UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS

SPENCER ROLAND BUENO, individually and on behalf of all others similarly situated, Plaintiff, v. CBOE GLOBAL MARKETS, INC., CBOE HOLDINGS, INC., CBOE FUTURES EXCHANGE, LLC, CHICAGO BOARD OPTIONS EXCHANGE, INC., and JOHN DOES 1-20 Defendants.	**CLASS ACTION COMPLAINT** **JURY TRIAL DEMANDED**

TABLE OF CONTENTS

Page

Plaintiff Spencer Roland Bueno ("Plaintiff"), individually and on behalf of all others similarly situated, brings this class action based upon personal knowledge of his own acts and upon information and belief as to all other matters alleged herein, including the investigation of Plaintiff's counsel, against Cboe Global Markets, Inc., CBOE Futures Exchange, LLC, and the Chicago Board Options Exchange, Inc. (together, "CBOE"), as well as against other unknown entities ("John Doe Defendants"):

NATURE OF THE ACTION

1. This case involves the CBOE Volatility Index (the "VIX"). It is widely known as the U.S. stock market's "fear gauge," in that it seeks to measure the expected volatility of the S&P 500. Indeed, much of the recent press about market volatility has not just been about the equity markets themselves, but rather has also been about the VIX.

2. CBOE created the VIX to measure volatility in the equity market pursuant to an exclusive licensing agreement with S&P to use S&P's benchmark figure for the value of the equity market, *i.e.*, the S&P 500 ("SPX"). Having secured an exclusive license on SPX in order to create the VIX, CBOE has since built a suite of proprietary products based upon both, including: option contracts based on the SPX ("SPX Options"), options based on the VIX ("VIX Options"), and futures based on the VIX ("VIX Futures"). Crucially, CBOE's exchanges are the *only* places to trade these products.

3. With power over the equity market's "fear gauge," *and* exclusive control of the most popular instruments available to those who want to trade it, CBOE became corrupt. CBOE's desire for profits and market-share, combined with investor appetite in the period of market calm following the global financial crisis, led CBOE to push VIX Options and VIX

Futures into the marketplace even though it knew they were flawed, and to allow them to remain there, even though it knew they were being manipulated.[1]

4. Because nobody can physically deliver "the VIX"—as it is nothing more than CBOE's mathematical construct, not a physical good—all VIX Options and Futures are cash-settled. When VIX Options and Futures expire, CBOE makes a series of calculations to determine who owes how much cash to whom. In essence, it determines who is the winner and who is the loser, and by how much.

5. In theory, CBOE performed this calculation by taking prices from trades in the SPX Options market (which CBOE also controlled). This method assumed, in essence, that the prices people are willing to pay or accept for a 30-day option on the SPX might be a good way to measure the market's expectation of how much the SPX will move in the next 30 days, and thus what VIX Options and Futures should be worth today.

6. But the actual math behind that basic concept is developed and administered by CBOE through an incredibly complex formula. And that formula is not fed with SPX Options market data, but instead with the results of an opaque "Special Opening Quotation" ("SOQ") process. A recent academic study[2] and an even-more-recent "whistleblower" letter to U.S regulators[3] flagged that multiple suspicious choices which CBOE made when designing the SOQ

[1] There was a greater than 3000% increase in daily VIX Options transactions between 2006 and 2017, and over a 15,000% increase in VIX Futures. CBOE has reaped tremendous profits off its monopolistic control over the nation's financial "fear gauge." As discussed below, its annual report has made clear its 88% rise in "transaction fees" has occurred "primarily" because of volume increases in "proprietary" VIX-related trading. Trading fees on VIX Options, VIX Futures and SPX Options accounted for more than 60% of CBOE's total revenue—or more than $300 million—in 2017 alone.

[2] Griffin, John M. and Shams, Amin, *Manipulation in the VIX?* (May 23, 2017), https://ssrn.com/abstract=2972979.

[3] Wall Street Journal, *Regulator Looks Into Allege Manipulation of VIX, Wall Street's 'Fear Index'"* (February 13, 2018), https://www.wsj.com/articles/wall-street-regulator-probes-alleged-manipulation-of-vix-a-popular-volatility-gauge-1518547608.

settlement process meant that the process (and thus the cash settlement values of VIX Options and Futures) was uniquely vulnerable to being manipulated. In other words, CBOE designed, then regularly administered, a fatally flawed process.

7. CBOE also *knew* the process was fatally flawed. As the designer of the process, CBOE was intimately familiar with how it was constructed. And as its administrator of the process, CBOE knew exactly what levers people were pulling and what buttons people were pushing as VIX Options and Futures settlement values were being determined on a monthly and weekly basis. This complaint sets out a series of detailed and original economic analyses—which improve upon and extend far beyond anything publicly reported to date—each of which confirm that CBOE knew the settlement process was being abused.

8. For instance, Plaintiff's analyses demonstrate that CBOE would have seen, week after week *for years on end*, that: (1) the volume of trading in out-of-the-money SPX Options spiked dramatically during the VIX settlement window; (2) VIX Options and Futures settlement values were significantly different from the intraday VIX values immediately after the settlement window; and (3) the number of trades in out-of-the-money SPX Options actually ***increased*** as those options became more out of the money (and thus had more impact on the VIX Options and Futures settlement value), and conversely decreased when those options became less out-of-the-money. As CBOE well knew—none of these features are consistent with an un-manipulated market. Notably, other studies performed by Plaintiff show that pricing behaviors have changed since May 2017, when allegations that the VIX settlement process was rigged started to gain broader attention in public media.

9. Yet it was only recently that Plaintiff and members of the class had reason to sift through the complex mass of data to uncover these patterns and piece together what it meant for

the complex settlement process. Indeed, it has taken months to corroborate May 2017 academic work showing manipulation, and it was not until February 13, 2018 that an industry insider came forward to show the academic work was right.[4] Former government officials then commented on these facts. On February 14, 2018, for example, former Commissioner of the Commodities Futures Trading Commission ("CFTC") Bart Chilton stated that the allegation that the VIX was manipulated "rings true to me," and added that "there's certainly enough smoke."[5] On February 16, 2018, former Securities Exchange Commission ("SEC") Chairman Harvey Pitt echoed the comments of former Commissioner Chilton during an appearance on CNBC, stating "it's quite clear that [the VIX] indexes' options can be manipulated. . . . the Cboe, as the marketplace, should have sprung in to action."[6] Multiple regulators, including the CFTC, the SEC, and the Financial Industry Regulatory Authority, are now reported to be investigating the manipulation of VIX-related products.

10. Of course, this systemic manipulation of VIX products is not "news" to CBOE and the privileged few that co-participated in the manipulation. CBOE's SPX and VIX products have been its lifeblood for several years, generating the lion's share of its revenue and profit. With an owner's knowledge of the VIX Options and Futures settlement process, and unlimited access to the underlying data, CBOE thus knew of such patterns of manipulation long ago.

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[4] Saqib Iqbal Ahmed, John McCrank, *Whistleblower alleges manipulation of Cboe Volatility index*, Reuters (February 13, 2018). Available at: https://www.reuters.com/article/us-usa-stocks-volatility-manipulation/whistleblower-alleges-manipulation-of-cboe-volatility-index-idUSKBN1FX0ES.

[5] CNBC, *Former CFTC Commission: Whistleblower Allegation About Volatility Index Manipulation 'Rings true'"* (February 14, 20018), https://www.cnbc.com/2018/02/14/ex-cftc-head-bart-chilton-on-whistleblower-vix-manipulation-allegation.html.

[6] MarketWatch, *Ex-SEC Chairman Says "'It's Quite Clear' Wall Street's 'Fear Gauge' Can Be Manipulated"* (February 16, 2018), https://www.marketwatch.com/story/ex-sec-chairman-says-its-quite-clear-wall-streets-fear-gauge-can-be-manipulated-2018-02-16.

11. The flaws in the VIX settlement process were enabled and exacerbated by the fact that CBOE doled out special privileges to anonymous industry insiders. For instance, only designated participants had the right to participate in the SOQ settlement process by providing non-binding quotes rather than executable orders. And CBOE permitted only certain privileged participants to place so-called "strategic orders" in the closing minutes of the process—orders that in fact were highly complex, "if-then" scenarios that allowed for an even higher level of one-sided gamesmanship. CBOE also rewarded only a privileged few participants with a *discount* for playing such games with certain types of SPX Options (*i.e.*, the more illiquid ones, which had the greatest impact on the settlement process).

12. Despite knowing that the settlement process it created and administered was itself a type of deceptive device—as it allowed a privileged few to game the process to produce a desired set of cash payments to their advantage—CBOE continually doubled, and then tripled down on the deception. As explained below, CBOE has continuously marketed VIX, and VIX Options and Futures as "the world's premier barometer of investor sentiment and market volatility," and VIX Futures as "a pure play on implied volatility independent of the direction and level of stock prices." These statements to the market were all false and misleading, as were the VIX Options and Futures settlement values that CBOE calculated and published to the market. As CBOE knew, the settlement values for VIX Options and Futures were not being driven by natural market forces of supply and demand, but rather by the unlawful profit motives of a privileged few. And as CBOE also knew, all of this manipulation was being carried out through the John Doe Defendants' use of SPX Options, another product proprietary to CBOE, and tradable only on CBOE's exchange.

13. CBOE is thus liable pursuant to the Securities Exchange Act of 1934 for employing a device and scheme to defraud class members into believing VIX Options were priced and settled according to normal market forces; for making untrue statements and omissions regarding the reliability of VIX Options and their settlement process; for material omissions regarding whether those options were manipulated; and for carrying out its entire VIX Options business as a series of acts that operated as a fraud and deceit upon members of the class for the same reasons.

14. CBOE is liable for similar reasons pursuant to the Commodity Exchange Act for claims arising out of VIX Futures, which requires, for instance, CBOE to enforce rules preventing price manipulation on its exchanges. CBOE failed to enforce such rules when it designed, made public, and promoted a process that was vulnerable to manipulation; provided certain favored insiders with specialized tools that made such manipulation even easier; and then knowingly allowed investors to be cheated by such manipulation on a weekly basis, all because CBOE was driven more by profits and market share than by a desire to follow (and apply) the rules.

15. Also named herein—as the "John Doe Defendants"—are the persons or entities who participated in CBOE's manipulative scheme by carrying out such acts of manipulation using SPX Options, making artificial the prices for those options, VIX Options and Futures, and VIX ETPs (defined on page 18 below).

PARTIES

A. Plaintiff

16. Plaintiff Spencer Roland Bueno is an individual who resides in La Jolla, California. From 2014 through 2017, Mr. Bueno transacted in VIX Options and SPX Options on CBOE's Option Exchange ("COE"), and routinely held such contracts through settlement,

meaning he made or received payments based on the cash-settlement calculations run by CBOE, which were affected by the manipulation discussed herein. During this time period, Mr. Bueno also transacted in VIX ETPs (defined at page 18 below), which were also affected by the manipulation discussed herein. As a direct and proximate result of the wrongdoing alleged herein, Mr. Bueno suffered economic injury to his business and property.

B. Defendants

17. Defendant Cboe Global Markets, Inc. (formerly known as CBOE Holdings, Inc.), is a corporation organized under the laws of Delaware with its principal place of business in Chicago, Illinois. Cboe Global Markets, Inc. maintains offices around the globe, including in New York, NY. CBOE Global Markets, Inc. is the publicly traded holding company of, among other entities, CBOE Futures Exchange, LLC (which is responsible for operating the Chicago Futures Exchange, or "CFE") and the Chicago Board Options Exchange, Inc. (which is responsible for operating the COE).

18. Defendant Cboe Futures Exchange, LLC is a corporation organized under the laws of Delaware with its principal place of business in Chicago, Illinois.

19. Chicago Board Options Exchange, Inc. is a corporation organized under the laws of Delaware with its principal place of business in Chicago, Illinois.

20. Defendants Cboe Global Markets, Inc., Cboe Futures Exchange, LLC, Chicago Board Options Exchange, LLC, and their subsidiaries, officers, and directors are referenced collectively in this Complaint as "CBOE."

21. John Doe Defendants 1-20 are persons and entities that directly or indirectly manipulated or attempted to manipulate the settlement prices of VIX Options, VIX Futures, and VIX ETPs, including through trading or quoting SPX Options during the settlement window for VIX Options and VIX Futures. The identity of the John Doe Defendants cannot be known

without discovery from CBOE because trading of VIX Options and SPX Options on the COE, and of VIX Futures on the CFE, is anonymous. Plaintiff will request leave to amend this complaint upon learning the identity of the John Doe Defendants during the course of appropriate discovery.

JURISDICTION AND VENUE

22. This Court has subject matter jurisdiction over this action pursuant to Section 2 of the Sherman & Clayton Acts ("Sherman Act") (15 U.S.C.A. § 2), Section 22 of the Commodity Exchange Act ("CEA") (7 U.S.C. § 25),[7] Section 10(b) of the Securities and Exchange Act of 1934 ("Exchange Act") (15 U.S.C. § 78aa),[8] and pursuant to 28 U.S.C. §§ 1331 and 1337(a).

23. Venue is proper in this District pursuant to Section 2 of the Sherman Act (15 U.S.C.A. § 2), Section 22 of the CEA (7 U.S.C. § 25), Section 10(b) of the Exchange Act (15 U.S.C. § 78aa), and pursuant to 28 U.S.C. §1391. A substantial part of Defendants' acts or omissions occurred in this District, for which Defendants, directly or indirectly, used the means and instrumentalities of interstate commerce, including, but not limited to, the facilities of the national securities markets.

24. This Court has personal jurisdiction over each Defendant, because: each Defendant was found or resided in this District, had agents in this District, or transacted business throughout the United States, including in this District; a substantial part of the events giving rise to Plaintiff's claims arose in this District; and a substantial portion of the affected interstate trade and commerce described herein has been carried out in this District.

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[7] VIX Futures are "contracts for future delivery" as that term is defined in the CEA (7 U.S.C. § 1a(9)), and are a "contract of sale of [a] commodity for future delivery" as that term is used in the CEA (7 U.S.C. § 25(a)(1)(B)).

[8] SPX Options and VIX Options are "securities" as that term is defined in the Exchange Act (15 U.S.C. § 78c), including because they are an "option . . . entered into on a national securities exchange relating to . . . any instrument commonly known as a 'security.'"

FACTUAL BACKGROUND

A. Futures and Options Contracts

25. An option contract is an agreement that gives the buyer the right—but not the obligation—either to buy (in the case of a "call option") or to sell (in the case of a "put option") a particular commodity or financial instrument, at a predetermined price, at or during a specified time period in the future (the "expiry date"). The agreed price is generally known as the "strike price."

26. A physically settled option requires physical delivery of the underlying financial instrument on settlement. For example, many stock options are physically settled, meaning settlement requires actual delivery of the stock to the holder if she exercises the option. A cash-settled option, in contrast, results in a cash payment to the holder of the option based on prevailing market values for the underlying product or instrument at the time of settlement, rather than delivery of the product or instrument.

27. The main driver of whether a cash-settled option is exercised is whether it is "in-the-money" or "out-of-the-money." An in-the-money option is one where the holder is entitled to a cash payment if she exercises the option. For example, if one has the right to buy a widget at a price of $300 (a call), and the market price for the widget is currently $500, the call option is in-the-money—because one could buy a widget for $300 and immediately sell it for $500.

28. An out-of-the-money put or call is one where the holder is not entitled to a cash payment if she exercises the option. For example, if one has the right to sell a widget at a price of $300 (a put), and the market price for the widget is currently $500, the option is out-of-the-money—because the opportunity to sell at $300 is worthless when one could sell at $500.

29. Whether a put or call option is in-the-money or out-of-the-money depends on the relevant prevailing market price—the so-called "at the money" price. In the case of a widget, the at-the-money price would be the prevailing market price of a widget.

30. Futures contracts are similar to options contracts, in that they are a promise—generally made through a futures exchange—to buy or sell a particular commodity or financial instrument, at a predetermined price, at a fixed date in the future (*i.e.*, again, on an "expiry date"). Futures contracts can also be cash-settled, instead of requiring physical delivery of the underlying commodity or instrument on the expiry date.

31. Because there is no "SPX" or "VIX" to be physically delivered, each of SPX Options, VIX Options, and VIX Futures are all cash-settled.

B. The SPX and SPX Options

32. The S&P 500 index (SPX) is a capitalization-weighted index of 500 U.S. stocks from a broad range of industries. The impact of a component's price change is proportional to the issue's total market value, which is the share price multiplied by the number of shares outstanding.

33. The SPX is widely regarded as the leading benchmark of the overall U.S. stock market, and CBOE is the exclusive provider of options on the SPX (SPX Options). CBOE provides a range of SPX Options, including SPX Options with A.M. settlement, with P.M. settlement, weekly options, end-of-month options, and Mini SPX Options.

34. SPX Options are available for trading solely on CBOE's COE. Indeed, CBOE markets SPX Options as its "flagship contract," and as "the index option of choice for

institutional investors trading large and complex [S&P 500 options] orders."[9] As CBOE acknowledged in its 2016 Annual Report, "[t]he options we offer on the S&P 500 Index are exclusive to CBOE and contribute substantially to our volumes and transaction fees."[10]

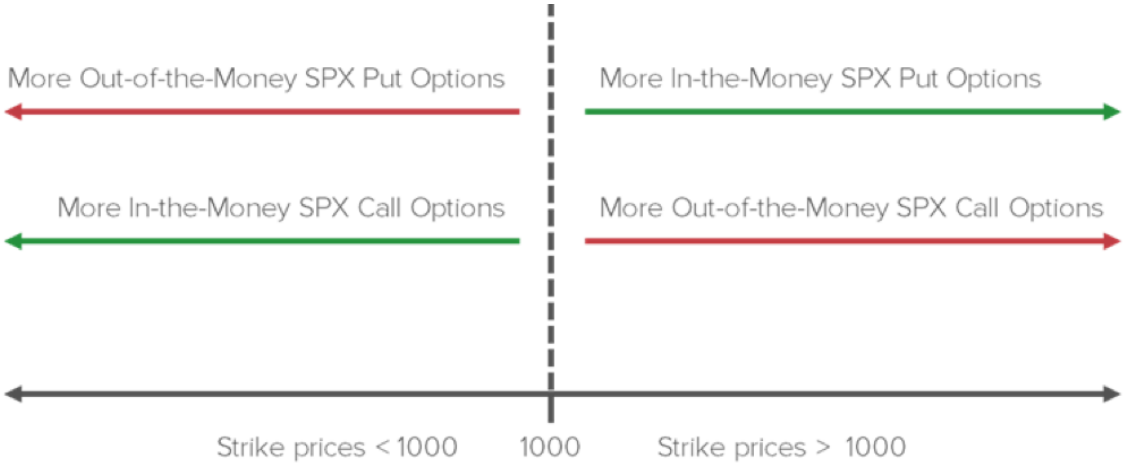
35. Like any other option, SPX Options can be either call or put options. They also can be in-the-money or out-of-the-money at any given point in time. Whether an SPX Option is at-the-money depends on the market's current expectation of the S&P 500 index's value in the future. For example, the at-the-money price for an SPX option that expires in 30 days reflects the market expectation of the level of the S&P 500 in 30 days' time.

36. There is a spectrum of in-the-money/out-of-the-money SPX put and call options, shown below for a hypothetical at-the-money price of $1,000. SPX Option puts that have lower strike prices are more out-of-the-money because the market is less likely to decline to those lower strike prices. Similarly, SPX Option calls that have higher strike prices are more out-of-the-money because the market is less likely to rise to those higher strike prices. This can be seen in the following diagram:

[9] CBOE *S&P 500 Index*, http://www.cboe.com/products/stock-index-options-spx-rut-msci-ftse/s-p-500-index-options/s-p-500-index.

[10] *CBOE 2016 Annual Report*, at 12.

At-The-Money Strike Price
For SPX Option Puts and Calls



C. The VIX

37. The VIX is a popular index used to measure the stock market's expectation of volatility, and is colloquially referred to as the "fear index" or the "fear gauge." The VIX is higher when the market is expected to be more volatile 30 days in the future (*i.e.*, when investors have more "fear" of swings in stock prices), and is lower when the market is expected to be less volatile 30 days in the future.

38. VIX is determined by reference to the prices of SPX Options because the prevailing quotation levels of SPX Options serve as an indicator of the market's expectations of future stock price volatility. For example, an option to buy or sell the S&P index at a given level will be worth more when the market is volatile (and more likely to move significantly above or below that level), whereas it will be worth less when the market is calm (and less likely to move significantly above or below that level).

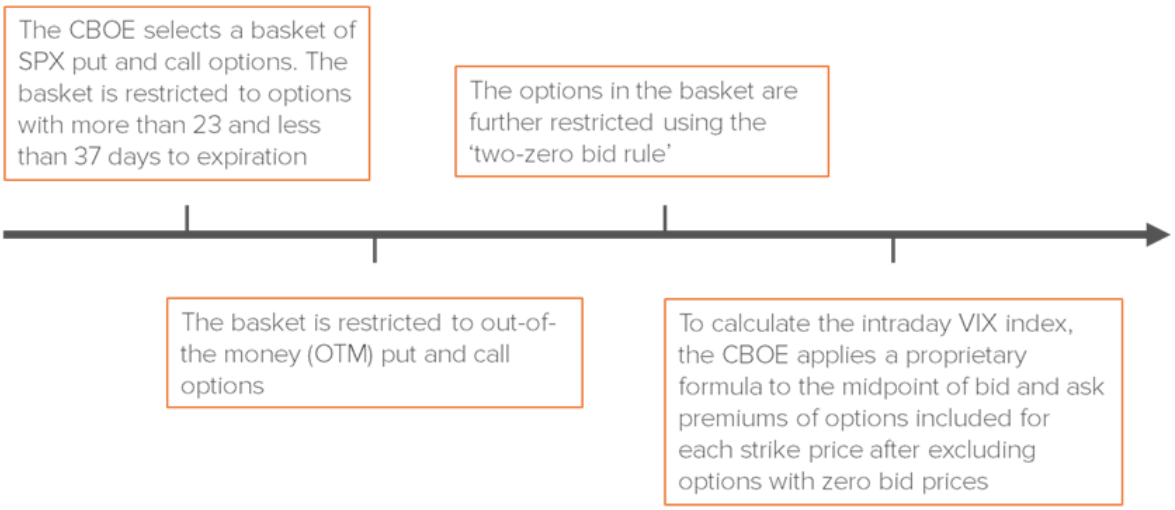
39. CBOE explains the relation between SPX Options and the VIX on its website:[11]

[11] CBOE, *VIX FAQs*, http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-faqs#1.

The VIX Index is an up-to-the-minute market estimate of implied (expected) volatility that is calculated by using the midpoint of real-time S&P 500® Index (SPX) option bid/ask quotes. More specifically, the VIX Index is intended to provide an instantaneous measure of how much the market thinks the S&P 500 Index will fluctuate in the 30 days from the time of each tick of the VIX Index.

Cboe Options Exchange® (Cboe®) calculates the VIX Index using standard SPX options and weekly SPX options that are listed for trading on Cboe. Standard SPX options expire on the third Friday of each month and weekly SPX options expire on all other Fridays. Only SPX options with Friday expirations are used to calculate the VIX Index. Only SPX options with more than 23 days and less than 37 days to the Friday SPX expiration are used to calculate the VIX Index. These SPX options are then weighted to yield a constant, 30-day measure of the expected volatility of the S&P 500 Index.

40. The VIX calculation process can be summarized in the following diagram:



41. To determine which SPX put and call options should be used to calculate the VIX, the calculation process starts from the strike price that is closest to the prevailing at-the-money value and proceeds in both "out of the money" directions until "two zero-bid" strike prices are reached. The "two-zero-bid rule" requires that the basket of SPX put and call options used to determine the value of the VIX must be drawn from puts and calls that are not "zero-bid" two or more times in a row.

42. A put or a call for an SPX Option at a given strike price will be "bid" when there is a party willing to buy the SPX Option at that strike price. A put or a call for an SPX Option at

a given strike price will be "zero-bid" when there are sufficient "ask" offers to clear all "bid" offers at that price, with volume left over on the "ask" side of the market. The following table offers a hypothetical illustration of whether the strike for a series of calls or puts on SPX Options would be included in the VIX calculation upon application of the "two-zero-bid rule":

Application of the "Two-Zero-Bid Rule"

Put Strike	Bid Premium	Ask Premium	Included in VIX calculation?
1380	0.1	0.2	Yes
1375	0.1	0.15	Yes
1370	0.05	0.35	Yes
1365	0	0.35	No
1360	0	0.35	No
1355	0.05	0.35	Excluded following two zero bids
1350	0.05	0.15	
1345	0	0.15	

Call Strike	Bid Premium	Ask Premium	Included in VIX calculation?
2100	0.05	0.15	Yes
2120	0	0.15	No
2125	0.05	0.15	Yes
2150	0	0.1	No
2175	0	0.05	No
2200	0.05	0.05	Excluded following two zero bids
2225	0.05	0.1	
2250	0	0.05	

43. As this table demonstrates, whether a given strike price (or series of strike prices) is included in the calculation for the VIX process is dependent on whether participants have chosen to bid on puts or calls at those strike prices.

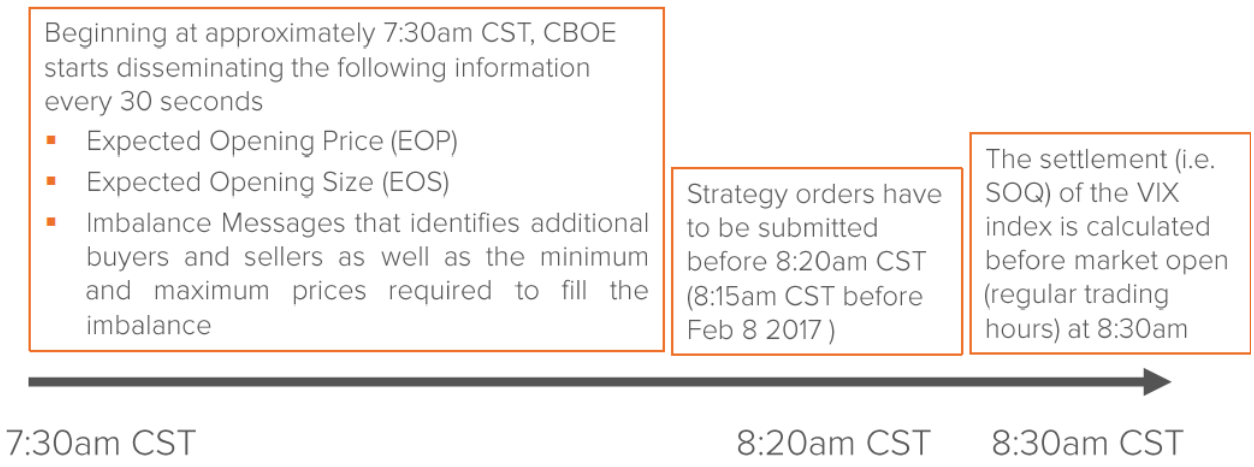
D. VIX Options, VIX Futures, VIX ETPs, and the "SOQ" Settlement Process

44. Initially the VIX was just a benchmark figure. Investors could not "take a position" on the VIX, or on the direction they thought it would go. In March 2004 however, CBOE responded to investor demand to monetize the VIX by creating VIX Futures, and then followed up with the creation of VIX Options in 2006. These CBOE products—exclusive to CBOE—now allow traders and investors to speculate on the extent to which the stock market, as reflected by the S&P 500, will be more or less volatile in the future.

45. VIX Options can only be exercised at expiration, and all are cash-settled. VIX Futures are also cash-settled at expiry. The cash-settlement value at expiry is determined

through the same CBOE-administered SOQ process for both VIX Options and Futures, but this process is only similar—and not identical—to the process used to calculate the VIX itself.[12]

46. The SOQ settlement process is conducted by CBOE using a proprietary auction mechanism called the "Hybrid Opening System" (or "HOSS"). The HOSS finds a single clearing price that maximizes the number of contracts that can be traded within the SOQ price range. The following table demonstrates the HOSS auction mechanism within the SOQ process:



47. CBOE keeps confidential the identity of the participants in the SOQ process. However, according to CBOE Rule 8.13, "Lead Market-Markers" are required to enter opening quotes for SPX Options, and according to CBOE Rule 8.85, "Designated Primary Market Makers" are required to enter opening quotes for SPXW options (*i.e.*, weekly SPX Options). CBOE does not publicize the identity of these privileged few participants.

[12] In addition to those discussed below, other differences between the intraday VIX calculation and the settlement calculation include that: (1) the VIX is calculated and published every 15 seconds throughout the trading day, whereas the VIX settlement price is calculated on the day that VIX Options and VIX Futures expire—which has been on a weekly basis since July 23, 2015 (before which it was monthly); (2) settlement calculations include only SPX Options that expire in exactly 30 days, whereas the intraday VIX computations include SPX options that expire in the range of 23 to 37 days; and (3) the intraday VIX is derived from the midpoint of bid and ask premiums of SPX Options, whereas the settlement calculations use actual traded prices where possible.

48. Both the orders and quotes of Lead Market-Markets and Designated Primary Market Makers are eligible to participate in the SOQ, giving them special influence in the determination of the settlement values for VIX Options and VIX Futures. By contrast, all other market participants can participate in the opening only through orders, and not through quotes.

49. Where there is no opening trade for SPX Options during the settlement window on a settlement date for VIX Futures and Options—and thus no price to incorporate into the SOQ and HOSS processes—the opening price will be the average of an SPX Option's bid and ask price determined at the open at 8:30 a.m. CST. At that time, CBOE executes SPX Options orders at market-clearing prices and removes all remaining unexecuted orders. The auction clearing prices for SPX Options expiring in exactly 30 days are then used as part of the calculations to settle VIX Options and Futures expiring that calculation day.

50. Shortly after VIX Options were created, a new set of products arose which allowed the market to trade the VIX. Since late 2008, the market has witnessed an increasing number of exchange-traded funds ("ETFs"), exchange-traded notes ("ETNs"), and options or futures on the shares of such funds or notes (together with ETFs and ETNs, "exchange-traded products" or "VIX ETPs"[13]) whose value is linked to VIX and VIX Options and VIX Futures. Between 2008 and 2018, the combined value of the VIX ETPs was approximately $25 billion.

[13] "VIX ETPs" as defined here and used throughout this Complaint does not include "inverse" ETNs or ETFs whose value is inversely linked to VIX and VIX Options and VIX Futures.

FACTUAL ALLEGATIONS

I. CBOE WAS OBLIGED TO ENSURE SETTLEMENT VALUES FOR VIX OPTIONS AND FUTURES RELIABLY TRACKED MARKET VOLATILITY, AND REPRESENTED TO THE MARKET THAT THIS WAS TRUE

A. CBOE Was Required To—And Did—Publish Rules Prohibiting "Abusive Trade Practices"

51. CBOE publishes a set of rules (the "CBOE Rules") that impose obligations on "Market Makers," "Registered Market Makers," and "Designated Primary Market Makers."[14]

52. CBOE publishes these rules because it, as a "board of trade," is required to "establish, monitor and enforce" such rules under Section 7 of the CEA. Among other provisions, the CEA provides that boards of trade shall:

a. "establish, monitor, and enforce compliance with the rules of the contract market, including . . . rules prohibiting abusive trade practices on the contract market," 7 U.S.C.A. § 7(d)(2)(A);

b. "have the capacity to detect, investigate, and apply appropriate sanctions to any person that violates any rule of the contract market," 7 U.S.C.A. § 7(d)(2)(A);

c. "list on the contract market only contracts that are not readily susceptible to manipulation," 7 U.S.C.A. § 7(d)(3); and

d. "have the capacity and responsibility to prevent manipulation, price distortion, and disruptions of the delivery or cash-settlement process through market surveillance, compliance, and enforcement practices and procedures," 7 U.S.C.A. § 7(d)(4).

[14] CBOE appoints broker-dealers as "Market Makers," "Registered Market-Makers," "Options Market Makers," and "Designated Primary Market Makers" for both its options and futures exchanges. *See* CBOE Rule 8.

53. The CBOE Rules—published pursuant to CBOE's multiple responsibilities under CEA Section 7—include requirements to trade competitively, to "contribute to the maintenance of a fair and orderly market, and [not to] enter into transactions or make bids or offers that are inconsistent with such a course of dealings." CBOE Rule 8.7.

B. CBOE Repeatedly Represented To The Market That VIX Options and Futures Were A Reliable Means Of Trading In Equities Market Volatility

54. In accordance with its obligation to "list . . . only contracts that are not readily susceptible to manipulation" (as just discussed), CBOE has long promoted VIX Options and Futures as an accurate and reliable means for investors to take positons on market volatility.

55. As of the date of filing, for example, CBOE's website promoted both VIX Options and Futures for a variety of purposes, ranging from speculation, to risk management, to portfolio diversification, to hedging:[15]

> Cboe Volatility Index® (VIX®) Options and Futures help you turn volatility to your advantage. Harness it to seek diversification, hedge or capitalize on volatility or efficiently generate income.

56. Indeed, through its website, CBOE expressly represents VIX Options and Futures as a means for investors to protect themselves against adverse market moves, to cabin or reduce their risk, and to achieve efficient investment returns:

[15] CBOE, "Cboe Vix" webpage, http://insight.cboe.com/vix/.

57. CBOE has promoted VIX Options and Futures in this way for years, even as it has changed how it offers them. For example, when CBOE moved from offering VIX Options and Futures with only monthly expiries to also offering them with weekly expiries in 2015, it touted this change as allowing "more opportunities" for "more targeted" use of the products to reduce risk or for investment:

58. Through the fact sheets that it published for its VIX products, CBOE has stressed that the VIX index upon which the VIX Options and Futures were based was "a leading measure of market expectations of near-term volatility."[16] CBOE has also stressed that "[t]he addition of weekly expirations to standard monthly features and options expirations offers volatility exposures that more precisely track the performance of the VIX Index."[17] Similarly, CBOE has emphasized that "[w]ith the launch of VIX Futures at Cboe Futures Exchange (CFE) in 2004 and

[16] Cboe VIX, *VIX Futures and Options*, (2018, v 1.2), http://www.cboe.com/micro/ vix/pdf/vix-fut-and-options-cboe-vix-fact-sheet.pdf.

[17] *Id.*, at 2.

VIX Options at Cboe in 2006, there has been a growing acceptance of trading VIX and VIX-linked products as risk management tools."[18]

59. All of these and multiple other similar representations to the market regarding the accuracy and reliability of VIX Options and Futures as trading and investment products were part of a deliberate and concerted plan by CBOE as it sought to grow itself as a newly "for profit" company.

60. In 2007, for example, CBOE engaged in a "new branding campaign" through which it wanted to "communicat[e] to the world that CBOE is a vital necessity in the options marketplace for which there is no substitute."[19] By 2012, CBOE was marketing its creation of weekly expiring VIX Options as allowing investors "targeted trading strategies around market news and events,"[20] *i.e.*, to engage in trading based on relevant market events.

61. As seen in the examples above, CBOE represented VIX Options and Futures as honestly and accurately reflecting market volatility throughout its advertising, marketing campaigns, web and print product descriptions, annual reports, and elsewhere. At no point did CBOE disclose to the public or investors that the SOQ process was, in fact, routinely hijacked by the John Doe Defendants in order to manipulate the settlement values of VIX Options and Futures, with distorting effects for the prices of both SPX Options and VIX ETPs.

62. But this hijacking was occurring, consistently, for *years*. The SOQ settlement process CBOE designed and administered had itself become a deceptive device—allowing the

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[18] *Id.*, at 2.

[19] CBOE, Annual Report 2006, at 3, http://www.cboe.com/framed/pdfframed?content=/aboutcboe/annualreportarchive/annualreport2006.pdf&section=SEC_ABOUT_CBOE&title=Cboe+Annual+Report+2006.

[20] CBOE, Annual Report 2012, at 4, http://www.cboe.com/framed/pdfframed?content=/aboutcboe/annualreportarchive/annualreport2012.pdf&section=SEC_ABOUT_CBOE&title=Cboe+Annual+Report+2012.

privileged few with the incentive, means, and access to fool everyone else into paying artificial prices.

II. CONTRARY TO CBOE'S OBLIGATIONS AND REPRESENATIONS, THE VIX SETTLEMENT PROCESS WAS FLAWED AND HIGHLY VULNERABLE TO MANIPULATION

63. While CBOE's proprietary settlement process for VIX Options and Futures was complex, it was ripe for corruption by those with the necessary level of sophistication. In the words of Matt Levine (a former banker at Goldman Sachs and a former mergers and acquisitions lawyer at Wachtell, Lipton, Rosen & Katz), the process was flawed because:

> [I]f you are a trader who owns a lot of the market in VIX futures, you could push around a large dollar value of futures by trading a small dollar value in options. This is particularly true because the S&P option volume is divided among many strikes, and the illiquid deep out-of-the-money S&P 500 options have a big influence on the VIX: You can move the price of those options a lot with relatively small trades, and those price changes have a disproportionate effect on the VIX. . . . [Thus,] if you are going to manipulate a tradable market . . . then VIX looks pretty tempting.[21]

64. As the complaint explains below, these temptations were indulged in multiple ways because the now-notorious SOQ settlement process contains multiple flaws.

A. The Settlement Process Was Vulnerable to Manipulation by "Banging the Close"

65. The VIX settlement process is dependent on the value of thinly traded, illiquid financial instruments. Specifically, it relies upon out-of-the-money SPX Options. These SPX Options trade in far lower volumes than VIX Options and VIX Futures. Indeed, the paper by Prof. Griffin and Mr. Shams found that "the size of VIX futures with open interest at settlement

[21] Matt Levine, *VIX Trading, Hoaxes, and Blockchain* (May 24, 2017), https://www.bloomberg.com/ view/articles/2017-05-24/vix-trading-hoaxes-and-blockchain.

is on average 5.7 times the size SPX options traded at settlement, and it is 7.3 times for VIX options that are in-the-money at settlement."[22]

66. This made it easier for the John Doe Defendant to move prices in the direction they wanted, because trading even a small number of out-of-the-money SPX Options could result in large price differences in VIX Options and Futures. This strategy is generally known as "banging the close."

67. The ability to bang the close was amplified because active trading in "strategy orders" for the relevant SPX Options must be submitted before 8:20 a.m. CST, but CBOE only begins publishing information about the relevant SPX Options at 7:30 a.m. CST. This means that Defendants only needed to move the market in the intended direction shortly before 8:20 a.m. CST in order to have the intended effect. The short time window for manipulation is amplified by the relatively infrequent nature of VIX settlements—expiring VIX Futures and Options typically settle weekly (from July 23, 2015), or monthly on the third or fourth Wednesday of each month (since they started trading),[23] with the final settlement values determined on the morning of their respective expiration dates. Put another way, if the SOQ settlement window was longer, during normal market hours, or occurred more often, the John Doe Defendants would have had more difficulty reaping their ill-gotten gains.

68. Additionally, out-of-the-money SPX Options often have a large bid-ask spread, which allows for large price changes within the spread. Such trading is not observable by third

[22] Griffin, John M. and Shams, Amin, *Manipulation in the VIX?* (May 23, 2017), at 32, https://ssrn.com/abstract=2972979.

[23] On July 21, 2015, the SEC granted CBOEs request to commence weekly expiries of VIX Options. *See* Securities and Exchange Commission, *Release No. 34-75501*, https://www.sec.gov/rules/sro/cboe/2015/34-75501.pdf .

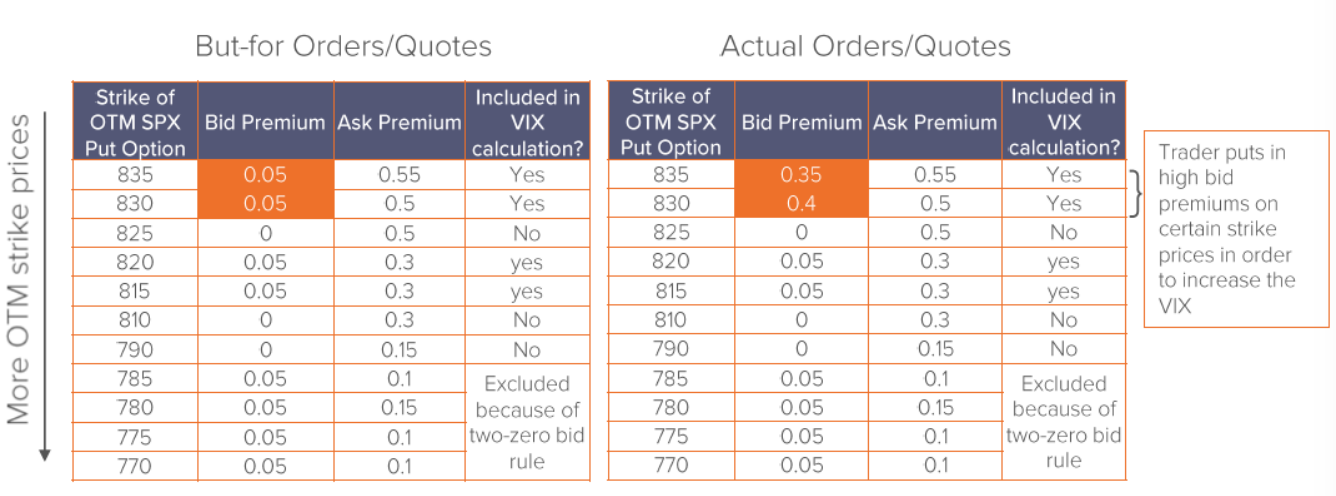
parties until the SOQ auction takes place. It would therefore be too late to arbitrage any irrational quote movements.

69. Because the VIX SOQ settlement process relied upon thinly traded instruments over a short time period, the John Doe Defendants could and did engage in trading designed to move market prices for these instruments in a desired direction (which had a corresponding impact upon prices of SPX Options and the value of VIX ETPs). Specifically, they could and did raise their bid premiums or lower their ask premiums for puts at certain strike prices, knowing that those manipulated prices would be incorporated into the process.

70. By placing higher bid premiums on puts at particular strike prices than they otherwise would have, the John Doe Defendants were able to "bang up" the level of the mid premium for that strike (*i.e.*, the mid level between the bid and ask premium for a put at a given strike), and thus increase the settlement value for any corresponding VIX Option or VIX Future. Conversely, by placing lower ask premiums on puts at particular strike prices than they otherwise would have, the John Doe Defendants were able to decrease or "bang down" the level of the mid premium for that strike, and thus decrease the settlement value for any corresponding VIX Option or VIX Future.

71. The following table illustrates this strategy—the left hand side of the table shows the bid/ask premiums that might occur during the SOQ process absent manipulation. In this scenario, the out-of-the-money SPX Options have bid premiums for a put with a strike of 835 (*e.g.*, a bid premium at 0.05) and for another put with a strike of 830 (*e.g.*, again, a bid premium at 0.05). As discussed above, these bid premiums represent the market clearing prices for each relevant strike price.

SOQ "Banging the Close"



72. By contrast, the right hand side of the table shows the much higher bid premium that the John Doe Defendants were able to achieve for SPX Options by purchasing a large volume of puts with the same two strike prices (*e.g.*, bid premiums of 0.35 and 0.4 for the two strike prices of 835 and 830, respectively). In this example, the strategy of purchasing a large amount of puts during the SOQ creates an artificially high VIX level by pushing the mid premium for the SPX Option puts with strikes at 835 and 830 much higher (*i.e.*, to the mid point between the bid/ask premiums of 0.35/0.55 and 0.4/0.5) than it would have been in the non-manipulated scenario (*i.e.*, to the mid point between the bid/ask premiums of 0.005/.055 and 0.05/0.5).

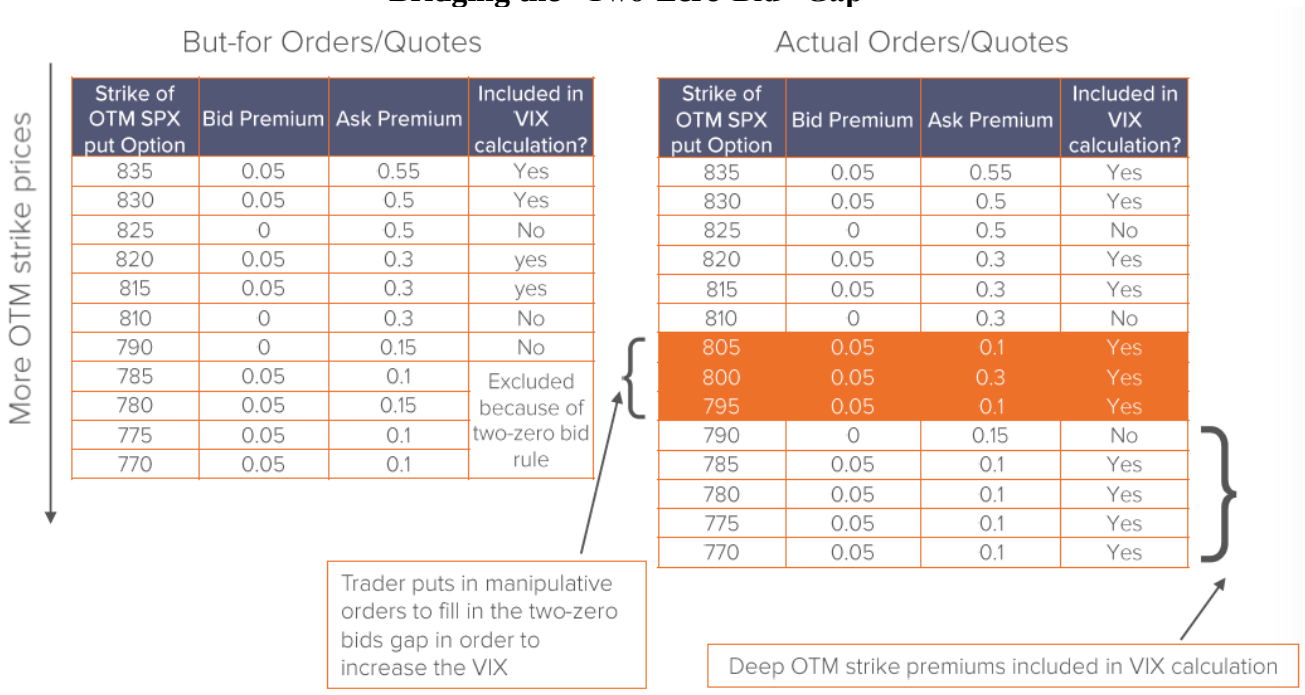
B. The Settlement Process Was Vulnerable to Manipulation by Abuse of the "Two-Zero-Bid Rule"

73. As discussed above, the SOQ calculation starts at the center and works outwards through increasingly out-of-the-money strike prices. This calculation stops when two zeroes are found in a row—the so-called "two-zero-bid rule." The calculation stops at that point because it is supposedly an indication that the SPX Option is so far out-of-the-money that the pricing for that option is not sufficiently reliable to use in the settlement calculation.

74. The John Doe Defendants—particularly those privileged few (like CBOE market makers) who could participate in this process merely by placing quotes (instead of actual orders) and by placing complex order types at the last minute—could and did circumvent the "two-zero-bid rule" by spreading bids out across strike prices. This was done to ensure that there were never two or more consecutive "zero bid" puts ahead of any strike prices that the John Doe Defendants wanted the SOQ process to take into account. With any "two-zero-bid" gaps artificially bridged in this way, the SOQ calculation would reach deeper and deeper into the range of out-of-the-money strike prices when determining the settlement value for the expiring VIX Options and VIX Futures.

75. The following table illustrates this strategy, and the way in which the John Doe Defendants could achieve greater weighting from deep out-of-the-money puts in the SOQ process:

Bridging the "Two-Zero-Bid" Gap



76. The manipulative effect of such a scheme was magnified by the formula used by CBOE. The VIX is calculated using the following formula:

$$\sigma_1^2 = \frac{2}{T_1}\sum_i \frac{\Delta K_i}{K_i^2} e^{R_1 T_1} Q(K_i) - \frac{1}{T_1}\left[\frac{F_1}{K_0} - 1\right]^2$$

77. This formula shows a number of important relationships that influence how the VIX is set. The term $Q(K_i)$ is the midpoint of the bid-ask spread for each option with strike K_i. The price of each K_i is weighted in the equation by the weight factor:

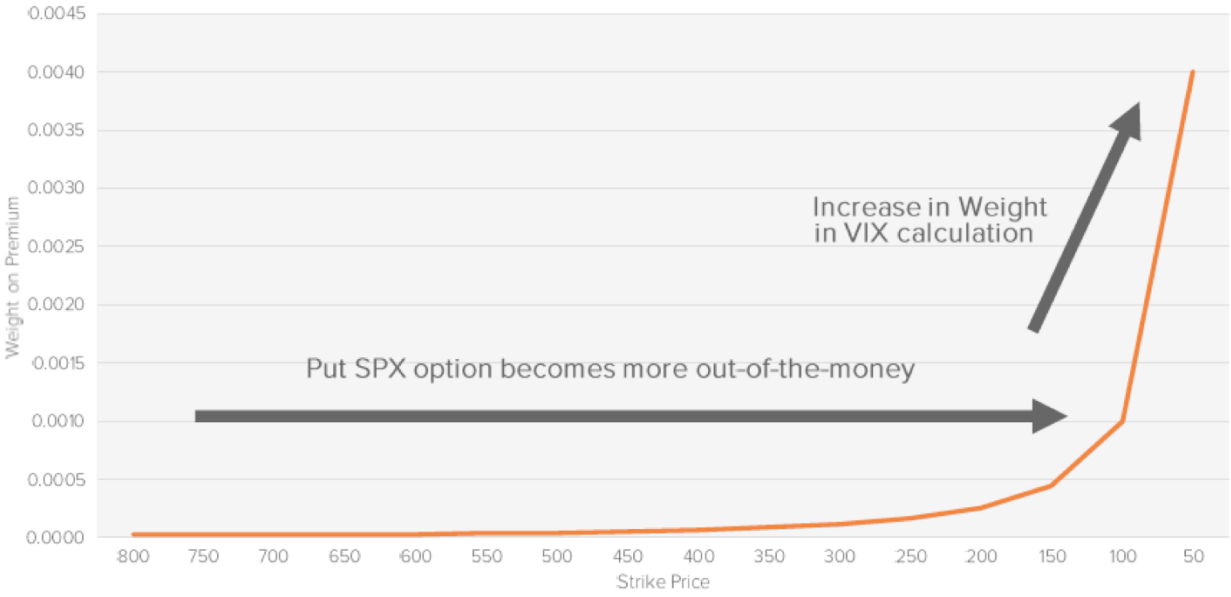
$$\frac{\Delta K_i}{K_i^2} e^{R_1 T_1}$$

78. The size of this weighing factor therefore determines how much the pricing of a given strike will influence the VIX settlement value. First, consider ΔK_i, which is half the difference between the strike prices on either side of a given strike price K_i. This variable captures whether certain strikes were "skipped" and therefore trading across strike prices that were more spread out. ΔK_i tends to be larger for the more out-of-the-money options. Second, consider K_i^2 which is the square of the strike price. If this term is smaller, *e.g.*, has a smaller strike price, then the weighing factor will *increase*. For this reason, out-of-the-money put options (not call options) have a much greater impact on the ultimate VIX settlement price because out-of-the-money put options are always *less* than the prevailing at-the-money price while out-of-the-money call options are always *greater* than the prevailing at-the-money price.

79. Together, these factors mean that *the most out-of-the-money put options* will have a disproportionate impact on the ultimate VIX settlement price. This means that by avoiding the two-zero-bid rule, and thus causing the calculation to reach into bids and asks that were *even*

deeper out of the money, John Doe Defendants were able to greatly amplify the impact of their manipulative acts. This relationship is shown in the following figure.

Hypothetical Example: Moneyness of SPX Put Option and Weight on Premium in VIX Calculation



C. The Settlement Process Was Vulnerable to Manipulation by "Spoofing"

80. The John Doe Defendant could also move the VIX settlement price by delaying or cancelling their bids or asks on SPX Options at certain strikes, again to manipulate the mid premiums calculated by the SOQ process for puts at those strikes.

81. For example, by placing a high bid for a put at a given strike price but then cancelling it, or delaying a high bid until after the SOQ process was complete, the John Doe Defendants were able to ensure the high bid for that strike was not included in the VIX calculation, which decreased the VIX settlement price. Conversely, by placing a lower bid for an ask at a given strike price but then cancelling it, or delaying a low ask until after the SOQ process was complete, the John Doe Defendants could ensure that the low ask for that strike was not included in the VIX calculation, which increased the VIX settlement price.

82. The following table illustrates this strategy—the left hand side of the table shows the ask premium that a non-manipulating party might place for a SPX Option put with a strike of 835 (*e.g.*, 0.55) and for another with a strike of 830 (*e.g.*, 0.5). By contrast the right hand side of the table shows the much higher ask premium that the John Doe Defendants would hypothetically have placed for SPX Option puts with the same two strike prices (*e.g.*, 0.66 and 0.61 respectively):

SOQ Manipulation Strategy
– "Spoofing the Mid Premium"

More OTM strike prices ↓

But-for Orders/Quotes				Actual Orders/Quotes				
Strike of OTM SPX Put Option	Bid Premium	Ask Premium	Included in VIX calculation?	Strike of OTM SPX Put Option	Bid Premium	Ask Premium	Included in VIX calculation?	
835	0.05	0.55	Yes	835	0.05	0.66	Yes	Trader delayed/cancelled low ask premiums on certain strike prices in order to increase the VIX
830	0.05	0.5	Yes	830	0.05	0.61	Yes	
825	0	0.5	No	825	0	0.5	No	
820	0.05	0.3	yes	820	0.05	0.3	yes	
815	0.05	0.3	yes	815	0.05	0.3	yes	
810	0	0.3	No	810	0	0.3	No	
790	0	0.15	No	790	0	0.15	No	
785	0.05	0.1	Excluded because of two-zero bid rule	785	0.05	0.1	Excluded because of two-zero bid rule	
780	0.05	0.15		780	0.05	0.15		
775	0.05	0.1		775	0.05	0.1		
770	0.05	0.1		770	0.05	0.1		

83. By placing these higher ask premiums, and then cancelling them before they were taken into account by the SOQ process, or by delaying them until after the SOQ process was complete, the John Doe Defendants were able to distort the SPX Option mid premium, and thereby to manipulate the final VIX settlement value.

III. CONTRARY TO CBOE'S OBLIGATIONS AND REPRESENTATIONS, THE VIX SETTLEMENT PROCESS WAS BEING CONSISTENTLY MANIPULATED BY THE JOHN DOE DEFENDANTS

84. In May 2017 a research paper titled "Manipulation in the VIX?" by Professor Griffin and Mr. Shams of the University of Texas was published.[24] While Plaintiff's analyses here are both an improvement upon and an expansion of the more theoretical work presented by the paper, it contains some similar tests, and notably concludes with an indictment of the entire VIX settlement process:[25]

> First, at the exact time of monthly VIX settlement, highly statistically and economically significant trading volume spikes occur in the underlying SPX options. Second, the spike occurs only in the out-of-the-money SPX options that are included in the VIX settlement calculation and not in the excluded in-the-money SPX options. Third, there is no spike in volume for the similar S&P 100 Index or SPDR S&P 500 ETF options that are unconnected to volatility index derivatives. Fourth, if traders sought to manipulate the VIX settlement, they would want to move the price by optimally spreading their trades across the SPX strike and increasing the number of trades in the deep out-of-the-money put options consistent with the VIX formula. Trading volume at settlement follows this pattern, whereas normally deep out-of-the-money options are rarely traded. Fifth, there are certain options that have discontinuously higher weight in the VIX formula but are otherwise very similar to other options. These options exhibit jumps in trading volume at settlement that are not present at normal times.

85. The Griffin and Shams paper also considered alternative—purportedly innocent—explanations for these suspicious trading patterns, such as potential hedging or "pent-up liquidity demand." But ultimately it rejected them all as inconsistent with the trading data.[26]

86. Most recently, on February 12, 2018, the firm Zuckerman Law wrote to the SEC and the CFTC purporting to represent a whistleblower "who has held senior positions at some of the largest investment firms in the world." The February 12 letter alleges that CBOE was responsible for allowing "pervasive flaw[s]" in the VIX; for failing "[to] implement circuit

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[24] Griffin, John M. and Shams, Amin, *Manipulation in the VIX*? (May 23, 2017), https://ssrn.com/abstract=2972979.

[25] *Id.*, at 2-3.

[26] *Id.*, at 3.

breakers on the VIX futures"; for failing "[to] plac[e] any safeguards around an unstable market structure for VIX products"; and for providing "woefully inadequate" disclosure in respect of those flaws and lack of safeguards. The letter also alleges that unknown "trading firms with sophisticated algorithms [capable of moving] the VIX up or down by simply posting quotes on S&P options" were actively manipulating in this way.

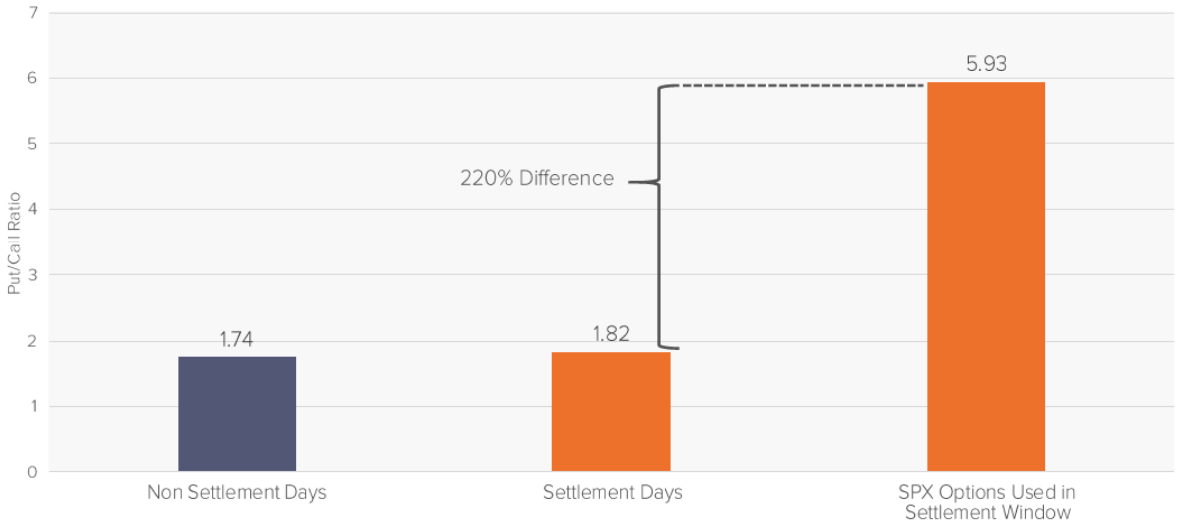
87. Between these academic analyses and whistleblower allegations, as supported by the public opinions of multiple former public regulators (refer to the statements of former CFTC Commissioner Chilton, and Former SEC Chairman Pitt, *supra* at ¶9)—consensus is building that the SOQ process was corrupted. But members of the class need not wait for the final results of any eventual government investigation. Plaintiff's extensive economic analyses demonstrate that the settlement process routinely was being exploited.

A. The Ratio of Trading Volume for SPX Option Puts to Calls Skews Significantly on Settlement Days

88. As discussed above, SPX Option put trades have a greater influence on the ultimate settlement price. A uniquely disproportionate use of puts over calls thus would be another indication of manipulative activity, as it would indicate that market actors just so happened to be preferring the type of order that would maximize a manipulative effect *during exactly the time* when such manipulative effect was possible.

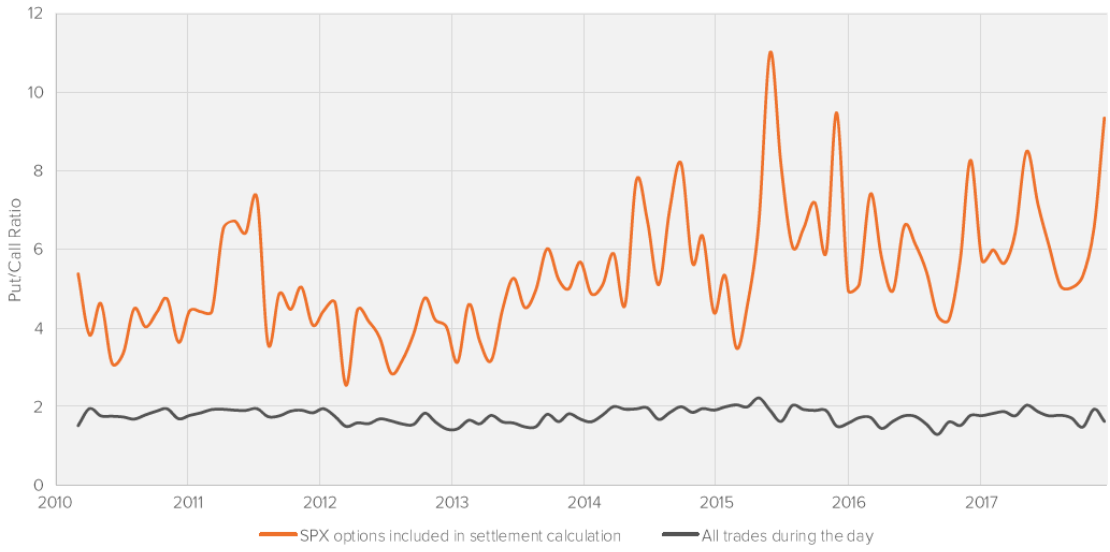
89. And this is what the data show. As seen in the following table, the ratio of put trades to call trades was relatively similar (1.74 to 1.82) when considered across the whole of expiry and non-expiry days, but it ballooned (to 5.93) during the SOQ settlement window:

Average Put/Call Ratio
6 July 2010 – 13 March 2018



90. That the strongest tool for manipulation was heavily favored during the time of day when manipulation was most likely to occur can also be seen by tracking the trend over time. In the following chart, the blue line represents the (relatively constant) ratio of puts to calls throughout the trading day, while the (higher) orange line measure the same ratio for only the SPX Options included in the SOQ process. As can be seen, the ratio of put to calls was far higher for the SPX Options used in the settlement process.

Monthly Average SPX Option Put/Call Ratio



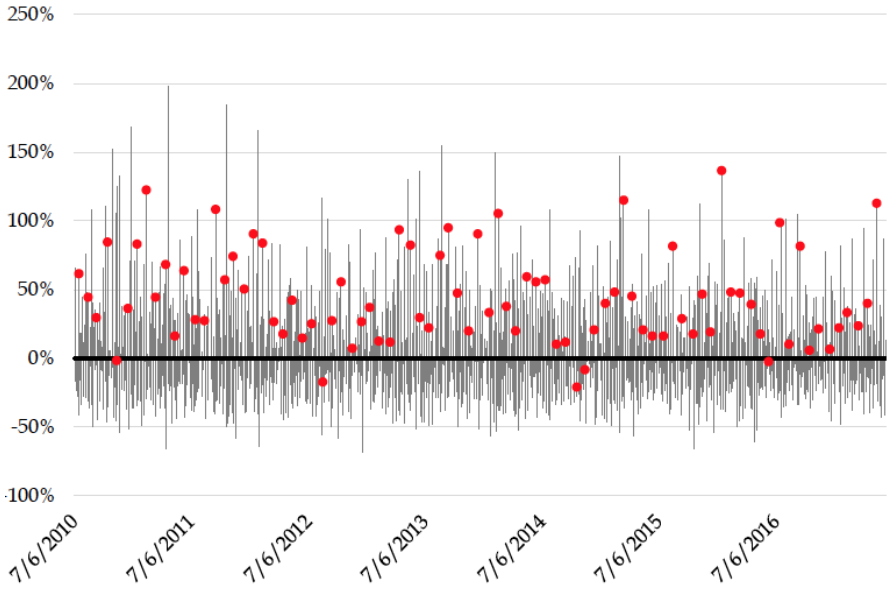
B. The Trading Volume of Out-of-The-Money Trades Skyrockets During the Settlement Window

91. The data show that SPX Options are traded in greater volume on the days when VIX Options and VIX Futures are expiring, as seen in the following chart:

Average Daily SPX Options Volume
On Expiration Dates Vs. All Other Dates
2010-2017

92. Another way of showing that there was an abnormally high volume of transactions for settlement days is to compare SPX trading volumes on the day prior to the expiration day for VIX Options and Futures. In the following graph, the spikes represent the percentage by which the trading volume of SPX Options increased or decreased from one day to the next (spikes above 0% show that trading volume increased, and spikes below 0% show that it decreased). The red dots in this graph indicate the VIX Options and VIX Futures expiry days. Combined, the spikes and the dots show that—for the 83 expiry days between July 6, 2010 and July 6, 2017—*all but five* of those days experienced higher SPX Option trading volume than the prior non-expiry day.

Day-Over-Day Percentage Change in SPX Options Volume
(Red Dots Indicate VIX Option and VIX Future Expiry Dates)
2010-2017



93. That this increase in volume was not just generalized interest in settling contracts, but attempts to *manipulate* the settlement process, is confirmed by Plaintiff's deeper dive into the *type* of transactions that make up this volume spike.

94. Specifically, as outlined in Section II.B above, the weight assigned to the strike price for a put on a given SPX Option during the SOQ increases as the "out-of-the-moneyness" of that option increases. Typically, the more "out-of-the-money" an option is, the less likely it is to be traded, because it has a lower probability of becoming "in-the-money" and rewarding its holder with a cash payment. For this reason, out-of-the-money options are typically traded at lower volumes as they become more out-of-the-money. However, because out-of-the-money options have greater weight in the SOQ process, a reversal of this trend would be yet another indicator that the SOQ process was being manipulated.

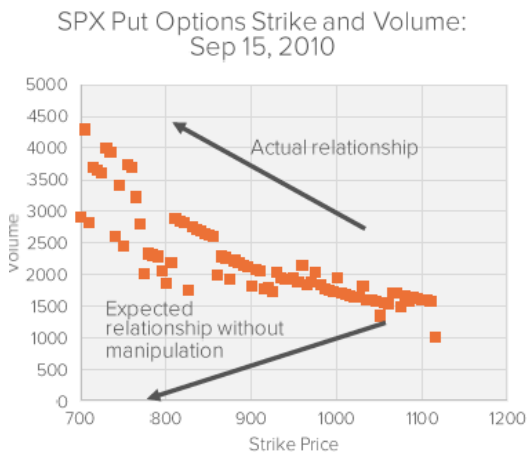
95. The following charts provide multiple ways of measuring this phenomenon, but the conclusion is the same in each case: out-of-the-money SPX Options were being traded at

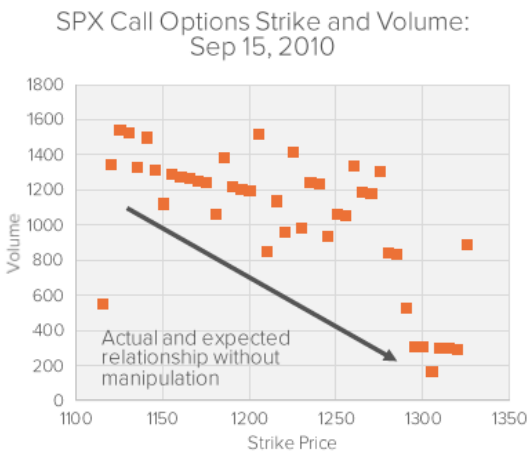
inexplicable volumes during the SOQ settlement period, which is further proof that the settlement process was being manipulated.

96. *A Single-Day Demonstration Of The Positive Correlation Between SPX Option Trade Volume And Out-Of-The-Moneyness*: The follow table demonstrates—for a single, example day—the disconnect between (a) the expected relation between how far out-of-the-money a put option is and how much trading volume one would expect to see for that option, versus (b) the actual out-of-the-money vs. trade volume relationship on an expiration day.

97. The left hand side of the table (showing puts, the stronger tool for manipulation) inexplicably demonstrates a *positive* relationship between volume and how far out-of-the-money the option was—meaning, the *less* likely an SPX Option put was to result in a cash payout to its owner upon expiry, the *more* often it was traded. By sharp contrast, the right hand side of the table (showing calls, the weaker tool for manipulation) shows the expected relationship—the *less* likely an SPX Option call was to result in a cash payout to its owner upon expiry, the *less* often it was traded. These patterns—shown here for just one of many available example days—are the opposite of the relation one would expect to see in an manipulated market.

Correlation of Trading Volume vs. Out-Of-The-Moneyness for SPX Option Puts and Calls – September 15, 2010

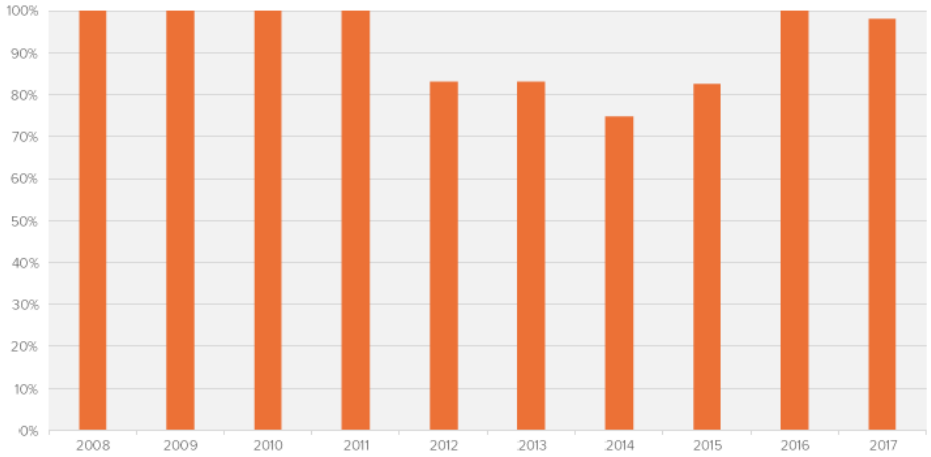




98. *There Was A Positive Correlation Between SPX Put Option Trade Volume and Out-Of-The-Moneyness For Ten Years*: The following graph takes the negative correlation between "moneyness" and trading volume for SPX Option puts demonstrated by the above example day, and then measures it during the SOQ settlement window over the last ten years.

99. It demonstrates a 100% correlation for five out of the ten years—meaning that, *for every expiry day for half of the last decade*, the SPX Option puts that were the least likely to result in a cash payout for the owner were the most heavily traded. The graph also shows the same negative correlation at least *80% of the time* for the remaining four out of five years. Again, these results are the opposite of what one would expect to see in an un-manipulated market.

Percentage of Days With Negative Correlation Between "Moneyness" and Trading Volume for SPX Put Options During VIX Settlement Window

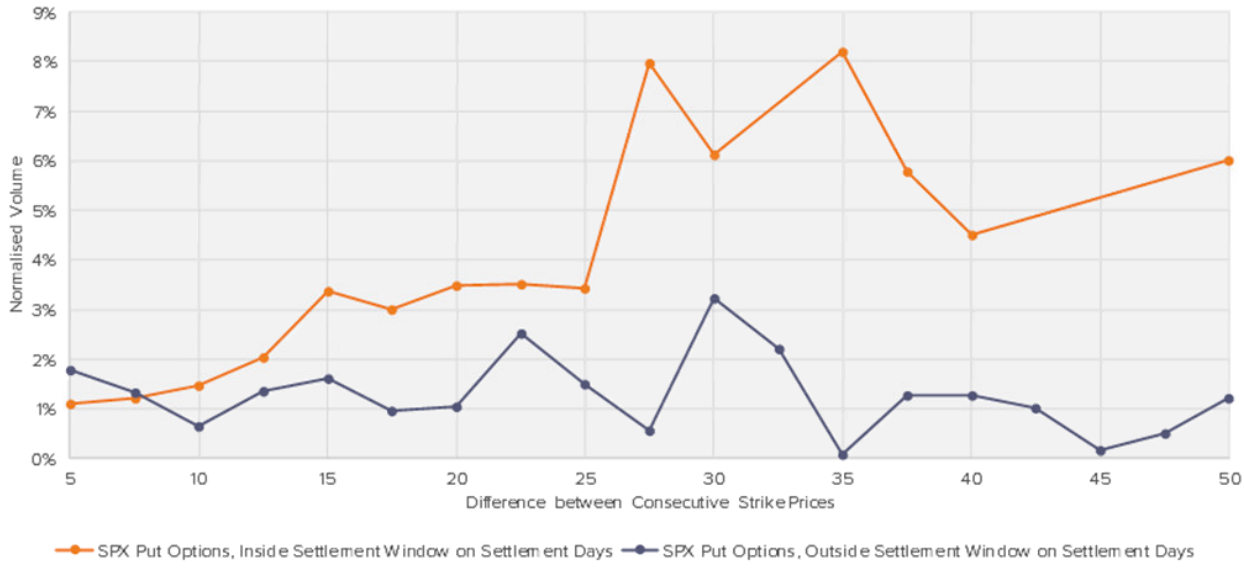


100. *The Abnormal Trade Volume of Certain SPX Options Is Also Present For SPX Options That Carry More Weight In The SOQ Formula Because They Are More "Spread Out" From Surrounding Options With Different Strike Prices*: Plaintiff also examined whether SPX Options with strike prices associated with a large ΔK_i experienced larger trading volume. As

discussed in Section II.B above, ΔK_i plays an important part in the VIX weighting formula—strike prices that have a larger ΔK_i will have a larger impact on the ultimate VIX value.[27]

101. As demonstrated in the following graph, Plaintiff's analyses show that there were substantially greater trading volumes in SPX Options associated with a larger ΔK_i relative to those SPX Options associated with a smaller ΔK_i. In other words—Plaintiff's analyses again show that a particular type of SPX Options (like puts over calls, and like more out-of-the-money over less-out-of-the-money) is traded in greater volumes during the settlement window than outside of the settlement window. The logical inference is that this occurred because the John Doe Defendants were again deliberately trading this type of SPX Option to achieve greatest impact upon the SOQ settlement process.

Normalized Volume and Difference Between Consecutive Strike Prices
Inside vs. Outside the Settlement Window on Settlement Days
October 17, 2007 – March 7, 2008

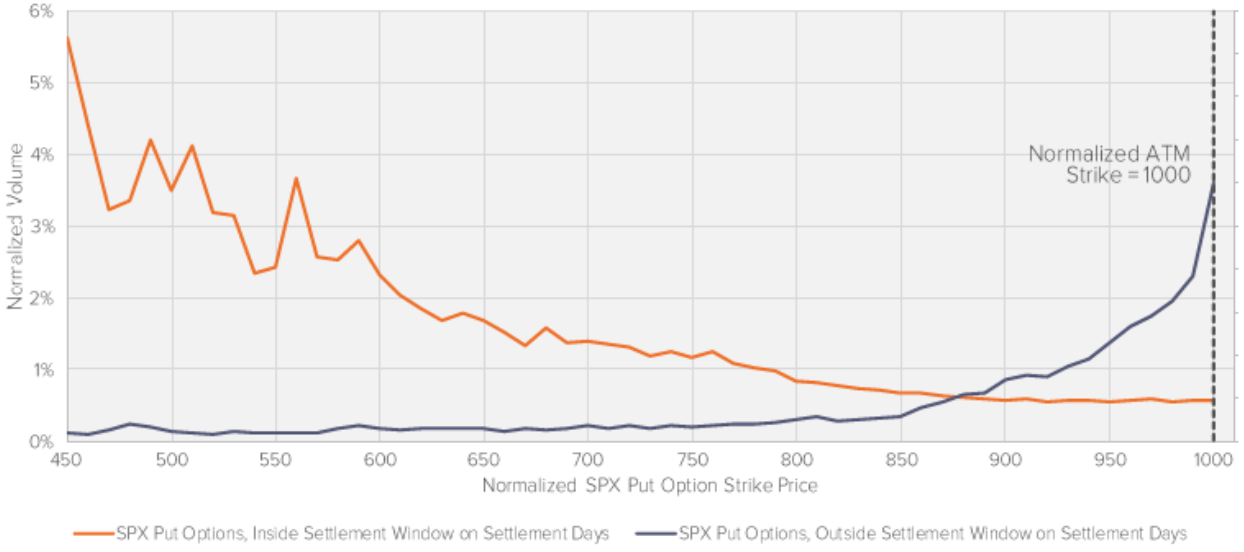


[27] ΔK_i is half the difference between the strike prices on either side of a given strike price K_i. This variable captures whether certain strikes were "skipped," and therefore whether trading across strike prices is more spread out.

102. *These Abnormal SPX Option Trade Volume Relationships Do Not Appear Outside The Settlement Process*: That the volume of out-of-the-money SPX Options traded during the settlement window is abnormal compared to normal market activity can also be seen by plotting the trading volumes across the last ten years. The following graph plots the normalized volume of trading for SPX Options with a normalized strike price of $1,000 both during the SOQ settlement window (orange line) and outside the settlement window (blue line).

103. It shows that not only does the volume of trading in SPX Options increase during the SOQ window as the strike price for those options decreases, but also that the *opposite* is true for the same type of options outside of that window. In other words, it shows that where the settlement process is *not* implicated, ordinary market forces prevail and trading volume is higher for SPX Options that are closer to being in-the-money (*i.e.*, more likely to result in a cash payout to their holder), and lower for SPX Options that are further out-of-the-money (*i.e.*, less likely to result in a cash payout to their holder).

Normalized Strike Price and Volume of SPX Put Options
Inside v. Outside the Settlement Window
on Settlement Days October 17, 2007 to March 7, 2018



C. VIX Settlement Values Consistently Differ From VIX Intraday Trading Values Immediately Post- Settlement

104. The VIX settlement value is supposed to reflect the VIX price on a given settlement day. Absent manipulation, then, the VIX values determined for expiring VIX Options and Futures during the SOQ process should generally match the VIX values displayed in the VIX Options and VIX Futures markets when they open for trading *immediately after* the SOQ process. To the contrary however, Plaintiff's expert analyses demonstrate that settlement values are statistically significantly different from the VIX opening values *63% of the time* from 2005 to 2017.

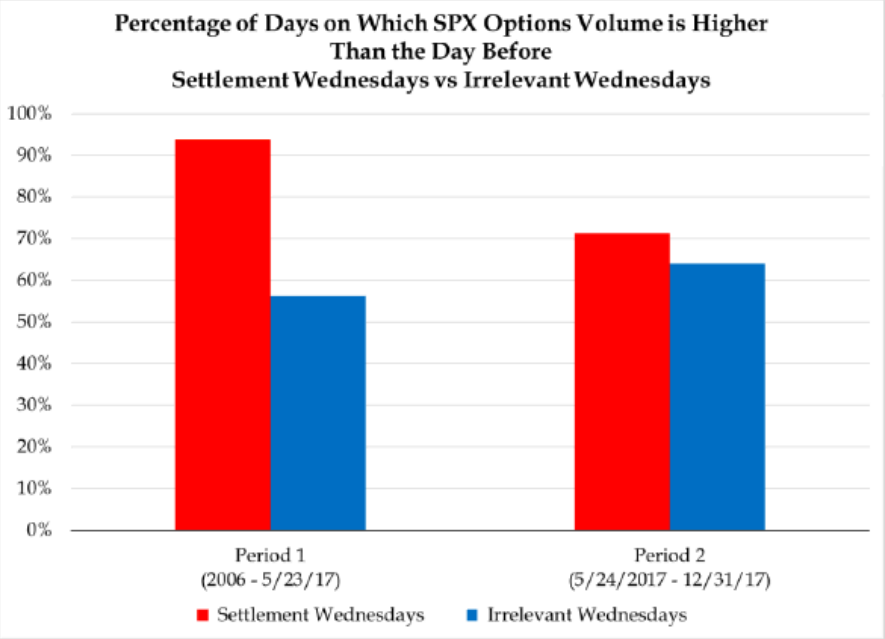
D. The Data Show Signs of Changing Behavior After May 2017—When the Griffin and Sham Paper Was Published

105. Plaintiff also analyzed data to see if there were signs behaviors changed after the publication of the Griffin and Sham paper—which, as discussed above, explained how the settlement process was apparently being manipulated. If the market was acting one way prior to publication, and another way after, that would be consistent with a lessening of the abuses out of an increased fear of getting caught. There are signs that such changes are what in fact happened.

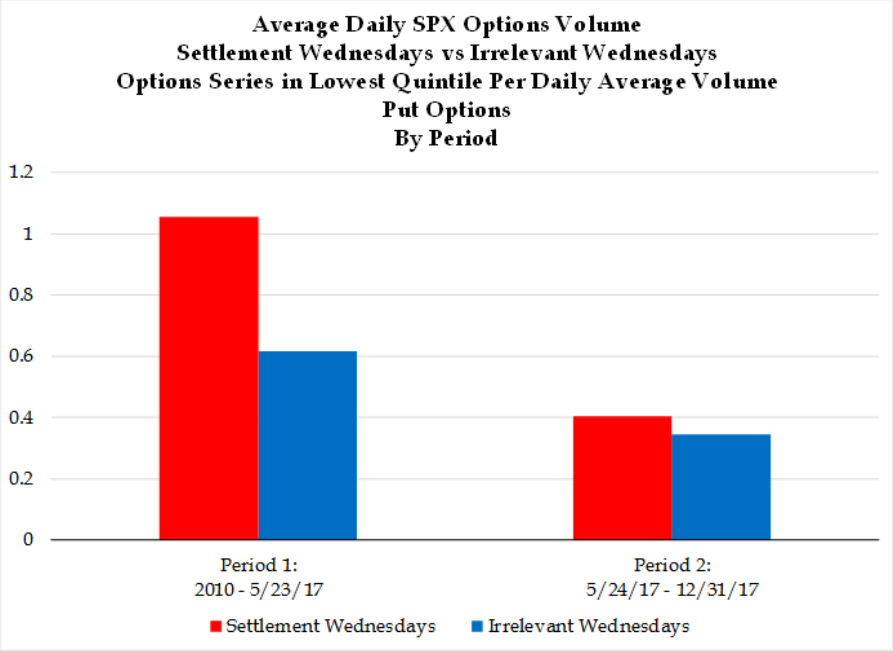
106. As discussed above, Plaintiff analyzed trade volume data and found that the spike in volumes on settlement days was indicative of manipulation. Another study was done, as seen in the following graph, that broke this data up by time period. The following graph demonstrates how often SPX trading volume was higher than the day before, both for Wednesdays on which VIX Options and Futures were expiring (red bar) and Wednesdays on which they were not (blue bar). It then compares this measure before May 2017 (left hand side) and after (right hand side).

107. In both periods, there is a greater volume of trading in SPX Options before and after the article's publication. But prior to the article's publication, there was *much* more activity, relatively speaking, on settlement days. This suggests trading in SPX Options became

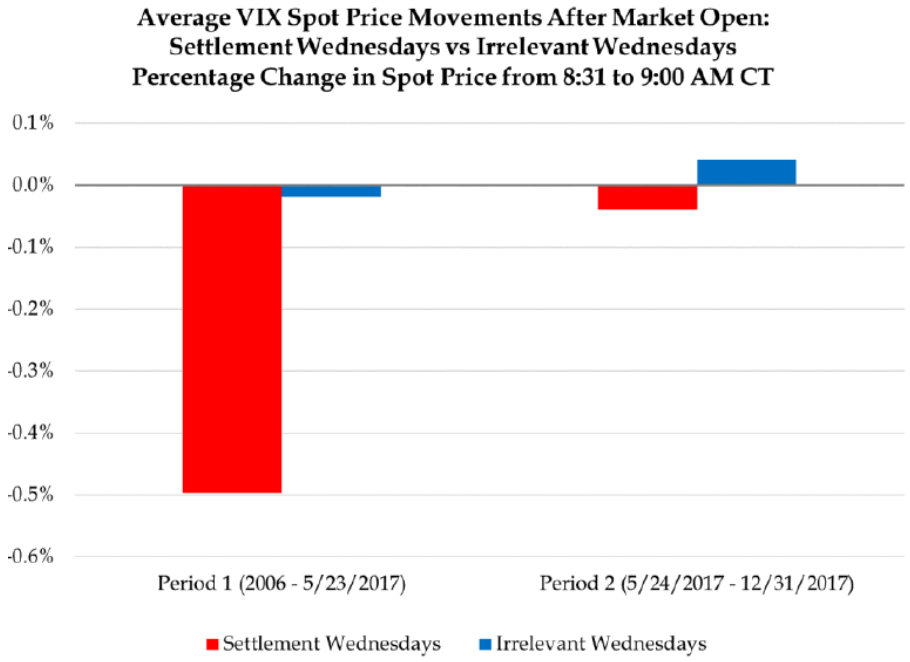
less attractive in May 2017 than it was before—which is consistent with the John Doe Defendants dialing back their attempts to "bang the close" on settlement days.



108. This change in the relative volume of SPX Options holds even when considering only deeply out-of-the-money put options. The following chart makes the same comparison as above, but only for those SPX puts that were the most out-of-the-money (the "Lowest Quintile").



109. Further examples exist demonstrating that the John Doe Defendants changed their manipulative behavior when VIX manipulation allegations became widespread in May 2017. The following chart demonstrates there was a much bigger gap between the VIX opening price and the VIX price after thirty minutes of trading prior to May 2017. This is consistent with the settlement value produced by the SOQ settlement process—and, by extension, the opening price—being *more* artificial prior to May 2017 than it was after.



IV. CBOE KNEW THE VIX SETTLEMENT PROCESS WAS FLAWED AND THAT IT WAS BEING MANIPULATED

A. CBOE Was Aware of the Manipulation Because It Designed, Administered, and Marketed the Flawed Products and Processes

110. CBOE established the methodology for calculating VIX and the process that market participants must follow to set the VIX settlement value. CBOE alone had access to the SPX Options data used to calculate VIX settlement prices, was solely responsible for calculating those prices, and solely responsible for publishing the final settlement prices to the market. The

prices, in turn, determined how much money market participants gained or lost in holding VIX Options and VIX Futures on each settlement date, and impacted the values of VIX ETPs.

111. As the administrator of SPX Options, VIX Options, VIX Futures, and the SOQ process, CBOE had a front-row seat to *every settlement* to see exactly who was doing what, when, and in what instruments. CBOE had access to all of the relevant data necessary to reveal the fact that manipulators rigged the settlement prices. Having viewed these data on the relevant settlement dates in real-time as part of its SOQ process, CBOE knew or was reckless as to whether the John Doe Defendants rigged the VIX settlement values.

112. Rather than disclosing the fact of the manipulation, however, CBOE affirmatively and knowingly (or recklessly) published the wrong, manipulated prices to the market. Thus, independent of CBOE's misleading qualitative statements about the integrity of its VIX Options and VIX Futures, CBOE knew or recklessly disregarded the fact that its quantification of the VIX settlement value was materially misleading during the Class Period (defined below).

113. As discussed above, after public reports triggered a need to investigate the SOQ settlement process (and provided clues regarding *where* and *what* to look for), Plaintiff was able to locate trading patterns that perfectly line up with the vulnerabilities of CBOE's design choices. As the creator of VIX Options and Futures, CBOE was better positioned than anybody to recognize those weaknesses. In fact, it knew of them years ago.

B. CBOE Ignored and Concealed the Manipulation Because VIX Options and Futures Were Its "Crown Jewels"

114. CBOE was motivated to hide the flaws in the settlement process for VIX Options and VIX Futures because those products were its "crown jewels"—without which CBOE's revenues and shareholder profits would fall, and its market share decline.

115. Since the order protection provisions of Regulation NMS were promulgated for equity options, brokers must direct orders to venues that display the best prices in the form of the national best bid and offer. This has created a market where individual exchanges like CBOE are hungry to provide proprietary products which—unlike generic securities that can and sometimes must be traded at other exchanges—are not multiply-listed, and instead listed or traded at CBOE exclusively.

116. CBOE has thus long promoted and prioritized order flow directed towards its proprietary products over its multiply-listed products, because its proprietary products generate far higher revenue per contract.[28] CBOE's multiply-listed options, in particular, are losing earning potential due to the expanding number of options exchanges, which have grown from five exchanges to fifteen in the past decades—a trend which shows no sign of abating as CBOE expects its competitors and new entrants may continue to open more exchanges.[29]

117. CBOE has a lock on the SPX and VIX markets because of its exclusive licensing relationship with Standard & Poor's, which permits only CBOE to list SPX options.[30] As a consequence, CBOE recognizes that its chief business risk, if not its entire profit structure and survival, is bound to two related threats: first, the loss of CBOE's "right to exclusively list and trade certain index options and futures"—in particular "exclusive licenses to list securities index options . . . granted to us by the owners of such indexes and based on which we have developed

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[28] *CBOE 2016 Annual Report*, at 7 (emphasis added), https://www.cboe.com/framed/pdfframed?content=/aboutcboe/annualreportarchive/annual-report-2016.pdf&section=SEC_ABOUT_CBOE&title= CBOE+Annual+Report+2016.

[29] *Id.* at 8.

[30] "We have the *exclusive* right to offer options contracts on the S&P 500 Index and the S&P 100 Index as a result of a licensing arrangement with S&P OPCO LLC ("S&P) . . . . We are also authorized to use the S&P 500 Index and S&P 100 Index for *the creation of CBOE volatility indexes, such as the VIX Index, and tradable products on those volatility indexes.*" *Id.* at 11 (emphasis added).

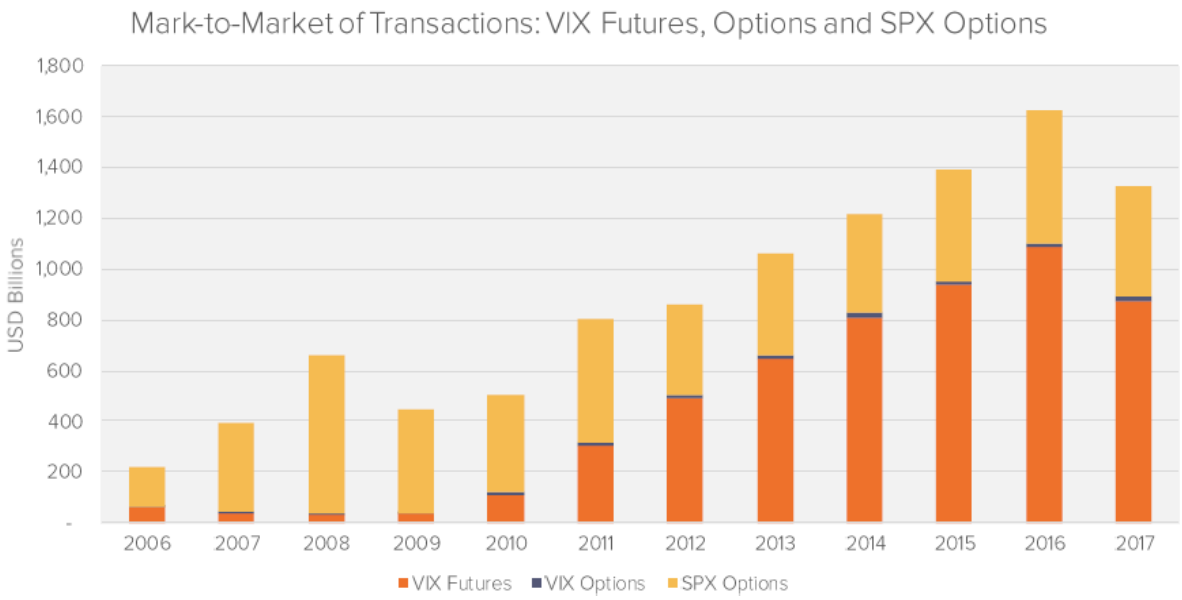
our proprietary VIX methodology"[31]; and second, market participants moving order flow from CBOE to other exchanges.

118. CBOE Chairman and CEO Edward T. Tilly confirmed the importance of these proprietary offerings, and specifically of its SPX/VIX line of products, on an earnings call on February 8, 2017. He stated that "CBOE's proprietary index and volatility market data, it is a unique offering, much more value [sic] than our competitors because of primarily of the VIX and S&P." On the same call, CBOE's CFO Alan J. Dean echoed these comments, adding: "I think there's a lot of opportunity, a lot of ways we can continue that growth from that VIX futures product which, as Ed said, was really designed for the options traders and has turned out to be a homerun."[32]

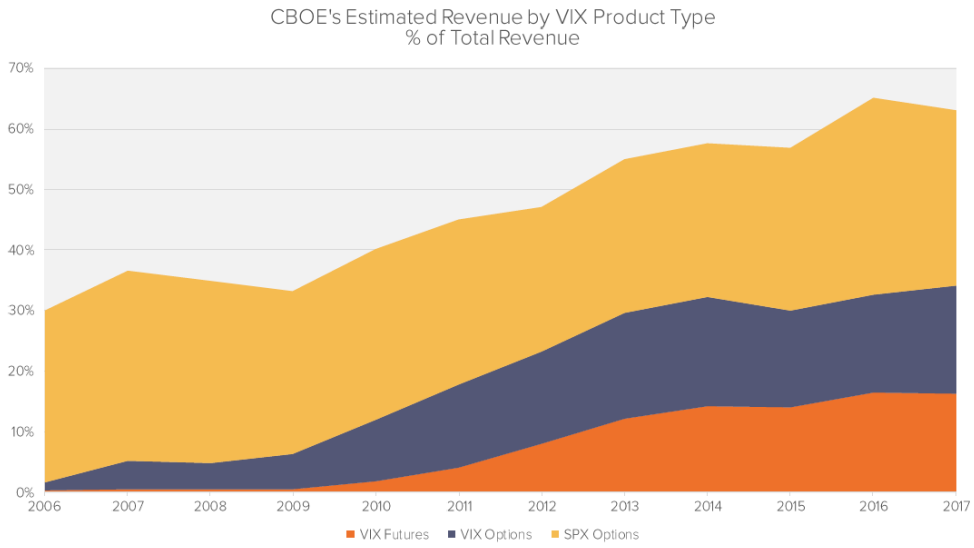
119. As the following graph demonstrates, the market for VIX Options, VIX Futures, and SPX Options has increased significantly in recent years, ballooning from a little over $200 billion in 2006 to over $1.6 trillion in 2016:

[31] *Id.* at 3, 26.

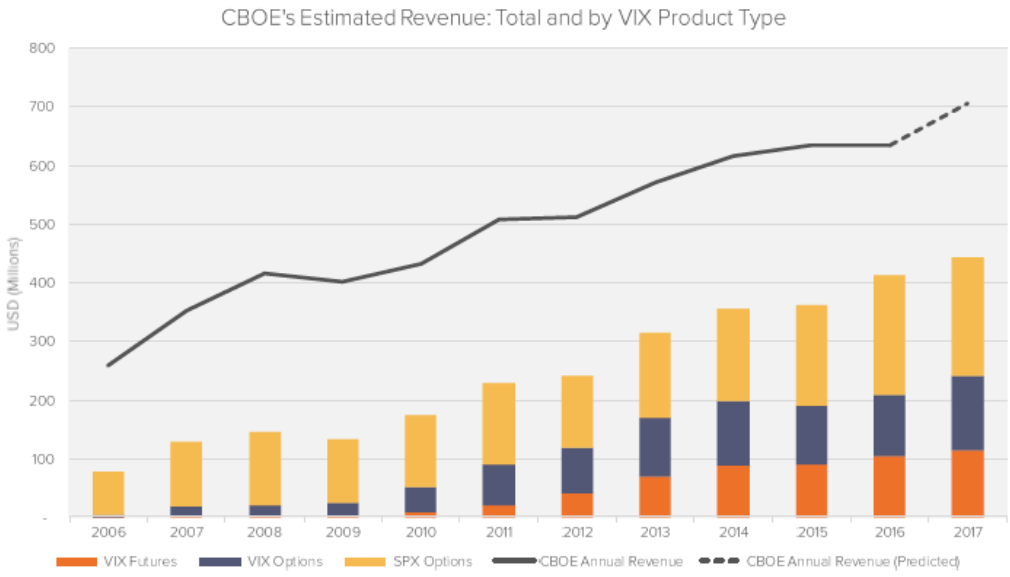
[32] *See* https://www.sec.gov/Archives/edgar/data/1374310/000110465917007806/a16-23690_24425.htm.



120. Because SPX Options, VIX Options, and VIX Futures are all proprietary to CBOE—and thus are traded exclusively on CBOE's exchanges—as the market has grown, so too have CBOE's revenues from the fees it collects on this trading. CBOE's estimated revenue from SPX Options and VIX-related products has grown from less than a third of its total revenue in 2006, to almost two thirds by 2017:



121. As a result, these three products—SPX Options, VIX Options, and VIX Futures—are now a "cash cow" for CBOE, generating almost half a billion dollars in annual revenue:



122. CBOE has celebrated and encouraged this growth. For example, CBOE Chairman and CEO Edward T. Tilly declared that "2016 was our sixth consecutive year of record revenues and solid financial results, led by record index trading, with new all-time highs in trading volume for our S&P 500 (SPX) options and CBOE Volatility Index (VIX) futures."[33]

123. The trading fees on these products, fueled by vigorous marketing and promotion by CBOE officials, are such that CBOE is now "dependent" upon them for its continued success:

> In 2016, approximately 88.2% of our transaction fees were generated by our futures and index options, the overwhelming majority of which were generated by our exclusively-licensed products and products based on the VIX methodology. The bulk of this revenue is attributable to our S&P 500 Index options and VIX Index options and futures. *As a result, our operating revenues are dependent in large part on the exclusive licenses we hold for these products and our ability to maintain our exclusive VIX methodology.*[34]

124. In sum, CBOE's motive to hide the manipulation of its flawed SOQ process and the related VIX Options and VIX Futures was no mere ordinary profit motive. CBOE had to

[33] *CBOE 2016 Annual Report*, at 7 (emphasis added), https://www.cboe.com/framed/pdfframed?content=/aboutcboe/annualreportarchive/annual-report-2016.pdf&section=SEC_ABOUT_CBOE&title=CBOE+Annual+Report+2016.

[34] *Id.* (emphasis added).

misrepresent and deny the fact of manipulation because it was quite possibly a matter of life-and-death for the company. Anything that threatened the market's confidence in CBOE's "flagship" VIX products—or gave Standard & Poors reason to reconsider its exclusive licensing agreement—could destroy CBOE's 'cash cow,' and bring the company to ruin.

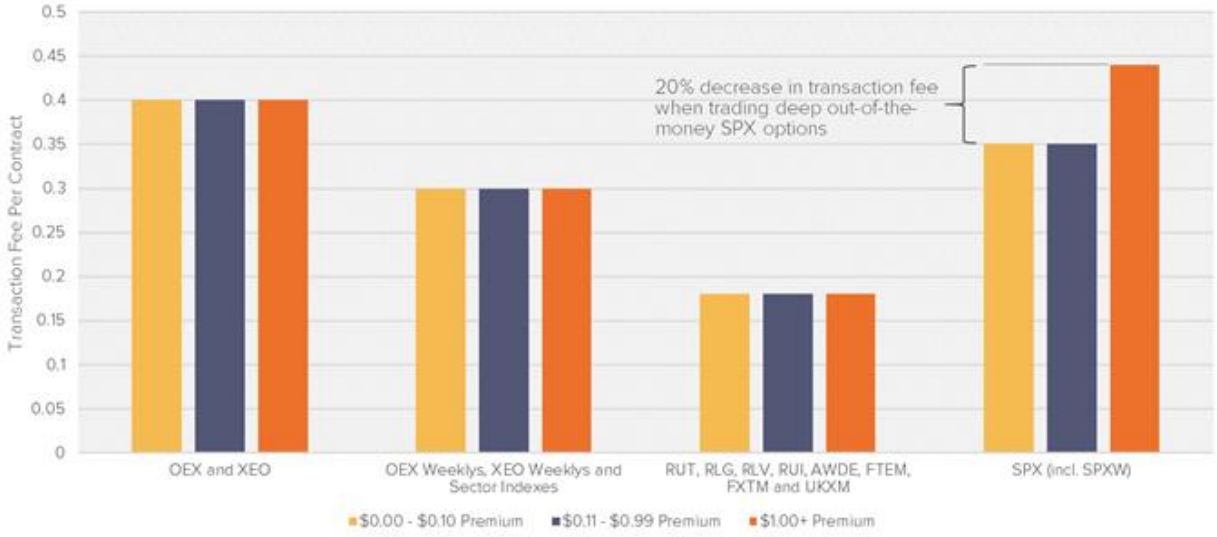
C. CBOE Not Only Ignored The Flaws In The Settlement Process—It Facilitated and Encouraged The John Doe Defendants to Exploit Them

125. As discussed above, one of the flaws in the SOQ process is that it does not just incorporate out-of-the-money SPX Options, but instead assigns increased weight to them.

126. As an initial matter, this was not always the case—for ten years the VIX was calculated using only strikes for at-the-money or near-the-money S&P 100 options. It was only around the time that CBOE was laying the groundwork for launching VIX Options and Futures—in 2003—that it inexplicably switched to the far-more-vulnerable system described above. In this way, CBOE created a flaw that just-so-happened to make CBOE's subsequently launched VIX Options and VIX Futures attractive to well resourced traders who could exploit that flaw.

127. Even worse, CBOE has been *effectively paying* certain traders to encourage them to exploit the system's flaws. Such payments come in the form of steep discounts and rebates for quoting out-of-the-money SPX options. Almost *no other options* at CBOE enjoy this rebate/discount incentive. As the following graph shows, the anomalous SPX option discounts stand apart from rebates and discounts in other comparable CBOE option contracts.

CBOE Transaction Fee Per Options Contract – Customer Orders March 1, 2018 Fee Schedule



D. CBOE Has Not Fixed The SOQ Process, Even After The VIX Manipulation Has Been Revealed

128. As discussed above, an academic paper in May 2017 began shining a spotlight on the susceptibility of the settlement process to manipulation. CBOE's reaction is telling: rather than committing to a meaningful investigation and reform, it reflexively, immediately, and quite conclusory denied any problems existed.

129. For instance, in response to the Griffin and Shams paper, for example, CBOE "vehemently denied the paper's conclusions," saying that the authors "didn't consider the full range of possible reasons other than manipulation that could explain the moves they observed."[35] CBOE's chief regulatory officer, Greg Hoogasian assured the public that the CBOE "has a dedicated regulatory department that works with FINRA to monitor certain trading activity for

[35] Nick Baker, Cecile Vannucci, *What If Somebody Really Is Gaming the VIX?*, BLOOMBERG (February 13, 2018), https://www.bloomberg.com/news/articles/2018-02-14/billions-in-vix-rigging-profits-a-battered-index-takes-new-hit.

our securities markets, including trading activity that could impact the VIX settlement."[36] With regard to the integrity of the VIX itself, CBOE officials said the VIX is a "transparent, closely regulated, and *highly reliable gauge of market sentiment with no history of failure.*"[37]

130. CBOE similarly issued public denials of the whistleblower letter sent to the SEC and CFTC. CBOE's Head of Research, Bill Speth, said that the whistleblower's letter contains "a lot of mistakes and a lot of misconceptions" and reinforced the integrity of the entire VIX settlement process: "There are structural safeguards built into the process of the calculation of the VIX settlement value that would hinder the type of manipulation the letter alleges. Our regulatory group actively surveils for potential VIX settlement manipulation."[38]

E. CBOE Knew About Manipulation Of Other CBOE Volatility Options And Futures Products, But Took Only Slow And Limited Corrective Action

131. Among the many reasons why CBOE would have known that sophisticated traders were taking advantage of the VIX SOQ process is because they had done the same thing for identical SOQ processes in respect of highly similar CBOE proprietary volatility products that were also traded on CBOE's exchanges.

132. For example, in June 2016 CBOE imposed a $400,000 fine on Morgan Stanley for manipulating the other volatility products offered by CBOE known as the VXEM, VXEW, and OV, and in December 2017 it imposed a $450,000 fine on a company named DRW for manipulating the VXEM. In both cases, the methods of manipulation that resulted in the fines were *the same methods* as the John Doe Defendants used in respect of the VIX SOQ process.

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[36] Elliot Blair Smith, *How S&P 500 options may be used to manipulate VIX 'fear gauge,'* MARKETWATCH (June 19, 2017), https://www.marketwatch.com/story/how-sp-500-options-may-be-used-to-manipulate-vix-fear-gauge-2017-06-19.

[37] *Id.* (emphasis added).

[38] Saqib Iqbal Ahmed, John McCrank, *Whistleblower alleges manipulation of Cboe volatility index*, REUTERS (February 13, 2018), https://uk.reuters.com/article/us-usa-stocks-volatility-manipulation/whistleblower-alleges-manipulation-of-cboe-volatility-index-idUKKBN1FX0ES.

133. For example, in the case of Morgan Stanley, the settlement and fine included an admission that a spike in SPX option orders can drive up the value of the index: "[A]s a result of these option market orders . . . approximately half the strike prices used to calculate the VXEM settlement opened at prices significantly lower than where they had been the previous day, and where they had closed that same day."[39]

134. Similarly in the case of DRW, the misconduct involved manipulating the identical "two-zero-bid rule" that exists in the VIX settlement process: [40]

> [O]n nine trade dates, DRW . . . submitted minimum increment option orders, or 'safety bids,' in addition to its 'strategy orders,' ensuring that certain option series were included in the final settlement calculations of the SOQ. This conduct impacted the final settlement calculation of the VXEM, VXEW, and OV futures contracts. As a result of this conduct, the final settlement calculations . . . included additional options series in the SOQ settlement calculation that otherwise would not have been included due to the Two Zero Bid rule.

135. It is notable that in both cases CBOE waited *until years after the manipulation had occurred* before it imposed any penalties upon the manipulators. In the case of Morgan Stanley, CBOE delayed from November 2012 until June 2016 (over three and a half years). In the case of DRW, CBOE delayed from February 2014 to December 2017 (more than two and a half years). Conveniently, during this period of delay in which CBOE never disclosed the systemic manipulation at issue in this case, the volume of SPX Options and VIX Options and Futures traded on CBOE's exchanges almost doubled.

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[39] Business Conduct Committee Panel of the CBOE Futures Exchange, *Decision Accepting Offer of Settlement*, CFE 15-0003, https://cfe.cboe.com/publish/CFEDisDecision/CFE%2015-0003.pdf.

[40] Business Conduct Committee Panel of the CBOE, *Decision Accepting Letter of Consent*, CFE 17-0010, http://cfe.cboe.com/publish/CFEDisDecision/CFE%2017-0010%20DRW%20620%20Decision1.pdf.

V. ADDITIONAL INDICIA EXIST DEMONSTRATING THAT THE SETTLEMENT PROCESS FOR VIX OPTIONS AND FUTURES WAS FLAWED

136. While the flaws described above are largely unique to CBOE's SOQ process, they make it susceptible to manipulation for many of the same reasons as have now been proven for multiple other financial benchmarks (*e.g.*, LIBOR, the London Gold Fix, ISDAfix, and others, which have all been found to lack adequate safeguards to prevent price manipulation).

137. Indeed, Timothy Klassen, a member of the Goldman Sachs team that assisted CBOE in the development of the VIX, said that "trying to manipulate the VIX is not conceptually different from trying to manipulate any other index" that is dependent on underlying financial contracts.[41] A comparison to other now-known-to-be-flawed benchmarks, and to best-practices for the design of financial benchmarks, confirms this.

138. *VSTOXX:* The VSTOXX index, which is a European volatility index equivalent to the VIX and is traded through options and futures, does not use a single opening price. Instead, settlement of VSTOXX options and futures is based on the average of VSTOXX values calculated every five seconds over the course of a 30-minute window. In addition, VSTOXX options and futures are settled only using trades that have a premium of at least 0.5 euros. As a consequence, anyone wishing to manipulate the VSTOXX has to maintain the price discrepancy for a longer period of time at a higher cost, and at greater risk than they need to in order to manipulate the VIX.

139. The final VSTOXX settlement price is the average of the VSTOXX index values calculated every five seconds over the course of 30 minutes from 11:30-12:00 CET. The calculation occurs during normal market trading hours. In contrast, the VIX futures settlement

[41] See Elliot Blair Smith, "How S&P 500 options may be used to manipulate VIX 'fear gauge,'" MARKETWATCH (June 19, 2017), https://www.marketwatch.com/story/how-sp-500-options-may-be-used-to-manipulate-vix-fear-gauge-2017-06-19.

occurs during an SOQ period prior to the opening of the market, which renders it more prone to collusive manipulation by a small number of SPX Options traders and market makers.

140. Given these additional safeguards, it is not surprising that while there are *some* alleged signs of manipulation with the VSTOXX, they pale in comparison to what has been uncovered by Plaintiff here with respect to the VIX.

141. *IOSCO Principles.* The VIX settlement process also falls far short when compared to the IOSCO Principles for Financial Benchmarks. Published by the Board of the International Organization of Securities Commissions, these principles describe mechanisms and processes for the administration of benchmarks that will be free of manipulation.

142. IOSCO Principle 3 states that Benchmark Administrators should ensure "existing or potential conflicts of interest do not inappropriately influence Benchmark determinations." This principle is violated here because CBOE, the Benchmark Administrator, derives revenue from the trading activity that constitutes input to the benchmark as well as from trading activity that is connected to the benchmark. CBOE therefore has an incentive to design the Benchmark in a way that will encourage additional trading so that CBOE can generate additional revenues.

143. IOSCO Principle 7(a) states that data used to construct a benchmark should "be based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand." This principle is not met here because the data used to construct the VIX settlement is drawn from illiquid instruments that lack trading depth, and through a process that invites market participants to abuse their monopolistic powers to move prices.

144. IOSCO Principle 7(b) states that data used to construct a benchmark should "be anchored by observable transactions entered into at arm's length between buyers and sellers in the market for the Interest the Benchmark measures." This principle is similarly violated. The

benchmark is not constructed from transactions in the highly liquid VIX market, but from transactions in an illiquid period of the SPX Option market, in special process in which CBOE's self-appointed market makers have preferential trading powers. There is therefore a disconnect between the VIX benchmark and the data used to construct the VIX settlement value that leaves the benchmark "dog" prone to be wagged by manipulation of the data in its "tail."

145. *ICE Swap Rate.* The VIX Settlement also sharply contrasts with the ICE Swap Rate. The ICE Swap Rate was introduced in its current form on March 31, 2015 in response to investigations conducted by the US Commodities Futures Trading Commission and the United Kingdom Financial Conduct Authority into manipulation of what was previously known as the ISDAfix benchmark.

146. Rather than conducting a specialized procedure, pre-opening, with a limited group of participants as was done here by CBOE, the ICE Swap Rate directly relies on live trading activity from a number of different swap trading platforms. The benchmark administrator, the ICE Benchmark Administration Limited ("IBA"), receives data feeds from a number of different swap platforms, capturing two minutes of tick update data of the top 10 levels of each trading venue's order book.[42]

147. For the ICE Swap Rate, after the data files provided by the various trading platforms are verified by the IBA, the IBA combines all of the order books at 24 randomized points in time into snapshots by ranking the different prices available across all venues at a given time and aggregating the volumes at each of the price levels. The snapshots are therefore based on tradable quotes formed by the competitive forces of supply and demand.

[42] ICE Benchmark Administration, *IOSCO Assessment Report*, https://www.theice.com/publicdocs/ISR_IOSCO_Principles.pdf.

148. Because the ICE Swap Rate relies on live trading in the actual instruments associated with the benchmark, where those instruments are highly liquid and their trading data is gathered from a spectrum of trading platforms, the ICE Swap Rate is far more reliable than the VIX SOQ settlement process. Instead, the SOQ process much more closely resembles the flawed and manipulated ISDAfix rate that the ICE Swap Rate was introduced to replace.

149. *Oil and other commodities benchmarks.* Some of the issues present in the VIX Settlement process mirror concerns that U.S. and E.U. regulators have had about pricing in the commodities markets. Specifically, since before 2014, regulators in the U.S. and E.U. became concerned that oil benchmark prices were based on "incomplete information from unregulated, illiquid markets."[43]

150. These benchmark prices have "long been under fire from regulators" because the benchmark administrators operate in a shroud of secrecy while generating profit from selling gathered market information to subscribers. The relevant benchmarks are often generated from submissions or reports, rather than from live trading activity.

151. The exact same concerns are present here. The SPX Options market employed in the SOQ process is illiquid in the same way as the commodity markets subject to scrutiny by the U.S. and E.U. regulators. Further, CBOE is also subject to the same conflict of interest concerns raised in those markets—it stands to benefit from manipulative activity in the form of increased trading revenues.

[43] Economist Magazine, *Fixing the Fix* (February 10, 2014), https://www.economist.com/news/finance-and-economics/21595943-european-union-wants-change-how-commodity-benchmarks-are-set-fixing-fix.

VI. PLAINTIFF AND MEMBERS OF THE CLASS WERE HARMED BY CBOE'S DECEPTIVE SCHEME, AND THE JOHN DOE DEFENDANTS' MANIPULATIVE ACTS

152. In essence, CBOE used its image as a trusted Self-Regulatory Organization to stoke demand for its products, while disguising the reality that its desire for fees and commercial self-interest had undermined the integrity of the market.

153. Because CBOE assured the market that CBOE's VIX Options and Futures products were fair and orderly, investors have poured billions of dollars them, believing that the prices at which they bought, sold, and settled were determined by natural market forces of supply and demand, and not rigged by manipulators who had special powers to game the obscure VIX settlement process. Similarly, based on these same assurances by CBOE, investors traded SPX Options, and VIX ETPs, believing that prices for these products were also determined by natural market forces, and not instead corrupted by manipulation of the SOQ settlement process.

154. Plaintiff and members of the class were thus harmed because they were transacting in products that were not the result of regular forces of supply and demand. Rather, Plaintiff and members of the class were tricked into trading SPX Options, VIX Options, VIX Futures, and VIX ETPs that were mispriced due to CBOE and the John Doe Defendants' manipulative scheme. Their punishment was that they were forced to pay more (or to accept less) from these products than they would have in a fair and orderly market.

VII. DEFENDANTS FRAUDULENTLY CONCEALED OR DENIED THEIR MANIPULATION

155. During the Class Period (defined below), the John Doe Defendants concealed their manipulative activities, while CBOE affirmatively misrepresented that manipulation had not occurred to any meaningful degree, much less to the systemic degree that Plaintiff's investigation has uncovered.

156. On June 19, 2017, for example, CBOE's chief regulatory officer, Greg Hoogasian assured the public that the CBOE "has a dedicated regulatory department that works with FINRA to monitor certain trading activity for our securities markets, including trading activity that could impact the VIX settlement."[44] With regard to the integrity of the VIX itself, CBOE officials said the VIX is a "transparent, closely regulated, and *highly reliable gauge of market sentiment with no history of failure."*[45] In further response to the Griffin and Shams paper, on February 13, 2018, CBOE "vehemently denied the paper's conclusions," saying that the authors "didn't consider the full range of possible reasons other than manipulation that could explain the moves they observed."[46]

157. CBOE similarly issued public denials of the whistleblower letter sent to the SEC and CFTC. CBOE's Head of Research, Bill Speth, said that the whistleblower's letter contains "a lot of mistakes and a lot of misconceptions" and reinforced the integrity of the entire VIX settlement process: "There are structural safeguards built into the process of the calculation of the VIX settlement value that would hinder the type of manipulation the letter alleges. Our regulatory group actively surveils for potential VIX settlement manipulation."[47]

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[44] Elliot Blair Smith, *How S&P 500 options may be used to manipulate VIX 'fear gauge,'* MARKETWATCH (June 19, 2017), https://www.marketwatch.com/story/how-sp-500-options-may-be-used-to-manipulate-vix-fear-gauge-2017-06-19.

[45] *Id.* (emphasis added).

[46] Nick Baker, Cecile Vannucci, *What If Somebody Really Is Gaming the VIX?*, BLOOMBERG (February 13, 2018), https://www.bloomberg.com/news/articles/2018-02-14/billions-in-vix-rigging-profits-a-battered-index-takes-new-hit.

[47] Saqib Iqbal Ahmed, John McCrank, *Whistleblower alleges manipulation of Cboe volatility index*, REUTERS (February 13, 2018), https://uk.reuters.com/article/us-usa-stocks-volatility-manipulation/whistleblower-alleges-manipulation-of-cboe-volatility-index-idUKKBN1FX0ES.

CLASS ACTION ALLEGATIONS

158. Plaintiff brings this action on behalf of himself and as a class action under Rules 23(a), (b)(2), and (b)(3) of the Federal Rules of Civil Procedure, seeking monetary damages on behalf of the following class (the "Class"):

> All persons or entities who held or traded SPX Options, VIX Options, VIX Futures, or VIX ETPs during the following time periods:
>
> - From March 26, 2004 to the present in the case of VIX Futures and SPX Options;
> - From February 24, 2006 to the present in the case of VIX Options; and
> - From August 2008 to the present in the case of VIX ETPs (together, the "Class Period").
>
> Excluded from the Class are Defendants and their employees, affiliates, parents, subsidiaries, whether or not named in this Complaint, and the United States government.

159. Plaintiff believes there are thousands of members of the Class as described above, the exact number and their identities being known by CBOE, making Class members so numerous and geographically dispersed that joinder of all members is impracticable.

160. There are questions of law and fact common to each Class that relate to the existence of the alleged manipulative activities, and the type and common pattern of injury sustained as a result thereof, including, but not limited to:

a. whether the SOQ settlement process for VIX Futures and Options was flawed in a way that made it susceptible to manipulation and market monopolization;

b. whether the SOQ process was in fact manipulated and subject to market monopolization by the John Doe Defendants, in violation of the Exchange Act, the CEA, and the Sherman Act;

c. whether manipulation and market monopolization of the SOQ process had an impact upon the prices of SPX Options, and upon the cash settlement value of VIX Options and VIX Futures;

d. whether manipulation and market monopolization of the SOQ process had an impact on the value or prices of shares or notes in VIX ETPs;

e. whether CBOE was aware of the flaws in the SOQ process;

f. whether CBOE misrepresented (actively, or by omission) the flaws in the SOQ process, in violation of the Exchange Act, the CEA or both;

g. the identity of the John Doe Defendants;

h. the duration of the manipulation and market monopolization;

i. the nature and character of the acts performed in furtherance of the manipulation and market monopolization;

j. whether the conduct of Defendants, as alleged in this Complaint, caused damages to Plaintiff and other members of the Class and the amount and extent of those damages;

k. the appropriate measure of damages sustained by Plaintiff and other members of the Class.

161. During the Class Period, Plaintiff purchased or sold VIX Options that were settled using VIX settlement values that were manipulated or monopolized by Defendants, and Plaintiff's interests are coincident with and not antagonistic to those of the other members of the Class.

162. Plaintiff is a members of the Class, has claims that are typical of the claims of the Class members, and will fairly and adequately protect the interests of the members of the Class.

In addition, Plaintiff is represented by counsel who are competent and experienced in the prosecution of antitrust and class action litigation.

163. The prosecution of separate actions by individual members of the Class would create a risk of inconsistent or varying adjudications.

164. The questions of law and fact common to the members of the Class predominate over any questions affecting only individual members, including legal and factual issues relating to liability and damages.

165. A class action is superior to other available methods for the fair and efficient adjudication of this controversy. Treatment as a class action will permit a large number of similarly situated persons to adjudicate their common claims in a single forum simultaneously, efficiently and without the duplication of effort and expense that numerous individual actions would engender. The Class is readily definable and is one for which records should exist in the files of CBOE or other Defendants and prosecution as a class action will eliminate the possibility of repetitious litigation.

166. Class treatment will also permit the adjudication of relatively small claims by many members of the Class who otherwise could not afford to litigate claims such as the ones asserted in this Complaint. This class action presents no difficulties of management that would preclude its maintenance as a class action.

CAUSES OF ACTION

CLAIM ONE

VIOLATION OF §2 OF THE SHERMAN ACT, 15 U.S.C.A. § 2 (AGAINST JOHN DOE DEFENDANTS)

167. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

168. Each of the John Doe Defendants traded and placed orders for SPX Options to manipulate the SOQ settlement process for expiring VIX Futures and Options so that they could gain large cash windfalls, or avoid large cash expenses, or both.

169. John Doe Defendants' trades and orders for SPX Options were at non-competitive prices that purposely inflated or depressed prices for VIX Options, VIX Futures, and VIX ETPs in a direction that benefited the John Doe Defendants.

170. The John Doe Defendants possessed monopoly power in the market for VIX Futures, VIX Options, and VIX ETPs, and willfully maintained that power, through their intent and ability to dictate the SOQ settlement prices for VIX Options and for VIX Futures, including the ability to set those prices at artificial levels.

171. The John Doe Defendants used their monopoly power to dictate the SOQ settlement prices for VIX Options and for VIX Futures, including to set those prices at artificial levels, in order to prevent free markets from operating, and in order to move the prices for VIX Options, VIX Futures, and VIX ETPs in a direction that benefited the John Doe Defendants.

172. The John Doe Defendants' ability to control prices for VIX Options and for VIX Futures is demonstrated by the anomalous patterns demonstrated in Plaintiff's experts' economic analyses of VIX prices, including as alleged in Section III above.

173. John Doe Defendants' conduct has no legitimate business purpose or procompetitive effect.

174. The Class has suffered and will suffer economic injury of the type that the antitrust laws were intended to prevent.

175. The Class has been injured and will be injured by the harm to competition as a result of the John Doe Defendants' conduct.

CLAIM TWO

VIOLATION OF 15 U.S.C. § 78a, et seq.
MANIPULATION IN VIOLATION OF RULE 10(B) OF THE SECURITIES EXCHANGE ACT OF 1934 AND RULE 10B-5 PROMULGATED THEREUNDER
(AGAINST CBOE)

176. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

177. By its misconduct, CBOE violated § 10(b) of the Exchange Act and Rule 10b-5 promulgated thereunder.

178. In violation of the aforementioned laws, CBOE (a) employed devices, schemes, and artifices to defraud; (b) made untrue statements of material fact and/or omitted material facts necessary to make the statements made not misleading; and (c) engaged in acts, practices, and a course of business which operated as a fraud and deceit upon the Class, in violation of Section 10(b) of the Exchange Act and Rule 10b-5 promulgated thereunder.

179. The elements of a Rule 10b-5 claim are: (1) manipulative acts; (2) damage; (3) caused by reliance on an assumption of an efficient market free of manipulation; (4) scienter; (5) in connection with the purchase or sale of securities; (6) furthered by the defendant's use of the mails or any facility of a national securities exchange.

180. CBOE has undertaken a number of manipulative acts in furtherance of a fraudulent scheme. CBOE offered VIX Options to investors, despite CBOE knowing that settlement prices for VIX Options and VIX Futures were highly susceptible to manipulation, and were in fact manipulated. CBOE never disclosed this fact to the market. It is not necessary that CBOE itself engaged in manipulative trading. It is enough that CBOE deceived investors into "believing that prices at which they purchase[d] and s[old] securities are determined by the

natural interplay of supply and demand, not rigged by manipulators." *In City of Providence, Rhode Island v. Bats Glob. Markets, Inc.*, 878 F.3d 36 (2d Cir. 2017).

181. The fraudulent scheme of CBOE caused damage to the Class, who lost money trading VIX Options and VIX ETPs. CBOE made repeated false statements and omissions about the reliability and trustworthiness of its VIX Futures and VIX Options financial products to the market. It also deceived the market by calculating the VIX settlement values and then reporting those values to investors without disclosing the fact that those values had been manipulated and did not reflect true VIX settlement values, as CBOE knew or should have known. As a direct and proximate result of CBOE's false statements, misrepresentations and omissions of material facts, the Class has suffered damages in connection with the settlement of VIX Options and trading VIX ETPs.

182. Investors have relied upon these false statements during the relevant period to their detriment, in that the Class relied on an assumption of an efficient market free of manipulation. CBOE made many public statements to this exact effect. CBOE also made many public denials that any manipulation of the VIX-related products was occurring in response to news articles, whistleblower letters, and the like. Investors believed they were trading in competitive markets where prices were driven by supply and demand.

183. CBOE also had scienter. Scienter is met because the Class has pled facts giving rise to a strong inference that the defendant intended to deceive investors by artificially affecting the market price of securities. CBOE knew or should have known of the manipulation of VIX Options prices for all the reasons set forth in the "Factual Allegations" section of this Complaint. CBOE knew or should have known VIX Options were manipulated shortly after CBOE changed the VIX formula and facilitated a settlement process that effectively promoted manipulation—

particularly when viewed in the context of the financial discounts that CBOE extended in a manner that encouraged manipulation, as detailed in this Complaint. CBOE knew or should have known that the manipulation of VIX Options and Futures prices would impact the value of VIX ETPs.

184. At the same time, CBOE concealed this manipulation because CBOE derived an increasingly large part of its revenues from trading in VIX-related products on its exchanges, including VIX Options. Further, CBOE knew that if it disclosed to the market that its settlement process for VIX Options was susceptible to manipulation—and was in fact being manipulated—it would have scared away VIX Options investors, and reduced CBOE's revenues.

185. CBOE's acts and the damage caused by them were also done in connection with the purchase or sale of securities. VIX Options, SPX Options, and VIX ETPs are securities. SPX Options and VIX Options were central to the manipulative scheme of CBOE. These acts and the damage caused by CBOE were also furthered by CBOE's use of the mails or any facility of a national securities exchange. Specifically, the manipulative trading occurred in respect of the purchase and sale of VIX Options, which are securities, and on CBOE's option exchange, which is a national securities exchange.

CLAIM THREE

VIOLATION OF 7 U.S.C. § 1, et seq.
FAILURE TO ENFORCE RULES AND PREVENT PRICE MANIPULATION
IN VIOLATION OF THE COMMODITY EXCHANGE ACT
(AGAINST CBOE)

186. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

187. By failing to enforce bylaws, rules, regulations, and resolutions despite its status as a registered entity, CBOE violated the CEA, specifically 7 U.S.C. §§ 7 and 25(b), hence allowing prices of VIX Futures to be artificial during the Class Period.

188. CBOE, as a registered entity under the CEA (7 U.S.C. § 1a), engaged in actions and omissions that constitute a failure to enforce the mandatory rules that it was required to follow under the CEA, in violation of 7 U.S.C. §§ 7 and 25(b). CBOE has done so in bad faith.

189. CBOE publishes rules (the "CBOE Rules") imposing obligations for its "Market Makers," "Registered Market Makers," and "Designated Primary Market Makers."[48] These rules include requirements to trade competitively, to "contribute to the maintenance of a fair and orderly market, and [not to] enter into transactions or make bids or offers that are inconsistent with such a course of dealings." CBOE Rule 8.7.

190. CBOE was on notice that CBOE Rule 8.7 was violated, among other CBOE rules. Specifically, CBOE knew from before the Class Period started, and throughout the Class Period, that the VIX settlement value was actively manipulated. CBOE was solely responsible for collecting the data that was necessary to calculate the VIX settlement value and did in fact undertake those activities both before and during the Class Period. The facts presently available demonstrate that CBOE knew or suspected manipulation before and during the Class Period, as detailed herein. CBOE's refusal to address the manipulation taking place in the relevant markets constitutes a failure to enforce bylaws, rules, regulations, and resolutions.

191. CBOE's failure to do so was in bad faith. CBOE itself modified the VIX settlement process in 2003 to facilitate manipulative activity. It extended financial and trading

[48] CBOE appoints broker-dealers as "Market Makers," "Registered Market-Makers," "Options Market Makers," and "Designated Primary Market-Makers" for both its options and futures exchanges. *See* CBOE Rule 8.

benefits that furthered manipulation. CBOE also earned millions of dollars in profits from the manipulative scheme, including from transaction fees on manipulative trades, and for that reason turned a blind eye to the manipulative activities of the John Doe Defendants throughout the Class Period. CBOE has defended these fees by denying the fact they are associated with any kind of manipulative activities. In fact, CBOE has begun a publicity campaign denouncing critics of the VIX settlement process and has to date continually defended the flawed VIX settlement process.

192. CBOE's failure to enforce its own rules was conducted with knowledge or with reckless disregard of the rules, thus depriving the Class of a lawfully operating market during the Class Period.

193. The Class transacted at artificial and unlawful prices resulting from CBOE's failure to enforce the rules in violation of the CEA, 7 U.S.C. § 1, *et seq*., and as a direct result were injured and suffered actual damages.

CLAIM FOUR

VIOLATION OF 15 U.S.C. § 78a, et seq.
MANIPULATION IN VIOLATION OF RULE 10(B) OF THE SECURITIES EXCHANGE ACT OF 1934 AND RULE 10B-5 PROMULGATED THEREUNDER
(AGAINST JOHN DOE DEFENDANTS)

194. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

195. By their misconduct, the John Doe Defendants violated §10(b) of the Exchange Act and Rule 10b-5 promulgated thereunder.

196. In violation of the aforementioned laws, the John Doe Defendants (a) employed devices, schemes, and artifices to defraud; (b) made untrue statements of material fact and/or omitted material facts necessary to make the statements made not misleading; and (c) engaged in

acts, practices, and a course of business which operated as a fraud and deceit upon the Class, in violation of Section 10(b) of the Exchange Act and Rule 10b-5 promulgated thereunder.

197. The elements of a Rule 10b-5 claim are (1) manipulative acts; (2) damages; (3) caused by reliance on an assumption of an efficient market free of manipulation; (4) scienter; (5) in connection with the purchase or sale of securities; (6) furthered by the defendant's use of the mails or any facility of a national securities exchange.

198. The John Doe Defendants have undertaken a number of manipulative acts in furtherance of a fraudulent scheme. The John Doe Defendants have, for example, banged the close, manipulated the two-zero-bid rule, and submitted false bids and offers throughout the Class Period. These actions systematically manipulated SPX Options prices, VIX Options settlement values, and VIX ETP values throughout the Class Period.

199. The manipulative acts of the John Doe Defendants caused damage to the Class. Specifically, the John Doe Defendants manipulated VIX settlement values so that they could gain large cash windfalls, or avoid large cash expenses, or both. These illicit gains were made at the expense of the Class. As a direct and proximate result of the John Doe Defendants' wrongful conduct the Class has suffered damages in connection with the settlement of VIX Options. Similarly, the manipulative acts of the John Doe Defendants had a direct impact upon prices for SPX Options, and upon the value of shares and notes in VIX ETPs, at the direct and proximate expense of the Class.

200. Throughout the Class Period, the Class relied on an assumption of an efficient market free of manipulation. Investors believed they were trading in competitive markets where prices were driven by supply and demand. The John Doe Defendants employed devices, schemes and artifices to defraud while in possession of material, adverse, non-public

information, specifically, they improperly manipulated prices of VIX Options and SPX Options, and of notes and shares in VIX ETPs, as detailed in this Complaint.

201. The John Doe Defendants, individually and in concert, directly and indirectly, by the use, means or instrumentalities of interstate commerce and/or of the mails, engaged and participated in a continuous course of conduct to conceal adverse material information about the SPX Options, VIX Options, and VIX ETPs from the market.

CLAIM FIVE

VIOLATION OF 7 U.S.C. § 1, et seq.
MANIPULATION IN VIOLATION
OF THE COMMODITY EXCHANGE ACT
(AGAINST JOHN DOE DEFENDANTS)

202. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

203. By their intentional misconduct, the John Doe Defendants violated the CEA, specifically 7 U.S.C. §§ 6b(a), 6c(a), 9(3), 13(a)(2), 25(a), and CFTC rules adopted under the CEA (17 C.F.R. § 180.2), and caused prices of VIX Futures to be artificial during the Class Period.

204. The John Doe Defendants' trading and other activities alleged herein constitute market manipulation of prices of VIX Futures, in violation of 7 U.S.C. §§ 6b(a), 6c(a), 9(3), 13(a)(2), 25(a), and 17 C.F.R. § 180.2.

205. The John Doe Defendants possessed and exercised an ability to manipulate market prices through the manipulative schemes described above. Specifically, the John Doe Defendants banged the close on VIX settlement days, manipulated the two-zero-bid rule to ensure certain strikes would be used in the settlement computation, and submitted false bids and offers to manipulate the VIX settlement price.

206. The John Doe Defendants directly and indirectly caused artificial prices through their manipulative activities. They did so manipulating the prices of the SPX Options that CBOE used in its VIX settlement calculation, and by influencing the levels of bids and asks associated with each of those SPX Options.

207. The John Doe Defendants specifically intended to cause the artificial VIX Futures prices. The John Doe Defendants knew they would experience large cash windfalls or prevent large cash payouts if they were successfully able to shift the VIX settlement value. This provided ample motivation for the John Doe Defendants to purposefully shift the VIX settlement value artificially upwards or downwards. The John Doe Defendants also had the opportunity to do so because they executed their SPX Option trades in the narrow time window of the SOQ auction, which had a large influence on the ultimate VIX price.

208. The John Doe Defendants' manipulation deprived the Class of a lawfully operating market during the Class Period.

209. Plaintiff and other members of the class transacted at artificial and unlawful prices resulting from the John Doe Defendants' manipulations in violation of the CEA, 7 U.S.C. § 1, *et seq*., and Rule 180.2, and as a direct result thereof were injured and suffered damages. Plaintiff sustained and is entitled to actual damages for the violations of the CEA alleged therein.

CLAIM SIX

VIOLATION OF 7 U.S.C. § 1, et seq.
EMPLOYMENT OF MANIPULATIVE OR DECEPTIVE DEVICE
OR CONTRIVANCE IN VIOLATION OF THE COMMODITY EXCHANGE ACT
(AGAINST JOHN DOE DEFENDANTS)

210. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

211. By their intentional misconduct, from March 26, 2004 to present, the John Doe Defendants each violated the CEA, specifically 7 U.S.C. §§ 9(1), 13(a), and CFTC rules adopted under the CEA (17 C.F.R. § 180.1), and caused prices of VIX Futures to be artificial during the Class Period.

212. The John Doe Defendants' trading and other activities alleged herein constitute market manipulation of prices of VIX Futures, in violation of the CEA, 7 U.S.C. §§ 9(1), 13(a), 25(a), and 17 C.F.R. § 180.1.

213. The John Doe Defendants used or attempted to use manipulative scheme to defraud the market in respect of the settlement process for VIX Futures. Specifically, the John Doe Defendants submitted false bids and offers into the SOQ process with the intent of sending false market information to buyers and sellers of VIX Options and Futures. They have done so on every occasion where they have manipulated the VIX settlement value to benefit their financial positions.

214. The John Doe Defendants had knowledge of the impact this fraud would have on the marketplace. In fact, the John Doe Defendants intended to mislead the market in this manner to benefit their financial positions. There would be no reason to undertake the manipulative scheme described herein if there would be no impact on the relevant markets.

215. There is also no legitimate justification for this manipulation and deception. The only reason to manipulate the SOQ process, and thus the VIX settlement value, was to introduce artificiality into the prices for VIX Futures and VIX Options.

216. The John Doe Defendants' manipulation deprived the Class of a lawfully operating market during the Class Period.

217. The Class transacted at artificial and unlawful prices resulting from the John Doe Defendants' manipulations in violation of the CEA, 7 U.S.C. § 1, *et seq*., and Rule 180.1, and as a direct result thereof were injured and suffered damages. The Class also suffered damages under 17 C.F.R. 180.1 for substantially the same reasons set forth in Claim Three above.

CLAIM SEVEN

VIOLATION OF 7 U.S.C. § 1, et seq.
PRINCIPAL-AGENT LIABILITY
IN VIOLATION OF THE COMMODITY EXCHANGE ACT
(AGAINST ALL DEFENDANTS)

218. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

219. Each Defendant is liable under the CEA (7 U.S.C. § 2(a)(1)(B)), for the manipulative acts of their agents, representatives, and/or other persons acting for them in the scope of their employment.

220. The Class sustained and is entitled to actual damages for the violations of the CEA alleged herein.

CLAIM EIGHT

VIOLATION OF 7 U.S.C. § 1, et seq.
AIDING AND ABETTING LIABILITY
IN VIOLATION OF THE COMMODITY EXCHANGE ACT
(AGAINST ALL DEFENDANTS)

221. Plaintiff hereby incorporates each preceding and succeeding paragraph as though fully set forth herein.

222. Defendants knowingly aided, abetted, counseled, induced, and/or procured the violations of the CEA alleged herein. Defendants did so knowingly of each other's manipulation of VIX Futures, and willfully intended to assist these manipulations, which resulted in the prices

of VIX Futures becoming artificial during the Class Period in violation of the CEA (7 U.S.C. §§ 13c(a) and 25(a)(1)).

223. The Class sustained and is entitled to actual damages for the violations of the CEA alleged herein.

PRAYER FOR RELIEF

224. WHEREFORE, Plaintiff, on behalf of himself and the proposed Class of similarly situated entities, respectfully request:

a. That the Court certify this lawsuit as a class action under Rules 23(a), (b)(2), and (b)(3) of the Federal Rules of Civil Procedure, that Plaintiff be designated as class representatives, and that Plaintiff's counsel be appointed as Class counsel for the Class;

b. For a judgment awarding Plaintiff and the Class damages, as well as punitive or exemplary damages, against Defendants for their violations of the Exchange Act, and the CEA, together with prejudgment interest at the maximum rate allowable by law;

c. For an award to Plaintiff and the Class of their costs of suit, including reasonable attorneys' and experts' fees and expenses; and

d. For such other and further relief as the Court may deem just and proper.

JURY DEMAND

Pursuant to Federal Rule of Civil Procedure 38, Plaintiff, on behalf of himself and the proposed Class, demands a trial by jury on all issues so triable.

DATED: April 5, 2018

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