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REGULATORY REFORM

The Role of Technology in Financial Markets Regulation



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In response to the “Great Recession,” the financial crisis of 2008 that resulted in millions of unemployed Americans and trillions of dollars in lost wealth,¹ Congress enacted the Dodd-Frank Wall Street Reform and Consumer Protection Act (“Dodd-Frank Act”). The Dodd-Frank Act changed the regulatory system charged with regulating the financial systems viewed as responsible for the crisis.²

Since enactment of the Dodd-Frank Act, financial regulators have attempted to achieve the oversight mandated by the Act but have struggled to apply outmoded approaches to technologically progressive markets.³ Because of the technological innovations being used in the markets, the regulators must not only “keep

¹ *Wall Street Reform: The Dodd-Frank Act*, THE WHITE HOUSE, <https://www.whitehouse.gov/economy/middle-class/dodd-frank-wall-street-reform>.

² *Id.*

³ See, e.g., Timothy Massad, Chairman, Commodity Futures Trading Comm’n, Remarks before the Global Exchange and Brokerage Conference (June 3, 2015) [hereinafter “Global

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pace with th[e] rapidly changing environment, but, where possible, also . . . harness and leverage advances in technology to better carry out [their] mission.”⁴

This article briefly identifies the technologies being used by financial regulators to efficiently and effectively provide market oversight mandated by the Dodd-Frank Act. This memorandum focuses on three financial regulatory entities: the U.S. Securities and Exchange Commission (“SEC”), the U.S. Commodity Futures Trading Commission (“CFTC”), and the Office of Financial Research (“OFR”).

I. Securities and Exchange Commission

The Dodd-Frank Act, containing more than ninety provisions requiring SEC rulemaking,⁵ expanded the responsibilities of the SEC, leading the agency to invest in technology in order to achieve greater oversight of the markets. Two forms of technology currently being used are SEC’s Market Information Data Analytics System (“MIDAS”) and National Exam Analytics Tool (“NEAT”). Additionally, the SEC is seeking to establish a market-wide consolidated audit trail (“CAT”), “which

Exchange”] (“The days when market surveillance could be conducted by observing traders in floor pits are long gone.”).

⁴ Mary Jo White, Chair, Sec. & Exch. Comm’n, The SEC in 2014 (Jan. 27, 2014) [hereinafter “SEC in 2014”].

⁵ *Dodd-Frank Wall Street Reform and Consumer Protection Act*, U.S. SEC. & EXCH. COMM’N, <https://www.sec.gov/spotlight/dodd-frank.shtml>.

will result in a database of comprehensive and readily accessible data regarding orders and executions, along with trader identification.”⁶

A. MIDAS

The advancement of technology has created an “algorithmic marketplace” consisting of high-frequency traders and other investors operating under outmoded market structure rules and industry practices designed for “manual markets.”⁷ In response to the evolving technology being used in the markets, the SEC has employed MIDAS⁸ as a means to “sift through massive amounts of trading data across markets instantaneously, an exercise that once took the staff weeks or months.”⁹

MIDAS allows the SEC to more closely monitor markets, helping the agency understand long-term market trends, flash crashes, and, more generally, how the markets function.¹⁰ Additionally, MIDAS has the potential to allow SEC to monitor the impact of its own policies that alter market practices.¹¹ And by providing all of the data collected by MIDAS on the SEC’s website, the SEC has created public transparency for the highly evolved securities markets. In recent remarks, Commissioner Kara Stein has urged the SEC to expand MIDAS’s capabilities, calling for “an upgrade to include, for example, firm attributions (participant IDs) and privileged information, or so-called hidden orders.”¹²

B. NEAT

While MIDAS provides insight into how markets function, NEAT allows the SEC to quickly analyze vast amounts of a registrant’s trading data for evidence of suspicious activity.¹³ Like MIDAS, “NEAT replaced what was formerly a labor-intensive process that often consumed weeks or months of examiner time and resulted in a sampling of a limited time period of such data, as opposed to the systematic and complete analy-

sis of years’ worth of data that NEAT facilitates.”¹⁴ In one example, SEC examiners used NEAT to analyze seventeen million transactions executed by one investment adviser in thirty-six hours.¹⁵ NEAT, therefore, enables the SEC to answer the call of its mission to efficiently and effectively monitor the securities markets and protect consumers from misconduct previously hidden to regulators.

C. Consolidated Audit Trail

The SEC is currently developing CAT, an ambitious technology aimed at expanding the accomplishments of MIDAS by collecting public and non-public data.¹⁶ CAT will obtain public data from the eighteen U.S. public stock and options exchanges and non-public data—e.g., when and where the transactions occur and the identities of the parties to the transactions—from private trading venues run by banks, also known as “dark pools.”¹⁷ Previously, data from these dark pools did not have to be immediately reported to the SEC, but after the agency adopted the Consolidated Audit Trail Rule, this data is available to the SEC, “significantly enhanc[ing] the ability of regulators to monitor the equity markets.”¹⁸ Before the CAT technology becomes realized, however, the SEC is relying on the existing audit trail data of the self-regulatory organization, Financial Industry Regulatory Authority.¹⁹

As Commissioner Stein has noted, these tools are vitally important to the oversight of securities markets. She has noted that “[t]ools like the CAT and an upgraded MIDAS help us modernize oversight of the securities markets to ensure they are worthy of investors’ faith and trust. That benefits the SEC. That benefits market participants. That benefits investors. Ultimately, that benefits the economic well-being of our nation.”²⁰

II. Commodity Futures Trading Commission

Former CFTC Chairman Gary Gensler stated that the Dodd-Frank Act will “bring comprehensive regulation to the swaps marketplace,” subjecting swap dealers to “robust oversight.”²¹ Examples of the robust oversight created by the Dodd-Frank Act (and CFTC’s use of technology) are swap data repositories (“SDRs”), which, as the name suggests, contain swap data reporting and recordkeeping.²² Pursuant to the Dodd-Frank Act, all

⁶ Mary Jo White, Chair, Sec. & Exch. Comm’n, Taking Stock of Treasury Market Regulation (Oct. 20, 2015).

⁷ Mary Jo White, Chair, Sec. & Exch. Comm’n, Enhancing Our Equity Market Structure (June 5, 2014) [hereinafter “Market Structure”].

⁸ MIDAS collects about one billion records of trading data daily from consolidated tapes and separate proprietary feeds by each equity exchange, time-stamped to the microsecond. MIDAS: Market Information Data Analytics System, U.S. SEC. & EXCH. COMM’N, <http://www.sec.gov/marketstructure/midas.html>. Former Chairman Elisse Walter compared the technology, calling it the world’s greatest data sandbox, to “the first time scientists used high-speed photography and strobe lighting to see how a hummingbird’s wings actually move.” Elisse Walter, Chairman, Sec. & Exch. Comm’n, Harnessing Tomorrow’s Technology for Today’s Investors and Markets (Feb. 19, 2013).

⁹ SEC in 2014, *supra* note 4.

¹⁰ MIDAS: Market Information Data Analytics System, U.S. SEC. & EXCH. COMM’N, <http://www.sec.gov/marketstructure/midas.html>.

¹¹ Walter, *supra* note 8.

¹² Kara Stein, Commissioner, Sec. & Exch. Comm’n, Market Structure in the 21st Century: Bringing Light to the Dark (Sept. 30, 2015).

¹³ SEC in 2014, *supra* note 4. Chair Mary Jo White boasted that NEAT would allow SEC examiners to efficiently identify signs of insider trading, front running, window dressing, and improper allocations of investment opportunities among other kinds of misconduct. *Id.*

¹⁴ U.S. SEC. & EXCH. COMM’N, AGENCY FINANCIAL REPORT FISCAL YEAR 2014 29 (2014).

¹⁵ SEC in 2014, *supra* note 4.

¹⁶ Walter, *supra* note 8. Former Chairman Walter suggested that CAT “could be the most important regulatory development in [her] lifetime.” *Id.*

¹⁷ Silla Brush & Matthew Phillips, SEC Computer Called CAT Will Peer into Dark Pools, Track Orders, BLOOMBERG, <http://www.bloomberg.com/news/articles/2014-08-07/sec-computer-called-cat-will-peer-into-dark-pools-track-orders>.

¹⁸ Mary Jo White, Chair, Sec. & Exch. Comm’n, Focusing on Fundamentals: The Path to Address Equity Market Structure (Oct. 2, 2013).

¹⁹ *Id.*

²⁰ Stein, *supra* note 12.

²¹ Dodd-Frank Act, U.S. COMMODITY FUTURES TRADING COMM’N, <http://www.cftc.gov/lawregulation/doddfrankact/index.htm>.

²² Data Repositories, U.S. COMMODITY FUTURES TRADING COMM’N, <http://www.cftc.gov/industryoversight/datarepositories/index.htm>.

swap transactions must be reported to SDRs, thereby compelling transparency in the swaps marketplace that did not exist before the enactment of the Dodd-Frank Act.²³

Like MIDAS, the CFTC posts the data obtained from SDRs on websites and publishes a “Weekly Swaps Report” to provide the public with a “snapshot of the swaps market” including the price and volume for individual swap transactions.²⁴ Additionally, the data being collected by the SDRs empowers the CFTC “to engage in meaningful oversight, and when necessary, enforcement actions.”²⁵

Data harmonization, however, has posed an obstacle to regulators’ realizing the full benefit of the swap transaction data aggregated by SDRs, four of which are located in the United States. Early on after the implementation of SDR reporting, the issue of data harmonization was highlighted by Scott O’Malia, a former Commissioner and Chair of the CFTC’s Technology Advisory Committee, which was created to “advise the Commission on the impact and implications of technological innovations on financial services and the futures markets, and the appropriate legislative and regulatory response to increasing use of technology in the markets.”²⁶ O’Malia complained of the difficulties of aggregating the SDR data due to the inconsistent formats in which the data is reported to SDRs.²⁷ Recently, Chairman Timothy G. Massad spoke of the continued focus on data harmonization both domestically and internationally, including a clarification of CFTC rules relating to data collection and the CFTC’s development of unique product and swap identifiers aimed at standardizing the collection and use of data.²⁸

Indeed, data and technology accounts for forty percent of CFTC’s seventy-two million dollar requested budget increase.²⁹ If those funds are appropriated, the CFTC would in part use the funds to aid in aggregating a variety of data received from multiple industry sources (including SDRs) and develop high performance computer systems to address the “increasing complexity, volume, and interrelations of the data set.”³⁰

²³ Timothy Massad, Chairman, Commodity Futures Trading Comm’n, Remarks before the DerivOps North America 2015 (Apr. 22, 2015) [hereinafter “DerivOps”].

²⁴ *Id.* The ability of the CFTC to provide a “snapshot” of the rapidly progressing swaps market is similar to capabilities of MIDAS in the securities market. *See supra* note 8.

²⁵ Global Exchange, *supra* note 3; *see also* DerivOps, *supra* note 23 (“The availability of accurate data also means we can do much more to evaluate systemic risk and make sure that the markets operate fairly”).

²⁶ Technology Advisory Committee, U.S. COMMODITY FUTURES TRADING COMM’N, <http://www.cftc.gov/About/CFTCCcommittees/TechnologyAdvisory/index.htm>.

²⁷ Joanne Morrison, *Regulators, Industry Tackle Swap Data Reporting Challenges*, FUTURES INDUST., 50 (Nov. 2013).

²⁸ DerivOps, *supra* note 23.

²⁹ Timothy Massad, Chairman, Commodity Futures Trading Comm’n, Testimony before the U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government (May 5, 2015).

³⁰ *Id.* Chairman Massad reported to the Senate Committee that the CFTC is currently receiving over three hundred million records per day. *Id.*

III. Office of Financial Research

Unlike the SEC or CFTC, the OFR was established by the Dodd-Frank Act and designed to support the Financial Stability Oversight Council (“FSOC”) by measuring risks to the financial system and collecting and standardizing financial data.³¹ To accomplish its mission, the OFR developed a technology known as Legal Entity Identifier (“LEI”) similar to a bar code for entities engaging in financial market transactions.³² LEI will prevent the confusion of similarly named financial institutions and “allow analysts to combine and analyze multiple public and proprietary datasets.”³³ Currently, the adoption of LEI has been largely driven by the efforts of derivatives regulators; international swap regulators require financial firms to use the LEI and the CFTC requires the use of the LEI for reporting swap data to SDRs.³⁴ The OFR, however, is encouraging all financial regulators (like the SEC) to require the use of LEI in financial reporting in order to create a comprehensive program that can be used by any financial regulatory agency.³⁵ The OFR also plans on using the global LEI system to fulfill another Dodd-Frank Act requirement, the creation of a reference database for financial entities and financial instruments, providing consolidated information available to regulators, academics, the financial industry, and the public.³⁶

IV. Conclusion

Financial regulators realize that while technology can greatly benefit the markets, it can also make investors and the markets more vulnerable. Agencies like the SEC, CFTC, and OFR strive not to prohibit technological innovations of markets, but to identify where “the computer-driven trading environment may be working against investors rather than for them.”³⁷ This goal of overseeing rapidly evolving markets requires these agencies to embrace technology as a means of efficiently monitoring the markets in order to understand how markets function. Only with this understanding can financial regulators effectively safeguard investors and the markets from being subjected to another future financial crisis.

³¹ *About the OFR*, OFFICE OF FIN. RESEARCH, <http://financialresearch.gov/about/> (“Our job is to shine a light in the dark corners of the financial system to see where risks are going, assess how much of a threat they might pose, and provide policymakers with financial analysis, information, and evaluation of policy tools to mitigate them.”).

³² Linda Powell, *The Legal Entity Identifier (LEI) is Good News for Financial Technology Developers*, DATA.GOV, <https://www.data.gov/consumer/legal-entity-identifier-lei-good-news-financial-technology-developers/>.

³³ OFFICE OF FIN. RESEARCH, 2014 ANNUAL REPORT 95 (2014) [hereinafter “Annual Report”]; *see also* Powell, *supra* note 32 (“In the future, the LEI is expected to enable developers to build applications that track the complex hierarchies and networks of ownership, and control of corporations and holding companies.”).

³⁴ Annual Report, *supra* note 33, at 98.

³⁵ *Id.*

³⁶ *Id.* at 102-103.

³⁷ Market Structure, *supra* note 7.