . .").

69. *See, e.g.*, *Regulation: Disciplinary Actions*, NYSE, https://www.nyse.com/regulation/disciplinary-actions (last visited Jan. 19, 2018).

70. FINANCIAL INDUSTRY REGULATORY AUTHORITY, 2015 YEAR IN REVIEW AND ANNUAL FINANCIAL REPORT 12 (2016) (listing exchanges for which FINRA provides market regulation under contract).

71. *See, e.g.*, Mary Jo White, Chair, SEC, Statement at Open Meeting: Order Approving the Consolidated Audit Trail National Market System Plan (Nov. 15, 2016), https://www.sec.gov/news/statement/white-statement-open-meeting-111516html.html ("With the implementation of the CAT, regulators will have access to complete and integrated audit trail data . . . the result of a collective effort by the Commission staff, the exchanges, FINRA and a host of market participants that invested extensive time and energy into this project.").

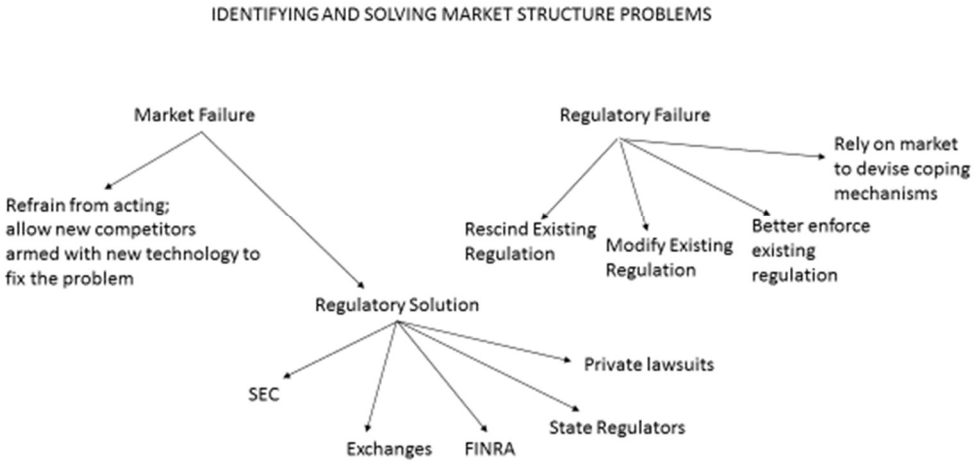
72. *See, e.g.*, Lanier v. BATS Exchange, Inc., 838 F.3d 139 (2d Cir. 2016) (dismissing breach of contract claims based on allegations that the defendant exchanges violated SEC regulations by transmitting market data in such a way that certain market participants—who paid extra—had a speed advantage); *In re* Barclays Liquidity Cross and High Frequency Trading Litigation, 126 F. Supp. 3d 342 (S.D.N.Y. 2015) (dismissing claims related to exchanges' sale of enhanced market data feeds, co-location, and HFT-friendly order types and the veracity of dark pool's marketing as it pertained to HFT); Braman v. The CME Group, Inc., 149 F. Supp. 3d 874, 892 (N.D.

These cases typically focus on exchanges' practices of selling proprietary data streams to HFT firms, allowing HFT firms to buy the right to co-locate their servers near exchange matching engines, and creating order types that facilitate profitable HFT. While plaintiffs have not yet prevailed in these cases, a successful class action could force changes in the way exchanges and dark pools interact with HFT firms.

IV. IDENTIFYING EQUITY MARKET STRUCTURE PROBLEMS AND DEVISING SOLUTIONS

The first step in figuring out whether regulatory changes are warranted is identifying the problems that need to be solved, isolating their causes, determining whether regulation is the proper solution, and—if so—what kind of regulation will work best. As Figure 2 shows, identifying the problem is a prerequisite to designing an appropriate solution and measuring the effectiveness of that solution once it is in place. A problem may be the result of a market failure or a government failure. When confronted with new phenomena in the markets, regulators should be careful not to mistake market solutions for problems.[73] The SEC's economists should examine the data and assist in setting priorities.

Identifying and Solving Market Structure Problems: Considering the Options[74]



Ill. 2015) (dismissing claims in connection with the exchanges' accommodations for HFT firms and noting, read literally, the plaintiffs' claim would mean that "every non-HFT trader would be damaged simply by virtue of the fact that HFTs are operating on the exchange").

73. For example, the dissenting commissioners argued that the trade-through rule of Regulation NMS may have been a reaction to "successful market-driven innovations" in the way market participants search for liquidity in the electronic markets rather than a solution to "intractable market structure problems that can only be solved by government intervention." Dissent to the Adoption of Regulation NMS, 70 Fed. Reg. 37632, 37,635 (June 29, 2005) (to be codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270).

74. Author rendering.

After identifying the problem, the next step is devising a solution. The solution may come from the market, a regulator, or a combination of the two. A private solution may be simply to allow innovation and competition to erode the problem over time. A government solution might include both regulatory actions—strengthening existing regulatory requirements, adding new regulations, or better enforcing existing rules—and deregulatory actions—repealing existing rules, exempting certain conduct, or revising rule interpretations. Regulatory solutions for equity market structure problems may come from the SEC, FINRA, the exchanges in their self-regulatory capacity, state regulators, or private plaintiffs.

A. Determining whether a Problem Exists

Cutting through the rhetoric regarding equity market structure to determine whether a problem exists is difficult. Helpful in this regard is remembering that many of the features and problems in today's markets have very similar precedents in past markets.[75] Financial economists generally find that, while our equity markets are not perfect and could certainly benefit from reforms, on the whole, U.S. equity markets serve investors well by offering them liquidity and low transaction costs.[76] Standard measures of market quality reflect considerable improvement over time.[77] As reforms are undertaken, it is important to investigate their potential effects on market quality. Market quality cannot be measured in terms of transaction costs alone; other things, such as the ability to execute block transactions and how well the market serves different types of issuers, matter too.

1. High Frequency Trading

HFT is an area that some market observers have identified as problematic. They are concerned that HFT is harmful to retail investors,[78] market quality and integrity,[79] and

75. *See, e.g.*, Equity Market Structure Concept Release, *supra* note 10, at 3607 ("Proprietary firms largely have replaced more traditional types of liquidity providers in the equity markets, such as exchange specialists on manual trading floors and OTC market makers that trade directly with customers."); *id.* at 3612 ("Undisplayed liquidity in general is not a new phenomenon."); Jones, *supra* note 5, at 2; Korsmo, *supra* note 17, at 548 ("Momentum ignition, again, closely resembles classic forms of market manipulation though HFT technology has allowed new levels of sophistication."). Korsmo also points out that algorithmic trading is not new; it has long been used "to manage orders and execute trading decisions made by actual humans . . . ." *Id.* at 539.

76. *See, e.g.*, Angel et al., *supra* note 26, at 150002-34 ("Improvements in market quality have benefited small traders and new evidence presented in this report indicates that it has also benefited the institutional trader executing very large orders over many days."); Jones, *supra* note 5, at 16 (arguing that "US equity markets overall are doing a good job of providing liquidity to institutional traders").

77. For an excellent discussion of improvements in market quality and current challenges, *see* Angel et al., *supra* note 26, *passim*.

78. *See, e.g.*, LEWIS, *supra* note 2, *passim*.

79. For an explanation of how HFT works to harm the market, *see* Haim Bodek, *HFT Is an Artificial Industry @ TradeTech 2013 Reg NMS*, YOUTUBE (Apr. 26, 2013), https://www.youtube.com/watch?v=ItfAKguEdAE.

market stability.[80] They argue that HFT firms "front-run" the market.[81] Critics also contend that even HFT's contribution to the market—the liquidity HFT provides—is not as good as it seems at first glance; it is less deep, more transient, and more disruptive than the liquidity offered by more traditional market makers.[82] Some market observers classify as unfair the methods HFT firms use—co-locating their computers next to the exchanges' computers; paying for expensive private data feeds that are better and faster than the public ones; buying other potentially market-moving data; placing and cancelling many orders; and negotiating special order types that flash, hide, and slide.[83] The SEC, in its Equity Market Structure Concept Release, asks the question that troubles many of these observers: "[I]s it unfair for market participants to obtain a competitive advantage by investing in technology and human resources that enable them to trade more effectively and profitably than others?"[84] The speed of making, rescinding, and reposting quotes that gives HFT firms their name is also perceived by some to be a problem.[85] HFT firms have driven the proliferation of order types and maker-taker/taker-maker rebates offered by trading venues—features that add to the complexity of the markets.[86] Micah Hauptman of the

80. *See, e.g.*, ANDREI KIRILENKO ET AL., THE FLASH CRASH: THE IMPACT OF HIGH FREQUENCY TRADING ON AN ELECTRONIC MARKET 26 (May 5, 2014), http://www.cftc.gov/idc/groups/public/@economicanalysis/documents/file/oce_flashcrash0314.pdf (showing that HFT firms "contributed to the Flash Crash [on May 6, 2010] by engaging in their typical immediacy-absorption practice of aggressively removing the last few contracts at the best bid or ask levels and then establishing new best bids and asks at adjacent price levels"); Korsmo, *supra* note 17, at 528 ("The most troubling risk associated with HFT, which has generated widespread concern, is that HFTs will inadvertently—or even deliberately—cause extreme volatility events such as the Flash Crash."); Pasquale, *supra* note 15, at 2100 (discussing the harmful effect HFT firms have on volatility, particularly during times of market stress); Emory Zink & W. Travis Selmier, *High Frequency Trading and Dark Pools: An Interview with John Succo*, 56 BUS. HORIZONS 715, 716 (2013) (quoting hedge fund executive John Succo, who states that HFT "creates more volatility in both normal and non-normal times").

81. *See, e.g.*, JOSEPH E. STIGLITZ, TAPPING THE BRAKES: ARE LESS ACTIVE MARKETS SAFER AND BETTER FOR THE ECONOMY? 13 (Apr. 15, 2014), https://www.frbatlanta.org/-/media/documents/news/conferences/2014/fmc/Stiglitz.pdf (arguing that HFT firms are engaged "in sophisticated versions of front running" that involve obtaining and acting on information faster than others in the market).

82. *See, e.g.*, Thomas Clarke, *High-Frequency Trading and Dark Pools: Sharks Never Sleep*, LAW & FIN. MKTS. REV. 342, 346–47 (Dec. 2014) (arguing that "there are critical differences between high-frequency traders and traditional market makers," including the lack of formal responsibilities, failure to contribute to market depth, and short-lived nature of HFT quotes); Korsmo, *High Frequency Trading*, *supra* note 17, at 568 ("This large volume can mask the fact that this apparent liquidity is actually very shallow, as the HFTs typically have no appetite for accumulating any significant position."); STIGLITZ, *supra* note 81, at 9–11 (arguing that HFT liquidity is illusory).

83. *See generally* Steven McNamara, *The Law and Ethics of High-Frequency Trading*, 17 MINN. J.L. SCI. & TECH. 71, 104 (2016) (discussing aspects of HFT that are unfair). *See also* Pasquale, *Law's Acceleration of Finance*, *supra* note 15, at 2092 (decrying as "unfair . . . non-governmental organizations giving HFT firms early access to potentially market-moving information"); Schneiderman New York Law School Speech, *supra* note 51, at 3 (discussing efforts to pursue "fundamentally unfair—and potentially illegal—situations").

84. Concept Release on Equity Market Structure, 75 Fed. Reg. 3594, 3605 (Jan. 21, 2010) (to be codified at 17 C.F.R. pt. 242); *see also id*. at 3610 ("Is it fair for some market participants to pay to obtain better access to the markets than is available to those not in a position to pay for or otherwise obtain co-location services?").

85. *See, e.g.*, Letter from Clive Williams, Head of Global Equity Trading, T. Rowe Price, et al. to Elizabeth Murphy, Secretary, SEC 3 (Aug. 30, 2010), https://www.sec.gov/comments/s7-02-10/s70210-290.pdf (noting the high level of order cancellations by HFT firms and recommending a cancellation fee).

86. *See, e.g.*, Letter from Haim Bodek, Managing Principal, Decimus Capital Markets, LLC, to SEC (Sept. 15, 2014), https://www.sec.gov/comments/sr-nyse-2014-32/nyse201432-1.pdf (arguing that "it is beyond serious question that accommodation of high-frequency trading strategies via these order types is a central issue for our

Consumer Federation of America crystalizes some of the key objections to HFT:

> HFT firms can, and indeed do, deploy their technological advantages and dominant role in ways that are unproductive and harmful to investors and to the market . . . . HFT firms often pay exchanges to receive market data ahead of the public. Using that data combined with their technological prowess, they send quotes faster than, and execute profitable trades ahead of, others. Additionally, HFT firms engage in trading activities that are in some cases intentionally predatory and manipulative. In other cases, they engage in trading activities that are not intentionally predatory and manipulative, but that nonetheless disadvantage other traders and adversely affect market quality . . . . As a result, HFT has become perhaps the single greatest driver of the perception that there is a two-tiered market that is not serving the interests of long-term investors. In addition, because of their commanding role in the market, when HFT firms' technologies experience failures, those failures can expose the financial system to excessive risk.[87]

HFT's defenders, by contrast, point to academic research showing the liquidity, transaction cost reduction, and price discovery benefits that HFT brings to the equity markets and argue that these benefits help the economy flourish. Columbia Business School Professor Charles Jones surveyed empirical examinations of HFT and found that "[t]hese papers all come to the same conclusion: HFT and [algorithmic trading] improve market quality."[88] Likewise, Professor Holly Bell argues that:

> HFT has improved liquidity by lowering spreads; has reduced trading costs, making markets accessible to a greater number of people; has improved price synchronization of related securities; performs a stabilizing function during extreme market price movements; has increased direct price improvements for retail investors; and in some cases has made pricing more efficient.[89]

The improved liquidity and price discovery that HFT brings translate into stronger capital markets, which are good for the companies that rely on these markets to fund themselves and for the rest of the economy.[90]

Many of the practices critics find objectionable are consistent with HFT firms' role as market makers and keep stock prices informative. Professor Craig Pirrong has pointed out that market makers, by nature of their role in smoothing out market imbalances, "tend to buy and sell frequently and to hold their positions for short periods of time."[91] Pirrong

---

current equity market structure and its ongoing evaluation by the" SEC).

87. MICAH HAUPTMAN, TOWARD A U.S. EQUITY MARKET STRUCTURE THAT SERVES ALL INVESTORS 30 (Consumer Federation of America White Paper) (2014), http://www.consumerfed.org/pdfs/CFA-Market-Structure-White-Paper.pdf.

88. Jones*, supra* note 5, at 23.

89. Holly A. Bell, *Using the Market to Manage Proprietary Algorithmic Trading, in* REFRAMING FINANCIAL REGULATION ENHANCING STABILITY & PROTECTING CONSUMERS 253, 261 (Hester Peirce & Benjamin Klutsey eds., 2016).

90. *See, e.g.*, Jones *supra* note 5, at 51 (arguing that HFT produces improvements in liquidity that produce a lower cost of capital and a stronger economy); Korsmo, *supra* note 15, at 550 (pointing to the benefits to long-term investors, corporations raising money, and the economy).

91. Craig Pirrong, *Pick Your Poison—Fragmentation or Market Power? An Analysis of RegNMS, High Frequency Trading, and Securities Market Structure*, 26 J. APPLIED CORP. FIN 8, 10 (2014).

further explains that, to avoid losses, HFT firms must update their quotes (which results in frequent cancellations) to reflect new information as soon as they get it.[92] Because of their ability to quickly obtain and respond to new information, HFT firms may be more efficient than traditional market makers.[93] HFT helps to ensure that prices across markets and across related products (such as exchange traded funds and their components) are informative and aligned.[94]

Others have pointed out that classifying HFT firms as front-runners is problematic. The HFT firm "has no preexisting relationship with the trader placing the order that the HFT detects," which means that the HFT firm is not breaking any duty to the other trader.[95] Korsmo argues against regulatory prohibitions that "would, in effect, command market participants to trade without reference to one of the most salient pieces of public information regarding a security's value—what other sophisticated market participants think, as evidenced by their trading activity."[96] Markets should not operate in a way that deters informed investors from benefiting (consistent with professional responsibilities and the constraints of insider trading law) from the work of obtaining information,[97] but artificial constraints on other traders could harm markets.

HFT methods—co-location, expensive technology, and ample resources—have non-controversial parallels elsewhere. In the past when firms "paid hundreds of thousands of dollars to buy exchange memberships that gave them the right to trade on the floor for the same reason" HFT firms co-locate.[98] On a more mundane level, the Black Friday shopper who skips Thanksgiving dinner to "co-locate" in front of the store gets the deals before they sell out. Holders of one type of credit card reportedly got first dibs on buying Hamilton tickets.[99] Some firms enjoy technological, talent, timing, and funding advantages over others.[100] However, the thick layer of regulation in today's equity markets that advantages

92. *Id.* at 12.

93. *See, e.g.*, JAMES ANGEL ET AL., EQUITY TRADING IN THE 21ST CENTURY 38 (Marshall Research Paper Series, Working Paper FBE 09-10, May 18, 2010) ("These electronic proprietary traders have substantial advantages over traditional dealers who cannot see as much information, process as much information, or react as quickly to new information as can computers.").

94. Fox et al., *supra* note 4, at 221 ("[S]imply as a result of their efforts to avoid losses to informed traders, liquidity providers are repeatedly revising their quotes so they come to fully reflect informed traders' information, making stock prices genuinely informative."). *See also* Pirrong, *supra* note 91, at 11 (describing HFT firms as "the enforcers of the Law of One Price").

95. Fox et al., *supra* note 4, at 227.

96. *See, e.g.*, Korsmo, *supra* note 17, at 560.

97. Stiglitz, for example, expresses concern about the distortion caused by HFT firms "stealing the information rents that otherwise would have gone to those who had invested in information" STIGLITZ, *supra* note 81, at 7.

98. Pirrong, *supra* note 91, at 11.

99. *See, e.g.*, Kelly B. Grant, *'Hamilton' Tony Nod Makes getting Tix Even Harder*, CNBC (May 3, 2016),http://www.cnbc.com/2016/05/02/getting-hamilton-tickets-takes-patience-and-money.html (reporting that one credit card issuer's "cardholders got early access to Hamilton tickets at box office prices during three presale events in August and September 2015 and January 2016").

100. The trajectory of a Mom-and-Pop cell phone photo album start-up featured on Season 5 of the CNBC television show Shark Tank is illustrative. A clever design allowed the albums to be shipped by bulk and that thus allowed the company to offer its service at a lower price than competitors. The company's Shark Tank appearance brought publicity, a new investment and ultimately a buyout by a larger company. This combination of advantages—innovative design, television celebrity, and the resources of a large, established company—gave the company a competitive advantage, but nobody would deem that unfair. *See generally* Amit Chowdhry, *This Startup Made a Deal on 'Shark Tank' and Just Sold to Shutterfly for $14.5 Million*, FORBES (Nov. 18, 2014),

some firms and disadvantages others complicates attempts to draw analogies to other markets.

Although there does not seem to be "a causal link between HFT [firms] and ongoing increased volatility,"[101] HFT firms—like traditional market makers[102]—sometimes stop providing liquidity, including during market crashes.[103] During the flash crash of May 6, 2010, many non-HFT market makers also failed in their role as liquidity providers due to technical problems or the use of stub quotes, which are intentionally set far from the market price to avoid being executed.[104] In response to recent flash crashes, regulators and market participants have worked on refining mechanisms to moderate the consequences of such events.[105] If successful, these changes may help to alleviate some volatility-related concerns about HFT.

2. Dark Pools

Dark pools and the attendant "fragmentation" of market liquidity is another matter at the heart of market structure discussions. Dark pools accounted for approximately sixteen to eighteen percent of total U.S. equity volume in 2015, up from four percent in 2005.[106] As more trades occur in dark pools, they become even more attractive places to trade.[107]

On the positive side, investors have a lot of choices. Dark pools offer institutional investors the important ability to avoid giving the rest of the market insight into trading plans, and direct transaction costs may be lower than they would be on an exchange. Moreover, the multiplicity of venues may contribute to the resilience of the US financial system; a failure at one trading venue is not as difficult for the market to handle if there are redundant trading venues.[108]

---

https://www.forbes.com/sites/amitchowdhry/2014/11/18/shutterfly-acquires-groovebook/#6b35a01a5bbe; Sarah Perez, *Shark Tank-Backed GrooveBook Acquired by Shutterfly for $14.5 Million*, TECHCRUNCH (Nov. 17, 2014), https://techcrunch.com/2014/11/17/shark-tank-backed-groovebook-acquired-by-shutterfly-for-14-5-million/.

101. Fox et al., *supra* note 4, at 245.

102. *See, e.g.*, Jones, *supra* note 5, at 2 (pointing to the 1962 and 1987 crashes as instances when intermediaries "exacerbated the downturn"); *see also* SEC, *supra* note 40, at 33. ("Certain market makers at times did not honor their quotations for those with whom they preferred not to trade and 'backed away' from their quotes as reprisal for, among other reasons, perceived prior backing away by other market makers.").

103. *See, e.g.*, CFTC & SEC, FINDINGS REGARDING THE MARKET EVENTS OF MAY 6, 2010, AT 45–56 (Sept. 30, 2010), https://www.sec.gov/news/studies/2010/marketevents-report.pdf [hereinafter CFTC & SEC REPORT] (discussing the actions of HFT firms during the flash crash).

104. *Id*. at 37–39 (describing the actions of "traditional equity and ETF market makers").

105. *See, e.g.*, *US Equity Market Structure: Lessons from August 24,* BLACKROCK 1 (Oct. 2015), https://www.blackrock.com/corporate/en-us/literature/whitepaper/viewpoint-us-equity-market-structure-october-2015.pdf ("The events in the US equity market on August 24, 2015 marked the first true opportunity to assess the efficacy of reforms implemented in response to the 2010 "Flash Crash", such as individual stock trading halts, policies to address erroneous transactions, and the market-wide circuit breaker.") (citation omitted); *But see* Angel et al., *supra* note 26, at 150002-27-29 (warning of potential unintended consequences).

106. *See* HEALTHY MARKETS, *supra* note 9, at 6 (estimating dark pools' share of trading volume in 2015); *The Impact of Equity Market Fragmentation and Dark Pools on Trading and Alpha Generation*, VOYA 9, Table 7 (June 2016), https://investments.voya.com/idc/groups/public/documents/investor_education/fundspace_bswp-darkpools.pdf (estimating dark pool market share from 2004 to 2013).

107. *See, e.g.*, Amy Kwan et al., *Trading Rules, Competition for Order Flow and Market Fragmentation*, 115 J. FIN. ECON. 330, 331 (2015) (describing a "positive feedback loop" in which "[a]s traders begin to migrate their order flow to dark venues, the probability of trade execution rises, which in turn attracts more trades to dark pools").

108. *See, e.g.*, John McCrank, *NYSE Shut Down for Nearly Four Hours by Technical Glitch*, REUTERS (July

On the negative side, the number of trading venues contributes to market complexity and makes executing trades more difficult. Partly as a consequence of orders being filled across multiple venues, the average trade size is now quite small—175 shares, which can make trading for institutional investors more costly.[109] Moreover, part of the investor-choice value of having multiple trading venues is lost because of trade execution rules that dictate where an order will be executed. More fundamentally, the more trading that occurs in dark venues, the less accurate publicly quoted prices may be because they reflect only a subset of trades.[110] Publicly posted bids and offers, which have been losing ground to private liquidity, provide the baseline for the rest of the market. Arbitrage, however, works to incorporate information from dark pool transactions into public prices. Dark pools also raise concerns because their operators may have potential conflicts of interest.[111] The enforcement actions noted above[112] that allege misrepresentations by dark pool operators cause some observers to fault dark pools for enabling HFT.[113] Another concern is regulatory parity; ATSs look similar to exchanges without commensurate regulatory burdens.[114] Yet most critics, while calling for reforms to address these problems, acknowledge that dark pools are an important part of the market.[115] As with HFT, many of

9, 2015, 3:47 a.m.), http://www.reuters.com/article/us-nyse-trading-idUSKCN0PI25A20150709 ("[M]any traders said that it did not matter that the NYSE was down. That's because there are 11 U.S. stock exchanges, including those run by Nasdaq OMX Group (NDAQ.O) and BATS, along with more than 40 private stock-trading venues, so the trading of NYSE-listed stocks was uninterrupted.").

109. VOYA, *supra* note 106, at 3.

110. *See, e.g.*, Luis A. Aguilar, Comm'r, SEC, *Public Statement: Shedding Light on Dark Pools* (Nov. 18, 2015), https://www.sec.gov/news/statement/shedding-light-on-dark-pools.html#_ednref36 (asking "Should the Commission consider limiting the growth of equity ATSs, especially if that growth begins to threaten the quality of price discovery, as some studies suggest it might?") (citation omitted); Sal Arnuk & Joseph Saluzzi, *Phantom Indexes: Major Market Indexes Reflect Only 30% of All Trades Intraday*, THEMIS TRADING LLC 4 (June 22, 2011), http://blog.themistrading.com/wp-content/uploads/2011/06/THEM-White-Paper-Analysis-Phantom-Indexes-FINAL-06.22.11.pdf (arguing that in a post-Regulation NMS world of fragmented liquidity, the "primary market alone is no longer a complete enough source of data when calculating an index value since it represents only about one in four trades"); *Dark Pools, Internalization, and Equity Market Quality*, CFA INST. 60 (2012), http://www.cfapubs.org/doi/pdf/10.2469/ccb.v2012.n5.1 (raising concern that when dark liquidity—dark pools and internalization—make up a "majority" of trading, the incentives to display liquidity and, consequently, market quality, will suffer).

111. *See, e.g.*, HEALTHY MARKETS, *supra* note 9, at 10 (explaining that "[b]rokers have a strong preference to route to their own dark pools"). *See also* Aguilar, *supra* note 110 (discussing different types of conflicts of interest faced by dark pools).

112. *See supra* Table 1.

113. *See, e.g.*, Chris Rose, *Dark Pools and Flash Trading: The Secret World of Automated High-Frequency Trading*, 8 J. BUS. & ECON. RES. 11, 15 (2010) ("With only the SEC as an arbiter in between the HFTs virtually minting money and the public being bilked out of money in each trade, the average consumer is obviously the loser, and the imbalance has to be corrected since dark pools and flash orders hide the secret world of high-frequency trading.").

114. *See, e.g.*, CFA INST., *supra* note 110, at 29 (calling for "a functional approach to regulation . . . to maintain a level playing field in which all functionally similar trading venues are treated in the same way"); Letter from Micah Hauptman, Fin. Serv. Counsel, Consumer Fed. of Am., to Brent J. Fields, Secretary, SEC (Feb. 26, 2016), https://www.sec.gov/comments/s7-23-15/s72315-51.pdf ("This fundamentally flawed regulatory approach should serve as a case study in what can happen when, in the name of fostering innovation, new, unknown entrants are allowed into the market to provide substantially similar products or services as existing market participants but with significantly less transparency and significantly greater complexity and conflicts of interest.").

115. *See, e.g.*, CFA INST., *supra* note 110, at 60 (calling for equity market structure reforms, but concluding that "the proliferation of dark trading venues can be considered a positive development overall").

the identified problems have statutory and regulatory roots.

B. Disentangling Market and Regulatory Failures

The task of identifying root problems is particularly difficult because SEC regulation has played such an important role in shaping US equity markets. These regulations may produce distortions and other unintended consequences. As former SEC Commissioner Daniel Gallagher explains, "[M]any of today's major market-structure issues have more to do with the unintended effects of regulation than with failures of markets themselves."[116] Even a well-crafted rule that is poorly enforced can harm the markets. In equity market structure, given the intense role regulation plays, it is inevitably the source of some problems.

1. Identifying Market Failures

Some problems arise from the markets, rather than from regulation. Markets generally work well to bring together people who benefit from transacting with one another and, in the process, allocate resources efficiently. The transacting parties bear the costs and benefits of their transactions. Both the buyer and the seller believe that doing the deal is better than not doing the deal. Society generally benefits when buyers and sellers engage in these mutually beneficial transactions.

Sometimes, however, the market falls short of this ideal, and, in those circumstances, government intervention might be appropriate. Calls for regulation often come in response to perceived instances of externalities, market power, asymmetric information, or public goods.[117]

An externality exists "when one party's actions impose uncompensated benefits or costs on another party."[118] The factory that sends its pollutants over the neighboring farmer's fields or into the local water supply is a standard example. If property rights are not clearly defined and the factory does not take the farmer's costs into account, the factory over-pollutes. Externalities also can be positive, in which case there might be under-production.

In the market structure context, observers point to a number of potential externalities. To the extent HFT firms' rapid trading exacerbates market volatility, they may be imposing

---

116. Daniel M. Gallagher, *How to Reform Equity Market Structure: Eliminate "Reg NMS" and Build Venture Exchanges, in* PROSPERITY UNLEASHED: SMARTER FINANCIAL REGULATION 95, 99–100 (Norbert J. Michel ed., 2017), http://www.heritage.org/markets-and-finance/report/how-reform-equity-market-structure-eliminate-reg-nms-and-build-venture.

117. *See generally OMB Circular A-4, "regulatory analysis,"* OFFICE OF MGMT. & BUDGET 4–5 (Sept. 17, 2003), https//georgewabush-whitehouse.archieves.gov/omb/memorandum/m03-21. (describing externalities, asymmetric information, and market power); SUSAN E. DUDLEY & JERRY BRITO, REGULATION; A PRIMER 12–14 (2d ed. 2012) (describing externalities, asymmetric information, monopoly power, and public goods); ROBERT COOTER AND THOMAS ULEN, LAW & ECONOMICS 38–42 (6th ed. 2012) (describing monopoly and market power, externalities, public goods, and information asymmetries); Fred E. Foldvary & Eric J. Hammer, *How Advances in Technology Keep Reducing Interventionist Policy Rationales* (Mercatus Center at George Mason Univ. Working Paper, July 2015) (discussing common rationales for government intervention); THOMAS A. LAMBERT, HOW TO REGULATE: A GUIDE FOR POLICYMAKERS 22-217 (2017) (describing the market failures that underlie calls for regulation). *See also Boudreaux on Market Failure, Government Failure and the Economics of Antitrust Regulation*, ECONTALK (Oct. 1, 2007), http://www.econtalk.org/archives/2007/10/boudreaux_on_ma.html.

118. OFFICE OF MGMT. & BUDGET, *supra* note 117, at 4.

an externality. Likewise, an algorithm gone wild could cause market stress.[119] Stiglitz argues that HFT discourages real information provision and thus makes markets less informative.[120] Other critiques of HFT as a pointless "arms race" may be read to suggest that too many resources are poured into HFT because HFT firms are not bearing all the costs of their activities.[121] A potential positive externality arises in the market structure context when trading venues make bids and offers public and thus generate information that is useful for all market participants, not just those that pay to use the venue.

Market power refers to the situation when a firm is able to "reduce output below what would be offered in a competitive industry in order to obtain higher prices."[122] The monopolistic producer maximizes its profits by producing less than would be efficient.[123] Product quality may also suffer under monopolists, who do not face competitive pressure. Market power can be the intended or unintended product of regulation.[124] For example, when "a market can be served at lowest cost only when production is limited to a single producer"[125]—a natural monopoly—a government may choose to pick a single producer and regulate the fees it charges.

Concerns about market power are evident in market structure discussions. As one example, the exchanges' sale of detailed data about the bids, offers, and trades on their markets—has generated years of litigation over whether the exchanges are improperly exploiting their market power in setting fees for the data.[126] The greater an exchange's market share, the more it can charge for its market data; the more important a trading venue is, the less traders can afford to go without the information. More generally, some argue that "exchanges have strong natural monopoly tendencies" because trading of a particular security tends to concentrate in one place.[127]

An asymmetric information market failure occurs when the market generates inadequate information. Sellers know more than buyers about the product they are selling and, in some cases, may not provide buyers the information they need to make a good decision.[128] In the market structure context, if a user of dark pools cannot get adequate

---

119. *See, e.g.*, CFTC & SEC REPORT, *supra* note 103, at 2–3 (describing results of trading launched by faulty algorithm).

120. STIGLITZ, *supra* note 81, at 7.

121. *See, e.g.*, Pasquale, *supra* note 15, at 2098–99 (commenting that "[w]hile HFT's defenders defend the technology as a modernization of markets, it often amounts to little more than an arms race for speed . . . "and noting that other traders have to "invest in masking their own moves"). On the other hand, there may be positive externalities if HFT generates advances that can be used in other fields. By way of comparison, consider the much-hyped computer chess masters. As one member of the IBM Deep Blue project noted, teaching computers to play chess has yielded useful lessons about artificial intelligence. Robert Siegel, *20 Years Later, Humans Still No Match for Computers on the Chessboard*, NPR (Oct. 24, 2016), http://linkis.com/www.npr.org/sections/1PIYj (reporting comments from Murray Campbell).

122. OFFICE OF MGMT. AND BUDGET, *supra* note 117, at 4.

123. *See, e.g.*, COOTER & ULEN, *supra* note 117, at 39 ("[T]he monopolist's profit-maximizing output and price combination occurs at a point where the price exceeds the marginal cost of production. The price is too high, and the quantity supplied is too low from the viewpoint of efficiency."). Monopsony exists when the buyer has the market power. *Id*.

124. OFFICE OF MGMT. AND BUDGET, *supra* note 117*,* at 5.

125. *Id.*

126. *See, e.g.*, Sec. Indus. & Fin. Mkts. Assoc., Exchange Act Release No. 1015, 2016 WL 4035551, (June 1, 2016).

127. *See, e.g.*, Pirrong, *supra* note 91, at 10.

128. *See, e.g.*, COOTER AND ULEN, *supra* note 117, at 41 ("[S]evere asymmetries can disrupt markets so

information about how those trading venues operate and the possible conflicts of interest, it cannot accurately assess the risks of trading in dark pools. Given the investor demand for information, some—but not all—dark pools voluntarily provide information to users. Some observers contend that dark pools, without a regulation forcing uniform disclosure, will provide the information to some users, but not others.[129] Another asymmetric information problem may arise in connection with the many order types.[130] Although regulatory transparency demands are higher for exchanges than dark pools, the complexity and number of order types makes it very difficult even for sophisticated market participants to figure out how their orders will be handled.[131]

The fourth commonly identified market failure is the public goods problem, in which "the cost of providing an additional unit is negligible and excluding users is costly."[132] When you search for something on Wikipedia, you might see a request asking you for a donation, but you do not have to contribute.[133] This is the free rider (or free reader) problem. In the market structure context, publicly available bid and ask data from exchanges could be considered a public good; dark pools and their traders use these public quotes as reference points without interfering with anyone else's use. Once the data are made available publicly, it is hard to exclude users.

2. Identifying the Regulatory Roots of Failure

The degree of regulatory prescription that characterizes equity markets means that equity markets phenomena often have regulatory roots. For example, the dissenting commissioners argued that Regulation NMS allowed "the majority's arbitrary notions and unfounded assumptions about how markets and investors should interact [to take] unwarranted precedence over the interplay of competitive forces within the marketplace."[134] Regulation NMS set in motion major technological, operational, and structural changes in the market. Even before Regulation NMS took effect, technological change had spurred the proliferation of trading venues,[135] but Regulation NMS supported

much that a social optimum cannot be achieved by voluntary exchange.").

129. *See, e.g.*, Letter from David W. Blass, Gen. Couns., Inv. Co. Inst., to Brent J. Fields, Sec'y, SEC at 3 (Feb. 25, 2016), https://www.sec.gov/comments/s7-23-15/s72315-10.pdf ("Absent regulatory action, market participants will continue to have difficulty obtaining this critical information and certain participants, especially smaller funds, might not be able to obtain this information at all.").

130. *See generally* Phil Mackintosh, *Demystifying Order Types*, KCG (Sept. 2014), http://www.smallake.kr/wp-content/uploads/2016/02/KCG_Demystifying-Order-Types_092414.pdf.

131. *See, e.g.*, Chris Dietrich & Timothy Martin, *ICE Seeks to Reduce Order Types at the NYSE: CEO Says Big Board Will Petition Regulators in Bid to Reduce Complexity*, WALL ST. J. (May 8, 2014, 5:33 PM), https://www.wsj.com/articles/SB10001424052702304885404579549372363787310 (reporting that Jeffrey Sprecher, CEO of the company that owns the NYSE, stated "We believe that exchanges and dark pools should adopt a moratorium on creating any new types of orders").

132. DUDLEY & BRITO, *supra* note 117, at 13. *See also* Cooter & Ulen, *supra* note 117, at 40 (explaining that a public good is characterized by "[n]onrivalrous consumption" and "[n]onexcludability").

133. *From Wikipedia Founder Jimmy Wales*, WIKIMEDIA FOUND., https://donate.wikimedia.org/w/index.php?title=Special:FundraiserLandingPage&country=US&uselang=en&utm_medium=sidebar&utm_source=donate&utm_campaign=C13_en.wikipedia.org (last visited Jan. 19, 2018) (asking for donations). If donations do not work, an effective nongovernmental solution to this public goods problem would be setting up a paywall as many newspapers do.

134. Dissent to the Adoption of Regulation NMS, 70 Fed. Reg. 37632, 37633 (June 29, 2005) (to be codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270).

135. *See, e.g.*, Jonathan R. Macey & Maureen O'Hara, *From Markets to Venues: Securities Regulation in*

fragmentation by offering small exchanges a market toe-hold through the protection offered by the trade-through rule. Relatedly, Regulation NMS may have accelerated the demand for new order types.[136]

According to some observers, problems in the provision of market data stem in part from the consolidation and distribution of certain market data through government established monopoly data consolidators—Securities Information Processors (SIPs). The SIPs generate the National Best Bid and Offer (NBBO) for each security, which are important for determining compliance with Regulation NMS's trade-through rule. Functioning SIPs are essential to market functioning.[137] According to former Commissioner Gallagher, these SIPS are "effectively noncompetitive as public utilities."[138] In dissenting from Regulation NMS, Commissioners Paul Atkins and Cynthia Glassman noted that in "the single consolidator model, the majority grants a monopoly for the consolidation of market data, which erects another barrier to encouraging competitive solutions for market data consolidation."[139] Monopolies lack incentives to innovate, so it is not surprising that some of the concerns about HFTs' ability to receive and react to market data faster than others seem in part to stem from the relatively slow speed of public market data.[140] The SIPs, which consolidate best price and other market data from across exchanges, lag behind trading venues' private data feeds, which they sell to market participants willing to pay for them. The lag offers opportunities for market participants who pay for faster, private feeds.[141] To address this problem, some, including the SEC have recommended a further regulatory intervention—requiring "that trading center data be delayed for a sufficient period of time to assure that consolidated data reaches users

an Evolving World, 58 STAN. L. REV. 563, 570–71 (2005) (explaining that the "dramatic fall in the transaction costs associated with operating a trading venue" has contributed to the rise of new trading venues).

136. *See, e.g.*, Bodek, *supra* note 79 (describing the rise of new order types as a form of regulatory arbitrage in the post-Regulation NMS environment); Gallagher, *supra* note 116, at 98 (arguing that the driving force behind these order types is the trade-through rule of Regulation NMS, which has facilitated the survival of exchanges that otherwise would not and has thus led to intense competition for orders among exchanges).

137. *See, e.g.*, Scott Patterson et al., *Nasdaq Shutdown Bares Stock Exchange Flaws*, WALL ST. J. (Aug. 24, 2013, 6:23 PM), https://www.wsj.com/news/articles/SB10001424127887324619504579031270514157580 (discussing how a problem with the SIP that caused the Nasdaq market to shut down reflects the perils caused by SIP's out-of-date technology).

138. Gallagher, *supra* note 116, at 98.

139. Dissent to the Adoption of Regulation NMS, 70 Fed. Reg. 37632, 37643 (June 29, 2005) (to be codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270). *See also* Letter from Donald Bollerman, Head of Market Operations, IEX, to Mary Jo White, Chair, 'SEC (Dec. 10, 2014) (calling for changes to the SIPs, including "allowing for the possibility of competing, registered securities information processors acting as consolidators of market data").

140. *See, e.g.*, Fox *et al*., *supra* note 4 , at 238–42 (describing "slow market arbitrage" and "exploitation of midpoint orders" in dark pools, two practices by which an HFT firm discovers and exploits a stale quote to make a profit, and arguing that these practices consume resources without benefiting the markets).

141. HFT firms buy private feeds to get a trading advantage. Some market observers worry that the lag also creates other opportunities, including the possibility that internalizers, aware from their private data feeds of a price movement, are able to execute trades with retail orders at prices based on the stale SIP price. *See* Stanislav Dolgopolov, *Wholesaling Best Execution: How Entangled Are Off-Exchange Market Makers?*, 11 VA. L. & BUS. REV. 149, 191–92 (2016) (discussing this hypothetical as a potential violation of the wholesaler's best execution obligations, but speculating that such "data feed arbitrage" might not be profitable in this context); Charles Levinson, *U.S. Investigates Market-Making Operations of Citadel, KCG*, REUTERS (May 10, 2016, 4:20 PM) (discussing suspicions that internalizers, who have access to fast data feeds, are basing claims that customers are getting a good deal on stale prices from slower data feeds).

first."[142]

Regulatory ambiguity can create problems. For example, a lack of regulatory clarity may have contributed to HFT firms' failure to serve as consistent liquidity providers during events like the "flash crash" of May 6, 2010[143] or the market disruptions of August 24, 2015. One reason for the inactivity of HFT firms during these events may be uncertainty over whether trades would be broken and how trading would restart after a trading halt.[144] Thus, the disappearing liquidity problem—sometimes characterized as a market failure—may be best addressed by setting easier-to-understand ground rules about when a trade will be deemed "clearly erroneous" and how equities will reopen after a trading halt.

C. Allowing Market Solutions to Work

Even a correctly identified market failure may not require a regulatory solution. Practices that are problematic may be gone before regulators have a chance to react to them. Arbitrage activity by market participants seeking to make profits on price inconsistencies organically links markets without regulatory intervention. Competition, innovation, and failure may be better equipped to solve a problem than a government regulator. As technology improves, some market failures disappear without government intervention.[145] New technology facilitated the rise, for example, of ECNs, which offered competition to exchanges.[146] Algorithms are often associated with HFT firms, but they are also useful for institutional investors seeking to improve their execution.[147] Some market observers—including most prominently Lewis in *Flash Boys*—point to the Investors Exchange (IEX), which intentionally slows access to its market and makes market data freely available, as a market-generated solution to concerns about HFT.[148] Holly Bell additionally points to the

142. Equity Market Structure Concept Release, *supra* note 10, at 3611. *See also* Fox et al., *supra* note 4, at 268–71 (analyzing different approaches to curtailing harmful HFT and suggesting that changes to market data rule interpretations to delay private data feeds may be the best approach).

143. CFTC & SEC REPORT, *supra* note 103.

144. *See, e.g.*, Transcript of Equity Market Structure Advisory Committee Meeting, SEC 30 (Feb. 2, 2016), https://www.sec.gov/spotlight/emsac/emsac-020216-transcript.txt (comments of Stacey Cunningham, Chief Operating Officer, NYSE), 30 (explaining, with respect to the market volatility of August 24, 2015: "There were concerns that [clearly erroneous] trades might be busted, determined and busted, in 2010. There were thousands of clearly erroneous trades that were busted. So while we didn't see that in August, it wasn't quite clear to market makers that that wouldn't be the result."); *id*. at 77 (comments of Matthew Andresen, co-CEO Headlands Technologies) ("[N]ot knowing one's position, not having certainty around one's position is the number one way to ensure that people don't make markets and don't make tight markets . . . . as long as you know where you stand, your appetite for going into the next reopening will be much greater.").

145. Foldvary & Hammer, *supra* note 117, at 3 (discussing ways in which technology has reduced the number of market failures).

146. For a fascinating discussion of the rise of ECNs, *see* PATTERSON, DARK POOLS, *supra* note 2 *passim*.

147. *See, e.g.*, John D'Antona, Jr., *Buy Side Not Happy with Algos*, TRADERS MAG. ONLINE NEWS (Jan. 25, 2017), http://www.tradersmagazine.com/news/algos_dma/buy-side-not-happy-with-algos-115868-1.html (explaining that buy-side traders are "increasingly executing more via algos away from their top three brokers as they seek superior trading performance and greater levels of control and transparency for their clients").

148. *See, e.g.*, LEWIS, *supra* note 2 (chronicling the creation of the IEX); Jordan M. Marciello, Note, *Are You Afraid of the Dark?:How the New York Attorney General Is Shedding Light on Dark Pools and High Frequency Trading*, 49 SUFFOLK U. L. REV. 163, 179–80 (2016) (praising the "revolutionary exchange, known as IEX, . . . as an ideal response to the conflicts of interest afflicting the stock market"). *See also* Philosophy of the Investors' Exchange, IEX, https://www.iextrading.com/ (last visited Mar. 7, 2017) ("We are designing a venue that incorporates three important considerations: shareholder alignment, issuer and investor protection, and trading quality. Everything we build is guided by IEX's core principles: fair, simple and transparent.").

way that trading venues like Luminex, a block trading venue that seeks to run like a utility for the buy-side firms that own it,[149] arose in response to concerns about HFT.[150]

Markets not only address market failures through the entrance of new competitors, but also through losses and failure. The market's harsh discipline may be a more effective approach to policing algorithms than regulatory pre-approval of algorithms would be. Both Jones and Korsmo, for example, point to the painful consequences for Knight Capital after a new algorithm did not work as intended.[151] The falling profitability of HFT—from $7.2 billion in 2009 to $1.1 billion in 2016—may signal that fewer resources will be allocated to HFT in the future.[152]

Regulators could give investors more autonomy about how, where, and with what priorities (price, speed, anonymity, likelihood of getting orders filled, etc.) to trade. Greater investor autonomy could help to address concerns about alleged predation by HFTs. Trading venues also would have more flexibility to design their markets to discourage or encourage HFT. Some trading venues already cater to institutional investors that seek to trade large blocks of stock without moving the market, but there would be more flexibility to serve these investors. Exchanges and other venues competing solely to satisfy customer preferences would have greater incentives to make better disclosures about how they operate. There might be less pressure for exchanges to create complex order types and more competition in market data consolidation and distribution.[153]

Regulators should look at how their rules might impede market-generated solutions. In the case of IEX, for example, the use of an intentional delay by an exchange appeared to some commentators to violate Regulation NMS.[154] Professor Terrence Hendershott put it this way:

[U]nder Reg NMS, the exchange marketplace is not a free market. In an ideal

---

149. *See A Consortium Motivated by Progress, Not Profits*, LUMINEX TRADING, http://luminextrading.com/about-us/ (last visited Mar. 7, 2017) ("Luminex Trading & Analytics offers low-cost trading and superior execution quality with minimal information leakage by interacting only with venue-approved participants. Our collaborative approach seeks to improve trust, liquidity, and control, and help buy side traders execute large block trades with little market impact.").

150. Bell, *supra* note 89, at 266–67.

151. *See* Jones, *supra* note 5, at 39–40; Korsmo, *supra* note 17, at 569–70. Korsmo notes that regulators are unlikely to have "the necessary expertise to do a better job of evaluating the soundness of new algorithms than the actual creators of those algorithms, who already have enormous incentives to ensure their safety and quality." *Id.* at 605.

152. Tabb Group, Market Maker/HFT US Equity Revenues: US Equity Market Maker/HFT Industry Profitability (undated), on file with author.

153. For an interesting picture about what exchanges might look like absent regulation, see Fischer Black, *Equilibrium Exchanges*, 51 FIN. ANALYSTS J. 23, 29 (1995) ("conjectur[ing] that [exchanges in a competitive equilibrium] will offer noncancelable *indexed limit orders* at different levels of urgency but will not offer market orders or conventional limit orders").

154. *See, e.g.*, Letter from Elizabeth K. King, Gen. Counsel & Sec'y, NYSE, to Brent J. Fields, Sec'y, SEC (Nov. 12, 2015), https://www.sec.gov/comments/10-222/10222-19.pdf (arguing that "IEX's Intentional Programmed Delay . . . Does Not Meet the Requirements of a Protected Quotation Under Regulation NMS"); Letter from John C. Nagel, Managing Dir. & Senior Deputy Gen. Counsel, Citadel LLC, to Brent J. Fields, Sec'y, SEC (Nov. 6, 2015) (arguing that "absent an amendment to Regulation NMS, IEX quotations cannot be deemed immediately and automatically accessible as required by the Regulation NMS Rule 600 definition of protected quotations") (footnote omitted). *But see* Letter from J.W. Verret, Assistant Professor of Law, George Mason Univ. Sch. of Law, to Brent J. Fields, Sec'y, SEC (Nov. 20, 2015), https://www.sec.gov/comments/10-222/10222-23.pdf (arguing that the contention that IEX's proposed speed bump violates Regulation NMS "rests on an overly formalistic reading of Regulation NMS that fails to account for the rise of high speed trading in the last decade").

> world, exchanges could design themselves in any fashion and competition would determine who succeeds and fails. But the world we live in is one where exchanges agree to a set of standards for regulatory-granted access to order flow. And IEX's current exchange proposal does not meet those standards.[155]

Regardless of the merits of the particular criticism, the concerns raised with respect to IEX illustrate the broader point that regulations can serve as barriers to useful innovations.

D. Devising Regulatory Solutions

If markets cannot solve a problem effectively, a regulatory solution may be in order. There are multiple potential regulators, an array of possible regulatory approaches, and several different ways to think about regulation. Each of these aspects of regulatory design matters in the context of equity market structure.

1. The Regulator Matters

As described above, the securities markets have several regulators, including the SEC, state regulators, FINRA, the exchanges in their self-regulatory capacity, and private litigants. In the current legal framework, the SEC, working with FINRA and the exchanges, has primary responsibility for market structure regulation.[156] Congress underscored the SEC's responsibility for market structure in its mandate to the SEC to "facilitate the establishment of a national market system for securities."[157]

While state securities regulators have an important role to play in combatting securities offering fraud in their states, absent a move to competitive federalism, their involvement in market structure regulation is likely superfluous and potentially harmful. Brian Knight analyzes the appropriate level of regulation in the context of financial technology with reference to efficiency, competitive equity among market participants, and political equity among the residents of the various states.[158] In the market structure context, efficiency, and political equity weigh in favor of a federalized approach to market structure regulation. It is more efficient to have a single regulator of our national equity markets. If one state regulator is permitted to unilaterally decide to regulate market structure, citizens of other states will effectively be subject to the regulatory decisions of a state government in which they have no voice.[159]

As discussed above, New York has waded into market structure regulation, including with several high-profile cases under the Martin Act. One commentator contends that the

---

155. Terrence Hendershott, *SEC Shouldn't Approve IEX Until Reg NMS Is Re-Examined*, THE HILL (Mar. 18, 2016 4:00 PM), http://thehill.com/blogs/congress-blog/technology/273431-sec-shouldnt-approve-iex-until-reg-nms-is-re-examined.

156. *See, e.g.*, Korsmo, *supra* note 17, at 531 (recommending that "the regulatory center of gravity remain in the U.S. Securities and Exchange Commission ("SEC"), the only agency with the scope and expertise to oversee such activity").

157. 15 U.S.C. § 78k–1(a)(2) (2016) ("The Commission is directed, therefore, having due regard for the public interest, the protection of investors, and the maintenance of fair and orderly markets, to use its authority under this title to facilitate the establishment of a national market system for securities.").

158. Brian Knight, *Federalism and Federalization on the Fintech Frontier*, 20 VAND. J. ENT. & TECH. L. 129 (2017).

159. As Knight explains: "One state's regulations can distort the entire national market, especially if the state is large and economically important." *Id.* at 195.

Martin Act's "loose standards and broad prosecutorial authority enable a single elected state official to pursue regulatory ends with national implications, even if those ends conflict with the judgment of the federal officials enforcing federal law."[160] Professor John Coffee, by contrast, argues that the states have a role to play in policing the relationship between trading venues and their participants: "If the SEC slumbers long enough, refusing to face a problem, sooner or later another regulator (usually one based in New York) will step in. Eventually, an embarrassed SEC will be forced to follow. Competition among regulators thus appears desirable."[161] Competition of the sort Professor Coffee envisions, however, subjects market participants to conflicting regulatory mandates. By contrast, the regulatory competition outlined by Professor Roberta Romano would allow state regulators to compete with the SEC for the opportunity to regulate the equity markets, but would not invite redundant regulation.[162]

The current system is not one in which regulators compete with one another to provide effective regulation. New York's enforcement actions have merely amplified SEC actions by increasing the penalties.[163] The sizeable penalties might draw other states into bringing their own market structure cases. If that were to happen, dark pools would face conflicting regulatory mandates and prohibitive legal exposure.[164]

The SEC—pursuant to congressional design[165]—historically has relied heavily on regulatory delegation. Self-regulation—a term that is less straightforward than it sounds[166]—has long been part of securities regulation, albeit not in a consistent form over time. Overseen by the SEC, FINRA and the exchanges in their self-regulatory capacity play an important role in regulating the equity markets. The scope of these roles deserves reconsideration in light of changes in the markets and in these non-governmental

160. James R. Copland, *Liberal Officials Commit Wrongs in the name of States' Rights*, WALL ST. J., Feb. 28, 2017, at A17.

161. John C. Coffee, *High Frequency Trading Reform: The Short Term and the Longer Term*, THE CLS BLUE SKY BLOG (July 21, 2014), http://clsbluesky.law.columbia.edu/2014/07/21/high-frequency-trading-reform-the-short-term-and-the-longer-term/.

162. *See* Roberta Romano, *Empowering Investors: A Market Approach to Securities Regulation*, 107 YALE L. J. 2359, 2361 (1998) (advocating "a market-oriented approach of competitive federalism that would expand, not reduce, the role of the states in securities regulation").

163. *See, e.g.*, Press Release, SEC, Barclays, Credit Suisse Charged with Dark Pool Violations (Jan. 31, 2016), https://www.sec.gov/news/pressrelease/2016-16.html (announcing two dark pool settlements that involved equal penalty payments—$30 million in one matter and $35 million in the other—to the SEC and NYAG).

164. *See* Brooke Sgambati, Note, *Using the Martin Act to Bring Fraudulent Practices in Dark Pools to Light: An Analysis of the Martin Act's Applicability to Misrepresentations Regarding the Operation of Dark Pools*, 49 COLUM. J. L. & SOC. PROBLEMS 586, 603 (2016) (suggesting that if every state followed New York's aggressive lead, "the financial industry could find itself in an untenable situation, in which various regulators with overlapping authority imposed conflicting standards on industry participants."). This author nevertheless concluded that New York's involvement in regulating dark pools through enforcement was justified "[a]s there is widespread consensus that dark pools are underregulated" and "a vast number of these transactions take place in New York. *Id.* at 606, 609. Given that Congress committed regulation of the securities markets to the SEC without regard for the New York-centric nature of the industry, this justification for New York regulatory intervention seems to fall short.

165. *See, e.g.*, Exchange Act § 19, 15 U.S.C. § 78s (2010) (establishing framework for delegation of authority to self-regulatory organizations).

166. *See, e.g.*, Hester Peirce, *The Financial Industry Regulatory Authority: Not Self-Regulation After All* (Mercatus Center at Geo. Mason Univ., Working Paper Jan. 6, 2015), https://www.mercatus.org/publication/financial-industry-regulatory-authority-finra-not-self-regulation-after-all (discussing ways in which FINRA is not an SRO).

regulators. Former SEC Commissioner Daniel Gallagher asks, for example, "whether exchanges that outsource their regulatory responsibilities to FINRA are still SROs at all, or whether they've instead effectively become FROs – FINRA-regulated organizations" and "whether the benefits of rule standardization amongst exchanges are canceled out by the lack of a competition of ideas among exchange regulatory regimes contributing to the development of best practices."[167] Professors Jonathan Macey and Maureen O'Hara suggest that for-profit exchanges should only be permitted to engage in self-regulation when they internalize the costs and benefits of the regulation; thus, exchanges should be permitted to set business continuity, anti-manipulation, and insider trading rules, but not rules governing trading practices.[168]

Given the rapidly changing and technologically sophisticated marketplace, the SEC should work with the industry. The SEC's Equity Market Structure Advisory Committee, which includes industry participants, is an example of such cooperation. The broader financial industry, in a technology-heavy area, may be better able to quickly and effectively address problems.[169] In this vein, Professor Charles Korsmo calls for "an evolving body of best practices regulation" to govern HFT.[170] While a cooperative approach offers flexibility and incorporates the expertise of at least certain parts of the marketplace, it must be undertaken with great care, as it can become a subtle way for incumbents to enlist the government's help in building barriers to entry.

Private plaintiffs cannot effectively regulate market structure through law suits. First, as with state attempts to engage in supplementary regulation of the equity markets, private efforts run the risk of imposing conflicting obligations on market participants.[171] Private plaintiffs, in the context of the facts and circumstances of a lawsuit, cannot balance the market's many complex facets. Courts might interpret legal obligations in a way that conflicts with other courts' interpretations and with regulatory interpretations. Moreover, private plaintiffs' attempts to regulate exchanges' interactions with HFT firms run up against the immunity exchanges enjoy[172] and the lack of an express private right of action under section 6(b) of the Exchange Act.[173]

---

167. Daniel M. Gallagher, Comm'r, SEC, Remarks at the 2014 SRO Outreach Conference (Sept. 16, 2014), https://www.sec.gov/News/Speech/Detail/Speech/1370542969623.

168. Macey & O'Hara , *supra* note 135, at 585–92.

169. *See, e.g.*, Tom C.W. Lin, *The New Financial Industry*, 65 ALA. L. REV. 567, 608–612 (2013) (explaining the value of involving industry in efforts to regulate "cyborg finance").

170. *See, e.g.*, Korsmo, *supra* note 17, at 530.

171. *See, e.g.*, Lanier v. BATS Exch., Inc., 838 F.3d 139, 155 (2d Cir. 2016) ("From the Exchange Act—which focuses on the need to create a national market system—we can infer that Congress intended for the regulations governing national securities exchanges and securities information processors to be uniform. Allowing conflicting judicial interpretation of the SEC requirements pursuant to state contract law would stand as an obstacle to the uniformity that Congress intended to create for the national market system.").

172. *In re* Barclays Liquidity Cross And High Frequency Trading Litig., 126 F.Supp.3d 342, 356 (S.D.N.Y. 2015) (holding that "the Exchanges are absolutely immune from suit based on their creation of complex order types and provision of proprietary data feeds, both of which fall within the scope of the quasi-governmental powers delegated to the Exchanges[,] [a] conclusion [that] is reinforced by the fact that the SEC has ample authority and ability to regulate those activities and address any improprieties by the Exchanges . . .").

173. *Id.* (explaining that since, "in 1975, Congress comprehensively amended Section 6(b) [,] every Court to have applied the amended provision has concluded that it does not provide a private right of action") (citations omitted).

2. The Regulatory Approach Matters

Once the decision to regulate is made, another key decision is how that regulation will be carried out. Sometimes new regulation is not needed; better enforcement of existing regulations may be sufficient. Antifraud and market manipulation rules are useful tools in maintaining well-functioning markets.[174] New regulations should be tailored to meet the problem they are designed to solve. They should seek to minimize market distortions. Regulations that disrupt the liquidity provided by HFT or the anonymity provided by dark pools, for example, could have far-reaching implications.[175] Disclosure regulations may work better and disrupt less than command and control regulations.[176] Although seemingly technical and innocuous, regulatory attempts to reshape the equity market structure can have the damaging side-effect of involving the government in capital allocation decisions.[177] Regulations must not subsidize private risk-taking or allow for loss absorption by taxpayers.[178] Regulatory solutions should allow flexibility to accommodate the different demands of investors and issuers and to facilitate innovation by trading venues.

Economic analysis is a useful tool in deciding which regulatory strategy to pursue. Others have argued that cost-benefit analysis cannot be the guiding principle for regulating practices such as HFT.[179] Attempting to understand the costs and benefits of different alternatives provides valuable information to regulators, even if they ultimately choose a regulatory approach based on other considerations. A careful economic analysis can spot potential unintended consequences in time to stop them. Pilot programs, which the SEC uses to test changes to equity market structure, can provide important insights on how a regulatory change might work.[180] The SEC also may be able to use historical data to run simulations.[181]

---

174. Defining manipulative activity in any context, including the HFT context, is difficult. *See, e.g.*, Korsmo, *supra* note 17, at 551–57 (suggesting a way to adapt traditional conceptions of market manipulation to HFT).

175. *See, e.g.*, Edwin Batista, *A Shot in the Dark: An Analysis of the SEC Response to the Rise of Dark Pools*, J. HIGH TECH. L. 83, 106 (2014) (recommending that "[d]ark pools should not be regulated too heavily because dark pools serve an important market function").

176. *See, e.g.*, OFFICE OF MGMT. & BUDGET, *supra* note 117, at 16 (discussing different types of regulation).

177. Some commentators would welcome such a development. *See, e.g.*, Pasquale, *supra* note 15, at 2121 (calling for the "renewal of proposals for substantive channeling of investment by government"). In this view, among other things, government could play a role in ensuring that fewer resources went to HFT. *See, e.g.*, *id*. at 2098 ("Top computer science talent (to develop new algorithms) is not only expensive for firms themselves, but also draws the technically talented away from fields like transportation, energy, and pharmaceuticals, where their skills could contribute to real productivity gains.") (footnote omitted). The government is unlikely to be better at productively allocating resources than private markets, which specialize in resource allocation. Regulatory interventions sometimes impair the market's ability to allocate resources.

178. Korsmo, for example, proposes a government-backed insurance fund modeled after the Federal Deposit Insurance Corporation to handle losses caused by HFT firms. *See* Korsmo, *supra* note 17, at 607. Such an approach invites the moral hazard that has so plagued the banking system as a result of deposit insurance. For a discussion of some of the problems associated with deposit insurance, see Thomas L. Hogan & Kristine Johnson, *Alternatives to Federal Deposit Insurance in* REFRAMING FINANCIAL REGULATION: ENHANCING STABILITY AND PROTECTING CONSUMERS 226 (Hester Peirce & Benjamin Klutsey, eds. 2016).

179. *See, e.g.*, McNamara, *supra* note 83, at 150–51 ("Since it is difficult to draw useful estimates of costs and benefits in a system as complicated as the current equity markets, the principles of freedom from misrepresentation, a level playing field, and institutional integrity should play a strong role in building a regulatory strategy for HFT that best serves the goal of a stable, healthy, and just economy.").

180. *See, e.g.*, Press Release, SEC, SEC Approves Pilot to Assess Tick Size Impact for Smaller Companies (May 6, 2015), https://www.sec.gov/news/pressrelease/2015-82.html.

181. *See, e.g.*, SEC, *Transcript of Equity Market Structure Advisory Committee Meeting 95* (Aug. 2, 2016),

Robust analysis depends on good information. Efforts such as the SEC's Market Information Data Analytics System (MIDAS) and Consolidated Audit Trail (CAT) initiatives are designed to provide such data.[182] Better data should help the SEC and market participants to gain a deeper understanding of what is happening in the markets and thus to design more effective solutions to any problems identified.

Good information is also important to market participants, and the SEC can play a role in ensuring that they have the information they need to be able to make the best decisions in light of their own circumstances. Disclosure requirements are sometimes appropriate, but even these requirements must be carefully considered and crafted. For example, the SEC has considered, and others have recommended,[183] a disclosure approach to address the asymmetric information problem in the dark pool context.[184] Dark pools, in the meantime, have offered enhanced voluntary disclosure.[185] Even disclosure rules, if not carefully designed,[186] however, could—in the view of some commenters—drive dark pools out of business, deter new ones from entering, favor a particular business model,[187]

---

https://www.sec.gov/spotlight/emsac/emsac-080216-transcript.txt (comments of Bill Alpert, Senior Editor, Barron's) (recommending that the SEC "do back test simulations"); *id*. at 60 (comments of John Zecca, Senior VP, MarketWatch, NASDAQ) (recommending "market simulations to expedite consideration of some proposals").

182. *See What is MIDAS?*, SEC, https://www.sec.gov/marketstructure/midas.html#.WMDo5zsrLIU (last visited Nov. 7, 2017); Press Release, SEC, SEC Approves Plan to Create Consolidated Audit Trail (Nov. 15, 2016), https://www.sec.gov/news/pressrelease/2016-240.html.

183. *See, e.g.*, Letter from David W. Blass, Gen. Counsel, Inv. Co. Inst., to Brent J. Fields, Sec'y, SEC 3 (Feb. 25, 2016) ("The transparency that would result from making Form ATS-N filings available publicly would provide a valuable tool for funds to use to assess NMS Stock ATSs, make informed routing decisions, and evaluate the performance of their brokers."); Letter from Mark Holder, Managing Dir., UBS Sec. LLC, to Brent J. Fields, Sec'y, SEC (Mar. 21, 2016) (arguing on behalf of largest ATS for public disclosure mandate to apply to ATSs of all sizes); Letter from Theodore R. Lazo, Managing Dir. and Assoc. Gen. Counsel, SIFMA, to Brent J. Fields, Sec'y, SEC (Mar. 7, 2016) (calling for mandatory public disclosure of Form ATS); Letter from John A. McCarthy, Gen. Counsel, KCG Holdings, Inc., to Brent J. Fields, Sec'y, SEC 1 (Mar. 15, 2016) (supporting "uniform," public disclosure by equity ATSs of "their operations and potential conflicts of interest" to "empower market participants to make informed decisions about where to route their orders"); Letter from Kurt N. Schacht, Managing Dir., Standards & Advocacy, CFA Inst., and James C. Allen, Head, Capital Markets Policy, CFA Inst., to Brent J. Fields, Sec'y, SEC (Feb. 26, 2016) (arguing that "there is insufficient transparency with respect to" dark pools and expressing concern "that this limits the ability of market participants to make informed choices about trading venue options"). *See also* Fox et al., *supra* note 4, at 274 (arguing for a disclosure-based approach to dark pool regulation "to assist customers in determining whether their orders are being routed to venues offering best execution and whether order-routing directions are being ignored"). *But see* Letter from Dennis M. Kelleher, President & CEO, Stephen W. Hall, Legal Dir. & Sec. Specialist, and Allen Dreschel, Attorney, to Brent J. Fields, Sec'y, SEC 2–3, 7 (Feb. 26, 2015) (arguing for a reversal of the approach embraced in Regulation ATS, which it described "[as] philosophically misguided from the very beginning" and calling for a stronger rule that bans conflicts of interest, subjects dark pools to the same rules as exchanges, and allows for stronger enforcement).

184. *See* Regulation of NMS Stock Alternative Trading Systems, 80 Fed. Reg. 80,997, 81,113, (Dec. 28, 2015) (to be codified at 17 C.F.R. pts. 240, 242, 249).

185. *See Healthy Markets ATS Transparency Index*, HEALTHY MKTS. TRANSPARENCY & TR., https://www.healthymarkets.org/ats-transparency-index (last visited Jan. 19, 2018) (providing transparency metrics as of March 2016 and concluding that "that overall transparency has increased across the board").

186. Commenters on the SEC's proposal commonly raised concerns, for example, about the proposed affiliate disclosures and disclosures related to subscriber agreements. *See, e.g.*, John F. Linares, Gen. Counsel, Level Automated Trading System, to Brent J. Fields, Sec'y, SEC (Sept. 7, 2016) (raising concerns about affiliate and subscriber agreement disclosures); Letter from David M. Weisberger, Managing Dir., Markit, to Brent J. Fields, Sec'y, SEC 7–8 (Apr. 15, 2016) (objecting to breadth of affiliate disclosure in proposal).

187. Some commenters argued that the proposed requirements could serve as a barrier to entry. *See, e.g.*,

unintentionally function as merit regulation that affects the way ATSs operate,[188] and decrease the attention that market participants pay to dark pool disclosures.[189]

When a regulatory failure is the source of a market structure problem, eliminating the offending regulation may be the answer. It is common for regulators instead to look for ways to strengthen a regulation that appears not to be working as intended. The SEC, for example, has considered expanding Rule 611 of Regulation NMS, the trade-through rule by turning it into a trade-at rule.[190] A trade-at rule, which would seek to force trading venues to display prices, would be more prescriptive than a trade-through rule.[191] As the SEC has recognized elsewhere, execution decisions turn on many factors:

> [T]he size of the order, the trading characteristics of the security involved, the availability of accurate information affecting choices as to the most favorable market in which execution might be sought, the availability of technological aids to process such data, the availability of economic access to the various market centers and the costs and difficulty associated with achieving an execution in a particular market center.[192]

Letter from Marc R. Bryant, Senior Vice President and Deputy Gen. Counsel, Fidelity Investments, to Brent J. Fields, Sec'y, SEC (Feb. 26, 2016) [hereinafter Bryant Letter] ("We anticipate that the cumulative burden of the Proposal's extensive disclosure requirements on NMS Stock ATS and existing requirements on ATSs, may act as a barrier to entry for new NMS Stock ATSs in the marketplace and/or force some smaller NMS Stock ATSs out of business."); Letter from William P. Neuberger and Andrew F. Silverman, Managing Dirs. and Global Co-Heads of Morgan Stanley Electronic Trading, to Brent J. Fields, Sec'y, SEC 3 (May 19, 2016) (arguing that the "Proposal treats all ATSs as standalone, exchange-like price/time priority models, fails to account for distinct ATS models . . . and does not consider that an ATS may be part of a broader, integrated electronic offering available to clients choosing to access the markets through a full-service broker-dealer").

188. *See, e.g.*, Bryant Letter, *supra* note 187 ("We are concerned that the proposed process for declaring NMS Stock ATSs 'effective' or 'ineffective' may result in SEC staff undertaking merit based reviews that may impact innovation.").

189. *See, e.g.*, Letter from Micah Hauptman, Financial Services Counsel, Consumer Fed'n of Am., to Brent J. Fields, Sec'y, SEC (Feb. 26, 2016) (arguing that "the proposed filing and review process for determining whether an ATS qualifies for an exemption from the Exchange Act definition of 'exchange' . . . may backfire by giving market participants a false sense of security that the Commission's deeming an ATS's Form ATS-N 'effective' will be tantamount to the Commission's approval of an ATS's operations on the merits"). *See also* Letter from Rick A. Fleming, Inv'r Advocate, SEC, to Brent J. Fields, Sec'y, SEC 12 (Sept. 9, 2016) (cautioning that the review process could "encourage market complacency" and recommending that "public and investor scrutiny of the Form ATS-N filings should be encouraged").

190. Concept Release on Equity Market Structure, 75 Fed. Reg. 3594, 3613 (Jan. 21, 2010) (to be codified at 17 C.F.R. pt. 242) ("Should the Commission consider a ''trade-at'' rule that would prohibit any trading center from executing a trade at the price of the NBBO unless the trading center was displaying that price at the time it received the incoming contraside order?").

191. For a discussion of how a trade-at requirement might work, what its unintended consequences might be, how it might affect different types of investors, and how it might be gamed, see Angel et al., *supra* note 26, at 150002-30-33.

192. Payment for Order Flow, 59 Fed. Reg. 55006, 55008–55009 (1994) (quoting Second Report on Bank Securities Activities: Comparative Regulatory Framework Regarding Brokerage-Type Services 97-98, n.233 (Feb. 3, 1977), *as reprinted in* H.R. Rep. No. 145, 95th Cong., 1st Sess 2333 (Comm. Print 1977). *See Rule 5310*, FINRA (May 9, 2014), http://finra.complinet.com/en/display/display_main.html?rbid=2403%20&element_id=10455 (requiring FINRA members, in customer transactions, to "use reasonable diligence to ascertain the best market for the subject security and buy or sell in such market so that the resultant price to the customer is as favorable as possible under prevailing market conditions" and setting forth metrics for assessing a member's reasonable diligence, including "the character of the market," "the size and type of transaction," "the number of markets checked," "accessibility

A trade-at requirement that adds further inflexibility to the Regulation NMS regime could make it more difficult for market participants to execute trades in a manner that is consistent with their weighting of the different execution quality factors.

3. The Regulatory Attitude Matters

Finally, in crafting a regulatory approach, attitude matters. Humility is important.[193] Regulators have an important role to play in regulating the markets, but regulators' knowledge is limited, and they cannot solve every problem they identify. The SEC has to balance priorities that compete with equity market structure reform[194] and many different priorities even within equity market structure reform. Moreover, the technology changes so fast that it is difficult for a regulator even to know what the market will look like in five years, let alone what an effective regulatory structure for the future market would be.

A willingness to be flexible is important. Equity markets have to meet the needs of investors and issuers with different objectives and priorities.[195] What works well for large, heavily traded issuers may not work well for small, infrequently traded issuers. Long-term and short-term investors may have different preferences in trading venues. The interests of retail investors who want to trade only a small number of shares may diverge from the interests of institutional investors trading large blocks of shares. Yet the interests of retail investors are also closely tied to those of institutional investors who manage most retail investor money. Market structure can accommodate these different needs, if regulators allow it the necessary flexibility. Thus, the best regulatory attitude avoids codifying regulatory preferences or the preferences of any one group, but allows the market to develop its own ways of dealing with the needs of each of these constituencies. A flexible regulatory attitude respects the decisions of investors, traders, and trading venues, accommodates diversity, and invites experimentation.

The SEC's attitude on market structure issues has wavered from the flexibility of Regulation ATS to the prescriptiveness of Regulation NMS. A willingness to learn from mistakes and successes is another key piece of the regulatory attitude.

V. CONCLUSION

Popular narratives about HFT and dark pools have helped to shape recent regulatory and enforcement agendas. Regulations also play a big role in these stories, at times pushing the markets in ways that facilitate competition and, at other times, unwittingly inhibiting investor-friendly innovation. As regulators determine how to ensure that their role in future narratives is a positive one—one that furthers investor protection, market quality and capital formation, they should seek to disentangle market and regulatory failures. Often the best thing a regulator can do is allow competition, arbitrage, and innovation to work. If a regulatory solution is necessary, regulators should craft flexible solutions that match the

---

of the quotation," and "the terms and conditions of the order").

193. *See, e.g.*, Bell, *supra* note 89, at 260 ("There is no all-knowing, neutral third party in society who has all information, past, present, and future, who can decide what the moment-by-moment or long-run socially optimal outcome should be. It is this ignorance that requires us to rely on markets to determine that outcome.").

194. For example, a comparison of the equity markets and fixed-income markets might lead the SEC to conclude that the latter should receive priority on its reform agenda.

195. As Professors Macey and O'Hara explain, "[e]ven among particular constituencies . . . .there is growing heterogeneity of interests . . . " Macey & O'Hara, *supra* note 135, at 571.

dynamism of the markets.