SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-98451; File No. SR-Phlx-2023-07)

September 20, 2023

Self-Regulatory Organizations; Nasdaq PHLX LLC; Order Granting Approval of a Proposed Rule Change, as Modified by Amendment No. 1, to Make Permanent Certain P.M.-Settled Pilots

I. Introduction

On February 23, 2023, Nasdaq PHLX LLC ("Phlx" or "Exchange") filed with the Securities and Exchange Commission ("Commission"), pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 ("Act")[1] and Rule 19b-4 thereunder,[2] a proposed rule change to make permanent the pilot program to permit the listing and trading of options based on 1/100 the value of the Nasdaq-100 Index ("Nasdaq-100") and the Exchange's nonstandard expirations pilot program (collectively, the "Programs"). The proposed rule change was published for comment in the Federal Register on March 2, 2023.[3] On April 7, 2023, pursuant to Section 19(b)(2) of the Act,[4] the Commission designated a longer period within which to approve the proposed rule change, disapprove the proposed rule change, or institute proceedings to determine whether to disapprove the proposed rule change.[5] On May 11, 2023, the Exchange filed Amendment No. 1 to the proposed rule change ("Amendment No. 1").[6] On May 31, 2023, the Commission instituted proceedings to determine whether to approve or disapprove the proposed rule change

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1 15 U.S.C. 78s(b)(1).

2 17 CFR 240.19b-4.

3 See Securities Exchange Act Release No. 96980 (February 24, 2023), 88 FR 13161 ("Notice").

4 15 U.S.C. 78s(b)(2).

5 See Securities Exchange Act Release No. 97260, 88 FR 22498 (April 13, 2023). The Commission designated May 31, 2023, as the date by which the Commission shall approve or disapprove, or institute proceedings to determine whether to approve or disapprove, the proposed rule change.

6 In Amendment No. 1, the Exchange inserts two footnotes and amends a sentence in order to further clarify parts of the empirical analysis performed by the Exchange. Amendment No. 1 is available at: https://www.sec.gov/comments/sr-phlx-2023-07/srphlx202307.htm.

and published Amendment No. 1 for notice and comment.[7] On August 28, 2023, the Commission designated a longer period for Commission action on proceedings to determine whether to approve or disapprove the proposed rule change, as modified by Amendment No. 1.[8] The Commission did not receive any comment letters and is approving the proposed rule change, as modified by Amendment No. 1.

## II. Background

When cash-settled[9] index options were first introduced in the 1980s, they generally utilized closing-price settlement procedures (i.e., p.m. settlement).[10] The Commission became concerned with the impact of p.m.-settled, cash-settled index options on the underlying cash equities markets, and in particular, added market volatility and sharp price movements near the close on expiration days.[11] These concerns were heightened during the "triple-witching" hour on the third Friday of March, June, September, and December when index options, index futures, and options on index futures expired concurrently.[12] Academic research at the time provided at least some evidence suggesting that futures and options expirations contributed to excess volatility and reversals around the close on those days.[13]

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7 See Securities Exchange Act Release No. 97624, 88 FR 37107 (June 6, 2023).

8 See Securities Exchange Act Release No. 98232, 88 FR 60525 (September 1, 2023). The Commission designated October 28, 2023, as the date by which the Commission shall either approve or disapprove the proposed rule change.

9 The seller of a "cash-settled" index option pays out the cash value of the applicable index on expiration or exercise. A "physical delivery" option, like equity and ETF options, involves the transfer of the underlying asset rather than cash. See Characteristics and Risks of Standardized Options, available at: https://www.theocc.com/Company-Information/Documents-and-Archives/Options-Disclosure-Document.

10 See Securities Exchange Act Release No. 65256 (September 2, 2011), 76 FR 55969, at 55972 (September 9, 2011) (SR-C2-2011-008) (Order approving proposed rule change to establish a pilot program to list and trade SPXPM options on the C2 Options Exchange, Incorporated) ("C2 SPXPM Approval").

11 See id.

12 See id.

13 See Securities and Exchange Commission, Division of Economic Risk and Analysis, Memorandum dated

In light of the concerns with p.m. settlement and to help ameliorate the price effects associated with expirations of p.m.-settled, cash-settled index products, in 1987, the Commodity Futures Trading Commission approved a proposed rule change by the Chicago Mercantile Exchange ("CME") to provide for a.m. settlement[14] for index futures, including futures on the S&P 500 Index.[15] The Commission subsequently approved a proposed rule change by Cboe Options Exchange ("Cboe Options") to list and trade a.m.-settled options on the S&P 500 Index.[16] In 1992, the Commission approved Cboe Options' proposal to transition all of its European-style cash-settled options on the S&P 500 Index to a.m. settlement.[17] However, in 1993, the Commission approved a proposed rule change allowing Cboe Options to list p.m.-settled options on certain broad-based indexes, including the S&P 500, expiring at the end of each calendar quarter (since approved as permanent).[18] Starting in 2006, the Commission approved a number of proposals, on a pilot basis, permitting Cboe Options to introduce other

February 2, 2021 on Cornerstone Analysis of PM Cash-Settled Index Option Pilots (September 16, 2020) ("Pilot Memo") at 5, available at: https://www.sec.gov/files/Analysis_of_PM_Cash_Settled_Index_Option_Pilots.pdf (citing, among other papers, Stoll, Hans R., and Robert E. Whaley, "Expiration day effects of index options and futures," Monograph Series in Finance and Economics, no. 3 (1986)).

14 The exercise settlement value for an a.m.-settled index option is determined by reference to the reported level of the index as derived from the opening prices of the component securities on the business day before expiration.

15 See Proposed Amendments Relating to the Standard and Poor's 500, the Standard and Poor's 100 and the Standard Poor's OTC Stock Price Index Futures Contract, 51 FR 47053 (December 30, 1986) (notice of proposed rule change from the CME). See also Securities Exchange Act Release No. 24367 (April 17, 1987), 52 FR 13890 (April 27, 1987) (SR-CBOE-87-11) (noting that the CME moved the S&P 500 futures contract's settlement value to opening prices on the delivery date).

16 See Securities Exchange Act Release No. 24367 (April 17, 1987), 52 FR 13890 (April 27, 1987) (SR-CBOE-87-11).

17 See Securities Exchange Act Release No. 30944 (July 21, 1992), 57 FR 33376 (July 28, 1992) (SR-CBOE-92-09). The Commission also approved proposals by other options markets to transfer most of their cash-settled index products to a.m. settlement. See, e.g., Securities Exchange Act Release No. 25804 (June 15, 1988), 53 FR 23475 (June 22, 1988) (SR-NYSE-87-11 and 88-04).

18 See Securities Exchange Act Release No. 31800 (February 1, 1993), 58 FR 7274 (February 5, 1993) (SR-CBOE-92-13). See also Securities Exchange Act Release Nos. 54123 (July 11, 2006), 71 FR 40558 (July 17, 2006) (SR-CBOE-2006-65); and 60164 (June 23, 2009), 74 FR 31333 (June 30, 2009) (SR-CBOE-2009-029).

index options with p.m.-settlement. These include p.m.-settled index options expiring weekly (other than the third Friday) and at the end of each month,[19] as well as p.m.-settled S&P 500 Index options and Mini-S&P 500 Index options expiring on the third Friday of the month.[20]

Subsequently, other exchanges, including Phlx, sought to permit the listing and trading of p.m.-settled options on certain broad-based indices. In December 2017, the Commission approved Phlx's nonstandard expirations pilot program on a pilot basis ("Nonstandard Pilot").[21] In April 2021, the Commission approved Phlx's pilot to permit the listing and trading of options based on 1/100 the value of the Nasdaq-100 ("XND" or "XND options") on a pilot basis ("XND Pilot").[22] In the course of approving both Programs, the Commission reiterated its concern about the potential impact on the market at expiration for the underlying component stocks for a p.m.-settled, cash-settled index option.[23] However, the Commission also recognized the potential impact was unclear.[24] The Commission approved the Programs on a pilot basis to allow the Exchange and the Commission to monitor for and assess any potential for adverse market

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19 See Securities Exchange Act Release Nos. 62911 (September 14, 2010), 75 FR 57539 (September 21, 2010) (SR-CBOE-2009-075); 76529 (November 30, 2015), 80 FR 75695 (December 3, 2015) (SR-CBOE-2015-106); and 78531 (August 10, 2016), 81 FR 54643 (August 16, 2016) (SR-CBOE-2016-046).

20 See Securities Exchange Act Release Nos. 68888 (February 8, 2013), 78 FR 10668 (February 14, 2013) (SR-CBOE-2012-120); and 70087 (July 31, 2013), 78 FR 47809 (August 6, 2013) (SR-CBOE-2013-055).

21 See Securities Exchange Act Release No. 82341 (December 15, 2017), 82 FR 60651 (December 21, 2017) (SR-Phlx-2017-79) ("Nonstandard Approval Order"). The Commission subsequently approved proposed rule changes to amend the Nonstandard Pilot to allow the Exchange to also list p.m.-settled options with Tuesday and Thursday expirations on the Nasdaq-100 and the Nasdaq-100 Micro Index. See Securities Exchange Act Release Nos. 95391 (July 29, 2022), 87 FR 47797 (August 4, 2022) (SR-Phlx-2022-22); and 96411 (November 30, 2022), 87 FR 74688 (December 6, 2022) (SR-Phlx-2022-38).

22 See Securities Exchange Act Release No. 91524 (April 9, 2021), 86 FR 19909 (April 15, 2021) (SR-Phlx-2021-07) ("XND Approval Order").

23 See Nonstandard Approval Order, 82 FR at 60653 and XND Approval Order 86 FR at 19911. See also Securities Exchange Act Release Nos. 64599 (June 3, 2011), 76 FR 33798, 33801-02 (June 9, 2011) (order instituting proceedings to determine whether to approve or disapprove a proposed rule change to allow the listing and trading of SPXPM options); C2 SPXPM Approval, 76 FR at 55972-76; and 68888 (February 8, 2013), 78 FR 10668, 10669 (February 14, 2013) (order approving the listing and trading of SPXPM on Cboe Options).

24 See XND Approval Order, 86 FR at 19909.

effects.[25] In order to facilitate this assessment, the Exchange committed to provide the Commission with data and analysis for each pilot[26] and to make such data publicly available.[27] In addition to the Exchange's data and analysis, Cornerstone Research also conducted an analysis at the direction of Staff from the Commission's Division of Economic and Risk Analysis. The analysis utilizes the level of expiring p.m.-settled index options open interest and the measures of volatility and price reversals for the corresponding index futures, the underlying cash index, and index component securities in the minutes leading up to and immediately following the market close to study the effects of pilot programs allowing p.m.-settled index options. The Pilot Memo is discussed in more detail below.

III. Description of the Proposal, as Modified by Amendment No. 1

The Exchange proposes to make permanent the Nonstandard Pilot and the XND pilot. The Nonstandard Pilot permits the Exchange to open p.m.-settled options on broad-based indexes that expire (1) on the last day of the trading month ("EOM expirations") and (2) on any Monday, Wednesday, or Friday (other than the third Friday-of-the-month or days that coincide with an EOM expiration) and, with respect to options on the Nasdaq-100 ("NDX" or "NDX options") and XND options, any Tuesday or Thursday (other than days that coincide with the third Friday-of-the-month or an EOM expiration). The XND Pilot permits the listing of XND options, which are European-style and cash-settled, and have a contract multiplier of 100. The

25 See XND Approval Order, 86 FR at 19911 and Nonstandard Approval Order, 82 FR at 60653.

26 See XND Approval Order, 86 FR at 19910-19911 and Nonstandard Approval Order, 82 FR at 60652-60653.

27 See, e.g., Securities Exchange Act Release Nos. 84835 (December 17, 2018), 83 FR 65773, at 65773-74 (December 21, 2018) (SR-Phlx-2018-80) (stating the Exchange will make public on its website any data and analysis it submits to the Commission under the Nonstandard Pilot); and 93447 (October 28, 2021) 86 FR 60719, at 60720 (November 3, 2021) (SR-Phlx-2021-66) (stating the Exchange makes public on its website data and analysis previously submitted to the Commission under the XND Pilot and committing to make public any data or analyses submitted in the future).

contract specifications for XND options mirror those of the NDX options contract listed on the Exchange, except that XND options are based on 1/100 of the value of the Nasdaq-100, and are p.m.-settled pursuant to Options 4A, Section 12(a)(5) of the Phlx Rules.

The Nonstandard Pilot was extended on multiple occasions, including recently, and is set to expire on November 6, 2023.[28] Similarly, the XND Pilot was extended on multiple occasions and is set to expire on November 6, 2023.[29]

The Exchange states it has provided pilot data to the Commission with respect to the Programs, pursuant to the Nonstandard Approval Order and the XND Approval order.[30] The Exchange also states it provides ongoing monthly data in addition to the data provided in the Notice.[31] Now, the Exchange proposes to make the Programs permanent.

## IV. Discussion and Commission Findings

After careful review, the Commission finds that the proposed rule change, as modified by Amendment No. 1, is consistent with the Act and the rules and regulations thereunder applicable to a national securities exchange.[32] In particular, the Commission finds that the proposed rule change, as modified by Amendment No. 1, is consistent with Section 6(b)(5) of the Act,[33] which requires, among other things, that the Exchange's rules be designed to prevent fraudulent and manipulative acts and practices, to promote just and equitable principles of trade,

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28 See Securities Exchange Act Release No. 97385 (April 26, 2023), 88 FR 27549, at 27549-27550 (May 2, 2023) (SR-Phlx-2023-13) ("Programs Extension").

29 See id.

30 See Notice, 88 FR at 13175. The Exchange has made public on its website data and analyses previously submitted to the Commission under the Programs. See http://www.nasdaqtrader.com/Trader.aspx?id=currentregulatory.

31 See Programs Extension, 88 FR at 27549-27550.

32 In approving this proposed rule change, the Commission has considered the proposed rule's impact on efficiency, competition, and capital formation. See 15 U.S.C. 78c(f).

33 15 U.S.C. 78f(b)(5).

to remove impediments to and perfect the mechanism of a free and open market and a national market system, and, in general, to protect investors and the public interest. In its proposal to make the Programs permanent, the Exchange addressed market capacity around the market close and provided an empirical assessment of the impact of its p.m.-settled index options on options market quality. Each of these elements is discussed in greater detail below. As stated above, no comments were received on the proposed rule change.

Market Impact Considerations

The Exchange's analysis presents data that the introduction of p.m.-settlement is correlated with an increase in options trading tied to the Nasdaq-100.[34] The data shows an increase in trading volume and notional open interest for NDX and XND options during the sample period.[35]

In addition to reviewing the data and analysis provided by the Exchange, the Commission reviewed the analysis in the Pilot Memo, which evaluates whether higher levels of expiring open interest in p.m.-settled index options results in increased volatility and price reversals around the close. The Pilot Memo shows that the market share for p.m.-settled options, in particular options on S&P 500 Index, has grown substantially since 2007.[36] The Pilot Memo examines whether and to what extent expiring open interest in p.m.-settled index options is empirically related with the tendency of the corresponding index futures, the underlying index, or index components to experience increased transitory volatility and price

[34] See Notice, 88 FR at 13167.

[35] See id. at 13163.

[36] See Pilot Memo at 2. The Pilot Memo also examined options on the Russell 2000 Index and the Nasdaq-100. However, during the time period covered by the study (2007-2018), the markets for both a.m.- and p.m.-settled options on these indexes were very small compared to the size of that for S&P 500 Index options. In addition, because p.m.-settled NDX options were only introduced in 2018, the number of observations for NDX options was much smaller than for other indexes. See id. at 4.

reversals around the time of market close on expiration dates. The Pilot Memo concludes that, although expiring p.m.-settled index option open interest may have a statistically significant relationship with volatility and price reversals of the underlying index, index futures, and index component securities around the market close, the magnitude of the effect is economically very small.[37] For example, the largest settlement event that occurred during the time period studied in the Pilot Memo (a settlement of $100.4 billion of notional on December 29, 2017) had an estimated impact on the futures price of only approximately 0.02% (a predicted impact of $0.54 relative to a closing futures price of $2,677).[38]

In order to analyze the effect of a very large increase in settlement volume for Nasdaq-100 p.m.-settled options contracts, the Exchange uses the estimated regression coefficients in the Pilot Memo to estimate the change in the volatility of index futures prices when settlement volume increased from the 25$^{th}$ percentile to the 75$^{th}$ percentile.[39] For both the S&P 500 Index and the Nasdaq-100, the Exchange estimates the relative impact would be small for both indexes.[40]

The Exchange also provides additional analysis on market capacity around the market close.[41] Specifically, the Exchange presents data that the closing auction volume on the equity market have become much larger than the opening auction, which may indicate that there is sufficient liquidity in closing auctions to absorb liquidity demand associated with p.m.-settlement of NDX and XND options.[42] In addition, the Exchange states that the liquidity

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37 See id. at 3.

38 See id.

39 See Notice, 88 FR at 13173-13174.

40 See id. at 13174.

41 See id.

42 See id.

available at or around the close would be able to mitigate any excess volatility created by the options settlement at the market close.[43]

Further, the Exchange represents that it has sufficient systems capacity to handle p.m.-settled options on broad-based indexes with nonstandard expirations dates and has not encountered any issues or adverse market effects as a result of listing them.[44]

Market Quality Considerations

The Exchange also completed an analysis intended to evaluate whether the Programs impacted the quality of the NDX options market. Specifically, the Exchange presents findings on three market characteristics: trading volume, open interest, and spreads. The Exchange concludes that there is no evidence that NDX and XND options contracts, which are p.m.-settled, would result in reduced trading activity or degradation in market quality of the a.m.-settled index options.[45] The Exchange notes within its analysis that it seems unlikely that the introduction of XND option contracts had a significant impact on the market quality of the full-sized NDX option contracts.[46]

Further, the Exchange observed a consistent decrease in relative quoted spread from 2017 to 2022 for NDX options.[47] When the Exchange compared the spread trend of NDX monthly contracts to that of QQQ monthly contracts, the Exchange states that the results suggest that there is gradual decrease in both the NDX monthly contracts spread and the QQQ contracts

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43 See id.

44 See Notice, 88 FR at 13176.

45 See id.

46 The Exchange states that given that the size of the market (measured in volume) for XND options volume is small compared to that of other p.m.-settled NDX options, the Exchange believes the introduction of XND option contracts is unlikely to adversely impact the market quality of a.m.-settled NDX options. See Amendment No. 1, supra note 6.

47 See Notice, 88 FR at 13171.

spread during the sample period.[48] The Exchange uses duration weighted relative quoted spread as a measure of the cost of trading and examines whether the introduction of p.m.-settled index options results in any deterioration of spreads for am-settled NDX options.[49] The Exchange finds a consistent decrease in the relative quoted spread is prevalent from 2017 to 2022 and no obvious change in the trend following the introduction of p.m.-settled index options.[50] The analysis also considered whether the move from a.m. settlement to p.m. settlement for Friday weekly expirations (other than third-Friday-of-the-month) led to changes in spreads for those contracts.[51] The sample timeframe was from July 2017 through August 2018.[52] The relative quoted spread decreased during first part of 2018 and increase in May and June 2018; however, it remained comparable to the 2017 average.[53] Overall, the Exchange observes no evidence of deterioration of spreads associated with the introduction of p.m.-settled NDX options.[54]

The Commission believes that the evidence contained in the Exchange's filing, the Exchange's pilot data and reports, and the Pilot Memo analysis demonstrate that the Programs have benefitted investors and other market participants by providing more flexible trading and hedging opportunities while also having no disruptive impact on the market. The market for p.m.-settled options has grown in size over the course of the Programs, and analysis of the pilot

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48 See id. at 13171-13172, 13175-13176.

49 See id. at 13169-13170.

50 See id.

51 See id.

52 See id. at 13170-13173. The Exchange used a regression analysis to test whether the spread of NDX contracts changed after the introduction of p.m.-settled index options. See Notice, 88 FR at 13171. The regression model is meant to study the effect of the introduction of Friday p.m.-settled NDX options expirations (on all but the third Friday of the month) that occurred in January 2018. See Amendment No. 1, supra note 6.

53 See Notice, 88 FR at 13173.

54 See id.

data did not identify any significant economic impact on the underlying component securities surrounding the close as a result of expiring p.m.-settled options nor did it indicate a deterioration in market quality (as measured by relative quoted spreads) for an existing product when a new p.m.-settled expiration was introduced. Further, significant changes in closing procedures in the decades since index options moved to a.m. settlement may also serve to mitigate the potential impact of p.m.-settled index options on the underlying cash markets.

Accordingly, the Commission finds that the proposed rule change, as modified by Amendment No. 1, is consistent with Section 6(b)(5) of the Act[55] and the rules and regulations thereunder applicable to a national securities exchange.

V. Conclusion

IT IS THEREFORE ORDERED, pursuant to Section 19(b)(2) of the Act,[56] that the proposed rule change (SR-Phlx-2023-07), as modified by Amendment No. 1, be, and hereby is, approved.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.[57]

**Sherry R. Haywood**,

*Assistant Secretary.*

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[55] 15 U.S.C. 78f(b)(5).

[56] 15 U.S.C. 78s(b)(2).

[57] 17 CFR 200.30-3(a)(12).