

Roundtable on Options Market Structure

Supporting Data

Staff of the Office of Analytics and Research

Division of Trading and Markets¹

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¹This research note is published in the authors' official capacities as staff of the Division of Trading and Markets, but does not necessarily reflect the views of the Commission, the Commissioners, or other members of the staff.



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1. Executive Summary

The U.S. options market has evolved into a critical component of modern market structure, experiencing unprecedented growth in scale, complexity, and retail participation over the past decade. This report synthesizes key trends and structural shifts observed over recent years.

Market Expansion

In recent years options trading broadened dramatically, including both the number of contracts traded and quoting and trading activity. For example, since 2012 the number of unique underliers (i.e., the security underlying an options class) rose by 144% and listed option securities increased more than sevenfold. Options Price Reporting Authority (“OPRA”) message volumes surged from 9 billion per day in 2017 and peaked at 247 billion per day in early 2025.

Liquidity, Fragmentation and Concentration Dynamics

Despite overall growth in the number of unique underliers and listed options, liquidity remains concentrated in the most active symbols. The top 10 underliers now account for 31% of total options volume. At the same time, exchange fragmentation has intensified: by 2025, 18 venues each held more than 1% market share, even as exchange operator consolidation reduced the number of exchange families.

Market Maker Landscape

From 2015 to 2021 the number of broker-dealers reporting revenue from listed options market making declined steadily each year before stabilizing in 2021. The decline was primarily in broker-dealers with lower net capital.

Individual Customer Participation and 0DTE Surge

Individual Customer² engagement surged after the adoption of zero-commission option trading, with millions of accounts trading options and a notable rise in short-dated strategies. Trading on expiration date (0DTE) now represents over 28% of total volume, concentrated in index products and select equities (exchange traded products (“ETPs”) and single stock options).

Payment for Order Flow and Execution Quality

Payment for order flow (“PFOF”) has become a dominant economic driver in retail options execution, with top consolidators controlling the vast majority of Individual Customer order flows. While certain exchange auctions can facilitate meaningful price improvement opportunities under wide spreads, electronic limit order books dominate retail executions with minimal price improvement.

² Individual Customer account type is defined as “An account that does not meet the definition of ‘institution’ as defined in FINRA Rule 4512(c) and is also not a proprietary account”, see [CAT Industry Member Technical Specifications](https://www.catnmsplan.com/sites/default/files/2026-02/02.13.26_CAT_Reporting_Technical_Specifications_for_Industry_Members_v4.1.0r14_CLEAN.pdf), Appendix G (defining accountHolderType), available at: https://www.catnmsplan.com/sites/default/files/2026-02/02.13.26_CAT_Reporting_Technical_Specifications_for_Industry_Members_v4.1.0r14_CLEAN.pdf (“CAT IM Tech Specs”)



2. Purpose

This staff report examines the evolution of the U.S. options market since the Commission's last options Concept Release³. Over these two decades, options trading has expanded dramatically in scale, complexity, and retail participation⁴—while the core regulatory framework has remained largely unchanged⁵.

By analyzing structural trends such as exchange fragmentation, liquidity concentration, PFOF practices, and the rise of ODTE trading, this report aims to:

- Describe market quality outcomes under the existing regulatory regime, including spreads, execution quality, and liquidity provision.
- Identify structural incentives and risks that may influence competition and investor protection.
- Support discussion on whether current rules adequately address today's market realities and what reforms could enhance competition, transparency, resiliency, and fairness.

As the options market enters a new phase of rapid growth and technological sophistication, these insights can inform policy discussions on how best to align regulatory objectives with evolving market dynamics.

³ See [Competitive Developments in the Options Markets](#), Securities Exchange Act Release No. 34-49175 (Feb. 3, 2004), 69 FR 6123 (Feb. 9, 2004) available at <https://www.sec.gov/rules-regulations/2004/02/competitive-developments-options-markets>.

⁴ A significant number of changes have occurred during this period, including the Penny Pilot and other exchange proposed rule changes, however large scale intermarket regulatory changes broadly speaking have not occurred.

⁵ See Staff of the Division of Trading and Markets, [Trade-Through Roundtable Supporting Data](#) (2025), available at: <https://www.sec.gov/files/trade-through-roundtable-supporting-data.pdf>.



3. Options Market Trends

This section highlights structural changes in breadth, quoting activity, and liquidity concentration—key drivers shaping execution quality and systemic resiliency.

3.1 Broadening of Options Markets

Trading in listed options expanded both in volume and breadth over recent years. The number of unique underliers that traded per year has increased from 3,452 in 2012 to 8,439 in 2025 (+144%). The increased breadth of options trading means that by the end of 2025 the majority (69.5%⁶) of listed equities had at least one options contract trade.

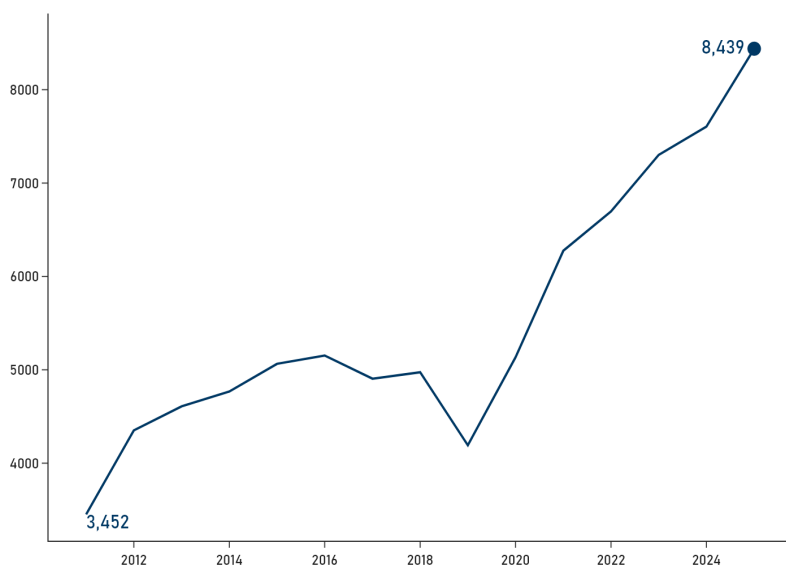


Figure 3.1: Count of Unique Underliers Per Year

Source: OPRA

The number of unique option securities⁷ (i.e., all puts and calls in each options class) that traded has been steadily increasing from 594,488 in 2012 to 4,866,065 in 2025 (+719%). This expansion underscores the growing complexity of the trading (and therefore quoting) surface, increasing operational demands on market makers and infrastructure providers.

⁶ Based on the 12,134 unique equity symbols reported to CAT on 12/31/25 per CAT reference data.

⁷ "Unique securities" counts were obtained by counting the unique Option Symbology Initiative ("OSI") identifier present in OPRA trade data. The OSI identifier is a 21-character symbol that identifies exchange-listed option contracts and includes the underlying ticker symbol, expiration date, call/put identifier and strike price.

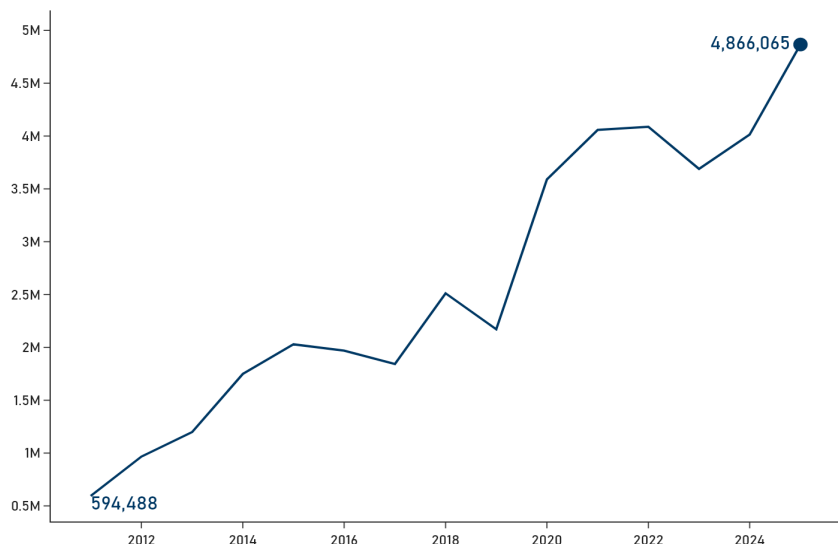


Figure 3.2: Count of Unique Options Securities per Year

Source: OPRA

3.2 Increase in OPRA Quote Messages

The increase in underlying securities that are trading, along with the increase in option securities trading, has also been accompanied by an explosion in the number of option quote messages per day⁸ across a growing number of options exchanges (18 operating as of April 2026). Options quote volumes have been increasing rapidly for a considerable time, as noted in the 2001 adopting release for amendments to the OPRA plan to account for the extraordinary increases in quote messages:

“The number of messages generated by the exchanges on a daily basis has been growing exponentially. In January 1999, OPRA reported an average of only about 17 million messages per day. By January 2000, OPRA reported an average of 40 million messages per day.”⁹

In January 2017 the median daily OPRA message count was approximately 9 billion and by December 2025 it was 131 billion (+1,347%). By the end of 2025, the OPRA feed was disseminating 3,275 times more messages than it did in 2000 – or nearly a full day at the 2000 rate (of 40MM per day) every 7 seconds.

⁸ Option quote counts are the monthly average of quote messages disseminated on the OPRA quotes feed. Given the extremely large volumes of quote data at this scale, the data in this section was limited to 2017 to 2025.

⁹ See [Options Price Reporting Authority: Final Rule](#), Securities Exchange Act Release No. 43621 (Nov. 27, 2000), 65 FR 75564 (Dec. 1, 2000), available at: <https://www.sec.gov/rules-regulations/2000/11/options-price-reporting-authority>.

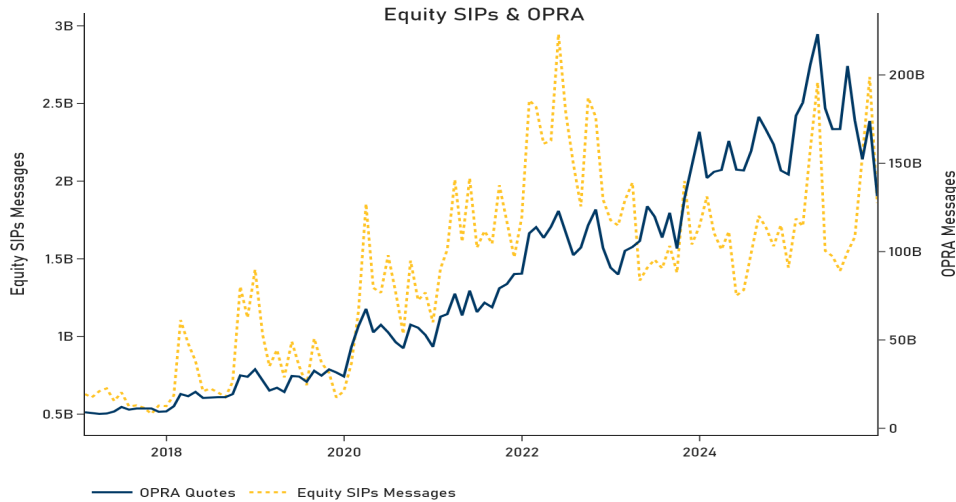


Figure 3.3: Average Daily Consolidated Tape Messages

Source: Equity SIPs & OPRA

In comparison, in January 2017 the median daily Equity SIPs message count was approximately 629 million and by December 2025 was approximately 2 billion (+196%).

Additionally, the Quote-To-Trade ratio on OPRA has risen from 9,133 in 2017 to 17,398 (+90%) by March 2025. In comparison, during the same period the Equity SIPs Quote-To-Trade ratio was 17 in 2017 and had fallen to 13 by the end of 2025 (-24%). While some of the difference between asset classes may be due to the increase in new venues in options (See Figure 6.1), equities also had an increase in venue count from 13 in 2017 to 16 at the end of 2025.¹⁰

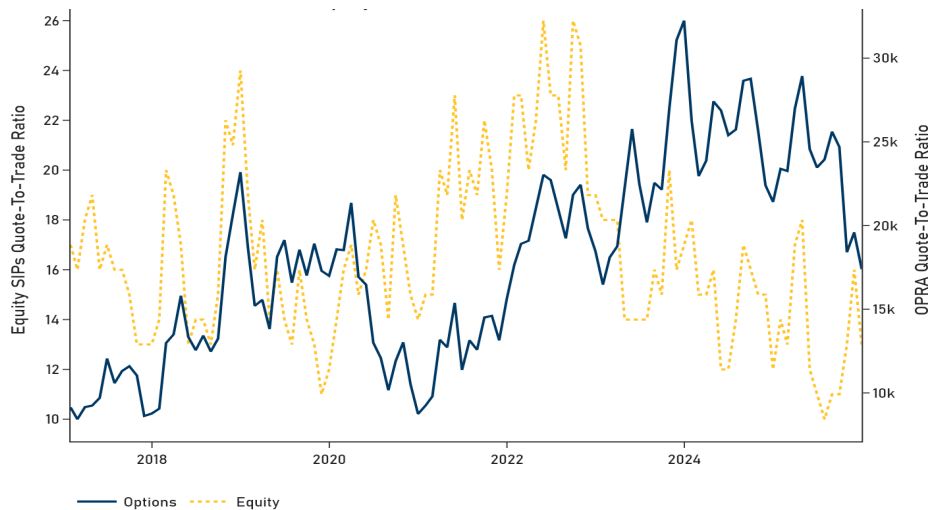


Figure 3.4: Quote-to-Trade Ratio Equity SIPs & OPRA, 2017-2025

Source: SIP & OPRA

¹⁰ IEX Trading. "Historical Market Statistics." IEX Trading. <https://iextrading.com/stats/#historical-stats> (accessed March 2nd, 2026).



3.3 Increasing Concentration in Most Liquid Symbols

Despite the broadening of the options markets, trading in options became more concentrated in the most liquid symbols in recent years. In 2012 the top 10 underliers totaled 24.0% of total volume, and by the end of 2025 they totaled 31.7%.

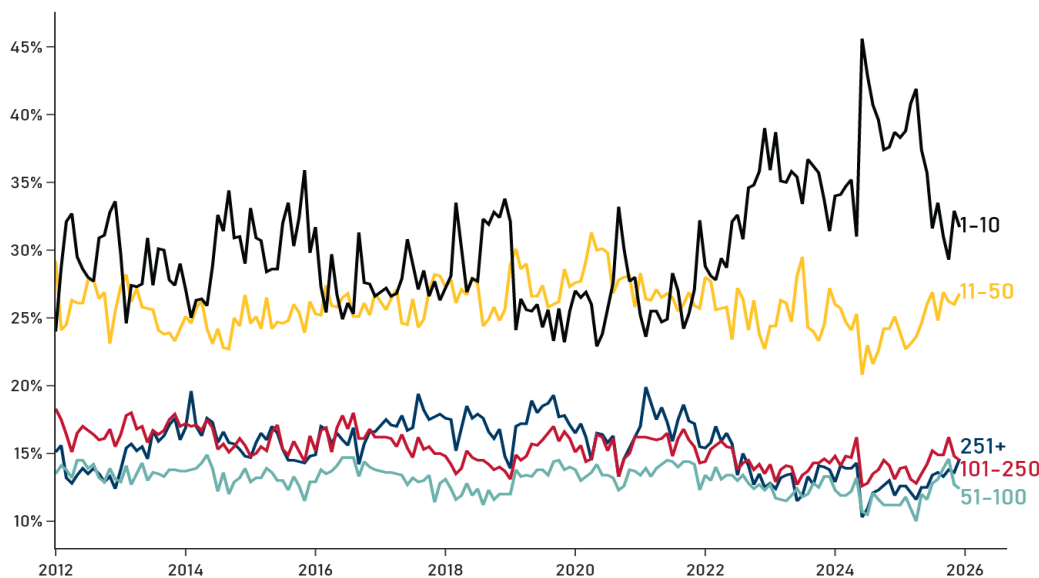


Figure 3.5: Monthly Percent of Contact Volume – Equity Options

ETP option trading was significantly more concentrated in the top ETPs, with the top 10 products totaling 75.4% in 2012, which remained relatively steady and ended at 83.8% at the end of 2025.

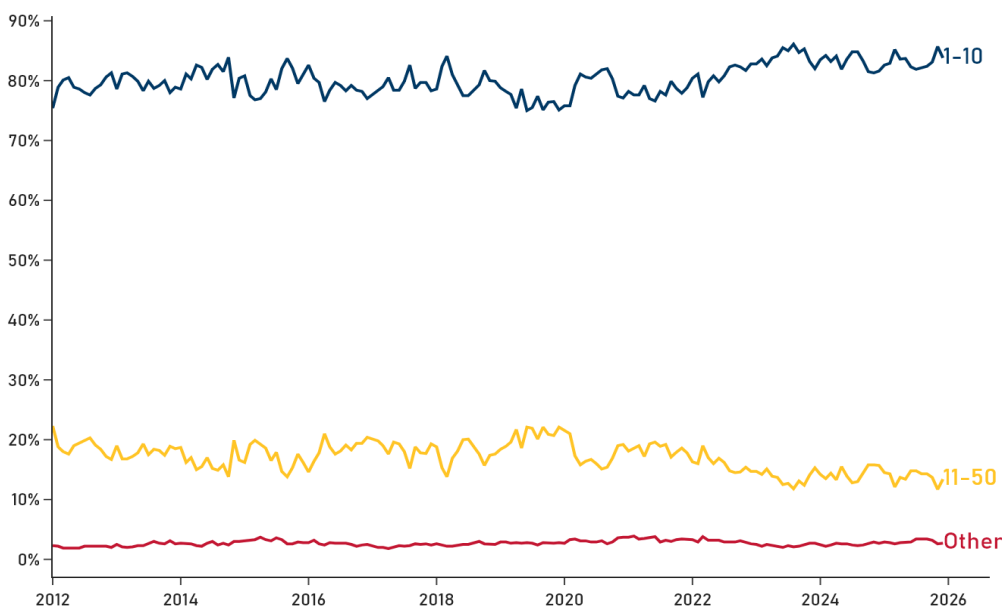


Figure 3.6: Monthly Contract Volume by Volume Bin, ETPs, 2012–2025



4. Options Market Makers

Between 2012 and the end of 2025 the number of broker-dealers reporting revenue from listed options market making¹¹ oscillated between being relatively stable (2012-2015), then decreasing (2015-2021), and then back to stability (2021-2025). From 2015 to 2021 the number of broker-dealers reporting revenue from listed options market making declined steadily each year before stabilizing in 2021.

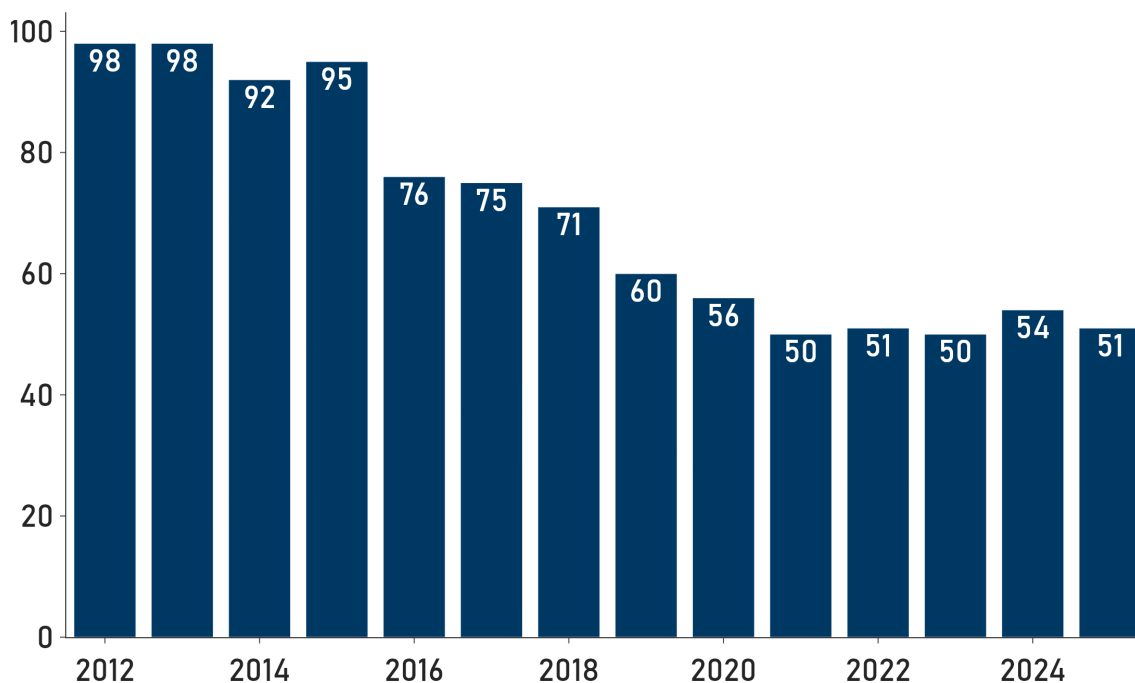


Figure 4.1: Count of Options Market Makers per Year

Source: FOCUS

Staff inspection of FOCUS filings indicates that the decline in the number of broker-dealers reporting options market-making revenue was from firms with relatively small levels of net capital.¹²

While net capital calculations reflect activities across a broker-dealer, and not just options market making activity, this shift indicates that firms currently acting as market-makers are predominantly larger and more well-resourced broker-dealers.

¹¹ This information is reported in FOCUS filings in Box 3945 "Revenue: Gains or losses on firm securities trading accounts: From market making in options on a national securities exchange."

¹² This decline may be due to a range of causes, including, for example, firm closures or mergers and acquisitions.



5. The Consolidator Model in Options

Unlike U.S. listed equities, where exchanges are almost entirely electronic and primarily price time priority, options exchanges attract order flow based on specialized auctions, floor presence and execution priority. U.S. listed options trading is executed only on exchange,¹³ compared to U.S. equities, where orders are executed on exchanges as well as a variety of off-exchange venues. The Options Clearing Corporation (“OCC”) generally only accepts for clearing standardized listed options that traded on an exchange.

For options, large market makers act as “consolidators” by purchasing individual investor options order flow. Consolidators choose the options exchange on which to execute the orders, perhaps based on where they (or an affiliate) are most likely to trade with the order as principal.¹⁴

Consolidators are typically affiliated with, or have agreements with, an on-exchange options market maker. Some options exchanges offer consolidators the ability to “direct” orders to an affiliated market maker, and the market maker gets a guaranteed allocation (e.g., 40%) if they are quoting at the best price. Other exchanges offer lead market makers or specialists an entitlement to orders of five or fewer contracts if they are quoting at the best price. Some options exchanges also offer “price improvement auctions,” in which a customer order can be exposed for price improvement over the published quotes.

The consolidator model has become the dominant method for retail orders to receive execution accounting for virtually all retail options orders.¹⁵

The proliferation of options exchanges and the exchanges’ efforts to attract consolidators’ substantial order flow has resulted in a marketplace with a variety of venues, priority rules, auction mechanisms, trading floors and fee models.¹⁶ Consequently, brokers have many choices when routing orders; similarly, liquidity providers have a range of venue choices. The various models may also impact the final transaction costs to customers and the trading profits of liquidity providers. Additionally, the means of achieving an execution are an important consideration as the transaction costs and anticipated profits to the liquidity providers may differ depending on if they use an exchange provided auction mechanism or route an order to the exchange’s limit order book. This fragmentation gives consolidators choice in the venues they can route to and likely increases the cost of coverage for competitor market makers.

5.1 PFOF Trends

Consolidators typically offer payment to the retail broker-dealer for the right to handle its customer order flow (i.e., payment for order flow or “PFOF”). In contrast to fees and rebates charged or paid by

¹³ Dash also operates the Dash ATS, an SEC registered alternative trading system (“ATS”) for single-leg and multi-leg options orders. Dash routes all orders paired on the ATS to registered options exchange automated auction facilities. All executions occur at the relevant options exchange.

¹⁴ See, e.g., “[Staff Report on Equity and Options Market Structure Conditions in Early 2021](https://www.sec.gov/files/staff-report-equity-options-market-struction-conditions-early-2021.pdf)”, pp.11-14, available at: <https://www.sec.gov/files/staff-report-equity-options-market-struction-conditions-early-2021.pdf>.

¹⁵ Huang et al., *Some Anonymous Options Trades Are More Equal than Others* (2024), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4951825.

¹⁶ See, e.g., “[U.S. equity options market models](https://www.nyse.com/data-insights/us-equity-options-market-models)”, NYSE. <https://www.nyse.com/data-insights/us-equity-options-market-models>.



exchanges,¹⁷ PFOF arrangements are privately negotiated and the rates and amounts can vary depending on the broker-dealer and its customer order flow.¹⁸

PFOF in options has steadily risen in both nominal terms and in importance. Aggregate PFOF payments in options now dwarf those in equities due to higher per-contract rates and the growth of the retail options market and now account for two-thirds of all PFOF.¹⁹ For example, recent academic research²⁰ finds that the top five PFOF providers accounted for over 95% of the total PFOF received by U.S. brokerages, and options PFOF is highly concentrated where the top three providers account for as much as 90% of total PFOF.

Research on the relationship between PFOF paid by consolidators and execution quality in options is currently relatively limited. One recent study argues that the amount of options PFOF and price improvement may be negatively correlated, and that higher per-contract PFOF payments received by retail brokers may be associated with lower received volume-weighted price improvement.²¹ However, responding studies argue that methodological choices in that paper resulted in overall execution costs higher than those typically experienced by customers; that using different analytical methods could have shown lower execution costs for the customers of some broker-dealers; and that this study excluded a significant portion of orders from retail brokerages, and should therefore not be used as a basis for drawing broad conclusions about the relationship between PFOF and retail trading in options.²² Another study describes the incentives that consolidators and DMMs face when handling orders and providing PFOF, and concludes that additional empirical research with more granular data is required to establish causal links between options spread, PFOF practices, and DMM priority.²³

¹⁷ Some options exchanges also administer on-exchange PFOF arrangements (often called a “marketing fee”) whereby certain market makers pay a fee when they trade with customer orders. The exchange collects these fees into a fund. The accumulated funds are then made available for disbursement to one or more designated market makers, generally those responsible for attracting the underlying customer order flow to the exchange, who subsequently disburse the funds to compensate broker-dealers or otherwise support order-flow-attraction arrangements.

¹⁸ Complete details of bilateral PFOF arrangements are typically not public; however, some information about these arrangements may be published by broker-dealers in their quarterly reports on order routing pursuant to 17 C.F.R. § 242.606(a).

¹⁹ See Ernst and Spatt, *Payment for Order Flow and the Retail Trading Experience* (2023), available at: <https://wifpr.wharton.upenn.edu/wp-content/uploads/2023/10/Payment-for-Order-Flow.pdf>. See also Ernst and Spatt, *Payment for Order Flow and Option Internalization*, n. 5 (2025), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4056512 (arguing that comparable investment amounts will generate ten times more PFOF in options than in equities).

²⁰ Bryzgalova et al, *Retail Trading in Options and the Rise of the Big Three Wholesalers* (2022), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4065019.

²¹ See *Some Anonymous Options Trades are More Equal than Others*.

²² See Hosty and Billings, *Evaluating Broker Execution Quality with a Trading Experiment: A Critique of “Some Anonymous Options Trades are More Equal Than Others”* (2025), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5399225; Committee on Capital Markets Regulation, *CCMR Staff Report: Empirical Research on U.S. Retail Options Markets* (June 2025), available at: <https://capmksreg.org/wp-content/uploads/2025/06/CCMR-Staff-Report-Retail-Options-Market-Study-6.17.25.pdf>.

²³ Hendershott, et al, *Option Auctions*, 39 Rev. Fin. Studies 783 (2025).



6. Increasing Fragmentation of Trading

Another material change in the options markets over the last several decades has been a substantial increase in the fragmentation of trading across options exchanges. Fragmentation has reshaped the options market, introducing both competitive opportunities and operational challenges. As shown below, in 2017 options trading was concentrated in the top three exchanges each with over 10% market share, with five exchanges which accounted for less than 5% each. Further fragmentation has also arisen from the addition of new exchanges' models from within existing exchange operators.

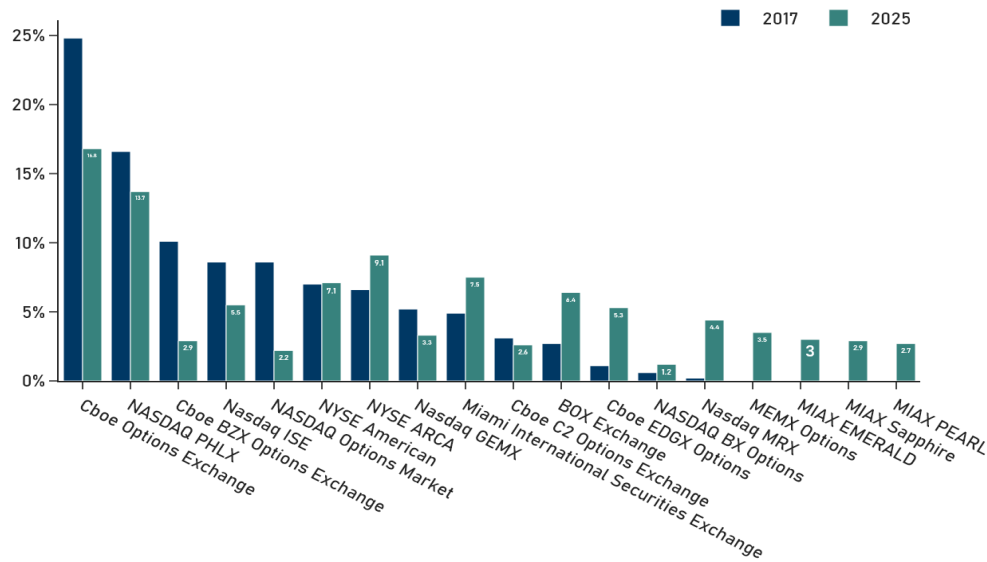


Figure 6.1: Options Exchange Contract Volume Market Share, 2017–2025

Source: OPRA

By 2025, options trading was more widely disbursed among the options exchanges with no single exchange capturing more than 20% market share and 18 total venues each with greater than 1% market share. Additionally, a considerable amount of consolidation among exchange operators has resulted in a smaller number of exchange operators in options, although recent new entrants²⁴ may reverse this trend.

Some academic studies suggest that increased competition from fragmentation may improve market quality by reducing fees and promoting innovation.²⁵ Alternatively, others state that greater fragmentation may increase complexity for routing, can raise costs for liquidity providers,²⁶ and may impact execution quality for retail and institutional traders. As liquidity disperses across venues, achieving best execution can become more difficult, and the cost of maintaining competitive quotes may rise. Additionally, while venue count has grown, consolidation among operators may concentrate influence and reduce competitive diversity.

²⁴ Recent new entrants include IEX Options. See Securities Exchange Act Release No. 103998 (Sep. 18, 2025), 90 FR 45681 (Sep. 23, 2025).

²⁵ Chao et al, *Discrete Pricing and Market Fragmentation: A Tale of Two-Sided Markets*, 107 Am. Econ. Rev. 196 (2017).

²⁶ Poser, *Market Makers in Financial Markets: Their Role, How They Function, Why They are Important, and the NYSE DMM Difference* (2021), available at: https://www.nyse.com/publicdocs/nyse/NYSE_Paper_on_Market_Making_Sept_2021.pdf.



7. Market Quality and Competitive Dynamics

One of the most important indicators of enhanced competition in the options markets historically has been the narrowing of spreads. For example, as the Commission noted in 2004 as a result of multiple listings, the trade-weighted consolidated national best bid and offer (“NBBO”) spreads fell from \$0.29 in August 1999 to \$0.18 in October 2000, a decline of nearly 38%.²⁷

7.1 Effective Spreads

Effective spreads²⁸ approximate trading costs to the customer by measuring the trade price relative to the midpoint of the quoted spread at the time the trade occurred. The relationship between effective spreads and order flow payments was described in the SEC staff’s 2000 study:²⁹

“Given that order flow payments are made by specialists and specialists are compensated based on effective spreads, the growth of payment for order flow intuitively could be expected, all other things being equal, to be accompanied by a widening of effective spreads.”

As shown below, the median effective spread for equity options was 2.2% in 2012, and by the end of 2025 it had declined to 1.9% (-13.3%). Similarly, ETP options had a median effective spread of 1.9% in 2012 and declined to 1.4% (-26%) by the end of 2025.

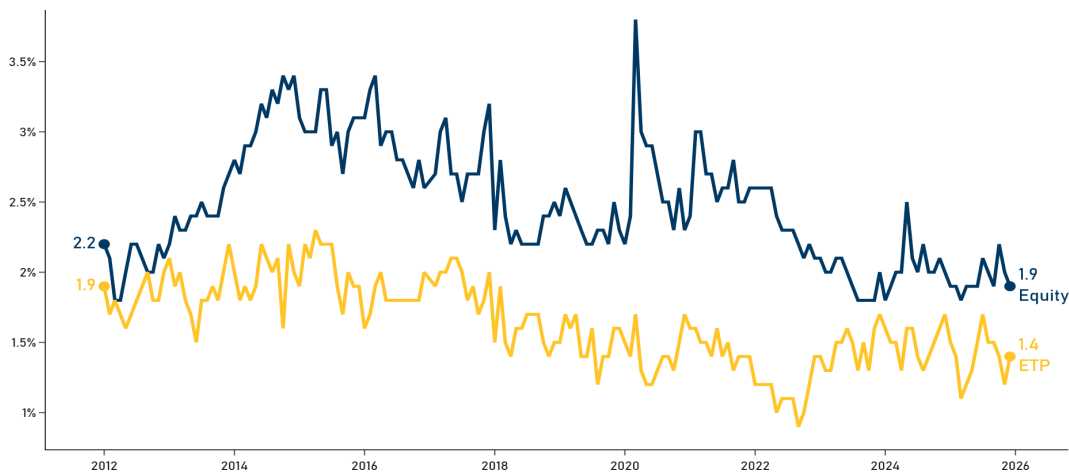


Figure 7.1: Monthly Median Effective Spread Equity Options vs ETP Options, 2012–2025

Source: OPRA

²⁷ See *Competitive Developments in the Options Markets* at 6126.

²⁸ The effective spread is twice the absolute difference between the trade price and the midpoint of the bid-ask spread at the time the trade report was received by OPRA. The lower the effective spread, the lower the cost to the investor.

²⁹ See Staff of the Office of Compliance Inspections and Examinations and Office of Economic Analysis, *Special Study: Payment for Order Flow and Internalization in the Options Markets* (2000), available at <https://www.sec.gov/news/studies/ordpay.htm>.



While ETP options effective spreads appeared to be trending downward from their January 2012 measurement until October 2022 rather steadily, equity options effective spreads were, if anything, increasing until the post-COVID dramatic surge in volume for liquid underliers and increase in liquidity providers brought it back down to previous levels.

The change in effective spreads was not uniform within each underlying product type. From 2012 to 2025 the median effective spread for the most liquid 10 equities declined slightly from 1.3% to 0.9%. Meanwhile, the effective spreads for the remaining underliers actually increased (by 0.5%, 1.3%, 1.5% and 0.4% respectively).

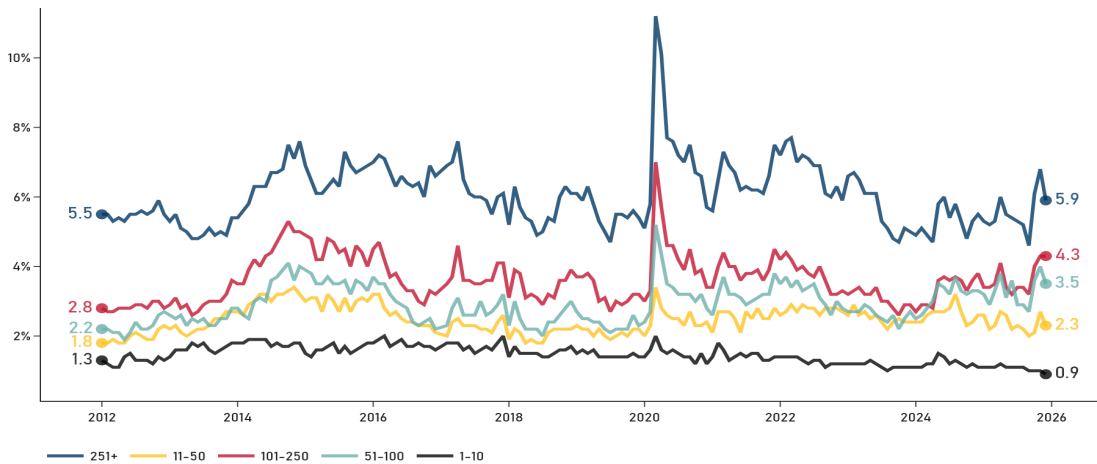


Figure 7.2: Monthly Median Effective Spread Equity Options, Percent of Trade Price

Source: OPRA

The effective spreads over time have also risen in nominal terms, since 2012 the median nominal effective spread for the most liquid 10 equities had declined slightly from 3.0¢ to 2.3¢. Meanwhile, the nominal effective spreads for the remaining symbols actually increased (0.3¢, 1.5¢, 1.3¢ and 2.2¢ respectively).³⁰

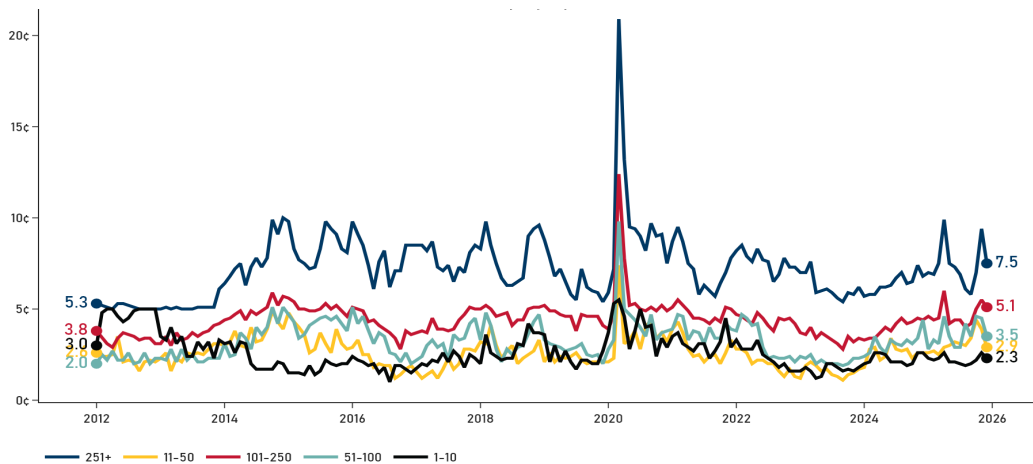


Figure 7.3: Monthly Median Effective Spread Equity Options, Cents

Source: OPRA

³⁰ Nominal values are not adjusted for inflation.



7.2 Trade Weighted Quoted Spreads

Trade weighted quoted spreads (“TWQS”) on the other hand have increased since 2012. For the most liquid underliers the TWQS for equity options was 1.6% in 2012 and finished 2025 at the same 1.6%. However, significant increases in TWQS were noted across all other bins of equity options.

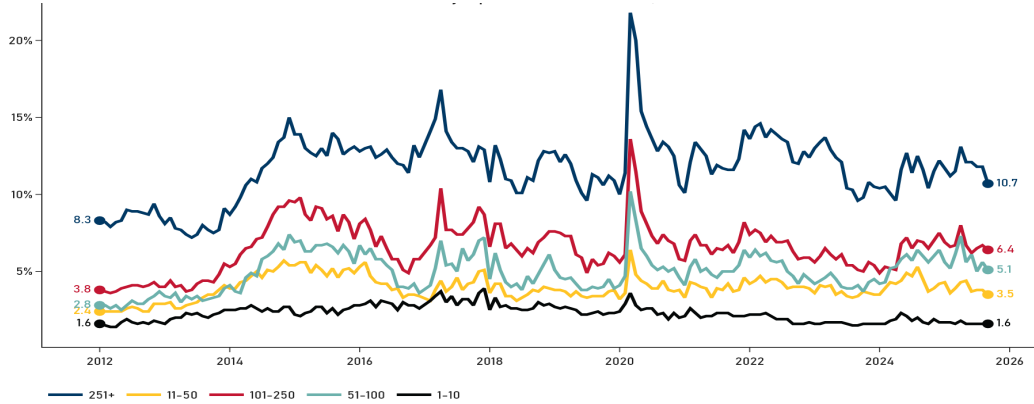


Figure 7.4: Trade Weighted Average NBBO Spread for Equity Options by Options Volume Rank, Percent

Source: OPRA

TWQS for ETPs stayed relatively constant for the most liquid bins during the period, where the top 10 ETPs remained flat at 1.7% in both 2012 and 2025. The majority of the remaining ETPs had increases in TWQS from 2012 to 2025.

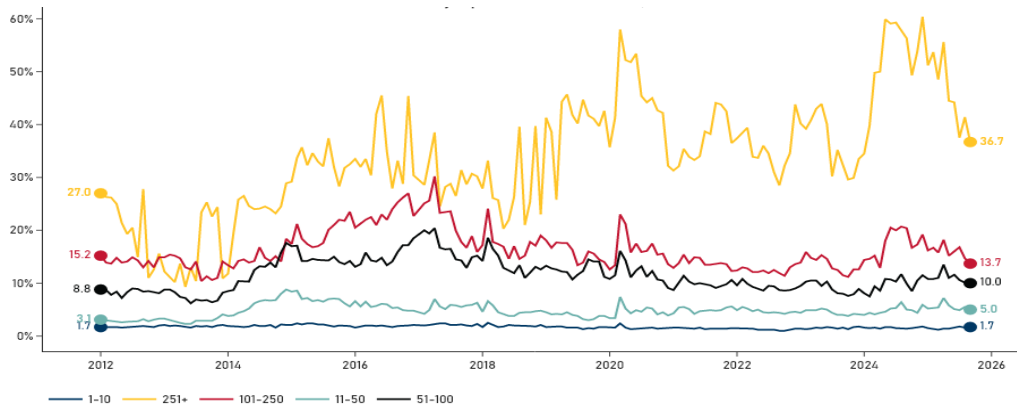


Figure 7.5: Trade Weighted Average NBBO Spread for ETP Options by Options Volume Rank, Percent

Source: OPRA

While effective spreads had mixed results, quoted spreads widened across all but the most liquid 10 underliers in both equities and ETPs, signaling potential deterioration in displayed market quality. The data appears to show a significant widening of the quoted spread, in both percentage and dollars, across nearly all options and over an extended period of time. The quoted spread, or NBBO, is an important piece of the Options Order Protection and Locked/Crossed Markets Plan,³¹ broker routing decisions and post-execution fill quality metrics.

³¹ The options markets operate under the Options Order Protection and Locked/Crossed Markets Plan. See Securities Exchange Act Release No. 60405 (July 30, 2009), 74 FR 39362 (Aug. 6, 2009).



8. Account Profiles and Market Participation

The distribution of CAT Customer IDs (“CCIDs”)³² that engaged in trading provides insight into participation patterns across asset classes. In terms of the number of active CCIDs, Individual Customer CCIDs dominate the landscape, with over 70 million CCIDs that traded equities during the period and approximately 5 million CCIDs trading both options and equities while only approximately 227 thousand traded options exclusively. This highlights the breadth of individual investor involvement in equity markets, while options activity—though smaller—still attracts a meaningful subset of Individual Customer CCIDs.

Institutional Customers³³ form the second-largest group, with nearly 5 million CCIDs active in equities and a smaller contingent (≈295,000) trading both asset classes and approximately four thousand trading options exclusively. Foreign³⁴ and Other Proprietary³⁵ CCIDs also contribute notable equity participation, but their options engagement remains limited, suggesting a primary focus on stock execution rather than equity derivatives.

Specialized categories—such as Broker Employee, Broker Average Price, and Broker Error³⁶—appear in much smaller numbers. Market Maker CCIDs, while few, show balanced participation across options and equities, consistent with their liquidity-provision role.

Table 8.1: Source – CAT

Account Holder Type	Traded Options	Traded Equities	Count
Individual Customer	5,299,576 (7.5%)	70,221,584 (99.5%)	70,603,493
Institutional Customer	298,802 (5.7%)	5,244,276 (99.9%)	5,251,526
Foreign Broker	11,743 (0.5%)	2,359,609 (99.7%)	2,366,560
Other Proprietary	204,221 (16.2%)	1,258,907 (100%)	1,258,930
Other	37,113 (8.8%)	421,540 (99.7%)	422,732

8.1 Newly Reported Individual Customer CCIDs Trading Options

The first tranche of CAT CCIDs were reported in June 2021, when more than 2.55 million Individual Customer CCIDs were recorded. This amount includes a mix of some new accounts that month and likely a very large amount of accounts that had been trading options prior to CCID reporting which began that

³² For additional detail on CCIDs, see *infra* Appendix A.0.3.

³³ An “Institutional Customer” is defined as “[a]n institutional account as defined in FINRA Rule 4512(c)”, CAT IM Tech Specs, Appendix G.

³⁴ A “Foreign” account is defined as a “non-broker-dealer foreign affiliate or non-reporting foreign broker-dealer”, *Id.*

³⁵ “Other Proprietary” accounts are not specifically defined. See *id.* (Other Proprietary).

³⁶ See *id.* (defining Broker Employee Accounts, Broker Average Price Accounts, and Broker Error Accounts).



month. By July 2021, monthly additions fell to roughly 342,000 and continued to decline throughout the remainder of 2021.

From mid-2022 through 2023, new CCID entry entered a steady state, fluctuating between 25,000 and 44,000 CCIDs monthly. A modest uptick appeared in early 2024, with counts exceeding 50,000 in May. However, the trend resumed its downward trajectory thereafter, with monthly figures sliding below 30,000 by late 2024 and continuing to decline through 2025. This reduction in new Individual Customer CCIDs entering the options markets may warrant consideration to determine what could be reversing what recently seemed to be a surge of public interest in options.

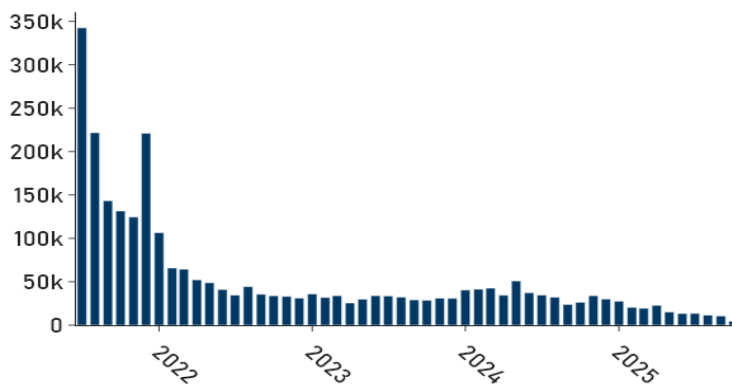


Figure 8.2: Newly Reported Individual Customer CCIDs

Source: CAT

8.2 Newly Reported Foreign CCIDs Trading Options

The entrance of new foreign CCIDs to options trading follows a markedly different trajectory—and scale—than Individual Customer CCIDs. Monthly additions were initially modest, beginning with 829 CCIDs in June 2021, compared to the 2.55 million Individual Customer CCIDs that began reporting in the same month. After this initial peak, foreign CCID openings stabilize at double- or triple-digit levels, typically ranging from 65 to 255 CCIDs per month through 2024.

A gradual upward trend emerged in 2025, with counts climbing from 376 in January to 670 in August, and spiking to 1,154 in September 2025—still an order of magnitude smaller than Individual Customer activity. Even at its highest point, foreign CCID creation remains a fraction of Individual Customer creation, although the growth rate of these CCID is noteworthy.

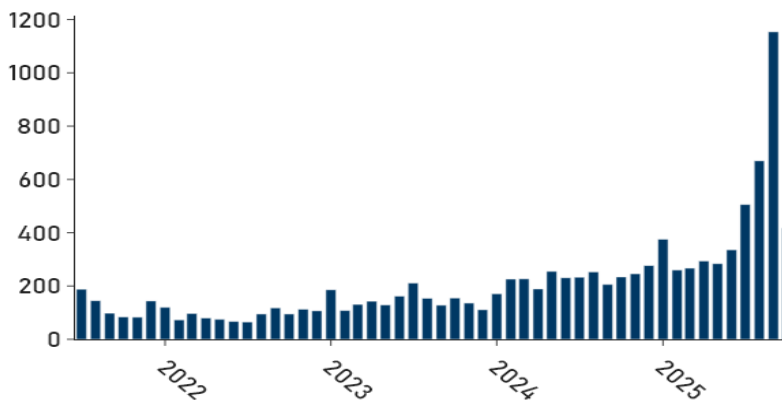


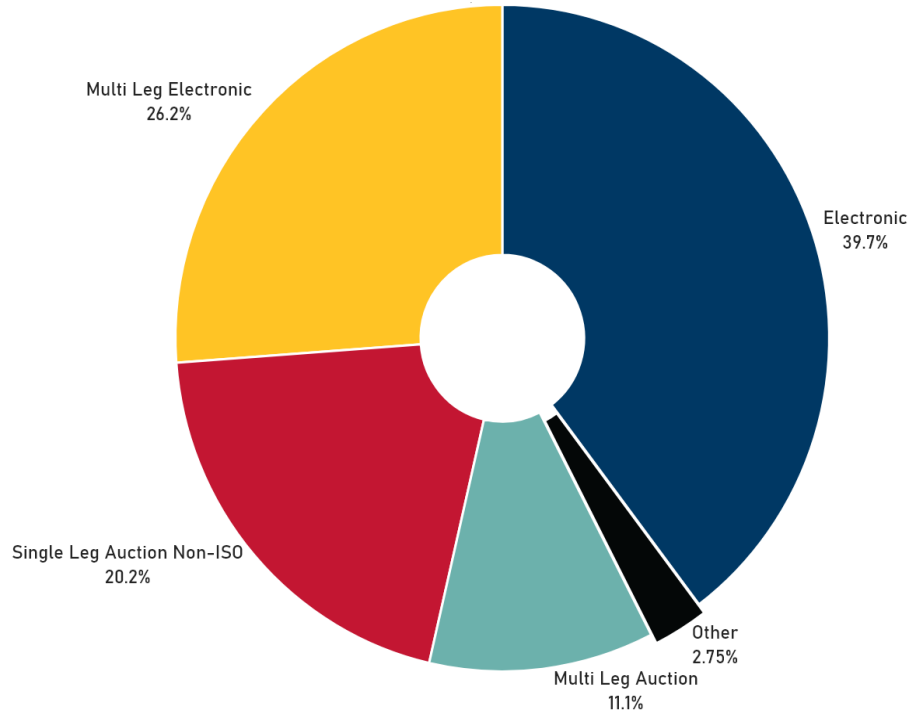
Figure 8.3: Newly Reported Foreign CCIDs

Source: CAT



9. The Customer Experience in Options

The breakdown illustrated in the graphic highlights how Individual Customer orders were distributed across various conditions—such as electronic limit order book, auctions and complex strategies for all options trades in Individual Customer accounts reported to CAT in December 2025.



**Figure 9.1: Individual Customer Trading by Sale Condition
% of Dollar Volume, December 2025**

Source: CAT

Electronic executions were the most common, however they represented only 39.7% of dollar volume executed. The second and fourth most common execution methods related to multi-leg or complex orders highlighting the prevalence of more advanced options strategies. Single Leg Auctions were the third most common sale condition representing 20% of all dollar volume, while the remaining sale conditions collectively represented only 2.75%.

9.1 Descriptive Metrics for Individual Customer Trades

The following four sections provide further descriptive metrics on the execution quality of Individual Customer orders from this December 2025 sample and are limited to the three most common sale conditions for simple (not complex or multi-leg) options orders: electronic, single-leg auctions and floor transactions.



9.1.1 Individual Customer Marketable Order Price Improvement

The data below show the percentage of marketable Individual Customer orders that received price improvement (PI) within each NBBO spread bin³⁷ at submission. The bins are defined by upper bounds ($\leq \$0.01$, $\leq \$0.05$, ...), and the reported percentages are bin-specific, not cumulative. In this sample, electronic executions show near-zero PI rates when spreads are tight and only low single-digit PI rates even in wider bins. Single-leg auctions exhibit meaningfully higher PI rates across bins (e.g., 22% in the tightest bin rising to 83–89% at wider spreads), indicating auctions are more likely to capture discretionary improvement when the spread permits. Floor trades show negligible PI rates throughout, though the sample is small.

Table 9.1: Individual Customer Marketable Order Price Improvement

Sale Condition	Total	Nickel	Dime	Quarter	Dollar	Five Dollar	Over 5 Dollar
Electronic	14,705,444	0%	0%	1%	4%	5%	13%
Single Leg Auction Non-ISO	6,057,550	22%	53%	51%	83%	89%	83%
Single Leg Floor	9,894	0%	0%	0%	0%	0%	0%

Source: CAT

9.1.2 Non-marketable Limit Order Price Improvement

The percentage of non-marketable limit orders (“NMLOs”) from Individual Customers that received price improvement within the same spread bins is markedly different across the three execution methods and also notably different than the marketable orders above. For NMLOs, electronic executions receive price improvement 80–99% of the time; single-leg auctions receive PI 96–99% of the time; and floor trades receive PI 92–98% of the time.

Table 9.2: Non-marketable Limit Order Price Improvement

Sale Condition	Total	Nickel	Dime	Quarter	Dollar	Five Dollar	Over 5 Dollar
Electronic	27,456,951	80%	83%	90%	96%	98%	99%
Single Leg Auction Non-ISO	23,058,172	96%	96%	97%	98%	99%	99%
Single Leg Floor	70,983	92%	95%	96%	98%	98%	98%

Source: CAT

³⁷ The NBBO spread is the difference between the national best offer and national best bid at the time the Individual Customer order is submitted; bins in the tables are defined by the upper bound of that spread (e.g., (0, \$0.01], (\$0.01, \$0.05],...).



9.1.3 Marketable Orders Effective Spread

For electronic executions, effective spreads rise sharply as the NBBO widens—from \$0.01 in the tightest bin to \$6.68 when the NBBO spread exceeds \$5.00. Single-leg auctions top out at \$2.98, while floor prints exhibit the somewhat wider effective spreads in all but the widest spread bins.

Table 9.3: Marketable Orders Effective Spread

Sale Condition	Total	Nickel	Dime	Quarter	Dollar	Five Dollar	Over 5 Dollar
Electronic	14,705,444	\$0.01	\$0.05	\$0.1	\$0.37	\$1.73	\$6.68
Single Leg Auction Non-ISO	6,057,550	\$0.02	\$0.05	\$0.1	\$0.17	\$0.82	\$2.98
Single Leg Floor	9,894	\$0.03	\$0.06	\$0.15	\$0.4	\$1.79	\$6.2

Source: CAT

9.1.4 Non-Marketable Orders Effective Spread

For non-marketable flow, effective spreads are uniformly lower across bins, consistent with limit-order price protection requirements of the Options Plan.³⁸ Electronic executions average \$0.01–\$2.45, auctions \$0.01–\$1.83, and floor trades \$0.01–\$1.66. The flatter profile underscores that non-marketable orders anchor to displayed prices, limiting slippage even when the NBBO is wide.

Table 9.4: Non-Marketable Orders Effective Spread

Sale Condition	Total	Nickel	Dime	Quarter	Dollar	Five Dollar	Over 5 Dollar
Electronic	27,456,951	\$0.01	\$0.05	\$0.1	\$0.15	\$0.61	\$2.45
Single Leg Auction Non-ISO	23,058,172	\$0.01	\$0.02	\$0.04	\$0.1	\$0.49	\$1.83
Single Leg Floor	70,983	\$0.01	\$0.05	\$0.06	\$0.14	\$0.42	\$1.66

Source: CAT

³⁸ Options Plan, § 5(a), p. 8.



9.1.5 Execution Method Across Spread Bins

Utilization of auctions hovers around 30 - 40% for most spread width bins. Marketable orders show a lower rate in markets with the tightest spreads before peaking at 43% for markets between a quarter and a dollar wide.

Table 9.5: Execution Method Across Spread Bins

Spread Bin	Total	Electronic	Single Leg Auction Non-ISO	Single Leg Floor
Nickel	14,491,657	73.4%	26.6%	0.0%
Dime	2,594,520	71.8%	28.1%	0.1%
Quarter	3,046,910	60.6%	39.3%	0.1%
Dollar	519,617	55.7%	43.8%	0.5%
Five Dollar	114,333	58.9%	40.2%	1.0%
Over 5 Dollar	5,851	64.6%	34.6%	0.9%

Source: CAT

NMLOs, which are much less heavily concentrated in the options with the tightest spreads, show a large outlier in the nickel and under bin, where auctions outnumber electronic flow and where the effective spreads shown above are very close between the two execution methods. NMLOs also converge to a roughly 40% auction utilization rate before declining in the widest markets.

Table 9.6: Execution Method Across Spread Bins

Spread Bin	Total	Electronic	Single Leg Auction Non-ISO	Single Leg Floor
Nickel	17,597,026	42.8%	57.2%	0.0%
Dime	8,124,635	59.7%	40.3%	0.1%
Quarter	15,174,476	60.1%	39.8%	0.1%
Dollar	6,916,679	60.0%	39.6%	0.4%
Five Dollar	2,517,689	63.8%	35.5%	0.7%
Over 5 Dollar	255,604	78.8%	20.9%	0.3%

Source: CAT

For both marketable and NMLOs, floor executions are rare but concentrated in wider spreads.



10. Zero Days To Expiration (0DTE) Trading

The share of options trading that occurs on the day of their expiration has increased steadily rising from 19.6% at the beginning of 2022 to 28% (+8.4%) by 2025. As of the end of 2025, over a quarter of all traded contract volume occurred on expiration date. 0DTE options have grown from a niche strategy to a significant share of total volume.

The data below reveal a clear bifurcation between 0DTE options— trading in contracts expiring on the same day—and all other options. From 2022 to 2025, 0DTE trading has grown into a significant component of overall options activity, particularly among Individual Customers and Market Makers. For Individual Customer accounts, 0DTE volumes surged from tens of millions of contracts per month in 2022 to hundreds of millions of contracts per month by 2025, accompanied by dollar volumes exceeding \$30 billion in peak months. Market Makers exhibit even larger footprints, with monthly 0DTE quantities surpassing 190 million contracts and notional exposure exceeding \$38 billion, underscoring their primary role in liquidity provision.

By contrast, trading in options in advance of their expiry date dominates in absolute scale, with monthly dollar volumes routinely in the hundreds of billions and quantities in the hundreds of millions to billions, reflecting the structural depth of longer-dated options markets. Institutional and proprietary accounts concentrate their activity in this segment, where strategic positioning and hedging are more prevalent.

The data illustrates two key dynamics:

- **0DTE adoption:** Individual Customer and Other Proprietary accounts increasingly engage in ultra-short-dated strategies.
- **Persistent dominance of longer maturities:** Despite the rise of 0DTE, traditional options remain the backbone of institutional and hedging flows, anchoring market stability.

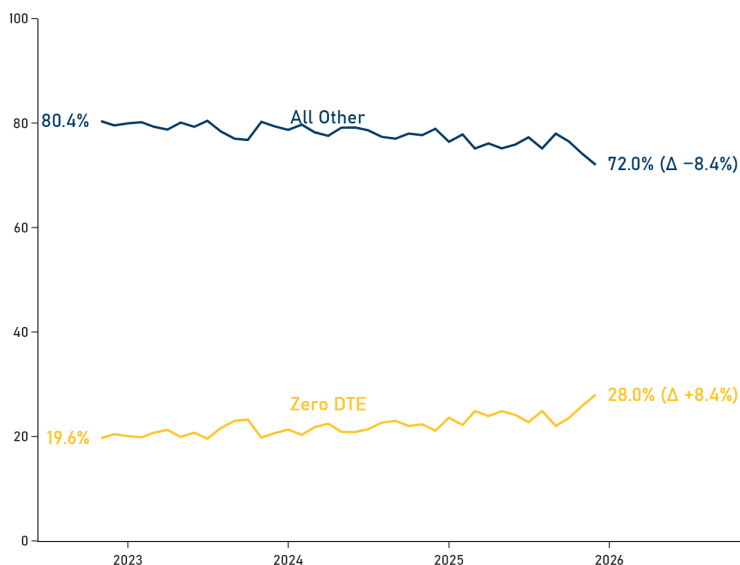
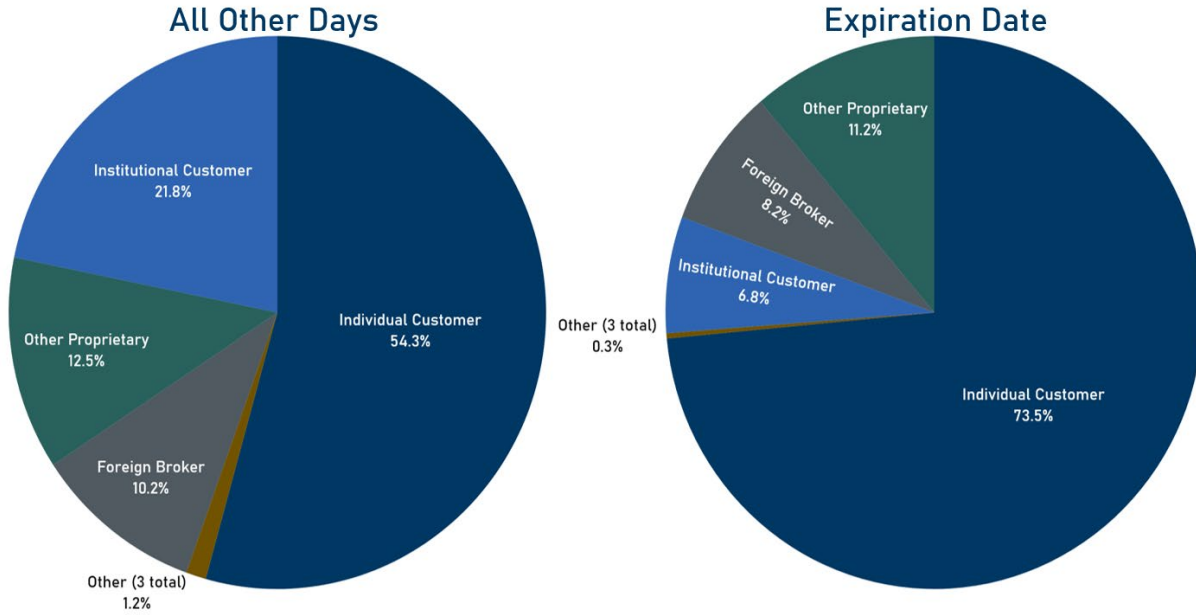


Figure 10.1: Zero DTE Share of Traded Contracts



The composition of traders on expiration day is also markedly different than on other trading days. On expiration day Individual Customers account for 73.5% of trading while on non-expiry days they account for only 54.3%. Institutional Customers, on the other hand, account for only 6.8% of trading on expiration day but 21.8% on non-expiry days. Foreign Broker, Other Proprietary and Other are similar across both expiration and non-expiry days.



**Figure 10.2: Account Composition Comparison (Ex-Market Makers)
 % of Contract Volume, Dec. 2025**

The composition of trading in 0DTEs has also changed between 2022 and December 2025, with Other Proprietary doubling in share (11.2% vs 5.6%) while Foreign and Institutional Customers shares remained relatively consistent.

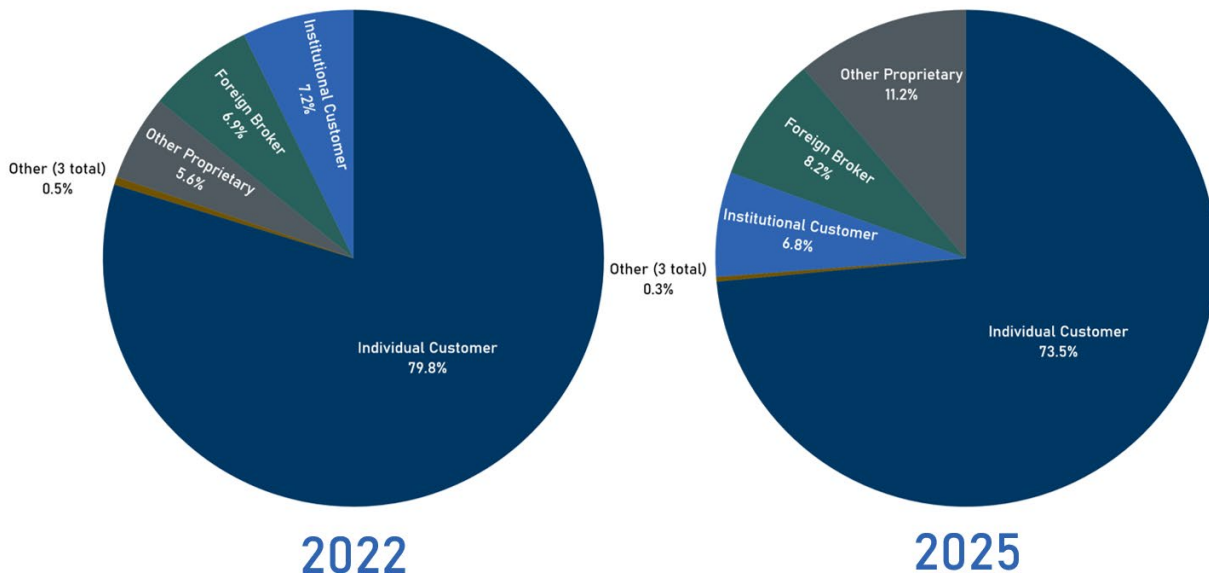


Figure 10.3: 0DTE Account Composition (Ex-Market-Makers), % Contract Volume



10.1 ODTE Underlying Breakdown

The most popular underliers for ODTE retail options trading are dominated by index products and a handful of high-profile equities. SPX, SPY, and QQQ top the list by both contract and dollar volume, reflecting the centrality of index exposure and tactical trading in the ODTE space. Notably, single-name underlier equities such as TSLA, NVDA, and AAPL also appear among the leaders, highlighting the appeal of short-dated strategies in both broad market and stock-specific contexts. The concentration of activity in a relatively small set of tickers underscores the focused nature of retail ODTE trading, with liquidity and notional risk clustered in the most recognizable symbols.

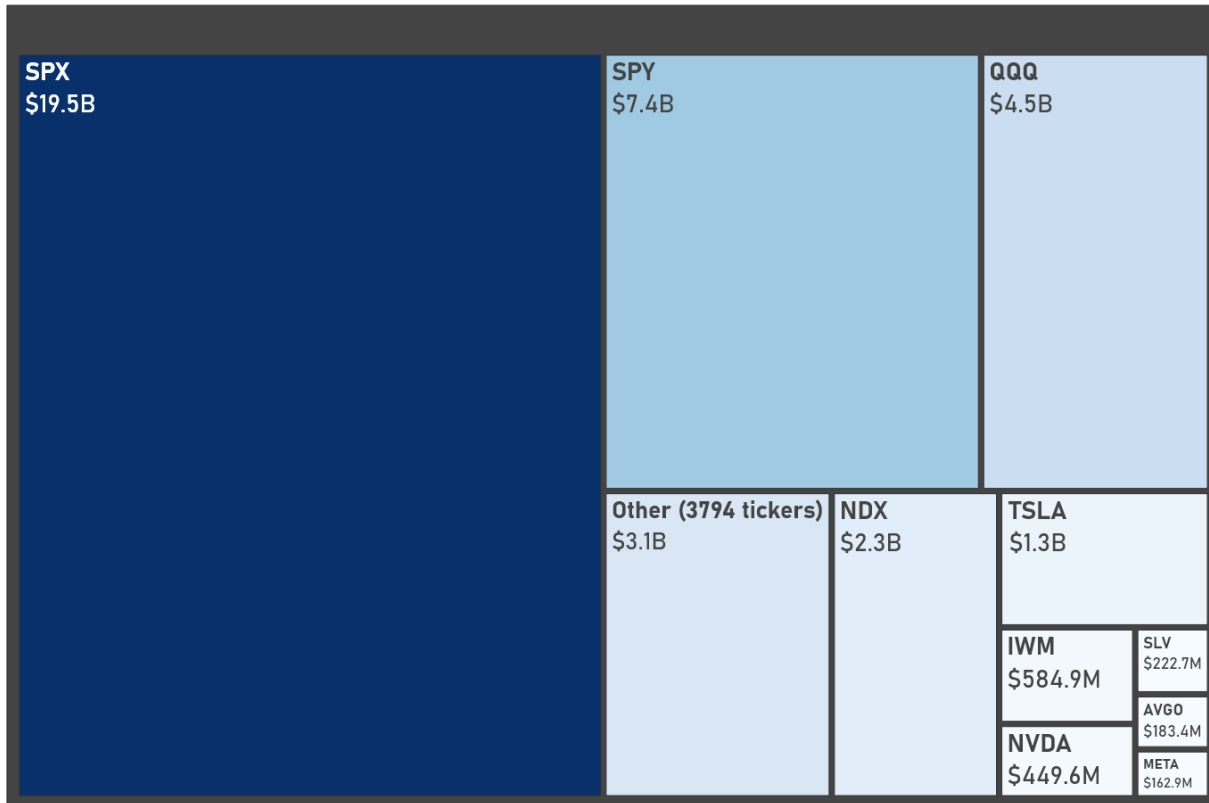


Figure 10.4: Top Zero-DTE Retail Option Tickers by Dollar Volume



Appendix A — Methodology

OPRA trade data was from January 1, 2012 to December 31, 2025. Sections specific to quoting are based on smaller time range of OPRA Quote Feed data from January 2017 to December 2025. Sections that utilize CCID data from the CAT use data from November 2022 to the end of 2025 commensurate with the implementation of that data element in CAT. Additional data drawn from FOCUS filings.

The approach for spread metric sections was to provide a broad encompassing informative metric that includes all options, followed by the same metric over two groupings; 1) a monthly contract volume bucketing by underlying at logical breakpoints given the distribution of options trading (Top 10, 11th-50th, 51st-100th, 101st-250th and 251st and over), and 2) a grouping by ‘Security Type’ (‘Equity’, ‘ETP’, ‘Other’).

A.0.1 Monthly Volume Bucketing Methodology

For each month a ranking was created where total contract volume for the calendar month was summed at the underlying security level and then ranked in descending order grouped by Security Type Bucket. These rankings were then bucketed into the 5 groupings (Top 10, 11th-50th, 51st-100th, 101st-250th and 251st and over).

A.0.2 Security Type Bucketing Methodology

The deliverable security for each option security, often referred to as the “underlying” security in this paper, were grouped into three security types based on their Security Type. The ‘Security Type’ was derived from the contemporaneous daily TAQ master files³⁹, and separated into three groups (Equity, ETP or Other⁴⁰). The paper primarily focuses on the impacts to the Equity group, which represent options written on the common stock of corporations; and ETPs, which represent exchange-traded fund, notes and other exchange-traded products. The Other group includes a variety of non-standard deliverables as well as indexes and have been removed from the body of the paper and are included in the appendix.

A.0.3 CAT Account Holder Types

Sections that utilize CAT-reported account type values utilize the field value definitions from the *CAT Reporting Technical Specifications for Industry Members*⁴¹ as reported by Industry Members.

Reports of events to CAT generally include a Firm-Designated ID (“FDID”), which is a unique and persistent identifier for each trading account at an industry member.⁴² The CAT NMS Plan Processor

³⁹ More granular Daily TAQ master file entries for the ‘Security Type’ or ‘Issue Type’ were not reported prior to Version 2.2 of the TAQ specification effective July 6, 2016. For dates prior to this specification change, the most recent granular value was propagated backwards based on the combination of CUSIP and ticker symbol. CUSIP+ticker symbol combinations that ceased trading prior to July 6, 2016, are classified as “Other” due to the lack of granular ‘Security Type’ values.

⁴⁰ Corporate securities were defined as Security Types ‘A’ or ‘H’, representing “Common Stock” and “ADR Common” per the Daily TAQ Client Spec v4.0 ([Daily TAQ Client Spec v4.0](#)). ETPs were defined as any Security Type that began with ‘ET’ and includes ETF, ETN, ETS and ETV (which was not included in the specifications as a valid value, but was observed in the data).

⁴¹ See *CAT IM Tech Specs* Appendix G.

⁴² See, e.g., CAT NMS Plan Section 1.1 (defining “[Firm Designated ID](#)”); CAT NMS Plan FAQs #M1, available at: <https://catnmsplan.com/faq#M1>.



uses each FDID, along with separately-reported account data, to generate a CAT Customer ID (“CCID”), which is a unique identifier across accounts that is available only to the Plan Processor and the CAT NMS Plan Participants. The Plan Processor then associates CCID (along with additional derived data) with individual CAT reports. It is possible for more than one CCID to be associated with a single FDID (for example, a joint account held by two people would be identified with a single FDID and associated with multiple CCIDs). It is also possible for a single CCID to be associated with multiple FDIDs (for example, where a natural person has accounts at multiple broker-dealers).

“Foreign” Account Holder Types are those for a “non-broker-dealer foreign affiliate or non-reporting foreign broker-dealer.”⁴³ Therefore, FDIDs and CCIDs associated with events with this Account Holder Type may not resolve to individual natural persons or legal entities (they may, for example, be to omnibus accounts), as most of the other Account Holder Types do.

The Account Holder Type is specified by CAT reporters on each CAT-reportable event. This analysis counts the unique CCIDs associated with relevant CAT events and links the CCID with the Account Holder Type on the event.⁴⁴ So, for example, where a single account associated with an event included multiple CCIDs, those CCIDs were counted separately. Similarly, where a single CCID was associated with activity across multiple accounts, that CCID was counted once.

A.0.4 Exclusions

Underlying symbols that were either identified as a test symbol based on indications in TAQ master entries, or those gleaned from exchange publications of test symbols were removed from the dataset. Additionally, indexes were removed from this analysis. A small number of underlying symbols which existed at the beginning but were delisted prior to July 2017 were also excluded as the TAQ master entries prior to this date did not include the necessary indication of the Security Type. For symbols that existed prior to July 2017 and continued to be listed after July 17 these Security Type values were backfilled.⁴⁵ For spread metrics specifically, fewer than 10% of transactions were also excluded from this analysis based on their sale condition code,⁴⁶ as it was determined that the quoted spread at the time of the trade report may not be indicative of the actual spread at the time of the trade being reported.

A.0.5 Descriptive Metrics for Individual Trades Methodology

Descriptive metrics were created using individual account single-leg option trades for the month of December 2025. Spread Width, Price Improvement and Effective Spread were all calculated based on the NBBO reported by the exchange at the time of the first order accept message associated with that CAT lifecycle ID.

⁴³ CAT IM Tech Specs Appendix G.

⁴⁴ In the vast majority of cases, the Account Holder Type is consistent across the events reported with any given FDID and enriched with any associated CCIDs, but CAT allows, in some cases, the Account Holder Type to vary across events for the same account. *See, e.g., CAT NMS Plan FAQs #B68, available at: <https://catnmsplan.com/faq#B68>.*

⁴⁵ The backfilling logic utilized a combination of the ticker symbol, CUSIP and Effective Date to account for recycled symbols and/or Security Type changes due to corporate action.

⁴⁶ Sale condition codes A through G were excluded from this calculation for data from 2012 - early 2019 as they represent either late or out of sequence (or both) records, where the effective spread is likely not accurate.