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Disruptive Technology and Securities Regulation

Chris Brummer
Georgetown University Law Center

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ARTICLES

DISRUPTIVE TECHNOLOGY AND SECURITIES REGULATION

*Chris Brummer**

Nowhere has disruptive technology had a more profound impact than in financial services—and yet nowhere do academics and policymakers lack a coherent theory of the phenomenon more, much less a coherent set of regulatory prescriptions. Part of the challenge lies in the varied channels through which innovation upends market practices. Problems also lurk in the popular assumption that securities regulation operates against the backdrop of stable market gatekeepers like exchanges, broker-dealers, and clearing systems—a fact scenario increasingly out of sync in twenty-first-century capital markets.

This Article explains how technological innovation “disrupts” not only capital markets but also the exercise of regulatory supervision and oversight. It provides the first theoretical account tracking the migration of technology across multiple domains of today’s securities infrastructure and argues that an array of technological innovations are facilitating what can be understood as the disintermediation of the traditional gatekeepers that regulatory authorities have relied on (and regulated) since the 1930s for investor protection and market integrity. Effective securities regulation will thus have to be upgraded to account for a computerized (and often virtual) market microstructure that is subject to accelerating change. To provide context, this Article examines two key sources of disruptive innovation: (1) the automated financial services that are transforming the meaning and operation of market liquidity; and (2) the private markets—specifically, the dark pools, electronic communication networks, 144A trading platforms, and crowdfunding websites—that are creating an ever-expanding array of alternatives for both securities issuances and trading.

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INTRODUCTION.....	978
I. TWENTIETH-CENTURY MARKET AND REGULATORY INFRASTRUCTURE.....	982
A. <i>Public Companies</i>	984
B. <i>Broker-Dealers</i>	987
1. Delegation Under the New Deal.....	987
2. 1960s Crisis Response, or New Deal 2.0.....	990
C. <i>Stock Exchanges</i>	992
II. DISRUPTIVE TECHNOLOGY IN NEW FINANCE.....	997
A. <i>Automated Financial Services</i>	998
1. Computerized Trading.....	999
2. Algorithms and Artificial Intelligence.....	1001
B. <i>Private Capital Markets</i>	1003
1. Alternative Trading Venues.....	1003
a. <i>From Island to Archipelago</i>	1004
b. <i>Order Handling and Decimalization</i>	1006
c. <i>Regulation NMS</i>	1008
2. Rule 144A Trading Platforms.....	1011
3. From Crowdfunding to Crowd Investing.....	1015
III. HOW TECHNOLOGY DISRUPTS REGULATORY PRACTICE.....	1020
A. <i>Disintermediation of Public Companies</i>	1020
B. <i>Disintermediation of Exchanges</i>	1024
1. A More Diverse Market Ecosystem.....	1024
2. New Incentive Structures for Trading Venues.....	1028
C. <i>The Fall . . . and Rise of Broker-Dealers</i>	1031
IV. RETHINKING TWENTY-FIRST-CENTURY REGULATORY RESPONSES	1035
A. <i>The Challenge of Expanding the Regulatory Perimeter</i>	1035
1. Old Categories Do Not (Always) Fit the New Market Ecosystem.....	1036
2. Regulatory Objectives Have Multiplied in the Post- Crisis (and Post-Recession) Era.....	1037
3. Extreme Policy Uncertainty Is Ill-Suited to Longstanding Administrative Processes.....	1038
B. <i>The Attractiveness (and Limitations) of Objectives-Based Regulation</i>	1039
C. <i>Two Models of Adaptive Financial Regulation</i>	1043
1. Pilot Programs.....	1044
2. Innovation Hubs.....	1047
CONCLUSION.....	1051

INTRODUCTION

For the first three decades following the birth of U.S. federal securities regulation in the 1930s, the biggest obstacles to achieving the core policy

goals of investor protection and market integrity came from either political resistance or cyclical changes in the economy that unveiled managerial incompetence, inadequate resources for regulatory authorities, or increasingly imaginative financial schemes. But, for all the resistance, the market ecosystem subject to securities regulation was quite stable and experienced only incremental change. As a result, the forward-looking legislative framework enacted in 1933 and in 1934 had time to mature and even improve itself based on the presumptive market role and dominance of key financial intermediaries.

By the turn of the century, however, securities regulation started to experience far more profound challenges, as an unprecedented degree of technological innovation began to upend the market microstructure animating capital markets. With advances in computer processing and information technology, key financial intermediaries like exchanges, investment banks, and broker-dealers began to find themselves pushed to the side by new market participants. Combined with intermittent reforms to the capital raising process, public offerings found themselves too eclipsed by new, increasingly sophisticated private players and venues that began to host and mediate capital market liquidity.¹

These developments are coming under scrutiny in the wake of the financial crisis and as market innovation and disruption have achieved breathtaking speed. More money is now raised in private placements than in public offerings as new platforms have been developed to process demand;² securities of blue-chip firms are as readily traded off exchanges as on them; human beings are no longer relied on to execute trades; and private websites are poised to list ventures and early stage ventures. Collectively, these developments, which are only accelerating with technological innovation, have left regulators flat-footed as they, too, try to find their way in the new ecosystem. To cope with the change, securities authorities have adopted either a “hands-off” policy or one of almost comical “concessions”—such as the recent discovery of Twitter and the blessing by the agency of tweets as a means of communicating with investors.³

Academics, meanwhile, have not fared much better. The acceleration of disruptive innovation is driving deep divisions—to paraphrase Larry Downes—between, on the one hand, the industrial law of the last century and the regulatory machinery to enforce it and, on the other hand, the digital

1. See VLADIMIR IVANOV & SCOTT BAUGUESS, *SEC, CAPITAL RAISING IN THE U.S.: AN ANALYSIS OF UNREGISTERED OFFERINGS USING THE REGULATION D EXEMPTION, 2009–2012*, at 8–9 (2013); Jerry W. Markham & Daniel J. Harty, *For Whom the Bell Tolls: The Demise of Exchange Trading Floors and the Growth of ECNs*, 33 J. CORP. L. 865, 903–04 (2008); Usha Rodrigues, *Securities Law’s Dirty Little Secret*, 81 FORDHAM L. REV. 3389, 3392 (2013).

2. IVANOV & BAUGUESS, *supra* note 1, at 8, 10.

3. Jessica Holzer & Greg Bensinger, *SEC Embraces Social Media*, WALL STREET J. (Apr. 2, 2013, 7:49 PM), <http://online.wsj.com/news/articles/SB10001424127887323611604578398862292997352> [<http://perma.cc/NPJ2-TRB4>].

economy that now drives financial markets and competitive advantage.⁴ As a result, changes in today's market microstructure are subsumed by various academic disciplines under generic categories of "disruption"—and in the process undermine the capacity to discriminate among different regulatory challenges—or commentators fail to fully grasp changes related to one another to collectively bend the structure of capital markets.

To be sure, as this Article shows, not all "disruption" is the same. Some forms of disruption are almost entirely technology based. Disruption under this guise can arise in the crevices of existing regulatory frameworks. New technologies can connect financial market participants in ways that bypass institutions that have been required by law or market forces to screen investors, bridge information asymmetries, or ensure market integrity. Yet other innovations may have appeal or be popular precisely because of their ability to engage, undermine, or elide existing regulatory and market systems. In either case, technology can create opportunities for market participants to do things that they were never able to do before, or to do things better (or faster) than before, and in the process, challenge or arbitrage established regulatory architectures.

Meanwhile, other forms of disruption have their origins in deregulatory policies that have spawned new market infrastructures. That is, legislative or agency reforms can and do create purposeful loopholes or exemptions through which a new market infrastructure arises endogenously as a response and, in the process, upends traditional regulatory and market systems. Regulation-driven disruption can consequently create gaps in existing rules and safeguards, but at the same time, erect new forms and tactics for investor protection. And yet, in virtually every case, regulatory and market disruptions overlap. Regulatory reforms allow new technologies to grow or chart new paths. Technology can spur regulatory responses or even opportunities that enable arbitrage or change incentives of market participants in unexpected ways.

These nuances make it difficult to develop a coherent typology of disruptive technology for securities market regulation and even more difficult to develop a coherent set of regulatory responses. Although it is now taken for granted that disruptive technologies as a whole are generally "less complicated, more accessible, and less expensive" than preexisting ones, their impact on regulatory infrastructures are often diverse and thus demand different policy responses.⁵ Making things worse, traditional securities regulation is itself premised on the sale of securities to the "public," or has been premised on a relatively stable set of market intermediaries—a fact scenario that no longer exists today.⁶ Technological

4. See generally LARRY DOWNES & PAUL NUNES, *BIG BANG DISRUPTION: STRATEGY IN THE AGE OF DEVASTATING INNOVATION* (2014).

5. Nathan Cortez, *Regulating Disruption Innovation*, 29 *BERKELEY TECH L.J.* 175, 182 (2014).

6. For perhaps indeed this reason, few theoretical articles have focused on technology and securities regulation per se. For some of the most notable, see generally, for example, John C. Coffee, Jr., *Brave New World?: The Impact(s) of the Internet on Modern Securities*

innovation runs circles around the ability of regulators to respond and adapt. The proliferation of new market infrastructures as a result challenges academics and policymakers alike at both conceptual and operational levels of regulatory design.

Creating a suitable theoretical framework for addressing disruptive innovation thus requires optics flexible enough to accommodate and examine diverse and dynamic market ecosystems against expanding sets of policy goals and regulatory mandates. This, in turn, requires eschewing traditional assumptions about how regulatory policy is operationalized and forces commentators to evaluate concretely the functional implications of disruption on the market.

Embracing such an approach proffers powerful policy analytics. Disruptive innovation, as this Article demonstrates, is often a story of not only market participation but also regulatory disintermediation. Consequently, when faced with the prospect of new transformative technologies, policy responses should identify what actor or aspect of the preexisting financial system is potentially being disintermediated by the technology. Second, and closely related, market supervisors should explore whether other microstructural developments or new institutions fill (or could fill) the regulatory vacuum or, alternatively, exacerbate the disintermediation at issue. And only then, finally, after undertaking the analysis, should interventions be devised to promote the underlying policy goals of the respective regulator while recognizing the dynamism of constantly evolving markets. To demonstrate this, this Article examines varying sources of disruptive innovation: automated electronic trading, dark pools of liquidity for exchange-traded securities, 144A trading platforms for private placements, and crowdfunding websites for start-ups enabled under the Jumpstart Our Business Startups (JOBS) Act.

By recasting disruptive innovation as one of financial market (and gatekeeping) disintermediation, this Article also provides a roadmap for

Regulation, 52 BUS. LAW. 1195 (1997) (noting the potentially information-enhancing benefits proffered by the internet); Donald C. Langevoort, *Information Technology and the Structure of Securities Regulation*, 98 HARV. L. REV. 747 (1985) [hereinafter *Information Technology*] (same); Donald C. Langevoort, *Toward More Effective Risk Disclosure for Technology-Enhanced Investing*, 75 WASH. U. L.Q. 753 (1997) (considering the promise of technology-enhanced investing for addressing information asymmetries). Otherwise, most other thoughtful interventions have focused on discrete manifestations of disintermediation in select markets or markets enabled by looser regulatory oversight. See generally Joan MacLeod Heminway & Shelden Ryan Hoffman, *Proceed at Your Peril: Crowdfunding and the Securities Act of 1933*, 78 TENN. L. REV. 879 (2011) (examining the operation of crowdfunding exemptions and its impact on securities regulation); Donald C. Langevoort & Robert B. Thompson, *IPOs and the Slow Death of Section 5*, 102 KY. L.J. 891 (2014) (examining exemptions and their impact on the market for public offerings); Jonathan R. Macey & Maureen O'Hara, *Regulating Exchanges and Alternative Trading Systems: A Law and Economics Perspective*, 28 J. LEGAL STUD. 17 (1999) (highlighting the value of Alternative Trading Systems (ATS) and the need for enabling, as opposed to mandatory, securities regimes); Elizabeth Pollman, *Information Issues on Wall Street 2.0*, 161 U. PA. L. REV. 179 (2012) (noting the growth of private placement intermediaries and the impact on disclosure).

better conceptualizing the future of securities regulation and rethinking the means with which we practice it. Although 144A trading, high frequency trading, dark pools, and crowdfunding have attracted a good deal of attention over the last couple of years from journalists, policymakers, scholars, and practitioners, they have yet to be addressed collectively from one theoretical vantage point. As a result, an all-too-obvious silo thinking has emerged, failing to connect microfinance to crowdfunding, the technological innovations in crowdfunding to new private placement platforms, and so on. This Article represents the first attempt to connect the dots. By tackling the hard work of charting these developments along a market and regulatory continuum, we will see how technology imposes a variety of interdependent and interrelated repercussions throughout securities markets that are fundamentally reshaping how they operate—and changing the effectiveness of the New Deal-era oversight and supervision.

Before jumping into this Article, one methodological note is in order. One of the difficulties of theorizing the scope of the impact of technological disruption and securities regulation is that it involves assessing both regulatory and market infrastructures across diverse issue areas and contexts. As such, a multidisciplinary approach is required that employs broad-based regulatory history, market theory and practice, and rigorous institutional analytics. With this in mind, in Part I, I offer an overview of the New Deal regulatory apparatus that continues to govern securities markets today. Part II introduces and explains the most dramatic forms of technological innovation in securities markets, and Part III then shows how these innovations disintermediate traditional regulatory gatekeepers and thus disrupt longstanding regulatory practice. Finally, in Part IV, this Article borrows from the New Governance literature⁷ to outline administrative reforms useful for engaging the challenge of disruptive innovation and highlights the necessity of adaptive regulatory regimes for high-tech capital markets animated by constant microstructural change.

I. TWENTIETH-CENTURY MARKET AND REGULATORY INFRASTRUCTURE

The legislative framework for U.S. securities regulation is both a response to the financial shenanigans leading up to the stock market crashes of the late 1920s and a national framework for ongoing supplemental regulation and oversight to be practiced by the then-newly created Securities and Exchange Commission (SEC or “the Commission”). As such, even after more than a half decade of reforms and revisions, it reflects both the primary policy concerns of the time, as well as the market ecosystem that dominated the early twentieth century.

Securities transactions in the decades preceding the creation of the federal securities laws were simple, albeit flawed. A company seeking to raise capital issued and sold securities to the public, often assisted by an

7. See *infra* note 309 and accompanying text.

investment bank that would help identify an appropriate wholesale and retail market for the securities and potentially underwrite the offering. Brokers then marketed shares to the public. Depending on the prestige and notoriety of the company, the firm's shares or bonds were listed on an exchange or traded over the counter.⁸

The issuance and sale of securities were, if not laissez-faire activities in the strictest sense, at least chronically under regulated. A collection of relatively weak "blue sky laws," actions under common law fraud, or reputational constraints were relied on to restrict market participants' bad conduct.⁹ With few investor protections, issuers lied about their earnings, plans, and even operations; brokers marketed securities unscrupulously, often lying to unsuspecting investors; and exchanges listed securities of questionable quality, with little to no help in maintaining quality or market stability.

By the early 1920s, individuals such as Ivar Krueger graced the cover of *Time* magazine after raising millions of dollars to fund a Ponzi scheme built on repaying loans and doling out dividends to investors until the money dried up.¹⁰ Along the way, neither the exchange nor brokers monopolizing its trade contacted or discussed the financial statements of the presumed auditor. Similarly, increasingly complex frauds were committed against the public—like that perpetrated by the Musica brothers, who created an entire network of fictitious firms to bolster false financial statements (and inflate earnings) for the then-New York Stock Exchange (NYSE or "the Exchange") listed McKesson & Robbins.¹¹

8. See Donald C. Langevoort & Robert B. Thompson, "Publicness" in *Contemporary Securities Regulation After the JOBS Act*, 101 GEO. L.J. 337, 353 (2012) (noting that listing on certain exchanges was "a means of signaling quality to potential traders").

9. Although state level initiatives had been launched selectively in other states targeting specific industrial activities and disclosures for out-of-state issuers, Kansas is largely credited with enacting the first blue sky law in 1911, which required companies selling securities in the state, as well as stockbrokers, to register with the bank commissioner and disclose information about their operations. See Jerry W. Markham, *Accountants Make Miserable Policemen: Rethinking the Federal Securities Laws*, 28 N.C. J. INT'L L. & COM. REG. 725, 731 (2003). That said, the most sweeping rules were those embraced in New York. In New York, brokers were prohibited from making false or misleading rumors, statements, or advertisements in connection with the sale of securities and from engineering the kinds of fictitious transactions that were making their way to the front pages of the nation's newspapers. *Id.* at 731–32. Moreover, the Martin Act, adopted in 1921, authorized the New York Attorney General to investigate and seek injunctions against fraudulent securities practices or manipulative activities, with much lower-level burdens of proof than those required under common law. *Id.* at 732. Nevertheless, even in New York, insider trading was largely permitted, as was margin trading, which allowed banks to make short-term loans using securities as collateral via what was then known as the "call money" market. *Id.* Furthermore, with the economy roaring, actions were rare.

10. See Justin Fox, *Forget Charles Ponzi (and Bernie Madoff). Ivar Kreuger Is the All-Time Fraud Champ*, TIME (Jan. 5, 2009), <http://business.time.com/2009/01/05/forget-charles-ponzi-and-bernie-madoff-ivar-kreuger-is-the-all-time-fraud-champ/> [<http://perma.cc/PB99-C9FA>].

11. See JOHN C. COFFEE, JR., GATEKEEPERS: THE PROFESSIONS AND CORPORATE GOVERNANCE 139–40 (2006).

The results were catastrophic. As President Franklin D. Roosevelt's close aid, and future Supreme Court Justice, Felix Frankfurter bemoaned:

During the height of the greatest speculative carnival in the world's history, billions of new securities were floated, of which a large part had no relation to the country's need and which inevitably became worthless; worthless not merely for millions who had sought speculative gains, but for those other millions who sought to conserve the savings of a lifetime.¹²

After the October 1929 stock market crash and the following years of falling stock prices, the U.S. Senate Committee on Banking and Currency launched an investigation, known now as "the Pecora Committee," into the causes of the crisis.¹³ The proceedings culminated in an assertion of a new "social control of finance," operationalized via the 1933 Securities Act ("the Securities Act" or "the 1933 Act") and the 1934 Exchange Act ("the Exchange Act" or "the 1934 Act"), along with subsequent streams of SEC rulemaking that in many ways continue today.¹⁴

Underpinning the reforms was an understanding of issuers, broker-dealers, and exchanges as the primary nodes of market infrastructure and the central culprits of the undue market "speculation" leading up to the crisis.¹⁵ Regulating each as agents of the investing "public" thus not only provided a response to the earlier decade of fraud, but also a forward-looking framework for future market oversight. Key to the regulatory policies was disclosure—in the case of firms and broker-dealers, disclosure about material information relating to issuers of securities and in the case of exchanges, information relating to the market value of such securities.

A. Public Companies

The centerpiece of the New Deal legislative framework was enhanced disclosure for companies selling securities. Investors, authorities recognized, needed protection. A prerequisite for such protection was having access to information necessary to making informed investment decisions. Up to that point, investors were far from being guaranteed "full information" relating to their investments. With no requirement or government agency credibly compelling disclosures from companies, "prospectuses used to sell stocks were 'little more than notices'"¹⁶ and were

12. A.C. Pritchard & Robert B. Thompson, *Securities Law and the New Deal Justices*, 95 VA. L. REV. 841, 849 (2009).

13. *Cf. id.* at 852.

14. *Id.* at 846–72.

15. This is demonstrated in the very scope of the Pecora Commission's work: to make an inquiry into any company issuing securities, to make an investigation of the "business conduct and practices of security exchanges and of the members thereof," and "to make a thorough and complete investigation of the practices with respect to the buying and selling and the borrowing and lending of securities." COMM. ON BANKING & CURRENCY, STOCK EXCHANGE PRACTICES, S. REP. NO. 73-1455, at 2 (1934).

16. Markham, *supra* note 9, at 734 (citing *United States v. Morgan*, 118 F. Supp. 621, 639 (S.D.N.Y. 1953)).

“too often deliberately misleading and illusive.”¹⁷ With this in mind, and with the Krueger and Musica scandals still fresh in the memory of the country’s voters, Roosevelt promised in his presidential nomination acceptance speech to “let[] in []the light of day on issues of securities, foreign and domestic, which are offered.”¹⁸

The Securities Act was, among other things, the first legislative step for achieving this goal. According to its dictates, whose relevant parts for this discussion were finalized in 1964, if a company crossed a certain threshold—by either selling securities to the public,¹⁹ allowing for their securities to be traded on exchanges,²⁰ or becoming too big²¹—it would have to make financial statements public and ensure their accuracy.²² Then under the Exchange Act, promulgated a year later in 1934, these disclosures had to be updated on a quarterly and yearly basis and subject to varying scrutiny by auditors and other securities professionals.²³

Section 5 of the Securities Act additionally subjected public offerings of securities to certain procedural hurdles.²⁴ In its original iteration, the statute limited sales efforts to after the SEC had declared the registration statement “effective.”²⁵ This then ignited a two-decade-long debate between regulators and industry as to the “proper balance between the demand for pre-effective marketing and the concerns about gun-jumping.”²⁶ Eventually, a compromise was reached in 1954 that prohibited sales and marketing of materials until a registration statement is filed and imposed a waiting period of at least twenty days, during which marketing efforts could commence, but securities could not be sold.²⁷ Only after the registration statement became effective, which generally involved SEC review, could sales commence.²⁸

All along, a new federal antifraud regime was launched. Section 10(b) of the Exchange Act and Rule 10b-5 created an expansive private right of action for misrepresentations and omissions made in connection with the sale of securities.²⁹ Meanwhile, section 11 of the Securities Act imposed

17. 1 LOUIS LOSS & JOEL SELIGMAN, *SECURITIES REGULATION* 27 (3d ed. 1993).

18. JOEL SELIGMAN, *THE TRANSFORMATION OF WALL STREET: A HISTORY OF THE SECURITIES AND EXCHANGE COMMISSION AND MODERN CORPORATE FINANCE* 19 (3d ed. 2003).

19. *See* Securities Act of 1933 § 5(a), 15 U.S.C. § 77e(a) (2012).

20. Securities Exchange Act of 1934 § 12(b), 15 U.S.C. § 78l(b).

21. 15 U.S.C. § 78l(g).

22. *Id.* §§ 78m(a), (i).

23. *Id.* § 78m.

24. *Id.* § 78e.

25. *Id.* § 77e (noting that no sales can commence “unless a registration statement is in effect”).

26. Langevoort & Thompson, *supra* note 6, at 891.

27. 15 U.S.C. § 77h; *see also id.* § 78f (requiring that marketing be made through a legally valid prospectus).

28. *See id.* § 78f.

29. *See id.* § 78j(b); Employment of Manipulative and Deceptive Devices, 17 C.F.R. § 240.10b-5 (2014).

heavier liability for misrepresentations in a registration statement,³⁰ just as section 12 gave potential rescission rights where the procedural hurdles were not followed.³¹

At the same time, some limited exemptions to both the procedural and informational regulations were available. The broadest exemption was section 4(2) of the 1933 Act (now section 4(a)(2)), which exempts transactions “not involving any public offering”—what today are known as “private placements”—from the registration requirements of section 5.³² In 1935, the SEC then interpreted the exemption to mean that companies can generally avoid registration if offerings are made among a small number of sophisticated investors and not broadly distributed.³³ Supreme Court and other federal cases, over the following twenty years, also elaborated the ambiguous clause and stressed the need for investors not only to be sophisticated, but also to have access to all relevant information.³⁴ Secondary sales also had to meet the same strict investor thresholds and, as always, avoid trading on exchanges.³⁵

Collectively, the New Deal framework created a broad regulatory perimeter for securities issuances. Under sections 5 and 15(d) of the 1933 Act, which were added in 1936, public offerings required registration with the SEC.³⁶ Section 12(g) of the 1934 Act, meanwhile, restricted the number of shareholders an unregistered company could have after achieving a significant economic size before becoming subject to reporting obligations.³⁷ Similarly, section 12(b) effectively prohibited unregistered companies from listing their securities on exchanges like the NYSE. Instead, trading would have to take place in the over-the-counter (OTC) markets where transactions have been executed through opaque and ad hoc networks of brokers and dealers, which have historically been more expensive.³⁸ Once any of the thresholds under sections 15(d), 12(b), or 12(g) of the 1934 Act were met, periodic reporting under the Exchange Act became mandatory.³⁹ Finally, privately issued securities under section 4(2)

30. 15 U.S.C. § 77k.

31. *Id.* § 77l.

32. *Id.* § 77d(2).

33. Relevant factors included the number of offerees, relationship of the offerees to each other, the number of units offered, the size of the offering, and the manner of the offering. *See* Letter of General Counsel Discussing the Second Clause of Section 4(1), Securities Act Release No. 285, 1935 WL 27785 (Jan. 24, 1935) [hereinafter Letter of General Counsel].

34. *See, e.g.*, SEC v. Ralston Purina Co., 346 U.S. 119, 124–25 (1953) (noting that because “[t]he design of the statute is to protect investors by promoting full disclosure of information thought necessary to informed investment decisions . . . the applicability of [the section] should turn on whether the particular class of persons affected needs the protection of the Act”).

35. 15 U.S.C. § 78l(b).

36. *Id.* §§ 77e, 78o(d) (requiring registration of public offerings).

37. *See id.* § 78l(g).

38. Walter Werner, *Adventure in Social Control of Finance: The National Market System for Securities*, 75 COLUM. L. REV. 1233, 1238 (1975).

39. ANNA T. PINEDO, MORRISON & FOERSTER LLP, FREQUENTLY ASKED QUESTIONS ABOUT PERIODIC REPORTING REQUIREMENTS FOR U.S. ISSUERS: OVERVIEW (2015),

of the 1933 Act could only be bought and sold amongst investors who could demonstrate high levels of sophistication and access to information normally required in a registration statement.⁴⁰

Circumventing registration thus likely increased the costs of capital for many companies. They could either avoid registration by limiting the number of shareholders they had and limiting the trading of their securities on thin OTC markets, which lacked reliable means of tracking the prices of stocks,⁴¹ or they could issue private securities to a small pool of sophisticated investors where secondary trading opportunities were limited and where notice of offerings had to be discrete.⁴² In either case, investors charged a premium for the limited transferability, lower transparency, and higher risk of the security and, in the process, drive up the cost of finance.

B. Broker-Dealers

Broker-Dealers would also attract more regulatory scrutiny. Oversight would, however, be asserted incrementally, and often circuitously, via a series of delegations of authority to a range of supervisors. Eventually, however, the SEC would come to assume some of its most direct authority as a growing volume of technology-enabled securities transactions overwhelmed the back office operations of securities firms.

1. Delegation Under the New Deal

The 1929 stock market crash needed enablers, and broker-dealers topped the list of likely culprits. After all, exchanges needed broker-dealers to make markets in listed securities (a topic discussed in the following subsection), and issuers needed salesmen to sell their securities. And, as brokers were paid on commission, not the appreciation of the securities, they were incentivized to do whatever it took to sell stocks or to act on their own account (as what the law recognizes as “dealers”) and to make money on speculation and market volatility.

The criticism was not without reason. Indeed, turn of the century brokers turned out to be especially good at beguiling people into parting with their money and, according to a 1933 House Committee Report, routinely worked “securities of an essentially unsound character” on an “unsuspecting public.”⁴³ Moreover, less than fair and honest marketing was combined with margin investing as investors (and broker-dealers) borrowed money to make investments and outsized bets. The result, as Frankfurter acknowledged during the subsequent consideration and debate

<http://media.mofo.com/files/Uploads/Images/FAQ-Periodic-Reporting-Requirements-for-US-Issuers-Overview.pdf> [<http://perma.cc/KJ9W-VHTY>].

40. *SEC v. Ralston Purina Co.*, 346 U.S. 119 (1953) (requiring that investors should be provided with adequate access to information usually contained in a registration statement).

41. See MARK INGEBRETSEN, *NASDAQ: A HISTORY OF THE MARKET THAT CHANGED THE WORLD* 38 (2002).

42. See *id.* at 31–32.

43. LOSS & SELIGMAN, *supra* note 17, at 27.

of the Exchange Act, was a speculative bubble that would upend the country's capital markets and savings capacity:

*By all the subtle and mesmerizing arts of modern salesmanship, the sellers of securities had so extended the field of security buyers that 55 per cent of all savings . . . went into publicly marketed securities. . . . The enormous, easy profits from their distribution stimulated the creation and sale of billions in securities, which have burdened industry and wasted or misdirected the capital resources of the nation.*⁴⁴

With this in mind, the Exchange Act was created to bear down more forcefully on the sales and marketing of securities. As mentioned above, section 10(b) and Rule 10(b)-5 prohibited the sale of securities through material misstatements and omissions in the marketing of investments during initial public offerings (IPOs), secondary trading, and even private placements. As such, it created a broad and federal layer of investor protection wherever the sale of a security arose.

The Exchange Act also provided the basis for more direct oversight for broker-dealers in particular. Though lacking precision as to the degree of discretion the SEC would ultimately enjoy, section 15 of the Exchange Act empowered the SEC to require broker-dealers to register with the commission and to register the securities in which they traded.⁴⁵ The SEC was also charged with the supervision of a firm's structure and taking measures to assure their solvency.⁴⁶ Accordingly, under this writ of authority, the SEC promulgated rules requiring the registration of all broker-dealers involved in OTC transactions and mandated that registered firms meet minimum capital requirements and provide adequate disclosures to investors.⁴⁷

Critically, OTC broker-dealers were also ultimately required to join what was then the National Association of Securities Dealers (NASD) (that later became the Financial Industry Registry Authority (FINRA)), the self-regulatory organization (SRO) for the industry created in 1939.⁴⁸ In time, NASD imposed obligations on broker-dealers to "know thy customer" (a requirement that the NYSE also imposed on member broker-dealers).⁴⁹

44. Pritchard & Thompson, *supra* note 12, at 849 (emphasis added) (quoting Felix Frankfurter, *The Federal Securities Act: II*, FORTUNE, Aug. 1933, at 53, 54).

45. Securities Exchange Act of 1934 § 15(a)(1)–(2), 15 U.S.C. § 78o(a)(1)–(2) (2012).

46. *Id.*

47. Robert L.D. Colby & Lanny A. Schwartz, *What Is a Broker-Dealer?*, in 2 BROKER-DEALER REGULATION 2-1, 2-5 to 2-7 (Clifford E. Kirsch ed., 2d ed. 2011).

48. See Nat'l Assoc. of Sec. Dealers, Inc., Exchange Act Release No. 2211, 1939 WL 36389 (Aug. 7, 1939). Under the Maloney Act, which revised the Exchange Act, market associations were given the right to register with the SEC and enforce a code of conduct on their members. And just as important, members could charge nonmembers higher prices while trading with one another at retail. With such incentives, the Maloney Act would ultimately create powerful economic incentives for market participants to seek self-regulation (giving rise to the NASD) and for broker-dealers to submit to association (and, by extension, federal) oversight. See INGEBRETSEN, *supra* note 41, at 42.

49. For an overview of FINRA's "know thy customer" expectations, see *Prepare to Invest*, FINRA, <http://www.finra.org/investors/suitability-what-investors-need-know> (last visited Nov. 27, 2015) [<http://perma.cc/9U6G-XQ8J>].

That is, broker-dealers were required to have “reasonable grounds for believing that [a] recommendation [was] suitable for [a] customer upon the basis of the facts, if any, disclosed by such customer as to his other security holdings and as to his financial situation and needs.”⁵⁰ This suitability rule then itself became interpreted to require brokers to obtain information concerning the customers’ other securities before making suggestions concerning highly speculative investments.⁵¹

Finally, section 7 of the Exchange Act tackled the challenge of margin lending—which, as discussed above, had in part enabled and exacerbated the crisis by allowing market participants to borrow money to purchase shares. As with section 15, the issue would be tackled through delegation. Here, however, the Federal Reserve Board, not the SEC, was given the authority to regulate “the amount of credit that may be initially extended . . . on any security,” and broker-dealers were prohibited from extending credit for any customer in contravention of the rules.⁵² With its newfound powers, the Federal Reserve subsequently promulgated Regulation T, which prohibits the extension of credit on marginable securities beyond a certain percentage of those securities’ value.⁵³

Though only of limited relevance for this Article, it must be added for the sake of completeness that in addition to the regulation of brokers, even more basic advisory and investment management functions were targeted as well under other congressional dictates. In the years leading up to the Great Depression, investment companies and trusts had become commonplace in American society. Unfortunately, although these companies were, as Ken Gailbraith noted, “greatly admired marvels of the time,” they were also highly problematic, and the SEC observed that many investment companies sold securities like door-to-door salesmen, advancing the interests of fund managers over investors.⁵⁴ To speak to abusive practices pertaining to the counsel given to investors, the Investment Advisers Act of 1940 imposed on managers a range of disclosure and recordkeeping obligations (and later,

50. THOMAS LEE HAZEN, *BROKER-DEALER REGULATION IN A NUTSHELL* 180 (2d ed. 2011) (quoting FINRA Rule 2310).

51. *See id.* at 180–81.

52. C. Edward Fletcher III, *Sophisticated Investors Under the Federal Securities Laws*, 1988 DUKE L.J. 1081, 1106 (quoting Securities Exchange Act of 1934 § 7(a), 15 U.S.C. § 78g(a) (2012)).

53. Importantly,

[v]iolations of these limits often return to haunt a broker in the course of litigation. Customers may point to margin violations offensively, after losing a large sum of money on a highly leveraged position created on borrowed money, or defensively, against a collection action by a broker whom a customer has failed to pay following such a loss.

Id.

54. Kara M. Stein, Comm’r, SEC, *Mutual Funds—The Next 75 Years* (June 15, 2015), <http://www.sec.gov/news/speech/mutual-funds-the-next-75-years-stein.html> [<http://perma.cc/N32G-JAJL>]; *see* Investment Advisers Act of 1940, 15 U.S.C. §§ 80b-1 to -21 (2012); Barry P. Barbash & Jai Massari, *The Investment Advisers Act of 1940: Regulation by Accretion*, 39 RUTGERS L.J. 627 (2008).

standards of conduct for registered advisors).⁵⁵ Meanwhile, the Investment Company Act requires mutual funds to register with the SEC and prohibits self-dealing by fund professionals.⁵⁶ Furthermore, the legislation bans outright affiliated transactions that would otherwise create incentives for fund managers to exploit shareholders.⁵⁷

2. 1960s Crisis Response, or New Deal 2.0

One unusual aspect of this approach was that, despite the enormity of the job, the SEC's authority was both modest and shared with other actors. This institutional posture in turn generated considerable ambiguity about the writ of the agency's authority to regulate broker-dealers. Two decades later, however, the SEC's position was reaffirmed and bolstered with additional new responsibilities, which deserve special mention, especially in light of the particularly important role played by technological change in driving the agency's ascent to power.

In the aftermath of the Great Depression, much of the policymaking energy relating to brokers and dealers, beyond the surveillance of fraud, focused on the commissions paid to brokers on exchanges.⁵⁸ But in the 1960s, Wall Street found itself on the brink of crisis in part due to its own good fortune. As SEC Chairman Hamer Budge testified, an exponential growth in securities trading threatened, quite unexpectedly, to undo the industry: "[B]rokerage firms [found] themselves in the paradox of being forced out of business by having too much business."⁵⁹ Between 1964 and 1968, the average daily reported volume on the NYSE jumped 265 percent, from just under five million shares per average day in 1964 to nearly fifteen million in December 1968.⁶⁰

In theory, the rise in transactions was good for business. But broker-dealers were not equipped to handle the back-office paper crunch. Financial transactions at the time required settlement and clearing procedures where orders were routinely written by hand and stock certificates were physically handed over and delivered to investors. With the jump in volume and inadequate manpower, however, this system broke down: "Stock certificates and related documents were piled 'halfway to the ceiling' in some offices; clerical personnel were working overtime, six and

55. See 15 U.S.C. §§ 80b-1 to -21.

56. See *id.* §§ 80a-1 to -64 (requiring the registration of investment companies, which include mutual funds). Notably, even this sector is facing prospects of weak market discipline and performance by market intermediaries. Jill E. Fisch, *Rethinking the Regulation of Securities Intermediaries*, 158 U. PA. L. REV. 1961, 1985 (2010) (arguing that weak market discipline, enabled in part by competition, requires rethinking the regulation of the mutual fund industry).

57. See 15 U.S.C. §§ 80b-1 to -21.

58. See *infra* Part I.C.

59. SELIGMAN, *supra* note 18, at 451 (alteration in original).

60. *Id.*

seven days a week, with some firms using a second or even a third shift [for staff] to process each day's transactions."⁶¹

Part of the increase was due to the rise in institutional investing. Professional market makers exploited multiple telephone lines and faxes to connect themselves to other firms and financial institutions in order to increase the volumes of transactions they made. But keeping track of it all was messy. On the front end, pricing was far from efficient, especially for smaller, less well-known OTC stocks. Unlike the NYSE, where, as seen below, special broker-dealers (aptly named "specialists") had monopolies on the shares they traded, traders and market makers routinely competed with one another to buy and sell a particular security.⁶² But they did so with relatively little information. Most broker-dealers subscribed to services publishing daily quotes for bid and ask prices for certain stocks, and the quotes would set the parameters for most trading taking place that day. But no rules required larger firms to post quotes, or, for that matter, follow through on the quotes they gave. Furthermore, firms polled by the company providing the list were not those doing the largest volume of trading in that particular stock, and their own internal records were often flawed or incomplete. So, these stock quotes were very far from being an accurate real-time source of data.⁶³

With transactions multiplying, complaints to the SEC about broker-dealer conduct quadrupled.⁶⁴ Some firms responded by hiring new people, pairing them with experienced workers and putting them to work immediately to handle and process orders. According to the leading treatise of the period, this only resulted in poor training and a decrease in output by experienced workers who had to teach colleagues how to do their jobs.⁶⁵ Meanwhile, other firms attempted to abruptly adopt computerized facilities and leapfrog the problem of manual recordkeeping. This too, however, was largely unsuccessful and even doomed leading Wall Street brokerages unprepared and inexperienced in technology. Goodbody & Co., then the fifth-largest firm on Wall Street, was doomed, according to a Merrill Lynch banker familiar with the company, due to its "overambitious efforts to automate."⁶⁶ When it was subsequently saved in a merger, it only succeeded in increasing the firm's woes. "It was trapped in the midst of change: efforts to automate failed, while manual procedure was deserted in anticipation of automation's success."⁶⁷ As Joel Seligman reports, other "instant computerization" problems plagued other firms that faced liquidation, including Lehman Brothers, which only narrowly escaped collapse.⁶⁸

61. *Id.*

62. *Id.* at 456.

63. *Id.*

64. *Id.*

65. *See id.* at 456-57.

66. *Id.* at 457.

67. *Id.*

68. *Id.*

The combination of breakdowns in back-office operations, higher operational costs, bad brokerage management, and debt had, by 1969, sent more Wall Street brokerages out of business than at any point in U.S. history. In response, the SEC eventually imposed higher requirements on brokerages than the modest \$5000 net capital threshold the agency had required of broker-dealers prior to the crisis and the NYSE's \$50,000 requirement for member firms carrying customers' accounts.⁶⁹

Even more critically, to strengthen the authority of the SEC over the industry, Congress passed the Securities Investor Protection Act,⁷⁰ which gave the SEC authority to require an SRO to adopt rules, practices, and inspections relating to the financial condition and health of the SRO's members.⁷¹ Four years later, the Securities Acts Amendments of 1975 were passed, which, among other things, brought broker-dealers who traded exclusively on national securities exchanges directly into the regulatory fold and made them subject to the same Exchange Act requirements (and SEC oversight) as OTC broker-dealers.⁷² For the first time, the NYSE not only governed conduct but also took a step toward overseeing the financial integrity of key market intermediaries given what was believed to be the relative inflexibility of firms to automate and the challenges of intermediating in high order, high data environments.

C. Stock Exchanges

The final objective of the postwar regulatory infrastructure was the oversight and supervision of stock exchanges. The regulation of broker-dealers, though an important aspect of the post-crash securities oversight, was not enough. Instead, as Justice Frankfurter himself acknowledged, "another . . . evil . . . must ultimately be reached, and that is the creation of boom markets for stocks through . . . the Exchange."⁷³ No longer would it or should it be the means for generating destructive speculation by the American investing public.

As a conceptual matter, stock exchanges have always exerted both economic and regulatory importance. On the one hand, unlike OTC markets, where dealers processed ad hoc orders free of listing requirements and disciplinary rules, exchanges have been critical price discovery mechanisms for stocks and bonds of major companies.⁷⁴ Once securities

69. *Id.*

70. Securities Investor Protection Act of 1970, 15 U.S.C. §§ 78aaa–III (2012).

71. See SELIGMAN, *supra* note 18, at 465.

72. See John G. Gillis, *Securities Law and Regulation: Securities Acts Amendments of 1975*, 31 FIN. ANALYSTS J. 12, 13 (1975) (noting that broker-dealers that previously did not have to register, including specialists, floor traders, and floor brokers, now had to register with the SEC).

73. Pritchard & Thompson, *supra* note 12, at 858 n.67.

74. See Jennifer Victoria Christine Dean, *Paradigm Shifts & Unintended Consequences: The Death of the Specialist, the Rise of High Frequency Trading & the Problem of Duty-Free Liquidity in Equity Markets*, 8 FIU L. REV. 217, 237 (2012) (noting that exchanges "promoted the dissemination of information via the process of dynamic price-discovery,"

were released onto exchanges, buyers could send their orders to brokers, who then transmitted the order to brokers on the exchange and to specialists who made markets for the securities. The bid and ask prices for the orders (or quotes) could then be compared on the floor and made public. By thus providing a focal point for trading, exchanges not only afforded investors opportunities to enter and exit investments quickly,⁷⁵ but they also generated valuable data for pricing stocks and bonds traded on secondary markets.

Indeed, the extent of concentration was so great that for many experts it created strong anticompetitive undercurrents. To understand why, it is important to note that price discovery has historically been an expensive business, with low levels of competition. Trading floors allowed the congregation of buyers and sellers of securities, but

real estate had to be purchased on the front end for a large trading facility. Then a large trading floor had to be built on which traders could collectively operate and interact. Finally, facilities had to be added for communication with linked institutions, either in the form of courier posts or phone banks.

Floor exchanges were also highly dependent upon human skill that is not easily replicable. When a client ma[de] a limit order, a floor broker must calculate (or guess) the appropriate amount to initially bid for on the exchange on behalf of the client based on his monitoring of the day's trading. Likewise, [personnel] must monitor limit orders and respond quickly to orders as they arrive. All along, time is critical—the longer it takes for execution of an order, the more likely the order may be cancelled or matched with another investor. Due to the various emotional, intellectual, and even physical demands of the job, the supply of skilled traders ha[d] always been limited and labor costs, high.⁷⁶

Consequently, the barriers to entry to the exchange business were high, and exchanges frequently could charge super premiums for their work.⁷⁷

Yet, significant responsibilities accompanied such authority. Stock exchanges, even in the nineteenth century, were expected to fulfill the “important mission” of establishing “a barrier between the public and those fraudulent, superficial, and impracticable enterprises and schemes which . . . [were calculated] to induce the public to invest in them.”⁷⁸ Exchanges thus had established listing committees tasked with examining listings by the late 1880s. By the 1930s, the NYSE in particular required that companies seeking to list (or sell) their securities on its floors first “file an application describing in detail the firm's capital structure, history, liabilities, properties, financial statements over the past five years, and

unlike other markets in which “the process of price-discovery generally occurs over a longer period of time”).

75. *Id.*

76. Chris Brummer, *Stock Exchanges and the New Markets for Securities Laws*, 75 U. CHI. L. REV. 1435, 1459 (2008).

77. *See id.* at 1455.

78. JOHN R. DOS PASSOS, A TREATISE ON THE LAW OF STOCK-BROKERS AND STOCK-EXCHANGES vi (1882).

officers” and imposed restrictions on short selling when the markets dived.⁷⁹ Exchanges also required that specialists—the broker-dealers dominating the trade of some securities—make themselves available to stabilize markets where the price of a security jumped or fell erratically.⁸⁰

The stock market crash of the late 1920s, however, would prove untrammelled self-regulation to be insufficient. For one, issuers looking to bypass the NYSE’s rules always could choose to register an “unlisted” security on any of the other eighteen securities exchanges that “permitted securities to be traded on an ‘unlisted’ basis.”⁸¹ Furthermore, and arguably more troubling, even the NYSE failed to enforce vigorously its own standards.⁸² Indeed, exchanges lacked clear rules with regard to how financial statements should be reported to investors or to exchanges.⁸³ Consequently, in the congressional hearings leading up to the creation of the Exchange Act, many observers felt that self-regulation lacked teeth and seriousness. Frankfurter in particular heartily agreed that the exchange was “long overdue” for governmental regulation, advising Roosevelt: “There has been more than ample time for self-regulation, and self-regulation they have shown is not in them.”⁸⁴

Several steps were thus taken over the ensuing decades to rein in exchanges. As discussed above, the challenges posed by unlisted (essentially OTC) securities were remedied, at least in part, by bringing OTC securities under the Exchange Act’s size and public offering parameters.⁸⁵ If issuers attained a certain economic impact or passed the shareholder threshold, they were required to report to the SEC.⁸⁶ Although price discovery was not as high as that offered on exchanges, disclosure as to the underlying issuer was mandatory.

Reforms for exchanges would, at least ostensibly, be more direct. The Exchange Act endowed the SEC under sections 5 and 6 with an affirmative grant of rulemaking authority and broad regulatory powers over the nation’s securities exchanges (dubbed “national securities exchanges” in the enabling legislation), their members (who were largely broker-dealers), and

79. SELIGMAN, *supra* note 18, at 46. A prospective issuer would also have to proffer, along with its application, copies of its charter, bylaws, leases, and other relevant corporate documents. *See id.* Stock exchanges also adopted a rule requiring brokers to secure written permission from clients before lending shares to short sellers. *See id.* at 12.

80. *See id.*

81. *See id.* at 47.

82. *See id.*

83. *See id.* at 48–49.

84. Pritchard & Thompson, *supra* note 12, at 858 (quoting Letter from Felix Frankfurter, Professor, Harvard Law Sch., to President Franklin D. Roosevelt (Feb. 14, 1934) (on file with the Felix Frankfurter Collection, Library of Congress, Reel 155)). Senator Fletcher, who introduced the bill in the Senate, similarly declared that reforms were necessary so “that the operation of securities exchanges shall never again intensify . . . or help precipitate a business depression” and to ensure that the stock exchange was a place “for investors and not . . . [a] resort for those who would speculate or gamble.” Werner, *supra* note 38, at 1245.

85. Securities Exchange Act of 1934 § 12(g)(1), 15 U.S.C. § 78l(g)(1) (2012) (indicating that once issuers meet certain asset and shareholder thresholds, registration is necessary).

86. *Id.*

the securities traded on exchanges. Along with overseeing the registration of exchanges, the SEC received more explicit competencies in areas aimed at ensuring reasonable rates of commission, interest, listing, and other charges, as well as sweeping residual powers to alter or supplement exchange rules in “supplemental” areas of regulatory concern.⁸⁷

Furthermore, the Exchange Act targeted the internal operations of exchanges. It explicitly authorized the fledgling SEC to write rules to “regulate or prevent floor trading by exchange members” and “to prevent excessive off-floor trading by members if the Commission found it ‘detrimental to the maintenance of a fair and orderly market.’”⁸⁸ Attempts to circumvent exchange rules relating to exchange-listed securities could thus be minimized.

Similar writs of authority were granted with regard to the regulation of specialists. As mentioned above, a particular brand of broker-dealers called “specialists” made themselves available to stabilize markets and “make” markets as either buyers or sellers where the price of a security jumped or fell erratically. In order to do so, they maintained a special order book where other brokers would leave customers’ limit orders and where they had advance knowledge of the orders from the market. With the help of the order book, specialists could maintain a sufficient inventory of a stock where it appeared demand would spike and few might be willing to sell, and they could liquidate investments in order to free up capital to purchase securities where customers sold shares and no other buyers were available. This created significant informational advantages, however, insofar as specialists (or their friends) could extract super-premiums for their market-making activities.⁸⁹ In light thereof, section 11(b) of the Exchange Act grants extraordinary power to the Commission to oversee specialists and restricts the specialists to those dealings reasonably necessary to permit them “to maintain fair and orderly markets.”⁹⁰

That said, many attempts to take on the often-conflicted nature of the exchange specialist were scrapped by the SEC in order to preserve the liquidity of the NYSE, which hosted upwards of 85 percent of the country’s top stocks and the stability-enhancing services the specialists provided.⁹¹

87. Specifically, “section 19(b) of the Exchange Act gave the SEC sweeping residual powers to alter or supplement exchange rules in twelve enumerated areas and ‘similar matters.’” Werner, *supra* note 38, at 1245 (quoting 15 U.S.C. § 78s(b)).

88. HAZEN, *supra* note 50, at 116.

89. See Nicholas Wolfson & Thomas A. Russo, *The Stock Exchange Specialist: An Economic and Legal Analysis*, 1970 DUKE L.J. 707, 717 (citing to language in the House Report accompanying the progenitor of the Exchange Act). Specialists were not the only ones with informational advantages. Indeed, just being on the trading floor offered a number of advantages. Floor brokers, in particular, were in “a position to discount or revise [their] market appraisals almost instantaneously . . . [as well as] increase, decrease, or cancel . . . orders more rapidly than a non-member to whom the same information [was] only made available at a later time.” SELIGMAN, *supra* note 18, at 146 (quoting SEC, REPORT ON THE FEASIBILITY AND ADVISABILITY OF THE COMPLETE SEGREGATION OF THE FUNCTIONS OF DEALER AND BROKER 16–17 (1936)).

90. 15 U.S.C. § 78k(b).

91. See SELIGMAN, *supra* note 18, at 145–49.

Yet the lighter touch would have significant consequences for the business of trading. Customers seeking to trade NYSE-listed stocks would have little bargaining power over the Commission's members of the exchange charged. And as a member-owned nonprofit organization, a club of leading brokers and dealers, the exchange's own rules in the matter were largely geared toward increasing the profits of exchange professionals and not toward the investing public.⁹²

Gradually, however, as the nation's market ecosystem developed and matured, the monopoly rents exercised by the exchange members would serve to push customers to respond in ways that would undermine the very price discovery that made exchanges attractive. By the time the 1960s arrived, institutional investors had become the largest owners of equities—a development in part aided by technological advances.⁹³ This change in equity ownership heightened the importance and costs of high commissions. Because institutions traded large blocks of shares, the commissions added up and were more concentrated. As institutions sought ways to circumvent the fees and costs, several techniques became popular. One of the most dominant approaches was to trade NYSE securities in the OTC market, often with a non-NYSE member. Another was to trade shares on a regional exchange.

The NYSE, seeing a potential threat to its liquidity, reacted to these trading strategies in the form of Rule 394, later renamed Rule 390, which prohibited NYSE members from executing trades in NYSE-listed securities outside of the exchange.⁹⁴ That way, the argument went, liquidity could be maintained and not diluted. But it brought along the useful bonus of allowing NYSE members to price gauge customers. Institutional investors balked and complained to the SEC.

The SEC responded in 1968 by initiating a review of fixed commission rates, which lasted nearly a decade.⁹⁵ As a matter of policy, the NYSE's actions created a difficult dilemma. On the one hand, liquidity was indeed a public good that was necessary for the price discovery process. At the same time, the NYSE's actions were patently anticompetitive and allowed the members to extract monopoly rents from traders. With the second issue ultimately outweighing the first, the SEC abolished fixed rates in 1975 and, in the process, eased the economic incentives that were driving trading to regional and OTC markets.⁹⁶

Yet arguably the most remarkable aspect of the investigation is that it would bring to light other less savory aspects of the market and the increasing fragmentation of the market. As policymakers became more familiar with the off-exchange trading generated by anticompetitive market practices, both the SEC and Congress highlighted the need for a central

92. *See id.*

93. *See supra* Part I.B.2.

94. *See* SELIGMAN, *supra* note 18, at 352.

95. *See* Robert L.D. Colby & Erik R. Sirri, *Consolidation and Competition in the U.S. Equity Markets*, 5 CAP. MKT. L.J. 169, 180–81 (2010).

96. *Id.*

market system for securities to maintain a robust and interconnected trading environment.⁹⁷ So along with the other legislative reforms, Congress granted the SEC explicit authority to mandate a “national market system” for the trading of securities and to protect the price discovery mechanism necessary to support robust capital markets.⁹⁸

Notably, this congressional writ did not resolve the issue of the proper balance between consolidation and competition; rather, it suggested that the SEC was to encourage both.⁹⁹ With no clear instruction, the SEC’s response was very much a compromise in which both policy objectives were embraced. The SEC required NASD “to disseminate the best bid and ask quotes made public on the floor of the exchanges and by significant OTC market makers.”¹⁰⁰ In this way, the purpose of transparency would be advanced. But there were limits. The SEC did not, namely, require the publication of all quotes, but instead obliged the dissemination of only the best quote of each exchange and OTC market maker.¹⁰¹ Furthermore, the SEC revised Rule 390 to permit NYSE members to route orders to the OTC market where better prices were available and allowed them to make markets in an expanding array of NYSE stocks, though “few members availed themselves of these opportunities.”¹⁰² Instead, deep structural changes in the NYSE’s market operations waited over two decades, during which time other regulatory and technological changes rocked the industry.

II. DISRUPTIVE TECHNOLOGY IN NEW FINANCE

The regulatory perimeter established by the Securities Act and Exchange Act and their implementing rules would remain robust for nearly a half century. This was in large measure due to the relative durability of the market ecosystem of the time. In short, securities markets’ infrastructure was not one prone to change, so the actors animating them could be regulated with some degree of consistency. The NYSE in particular had changed surprisingly little since its creation in 1792.¹⁰³ Investors interested

97. *See id.* at 181.

98. *See id.* at 181–83.

99. *See id.* at 180–81.

100. *Id.* at 181.

101. *See id.* at 181–82.

102. *Id.* at 182. Member firms seeking to reduce the costs of executing customer order flow could now route order flow to the third market, where listed stocks traded over the counter, as well as to the floor of the NYSE. Hans R. Stoll, *The Causes and Consequences of the Rise in Third Market and Regional Trading*, 19 J. CORP. L. 509, 510 (1994). Notably, however, “the loosening of the fixed commission rate structure and the ultimate deregulation of commissions in 1975” contributed to the decline of third-market trading “because institutional investors, who had used the third market to avoid the NYSE’s fixed commission rates, had less reason to trade away from the exchanges.” Mark Borrelli, *Market Making in the Electronic Age*, 32 LOY. U. CHI. L.J. 815, 840 (2001).

103. Notably, this ecosystem was not even very far removed from the times in which the NYSE was founded in 1792. Not far from coffee houses and offices of local traders who invested their savings, “[t]rading at the NYSE took place on the floor of the exchange . . . amid the haggling of a select group of insiders.” SCOTT PATTERSON, *DARK POOLS: HIGH-SPEED TRADERS, AI BANDITS, AND THE THREAT TO THE GLOBAL FINANCIAL*

in buying or selling securities placed orders with brokers on trading floors. These orders comprised either “market orders,” which required the broker to trade immediately at the best possible price, or “limit orders,” which specified a maximum price if buying or a minimum price if selling. From there, orders were executed on trading floors operated by the exchange. The broker forwarded the order to the trading room of his brokerage house, which then phoned the order to a clerk working on the exchange. In some instances, the clerk then handed the order to a broker working on a floor, who then walked the order to a post where a designated trader, “the specialist,” acted as an auctioneer and, in many exchanges, as a market maker for the securities.

Similarly, change came only incrementally to the trading of shares over-the-counter. As they had throughout the nineteenth century, retail investors seeking to buy an unlisted stock could make a limit order for a particular security with their broker. That broker would then decide to sell those shares himself at the prices specified by the limit or market order (based on assumptions or guesses relating to the prevailing price of the security) or, alternatively, send that order to a kind of wholesale broker, known as a “market maker,” who might develop a particular specialty in that security. But, again, in contrast to the NYSE specialists, OTC market makers might compete with one another to buy or sell particular securities.¹⁰⁴ Technology would, above all else, merely upgrade the relationship among the players by allowing faster communication, through telephones, that accelerated the ability of intermediaries to gather (albeit incomplete) data about the demand and price of a stock.¹⁰⁵

As the late 1970s and 80s arrived, however, more change came to the trading floors of America’s stock exchanges in the subsequent three decades than in the previous two hundred years. As demonstrated in the following sections, these changes not only came to redefine how markets operated but, by extension, redefined the incentives and very structure of the U.S. securities ecosystem. Not only did they enable the increasing automation in financial services, but they also enabled the development of new private capital markets that circumvented some of the traditional triggers of comprehensive oversight accompanying public offerings.

A. Automated Financial Services

Technology has impacted the delivery of financial services in two key ways. First, trading has evolved in ways in which human beings have found themselves displaced by computers in the execution of trades. Second, and even more profoundly, technological developments have

SYSTEM 68 (2012). And as in the 1970s, OTC trading was, at least in theory, a possibility. *Id.* at 73 (“[I]nvestors could simply meet on the street and exchange stock certificates for cold hard cash[.] . . . [and it] often occurred—on Broad Street itself (or its curb, which came to be known as the Curb Market).”).

104. See INGEBRETSEN, *supra* note 41, at 21.

105. See *id.* at 21–22.

enabled machines, rather than humans, to make the very decisions as to what securities should be bought and sold by executing highly complicated statistical analyses based on pre-set programming and directions.

1. Computerized Trading

The first major changes to the market ecosystem were tied to the advent of computerized trading. Prior to computerized trading, “[f]inancial information was disseminated slowly, usually by ticker tape, and telephonic communication was expensive.”¹⁰⁶ The trading environment was consequently primitive: middlemen were not uncommonly inches from one another on exchanges, allowing for the expeditious identification of counterparties. Or they shouted quick orders to one another over the phone.

The pricing of orders, and their handling, was in turn highly inefficient. Instead of relying on research or statistical departments to generate accurate pricing data for securities, many broker-dealers focused on their incoming orders to generate guesses about the market, and because orders were not widely distributed, specialists and market makers imposed high bid-ask spreads to generate exorbitant profits. Meanwhile, as was seen in the back-office crisis that played out throughout the 1960s, orders for both OTC and exchange-listed securities were poorly processed by overwhelmed market intermediaries.¹⁰⁷

In the mid-1970s, however, advances in computer processing allowed new forms of trading and connectivity to arise among trading professionals. Spurred in part by the SEC’s own acknowledgement of the need to “automate” trading in the 1960s, early personal and desktop computers were embraced by financiers in an effort to lend more structure to the market.¹⁰⁸ In 1966, a NASD Automation Committee was convened to help create a system where a centralized computer could replace a floor and allow dealer participants to quote prices for stocks.¹⁰⁹ After a half decade of work, the NASDAQ was created and boasted an electronic quotation system that displayed orders from a previously dislocated network of dealers. Over time, it became the world’s first electronic stock market¹¹⁰

106. Brummer, *supra* note 76, at 1458.

107. See INGEBRETSEN, *supra* note 41, at 50–51.

108. In a famous study conducted by the SEC entitled *Special Study of the Securities Markets*, the SEC itself opined that it might one day be

technically feasible to use a central computer to record and report interdealer quotations for some or all over-the-counter securities on a continuous basis. In addition to providing a method for instantaneously determining best quotations, such a system might provide wholly new means of matching buy and sell orders and even accomplishing their executions in some circumstances.

Id. at 66 (quoting SEC, SPECIAL STUDY OF THE SECURITIES MARKETS 669 (1963)).

109. *Id.* at 77.

110. See *NASDAQ’s Story*, NASDAQ, <http://www.nasdaqomx.com/aboutus/company-information/timeline> (last visited Nov. 27, 2015) [<http://perma.cc/JJS7-F3AY>].

and allowed dealers to compete in the provision of quotes for securities in real time with one another.¹¹¹

Meanwhile, the NYSE introduced its Designated Order Turnaround (DOT) system, which electronically routed smaller market orders directly to specialists.¹¹² And in 1984, the DOT system became SuperDOT for its ability to link financial firm members to trading specialists located at trading posts on the trading floor.¹¹³ Akin to a Craigslist for stocks of the 1980s, the system operated as an electronic bulletin board for institutional investors displaying a stock's price. Orders showed up on an order display book for specialists on the exchange to see at terminals on their workstations. Later in 1984, NASDAQ established a similar system called the Small Order Execution System (SOES) to allow brokers for small investors trading less than one thousand shares to place orders *directly* with market makers.¹¹⁴

That said, professional trade execution remained, for the most part, mired in the nineteenth century. NYSE traders, as they had for years, continued to scream out orders on trading floors and scribble numbers on scraps of paper to keep records of their dealings.¹¹⁵ Hand signals indicated how many shares they wanted to buy or sell, and the first to signal a trade won.¹¹⁶ Meanwhile,

most [NASDAQ] market makers traded over the phone or used a computer system called SelectNet, which displayed bids and offers on a screen and allowed traders to place orders through a window on their terminals, much like a primitive instant message system. While [it ran] on a computer network, SelectNet [did not] actually implement the trade. It merely transmitted information about bids and offers to human market makers, who executed the trades by hand.¹¹⁷

But the technological upgrades over time allowed for new kinds of profit-making ventures that redefined how money could be made in the market. Such profit-making opportunities became especially prevalent with the advent of personal computing in the 1980s—and ushered in the first of what is considered today to be “high speed” traders. With human beings still responsible for inputting most trades by hand, traders who could connect to actual trading platforms directly and execute trades by computer were able to make orders to buy and sell faster than their competitors. The seminal opportunity for technological upgrade came in 1986, when the NASDAQ Workstation software was unveiled, which could be downloaded onto a

111. See Michael J. McGowan, *The Rise of Computerized High Frequency Trading: Use and Controversy*, 2010 DUKE L. & TECH. REV. 16, ¶ 13. Initially, however, NASDAQ was prohibited from selling restricted shares and no attempts were made by the SEC at the time to introduce more competition in the trading industry.

112. *Id.* ¶ 6.

113. *Id.*

114. INGEBRETSEN, *supra* note 41, at 101.

115. See PATTERSON, *supra* note 103, at 70.

116. *See id.*

117. *Id.* at 79.

DOS-powered personal computer.¹¹⁸ The genius of the program is that it enabled traders to create a customized list of stocks to follow and, equally as important, to monitor market makers' activity.¹¹⁹ Then, in 1994, another leap forward was taken with the debut of the Workstation II, an open-source platform that eventually opened channels for speedy traders to trade via SOES and, later, opened other trading platforms.¹²⁰ Enterprising entrepreneurs could watch stock activity and execute trades via keystrokes when they saw the market moving.¹²¹

Leveraging technology not only to access prices but also to execute trades turned the sector inside out. By the early 1990s, speed no longer meant absolute proximity to the trading floor. Traders with terminals and the right market-surveillance software could beat longstanding incumbents and insiders (i.e., dealers and specialists on the NYSE and market makers on the NASDAQ) to the punch on trades from hundreds of miles away.

In this way, electronic trading presented the possibility of making money off of the market makers and reversed the traditionally privileged position market makers had vis-à-vis traders.¹²² In the case of the SOES system, which was the first system infiltrated by high speed traders (who are now called the SOES "bandits"), dealers and brokers who had dominated the sale of a particular security were suddenly forced to become more diligent about the markets they made and the prices they offered.¹²³ A moment's lapse could expose the trader to a move by a bandit that exploited poorly calculated spreads. In this way, speed arguably catalyzed more, not less, market integrity and accuracy with regard to the minute-by-minute ticks of the market.

2. Algorithms and Artificial Intelligence

For all of the advantages electronic trading brought to some smart traders, computerization itself was only a prelude to arguably even larger changes in the securities industry that would eventually take place. Another decisive development, which continues to advance today, is the increasing dependence on, and deployment of, computers and computer processing to not only execute trades and collect market data but to also *make independent trading decisions*.

Computer decisions are based on algorithms—set procedures and functions—to program trading in such a way as to respond to new data according to the pre-set objectives or functions of investors. These algorithms are designed to deliver the highest return, or risk-adjusted return, and define certain kinds of parameters to be included in the risk calculation.

118. INGEBRETSEN, *supra* note 41, at 81. Importantly, however, market makers who received limit orders from clients were under no obligation to broadcast them. *Id.* at 145.

119. *Id.* at 81.

120. *Id.*

121. *See id.*

122. *See id.* at 81–83.

123. *See* PATTERSON, *supra* note 103, at 81.

For example, market liquidity, volatility, or other factors could be introduced into the basic trade execution programming, and through these analytic variables, an automated trade decision is made.¹²⁴

By creating programs to respond instantaneously to new information, algorithmic trading enables degrees of data analysis and execution speed previously unattainable. Early on, traders would be able to simultaneously analyze and compare the movements of not just three stocks or thirty, but thousands, at a time, every second. And with time, traders developed ever more complex execution models that attempted to maximize the objective function established by programmers in more novel and advanced ways. Programs not only calculate trades, and execute them in increasingly elaborate manners, but also sift through data variables to identify the most relevant inputs and to learn from the evolving movements or actions of other market participants. Thus, over time, a range of different trades and programs inhabited the market ecosystem. These are discussed below.

Trigger trades: At its simplest, algorithms can be employed in ways to execute limit orders once basic thresholds are met.¹²⁵ A trade trigger is usually a market condition or a specified event, such as a rise or fall in the price of a security. “For an investor looking to buy Public Company shares at \$10 dollars [sic] a share, an algorithm observes the market and sends a purchase order as soon as the price reaches this figure.”¹²⁶

Trigger trades represent profit-making opportunities in several ways. To the extent to which a trader is first to pull the trigger, his or her trade is more likely to be executed and executed before other traders can adjust prices in response. Thus, fast execution can help enable trades of even large blocks without distorting the price in ways that severely disadvantage the trader pulling the trigger. Equally important, speed helps avoid the cost of trade latency—namely the risk that the price of a security will rise before an order can be made or that an offer or bid could be revoked before securing an agreement. Finally, and most controversially, speed can enable a trader to purchase and then resell a security at a higher price to institutional investors trying to unload large blocks of securities.

Statistical arbitrageurs: More complex strategies involve leveraging mathematical formulas and past historical data to identify mispricing of stocks as they relate to one another. If, for example, two stocks in the same sector tend to track one another closely, and if the spread between the two falls out of historical means, a trader could program a computer to trade on the under- or overpriced security, acting on the assumption that the historical correlation is likely to continue and a reversion to the relationship between the securities will occur.

124. *See id.* at 194–95 (describing specifically tradebot software for algo trading and personal computers).

125. Yesha Yadav, *Beyond Efficiency in Securities Regulation* 26 (Vanderbilt Law & Econ., Working Paper No. 14-8, 2014), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2400527 [<http://perma.cc/8V6W-HXXE>].

126. *Id.*

To hide trades, new *cloaking algo strategies* were devised whereby trades, especially buy orders, were broken up into their constituent pieces to mask intentions to purchase large numbers of stock.¹²⁷ Randomizing trade strategies also were introduced to shift unexpectedly and adopt different trade strategies to protect trades and help ensure best execution. To counter these strategies, counterparties developed ever more complex *order awareness algos* to detect trading strategies and hunt large market orders like hunters following their prey. Once momentum or trading patterns were detected, trigger trades would be executed in milliseconds to beat their competition to the punch.

Execution arbitrage (the “size game” algorithm): Algorithms were used to game order execution rules of the venues in which they operated. The idea behind the algorithms was simple, even if the math was not. It also can be demonstrated best by example. In the early 1990s, certain exchanges were giving priority to firms that placed large orders, regardless of whether they were ever executed.¹²⁸ With this in mind, several twenty-something traders developed various algorithm programs, the most famous being the “Monster Key,” to send artificially inflated orders in order to get priority and leap in front of the queue to match orders.¹²⁹ By engaging in this risky, albeit statistically sophisticated, manner of trading, traders could make a ridiculous offer and still get the best price. This strategy, once discovered, was then mimicked by others with names like “Bombs,” “Superbombs,” “Guerillas,” “Stealths,” and “Snipers,” all to exploit the rules established by the venues to increase the likelihood of execution.¹³⁰

B. Private Capital Markets

Automated trading and execution were not the only developments to transform the industry. Other changes would also roil markets as new venues for trading proliferated, often with the help of regulatory interventions. Namely, not only would securities be traded on more markets outside the traditional exchange infrastructure, but a secondary market for private placements would also be established.

1. Alternative Trading Venues

The impact of technology on the environment for securities issuances and trading proved, after a period of initial gestation and experimentation among market participants, to be profound. As the following sections indicate, engineers and programmers developed new platforms to accommodate electronic trading systems. New regulatory guidelines, meanwhile, incentivized, and in some instances necessitated, greater

127. See KENDALL KIM, *ELECTRONIC AND ALGORITHMIC TRADING TECHNOLOGY: THE COMPLETE GUIDE* 93 (2007).

128. See PATTERSON, *supra* note 103, at 94–95.

129. *Id.*

130. *Id.*

computerization and specialization with regard to services intermediaries provided.

a. From Island to Archipelago

The biggest limitation of artificial intelligence (AI) was that it did not always jive well with human intelligence. Human beings—in all their irrationality, impulsiveness, greed, and fear—were unpredictable and thus did not interact well with computers, even though people programmed them.¹³¹ Unlike computers, human beings made plenty of mistakes inputting and executing orders, “upsetting the rigid computer-driven systems, which depended on precise order.”¹³²

This was a huge problem for early adopters of technology throughout the 1990s. Even with the incremental creation of electronic platforms and trading systems, humans were still very much at the heart of trading. On the NYSE, which dominated trading of blue-chip stocks such as IBM and GE through floor specialists who monopolized the trading of a security, and even on the NASDAQ, where roughly five hundred market makers competed to offer the most attractive bids and offers of other stocks, trading was for the most part done manually. A change was thus needed in the form of new, sanitized markets to connect electronic (algorithmic) traders and develop a new market ecosystem free of human interference.

To accommodate this demand, engineers and financiers began to develop platforms to connect computerized trading systems. It was not an entirely novel project. As Part II.A explained, since the mid-1980s, systems had been in development to connect traders of small volumes directly to the market. During this period, traders themselves recognized the advantages (and profits) that could come from supercharging trading speeds. Eventually, however, some of the most popular programs, specifically the Watcher, began to generate sufficient volume, and operators recognized that a valuable service could be made matching orders coming into their system.¹³³ That way, buy and sell orders could be connected internally and thus avoid the commissions charged by the market makers on exchanges.

One of the most successful Datek traders, and creator of the Watcher, designed a system where users could trade directly between themselves without interacting with a market maker.¹³⁴ From this system, the electronic communication network (ECN) that would be known as “Island” was launched in 1996.¹³⁵ Island was innovative insofar as traders could subscribe to their services and receive information on stocks through an electronic feed. To promote the process and encourage trading, once trades were booked, they were reported to the consolidated tape—a program providing constantly updated information on trading volume and prices—

131. *Id.* at 29.

132. *Id.*

133. *Id.* at 116.

134. *See id.* at 116–17.

135. *See id.*

and then published for free on the Island website using a program called Bookviewer.¹³⁶ In providing the service, Island became known as one of the first “lit” alternative trading venues for securities trading.¹³⁷ Without having to rely on humans for processing all aspects of their orders manually, Island would set the stage for algorithmic trading to later grow, adapt, mutate, and evolve.

During the same decade, a company known as “Instinet” would also create a market-leading ECN.¹³⁸ This ECN hosted entirely anonymous trading among institutional investors and was facilitated through Instinet hardware. Traders had to rent the computer for a modest fee of about \$1000 a month, and their firms needed to pass through a credit committee that essentially only allowed the largest, most wealthy players to participate.¹³⁹ Computers would display buy and sell orders, though trades were not reported to the public until after they were completed. Equally “[i]mportant, the matching process wasn’t automated. Living, breathing Instinet traders sitting at desks in Instinet’s midtown Manhattan headquarters did the actual grunt work of bringing the buy and sell orders together and settling the deal, usually through a few quick phone calls with the institutions themselves.”¹⁴⁰

Between the two, “Island quickly gained a reputation as having one of the fastest ‘matching engines’—the computer system that links together buy and sell orders—on Wall Street.”¹⁴¹ Almost immediately, more traders began to migrate to its system, and as its popularity grew and more transactions were consummated on its platform, it started taking market share away from NSADAQ itself.¹⁴²

With Island’s dominance, competitors regrouped to knock the firm off its perch. One former SOES trader in particular, Jerry Putnam, recognized that a potentially successful strategy to challenge Island would be to create an ECN where trades were first routed there, and then if there was no match—due to limited liquidity—a software program driven by advanced AI infrastructure would assess the market and route the trade for its best match elsewhere.¹⁴³ From this pathbreaking idea, the “smart order router,” a computerized system that watches and surveys the rest of the market for trade matches, was born.¹⁴⁴ In short, a new kind of network was envisioned, one that could link “islands” of liquidity together: an

136. *Id.* at 119.

137. *Id.* at 118–19.

138. *Id.* at 110.

139. *See id.*

140. *Id.*

141. Scott Patterson, *Man Vs. Machine: How the Crash of ‘87 Gave Birth to High-Frequency Trading*, CNBC (Sept. 13, 2010, 4:47 PM), <http://www.cnbc.com/id/39038914> [<http://perma.cc/K5DT-SUT5>].

142. *Id.*

143. *Id.*

144. *Id.*

“archipelago” of markets. In 1997, Putnam launched the Archipelago ECN.¹⁴⁵

Archipelago prospered and grew with the help of investment banks like Goldman Sachs who were actively funneling orders into its system.¹⁴⁶ The firm’s savvy move to link pools of liquidity provided new levels of assurance that orders could and would be executed. Island, too, continued to eat into NASDAQ’s market share as a steady flow of traders began entering the market on the heels of the internet bubble.¹⁴⁷ By 1998, Island managed to capture one-tenth of the volume of all NASDAQ stocks and had established itself as the top NASDAQ dealer of premium internet stocks, such as Yahoo! and Amazon.¹⁴⁸

b. Order Handling and Decimalization

Yet the major drivers of ECN growth came not only from technological innovation, but from novel rulemaking as well. By 1997, evidence had been presented showing that market makers ignored odd-eighth quotes.¹⁴⁹ That is, instead of making bids in one-eighth increments, dealers quoted prices in one-half or three-quarter increments, suggesting a coordinated attempt to keep the bid-ask spread wide (and earn outsized profits).¹⁵⁰ In response to the scandal, which belied considerable market manipulation, in 1997 the SEC passed new “Order Handling Rules” that required exchange specialists and OTC market makers to publicly display customer limit orders (again, orders to buy or sell at a specific price) when the orders were better than the quotes offered by the specialist or market maker.¹⁵¹ In that way, the investing public could compete directly in the price discovery process and for transactions. Specialists and market makers could still trade at better prices in the ECNs without publishing an improved quote, but the ECN would have to eventually publish the improved prices and make them available to the investing public.

The idea behind the rules, which in many respects created the legal category of an ECN, was in part to bring Instinet trades to the light. But it had the side effect of essentially mandating that bids and offers for stocks on ECNs be displayed on terminals right beside those of the NASDAQ market makers.¹⁵² By opening up the market in this way, the playing field for the entire secondary market was leveled. Electronic systems like Island could suddenly compete head-to-head with investment banks and the exchanges. And large dealers like Goldman Sachs and Morgan Stanley

145. *Id.*

146. *Id.*

147. See PATTERSON, *supra* note 103, at 152–53.

148. *See id.*

149. See generally William G. Christie & Paul H. Schultz, *Why Do NASDAQ Market Makers Avoid Odd-Eighth Quotes?*, 49 J. FIN. 1813 (1994) (finding evidence that traders avoid using odd-eighth quotes and suggesting collusion as an explanation).

150. See Colby & Sirri, *supra* note 95, at 184.

151. Patterson, *supra* note 141.

152. *Id.*

now had to keep apprised of ECN markets as the dealer choke hold over order flow was cracked.¹⁵³ Technology became critical for processing the data, and home-based systems were quickly being replaced by screen-based networks.¹⁵⁴ Concomitantly, AI was used not only to execute but also to drive the trading process forward.

At the same time, the SEC regulated the new market venues with a markedly light touch. Although ECNs were poised to grow in importance, they were not regulated as exchanges. Instead, under Regulation ATS¹⁵⁵ and Rule 3b-18,¹⁵⁶ they could avoid registration with the Commission, as well as the securities registration requirements, self-regulatory obligations, and other restrictions on institutional members' exchange registration.¹⁵⁷ The primary condition was that they were operated by a broker-dealer, were not the dominant market for the trading of the security, and did not use the word "exchange" in their name.¹⁵⁸

Another catalyst driving electronic trading forward came in 2000 with "decimalization," which required that stocks be traded in penny increments instead of fractions of a dollar.¹⁵⁹ With decimalization, stocks could trade in more diverse increments, generating more computational complexity better tackled by computers than the human brain.¹⁶⁰ Moreover, penny increments sliced prevailing bid-ask spreads, forcing many established market makers to close shop—and opening up opportunities for hyper-efficient, high-speed firms that could do more work and handle greater volumes to stay in the black.¹⁶¹

Arguably the most important development arose when Rule 390 was repealed. As noted in the discussion above, Rule 390 prevented NYSE-listed companies from engaging in off-floor transactions.¹⁶² In 2001, however, after a series of public criticisms by SEC Chairman Arthur Levitt, the rule was effectively dismantled, and stocks listed on the NYSE, regional exchanges, and the Chicago Board Options exchange were freely tradable in the OTC markets.¹⁶³ This in turn released enormous pressure on the NYSE to compete with other more technologically advanced trading venues that could—and did—appeal to traders and nonmembers.¹⁶⁴

Collectively, these developments reshaped the industry of exchange trading as exchanges' market share decreased alongside commissions. The competition eventually forced exchanges to adapt for the sake of their own survival. The most dramatic move came in 2005. On April 20, John Thain,

153. PATTERSON, *supra* note 103, at 128.

154. *Id.*

155. *See* Colby & Sirri, *supra* note 95, at 183–84.

156. *Id.*

157. *Id.*

158. *See id.*

159. *See id.* at 184–85.

160. *See* Patterson, *supra* note 141.

161. *See id.*

162. *See* Colby & Sirri, *supra* note 95, at 181.

163. *See id.* at 176 n.13.

164. *See* KIM, *supra* note 127, at 46–47.

the CEO of the NYSE, announced alongside archrival Archipelago CEO Putnam that the two firms would merge and that the new exchange would promote a hybrid market that integrated into one platform both an auction and automated market.¹⁶⁵ Additionally, the firm would be publicly traded, instead of member owned.¹⁶⁶ By merging, it was hoped that the NYSE would win front-end technology, an experienced staff capable of running it, and entrepreneurial management.¹⁶⁷ Public ownership offering would meanwhile focus the firm on becoming as competitive and useful for traders and investors as for the exchange members who traditionally manipulated its rules for their benefit. Two days later, on April 22, 2005, NASDAQ announced a definitive agreement to purchase another large ECN, Instinet Group Incorporated, and in the process acquire Inet—a large ECN that traded 25 percent of the NASDAQ listed volume daily—and use its technology to help save costs and upgrade its systems.¹⁶⁸ Between the two transactions, the matching engine at NASDAQ became essentially the same one created in the early 1990s by early SOES traders, just as the NYSE's platform was that of the ECN Arca.¹⁶⁹

c. Regulation NMS

Inevitably, one outcome of the technological one-upmanship was market specialization as ECNs began to proliferate. Some catered to high frequency traders and provided an ideal environment for them to weave in and out of their markets—and thus boasted high levels of liquidity. Others, in contrast, would eventually seek to replicate and build off of Instinet's attempts to create high frequency trading (HFT)—free, anonymous “dark pools” of capital. The idea was that, by shifting trades into the shadows, they could allow institutional investors to trade large blocks of stocks without moving the market.¹⁷⁰ Meanwhile, established exchanges began to fight more deliberately for order flow by upgrading their platforms and changing the business models that had guided them for over two hundred years.

Not surprisingly, however, with competition, trading became decentralized and fewer market participants coalesced around the same venues to trade. This development in turn created market fragmentation, to the consternation of many policymakers and market participants. For one, regulators and economists began to worry that with fewer market participants interacting with one another in any one particular place, prices would respond more slowly to new information, creating longer periods in

165. *See id.*

166. *See id.*

167. *See id.* at 47.

168. *See id.* at 48.

169. *See* Patterson, *supra* note 141.

170. Such a strategy would in effect end up mimicking the so-called “fourth market” where investors trade with one another. Polly Nyquist, *Failure to Engage: The Regulation of Proprietary Trading Systems*, 13 YALE L. & POL'Y REV. 281, 288–89 (1995).

which market prices were out of alignment with their “real” equilibrium price.¹⁷¹ It also meant that infrastructure providers might not route trades to the venues that offered the best execution. Fragmentation also enabled a free rider problem to the extent that market participants operating via ECNs executed trades based on the market price generated and displayed by lit public venues.¹⁷² Because publicly generated information often fueled trading, ECNs’ business models relied at least in part on participants skimming the price information generated (and subsidized) by exchanges, though exchanges were not compensated for the information they generated.

With these concerns in mind, the SEC promulgated Regulation NMS in 2007 to better coordinate markets.¹⁷³ Under the regulation, any investor’s instructions to buy or sell a stock had to be diverted to the venue that displayed the best price.¹⁷⁴ If an investor placed a limit order to buy Twitter on the NASDAQ, where it was selling for \$41.22, and the investor’s broker, a NASDAQ market maker, discovered there was a better price on Archipelago for \$42, then he had to be routed to Archipelago.

Though the rules made intuitive sense, they unleashed yet another series of new pressures to ensure technological competitiveness. One element of the rule, the so-called trade-through rule, allowed firms to trade through human-controlled manual markets if they were too slow in processing orders.¹⁷⁵ Furthermore, trading venues would have to constantly monitor the price of the stock on every trading venue, all the time, a feat beyond the capacity of the mind.¹⁷⁶ Together, these new developments would make the use of industrial-strength computerized trading and execution a practical necessity.¹⁷⁷

But there were also a number of complications. Because prices were still the dominant component of trading decisions, any fluctuation in prices, no matter how minuscule, could result in an order being rejected or diverted to another venue. Or a firm could find itself with what it thought was a highly competitive bid one minute, and kicked to the back of the queue of incoming orders the next.¹⁷⁸ This raised risks of bad execution for HFTs, now the dominant source of liquidity, and could undermine the attractiveness of venues seeking their business.

Some venues responded to their technology-wielding (and fee-generating) customers by, among other things, rolling out new order types called “sitting duck limit orders” that allowed high-frequency traders who

171. Mark Klock, *The SEC’s New Regulation ATS: Placing the Myth of Market Fragmentation Ahead of Economic Theory and Evidence*, 51 FLA. L. REV. 753, 777 (1999).

172. *See id.* at 781.

173. Regulation NMS, SEC Release No. 34-51808, 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270 (June 9, 2005), <https://www.sec.gov/rules/final/34-51808.pdf> [<http://perma.cc/8FMD-DGCB>].

174. *See* Nyquist, *supra* note 170, at 292–93.

175. PATTERSON, *supra* note 103, at 239.

176. *Id.* at 49.

177. *Id.* at 239–40.

178. *See id.* at 49.

posted orders to remain hidden at a specific price point at the front of the trading line when the market was moving.¹⁷⁹ Through the orders, traders could sideline typical limit orders made by slower institutional investors like mutual funds and pensions. And to sweeten the incentives to trade, they created rules allowing HFTs to make other firms pay a “take” fee for using the liquidity they were “making.” Thus, in providing the special orders for privileged traders, exchanges were allowing, and even helping, firms circumvent Regulation NMS by creating a secret “dark pool inside the lit pool.”¹⁸⁰ Meanwhile, other ECNs resorted to slashing their commissions with the result that their bottom line would take a direct hit—all with the goal of becoming more attractive for a host of new competitors coming of age in the wake of the order-handling rules like BRUT, Sigma X, and B-Trade.¹⁸¹

Through such episodic forms, the SEC’s Regulation NMS, when combined with the order-handling rules and regulation alternative trading systems (ATS), facilitated a patchwork of regulations aimed at balancing competition and price discovery. Exchanges, significant OTC market makers, and ATS with more than 5 percent of the volume in a security would have to display their best bid and offers; broker-dealers would also have to report all trades, block or non-block, within thirty seconds.¹⁸² Trading centers additionally had to publish statistics to show what quality of markets they were providing training centers and were prohibited from trading at inferior prices to the best quote published by other electronic trading centers.¹⁸³ Meanwhile, broker-dealers were subject to increasingly stringent best execution requirements and obligated to disclose which trading centers they used to route their orders.¹⁸⁴

The market impact was, and continues to be, dramatic. As discussed above, all U.S. exchanges have become primarily electronic, a development that has boosted trading volume and is squeezing commissions on a per trade basis. At the same time, the fragmentation has given traders an expanded array of venues as to where and how to execute their trades, a topic this Article returns to below. Suffice it to say, for the moment, not only have electronic traders found and identified ecosystems that have suited their infrastructure needs, but institutional investors themselves also have used the fragmented ecosystem to execute even large trades in ways that do not necessarily move markets by filling them in smaller venues where quotes are not required to be published.

179. *See id.* at 50. Varying forms of queue-jumping programs were reportedly embedded in maker-taker functionality models marketed to select high frequency traders to additionally enable execution on favorable terms. Stanislav Dolgoplov, *The Maker-Taker Pricing Model and Its Impact on the Securities Market Structure: A Can of Worms for Securities Fraud?*, 8 VA. L. & BUS. REV. 231, 259 (2014).

180. PATTERSON, *supra* note 103, at 50.

181. *See* Dolgoplov, *supra* note 179, at 244–46.

182. *See* Colby & Sirri, *supra* note 95, at 182.

183. *See id.* at 184–85.

184. *See id.* at 185.

2. Rule 144A Trading Platforms

Many of the brokerages that had been participating in the migration away from exchanges realized that similar opportunities potentially existed in the private placement market. Just as algo traders needed private, volume-rich markets to sell and interact, issuers of securities increasingly sought pools of liquidity for their stocks and bonds where institutional traders could meet, off exchange, in order to avoid triggering Exchange Act reporting obligations.

The prospect of a secondary market for private placements was not novel, but was nonetheless riveting. As mentioned above in Part I, the broadest exemption to the section 5 registration requirement was section 4(2), which exempted transactions “not involving any public offering.”¹⁸⁵ But at the time of the New Deal, and for decades following it, just what was required to meet that threshold was ambiguous,¹⁸⁶ and if for whatever reason an issuer failed to comply with all the dictates of section 4(2), they would find themselves faced with rescission liability under section 12 of the Exchange Act. Only in the course of nearly forty years of case law, which worked to articulate standards for private placements, and the promulgation of Regulation D in 1982, which sculpted out three relatively clear paths for avoiding exemption under the Securities Act,¹⁸⁷ was sufficient comfort made available to incentivize issuers to expend more time investigating the prospects of nonpublic offerings.

Yet even then, more legal reforms were needed to facilitate a secondary market. The beauty of Regulation D was that it opened up a number of ways for companies to raise capital without going public. Rule 504, for example, permits general solicitations and unregistered offerings up to \$1 million,¹⁸⁸ and Rule 505 enabled fundraisings of \$5 million, though prohibited public marketing.¹⁸⁹ Most critical, however, was Rule 506, which opened a pathway for companies to issue an unlimited amount of securities to “accredited investors”—essentially investors earning more than \$200,000 a year or with a net worth greater than \$1 million—so long as they did not market the transaction to the public.¹⁹⁰ But there were still plenty of regulatory hurdles. Investors could invest in private securities, though they could not legally resell them without risking running afoul of

185. Securities Act of 1933 § 4(2), 15 U.S.C. § 77d(a)(2) (2012).

186. See Letter of General Counsel, *supra* note 33. Notably, no instruction was given as to how to weigh the varying factors that might indicate whether an offering qualified for an exemption, or whether and to what degree other factors were relevant. See *id.*

187. For an overview of Regulation D and Rules 504, 505 and 506, see *Fast Answers*, SEC, <http://www.sec.gov/answers/regd.htm> (last visited Nov. 27, 2015) [<http://perma.cc/8AQW-95LP>].

188. See Exemption for Limited Offerings and Sales of Securities Not Exceeding \$1,000,000, 17 C.F.R. § 230.504 (2013).

189. See Exemption for Limited Offers and Sales of Securities Not Exceeding \$5,000,000, 17 C.F.R. § 230.505.

190. See Definitions and Terms Used in Regulation D, 17 C.F.R. § 230.501(a)(5)–(6) (2012) (defining accredited investors).

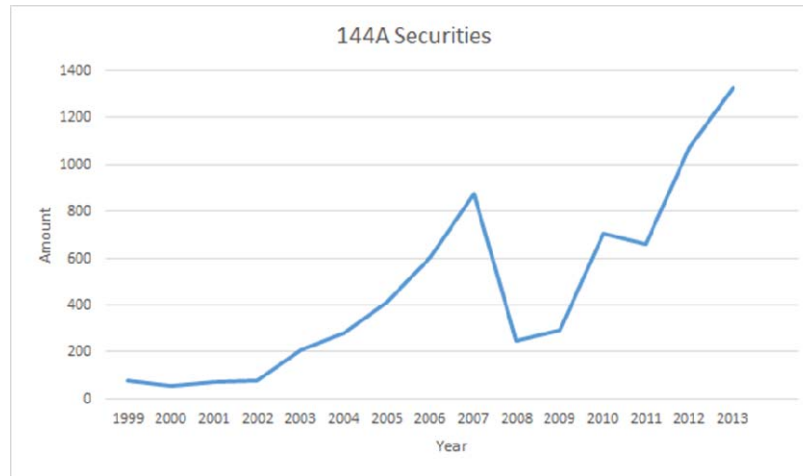
section 4(2) and likewise violating the Securities Act. As with the original section 4(2) exemptions, various means of reselling were often ambiguous and required cobbling together doctrines from the Securities Act in ways that were not always clear and thus raised concerns among institutions. The cost of raising capital under private placements was therefore still high since securities that were issued, even under Regulation D, were for the most part immobile and traded only with considerable difficulty.

The real revolution came about with Rule 144A in 1994, which would liberalize trading by institutional investors (referred to as “qualified institutional buyers” or “QIBs”) of securities that were privately placed.¹⁹¹ Specifically, Rule 144A would enable securities acquired pursuant to Regulation D (or other Rule 144A transactions) to be sold to other institutions (generally with \$10 million under management) with no holding period imposed and minimal disclosure requirements.¹⁹²

Even today, the impact of Rule 144A is hard to overstate. For the half century following the Exchange Act and well past the promulgation of Regulation D, the trading of private placements—to the extent to which it was even possible given what had been lengthy holding periods and legal risk when the “restricted securities” were traded—had been facilitated like any other over-the-counter securities—via a network of brokers and dealers reliant on phone lines, gossip, and hot tips. Rule 144A would change this significantly. Although issuances would still lack the market infrastructure found in public markets, Rule 144A would reshape capital markets by enabling more flexible fundraising and trading capabilities for institutional investors. Firms could raise capital, free of most substantive requirements (though notably Rule 10b-5 antifraud provisions would still be in effect), and sell their securities to well-heeled institutional investors. Institutional investors, meanwhile, could then trade the securities among one another. With channels now wide open, capital markets would be reshaped. Indeed, by 2006, America raised more money, \$162 billion, from private investors than from IPOs, from which \$154 billion was raised from the three major stock exchanges at the time.

191. *See* Private Resales of Securities to Institutions, 17 C.F.R. § 230.144A(a)(1)(i).

192. *Id.* § 230.144A(a)(1)(ii).

Figure 1¹⁹³

The only thing missing was a platform for connecting buyers and sellers of privately placed securities—in short, an off-exchange venue where the purchase and sale of private securities could coalesce without triggering registration requirements and the quarterly and annual disclosure requirements that accompanied it. With this in mind, in 2007, at the height of the housing bubble and the 144A market, several companies entered the race to create a private exchange for private placements. In 2007, Goldman Sachs started its own marketplace naming it “the Goldman Sachs Tradable Unregistered Equity platform,” or GStrUE.¹⁹⁴ The idea, as Lloyd C. Blankfein, the Goldman CEO, would argue, was to bring “the liquidity of an exchange with the flexibility of a private placement.”¹⁹⁵ The venture would attract, most spectacularly, Oaktree Management and Apollo Global Management, which both raised over \$700 million on the network.¹⁹⁶

Similarly, the NASDAQ exchange also entered the fray with a new platform, called “the Portal Market,” and planned to host nearly 500 different firms on its network.¹⁹⁷ Major investment banks, including

193. This figure was created with the help of librarians at the Georgetown Law Library. The IPO data used in this figure was gathered from a researcher’s website who compiled that information. See Jay. R. Ritter, *IPO Data*, WARRINGTON C. OF BUS., <http://bear.warrington.ufl.edu/ritter/ipodata.htm> (last visited Nov. 27, 2015) [<http://perma.cc/7AWJ-DLEL>]. In addition, the IPO and 144A data were drawn from Bloomberg Law.

194. Peter Lattman, *Private Goldman Exchange Officially Closes for Business*, N.Y. TIMES (Apr. 12, 2012, 5:09 PM), http://dealbook.nytimes.com/2012/04/12/private-goldman-exchange-officially-closes-for-business/?_php=true&_type=blogs&_r=0 [<http://perma.cc/2QD4-VKPK>].

195. *Id.*

196. *Id.*

197. See Elena Schwieger, *Redefining the Private Placement Market After Sarbanes-Oxley: NASDAQ’s Portal and Rule 144A*, 57 CATH. U. L. REV. 885, 888 (2008).

Merrill Lynch, Lehman Brothers, and Citigroup began to set up their own competing exchanges. With Portal in particular, which would be the largest venue, investors would be able to log on to a secure website to access data relating to the firms and then trade shares on a secure server. Prices, as on any other electronic communications network, could then be updated automatically.

There was, however, one enormous stumbling block: an absence of people interested in trading on the private exchanges. Investors who purchased shares of Apollo and Oaktree on GSTRUE “found few, if any, buyers, for their stock when they wanted to sell.”¹⁹⁸ Part of GSTRUE’s woes stemmed from the problem that credit markets froze up at the same time the platform was launched. Then, as Lehman failed, the financial crisis gripped global markets, and “investors became allergic to any investment where liquidity was an issue.”¹⁹⁹ As a result, investors in Apollo and Oaktree suffered steep losses as shares changed hands only at a “steep discount to their true value.”²⁰⁰ Eventually, GSTRUE and all of the first-generation firms vying to run private exchanges closed shop.

The retreat, however, proved only to be a tactical one. Eight years later, engineers were busy trying to think through a more palatable platform for the post-recession environment. One firm, SecondMarket, which was originally founded in 2004 to create a liquidity platform for restricted securities, diversified its business strategy in the wake of the crisis to also service liquidity needs of distressed or illiquid assets including bankruptcy claims, limited partnership interests, structured products (MBS, CDO, ABS), and Bitcoin.²⁰¹

Then, more spectacularly in 2013, NASDAQ (now called NASDAQ OMX) reentered the 144A market alongside SharesPost—a firm that allowed investors to swap shares of private companies for cash—to launch a new marketplace for trading shares in privately held companies.²⁰² As was the case a decade earlier with Portal, part of the venture’s appeal was allowing investors to buy into young and promising capital-hungry firms. But this time, instead of developing its platform by itself, NASDAQ leveraged SharesPost’s website, technology, and relationships with Silicon Valley to launch a joint venture.

198. Lattman, *supra* note 194.

199. *Id.*

200. *Id.*

201. See Rory Maher, *How Can Twitter and Facebook Employees Cash Out Now; SecondMarket Offers New Marketplace*, GIGAOM (Apr. 23, 2009, 1:15 PM), <http://gigaom.com/2009/04/23/419-how-can-twitter-and-facebook-employees-cash-out-now/> [<http://perma.cc/JS22-K6DF>].

202. See Aman Shah, *NASDAQ, SharesPost to Set Up Market for Unlisted Stocks*, REUTERS (Mar. 6, 2013, 9:52 AM), <http://www.reuters.com/article/2013/03/06/us-nasdaq-sharespost-idUSBRE9250KT20130306> [<http://perma.cc/JND6-MEE9>]; cf. *About Us, NASDAQ PRIVATE MARKET*, <https://www.nasdaqprivatemarket.com/about-us> (last visited Nov. 27, 2015) [<http://perma.cc/DY4X-3L9A>].

Business strategies are continuously changing as well.²⁰³ In contrast to Portal, the joint venture reportedly offered companies a greater degree of authority over a range of offering-related matters, even as they pertain to the secondary market: “who can buy and sell, how much equity and cash changes hands, and even the timing of trades”—a feature that competitor SecondMarket has similarly imported into its own growing platform.²⁰⁴ In that way, listing companies will enjoy more comfort as to the ownership of their shares and will be able to more effectively craft appropriate market signals to accredited investors and QIBs about their securities. Meanwhile, to reduce the likely considerable impact such restrictions would have on the liquidity of private issuances, the leveraging of a website instead of a closed-end platform potentially allows issuers to utilize new JOBS Act²⁰⁵ reforms (elaborated in the following section) to generally solicit investors to create a larger funding base. If successful, the new market could create a self-sustaining secondary exchange for smaller, entrepreneurial companies, or a bridge for early stage companies that might eventually list on a major exchange. The prospect of such an account has indeed only increased with an announcement by NASDAQ in October 2015 of its intent to purchase the company.²⁰⁶

3. From Crowdfunding to Crowd Investing

The same JOBS Act that provided the legal basis for expanding the 144A market also had an important impact on crowdfunding and triggered an explosion in web-based innovation and financial products for the young sector.

The definition of “crowdfunding” has been subject to some dispute, but traditionally the term has referred to methods by which entrepreneurs collect small contributions via an online interface to finance or capitalize their ventures.²⁰⁷ As a financing venture, its origins lie as much in banking

203. See J. O’Dell, *Is NASDAQ’s New Private Market the Exchange’s Last Hope in a Web-Driven World?*, VENTURE BEAT (Mar. 6, 2013, 12:01 PM), <http://venturebeat.com/2013/03/06/nasdaq-private-market-analysis/> [http://perma.cc/BQA5-FE3G].

204. *Id.*

205. See *infra* note 226 and accompanying text.

206. Kaja Whitehouse, *NASDAQ Buys Secondmarket As Hot Companies Stay Private Longer*, USA TODAY (Oct. 22, 2015, 2:47 PM), <http://www.usatoday.com/story/money/2015/10/22/nasdaq-buys-secondmarket-hot-companies-stay-private-longer/74402134/> [http://perma.cc/8UZY-4UNZ].

207. As a legal matter, under the federal securities laws, crowdfunding denotes the offer or sale of securities pursuant to the specified crowdfunding exemption established by section 4(a)(6) of the Securities Act. As a practical matter, however, “crowdfunding” is largely a term of art and refers generically to the method of raising capital by acquiring small amounts of capital directly from individual investors, typically via a publicly accessible online platform, in exchange for a specified reward. Crowd investing, meanwhile, is often used among market participants to denote crowdfunding programs where investors acquire equity in the venture. See Tanya Prive, *What Is Crowdfunding and How Does It Benefit the Economy*, FORBES (Nov. 27, 2012, 10:50 AM), <http://www.forbes.com/sites/tanyaprive/2012/11/27/what-is-crowdfunding-and-how-does-it-benefit-the-economy/> [http://perma.cc/B6JR-U4XN].

as they do in securities. In 1976, Muhammad Yunus lent \$27 to forty-two women to make bamboo furniture.²⁰⁸ The idea was to create new opportunities for the poor by giving entrepreneurs access to banking services and products that had until that time been foreclosed to them.²⁰⁹ After recuperating his capital, and demonstrating the safety of mini-loans to the poor, Yunus secured capital from central banks and foundations to extend the project to others.²¹⁰ Within five years, the program had over 30,000 members, from which the Nobel Prize-winning Grameen Bank was born.²¹¹

The revolution in what would be called “microlending” or “microfinance” met the internet age three decades later. In 2005, Kiva.org launched the first microlending website.²¹² By uploading profiles and pictures of potential loan recipients, it globalized Yunus’s original concept. It also reduced the informational asymmetries that naturally accompanied global finance. Lenders could identify (often personally) with borrowers, consider their business plan, and evaluate repayment in real time. In this way, finance operated via increasingly commonplace social media technology—which required far less expertise and coding than the ECNs and dark pools required to facilitate HFT—to generate interest in small-scale entrepreneurial activities taking place all over the world.²¹³ The concept was quickly replicated in 2006, when Prosper.com launched the first peer-to-peer lending site in the United States and took the unprecedented step of offering loans, often below bank rates, to entrepreneurs not in only developing countries, but in the United States as well.²¹⁴

The evolutionary leap from bank to securities finance arose circuitously. In 2009, Kickstarter launched as a new way to fund creativity.²¹⁵ The company, alongside commentator Michael Sullivan, also helped coin the

208. See Stefan Lovgren, *Nobel Peace Prize Goes to Micro-Loan Pioneers*, NAT’L GEOGRAPHIC NEWS (Oct. 13, 2006), <http://news.nationalgeographic.com/news/2006/10/061013-nobel-peace.html> [<http://perma.cc/J648-TNMY>].

209. See Muhammad Yunus, *Grameen Bank, Microcredit and Millennium Development Goals*, 39 ECON. & POL. WKLY. 4077, 4077 (2004).

210. See *id.*

211. See *Crowdfunding History*, FUNDABLE, <https://www.fundable.com/learn/resources/guides/crowdfunding-guide/crowdfunding-history> (last visited Nov. 27, 2015) [<http://perma.cc/798L-WGLM>].

212. See Press Release, Kiva, *Kiva.org Merges Philanthropy and Venture Capital with First-Ever Microlending Web Site* (Oct. 12, 2005), http://www.kiva.org/press/releases/release_20130114-15 [<http://perma.cc/6L6F-HYB7>].

213. See Emily Maltby, *Tapping the Crowd for Funds: Entrepreneurs Reach Out to Investors Through Social Networks, Sites for Capital*, WALL STREET J. (Dec. 8, 2010, 12:01 AM), <http://online.wsj.com/news/articles/SB1000142405274870349350457600746379697774> [<http://perma.cc/HT4Y-SN44>].

214. See *Institutional Investment Through Prosper*, PROSPER, <https://www.prosper.com/about/institutional/institutions/> (last visited Nov. 27, 2015) [<http://perma.cc/LG68-LZC6>].

215. See Yancey Strickler, *How Was the First Year of Kickstarter?*, FORBES (Feb. 3, 2014, 12:31 PM), <http://www.forbes.com/sites/quora/2014/02/03/how-was-the-first-year-of-kickstarter/> [<http://perma.cc/G44T-CGKG>].

term of “crowdfunding.”²¹⁶ Taking this concept as part of its brand, Kickstarter initiated a means of finance whereby young entrepreneurs would receive funding.²¹⁷ Contributors would not, however, receive cash back, much less interest.²¹⁸ Instead, contributors become eligible for a range of “rewards” ranging from video games to apps or whatever else the recipient of the funds is making or striving to create.²¹⁹ Notably, doing so allowed participants on the webpage, and especially entrepreneurs, to avoid falling within the definition of selling “securities” because contributors were not looking for a “profit” in the traditional sense.²²⁰ They were not entirely altruistic for sure, as they usually received something in return for their contributions, but because they were not investing their money for capital returns, the transactions fell well outside of the traditional meaning of a security (or, more relevantly, an “investment contract”) as defined under U.S. case law.²²¹ Because there were no dealings in securities, section 5 could not apply.

The prospect of securities-based crowdfunding was, however, of increasing interest to both Wall Street and entrepreneurs. In short, the technology that enabled peer-to-peer (donation-based) lending could be a powerful tool for enabling securities transactions as well. In that way, people could be free to donate, or seek perks, but they also could invest in early-stage ventures.

Several important roadblocks, however, were in the way. Most notably, once traditional securities transactions were married with internet technology, investors would be seeking “profits” and, by extension, capital returns, thus triggering section 5. Consequently, they would be subject to registration and disclosure obligations under the Securities Act²²² (and subsequent reporting requirements under the Exchange Act²²³).

Furthermore, exemptions were of limited help. Regulation D and Rule 144A were of little use on the internet as advertisements about securities constitute a “general solicitation”—which was banned for private placements (and the reason why much of the activity had been routed to

216. See Daniela Castrataro, *A Social History of Crowdfunding*, SOC. MEDIA WK. (Dec. 12, 2011), <http://socialmediaweek.org/blog/2011/12/a-social-history-of-crowdfunding/> [http://perma.cc/6YSP-K8XS].

217. See Chance Barnett, *Donation-Based Crowdfunding Sites: Kickstarter Vs. Indiegogo*, FORBES (Sept. 9, 2013, 9:00 AM), <http://www.forbes.com/sites/chancebarnett/2013/09/09/donation-based-crowdfunding-sites-kickstarter-vs-indiegogo/> [http://perma.cc/XCB6-YKJS].

218. See *id.*

219. See *id.*

220. See *id.*

221. SEC v. W.J. Howey Co., 328 U.S. 293, 298 (1946) (defining an investment contract to comprise an investment of money, with an expectation of profits arising from a common enterprise which depends solely on the efforts of others to determine if an investment is a security).

222. Securities Act of 1933, 15 U.S.C. §§ 77(a)–(mm) (2012).

223. Securities Exchange Act of 1934, 15 U.S.C. §§ 78(a)–(kk).

brokerages and private exchanges).²²⁴ Instead, several websites, beginning with AngelList in 2010, developed exclusive, closed-end accredited investor websites that allowed qualifying investors to invest capital alongside prominent angel investors in capital-hungry startups.²²⁵ As such, however, AngelList's reach was far more circumscribed than Prosper's or Kickstarter's. These web applications presented, above all else, administrative ease and a user-friendly experience for investors seeking to put capital toward attractive early-stage companies. Moreover, from the standpoint of many crowdfunding champions, even successful 144A issuances had the impact of locking out the retail public from opportunities to invest in early-stage companies.

Ultimately, regulatory reform, not technology, provided the most radical potential for reshaping the sector. In the wake of a failing banking system and plummeting interbank lending, President Barack Obama signed the JOBS Act into law to increase sources of finance for young businesses.²²⁶ Its implications were significant across private markets, which this Article returns to below, but three in particular promise to hold an enormous impact on the crowdfunding sector in particular.

The JOBS Act is best known for Title III.²²⁷ Under the rules laid out in the legislation, individuals are no longer constrained to the donation-based crowdfunding models like Kickstarter and Indiegogo.²²⁸ Instead, congressional reforms authorized, and subsequent SEC rules proposed, that a company could raise up to \$1 million within a twelve-month period from the general public through a website overseen by a broker-dealer or a lightly regulated website called a "funding portal."²²⁹ Investors, meanwhile, are subject to annual investment caps based on their income or wealth, and there are investor education requirements, as well as limits on general advertising.²³⁰ Via these reforms, the U.S. Congress opened the door to build out a new technological gateway for investing, built not so much on traditional investor protections of disclosure, but instead on prudential

224. Definitions and Terms Used in Regulation D, 17 C.F.R. § 230.502 (2012); Private Resales of Securities to Institutions, 17 C.F.R. § 230.144A (2014).

225. See Brad Stone, *AngelList, the Social Network for Startups*, BLOOMBERG BUS. (Jan. 16, 2014), <http://www.businessweek.com/articles/2014-01-16/angellist-the-social-network-for-startups> [<http://perma.cc/9B4U-EC DK>]; cf. Tanya Prive, *Angel Investors: How the Rich Invest*, FORBES (Mar. 12, 2013, 9:27 AM), <http://www.forbes.com/sites/tanyaprive/2013/03/12/angels-investors-how-the-rich-invest/> (discussing generally angel investors) [<http://perma.cc/RU3C-EADU>].

226. Jumpstart Our Business Startups Act, Pub. L. No. 112-106, 126 Stat. 306 (2012).

227. See *id.* §§ 301-05; Crowdfunding, 78 Fed. Reg. 66,428 (Nov. 5, 2013) (to be codified at 17 C.F.R. pts. 200, 227, 232, 239, 240, 249).

228. Crowdfunding, 78 Fed. Reg. at 66,429.

229. See Noam Noked, *Regulation A+ Offerings—A New Era at the SEC*, HARV. L. SCH. F. ON CORP. GOVERNANCE & FIN. REG. (Jan. 15, 2014), <http://blogs.law.harvard.edu/corpgov/2014/01/15/regulation-a-offerings-a-new-era-at-the-sec/> [<http://perma.cc/4DSB-5V9D>].

230. See Chris Brummer & Daniel Gorfine, *The JOBS Act Isn't All "Crowdfunding"*, FORBES (Oct. 8, 2013, 8:00 AM), <http://www.forbes.com/sites/realspin/2013/10/08/the-jobs-act-isnt-all-crowdfunding/> [<http://perma.cc/VG6Q-J889>].

limitations on the amount of exposure to which any investor could be exposed.

That said, arguably the most important role for crowd investing writ large is Title II of the JOBS Act.²³¹ This second part of the JOBS Act lifted the ban for general solicitations under Rule 505 and 506 transactions so long as the issuer reasonably believes, and has taken reasonable steps to verify that, the buyers of the private securities are accredited.²³² Through these reforms, Congress not only enabled the growth of 144A issuances as a general matter by removing a major impediment to their marketing of 144A securities, but also encouraged the growth of web-based marketing and social media campaigns through portals and (even more likely) registered broker-dealers. Not surprisingly, the rules themselves have unleashed a range of innovation among web service providers that offer data-verification programs for administrators of 144A campaigns to ensure high quality disclosures and appropriate investor accreditation.²³³

A third and closely related set of reforms is Title IV, commonly known as “the Regulation A+ reforms.”²³⁴ In this title, an earlier exemption for securities offerings, Regulation A, has been revamped to become more attractive to issuers. Regulation A’s “mini-registration” process permitted the sale of securities to both accredited and unaccredited investors so long as the issuer filed a mini-registration with the SEC and complied with relevant state law requirements in each state where funds were solicited. But it was of limited use as only \$5 million could be raised, and the process still involved both unclear and costly compliance procedures with varying securities regulators. Few if any issuers besides Fundrise, a real estate firm, used this exemption to raise money from investors in Washington, D.C., and Virginia for a local commercial real estate project.²³⁵ Title IV of the JOBS Act, which increases the offering limit from \$5 million to up to \$50

231. See Jumpstart Our Business Startups Act, Pub. L. No. 112-106, § 201, 126 Stat. 306 (2012); Eliminating the Prohibition Against General Solicitation and General Advertising in Rule 506 and Rule 144A Offerings, 78 Fed. Reg. 44,771 (July 24, 2013) (to be codified at 17 C.F.R. pts. 230, 239, 242); Amendments to Regulation D, Form D and Rule 156, 78 Fed. Reg. 44,806 (July 24, 2013) (to be codified at 17 C.F.R. pts. 230, 239); Eliminating the Prohibition Against General Solicitation and General Advertising in Rule 506 and Rule 144A Offerings, 77 Fed. Reg. 54,464 (Sept. 5, 2012) (to be codified at 17 C.F.R. pts. 230, 239).

232. Eliminating the Prohibition Against General Solicitation and General Advertising in Rule 506 and Rule 144A Offerings, 78 Fed. Reg. 44,772 (July 4, 2013) (to be codified at 17 C.F.R. pts. 230, 239, 242).

233. Crowdcheck, for example, helps platforms comply with investor protection obligations by providing investors with clear and easy to understand information about the companies on online platforms. See *About Us*, CROWDCHECK, <http://www.crowdcheck.com/about-us> (last visited Nov. 27, 2015) [<http://perma.cc/4GTZ-5Z6G>].

234. See Jumpstart Our Business Startups Act §§ 401–02 (adding § 3(b)(2)(D) to the Securities Act of 1933, 15 U.S.C. § 77c (2012)).

235. See *The Fundrise Story*, FUNDRISE, <https://fundrise.com/about?source=main-menu#story> (last visited Nov. 27, 2015) [<http://perma.cc/PN7T-W2YH>].

million in a twelve-month period, requires that certain filings be provided to investors and provides for annual audited financial statements.²³⁶

III. HOW TECHNOLOGY DISRUPTS REGULATORY PRACTICE

The technological innovation described above, though arising in diverse market contexts, has three important implications for the practice of securities regulation: First, technological innovation is increasingly disintermediating public companies, and the need to go public, for financing purposes. Second, exchanges are finding themselves increasingly pushed to the side as venues for secondary trading and even listing. Finally, and more complexly, the traditional dominance of exchange-based broker-dealers, like specialists and floor brokers, has given way to a new breed of financial intermediaries that increasingly provide both venues and liquidity for securities trading. In each case, the disruption of regulatory practice, while potentially improving prospects for capital formation and liquidity, presents novel questions of market integrity and, more fundamentally, fairness.

A. *Disintermediation of Public Companies*

Perhaps one of the most controversial aspects of the technological innovations achieved over the last decade has been the decreasing importance of section 5—another way of saying that the public offering process itself has become less important, or at least more optional. Technology, in short, has itself enabled a kind of regulatory arbitrage insofar as engineers and bankers have worked diligently to create market infrastructures that have made it easier for companies to avoid, or at least delay, public offerings and to access private capital. For leading commentators, including professors Bob Thompson and Donald Langevoort, this has helped usher in the “death” of section 5 altogether.²³⁷

The modus operandi for this important development has primarily been the 144A market. To understand why, it is useful to remember that, like any capital market, a private placement market requires two things in order to be viable and competitive: (1) buyers of the securities (institutional investors), and (2) a functioning secondary market (e.g., a connected marketplace). Technology has helped foster the conditions for both. On the one hand, technology has allowed investors to organize themselves as “institutions” and aggregate their savings and wealth in ways that ever more easily pass the \$100 million under management threshold for qualifying as

236. See Jumpstart Our Business Startups Act §§ 401–02. Under Tier 1, issuers are permitted to raise \$20 million in a twelve-month period, though subject to state rules and regulations; meanwhile, under Tier 2, issuers are permitted to raise \$50 million, and enjoy federal preemption, though offerings are subject to more onerous investment limits and disclosure obligations. 15 U.S.C. § 77c(b).

237. See Langevoort & Thompson, *supra* note 6; see also Robert B. Thompson & Donald C. Langevoort, *Redrawing the Public-Private Boundaries in Entrepreneurial Capital Raising*, 98 CORNELL L. REV. 1573, 1604–24 (2013) (examining the general expansion of alternative IPO-fundraising avenues for startups).

a QIB.²³⁸ Furthermore, brokers no longer need to search their client lists to decide who is interested in investing and creating funds. With internet-based intermediaries like AngelList, financial firms can instead engage more potential investors of varying wealth bases online in the promotion of their investment advisory or brokerage services. Additionally, the back-office maintenance of these relationships has been made easier with computer programming and the web.

Just as importantly, technology is enabling experimentation and the development of a more vibrant 144A secondary market. ECNs and accredited investor websites are providing a basis for both engaging qualified investors and connecting them to one another and to early-stage (and more mature) investments.²³⁹ In doing so, the internet is providing an “inexpensive professional-quality connection to the market,” while also lowering the cost of capital by reducing the perceived risk of investments.²⁴⁰ With more information available relating to investments and their managers on the web, and as prospects for a post-issuance aftermarket have improved, 144A securities have increased dramatically over the last two decades, as have IPOs in foreign jurisdictions on largely electronic exchanges.²⁴¹

But on the other hand, and even more so than the case of the disintermediation of exchanges and broker-dealers described in the subsequent two sections, we see that the rise of the private placement market, and its encroachment on public offerings, is very much a marriage of both technological innovation *and* regulatory reforms. That is, law has been as important as technology in helping to foster ripe conditions for circumventing the public offering process.

Rulemaking on the public side of the ledger has helped spur the private placement market as layers of additional regulatory reporting and corporate governance requirements have been loaded onto the section 5 framework. The Sarbanes-Oxley reforms of 2002, for example, notably required public companies to enhance reporting requirements for financial transactions, including off-balance-sheet transactions, pro-forma figures, and stock transactions of corporate officers.²⁴² They require internal controls for assuring the accuracy of financial reports and disclosures.²⁴³ Although widely lauded for having increased investor confidence, especially for

238. See, e.g., Schwieger, *supra* note 197, at 896 (summarizing requirements for QIBs).

239. See Douglas Price, *Direct Access Execution: ECNs, SOEs, Superdot, and Other Methods of Trading*, 2 J. HIGH TECH L. 1 (2002) (reviewing SIMIT PATEL, *DIRECT ACCESS EXECUTION: ECNS, SOES, SUPERDOT, AND OTHER METHODS OF TRADING* (2001)).

240. INGEBRETSEN, *supra* note 41, at 209.

241. See generally Brummer, *supra* note 76, at 1438; Coffee, *supra* note 6 (noting the potential information-enhancing benefits provided by the internet); Langevoort, *Information Technology*, *supra* note 6 (same). That said, questions persist as to the quality of information, even as liquidity risks might be assuaged. See generally Pollman, *supra* note 6 (noting potential risks of lack of information, asymmetric information, conflicts of interest, and insider trading).

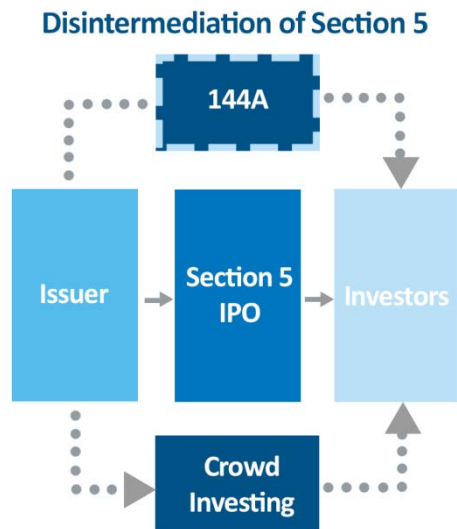
242. See Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, 116 Stat. 745.

243. See *id.* § 302(a)(4)(A).

foreign companies cross-listed in the United States, compliance costs averaged for many companies over \$1.5 million in the first years of the reforms' implementation.²⁴⁴ Similarly, the Dodd-Frank reforms in the wake of the financial crisis introduced measures including say-on-pay requirements for public companies and imposed relationships between customers and broker-dealers or investment advisers.²⁴⁵

Meanwhile on the private side, efforts focused on reducing the costs of private placements. As mentioned above, the original section 4(2) of the Securities Act presented only limited paths available for private placement, and the parameters of a safe harbor were clouded.²⁴⁶ Forty years later, Rule 144A provided bright-line rules clarifying how issuers could avoid running afoul of section 4(2) and, by extension, provided a regulatory front from which technological innovation could create a market infrastructure.²⁴⁷

Figure 2



Since then, both the SEC and legislators have worked assiduously to ease the need to go public in the first place. Along with the other important crowd investing provisions of the JOBS Act outlined above, for example, is Title V, which raises the threshold on the number of shareholders a

244. See Schwieger, *supra* note 197; Adam Pritchard, *Facebook, the JOBS Act, and Abolishing IPOs*, 35 REGULATION 12, 15 (2012) (noting the interest in the JOBS Act at reducing the burdens generated by Sarbanes-Oxley).

245. See Dodd-Frank Wall Street Reform and Consumer Protection Act § 951, 15 U.S.C. § 78n-1 (2012); Press Release, SEC, SEC Adopts Rules for Say-on-Pay and Golden Parachute Compensation As Required Under Dodd-Frank Act (Jan. 25, 2011), <http://www.sec.gov/news/press/2011/2011-25.htm> [<http://perma.cc/AD82-8ZS4>].

246. See Securities Act of 1933 § 4(2), 15 U.S.C. §§ 77a-mm.

247. See Private Resales of Securities to Institutions, 17 C.F.R. § 230.144A (2014).

company can have before it is subject to Exchange Act reporting requirements (e.g., a 10-Q or 10-K).²⁴⁸ Under the earlier rules that were updated in 1964 with the adoption of section 12(g) of the Exchange Act, a private company could remain private until it reached five hundred shareholders.²⁴⁹ Title V changes this limit to two thousand shareholders, or five hundred shareholders who are unaccredited.²⁵⁰ In combination with Title II of the JOBS Act, which, as discussed above, removes the prohibition on general solicitation, this means that many private companies will both be able to have more shareholders and solicit investments more broadly than at any point in the last half century.

The practical impetus behind the reforms was to avoid some of the pressures that growing technology companies like Microsoft and Facebook encountered that pushed them into arguably premature IPOs. In 1986, Microsoft had issued incentive stock to employees, “and because of active trading in secondary markets, this stock became widely dispersed.”²⁵¹ It became clear that soon more than five hundred shareholders would own the stock.²⁵² With the growing shareholder base, Bill Gates decided to conduct a public offering even when he did not need to raise any capital because the company would soon be required to comply with Exchange Act disclosure and compliance rules anyway.²⁵³ Facebook later faced similar challenges in 2011 when Goldman Sachs planned to create a special purpose vehicle (SPV) in order to allow its clients to invest up to \$450 million in the company.²⁵⁴ The idea was that the SPV would count as one shareholder and thus allow the company to avoid reporting obligations.²⁵⁵ The SEC frowned on such an approach, and the company was forced to go public—again at a time when its capital needs were still somewhat modest as compared to what it could raise (and did raise) in an IPO.²⁵⁶ The JOBS Act served in effect to reduce such pressure via new provisions under Title I that facilitated issuances by “emerging growth companies.”²⁵⁷

248. See Brummer & Gorfine, *supra* note 230; Susan Beblavi, *JOBS Act Title V: Raising the Threshold for Registration*, 90 DENV. U. L. REV. ONLINE 63 (2013), <http://www.denverlawreview.org/online-articles/2013/4/27/jobs-act-title-v-raising-the-threshold-for-registration.html> [<http://perma.cc/5B8P-NE8P>].

249. See Brummer & Gorfine, *supra* note 230.

250. See *id.*

251. Chris Manderson, *The “Facebook Problem,” Secondary Market Trading and the 500 Shareholder Rule: Part 2 of a 4-Part Series on the JOBS Act*, PE HUB (Apr. 24, 2012), <http://www.pehub.com/2012/04/the-“facebook-problem”-secondary-market-trading-and-the-500-shareholder-rule-part-2-of-a-4-part-series-on-the-jobs-act/> [<http://perma.cc/23T8-DHSA>].

252. See *id.*

253. See *id.*

254. See *id.*

255. Cf. *id.*

256. See *id.*

257. See Jumpstart Our Business Startups Act, Pub. L. No. 112-106, § 101, 126 Stat. 306 (2012). Emerging growth companies, those with less than \$1 billion in revenue over the past fiscal year, are exempt or at least partially exempt from certain burdensome disclosures for a time. Brummer & Gorfine, *supra* note 230.

Returning then to our original observation, public offerings in the twenty-first century are even less legally and practically necessary. This is *not*, of course, to say that they never happen, or even that they do not encounter bouts of popularity for companies seeking both to raise large amounts of capital and promote their brands and brand awareness.²⁵⁸ That said, technology has worked alongside regulatory reforms to make staying private easier and private placements more efficient and attractive. These developments contrast considerably with the public offering process, which is not only more costly than in the 1930s, but also presents fewer obvious comparative advantages. As a result, the public offering process, and indeed public company status, are faced with the uncomfortable prospect of becoming increasingly marginalized as private markets and private market infrastructure continue to develop in ways that maximize the flexibility of recent regulatory reforms.

B. Disintermediation of Exchanges

Accompanying the increasing means of circumventing registration requirements have been tools to avoid traditional trading environments. This in turn has created new incentives for exchanges and traders alike, as well as risks to market integrity.

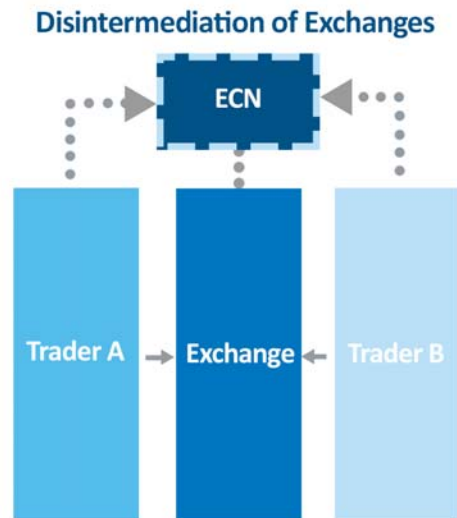
1. A More Diverse Market Ecosystem

Even more pronounced and rapid than the disintermediation of public offerings has been the disintermediation of exchanges as sources of liquidity. From the 1930s through the 1980s, major U.S. exchanges not only provided listing services for the most important companies in the country, but, as noted above, they were also the primary sites of secondary trading. The network externalities inherent to the trading business were inherently difficult to surmount, leading to a natural congregation of capital among several leading hubs, with the NYSE at the forefront.

Technology has upended this dominance. Massive real estate is no longer needed to establish a trading platform. And human beings are rarely physically present or populate trading venues. Instead, as we have seen, traders are automatically connected to a trading platform (often brokers operating through a subscription service) through which they indicate their willingness to buy or sell units of a security electronically. These orders are then displayed instantaneously, often via the internet, and the decisions to execute those trades are made by computers according to preestablished algorithms that are themselves relatively inexpensive to devise.

258. This has been especially the case recently where macroeconomic engineering has driven markets higher and, with them, market valuations and the potential returns on public offerings.

Figure 3



All the while, attracting liquidity is much easier than in the past, especially the liquidity necessary for secondary trading. Because investors can plug in from thousands of miles away, from the comfort of their own homes and offices, electronic venues can create the energized trading environment once thought to be the sole province of exchanges and can operate continuously, 24/7, as long as the trading system is turned on.²⁵⁹

Part of the popularity of ECNs in particular is that they offer a wider array of services than traditional exchanges. As seen in the history of alternative trading venues, instead of the twentieth-century unitary model of exchanges, which relied on liquidity centralization, ECNs position themselves to fill different market niches and provide a variety of services to traders and institutional investors.²⁶⁰

But it is worth elaborating that in the process, they operate quite differently, according to disparate business models, and thus impact price discovery in varying ways. Some dark pools act as brokers instead of dealers. In this group, traders develop prices based on the midpoint of the national best bid and offer (NBBO)—which is the best (lowest) available ask price and the best (highest) available bid price to investors when they buy and sell securities²⁶¹—and the volume-weighted average price

259. See Michael J. Barclay & Terrence Hendershott, *Price Discovery and Trading After Hours*, 16 REV. FIN. STUD. 1041, 1044 (2003).

260. See Markham & Harty, *supra* note 1, at 902–07.

261. The Consolidated Quotation System gives the NBBO for securities listed on the NYSE, while the Unlisted Trading Privileges Quote Data Feed gives the NBBO for securities listed on the NASDAQ.

(VWAP), a popular trading benchmark firms use for their trades.²⁶² Crosses are thus established at the agreed upon benchmark and executed electronically.

Commentators routinely include “block-crossing” dark pools, called “ITG Posit,” and Liquidnet in this kind of group.²⁶³ Liquidnet’s ATS system obtains information on a member about its trading intentions via its order management system (“indications of interest” or “indications”) and then uses that information to look for execution opportunities, or “matches,” among members interested in buying and selling the same stock.²⁶⁴ If a match of indications is detected, the potential buyer and seller are invited to negotiate with each other, anonymously, through the Liquidnet system.²⁶⁵ Once the buyer and seller agree on the transaction terms, an execution occurs.²⁶⁶ Similarly, ITG Posit crosses large institutional orders randomly several times a day, and Instinet operates scheduled continuous dark pools with both firms matching buy and sell orders electronically for execution without first routing the order to an exchange or other displayed market in order to avoid moving the price of the security.²⁶⁷

Meanwhile, other dark pools accept market, limit, or paid orders through continuous non-displayed limit order books that are themselves segmented from the main exchange. This group has in the past included many of the dark pools owned by major broker-dealers, including Credit Suisse Crossfinder, Goldman Sachs Sigma X, Citi Match, Barclays LX, Morgan Stanley MS Pool, and UBS PRN.²⁶⁸ Unlike the first group, where the NBBO and VWAP generate the basis of prices, execution prices are derived from the limit orders submitted by participants. Price discovery can arguably thus take place, though even here the trade sizes are often much smaller when compared to their block-size counterparts, and traders can use cloaking algorithms, as they do on public exchanges, to split “parent” orders into smaller “children” orders across networks to further mask trading activities and intentions.²⁶⁹ Dark pools in this group also can contain proprietary order flows from the broker-dealers that operate them

262. VWAP is calculated by adding up the dollars traded for every transaction (price multiplied by number of shares traded) and then dividing by the total shares traded for the day. See *Definition of “Volume Weighted Average Price—VWAP”*, INVESTOPEDIA, <http://www.investopedia.com/terms/v/vwap.asp> (last visited Nov. 27, 2015) [<http://perma.cc/T543-66B3>].

263. See, e.g., Haoxiang Zhu, Online Appendix of “Do Dark Pools Harm Price Discovery?” 3 (Oct. 24, 2013), http://www.mit.edu/~zhuh/Zhu_darkpool_online_appendix.pdf [<http://perma.cc/2ZKU-GWHR>].

264. See Liquidnet, Inc., Securities Act Release No. 9596, Exchange Act Release No. 72339 (June 6, 2014), <http://www.sec.gov/litigation/admin/2014/33-9596.pdf> [<http://perma.cc/97AD-NBV7>].

265. See *id.* at 3.

266. See *id.*

267. See Zhu, *supra* note 263, at 1.

268. See *id.*

269. See, e.g., *Rise of the Machines*, ECONOMIST (Jul. 30, 2009), <http://www.economist.com/node/14133802> [<http://perma.cc/Q7DH-B285>].

and thus create quasi-dealer relationships. Furthermore, transaction prices on these platforms are not necessarily calculated from the best bid and offer using a transparent rule.

Finally, a third group comprises entities at times classified as dark pools, in which incoming orders are rejected or accepted on fast-moving electronic markets.²⁷⁰ These kinds of traders have historically included firms like Getco and Knight. There is no internal matching as they compete for business like other market participants. In contrast with dark pools in the other groups discussed above, these HFTs invariably trade on their own accounts as principals as opposed to agents or marketplaces, and the fastest are periodically considered to be “pools” given the volume of their trades.²⁷¹

Each kind of actor potentially provides varying advantages vis-à-vis one another and exchanges. Block-size dark pools have the advantage of operating in many ways free of opportunistic algorithmic trading but do not necessarily offer a continuous trading environment or the kind of transparency that reflects the overall market demand for a security. As with the “upstairs” trading at the NYSE, they are not transparent and, given the larger size of the institutional orders, may find execution (best or otherwise) more difficult because counterparties with equally large positions (and a willingness to trade) must be identified. Other kinds of dark pools meanwhile offer a kind of continuous trading environment that mimics the flow of liquidity on exchanges and potentially help generate post-trade data from exchanges. That said, as segmented venues, they also impair liquidity formation and, with the prevalence of hidden orders, undermine informational efficiency as market participants have only incomplete information as to the overall depth of the market for securities. Slower traders may also find themselves more vulnerable to faster-paced, computer-driven algorithmic players.

270. See Zhu, *supra* note 263, at 1.

271. See *id.* at 2.

*Dark Pool Trading Mechanisms*²⁷²

Type	Example	Key Features
Block Crossing System	Liquidnet, BIDS, Instinet Cross	Large blocks from institutional investors traded with and between one another
Continuous Cross	Credit Suisse, Crossfinder, Goldman Sachs Sigma X, Barclays LX, Morgan Stanley MS Pool, Getco and Knight	Dark pool operates continuous, nondisplayed limit order books accepting market, limit, or “pegged orders” that establish prices based in part on observable market data or an agreed upon benchmark
Liquidity Cross	Getco and Knight	Dark pool operators generally trade on their own accounts as principals (as opposed to agents or marketplaces) to accept or reject immediately incoming orders

And ECNs are not the only players evolving intermediary platforms to challenge exchanges. Broker-dealers themselves have developed back-office platforms for “internalizing” the orders of their clients, and, just as important, a range of websites under the flexibility of Rule 144A and the JOBS Act are poised to increasingly “list” private securities in ways that disintermediate exchanges altogether, a topic this Article explores in more depth in the following section.

2. New Incentive Structures for Trading Venues

With the rise in competition, exchanges consequently hunt liquidity much like any other market participant. Exchanges cannot, in other words, assume that companies seeking to raise capital will necessarily do so on their exchange or via exchanges even more generally. Moreover, secondary

272. *See id.* at 3.

trading is no longer confined to one- or two-floor exchanges, but is instead more widely dispersed, both geographically and from the standpoint of venue, than at any time in the last half century. Specialists no longer monopolize the trading in any one security. Instead, multiple market makers routinely offer competing offers and bids for securities. Indeed, the most recent reports indicate that off-exchange venues like dark pools and ECNs host 40 percent of U.S. stock trading activity.²⁷³

From this standpoint, technological innovation has addressed one of the core problems of exchanges from the 1930s: the anticompetitiveness and rent seeking enabled by monopoly power. With more electronic and computer-based competition, the NYSE and traditional exchanges are ill-positioned to charge high commissions or trading fees for their services.

On the other hand, the disintermediation of exchanges and exchange services has unleashed efforts by exchanges (and their ECN competitors) to attract transactions from today's major liquidity providers, the HFTs. Among the most notable involve the development of different kinds of order types for high-frequency traders that participate and make orders on the exchange. Furthermore, "maker-taker" fees—pioneered by Island in the late 1990s but adopted by exchanges including the NYSE—that reward HFTs for providing liquidity on the exchange, while charging customers (often mutual funds and pension funds seeking to buy blocks of stocks), take that liquidity.²⁷⁴ By offering kickbacks of this sort, maker-taker fees encourage trading by incentivizing firms to post orders on an exchange, boosting trading activity.²⁷⁵

This business model, however, runs counter to the traditional "customer priority" design, where customer accounts are given order priority without having to pay exchange transaction fees.²⁷⁶ And they create vastly different incentives to trade. Because of the rebates, brokers have been said to channel orders to markets that provide the best maker-taker payments, not the best price for customers, thereby harming investors.²⁷⁷ What is more,

273. See John McCrank, *U.S. Securities Watchdog to Monitor Off-Exchange Stock Trading*, REUTERS (Jan. 31, 2014, 5:34 PM), <http://www.reuters.com/article/2014/01/31/regulations-finra-darkpools-idUSL2N0L521K20140131> (noting that 40 percent of this activity occurs away from the thirteen public securities exchanges, on around forty-five alternative trading venues) [<http://perma.cc/9ABY-ZPA2>]; James McAndrews & Chris Stefanadis, *The Emergence of Electronic Communications Networks in the U.S. Equity Markets*, 6 CURRENT ISSUES ECON. & FIN. 1, 3 (2000), http://www.newyorkfed.org/research/current_issues/ci6-12.pdf [<http://perma.cc/CY8A-PHXK>].

274. See PATTERSON, *supra* note 103, at 158–59.

275. Without the fees, some financial institutions have argued, fewer traders would post limit orders as they are most likely to be filled (at a loss) when new information arises indicating they are mispriced to the detriment of traders and more likely to go unexecuted where new information mitigates in their favor. See Dolgoplov, *supra* note 179, at 238–39 (noting that maker-taker rules "reward[] the very provision of liquidity by compensating for the pick-off risk of exposing limit orders").

276. See Sherree DeCovny, *Balancing the Options: Customer Priority Versus Maker-Taker in the U.S. Equity Options Markets*, FUTURES INDUSTRY, Mar./Apr. 2008, at 28–30.

277. See Editorial, *The Hidden Costs of Trading Stocks: "Best Execution" and Rebates for Brokers*, N.Y. TIMES (June 22, 2014), http://www.nytimes.com/2014/06/23/opinion/best-execution-and-rebates-for-brokers.html?_r=1 [<http://perma.cc/H5PP-UXPL>].

the integrity and efficiency of markets are potentially undermined. Critics argue that publicly viewed bid/offer prices in the market are distorted to the extent to which rebates are not openly reflected in the market for participants, especially for retail investors, to see.²⁷⁸ Furthermore, the rebates allow HFTs to buy and sell shares at the same price and to merely exploit the rebates, again obscuring the “real value” or “true price” of a security.²⁷⁹ Trading, in short, is rebate generated and not necessarily driven by new information or economic fundamentals.

Another significant development, again pioneered by ECNs in the 1990s but later adopted by exchanges, has been the development of colocation services for privileged (or paying) exchange customers. For a fee, exchanges offer broker-dealers the opportunity “to place their trading computers in the same data centers that house an exchange’s computer servers.”²⁸⁰ This gives the colocated traders tremendous advantages over other investors. Most traders see only the consolidated tape of prices that are fed through and connect exchanges in New York, Chicago, and other cities. But by being placed directly next to exchange servers, colocated traders get information with essentially advance notice, and with information (often for milliseconds) that others do not have, on which they trade. Given the massive advantages such asymmetric informational superiority conveys, “trading firms, from Wall Street banks to high-frequency hedge funds and market makers, spend millions each year” in order to “access prices a split second faster through direct feeds.”²⁸¹

At the extremes, exchanges have, according to recent lawsuits, taken the concept of speed yet a further step forward by selling private feeds of market data to customers before releasing the information to the public via the consolidated tape.²⁸² According to plaintiffs, paying customers can receive the data in as little as one microsecond, whereas it takes 1500 microseconds for the data to reach the processor (and then additional time for the data to be transmitted by the processor to ordinary customers).²⁸³ If true, the strategy would violate Regulation NMS’s dictates that exchanges furnish the data “as promptly as possible” and not discriminate against other market participants in the distribution of that information.²⁸⁴

Both individually and collectively, maker-taker fees, colocation services, and private data feeds reflect the disintermediation of exchanges as liquidity

278. Dave Michaels, *Trading Rebates Skew Markets, NYSE and Allies Tell SEC*, BLOOMBERG (Feb. 21, 2014, 12:01 AM), <http://www.bloomberg.com/news/articles/2014-02-21/trading-rebates-skew-markets-nyse-and-allies-tell-sec> [<http://perma.cc/4L5B-TJWP>].

279. See Editorial, *supra* note 277.

280. See Geoffrey Rogow, *Colocation: The Root of All High-Frequency Trading Evil?*, WALL STREET J. BLOGS (Sep. 20, 2012, 1:57 PM), <http://blogs.wsj.com/marketbeat/2012/09/20/colocation-the-root-of-all-high-frequency-trading-evil/> [<http://perma.cc/Q8Z5-SPQW>].

281. See *id.*

282. See, e.g., *Lanier v. BATS Exchange*, No. 14-cv-3745, 2015 WL 191446 (S.D.N.Y. Apr. 28, 2015).

283. See *id.* at 12.

284. Order Protection Rule, 17 C.F.R. § 242.611(a) (2014).

monopolists (or oligopolists) and, by extension, regulatory gatekeepers. The NYSE in particular no longer controls transactions in its shares, and trading is dispersed along a fragmented terrain of regional exchanges, ECNs, and other OTC markets. As this development has progressed, the NYSE has shifted from operating as a *provider* of liquidity, as was in effect their role in the 1930s environment where large firms had limited options with regard to where they listed and traded securities, to a *host*. As such, their business models have changed from warding off competition to engaging it head on and even mimicking many of their revenue-generating techniques. In some instances, this may be a cause for celebration, such as the NYSE's shift to a more automated system of transaction execution that has lowered commission fees for retail investors and institutions alike. But it also can create incentives to behave in ways that not only stretch, but arguably violate, established norms for exchanges both as venues and as financial intermediaries for customers.

C. The Fall . . . and Rise of Broker-Dealers

The disruption of exchanges had large and immediate implications for the broker-dealers operating on them. Although necessary at the turn of the century, and in the early stages of the automatization process, human beings are no longer required as before to take customer orders and execute them. Indeed, they compare poorly to the extent to which they have shown themselves to be slower, and far less accurate, than their electronic counterparts in both front- and back-office operations. This has led to a wholesale restructuring of the industry, and exchange brokers and dealers who survived the technological upgrades saw their profits fall as declining spreads and commissions cut into their pay.²⁸⁵

But this is only one-half of the story. For all of the dislocation caused by computerized trading, technology also created new opportunities for broker-dealers. After all, at the heart of a broker-dealer's work is "matching" investments to investors, albeit by commission, and/or making smart investments on its own account. Electronic trading presented new opportunities to do so on a scale not contemplated by earlier generations.

So not surprisingly, brokers used technology to create new kinds of matching services. On traditional exchanges, specialists abandoned their traditional informational advantages and assumed new nominations as "designated market makers" (DMMs). As DMMs, they could no longer receive an advance look at incoming orders, and instead provided liquidity according to preestablished protocols that catered to electronic orders. Meanwhile, other broker-dealers operating outside of the formal exchange system began to assume exchange-like functions insofar as they themselves began to host and became venues for securities trading. Importantly, these venues were not necessarily monopolized by one market maker. Instead,

285. See generally McAndrews & Stefanadis, *supra* note 273 (discussing the effects from the proliferation of ECNs).

they were built out in ways that allowed other broker-dealers (as well as funds, investment managers, and institutional investors) to aggregate—and that platform itself could be connected to others.

By making these changes in the face of changing technological developments, many broker-dealers have survived and thrived, and a new generation of financial services intermediaries has come of age. With the help of ever more powerful technological tools, broker-dealers can funnel trading into networks that bypass traditional exchange infrastructure. At the same time, many have not only become *agents* of liquidity, but are also dominant *sources* of liquidity via their HFT arms and algorithmic trading outfits. The sheer volume of orders made possible by instantaneous trades and millisecond-based execution has by extension transformed the very nature of liquidity on exchange markets. Liquidity is no longer a simple function of supply and demand dynamics, but is instead often driven by the arbitrage opportunities enabled by speed and superior data management.

Broker-dealers have likewise capitalized on the internet in particular to change their business model from the ground up. In all but name, broker-dealers can increasingly “list” securities on their own for investment. Crowdfunding websites allow financial services intermediaries to match investors with investment opportunities, one of the core functions of brokers, but on a scale far greater than before and in ways that can aggregate investors collectively. Likewise, and as mentioned above, the operators of 144A crowdfunding platforms are increasingly poised to provide a means for investing in private companies and other entities in the comfort of a controlled professional space, accredited investors’ homes.

There are, of course, plenty of mainline broker-dealers who continue to offer and provide marketing functions for offerings.²⁸⁶ That said, none of the most consequential changes in trading infrastructure or operations map onto the 1930s regulatory framework, which envisioned a far different market ecosystem than is the case today. The framers of the 1930s legislation envisioned exchanges as *the* dominant meeting place for securities trading and, thus, the broker-dealers operating on them as agents (albeit oligopolistic ones) of market integrity. These regulatory gatekeepers thus became subject to federal securities legislation and obligations of maintaining orderly markets.

But freed from exchange infrastructure, and the regulatory requirements associated with it, broker-dealers operating ECNs have, for the most part, been under no obligation to satisfy traditional market-making responsibilities.²⁸⁷ Instead, best execution obligations to connect limit

286. Though even here, technology has greatly impacted their operations. See Coffee, *supra* note 6, at 1208; Langevoort, *Information Technology*, *supra* note 6, at 777.

287. Indeed, according to some commentators, “[u]nlike the traditional market-maker and specialist systems, [the new intermediaries] have no *obligation* to provide liquidity, just the *incentive* provided by the rebate they receive every time a market participant takes liquidity from them.” Anthony Saliba et al., *Ephemeral Liquidity in a Purely Order-Driven Market*, TABBFORUM (May 23, 2010), <http://tabbforum.com/opinions/ephemeral-liquidity-in-a-purely-order-driven-market> [<http://perma.cc/8FC3-JUCP>].

orders to venues that meet Regulation NMS dictates are the mechanism through which the maintenance of orderly markets rely.²⁸⁸ In practice, this means that broker-dealers are obligated to swap downside market-making obligations normally associated with traditional exchanges for upside best execution restraints in today's markets. The two are, by their nature, in no way overlapping; the net result is risk siphoned off from market makers in turbulent market environments. Algorithmically generated limit orders from HFTs can, in short, disappear in milliseconds—as quickly as they appear—for no reason other than downward market momentum. This, in turn, can enable “flash crashes,” like that of May 6, 2010, which can undermine the stability of technically interconnected capital markets.²⁸⁹ Plus, rogue or unexpected algorithm activity or faulty hardware or software can cause systems to short-circuit or freeze, creating new operational risks.²⁹⁰

More fundamentally, broker-dealer regulation is itself facing potential changes as the internet and technology dramatically transform the very business models of financial services firms and broker-dealers in particular. With new technologies available to broker-dealers to aggregate liquidity, the need to charge transaction-based commissions tied to marketing efforts has diminished. Instead, financial intermediaries can generate alternative sources of revenue, like trading fees or other proprietary or bespoke services, for participants on the platform.

The most significant example of such innovation arose in venture capital services, which have sought to leverage web-based social media and crowd investing. In 2013, FundersClub, a private placement platform, initiated a new business model whereby it would avoid broker-dealer requirements by in part mimicking the matching qualities seen on electronic trading platforms.²⁹¹ In short, FundersClub created a website that offered opportunities to invest in specifically identified private companies listed on the site. Members of the FundersClub platform then can invest, but only

288. See Markham & Harty, *supra* note 1, at 911–13. There have been some first order regulatory initiatives for ECNs, though none have radically changed the responsibilities of infrastructure providers. See, e.g., Regulation of Non-Public Trading Interest, 74 Fed. Reg. 61,208 (Nov. 23, 2009) (to be codified at 17 C.F.R. pt. 242). FINRA has additionally released limited rules relating to ATS reporting of equity volume, other reporting issues, and clock synchronization. See FINRA, Reg. Notice No. 14-51 (Nov. 2014); FINRA, Reg. Notice No. 14-48 (Nov. 2014); FINRA, Reg. Notice No. 14-17 (Apr. 2014).

289. See generally Ian Poirier, *High-Frequency Trading and the Flash Crash: Structural Weaknesses in the Securities Markets and Proposed Regulatory Responses*, 8 HASTINGS BUS. L.J. 445 (2012) (discussing causes and effects of flash crashes along with prescriptive advice on how to mitigate the costs of such a phenomenon). Between 2:45:13 p.m. and 2:45:27 p.m., stocks of some major companies like Procter & Gamble lost nearly all their value, and others like Apple surged to values of nearly \$100,000. See WORLD FINANCE, Nov.–Dec. 2014, at 153.

290. In 2013, for example, in the space of just forty-five minutes, the financial services company Knight Capital lost over \$440 million as a result of unexpected and, according to some, “freak” algorithm activity. WORLD FINANCE, *supra* note 289, at 153.

291. See *How FundersClub Works*, FUNDERSCLUB, <https://fundersclub.com/how-it-works/> (last visited Nov. 27, 2015) (providing general information on FundersClub's operational and business framework) [<http://perma.cc/4WF4-HGLD>].

after first certifying themselves as accredited investors and waiting thirty days.²⁹² FundersClub then aggregates members into a venture capital fund that makes an investment, which is then managed by FundersClub on a post-investment basis.²⁹³ It was compensated, notably, for its efforts via a carried interest in the fund.²⁹⁴ Months later, a similar approach was adopted by AngelList, with the additional innovation of leveraging the insights, experience, and efforts of third-party “Lead Angels,” whereby a fund organized by AngelList would invest only alongside a recognized investor who may or may not also receive a portion of the carried interest.²⁹⁵

In some ways, the deal dynamics were merely web-based venture capital. But at the same time, they created novel challenges of interpretation. Though clearly the venture capital fund would have to comply with rules relating to investment advisors, would the platforms themselves (and their operators) require broker-dealer regulation? After all, the matching services performed, in some ways, the same services as twentieth-century broker-dealers by connecting investment dollars to investments with the help of a middleman. The difference here, however, is how a broker-dealer’s earnings are derived. Instead of a commission, which itself incentivized at times unscrupulous salesmanship, here the middleman would earn by participating in the investment’s carried interest. It is also, notably, a venture among accredited investors who can presumably “fend for themselves.”²⁹⁶ With this in mind, the SEC, in a no-action letter, ultimately declined to enforce against the operators of the FundersClub and AngelList websites for failing to register as a broker-dealer under the Exchange Act.²⁹⁷

292. See Sile Bao, *How Much of My Time Does FundersClub Take? How Long Does the Process Take?*, FUNDERSCLUB (Mar. 23, 2015, 1:10 AM), <https://support.fundersclub.com/hc/en-us/articles/204477348-How-much-of-my-time-does-FundersClub-take-How-long-does-the-process-take-> [http://perma.cc/9HR3-ZEF4].

293. See *How FundersClub Works*, *supra* note 291.

294. See *Using the Web to Match Private Companies and Potential Investors: SEC No Action Letters Open a Door, but Questions Remain*, GOODWIN PROCTOR: CLIENT ALERT (Apr. 2, 2013), http://www.goodwinprocter.com/Publications/Newsletters/Client-Alert/2013/0402_Using-the-Web-to-Match-Private-Companies-and-Potential-Investors.aspx [hereinafter GOODWIN PROCTOR: CLIENT ALERT] [http://perma.cc/5UC7-MLG5].

295. Investors, once becoming interested via the platform, would submit a request for information about the company, and if there was a sufficient amount of interest, AngelList Advisors would create a subscription agreement for each participating investor. See AngelList, SEC No-Action Letter, ¶ 3 (Mar. 28, 2013).

296. SEC v. Ralston Purina Co., 346 U.S. 119, 125 (1953) (noting that the section 4(a)(2) exemption for registration should turn on, among other things, whether offerees of securities “are shown to be able to fend for themselves”).

297. See GOODWIN PROCTOR: CLIENT ALERT, *supra* note 294. In essence, as AngelList noted, its model would be similar to that used by Angel Capital Electronic Network, an earlier web-based platform for accredited investors granted relief a decade earlier. See AngelList, *supra* note 295, ¶ 36. The website, designed to list small, private companies, was granted no-action relief, in large part on the basis of the fact that Angel Capital would not provide advice about the merits of a particular venture, receive any compensation contingent upon the outcome of any transaction, or hold themselves out as providing securities-related services other than a listing or matching service. *Id.*

Notably, the JOBS Act has cleared a path for a similar bypassing of broker-dealer rules for financial services firms connecting early-stage investment opportunities to *non-accredited* investors, assuming certain conditions are filled. In the legislation, crowdfunding portals—the websites displaying ventures in need of funding—are recognized as a new kind of financial intermediary legally distinct from broker-dealers and are not required to undergo the same registration requirements. Although the portals will be subject to supervision by FINRA, the self-regulatory agency that (not coincidentally) oversees broker-dealers, there are no “know the customer obligations,” as would be expected by typical broker-dealers. Instead, investments are merely posted on the website, according to some business prerogative or objective or after inspection by the portal manager, and the onus of “knowing” the customer resides in ensuring that certain prudential requirements (e.g., the investment caps) are properly administered.

IV. RETHINKING TWENTY-FIRST-CENTURY REGULATORY RESPONSES

At this point, it is helpful to reiterate that not all of the disruption outlined above is necessarily bad. With markets meeting the web, investors are in many ways better armed and better equipped to access information relevant to their decisions than ever before. That said, the accelerating disintermediation of New Deal gatekeepers places unprecedented stress on traditional regulatory approaches and forms of market supervision. Outdated regulatory approaches have, for their part, the potential of stifling even useful forms of innovation. And in those areas where disruption complicates or undermines investor protection or market integrity, one-shot substantive reforms of existing regulatory approaches are highly unlikely to be durable. As this part shows, not only are foundational categories and focal points of 1930s regulatory oversight increasingly out of kilter with the new market ecosystem, but multiplying policy objectives and increased uncertainty as to the market impact of reforms also hamper the rulemaking process. Indeed, even where agencies unveil smart new approaches, the specter of technological innovation can render even upgraded regulatory approaches outdated in a matter of milliseconds.

As a result, the challenge of disruptive technology and securities regulation requires not only rethinking the substance of regulation but also rethinking the process by which administration is administered. This part provides both the rationale and basic typology for a move from reactive, prescriptive regulation—also a relic of New Deal reforms in the wake of the Great Depression—to more responsive, adaptive forms of supervisory oversight.

A. The Challenge of Expanding the Regulatory Perimeter

As seen in Part I, securities regulation has long enjoyed, as a key component of its operative strategy, the dragooning of several key intermediaries into the service of national policy objectives. By

(mandatorily) registering and supervising central nodes of the financial services industry and the originators and facilitators of securities issuances, regulators could cast a wide net with which to promote investor protection and market integrity. Thus, not surprisingly, as the market ecosystem has changed, interest in expanding the regulatory perimeter has blossomed—either by imposing more duties on existing actors or extending new regulations to emerging players in the ecosystem. Such approaches, however, have proven difficult to execute due to several practical and administrative challenges.

1. Old Categories Do Not (Always) Fit the New Market Ecosystem

Rapid technological change makes expanding the regulatory perimeter more difficult, at least insofar as it has been accomplished in the past. At a basic level, technological and deal-driven innovation has progressed to such a point that intermediaries no longer fit neatly into twentieth-century molds of exchanges, specialists, floor brokers, and even broker-dealers. Statutory definitions are out of date, and broker-dealers, exchanges, and investment advisers provide overlapping, and in some instances economically, identical services. Regulatory action, as a result, has become more difficult “as markets provide ever more viable [or attractive] choices” for firms and individuals seeking to raise capital or trade securities.²⁹⁸

Plus, there is not only a multiplicity of regulators, but also a myriad of outdated conceptual and jurisdictional tools relied on by them. For example, efforts by FINRA, the SEC, and state regulators to target firms based on presumptions of commission-driven jurisdictional hooks for broker-dealers will be less relevant in a world where the revenues generated by intermediaries and infrastructure operators are derived from listing and trading fees or from providing venture capital advice and consulting services. Similarly, efforts to define or capture new intermediaries can be difficult.²⁹⁹ Take the simple exercise of defining (and regulating) “exchanges”: defining exchanges as venues that provide formal listing services, or even trading environments for major companies, is increasingly under strain where secondary trading is hosted by ECNs and where listing (especially in private placements) is increasingly becoming a less formal means of advertising an investment opportunity. Even basic concepts of “private” and “public” offerings become more difficult to disentangle to the extent to which more money is raised in private offerings than in traditional IPOs.

298. Steven M. Davidoff, *Paradigm Shift: Federal Securities Regulation in the New Millennium*, 2 BROOK. J. CORP. FIN. & COM. L. 339, 340 (2008).

299. See Lawrence A. Cunningham, *A Prescription to Retire the Rhetoric of “Principles-Based Systems” in Corporate Law, Securities Regulation, and Accounting*, 60 VAND. L. REV. 1411, 1481–84 (2007) (discussing principles-based rhetoric in relation to jurisdictional competition).

2. Regulatory Objectives Have Multiplied in the Post-Crisis (and Post-Recession) Era

Moving further afield, even where targeting specific financial intermediaries is, from a conceptual standpoint, relatively straightforward, just how to do so may not be. This is in part because deeper or broader regulation could conflict with other important policy priorities. As we saw above, the regulation of exchanges has consistently been mired in questions of the primacy of liquidity or competitiveness. And even more fundamentally, U.S. securities laws, like the SEC that enforces them, are imbued with varying policy goals, from investor protection to market integrity, with both occasionally conflicting with one another.³⁰⁰

That said, the potential for regulatory dissonance is higher now than in the past. And it is not just because financial innovation has restructured markets and the optics through which we view gatekeepers. It also is because recent post-crisis legislation has emphasized, albeit in varying sections of the regulation, both *more* regulation in light of financial innovation and *fewer* regulatory costs for raising capital, especially for small and medium-sized businesses seeking capital in a world of reduced bank lending. Superimposing both objectives and their own statutory ecosystems onto the New Deal framework creates a number of challenging trade-offs where ambitious expansions of regulatory remit are taken.

The JOBS Act provides a simple, straightforward example. By design, the JOBS Act was devised in order to reduce the regulatory burdens associated with making public offerings, especially for early-stage companies looking to access cash for ventures. But by doing so, it dislocates and sidelines other players: investment bankers are no longer working to underwrite the transactions; no listing is made on a fully regulated exchange; and the disclosures of a traditional public offering are greatly reduced. This then raises questions of investor protection, and with other gatekeepers out of the picture, the most logical place of regulatory pressure is the portal listing the securities. However, by doing so, costs that are placed on portals are driven up and offerings are potentially forced to register, which reduces their ability to earn revenues and ultimately forces them into the more rarified space of private placements. As a result, the idea of providing retail investors with modest opportunities to participate in early-stage ventures (and the ability of early-stage companies to access their capital) is largely frustrated.

The balance becomes all the more complicated with other (laudatory) goals like financial stability, which take center stage in rulemaking and supervision. In a post-Lehman Brothers world, the SEC has been tasked alongside other agencies with new responsibilities to ensure sound and

300. Specifically, the SEC is charged with powers to (a) protect investors; (b) maintain fair, orderly, and efficient markets; and (c) facilitate capital formation. See *The Investor's Advocate: How the SEC Protects Investors, Maintains Market Integrity, and Facilitates Capital Formation*, SEC, <http://www.sec.gov/about/whatwedo.shtml> (last visited Nov. 27, 2015) [<http://perma.cc/68N8-7532>].

stable markets—which increasingly involve issues of market design and electronic operations. Meeting the challenge will not be easy. As in the 1960s back-office crisis, today’s technology can lead to more efficient services, but if poorly implemented, it also can replicate and generate new problems that are as damaging to investor confidence as human error and sluggishness. Moreover, in a world of computer-driven trading, where the frequency of transactions is driving transaction volumes to ever-dizzying heights, glitches in technology, as well as faulty programming, have outsize effects on financial markets. The introduction of technology can thus help crack oligopolies and discipline old-line market actors, yet at the same time generate new sources of systemic risk. Consequently, any regulatory response can at least potentially have a range of trade-offs with regard to other policy goals, including capital formation and market liquidity.

3. Extreme Policy Uncertainty Is Ill-Suited to Longstanding Administrative Processes

How to regulate may also be difficult, even where policy goals are clear, because of the novelty that many regulatory issues present. Technology is not only accelerating trends that have been in motion for a half-century, like the speed of making or executing market transactions, it is also reshaping how market actors respond by disintermediating gatekeepers and even supplanting human judgment with computer programming.³⁰¹

The novelty of such changes places enormous strain on governmental response mechanisms. The consequences of microstructural change of this order, especially given its constant flux, is difficult, and in many instances impossible, to predict—as are the repercussions of any particular portfolio of regulatory reform. As scholars have noted in similar contexts, law is both an endogenous and exogenous force in shaping market ecosystems.³⁰² Regulations inform the commitments and relationships created by market participants, undergird the certainty behind financial transactions, and can serve as the focal point for technological innovation. Law can thus alter the competitive and cooperative relationships and interactions among market participants and infrastructure providers in ways that in turn give rules unexpected consequences.

Again, Regulation NMS serves as a useful example. As seen above, the best price mandates embraced in the reforms not only imposed higher regulatory burdens, but also ignited the ECN industry and even algorithmic trading. Once the reforms were promulgated, AI was not only commercially practical, but a practical necessity. Now, all trading venues have to constantly monitor the price of the stock on every trading venue, all the time, a feat that requires industrial-strength computer power. Though

301. See Cristie Ford, *Principles-Based Securities Regulation in the Wake of the Global Financial Crisis*, 55 MCGILL L.J. 257, 279–80 (2010).

302. See, e.g., D. Sornette, *Endogenous Versus Exogenous Origins of Crises*, ETH ZURICH, <http://www.er.ethz.ch/media/essays/origins.html> (last visited Nov. 27, 2015) [<http://perma.cc/CNS3-NJQD>].

the SEC was aware of the potential that such reforms would require using technology to upgrade existing systems for compliance purposes, few imagined a world where such operating systems would displace auction systems and the traditional trading floors altogether—and in the process potentially fragment the market’s price discovery processes.³⁰³

Policy uncertainty of this sort presents problems for today’s regulatory system. U.S. agencies act via processes that are themselves mediated through comprehensive planning and prescriptive regulation. For the SEC to promulgate rules, proposals must usually be shared with the public through notice-and-comment processes and run through varying levels of internal evaluation and, not infrequently, government-wide coordination.³⁰⁴ Furthermore, judicial dictates require “hyper detailed predecisional impact assessments” in order to establish a robust capacity to predict and assess the market and nonmarket impacts of any proposed action.³⁰⁵

Reacting at the administrative level to the responses of regulated entities to regulatory reforms can in turn become difficult, especially when first-order rules require either legislative compromise or significant administrative resources. Policymakers are incentivized to cram “all that c[an] possibly be thought or dreamed about actions they carry out, fund, or authorize into single-shot, all-encompassing decision extravaganzas.”³⁰⁶ Once made, decisions take their course, in ways expected and otherwise, and authorities (and market participants and the public at large) live with the consequences until a future crisis arises or economic or political cycles change. Regulatory action, as a result, can often become ossified as new priorities crowd an administrative or rulemaking agenda. Little effort is made to refine or modify decisions made, making first-order regulatory decisions all the more weighty—and often slow to be made. Law thus tends to be more static, and outdated, than would be warranted in any context of dynamic change.

B. The Attractiveness (and Limitations) of Objectives-Based Regulation

One potentially attractive answer to such challenges has been the implementation of more targeted “objectives-based” regulation.³⁰⁷

303. See Michael Stockham & Mackenzie Wallace, *SEC Enforcement Priorities for the Second Half of 2014*, RISK.NET (July 11, 2014), <http://www.risk.net/operational-risk-and-regulation/opinion/2354496/sec-enforcement-priorities-for-the-second-half-of-2014> [<http://perma.cc/9A5Y-TZ4J>].

304. See Robin Kundis Craig & J.B. Ruhl, *Designing Administrative Law for Adaptive Management*, 67 VAND. L. REV. 1, 4 (2014).

305. *Id.*

306. See *id.* at 5; Victoria Nourse & Gregory Shaffer, *Empiricism, Experimentalism, and Conditional Theory*, 67 SMU L. REV. 141, 167 (2014) (describing the view among new experimentalists who decry the pluralist interest group model as broken, captured by the regulated, and ossified).

307. See DEP’T OF THE TREASURY, BLUEPRINT FOR A MODERNIZED FINANCIAL REGULATORY STRUCTURE 142–46 (2008) (discussing the advantages of objectives-based regulation).

Although the precise contours of the term are occasionally subject to some debate, ultimately the idea turns on evaluating compliance with agency rules in terms of the degree to which a regulator's objectives and policy preferences are met. Objectives-based regulation is often associated with "principles-based regulation."³⁰⁸ This need not, however, be the case. In contrast to principles based regulation, objectives-based regulation not only queries whether participants are acting within the spirit of underlying rules, but also whether conduct achieves a specific objective.

At the same time, objectives-based regulation acknowledges that there may be more than one way to achieve a specific regulatory objective. And thus, some forms of compliance may be more efficient or effective for some market participants than others. Because of this flexibility, some commentators associate it with "minimalist" liberal theories of governance that give license to market-based decision making.³⁰⁹ For regulators, however, the appeal of objectives-based regulation is that the specifics of hard-to-operationalize mandates can be informed "more dynamically and insightfully by those with the greatest understanding of the relevant situations."³¹⁰

In short, regulatory rules are not so much supposed to be "vague" as much as relevant—and rather than ossifying, compliance practices are expected to evolve as older formulations are updated with new technologies, market practices, and risks (and opportunities) for the investing public. For this reason, for example, many regulators laud approaches like FINRA's "know your customer" and "suitability" rules that give supervisors broad powers when applying standards of fairness, appropriate disclosure, and fiduciary duty obligations where broker-dealers interact with the public. With rapidly changing intermediaries and firms processing investments, a flexible, though potentially upward-ratcheting, system of engagement helped authorities respond to markets in ways that helped cabin opportunities to exploit gaps in an increasingly outmoded, eighty-year-old system of rule-based prescriptions. Similarly, the SEC's new Regulation SCI requires entities like exchanges and other infrastructure providers to "design[], develop[], test[], maintain[], operate[], and surveil[]

308. See generally Vincent Di Lorenzo, *Principles-Based Regulation and Legislative Congruence*, 15 N.Y.U. J. LEGIS. & PUB. POL'Y 45 (2012) (providing a general overview on principles-based regulation).

309. Charles F. Sabel & William H. Simon, *Minimalism and Experimentalism in the Administrative State*, 100 GEO L.J. 53, 64–69, 78–82 (2011) (comparing minimalist systems employing market-based regulatory mechanisms and experimentalist approaches boasting decentralization, monitoring, continuous revision, and stakeholder participation as two different alternatives to command and control).

310. Dan Awrey, *Regulating Financial Innovation: A More Principles-Based Proposal?*, 5 BROOK. J. CORP. FIN. & COM. L. 273, 292–93 (2011). For this same reason, it should be distinguished from approaches such as that of Macey & O'Hara, see Macey & O'Hara, *supra* note 6, at 20, which argues for effectively voluntary regulatory regimes of regulatory compliance as opposed to mandatory ones.

systems” that are integral to their operations and requires that their technology meets prescribed operational standards.³¹¹

The ability to institutionalize objectives-based regulation will nevertheless depend on the circumstances. First, some objectives clearly will be more important than others, or have priority whereas others will not. Where objectives have a clear hierarchy, creating a system that reflects primary policy concerns is rather straightforward; where on the other hand objectives occupy the same levels of importance, the trade-offs inherent to pursuing any one compliance approach can produce uncertainty by regulated entities as to optimal compliance strategies.

Furthermore, the ability to graft objectives to the changing market ecosystem will vary. For example, the violation of antifraud rules can be relatively easy to spot even in today’s quickly evolving marketplace.³¹² Making omissions or misstatements tied to the sale of securities is identifiable whether they are conducted online or in person. Similarly, even if venues change, false or deceptive statements about who is operating the system or performing the trades are easily cognizable as fraudulent, and even traditional antifraud concepts and remedies are sufficient to address old problems in new contexts.

Enforcement becomes harder when old concepts themselves go under partial revision due to changes in market infrastructure. Take the issue of front running, for example. As we saw above, in the 1930s, there was a concern related to the ability of specialists to extract rents (through higher bid-ask spreads) given their ability to see orders coming down the pike.³¹³ Today, it is commonly associated with high-speed market makers, who weave in between markets. But are the two the same? In OTC markets, HFT traders may or may not be market makers and, in any case, do not have access to a formal limit book like specialists a half-century ago. Instead, the market ecosystem has changed. They may pay for direct feeds from exchanges or other venues, which give them time advantages. But advantages in time, in and of themselves, could also be analogous to floor traders and brokers who first had access to the telegraph in the 1800s, phone banks in the mid-twentieth century, and later the fax machine. With faster communications, brokers and dealers with access to technology could leverage their information before others—and securities regulations did not necessarily prohibit traders from trading on their informational advantages.

The NMS “best execution” rules, themselves in many ways a kind of objectives-based regulatory mandate, offer another example. When first

311. See Regulation Systems Compliance and Integrity, Exchange Act Release No. 73,639 (Nov. 19, 2014) (to be codified at 17 C.F.R. pts. 240, 242, 249); SEC, STAFF GUIDANCE ON CURRENT SCI INDUSTRY STANDARDS (2014), <https://www.sec.gov/rules/final/2014/staff-guidance-current-sci-industry-standards.pdf> [<http://perma.cc/3TK6-TQG6>].

312. Cf. Deanna Whitestone, *The Response to Enron in the United States and Canada: Are Principles-Based Accounting Standards More Effective at Preventing Financial Fraud?*, 11 SW. J.L. & TRADE AM. 381 (2005) (comparing the effectiveness of a rules-based standard to a principles-based approach in preventing corporate fraud).

313. See *supra* p. 995.

pronounced, they required brokers to provide the most advantageous order execution for their customers, which was at least assumed to be based on price. But how specifically they were to be implemented was largely left to market participants. Technology developed, however, in ways to differentiate the market and customer demands that justified several interpretations of the rule. Specifically, broker-dealers realized that their customers, especially large investment funds seeking to quickly deleverage, occasionally valued speed and certainty of execution over price. So with little explicit guidance, broker-dealers interpreted the parameters in ways that allowed them to charge premiums (higher than other brokers) where they offered other services promising superior execution. The upshot has been arguably more competition in the provision of trading services. But one consequence has been a gradual decline of the rule into irrelevance in the absence of supplemental rulemaking and guidance—and increasing opportunities to skim profits from customers.

As a result, objectives-based regulation can have highly unexpected consequences, even more than prescriptive regulatory approaches. Regulatory authorities would have to have both the ability and discretion to issue emergency orders and take immediate administrative remedial action where necessary in order to mitigate overly flexible policy interpretations by market participants. Closely related, in order to be most effective, objectives-based regulation requires considerable agency resources to operationalize. As discussed above, under the current regulatory dispensation, resources are devoted toward drafting specific rules, collecting feedback from stakeholders, and crafting proposals in ways to achieve policy priorities while accommodating diverse interests.³¹⁴ In a world of objectives-based processes, by contrast, resources are needed for a sustained investment in the infrastructure to support additional supervisory and relationship management personnel with firms, surveillance of market participants, and ongoing education programs to build more dialogic relationships with regulated actors.³¹⁵ As a result, objectives-based processes generally impose a higher and more permanent cost structure as compared to the rules-based approach that has characterized securities regulation since the New Deal.

314. *See supra* p. 1039.

315. *See* Awrey, *supra* note 310, at 283–84; *see also* Ford, *supra* note 301, at 289 (observing that even where regulators adopt strategies that are more “hands off” in their approach to detailed prescriptive rulemaking, it does not mean that they require fewer regulatory resources); William W. Bratton & Michael L. Wachter, *Reforming Securities Law Enforcement: Politics and Money at the Public/Private Divide*, in *REGULATORY BREAKDOWN: THE CRISIS OF CONFIDENCE IN U.S. REGULATION* 200, 211 (Cary Coglianese ed., 2012) (suggesting that higher compensation models would be required for a larger role for the SEC in prosecuting fraud). Possibly, alternative supplemental means of compensation for incentivizing regulatory supervision also would be warranted. *See, e.g.*, M. Todd Henderson & Frederick Tung, *Pay for Regulator Performance*, 85 S. CAL. L. REV. 1003, 1031–32 (2012) (suggesting alternative compensation models for incentivizing better bank oversight).

C. Two Models of Adaptive Financial Regulation

The appeal of objectives-based regulation is that it allows the market to find the most efficient means of meeting given regulatory objectives. But regulators need not always rely on the private sector for de facto rulemaking or compliance. Market actors are focused on maximizing profits and act with limited knowledge beyond their own individual circumstances. Furthermore, they may not have system-wide information relating to the practices of competitors and may fail to take into consideration (and simply disregard) the implications of their conduct for the health of the financial markets. Compliance techniques and market practices may, as a result, prove suboptimal.

Because of the inherent limitations of self-regulation, regulatory authorities, too, can innovate, not only with regard to the substance of market rules but also in terms of their tactics. Specifically, the SEC has at its disposal tools to adjust its rulemaking in ways that enable more knowledgeable, speedy, but incremental rulemaking that is often well-suited to a world of constant microstructural change. When utilized, this approach fosters experimentation to create more effective bespoke responses to new regulatory challenges.

The intellectual, if not practical, heritage of adaptive regulation at large is considerable, and its theoretical lineage reaches back to the original legal realists.³¹⁶ The objective is “not to carve away agency discretion, as market-based regulation does, but to add to it, albeit in a vastly different form compared to the front-end model.”³¹⁷ Under this model, agencies would not be removed from the decision-making process or disintermediated by the market as sources of regulatory authority. Instead, the decisions are made over a broader time horizon that makes the “front end” and the “back end” of decision making much less relevant.³¹⁸ As opposed to crafting one omnibus package of reforms,

agencies employing adaptive management engage in a program of iterative decisionmaking following a structured, multistep protocol: (1) definition of the problem, (2) determination of goals and objectives for management, (3) determination of the baseline, (4) development of conceptual models, (5) selection of future actions, (6) implementation and

316. See Nourse & Shaffer, *supra* note 306, at 166. As the two note, “The original realists stressed the virtues of experimentalism, reflected in Holmes’ famous dissent in *Abrams v. United States* where he stressed that even the Constitution “is an experiment, as all life is an experiment.” See *id.* (citing *Abrams v. United States*, 250 U.S. 616 (1919)). Jerome Frank himself, a former Chairman of the SEC, saw himself and other “experimental jurists” as the “humble servants to the master experimentalist, Franklin Roosevelt.” See *id.*

317. Craig & Ruhl, *supra* note 304, at 7 (emphasis omitted).

318. See *id.* at 5 (noting that while “front-end mode of administrative decisionmaking does produce agency decisions sooner or later, . . . it ossifies agency practices, politicizes agency decisions, stultifies flexibility, and generally makes administrative agencies unadministrative”).

management actions, (7) monitoring, and (8) evaluation and return to step (1).³¹⁹

1. Pilot Programs

In practice, the stage for regulatory experimentalism could play out in various ways. One approach would be to selectively adopt trial periods for new regulatory approaches where prospective rules and reforms could be tested and explored. So for example, the ban on general solicitation could be lifted for five years, with a sunset provision triggered absent some additional regulatory blessing. Or more onerous investigatory requirements on portals could be lifted where other (statistical or algorithmic) technologies are used to test or limit exposures of retail investors in crowd-fund securities, but likewise set to expire absent some regulatory finding that they insufficiently track or identify breaches in prudential requirements for investors.

To provide a sense of what an experiment could look like, consider the example of crowdfunding portals and the question of whether they should be able to provide information to potential investors about the quality of securities (either credit- or investment-wise) for prospective investors. From a regulatory standpoint, the fear is that insofar as portals begin to start differentiating investors, they take on aspects of giving investment advice. Enabling them to differentiate would thus provide a path around the Investment Advisers Act and its protections for investors. Portals would not be subject to the Investment Advisers Act's important prohibitions against conflicts of interest and disclosures to investors about the persons who are paid for advice concerning the desirability of investing in securities. On the other hand, providing basic kinds of information, like the credit rating of sponsoring entrepreneurs and education data of the entrepreneur, could well help investors make wiser decisions.

The question thus arises whether a more permissive regulatory scheme for portals would end up undermining or bolstering protections for investors. In many ways, this is a conceptual question and can be addressed by comparing the nature of the information provided by portals and the risks such tools would generate for investors. But empirical data could provide even more concrete information.

Here is how an easy experiment could be conducted: a study could be announced allowing some portals, upon randomized selection, to provide deeper levels of disclosure to investors. The first test group would be permitted to evaluate the company and provide information to the public relating to easily understandable metrics. These metrics could include FICO or credit scores (where the entrepreneur agrees) or the answers to simple queries—such as whether the entrepreneur has taken or passed a financial statement analysis course or other business course or whether the entrepreneur has enrolled in a prep course for emerging managers

319. *See id.* at 7.

established by the portal. A second test group would meanwhile be permitted to employ all of the above, as well as screen issuances placed on its platform, and advertise the screening. Finally, a control group would consist of portals under the current regulatory regime, subject to deep restrictions regarding the degree to which issuer information can be provided to the public.

Throughout the pilot period, participating portals would be required to collect and report the following data to the SEC:

- 1) The number of campaigns successfully completed;
- 2) The speed at which campaigns are successfully completed (capital accumulation);
- 3) Investor complaints lodged against the portal investments; and
- 4) The number of failed ventures (in all cases, entrepreneurs whose ventures failed would be required to report to the portals, within five days, the liquidation of their business).

An initial assessment could then be conducted one year after the commencement of the pilot. The assessment could include:

- 1) Assessments of the statistical impact of providing information on the quality of investment decisions by investors;
- 2) Assessments of the economic impact of providing information on the speed of capital accumulation; and
- 3) Assessments of the economic impact of providing information on the profits of the portal.

Thereafter, a rule could be drafted, or a subsequent extension of the experiment (or a different experiment under other parameters) could be conducted, depending on the results of the experiment and conclusiveness of the data received.

The idea of such an approach would, in short, be to create data for making regulatory decisions, much as the Food and Drug Administration does for experimental drugs. Along these lines, regulatory experimentation would allow a peek into the likely consequences of any particular policy action. Regulators could ask some of the questions central to policymaking in today's rapidly changing market infrastructure in advance: What should be the parameters for solicitation online and in an internet economy? What reasonable verification steps should be used for investor accreditation or wealth thresholds for crowdfunding? What kinds of potential innovations can and should be deployed to police the speed of financial transactions and the comparative advantages (and market risks) that such speed generates?

The deployment of such strategies would represent a considerable change in regulatory tactics for today's regulators. As mentioned above, the SEC

often relies on no-action letters to test varying approaches.³²⁰ And it can even promote, as seen in the case of FundersClub, a channel of further market disintermediation by allowing new business models to adapt to the platform and structure of the internet. That said, no-action letters are not controlled experiments. They do not require data collection and reporting or, for that matter, any iterative contact or information sharing with regulators during the course of the relevant conduct. As a result, they provide only a limited channel for bolstering regulatory expertise. Meanwhile, from the standpoint of market participants, no-action letters offer relief only to the firm making a request and, even then, only indicate that the SEC staff would not recommend that the Commission take enforcement action against the requester based on the facts and representations described in the individual's or entity's request. No guarantees are made.

Experimentalism, however, is not in itself new to securities regulation. The SEC has conducted more formal experiments and does so even today. The order handling rules, discussed above,³²¹ were phased in on a pilot basis, just as rules relating to short sales. And the national market system, in particular, has used the strategy. In 2011, the NYSE and other exchanges pushed for pilot circuit-breaker programs to help mitigate the impact of flash crashes.³²² And more recently, in 2014, the SEC announced a one-year pilot program to widen minimum quoting and trading increments (or "tick sizes") for small-cap stocks.³²³ Instead of regulating the field in its entirety, the program instructed FINRA and national securities exchanges to divide stocks of firms with market capitalizations of \$5 billion or less into three test groups of four hundred stocks and a control group.³²⁴ The control group will use the current tick size of one cent per share, while the test groups will all quote small-cap shares at five-cent minimum increments, according to a news release from the SEC.³²⁵

The idea behind the program is to test whether wider tick sizes increase the liquidity for smaller stocks. Theoretically, a wider spread between bid and offer prices would mean more profits for dealers and market makers, though it also could mean higher commissions and charges for individuals when they trade. The policy question is whether these hidden charges would be worthwhile to the extent they generated greater interest by traders

320. *See supra* p. 1035.

321. *See supra* pp. 1006–07.

322. SEC: *Circuit Breakers Pilot Programs to Expire April 11, 2011*, BLOOMBERG, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aMeT4yIl2fuI> (last visited Nov. 27, 2015) [<http://perma.cc/L9SW-R7ZT>].

323. Press Release, SEC, SEC Approves Pilot to Assess Tick Size Impact for Smaller Companies (May 6, 2015), <http://www.sec.gov/news/pressrelease/2015-82.html> [<http://perma.cc/7QV7-ATYX>].

324. *Id.*

325. *Id.* In one test group, trading would continue to occur at any price increment that is permitted today; in the second, trading would be done in five cent increments; and in the third group, securities would be subject to a "trade-at" requirement, which prevents price matching by a trading center that is not displaying the best bid or offer.

and thus increase demand for stock issuances by the small-cap firms. After reviewing the data, agency officials would examine what impact the reforms would have on the quality of the issuances and whether the program should be extended.

Notice that this kind of approach allows for multitiered rulemaking. Proposals are not one-shot exercises memorialized into law. And the data itself can help to inform regulatory decisions as well as (if necessary) further stakeholder comments. It generates, in short, the opportunity for a positive informational feedback loop and, by extension, better grounded decision making.

That said, experimentation of this sort is far from celebrated. The SEC has no webpage or official policy toward pilot programs. Neither are there formal protocols about when and under what circumstances they are used. As a result, without strict guidance, the reliance on data-driven exercises is driven by regulatory agendas and politics, as opposed to strict policy mandates.

2. Innovation Hubs

Another more ambitious approach involves shifting from micro-level experimentation to system-wide enterprise zones for financial market compliance and regulatory adaptation. Compliance costs, for example, could be offset or subsidized by other forms of regulatory assistance or other relief where they meet or surpass basic minimum standards. So, for example, avenues of special information sharing and expedited assistance could be opened with targeted industry members for the fulfillment of desired regulatory objectives. Or investment tax credits could be provided for market participants that undertake strategies to bolster investor protection or market stability.³²⁶

Along these lines, incentives could be provided to develop new techniques or data analysis infrastructures for portals to help ensure that investors have not breached personal investment limits promulgated under the JOBS Act. Or regulators could work alongside 144A websites to deliver and bless new data analytics that help ensure that ultimate purchasers of securities are accredited investors. Or market-making obligations could be eased where market infrastructures adopted speed bumps for trading or “off switches” to shut down trading where volatility is poised to generate a flash crash. In any event, technology could be leveraged in ways that not only change the cost structure and competition within markets—and even obscure the operations of markets and price discovery—but that also enhance prudential safeguards for investors.

This, too, is not an entirely novel proposal. In 2014, for example, the U.K.’s Financial Conduct Authority (FCA) launched an “innovation hub”

326. See Chris Brummer & Daniel Gorfine, *Crowdfunding: The Next Big Thing*, 57 MILKEN INST. REV. 66, 72 (2013). This approach is not unprecedented. See THE WHITE HOUSE, SOLAR PROGRESS REPORT: ADVANCING TOWARD A CLEAN ENERGY FUTURE 5 (2014) (examining the investment tax credit for solar panels).

aimed at helping to support and more effectively oversee a team of experts to in turn support financial technology startups that demonstrate that their innovations can help support consumers, whether individuals or businesses.³²⁷ Additionally, the hub will have a designated function of exploring how regulation can be adapted not only to contain growth, but also to foster it alongside investor protection. To do the job, the FCA will reportedly help steer young companies, or established companies with new models or financial products, through the regulatory process—and likewise learn new ways to administer more effective rules adapted to evolving technological developments.³²⁸

It also is designed to help regulators familiarize themselves with new technology. This in and of itself will require considerable face-to-face engagement for formal applications submitted by technology companies, as well as reiterated contact between regulators and regulated entities prior to the promulgation of rules.³²⁹ Thus, the innovation hub will provide qualifying businesses with a dedicated contact for innovation-related queries, including individual guidance and continued additional support for up to a year after authorization in order to help developers understand the regulatory framework and how it applies to them.³³⁰ In this way, areas of likely complexity can be identified early on, to help both focus regulators on potential challenges and ensure that potential applications are processed as quickly as possible.

And the United Kingdom is not alone. For the last two decades, countries have developed a variety of mechanisms to help spur not only market but also regulatory innovation and adaptability. China, for one, has established a “Shanghai Free Trade Zone” designed to facilitate capital account liberalization.³³¹ As part of this process, the government has designated Shanghai as the primary locus for the experimentation and launching of market reforms.³³² Keys to this have included an array of regulatory measures (1) connecting mainland stock exchanges to Hong Kong, (2) allowing more cross-border investment, and (3) enabling foreign

327. Anna Irrera, *FCA Out to ‘Unlock’ Fintech Innovation*, FIN. NEWS (Oct. 28, 2014), <http://www.efinancialnews.com/story/2014-10-28/fca-launches-innovation-hub-for-fintech-startups?ea9c8a2de0ee111045601ab04d673622> [<http://perma.cc/W4FG-M64P>].

328. *Financial Services and Fintech: What Is the FCA’s “Project Innovate”?*, OSBORNE CLARKE (June 13, 2014), <http://www.osborneclarke.com/connected-insights/blog/financial-services-and-fintech-what-fcas-project-innovate/> [<http://perma.cc/A583-Q2BY>].

329. See *“There Is Little That Bureaucrats Hate More than Innovation”*: *The FCA Opens Its Innovation Hub*, OSBORNE CLARKE (Oct. 29, 2014), <http://www.osborneclarke.com/connected-insights/blog/there-little-bureaucrats-hate-more-innovation-fca-opens-its-innovation-hub/> [<http://perma.cc/CUL9-APYH>].

330. *Id.*

331. J.P. MORGAN, ASIA PACIFIC ECONOMIC RESEARCH, https://www.jpmorgan.com/cm/BlobServer/China_Highlights_of_the_Shanghai_Free_Trade_Zone.pdf?blobkey=id&blobwhere=1320623477943&blobheader=application/pdf&blobheadername1=Cache-Control&blobheadervalue1=private&blobcol=urldata&blobtable=MungoBlobs (last visited Nov. 27, 2015) [<http://perma.cc/2BHW-5GYA>].

332. *Id.*

direct investment into the country.³³³ Market reforms have additionally embraced a number of regulatory enhancements. For each program, new rules have been unveiled, usually on a “pilot” basis, ranging from issues as diverse as quotas permitted to foreign funds and investors putting their capital to work onshore to changes in derivatives contracts to allow better netting of exposures in case of a counterparty default. The key to the process has, above all, been the cautious opening of the market, while also instituting new rules to support the process. Incremental and targeted, the process relies on experiments that are under the auspices of authorities within the zone and, if successful, are then “exported” to the rest of the country, or as seen in the case of the recent slowdown of China’s economy, slowed precipitously.

That said, securing an “innovation dividend” flowing from adaptive compliance systems requires deep procedural reforms in the United States. Arguably the same kinds of administrative hurdles and procedures like notice and comment would be required on the back end (post-experimentation) as on the front end.³³⁴ Furthermore, the promulgation of rules generally requires a range of internal clearing processes, dictated by courts and executive orders, and internal policymaking traditions. Some of these clearance processes, like cost-benefit analyses, could be streamlined, or even shortened in light of the new information generated by controlled regulatory experiments. Divvying rulemaking into two stages could, however, effectively double the procedural load required to pass rules as a range of constituencies (from chief counsel offices of divisions to general counsel to the Office of Information and Regulatory Affairs (OIRA)—the executive office in charge of ironically streamlining regulatory costs) would need consulting at varying stages of the policymaking process. As a result, a twenty-first-century securities framework would ideally create a set of standards enabling experimentation, either through an objectives-based regime or via *ex ante* rules, which would provide a means to leverage technology for both efficiency and investor protection.

Incentive programs, too, would run across a range of regulatory limitations, both procedural and substantive. Not only would legislation have to be amended in order to provide the basis for offering explicit incentives in other regulatory sectors (like tax), but prudential rules also

333. Jennifer Hughes, *HK-Shanghai Stock Link Poised to Launch*, FIN. TIMES, Nov. 11, 2014, at 22; HOGAN LOVELLS, FINANCIAL REFORMS FOR THE SHANGHAI (PILOT) FREE TRADE ZONE: SLOWLY COMING INTO FOCUS (2014), http://www.hoganlovells.com/files/Publication/aa8faa93-3cd0-4794-8561-14f49ed5e3ec/Presentation/PublicationAttachment/02529efd-222a-4c41-97e3-485157f087aa/SHALIB01-%231091563-v6-Client_Alert_-_Financial_Reforms_for_the_Shanghai_%28Pilot%29_Fre.pdf [<http://perma.cc/UUM4-P3CD>].

334. For example, the Paperwork Reduction Act of 1995, 44 U.S.C. §§ 3501–20 (2012), established the Office of Information and Regulatory Affairs (OIRA) within the Office of Management and Budget. Under Executive Order 12866, OIRA is responsible for reviewing agency draft regulations before publication. Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Sept. 30, 1993). Divvying rulemaking into two stages may mean that rules that involve a collection of information would need to receive OIRA approval twice.

could require amending in nontraditional ways. For example, if a crowdfunding site wanted to rate borrowers in order to help investors, say by posting scores for companies that indicate the degree to which they have gone beyond minimum disclosures of the JOBS Act, it would be viewed as effectively “advising” them and would thereby become a broker-dealer in the eyes of securities regulators.³³⁵ Thus, in order to assist firms in the provision of new investor protections, substantive regulatory requirements in the Exchange Act and Investment Advisor Act would require amending or, at a minimum, special exemptions.

Moreover, innovation zones, trial periods, and experimentation, like objectives-based regulation, could increase considerably the costs of regulation, at least as compared to traditional administrative processes. As indicated above, resources must be expended not only to propose legislation and review comments, but also to create the parameters for experimentation, develop proper safeguards, and examine the results for developing and refining initial policy hunches. Furthermore, even after developing thoughtful policy approaches, it will likely be necessary to periodically update and refine policies in ways to speak to changes in market practices or infrastructures. Thus, more resources would likely be necessary than those utilized in prescriptive, rules-based models of oversight that have dominated regulation since the 1930s.

With this in mind, the smartest policy approaches will have to leverage regulatory tools in thoughtful, strategic ways. In areas of financial market regulation, traditional, rules-based oversight and regulation is highly appropriate in areas either spared by rapid structural disintermediation or where the pace of change is predictable, allowing authorities to stay ahead of the regulatory curve. By contrast, objectives-based approaches should be deployed where the velocity of innovation is highest, but where fundamental changes to the relationship between market participants remain stable enough for efficient (though at times expensive) enforcement. Experimentation and pilot programs, which likely involve the greatest capital resources, should, meanwhile, be practiced sparingly and strategically, either where project designs can minimize costs or where uncertainty is greatest and the potential risks to investor protection—market stability or capital formation—is highest. That way, hypotheses can be tested and reforms made in a way in which policymakers are informed by not only the opinions of stakeholders, but also market data and empirical evidence.

335. This is a lesson learned the hard way by both Lending Club and Prosper. See Randall Smith, *Not Banks, but Still Lending Money and Drawing Investors*, N.Y. TIMES (Aug. 7, 2013, 10:32 AM), http://dealbook.nytimes.com/2013/08/07/not-banks-but-still-lending-and-drawing-investors/?_php=true&_type=blogs&_r=0 (“Both Florida and Missouri fined [Lending Club] \$100,000 each last year for selling unregistered securities.”) [<http://perma.cc/389A-QCBD>]; *Prosper Fined \$1 Million; Faces Class Action Lawsuit from Lenders*, PROSPER LENDING REV. (Dec. 2, 2008, 10:34 AM), <http://prosperlending.blogspot.com/2008/12/prosper-fined-1-million.html> (describing Prosper’s \$1 million settlement for selling unregistered securities) [<http://perma.cc/7AUH-32TH>].

In both of the latter two instances, technology should be embraced as a source of not only regulatory risk, but also of regulatory opportunity. One of the primary challenges that disruptive technology poses is that technology moves quickly, outstripping the capacity of regulators to understand or respond to change. To better equip them, information technology should be deployed to help keep investors better informed of the risks concerning their investments, without unnecessarily hiking disclosure costs. But even more can be done. Regulators can themselves develop algorithmic tools to help police fraud online. Information processing data analytics, similarly, could (and should) be used to constantly measure outcomes in submarkets like 144A or alternative venues like dark pools. And a flexible administrative platform could be developed across the SEC and other agencies, building on these tools, to enable regulators to adapt quickly to changing circumstances and ensure satisfaction of regulatory goals. Only at that point will regulators find themselves in a position not only to respond to disruptive innovation, but to track it in real time and, even more importantly, to mitigate its excesses.

CONCLUSION

The accelerating interplay of law and technology in securities markets is underdeveloped, both descriptively and normatively. All too often, commentators have assumed that though markets change, regulation is itself operationalized against a static, stable set of market gatekeepers, and the literature has failed to account for—and connect—the varied channels through which technology transforms markets. As a result, the impact of technology on capital markets regulation has itself been obfuscated. This Article has attempted to provide clarity, by tracing the regulatory structure that guides securities law approaches and then describing how deep microstructural changes in twenty-first-century capital markets are transforming the regulatory ecosystem across issue areas.

The preceding pages demonstrated that not all “disruption” is the same and that changes in securities issuances and investment, market microstructure, and trading have come from a variety of quarters. In some instances, the ability to connect traders in far-flung places more effectively and faster than ever before has changed the strategic dynamics driving market liquidity, whereas in others, advances in artificial intelligence have led to equally profound results for trading. And in yet other instances, developments in regulatory approaches, which reflect as much changes in political cycles as economic ones, can enable incremental changes that, when paired with revolutions in information technology, can fundamentally restructure securities markets. In the process, traditional gatekeepers have been increasingly sidelined as new actors occupy central positions in the processing of capital transactions.

Notably, this development is not in itself a necessarily “bad” one. Indeed, it is not only capital markets that have changed, but society as well. With new platforms (web based and otherwise), forms of media, and interconnectivity, the ability to disseminate information is greater than at

any previous point in history, as are the potential means by which investors can arm themselves with information before making investments or trades.

But there are challenges. Just as the modes and means of disseminating information have multiplied, so have opportunities with which fraud can be conducted and markets manipulated. Furthermore, changes in the market ecosystem and competitive dynamics are changing the incentives for market participants and gatekeepers in ways that may not always bolster financial stability or investor protection. Issuers are able to raise as much capital via nonpublic devices and private placement infrastructure as through IPOs; exchanges are no longer sources of capital but increasingly seekers of liquidity; and broker-dealers are able to connect investors in ways that they increasingly resemble exchanges.

All along, from a theoretical and policy perspective, basic tenets of securities regulation are undergoing profound transformation. Just what a “public” offering means is no longer easy to identify when private markets enjoy breadths and levels of participation that rival traditional section 5 offerings. “Listings” no longer are exclusively relegated to exchange architecture, as private platforms, websites, and portals can advertise offerings for sale and, in some instances, trading. Even the concept of an “exchange” has been moved as trading volumes are increasingly located in venues that, though not always regulated as exchanges, are hosting the lion’s share of secondary trading—trading that is itself done via computers rather than human beings.

Although the extent to which existing administrative tools are capable of engaging these challenges is not entirely known, indications are that New Deal regulatory procedures will need to be rethought and reimagined in order to cope with the dynamic change animating markets and market activity. In a world where trades are executed in milliseconds, regulatory ruminations that drag on for months, just to be quickly made irrelevant or outdated once implemented, seem flat-footed. Furthermore, where information is sparse—given the unpredictability about law, markets, and their interaction with one another—flexibility seems warranted and needed in twenty-first-century market regulation. In particular, a thoughtful pivot to regulatory experimentalism is warranted for areas like market infrastructure that are characterized by constant flux. Objectives-based regulation, paired with trial-and-error experimentation and adaptation are obvious administrative responses that should be incorporated into existing administrative procedures along with the resources to supervise such new strategies. In that way, regulators can meet the challenges of regulating market participants in a world where not only the behavior of regulated entities changes, but also the regulated entities themselves.