

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS

NATHAN L. TERWILLIGER, individually and
on behalf of all others similarly situated,

Plaintiff,

v.

CBOE GLOBAL MARKETS, INC., CBOE
FUTURES EXCHANGE LLC, and CHICAGO
BOARD OPTIONS EXCHANGE, INC.,

Defendants.

No. 1:18-cv-03074

CLASS ACTION COMPLAINT

JURY TRIAL DEMANDED

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Plaintiff, Nathan L. Terwilliger (“Plaintiff”), by and through his attorneys, individually and on behalf of all others similarly situated, brings this action on his own behalf and on behalf of a class consisting of all persons who, between January 1, 2008, and April 30, 2018 (the “Class Period”), purchased VIX Options or VIX Futures, held them on the settlement dates for their instruments, and were harmed as a result of Defendants’ actions as alleged herein (the “Class”). This action is based upon Plaintiff’s 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 Chicago Board Options Exchange, Inc. (collectively “CBOE” or “Defendants”).

I. SUMMARY OF THE CASE

1. This case turns in part on the concept of market volatility, which is uncertainty about future changes in the value of securities. Market volatility is important to investors, as it has a strong relationship with market performance: market volatility tends to decline as the stock market rises, and increase as the market falls.

2. The most popular measure of near-term market volatility is the VIX, an index created and calculated by the CBOE and over which it has exclusive commercial rights. The VIX purports to represent the stock market’s expectation of volatility over the next 30 days. CBOE calculates the VIX using weighted prices for certain out-of-the-money Standard & Poor 500 Options (“SPX Options”), a security created by the CBOE for its own business purposes and traded only on the CBOE’s own exchange, for which CBOE itself retains ultimate responsibility and control.

3. CBOE commercialized its VIX index by creating proprietary products called VIX Futures and VIX Options that also trade only on CBOE’s own exchange. Every transaction involving VIX Futures and Option contracts generates a fee for CBOE, and these fees, together with fees generated by trading in SPX Options, make up the majority of CBOE’s total revenues. CBOE repeatedly touted VIX Futures and VIX Options to investors as effective tools for trading and risk management.

4. The settlement value of VIX Futures and VIX Options is calculated by CBOE by reference to a figure called the VIX Special Opening Quotation (“SOQ”), using a methodology created by CBOE specifically for this purpose. Rather than looking at transactions in SPX Options over the course of the trading day, the generation of the VIX SOQ turns on out-of-the-money SPX Options trades and quotes posted during a very short period—an auction occurring before the trading day begins.

5. This proprietary SOQ process, which CBOE designed and executed in pursuit of its own commercial interests, could cheaply and easily be manipulated by traders seeking illicit profits in their trading of VIX Futures and VIX Options. There are several reasons for this vulnerability: first, the SOQ turns on trades or quotes posted in a short, premarket auction rather than during the trading day.¹ Accordingly, even a single manipulative trade posted in that period of relative illiquidity could move the VIX up or down. Second, the cost for such manipulative trading is minimal, as CBOE imposed only a five cent per-option contract threshold for the bid quote of an SPX Option to be included in the settlement calculation. Third, the SOQ process’ use of quotes provided by traders rather than actual trades enabled traders to easily manipulate the SOQ value without engaging in actual trades.

6. In this respect the SOQ process created and executed by CBOE lacked fundamental safeguards imposed by other commercial volatility indexes such as the VSTOXX, a European market volatility index, which, like VIX, is also traded through options and futures. VSTOXX, however, is calculated based on actual trading that occurs during a period in normal market hours, and only options trades with a premium of .5 Euros are included in its calculation—a bar more than ten times higher than that employed by CBOE. France’s financial

¹ See, e.g., CBOE, *Settlement Information for VIX Derivatives*, <http://cfe.cboe.com/cfe-products/vx-cboe-volatility-index-vix-futures/settlement-information-for-vix-derivatives> (“The final settlement value for the VIX futures and options is a [SOQ] of the VIX index calculated using opening prices of constituent SPX or SPX Weekly options that expire 30 days after the relevant VIX expiration date ... If there is no opening trade, the opening price is the average of an option’s bid and ask price determined at the open.”) (last accessed Apr. 30, 2018).

markets regulator, Autorité des Marchés Financiers, has asserted that the VIX settlement process is much more vulnerable to manipulation than the VSTOXX.

7. Given these serious flaws, it is not surprising that there is ample evidence that the settlement process for VIX Futures and VIX Options is in fact routinely manipulated up to the present day, to the detriment of investors in these instruments on CBOE's exchange, including Plaintiff. A May 23, 2017 paper by academics John Griffin and Amin Shams describes suspicious spikes between 2008 and 2015 in the volume of the out-of-the-money options used to calculate the VIX SOQ, occurring at the settlement time of the VIX index. Griffin and Sham conclude that these spikes are consistent with manipulation and are inconsistent with innocent trading practices such as hedging.

8. Experts retained by Plaintiff conducted their own independent analysis of the VIX Futures and VIX Options settlement process in 2018, and similarly concluded that on SOQ settlement dates for VIX Futures and VIX Options there were massively higher volumes of trading in the out-of-the-money SPX options that influence the SOQ settlement pricing of these instruments relative to other dates. They found similar suspicious volume and other indications consistent with manipulation on April 18, 2018, the expiration date of VIX Options purchased by Plaintiff.

9. Strikingly, the CBOE itself took the unusual step of acknowledging in a Form 8-K dated April 24, 2018, that the VIX final settlement value on April 18, 2018, was "higher than what market participants may have otherwise expected" and asserted that it intended to take certain steps to improve its settlement processes.

10. Despite the vulnerabilities in the design of the VIX SOQ process, the mounting evidence that VIX was in fact being systematically manipulated, and the foreseeability of the harm such manipulation would pose to investors trading in VIX Futures and VIX Options, CBOE in bad faith did nothing to alter its SOQ calculation process or address its defects, as it had powerful financial incentives to permit manipulation to go on. On monthly settlement days, manipulation gave rise to markedly higher trading volume, which in turn resulted in higher

transaction fees for CBOE. This failure to take reasonable care to ensure the SOQ settlement process was free of manipulation resulted in billions in losses to investors like Plaintiff who traded in VIX Futures and Options and held these instruments on their settlement dates, when manipulation occurred.

11. By its conduct, CBOE is liable to the Class under the common law of negligence, as it breached the quantum of reasonable care it owed Plaintiff and the Class to ensure that its services settling VIX Futures and Options on its own exchange were not subject to illicit manipulation. By the same conduct, the CBOE also violated the Commodity Exchange Act, which requires that the CBOE observe rules requiring it to prevent manipulation and other abusive practices in its contract market.

12. The investigation by counsel for Plaintiff into the factual allegations contained herein is continuing, and Defendants uniquely possess or control many of the facts supporting Plaintiff's allegations. Plaintiff believes substantial additional evidentiary support will exist for the allegations set forth herein after a reasonable opportunity for discovery.

II. JURISDICTION AND VENUE

13. The case presents claims under the common law of negligence and the Commodities Exchange Act ("CEA"). Accordingly, the Court has jurisdiction under Section 22 of the CEA, 7 U.S.C. § 25, and pursuant to 28 U.S.C. § 1331.

14. This is also a class action arising under the Class Action Fairness Act of 2005 ("CAFA"), 28 U.S.C. §§ 1332(d), 1453, 1711-1715, which explicitly provides for the original jurisdiction of the Federal Courts over any class action in which any member of the plaintiff class is a citizen of a state different from any defendant, and in which the matter in controversy exceeds in the aggregate the sum of \$5,000,000, exclusive of interest and costs. Plaintiff alleges that the total claims of the individual members of the Class are in excess of \$5,000,000 in the aggregate, exclusive of interest and costs, as required by 28 U.S.C. § 1332(d)(2)(A).

15. This Court has personal jurisdiction over each Defendant. All Defendants have: (1) transacted business in this District; (2) substantial contacts in this District; and (3) committed substantial acts, or negligently failed to undertake action, in this District.

16. Venue is proper in this District under 28 U.S.C. § 1391 (b), (c), and (d). Defendants resided and transacted business or had agents in this District.

III. PARTIES

17. Plaintiff Nathan L. Terwilliger is a resident of Michigan. During the Class Period he purchased VIX Options settling on April 18, 2018, and held them on April 18, 2018, and he has been injured by reason of Defendants' violations of law.

18. Defendant Cboe Global Markets, Inc. is a Delaware corporation with its principal place of business in Chicago, Illinois.

19. Cboe Futures Exchange, LLC is a Delaware limited liability company with its principal place of business in Chicago, Illinois.

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

21. 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 at "CBOE" or "Defendants".

IV. FACTUAL BACKGROUND

22. Like all U.S. exchanges, CBOE maintains its own private business interests, including the provision of certain intangible services to investors. Indeed, Cboe Global Markets, Inc. is a for-profit corporation that is publicly traded on the NASDAQ exchange.

23. The commercial activities of CBOE generate substantial operating revenues, of which the lion's share is fees produced by transactions in CBOE's proprietary products linked by exclusive license to the Standard & Poor's 500 ("S&P500"), a stock market index based on the market capitalizations of 500 large companies having common stock listed on the NYSE or NASDAQ. These products consist of S&P 500 Options, VIX Futures, and VIX Options.

24. CBOE provides investors with a suite of S&P500 options (“SPX Options”) that trade exclusively on CBOE. SPX Options are widely traded at various strike prices and maturities, and are an important indicator of investor sentiment, because their prices rise when investors predict near-term market volatility in the S&P500, and fall when investors forecast narrower expected fluctuations in the S&P500.

25. Relying on this feature, CBOE used SPX Options quotation and trading data to develop its proprietary VIX Volatility Index, which is an index of market volatility over the upcoming thirty days, sometimes referred to as the “fear gauge.” Outside the SOQ of a settlement day, CBOE calculates VIX based on SPX Options with more than 23 days and less than 37 days to expiration, relying on bid and ask quotes only, rather than actual trades.²

26. CBOE also successfully commercialized other instruments related to its proprietary VIX calculation, including VIX Futures and VIX Options, both of which trade only on CBOE’s exchange.

27. VIX Futures are contracts whose value depend on the VIX calculated during the SOQ at some future date which, in turn, depends on SPX Options pricing and/or quotes of this date. Investors can seek to profit in their trading of VIX Futures by holding a long or short contract through the settlement date, at which point CBOE determines whether the holder of the futures contract is entitled to receive a final-day distribution from the exchange, or must pay a final-day distribution to the exchange, depending on whether the prior day’s closing price for the contract is below or above the “spot price” for VIX at the time of settlement. Alternatively, the holder of a VIX future may close its position before the settlement date by buying or selling an offsetting obligation.

28. VIX Options give investors a different type of risk exposure to the VIX. VIX Options have designated expirations, which are Wednesdays unless adjusted for the holidays, and, unlike futures contracts, designated strike prices. An investor who is long (short) on a VIX

² See CBOE, *The BOE Volatility Index – VIX*[®] (White Paper) (2014), available at <https://www.cboe.com/micro/vix/vixwhite.pdf>.

Call Option will receive (pay) a cash amount equal to the greater of zero and the VIX calculated at the SOQ of the expiration minus the strike price. An investor who is long (short) on a VIX Put Option will receive (pay) a cash amount equal to the greater of zero and the strike price minus the VIX calculated at the SOQ of the expiration. Investors may not settle VIX Options prior to the expiration date.

29. Monthly VIX Options and VIX Futures are typically settled on the third or fourth Wednesday of each month, with infrequent adjustments based on various exchange holidays, and their exercise-settlement values are determined by CBOE using the clearing prices of SPX options in the SOQ that lasts for approximately an hour. Between 7:30 a.m. CST and 8:15 a.m. CST, traders and market makers can submit and cancel orders, while between 8:15 a.m. and 8:30 a.m. only orders relating to SPX Options within the eligible range of option strike prices can be submitted.³ At 8:30 a.m. the CBOE executes SPX options orders at market-clearing prices and removes unexecuted orders. SPX Options auction clearing prices at that time are used to calculate VIX settlement value. Quoting the CBOE Regulatory Circular RG17-019,⁴ “The opening price for any constituent option series in which there is no trade on CBOE will be the average of that option’s bid price and ask price as determined at the opening of trading.” SPX Options with bid quotes as low as just five cents are eligible for inclusion in the SOQ period’s determination of VIX settlement.

30. In certain important respects this process differs from the way other volatility indexes are calculated. The European counterpart to VIX, called VSTOXX, is a gauge similar to CBOE’s index; investors can acquire exposure to it through trades in options and futures. Unlike the VIX, however, VSTOXX excludes options with prices of less than .5 Euros, a bar nearly ten times higher than that employed by CBOE. Furthermore, VSTOXX is calculated based on actual

³ CBOE asserts in some public statements that it changed the period from 8:15 to 8:30 a.m. to 8:20 to 8:30 a.m. earlier in 2018, which does not appear to be consistent with some available data.

⁴ See CBOE, Regulatory Circular RG17-019 (Feb. 6, 2017), available at <http://www.cboe.com/publish/RegCir/REG17-019.pdf>

trades during a period in trading hours, rather than a combination of trades and quotes in a relatively illiquid period before market. The French markets regulator Autorité des Marchés Financiers has asserted that these distinctions make the VIX settlement process much more vulnerable to manipulation than the VSTOXX.

31 Indeed, features of the SOQ settlement process designed and implemented by CBOE make it very vulnerable to manipulation. First, the fact that the SOQ is set during a short window before trading opens means that even a single manipulative trade in this period can have an outsize impact on the calculation of the SOQ, which in turn permits lucrative profits on investments in futures and options settled by means of the SOQ process. Such leverage would not be possible if, like the VSTOXX, the SOQ settlement price was set during normal trading hours when trading volume is high and when the manipulative effect of individual trades would be dispersed. Moreover, CBOE imposes only a five-cent threshold on bid quotes of options contracts for inclusion in the SOQ settlement calculation, making manipulative trades quite cheap. Finally, in permitting the SOQ process to take into account quotes rather than just actual trades, CBOE makes the process vulnerable to traders who wish to move the index via behaviors like “spoofing”—the rapid submission and then cancellation of an order.

30. Expert analysis undertaken by academics studying VIX and independent work by Plaintiff’s experts reflect that, throughout the Class Period, the VIX index and the SOQ process were in fact systematically manipulated.

31. In a paper entitled “*Manipulation in the VIX?*” released May 23, 2017, John M. Griffin and Amin Shams examined data reflecting trading in both SPX Options and VIX Futures and Options between January of 2008 and April of 2015 derived from Tick Data, Bloomberg, the CBOE itself, and other sources. The authors concluded:

First, at the exact time of monthly VIX settlement, highly statistically and economically significant trading volume spikes occur in the underlying VIX options. Second, the spike occurs only in the OTM [out-of-the-money] SPX options that are included in the VIX settlement calculation and not in the excluded in-the-money (ITM) SPX options. Third, there is no spike in the volume for the similar S&P 100 Index (OEX) or SPDR S&P 500ETF (SPY) options that are unconnected to volatility index derivatives.

Fourth, if traders sought to manipulate the VIX settlement, they would want to move the prices by optimally spreading their trades across the SPX spikes and increasing the number of trades in the deep OTM put options consistent with the VIX formula. Trading volume at settlement follows this pattern, whereas normally deep OTM 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.

Griffin and Shams further concluded that these observations were not consistent with alternative, non-sinister explanations for volume spikes like pent-up liquidity demand and hedging.

32. Experts retained by Plaintiff, after conducting their own independent investigation of settlement dates in 2018, came to strikingly similar conclusions.

33. For all VIX derivative monthly settlement days in 2018 that they examined, the SOQ volume for out-of-the-money SPX Options—that is, the contracts used to calculate VIX for the SOQ process—far exceeds the SOQ volume on nearby weekly settlement dates not used for derivative settlements.⁵ This striking contrast is reflected in the charts below.

35. On March 28, 2018, a date which is not used for the purpose of calculating VIX settlement values for monthly VIX Options and VIX Futures, there is a very low volume of contracts meeting the SOQ requirements—the greatest volume is only 25 contracts:

⁵ See the data available at CBOE, *Settlement Information*, <http://cfe.cboe.com/cfe-products/vx-cboe-volatility-index-vix-futures/settlement-information-for-vix-derivatives/vix-settlement-series> (last visited Apr. 30, 2018).

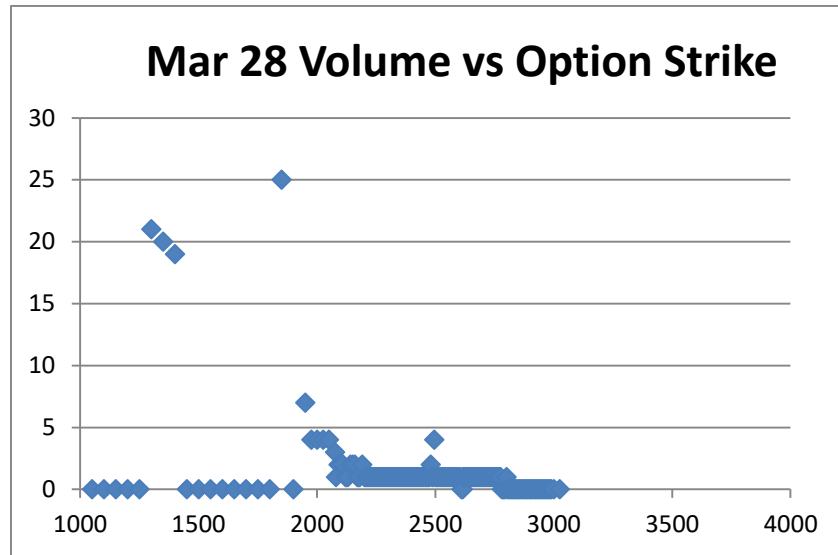


Figure 1: March 28, 2018 (not a settlement date for monthly contracts)

36. On March 21, on the other hand, a monthly settlement date used for the calculation of VIX SOQ for VIX Futures and VIX Options, there is extraordinary volume, exceeding 2,000 contracts, and the volume is at the furthest out-of-the-money put strike. The Figure 2 behavior of the number of contracts rising steeply as strike price decreases is a “manipulation hallmark” that Griffin and Shams discovered and explained. Further, a recent (April 23, 2018) CBOE 8-K itself describes this pattern for a different monthly settlement date as “... [appearing] consistent with the weights prescribed by the VIX Index formula.” It is both the greatly elevated quotation volume and the suspicious relationship to the out-of-the-money strike prices that indicate manipulative intent of market participants submitting the orders.

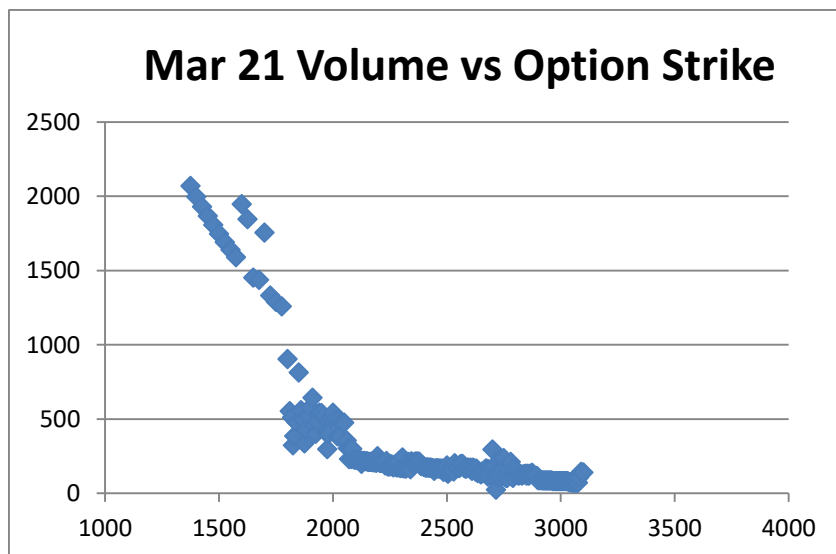


Figure 2: March 21, 2018 (a settlement date for a monthly contract)

34. Figure 3 shows this same SOQ settlement volume data for April 18, 2018, which is a monthly settlement date. As it happens, the April 18 volume far exceeds the closest earlier monthly settlement date of March 21. The April 18 total volume of all strike prices is 207,000 (a ratio of roughly 800 to the total volume of 252 for the non-monthly SOQ settlement date of March 28). The April 18 volume-versus-strike-price data invites the same observations as that of the March 21 data. Both the very high volume and the pattern of sharply increasing volume at lower strike prices are indicators of manipulation. The VIX calculation formula has the feature of increasing mathematical “weight” (essentially, “importance”) of option prices at lower strikes. Griffin and Shams argue that, mathematically speaking, the optimal manipulation strategy would employ the same “weight” in the volume of orders submitted with intent to manipulate.

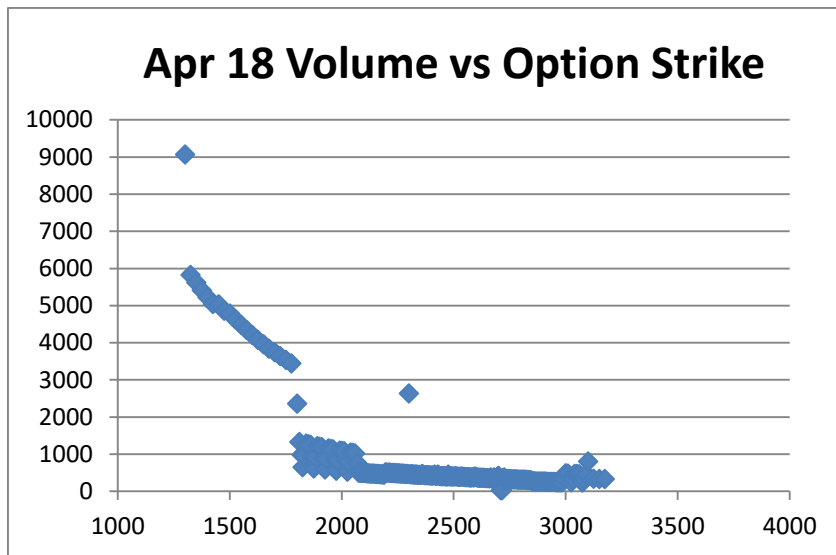
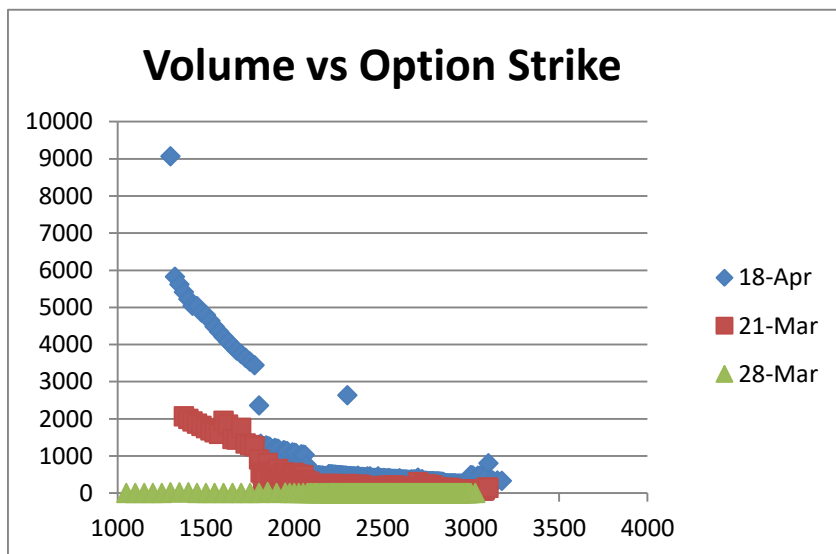


Figure 3: April 18, 2018 (a settlement date for a monthly contract)

This data is aggregated in the chart below, which plots the number of SPX Option contracts versus the strike price for each of the three dates (two monthly settlement dates at March 21 and April 18 and one non-monthly settlement date at March 28). The last curve appears to be “at zero” since its contract volumes are so small relative to those of the monthly settlement dates. The vastly increased volume on monthly settlement dates implies the attempts of one or more market participants to influence the final VIX settlement of the SOQ on these dates.



35. Startlingly, Cboe Global Markets itself issued a Form 8-K notice to investors describing unusual volume in the SPX Options used in the SOQ on the VIX on April 18, 2018, and acknowledging that it could undertake “improvements” to the VIX settlement process. The notice stated (with emphasis added):

During the opening auction on April 18th, a single market participant submitted orders to buy approximately 212,000 SPX options across a wide range of strike prices. Five additional market participants submitted buy orders totaling 20,000 options. The size and structure of these buy orders appeared consistent with the weights prescribed by the VIX Index formula. Offsetting this buy interest were sell orders submitted by nine participants for a total of 118,000 contracts. This left a buy order imbalance of 114,000 SPX options. This buy order imbalance contributed to the opening prices of the option series that were used to calculate the final VIX settlement value. Based on the orders that were submitted, we believe the auction process functioned as intended, ***notwithstanding that the final settlement value was higher than what market participants may have otherwise expected.***

The April settlement mirrors a larger liquidity trend we recently have observed on VIX monthly settlement mornings. We are assessing steps that Cboe can take to enhance the VIX settlement process and attract more liquidity to our settlement auction. We believe that our planned technology initiatives for Cboe Options Exchange will provide our market-makers with the capability to respond more efficiently to auctions at settlement. We are targeting Monday, April 30th, for the migration of SPX options to our Hybrid market model. Once migrated, all SPX market-makers will be able to stream their own electronically accessible quotes. This migration should increase the number of participants who can quote during the opening auction which can lead to increased liquidity.

The migration of SPX to the Hybrid market model will also bring other enhancements to market-makers. Electronic allocation on simple and complex order trades will be pro-rata with no customer priority or market-maker participation entitlements. We expect these enhancements will provide more transparency, with more visible quotes, leading to more interaction and ultimately, improved liquidity, including possibly during the SPX opening used for VIX settlement.

These initiatives to enhance market-maker liquidity are by no means our last. As we prepare for the migration of Cboe Options Exchange to Bats technology in October 2019, we plan to incorporate further enhancements to the “new” Cboe Options marketplace.

A. Harm to Plaintiff

36. During the period March 22 to April 9, 2018, the Plaintiff made four discrete purchases of VIX Put Options with a common expiration date of April 18, 2018, and a common option strike value of 16. His combined position was 220 contracts. By the specification of these CBOE VIX Put Option contracts, the payment to Plaintiff at expiration would be 220 contracts multiplied by 100 and again multiplied by the greater of zero or the difference between the strike price of 16 and the VIX setting at completion of SOQ on April 18. Hence, if the final VIX setting on this day had been 15, the Plaintiff would have received a cash payment of $220 \times 100 \times (16-15) = \$22,000$. Alternatively, had the final VIX setting been 17, the Plaintiff would have received zero.

37. Data of a public source shows that the VIX index had been 15.16 at 8:14 a.m. (Chicago time) on April 18. This is the last public value available prior to the time gap of 8:15 a.m. to 8:30 a.m. The official VIX setting for this SOQ was 17.26 (taken as the CBOE-listed VIX Futures settlement price). The next succeeding VIX value is 16.15 at 8:31 a.m. (just one minute after the termination of the SOQ and, therefore, not directly relevant to this VIX Option value). At the 8:14 a.m. value of 15.16, the Plaintiff would have received a cash settlement payment of \$18,480. Instead, with the final VIX setting at 17.26, a jump of more than 2 points, the Plaintiff's position was worthless.

38. Hence, the Plaintiff was directly harmed by the manipulation-fed VIX spike during the last minutes of the April 18, 2018 SOQ, and in this respect his injuries are the same as those of the Class.

B. Special Allegations Regarding CBOE's Negligence

39. CBOE owed Plaintiff and the Class a cognizable duty of reasonable care based on its public representations regarding VIX Options and Futures, its relationship to Plaintiff and the Class as a professional provider of intangible services settling VIX Futures and VIX Option contracts, and the foreseeability of the harm resulting from the exploitation of defects in the SOQ settlement process.

CBOE's marketing materials for its VIX Options and VIX Futures included the following claims:

With the launch of VIX Futures at Cboe Futures Exchange (CFE) in 2004 and VIX Options at Cboe in 2006, there has been a growing acceptance of trading VIX and VIX-linked products as risk management tools. **VIX options and futures enable investors to trade volatility independent of the direction or the level of stock prices. Whether an investor's outlook on the market is bullish, bearish or somewhere in-between, VIX futures and options can provide the ability to diversify a portfolio, as well as hedge, mitigate or capitalize on broad market volatility.**

40. Similarly, CBOE's website asserted that "Cboe Volatility Index® (VIX®) Options and Futures can help you turn volatility to your advantage. Harness it to seek diversification, hedge or capitalize on volatility or efficiently generate income."

41. Moreover, it was reasonably foreseeable to CBOE that the SOQ process it had designed could be manipulated in a manner that would harm investors who traded in the VIX Futures and VIX Options that were created by CBOE, were traded only on CBOE's exchange, and were settled by CBOE pursuant to a proprietary process as part of CBOE's pursuit of commercial profits. Indeed, as set out in Paragraph 31 above, the May 23, 2017 paper by Griffin and Shams described in detail evidence that exactly this kind of manipulation was taking place.

42. CBOE breached this duty of care by unreasonably and in bad faith failing to address flaws in the design of the SOQ that left the SOQ peculiarly vulnerable to manipulation. The flaws included:

- The SOQ period concentrates all VIX-determinative quotes and trades into a small, relatively illiquid segment of time prior to the market open. Since it is this period that rules payments to VIX Futures and Options holders, would-be-manipulators can effectuate manipulation using only a limited number of orders or trades.
- The VIX calculation for the SOQ will use the last traded price if any trades occur, but the calculation will use the average of bid and ask quotes

(not trades) when no trades occur during this SOQ period. This permitted manipulation by a variety of means: traders could influence the VIX settlement price by simply submitting put options quotes that are deeply out-of-the money, or by delaying or canceling bids or asks on SPX Options at certain strike prices. Posting a manipulative bid or ask quote entails much less cost—especially when the posted quote is off-market (a bid far below recent traded levels or an ask far above recent traded levels).

- Similarly, the very low five cent per-option contract threshold for contracts to be included in the calculation make it particularly cheap for manipulators to move VIX without facing substantial exposure.
- The range of SPX Options included in the VIX calculation is highly variable since it depends strongly on the aggregation of bid and ask quotes both within the SOQ and outside the SOQ. This range of SPX Options has a strong impact on the VIX result: all else equal, the VIX calculation gives a higher result when the range is larger and a lower result when the range is smaller. Accordingly, traders could manipulate calculated VIX by the simple expedient of expanding or contracting the range of bid and ask quotes being used, by adding bid quotes at strike prices where there would otherwise be no bids, or eliminating bids by trading them.

43. This breach was especially egregious in light of long-standing evidence available to CBOE that the flaws in the design of the SOQ were being exploited by traders seeking illicit profits. CBOE had access to all data relevant to every settlement, and had exclusive control both over the settlement process itself and the final settlement prices it made available to the market. By 2017 the weight of the data available even to outside experts was highly suggestive of manipulation in the SOQ process, as set out by Griffin and Shams in their paper.

44. CBOE's failure to remedy the defects in the SOQ process was in bad faith, in that CBOE had a strong financial incentive to leave the defects unchecked so as to enjoy the financial

benefits of increased volume in the trading of SPX Options, VIX Futures and VIX Options that resulted from the manipulation.

45. As set out in Paragraphs 36 to 38 above, Plaintiff was injured by breach of care in that he suffered harm as a result of a manipulated spike in volatility diminishing the value of his VIX Options expiring April 18, 2018. Members of the Class who purchased VIX Futures and VIX Options and who held those instruments on settlement days when volatility spiked as a result of manipulation were injured in the same manner.

C. Special Allegations Regarding CBOE's Violations of the CEA

46. CBOE is a registered entity under the CEA, 7 U.S.C. § 1a.

47. Pursuant to 7 U.S.C. §25(b)(1), “[a] registered entity that fails to enforce any bylaw, rule, regulation, or resolution that it is required to enforce by section 7, 7a-1, 7a-2, 7b-3, or 24a of this title . . . [or] a licensed board of trade that fails to enforce any bylaw, rule, regulation, or resolution that it is required to enforce by the Commission . . . shall be liable for actual damages sustained by a person who engaged in any transaction on or subject to the rules of such registered entity to the extent of such person’s actual losses that resulted from such transaction and were caused by such failure to enforce . . . such bylaws, rules, regulations, or resolutions.”

48. CEA provides that boards of trade, such as CBOE, 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. § 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. § 7(d)(2)(B));
- c. “list on the contract market only contracts that are not readily susceptible to manipulation” (7 U.S.C. § 7(d)(3));

- 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, including—(A) methods for conducting real-time monitoring of trading; and (B) comprehensive and accurate trade reconstructions” (7 U.S.C. § 7(d)(4));
- e. “reduce the potential threat of market manipulation or congestion (especially during trading in the delivery month), the board of trade shall adopt for each contract of the board of trade, as is necessary and appropriate, position limitations or position accountability for speculators” (7 U.S.C. § 7(d)(5)(A));
- f. “provide a competitive, open, and efficient market and mechanism for executing transactions that protects the price discovery process of trading in the centralized market of the board of trade.” (7 U.S.C. § 7(d)(9)(A));
- g. “maintain rules and procedures to provide for the recording and safe storage of all identifying trade information in a manner that enables the contract market to use the information—to assist in the prevention of customer and market abuses; and (B) to provide evidence of any violations of the rules of the contract market” (7 U.S.C. § 7(d)(10));
- h. “establish and enforce—(A) rules and procedures for ensuring the financial integrity of transactions entered into on or through the facilities of the contract market (including the clearance and settlement of the transactions with a derivatives clearing organization) . . .” (7 U.S.C. § 7(d)(11));
- i. “establish and enforce rules— (A) to protect markets and market participants from abusive practices committed by any party, including abusive practices committed by a party acting as an agent for a participant;

and (B) to promote fair and equitable trading on the contract market” (7 U.S.C. § 7(d)(12)).

49. CBOE violated these rules in multiple respects. As set forth above, CBOE either knew, or was reckless in disregarding, the fact that the SOQ process was not only vulnerable to manipulation but actually was routinely manipulated, and that this conduct constituted abusive trade practices. Nevertheless, CBOE did not stop VIX Futures and Options from trading, and did not prevent the manipulation from occurring. These failures were the result of CBOE’s bad faith, in that it profited from the high trading volume associated with the manipulation. These violations of the CEA resulted in harm to Plaintiff and other members of the Class who held VIX Futures and VIX Options on settlement days when there was manipulation of the SOQ process.

V. CLASS ACTION ALLEGATIONS

50. Plaintiff brings this action as a class action pursuant to Rule 23 of the Federal Rules of Civil Procedure on behalf of a class consisting of all persons who between January 1, 2008, and April 30, 2018 (the “Class Period”), purchased VIX Options or VIX Futures, held them on the settlement dates for their instruments, and were harmed as a result of Defendants’ actions as alleged herein (the “Class”). Excluded from the Class are Defendants, their aiders and abettors, directors and officers of CBOE, as well as their families and affiliates.

51. The members of the Class are so numerous that joinder of all members is impracticable. Throughout the Class Period, VIX Futures and VIX Options were actively traded on the CBOE. While the exact number of Class members is unknown to Plaintiff at this time and can only be ascertained through appropriate discovery, Plaintiff believes that there are hundreds or thousands of members in the proposed Class. Record owners and other members of the Class may be identified from records maintained or controlled by CBOE and may be notified of the pendency of this action by mail or similar means.

52. There is a well-defined community of interest in the questions of law and fact involved in this case. Questions of law and fact common to the members of the Class which predominate over questions which may affect individual Class members include:

- a. Whether the Defendants owe the Class a duty of reasonable care in the settlement of VIX Futures and VIX Options;
- b. Whether Defendants breached that duty;
- c. Whether Defendants violated the CEA;
- d. The extent of damage sustained by Class members and the appropriate measure of damages.

53. Plaintiff's claims are typical of those of the Class because Plaintiff and the Class sustained damages from Defendants' wrongful conduct alleged herein.

54. Plaintiff will adequately protect the interests of the Class and has retained experienced counsel. Plaintiff has no interests that conflict with those of the Class.

55. A class action is superior to other available methods for the fair and efficient adjudication of this controversy. Furthermore, as the damages suffered by individual Class members may be relatively small, the expense and burden of individual litigation makes it impossible for members of the Class to individually redress the wrongs done to them. There will be no difficulty in the management of this action as a class action.

VI. CAUSES OF ACTION

COUNT I

Ordinary Negligence Against CBOE

56. Plaintiff incorporates by reference paragraphs 1–45 as fully set forth herein.

57. Defendants owed Plaintiff and the Class the duty of reasonable care, which they breached.

58. Defendants were negligent in performing these duties in that they failed to use reasonable care in the design and maintenance of the VIX calculation process and the SOQ settlement process for VIX Options and VIX Futures, rendering them liable/and or strictly liable.

59. There is a strong public interest in these Defendants' proper and non-negligent performance of their duties.

60. Because of Defendants' breach of their legal duties, Plaintiff and the Class suffered damages as described herein.

61. The damages suffered by Plaintiff and the Class were all general and special damages arising from the natural and foreseeable consequences of Defendants' conduct.

COUNT II

Failure to Enforce Bylaws, Rules, Regulations, or Resolutions in Violation of the Commodity Exchange Act

62. Plaintiff repeats and incorporates by reference Paragraphs 1–38 and 46–49 above.

63. Pursuant to 7 U.S.C. § 25(b)(1), “[a] registered entity that fails to enforce any bylaw, rule, regulation, or resolution that it is required to enforce by section 7, 7a-1, 7a-2, 7b-3 or 24a of this title . . . [or] a licensed board of trade that fails to introduce any bylaw, rule, regulation, or resolution that it is required to enforce by the Commission . . . shall be liable for actual damages sustained by a person who engaged in any transaction on or subject to the rules of such registered entity to the extent of such person's actual losses that resulted from such transaction and were caused by such failure to enforce . . . such bylaws, rules, regulations, or resolutions.”

64. CBOE is a registered entity under the terms of 7 U.S.C. § 1a(40).

65. Plaintiff and other members of the Class engaged in transactions of VIX Futures and VIX Options subject to the rules of CBOE.

66. As set forth above, CBOE knowingly failed to enforce (and /or with reckless disregard of its rules and regulations avoid informing itself such that it was able to enforce) the following rules that it was required to follow pursuant to the CEA:

- a. 7 U.S.C. § 7(d)(2)(A): “The board of trade shall establish, monitor, and enforce compliance with the rules of the contract market, including . . . rules prohibiting abusive trade practices on the contract market.”

- b. 7 U.S.C. § 7(d)(2)(B): “The board of trade shall have the capacity to detect, investigate, and apply appropriate sanctions to any person that violates any rule of the contract market.”
- c. 7 U.S.C. § 7(d)(3): “The board of trade shall list on the contract market only contracts that are not readily susceptible to manipulation.”
- d. 7 U.S.C. § 7(d)(4): “The board of trade shall 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, including—(A) methods for conducting real-time monitoring of trading; and (B) comprehensive and accurate trade reconstructions.”
- e. 7 U.S.C. § 7(d)(5)(A): “To reduce the potential threat of market manipulation or congestion (especially during trading in the delivery month), the board of trade shall adopt for each contract of the board of trade, as is necessary and appropriate, position limitations or position accountability for speculators.”
- f. 7 U.S.C. § 7(d)(9)(A): “The board of trade shall provide a competitive, open, and efficient market and mechanism for executing transactions that protects the price discovery process of trading in the centralized market of the board of trade.”
- g. 7 U.S.C. § 7(d)(10): “The board of trade shall maintain rules and procedures to provide for the recording and safe storage of all identifying trade information in a manner that enables the contract market to use the information—(A) to assist in the prevention of customer and market abuses; and (B) to provide evidence of any violations of the rules of the contract market.”

- h. 7 U.S.C. § 7(d)(11): “The board of trade shall establish and enforce—(A) rules and procedures for ensuring the financial integrity of transactions entered into on or through the facilities of the contract market (including the clearance and settlement of the transactions with a derivatives clearing organization) . . .”
- i. 7 U.S.C. § 7(d)(12): “The board of trade shall establish and enforce rules—(A) to protect markets and market participants from abusive practices committed by any party, including abusive practices committed by a party acting as an agent for a participant; and (B) to promote fair and equitable trading on the contract market.”

67. As detailed in the Complaint above, CBOE had knowledge and/or with reckless disregard of its rules/regulations avoided acquiring such knowledge that: the SOQ used for settlement of VIX Futures and VIX Options was susceptible to being manipulated and was, in fact, being manipulated; the manipulation of the SOQ was manipulating the value of VIX Futures and VIX Options that CBOE allowed to be traded; this manipulation of the SOQ and VIX Futures and VIX Options constituted abusive trade practices; and CBOE continued to offer these products for trading, and failed to investigate, enforce, or apply appropriate sanctions against individuals or entities engaged in this manipulation and abusive trade practices.

68. As detailed in the Complaint above, CBOE failed to enforce these rules in bad faith. Specifically, CBOE knew that suspending trading in its proprietary products VIX Futures and VIX Options that were susceptible to manipulation would negatively impact the transaction fees and revenues CBOE realized during the Class Period, and would also negatively impact the value of CBOE’s stock (including shares held by and paid to CBOE officers and directors as part of their compensation). CBOE (including its officers and directors) therefore had a financial incentive to allow the manipulation described above to continue.

69. CBOE’s conduct caused injury to Plaintiff and other members of the Class who transacted in CBOE’s proprietary products, VIX Futures and VIX Options, that CBOE knew (or

was recklessly indifferent to knowing) were being traded in a manipulated market, at manipulated prices, and with artificial price trends, during the Class Period.

70. The damages to Plaintiff and other members of the Class were caused by CBOE's failure to enforce bylaws, rules, regulations, or resolutions that it was required to enforce under the Commodity Exchange Act.

71. Plaintiff and other members of the Class are each entitled to damages for the violations of the CEA alleged herein.

PRAYER FOR RELIEF

Plaintiff requests relief as follows:

A. That the Court determine that this action may be maintained as a class action under Rule 23(a), (b)(1), (b)(2), and (b)(3) of the Federal Rules of Civil Procedure, and direct that notice of this action, as provided by Rule 23(c)(2) of the Federal Rules of Civil Procedure, be given to Class members;

B. That the Court enter an order declaring that Defendants' actions, as set forth in this Complaint, violate the law;

C. That the Court award Plaintiff and Class members damages, punitive damages, and/or exemplary damages in an amount to be determined at trial;

D. That the Court award Plaintiff pre- and post-judgment interest;

E. That the Court award Plaintiff his costs of suit, including reasonable attorneys' fees and expenses; and

F. That the Court award any and all such other relief as the Court may deem just and proper.

DATED: April 30, 2018.

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