

CCMR Staff Report: Empirical Research on U.S. Retail Options Markets

Introduction

As policymakers consider the need for reforms to the existing regulatory structure for U.S. options markets, it is critical that discussions are based on a comprehensive and accurate assessment of the current U.S. options market landscape. In this staff report by the Committee on Capital Markets Regulation (“CCMR”), we provide a critical assessment of a recent study by Huang et al. (2025) that purports to find a negative relationship between price improvement and payment for order flow (“PFOF”) in retail options markets.¹ Price improvement entails the execution of a customer order at a better price than the best publicly available price on an exchange (the national best bid and offer or “NBBO”). PFOF refers to the monetary compensation received by a retail broker from a wholesale broker in exchange for routing a retail customer order to the wholesale broker. We conclude that Huang et al. (2025)’s analysis excludes more than 90% of orders for retail brokerages and therefore should not be the basis for drawing conclusions regarding the relationship between price improvement and PFOF for the overall retail options trading landscape.

Brief Overview of Huang et al. (2025)

Huang et al. (2025) examines retail options trading across six brokerages —E*Trade, Fidelity, Robinhood, Schwab, TD Ameritrade, and Vanguard. To conduct the study, the authors executed approximately 7,000 trades from mid-March 2024 through June 2024. Among the study’s reported results is a finding that higher PFOF is associated with lower price improvement. A September 2024 WSJ article references the Huang et al. (2025) results, reporting that the study shows the “hidden costs” of retail options trading.²

Huang et al. (2025), however, has a significant limitation — the 7,000 trades were *all* market orders with no limit orders included.³ A market order is an order to buy or sell a security at the best available price (i.e. the current market price), while a limit order is an order to buy or sell at a specified price or better. As noted by Huang et al. (2025), its study “only placed option *market* orders” [emphasis added] and did not consider other order types, such as limit orders.⁴

Based on its study of market orders, Huang et al. (2025) draws broad conclusions about the retail options market overall. They find “a large dispersion in the [retail option trades] execution quality

¹ Xing Huang, Philippe Jorion, & Christopher Schwarz, *Some Anonymous Options Trades Are More Equal than Others*, SSRN WORKING PAPER (2025), <https://dx.doi.org/10.2139/ssrn.4951825>.

² Alexander Osipovich, *Robinhood Touts Rock-Bottom Fees for Options Trading. Then Come the Hidden Costs*, THE WALL STREET JOURNAL (Sep. 23, 2024), <https://www.wsj.com/finance/investing/robinhood-touts-rock-bottom-fees-for-options-trading-then-come-the-hidden-costs-8d745bd8>.

³ Huang et al. (2025), *supra* note 1 at 3 (noting “we place market option orders at six different leading retail brokers”).

⁴ *Id.* at 38.

across originating brokers, ranging from 7% to 52% measured as a percent of NBBO”⁵ and argue that such dispersion “is not only statistically significant but also economically important”⁶ given the significant recent increase in option trade volumes.⁷ Critically, they claim to find “strong evidence that a primary economic driver of these differences is . . . payment for order flow.”⁸

However, Huang et al. (2025) does not consider the relative prevalence of market orders in retail options market trading.⁹ Therefore, a key open question is whether retail option market orders are sufficiently representative of the overall options market. We fill this gap by examining whether market orders are indeed representative of the overall retail options market, thus allowing a clearer interpretation of the Huang et al. (2025) results and providing insight into the usefulness of those results in drawing conclusions with respect to overall U.S. retail options trading.

CCMR Staff Analysis

Options brokers are required to file Form 606 on a quarterly basis, which provides transparency on how brokers route customer orders, including (i) order types and (ii) payment for order flow (“PFOF”). CCMR staff collected order type and PFOF data for all six retail options brokers examined in Huang et al. (2025) from their Form 606 filings.¹⁰

Figure 1 reports the relative prevalence of different order types over the Huang et al. (2025) sample period (April through June 2024),¹¹ and demonstrates that market orders constituted a small minority of the orders received by retail brokerages.¹² Across the six retail brokerages included in the study, 93% of all options orders were not market orders for the average brokerage.

⁵ *Id.* at 37.

⁶ *Id.* at 4.

⁷ *Id.* at 34.

⁸ *Id.* at 37.

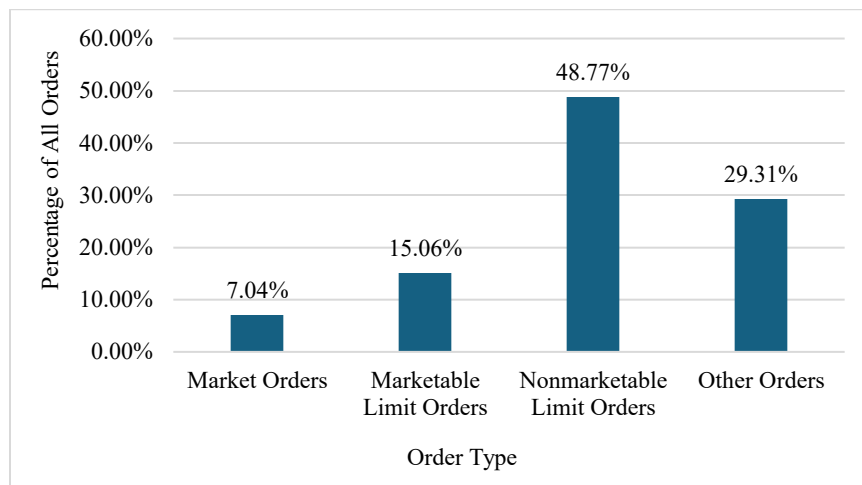
⁹ *Id.* at 40.

¹⁰ See E*TRADE - MORGAN STANLEY SMITH BARNEY LLC, *Quarterly Report: Q2 2024 (Form 606)* (Jul. 30, 2024), https://cdn2.etrade.net/1/24073108440.0/aempros/content/dam/etrade/retail/en_US/documents/pdf/order-routing-reports/2024/606-MSWM-2024Q2.pdf; FIDELITY BROKERAGE SERVICES LLC, *Quarterly Report: Q2 2024 (Form 606)* (Jul. 25, 2024), <https://clearingcustody.fidelity.com/app/literature/item/9916951.html>; ROBINHOOD FINANCIAL LLC, *Quarterly Report: Q2 2024 (Form 606)* (Jul. 22, 2024), https://cdn.finra.org/606/2024/165998_606_NMS_2024_Q2_V1.pdf; CHARLES SCHWAB, *Quarterly Report: Q2 2024 (Form 606)* (Aug. 20, 2024), https://www.finra.org/finra-data/606-nms-data?combine=schwab&field_firmname_value=&field_firmcrdnb_value=&field_context_identifier_value=; TD AMERITRADE CLEARING, INC., *Quarterly Report: Q2 2024 (Form 606)* (Jul. 16, 2024), https://cdn.finra.org/606/2024/5633_606_NMS_2024_Q2_V1.pdf; VANGUARD BROKERAGE SERVICES, *Quarterly Report: Q2 2024 (Form 606)* (Jul. 19, 2024), https://cdn.finra.org/606/2024/7452_606_NMS_2024_Q2_V1.pdf.

¹¹ Since Huang et al. (2025) began trading in mid-March, CCMR staff report results starting in the first full month of April.

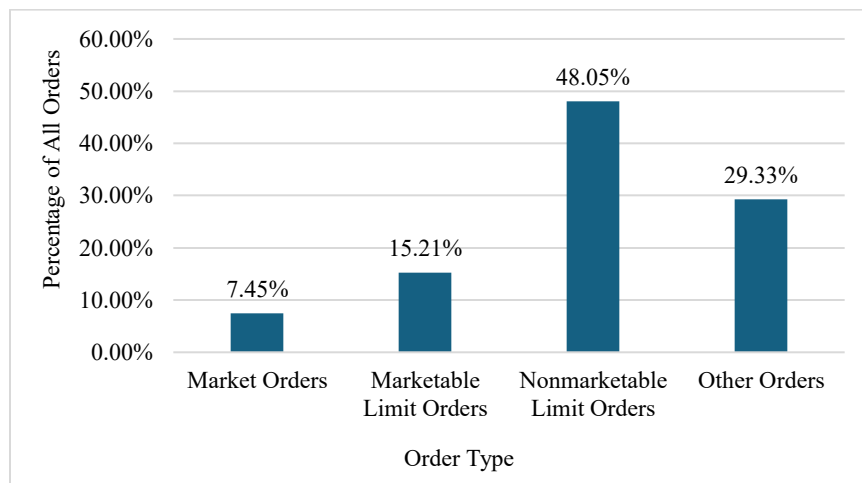
¹² Form 606 order type percentages are based on the number of orders received, not accounting for the number of shares in each order.

Figure 1: Order Types for Average Brokerage: April-June 2014, Monthly Average¹³



The immateriality of the Huang et al. (2025) data is not limited to the 3-month sample period studied by the authors. **Figure 2** reports the relative prevalence of different order types for the entirety of 2024 and demonstrates that market orders continued to represent only a small minority of trades for retail brokerages throughout the year. Thus, the limitations of the Huang et al. (2025) findings extend beyond the sample period.

Figure 2: Order Types for Average Brokerage: 2024, Monthly Average¹⁴



¹³ Order type data for April, May and June 2024 for each of the six brokerages are obtained from Form 606 filings and then averaged across the three months for each brokerage. We then compute an unweighted average of the individual brokerage data across all six brokerages, which is presented in **Figure 1**. Order type averages reported represent relative shares of non-directed orders, which constitute 99.84% to 100% of all orders for the six brokerages.

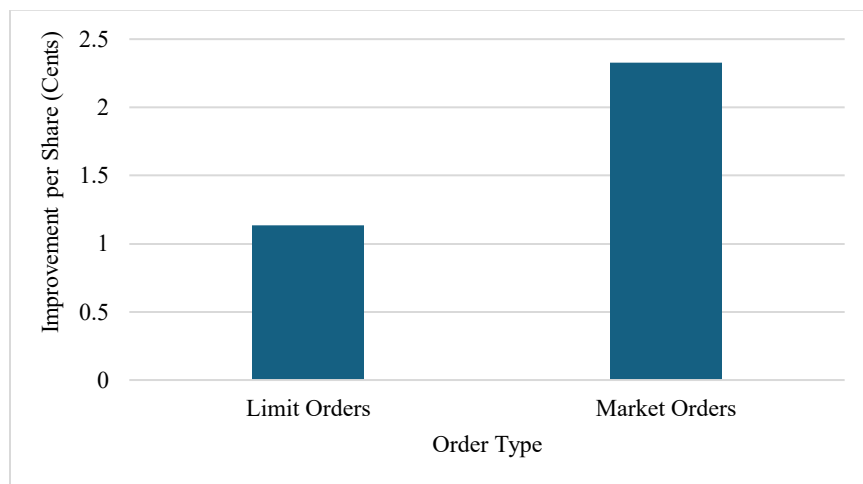
¹⁴ Same methodology as explained above in **Figure 1**, for all twelve months of 2024.

The fact that the Huang et al. (2025) sample does not include the vast majority of retail options trading activity limits the ability to draw conclusions regarding the relationship between PFOF and price improvement for retail options trading for two reasons.

First, as conceded by the authors, “other orders such as limit orders may be treated differently.”¹⁵ In other words, price improvement may vary based on the order type. For example, the price improvement received for limit orders may be different from the price improvement received for market orders.

Options markets do not mandate execution quality disclosures that allow us to calculate price improvement by order type; however, Rule 605 filings for equity markets allow for such an analysis of equity markets. **Figure 3** presents our analysis of price improvement for market orders and limit orders in U.S. equity markets, showing a significant difference between price improvement for limit orders and market orders in equity markets from April through June 2024 — the same period covered in the Huang et al. (2025) sample.

Figure 3: Magnitude of Price Improvement by Order Type at U.S. Exchanges¹⁶



Second, PFOF may also vary based on the order type. CCMR staff therefore collected PFOF data by order type for the retail options brokerages. **Figure 4** shows the average PFOF by order type across all brokerages in 2024, demonstrating that in fact PFOF varies significantly depending on

¹⁵ Huang et al. (2025), *supra* note 1 at 38.

¹⁶ Data are calculated from monthly Rule 605 reports of 14 major U.S. exchanges: the five NYSE exchanges, three Nasdaq exchanges, four CBOE exchanges, Investors Exchange, and Members Exchange. Since options are traded exclusively on exchanges, this report does not compare equity price improvement by order type across other trading venues, such as alternative trading systems (ATs) or broker-dealer internalizers. **Figure 3** presents volume-weighted averages of “Price Improvement Share – weighted average amount per share” data for market orders and marketable limit orders for all orders listed in Rule 605 reports. Volume weights are based on “Cumulative # of Shares of Covered Orders Executed with Price Improvement” as listed for each order in Rule 605 reports.

order type. Average PFOF for market orders was 26.73 cents, while average PFOF for nonmarketable limit orders was 23% higher at 32.99 cents.

Figure 4: Average PFOF by Order Type in 2024, Cents per Options Contract¹⁷



Conclusion

Overall, we find that (1) market orders represent a small minority of retail options trades, (2) price improvement can vary substantially across order types, and (3) PFOF varies substantially across retail options order types. Therefore, Huang et al. (2025)’s findings regarding the relationship between price improvement and PFOF for retail options market orders do not provide useful insight into the overall retail options trading landscape. This CCMR staff analysis therefore demonstrates that policy discussions regarding the options market need to be guided by comprehensive analyses of options market performance.

The significant limitations of the Huang et al. (2025) analysis also highlight the need for an extension of Rule 605 to cover options as well as equities. Rule 605 disclosures provide retail investors with valuable information regarding order execution quality, helping investors assess and compare how well brokerages fill customer orders with respect to equities. The options market currently lacks comparable disclosure requirements. As retail participation in options trading increases, extending Rule 605 to options becomes more critical, as it would promote greater transparency and enhance competition among brokers.

¹⁷ Payment for order flow data for all months of 2024 for each of the six brokerages are obtained from Form 606 filings and then averaged across all months for each brokerage. We then compute an unweighted average of the individual brokerage data across all six brokerages, which is presented in **Figure 4**. Order type averages reported represent relative shares of non-directed orders, which constitute 99.84% to 100% of all orders for the six brokerages.