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What Securities Pros Need To Know About SEC Data Analytics

By **Charles Riely and Danielle Muniz** (June 7, 2019, 2:19 PM EDT)

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On Dec. 6, 2016, an engineering research scientist, allegedly used Google to research the question "how [does the] sec detect unusual trad[ing]."[1] The question was not an academic one for the scientist: He had repeatedly misappropriated confidential information from his wife, a law firm associate, and had spent months using this information for trading.[2]

His search yielded several webpages concerning the U.S. Securities and Exchange Commission's detection and enforcement efforts.[3] Apparently unimpressed or undeterred by what he read, he continued purchasing securities with the stolen information, and was later charged by the SEC with insider trading.[4]

By now, the commission's use of data analytics should come as no surprise to potential defendants, and should not be a mystery to practitioners and compliance professionals. The SEC's data analytics efforts have been repeatedly highlighted by the SEC commissioners and cited in SEC press releases announcing successful investigations and cases.[5]

As recently as June 4, SEC chair Jay Clayton reiterated the agency's reliance on these efforts, stating that its data analytics work is "more important than ever" for the SEC, and that "data analytics can help [the SEC] use [its] existing resources more efficiently and effectively."[6]

This article explores the publicly available information concerning the SEC's use of data analytics to detect and pursue securities law violations such as insider trading and market manipulation. Although the math and computer programming behind these efforts may be complicated, the concepts behind data analytics are simple. Understanding these concepts is important for lawyers and other professionals responsible for supervision and compliance at investment advisers and broker-dealers.

The SEC's Use of Data Analytics in Enforcement and Exams

As highlighted by Clayton, the SEC's use of data analytics is an important tool for both its Division of Enforcement and the Office of Compliance Inspections and Examination, or OCIE, to accomplish their missions.[7]

The Division of Enforcement's most prominent use of data analytics is led by the Market Abuse Unit and the specialist in the unit's Analysis and Detection Center. The A&D Center was created in 2011, and includes specialized professionals focused on assisting the unit detect wrongdoing through trade reviews.[8] To generate leads, these specialists routinely review billions of lines of data the SEC has in house, using a number of programs.

One of the key programs the SEC highlights is called ARTEMIS, apparently named for the Greek goddess of the hunt.[9] ARTEMIS, an abbreviation for Advanced Relational Trading Enforcement Metric Investigation System, was developed in-house, and combines a review of historical trading and account holder data with other data sources to allow for "longitudinal, multi-issuer, and multi-trader data analyses."[10]

The SEC also uses data analysis in other parts of the Enforcement Division. First, the division's Center for Risk and Quantitative Analysis, or CRQA, created in 2013, supports the division's efforts through risk analytics, by identifying risks and threats that could be harmful to investors, assisting staff with risk-based investigations and developing ways to monitor for signs of wrongdoing.[11]

For example, CRQA built a database of trades the SEC had previously prosecuted to find patterns that would enable the commission to uncover new schemes.[12] As of 2016, it had provided support in over 100 cases, including in matters related to insider trading, hedge fund misconduct and complex financial instruments.[13]

Second, the division's new Retail Strategy Task Force, formed in 2018, has a number of initiatives built on the use of data analytics.[14] As Clayton pointed out earlier this week, the task force has used "data-driven analytical strategies" for identifying potential harmful practices to retail investors.[15]

Third, as detailed below, the Enforcement Division has highlighted the use of analytics in a wide range of cases brought throughout the division.

In addition, OCIE also routinely uses data analytics in the course of its work conducting exams of registered broker-dealers and investment advisers.[16] In 2014, SEC technologists developed the National Exam Analytics Tool, or NEAT, to assist OCIE examiners.[17] NEAT is designed to analyze the trading data of registrants during the course of exams.

The program can be used to systematically analyze years of trade data to look for insider trading or other securities law violations in minutes, as opposed to the weeks or months it previously took examiners to analyze smaller samples of data.[18] OCIE also has developed the High-Frequency Analytics Lab that can analyze market behavior down to the microsecond and help to identify potential abuse.[19]

Finally, the SEC's Division of Economic and Risk Analysis, or DERA, also provides important support to both Enforcement Division and OCIE efforts.[20]

The Principles Behind Data Analytics in Trade Surveillance

The primary principle underlying the use of data analytics in this realm is that unusual trading can itself be evidence of possible illegal conduct. This principle has been recognized in a variety of contexts by federal courts.

First, courts have routinely found that evidence of an unusual trading pattern can be evidence of insider

trading.[21] For example, in 2001, the First Circuit affirmed the conviction of a law firm employee who had appropriated material information regarding a bank merger his firm was handling, and then misappropriated that information by providing it to a broker with the intent that the broker use the information to purchase securities.[22] Right before the merger announcement, the broker placed trades on his account, his girlfriend's account and all his family accounts.[23]

The court found that, in conjunction with other evidence, this unusual trading pattern, which included a purchase that was nearly twice as large as the broker's previous trades, was sufficient to support the employee's conviction.[24] The inference that unusual trading may be evidence of insider trading, of course, is even more compelling if there is a pattern of trades before multiple public announcements.

Similarly, to prove market manipulation, the SEC must often show evidence of a pattern of unusual trading behavior to prove its claim.[25] For instance, in SEC v. Kwak, the defendants entered into a scheme to manipulate the stock price of Competitive Technologies Inc. by "matching trades" and by "marking the close."[26] A matched trade occurs when an individual purchases stock, knowing an offsetting transaction will be entered into by another, to mislead others about the market for a given stock.[27]

Meanwhile, "marking the close" occurs when an individual purchases or sells stocks near the close of trading to affect the closing stock price. In its decision denying the defendants' motions for judgment as a matter of law, the court cited as key evidence an SEC expert's testimony describing trading patterns, including late-day trading and trades where "one or more of the alleged scheme members were on both the buy and sell sides of a transaction."[28]

Finally, courts have repeatedly recognized that evidence that an investment adviser or broker-dealer wins a much greater portion of his or her allocated trades can be evidence of "cherry-picking."[29] This is a scheme in which an investment adviser or broker-dealer places multiple trades, and then "cherry-picks" the profitable trades for their own account, while placing the unprofitable trades in their customer accounts.

The SEC's Data Analytics Success Stories

What data analytics allows the SEC to do is to use quantitative tools at the outset to help it identify stark trading patterns at the beginning of an investigation or exam, or at least in the early stages. The SEC's public cases highlight the way that data analytics works in practice, and the commission routinely cites the surveillance work of the Analysis and Detection Center in generating insider trading cases.

For example, in his recent remarks, Clayton pointed to the case of SEC v. Jung et ano. to illustrate how these analytical tools work in practice.[30]

As alleged in the complaint, the case involved an employee of a prominent investment bank who made tens of thousands of dollars through suspicious trades.[31]

The unusual trading pattern highlighted in the complaint was stark: The investment bank employee used a friend's account to trade 12 separate times just before market moving public announcements.[32]

As highlighted by Clayton, "[t]his is a good example of the SEC's use of trading pattern recognition (trading in front of deals advised by a single investment bank) to uncover a scheme."[33]

Although the Market Abuse Unit's use of data analytics in insider trading cases may be well known, the cases filed by the commission also illustrate that its use of data analytics initiatives has improved its ability to detect the unusual trading patterns that form the basis of other types of cases. In 2015, for example, the SEC announced that it had engaged in a data-driven initiative to specifically identify cherry-picking schemes, and brought charges against an investor for the first time as a result of that initiative.[34]

In a press release, the co-chief of the SEC Enforcement Division's Asset Management Unit explained the need for the initiative, saying, "Cherry-picking schemes can be extremely difficult to detect without an investor astutely noticing that something may be amiss and coming to us with a complaint about the adviser."[35] The Market Abuse Unit similarly has recently also brought cherry-picking cases and credited the use of data analytics in the press release.[36]

The SEC's complaints in the cherry-picking cases detail how data analysis is used to prove misconduct. For example, in SEC v. Welhouse, the complaint spelled out in detail how the SEC used data analysis to show that the allocation of trades was not by chance.

The commission stated that Mark P. Welhouse had purchased options in an omnibus account for Welhouse & Associates Inc., and then waited to allocate purchases to his or his client's accounts until later in the day, when he saw which trades appreciated in value.[37] The profitable trades were disproportionately allocated to his personal and business accounts, while trades that depreciated in value were allocated to his clients'.[38]

As part of their investigation, SEC investigators conducted a statistical analysis.[39] They ran a simulation one million times to test the possibility that the profitability of Welhouse's accounts was based on luck.[40] According to the data, it was not. Welhouse's actual profit was substantially higher than each of the one million simulations.[41]

In addition, by comparing the proportion of profitable trades allocated to Welhouse's account to those allocated to Welhouse's clients, the investigators determined that the likelihood of the personal account receiving such a high proportion of profitable trades due to chance was less than one in one trillion.[42]

Data analytics also enabled the SEC to build an important case involving structured products. In 2016, the SEC announced that UBS had agreed to pay more than $15 million to settle charges that it had failed to "adequately educate and train its sales force about critical aspects of certain complex financial products it sold to retail investors."[43] In the press release, Andrew Ceresney, the director of the SEC Enforcement Division, stated, "We can now analyze literally hundreds of millions of trading records using sophisticated coding techniques that allow us to build platform wide cases rather than cases built investor by investor."[44]

Data Analytics Can Help Hedge Fund Advisers and Broker-Dealers Conduct Trade Surveillance and Fulfill Compliance Duties

The way that the SEC conducts its data analytics also reinforces the importance of firms using their own trade data to conduct surveillance to look for potential unusual patterns.

Under the securities laws, registered broker-dealers and investment advisers are responsible for reasonably supervising their employees with a view to preventing and detecting securities law violations. In addition, under Section 15(g) of the Exchange Act and Section 204A of the Investment

Advisers Act, registered firms also have a duty to maintain and enforce written policies and procedures reasonably designed to prevent the misuse of material nonpublic information given the nature of the firm's business.

Hedge fund advisers and broker-dealers have a powerful incentive to do surveillance of trading data on a routine basis, and should take a careful approach to reviewing such trade data for possible anomalies. Not only does the data provide an opportunity to see patterns of possible illegal trading, but finding these irregularities helps firms fulfill their duties and detect problems before they become more serious. In addition, regulators may take a dubious view if they later find a stark and obvious trading pattern of possible illegal activity in the firm's data that was never reviewed.

The need to use data analytics is especially pronounced in larger firms with sophisticated operations. First, both statutory provisions relating to supervision (which incorporate the concept of reasonableness) and material nonpublic information (which depend on the nature of the registrant's business) could be read to require a higher standard for sophisticated firms. Regardless of the precise legal requirements, regulators likely will have higher expectations for larger firms.

Second, most large firms are already using sophisticated data analytics as a regular part of their business to analyze performance and look for opportunities. It is important that a registrant's compliance and legal functions are aware of this data, and use it appropriately to carry out their responsibilities. To the extent that any trade is flagged as suspicious, it is important that the firm document the steps it takes to investigate and resolve the issue.

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Disclosure: Charles Riely was formerly an assistant director in the SEC's Market Abuse Unit, and worked on SEC v. McClatchey and the cherry-picking matter filed on Sept. 12, 2018 (SEC v. Bressman) referenced in footnote 33.

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[2] Complaint, SEC v. Yan, 1:17-cv-05257 at 6-10 (S.D.N.Y. July 12, 2017).

[3] Complaint, SEC v. Yan, 1:17-cv-05257 at 10 (S.D.N.Y. July 12, 2017); Press Release, SEC Files Insider Trading Charges Against Research Scientist Aiming to Avoid SEC Detection (July 12, 2017), https://www.sec.gov/news/press-release/2017-125.

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[22] United States v. Larrabee, 240 F.3d 18, 19-20 (1st Cir. 2001).

[23] See id. at 20.

[24] See id. at 20, 21-24.

[25] See SEC v. Kwak, No. CIVA 304-CV-1331 JCH, 2008 WL 410427, at *3 (D. Conn. Feb. 12, 2008); SEC v. U.S. Envtl. Inc., No. 94CIV.6608(PKL) (AJP), 2003 WL 21697891, at *1, 23-24 (S.D.N.Y. July 21, 2003), aff'd, 114 F. App'x 426 (2d Cir. 2004).

[26] See SEC v. Kwak, No. CIVA 304-CV-1331 JCH, 2008 WL 410427, at *1 (D. Conn. Feb. 12, 2008).

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[28] Id. at *3.

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