Via Electronic Submission

Securities and Exchange Commission
100 F Street, NE
Washington, DC 20549-1090
      rule-comments@sec.gov

Re: <u>**File No. S7-32-22**</u>**: Proposed Regulation Best Execution**

Summary

We are co-authors of the study entitled "The Actual Retail Price of Equity Trades" referenced in the Regulation Best Execution proposal (Release No. 34-96496, supra note 458).[1] In summary, we placed 85,000 market orders simultaneously at five different brokers using six different accounts, which allowed us to directly compare trading costs across brokers and market centers. Thus, our comments reflect the interests of retail investors, informed by our academic background and trading experience.

The current market structure in the U.S. provides market access to retail traders that is arguably the best in the world. The SEC deserves credit for creating this environment. We do appreciate the SEC's continued efforts to improve transparency through disclosure, to minimize potential conflicts of interest, and to lower costs and improve access for retail traders. For example, we strongly support the Disclosure of Order Execution Information proposal (Release No. 34-36493).

This "Regulation Best Execution" proposal aims at lowering execution costs further by requiring detailed policies and procedures for all broker-dealers and more robust policies and procedures for those engaging in certain conflicted transactions, especially Payments for Order Flow (PFOF). In our view, it is certainly worthy to require broker-dealers to establish, maintain, and enforce written policies and procedures reasonably designed to comply with best execution standards.

With that said, the SEC provides a detailed empirical analysis of the factors affecting price execution. It reports a statistically significant negative relationship between execution and PFOF, which is used to justify the increased scrutiny of PFOF. Using the SEC's own analysis, however, we demonstrate that PFOF has almost no economically meaningful impact on execution for these data. If the proposal assumes that additional monitoring of PFOF will improve order execution, then these results suggest that the benefits would be mild.

Additionally, it is important to note that almost all of the largest retail equity brokers use unaffiliated wholesalers and receive the same PFOF regardless of which wholesaler is selected for each trade. Thus, there is no conflict of interest for the broker when selecting wholesalers. Indeed, we give an example of best execution, with a broker increasing allocations to a new entrant in the wholesaler market that provides better prices.

Overall, we are concerned that the enhanced scrutiny of PFOF could instead lead to "reduction in conflicted transactions that would occur on the proposal" that "the Commission cannot quantify". Individual investors are greatly benefiting from the current environment with zero commissions, which have been spurred by the more widespread use of PFOF.

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[1] Our paper is available here: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4189239

Impact of Payment for Order Flow on Execution

In Section V.B.3 of the Proposal, the SEC examines the effect of PFOF on price execution and asserts that "wholesalers provide worse execution quality to brokers that receive more PFOF." This leads to the argument that the "the Commission preliminarily believes that any resulting reduction in conflicted transactions could improve the prices retail customers realize for their transactions"

The SEC draws its conclusions from Table 16, which displays regressions of price improvement measures for about 13 million observations across 58 brokers against a number of variables, including PFOF. Price improvement can be measured by the fraction E/Q of effective over quoted spread, where the latter is derived from the National Best Buy and Offer (NBBO) quotes, or equivalently price improvement as a fraction of the quoted spread. For instance, the table shows estimates of a regression of E/Q on several variables, including the PFOF rate, for which the coefficient is 0.0132.[2] This variable is indeed positive, suggesting that higher PFOF is associated with wider execution spreads, or worse execution. It is described as "statistically significant" at the 1% level, with a t-statistic of 2.82.[3]

The SEC analysis, however, fails to consider the economic significance of this number, which is more relevant to an economic cost/benefit analysis. We demonstrate that, according to the SEC's own analysis, the economic impact of PFOF on execution is minimal.[4] As a result, this weakens the support for the argument in this section.

To assess the magnitude of the effect, consider first the PFOF rate variable used in the table. This is defined as "the retail brokers' PFOF rate in bps," which is calculated by dividing the dollar PFOF amounts per share taken from Rule 606 filings by the share price of each trade.

Using the data in SEC's Table 6,[5] the share-weighted average price for non-ETF trades is $29.72.[6] Table 1 below compares the effect of PFOF for the brokers in our study. Consider for example TD Ameritrade (TD) with PFOF of $0.001 per share. This yields a PFOF rate of 0.337 bps. Multiplying this value by the coefficient of 0.0132 in Table 15 implies that TD's execution would have an E/Q ratio lower by 0.0044 if its PFOF were set to zero instead.

TD's E/Q ratio in our sample is 0.056, which corresponds to a Price Improvement relative to the quoted spread of PI = 50% − 0.056/2 = 47.2%. Eliminating PFOF would therefore lead to an E/Q ratio of 0.056-0.0044 = 0.052, or PI = 47.4%. The increase in PI is therefore 0.2%.

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[2] We use E/Q price execution measures to be consistent with the statistics presented in our paper. This variable controls for the large variation in quoted spreads.

[3] However, the very large number of observations in the analysis (more than 13 million) makes it more likely that standard errors are understated. The residuals cannot be independent across this very large pooled cross-sectional time series. The table does use standard errors clustered by stocks but ignores additional correlations induced within brokers or within the broker-wholesaler pair, which likely overstate t-statistics.

[4] This also supports the conclusion in our own paper that the "variation in PFOF cannot explain the large variation in execution."

[5] In this comment, Table 6 refers to that in the Order Competition Proposal, which focuses on orders under $200,000.

[6] We exclude ETFs as we did not include them in our experiment. Even with ETFs, the average price is close, at $34, so this would not change our conclusions.

Table 1.   Comparison of Execution Costs with and without PFOF
(Extending the SEC's Analysis in Table 15)

	PFOF	Price Improvement % of Spread (Higher is Better)		Effective/Quoted Spread E/Q (Lower is Better)	
	($/share)	Original	No PFOF	Original	No PFOF
TD Ameritrade	$0.00100	47.2%	47.4%	0.056	0.052
E*TRADE	$0.00199	36.1%	36.5%	0.278	0.269
Fidelity	None	35.8%	35.8%	0.284	0.284
Schwab	$0.00100	35.5%	35.7%	0.290	0.286
Robinhood	$0.00217	26.8%	27.3%	0.464	0.455
IBKR Lite	N/A	19.5%		0.610	
IBKR Pro	None	18.8%	18.8%	0.624	0.624

Source: Authors' paper for original PFOF and PI % Spread. Schwab was added in later experiments. Authors' calculations using estimated coefficient in SEC Table 16 as described in the text.

Next, we want to convert this number into a percentage of share value across all trades. So, first, we compute the average quoted spread for wholesaler trades. From the SEC's Table 6, this is twice the effective half-spread divided by E/Q, or 2 × 2.05 bps / 0.42, which results in a quoted spread of 9.76 bps.

Using the SEC's Table 2, we compute a weighted average PFOF amount of $0.00129.[7] This number, however, only applies to brokers receiving PFOF. Indeed, the SEC notes "… that about 80% of the share volume … that were routed to wholesalers and executed comes from PFOF brokers." Hence, across all brokers, the amount of PFOF for all orders is $0.00103 per share.

Next, dividing again by the average share price of $29.72 gives an average PFOF rate of 0.347 bps. Multiplying this value by the coefficient of 0.0132 in SEC's Table 16 implies that on average all orders would have a 0.0046 lower E/Q, or 0.23% increase in PI. Thus, multiplying 9.76 by the PI increase of 0.23% gives 0.0224 bps of potential savings in execution costs.

Finally, this allows us to assess the overall economic magnitude of the PFOF effect. The wholesaler trading volume is $13.1 trillion, annualized.[8] Applying the PI increase of 0.0224 bps gives a total dollar savings from eliminating PFOF of $29 million per year.

For this market, this is a very small amount. For comparison, using the effective spread, transaction costs on that same volume add up to $2,690 million per year. Hence, the SEC's own empirical evidence suggests that the elimination of PFOF is unlikely to lead to meaningful economic improvements in execution for NMS equity retail trades. If the proposal assumes that reductions in PFOF will improve order execution, these results suggest that the benefits would be mild.

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[7] In SEC's Table 2, the average PFOF amount is reported as $0.0013 and $0.00127 for market and marketable limit orders, respectively. Using the share volumes for these orders (72.20 and 34.77 billion, respectively, from SEC's Table 5), the weighted average is $0.00129.

[8] From SEC's Table 6 in the Order Competition Proposal, the wholesaler volume is $3,280 billion for 1Q 2022, or $13.1 trillion per year.

Brokers Incentives within Wholesaler Marketplace

It is important to note that brokers have no incentive to route a particular order to one wholesaler over another. This is because each broker receives the same amount of PFOF per share from their wholesalers. For example, looking at TD's 606 filing:

> "All market makers pay the same rate for each respective order flow type. TD Ameritrade does not negotiate payment as a condition for sending more order flow to a market maker."

Robinhood's 606 filing has a similar statement.[9]

> "The fixed percentage is the same for all non-exchange third-party market centers to which Robinhood Securities routes equity order flow."

Thus, while one could argue that a conflict may exist between PFOF and price execution across a broker's entire order flow, there should be no additional conflict on an order-by-order basis.

As an example of how brokers route orders to wholesalers, consider the entry of a new wholesaler, Jane Street, for Robinhood. Figure 1 displays the percentage of our orders that were routed to each wholesaler.

Figure 1. Share of Robinhood Orders Routed to Each Wholesaler
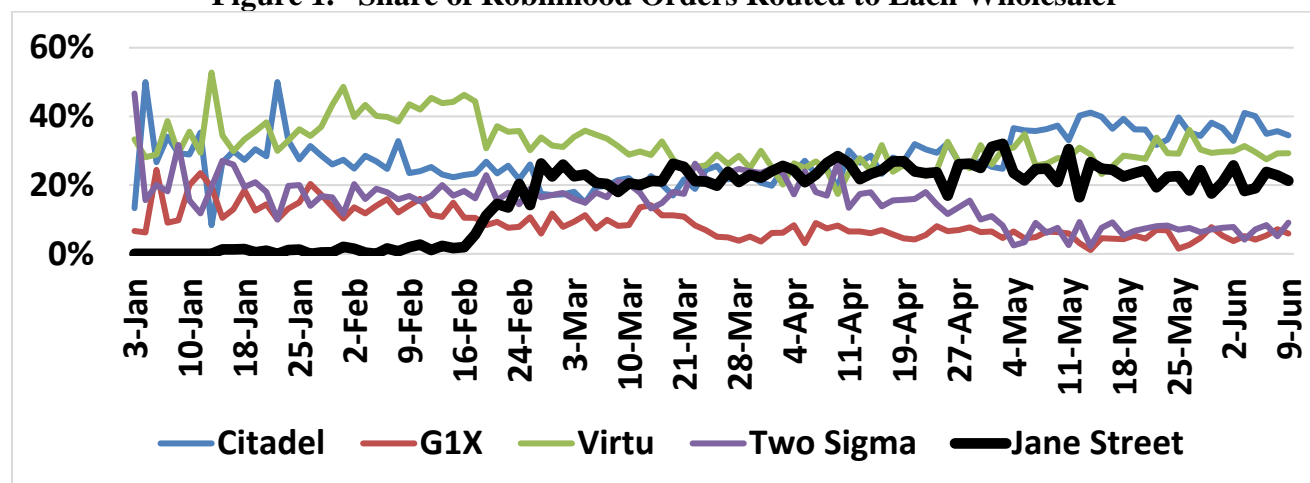
At the beginning of our sample period, none of our orders were routed to Jane Street. By the end of February, however, one-quarter of our orders went to Jane Street.

So, why did Robinhood start routing orders to Jane Street? Under best execution rules, we would presume that Jane Street was offering better execution than others. Indeed, Figure 2 describes our average price improvement across wholesalers. This confirms that Jane Street's execution quality was superior to others in January and February.

These findings show that Robinhood has increased its allocation to a wholesaler that offered better pricing. More generally, other research has shown that this practice also arises across the brokerage industry. This is consistent with providing best execution for retail clients.[10]

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[9] Note that Robinhood receives a percentage of NBBO rather than a fixed amount per share, which explains differences with other brokers.

[10] Dyhrberg, A., A. Shkilko, and I. Werner, 2023, "The Retail Execution Quality Landscape," available at SSRN 4313095. Their analysis uses Form 605 execution data for all trades by market centers.

Figure 2. Price Improvement across Robinhood Wholesalers (% of NBBO)
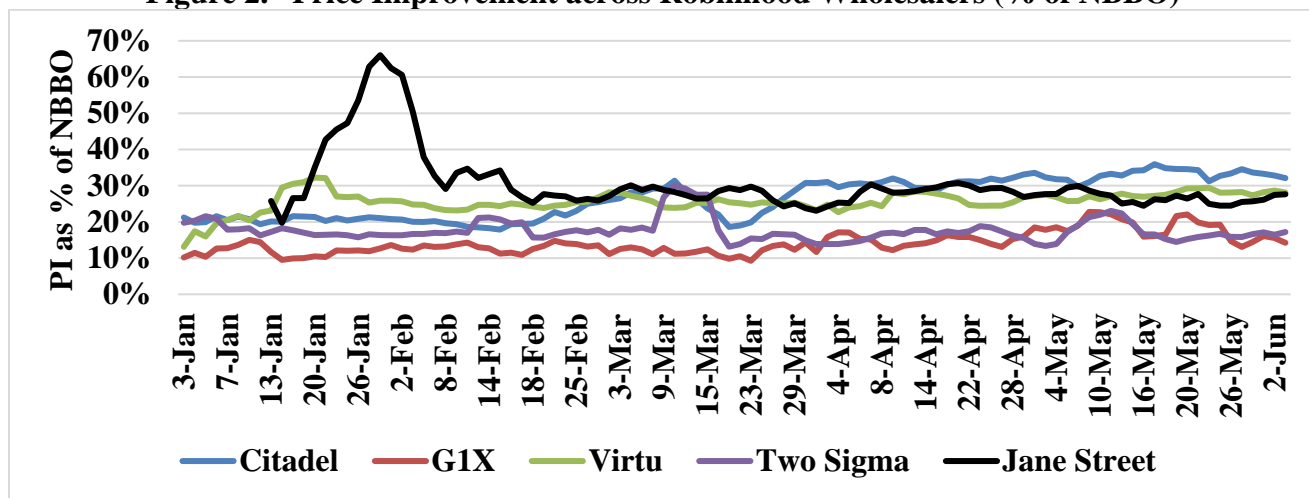
Conclusions

In our view, it is certainly worthy to require broker-dealers to establish, maintain, and enforce written policies and procedures reasonably designed to comply with best execution standards.

While we support the SEC's attention to execution quality in the retail trading market, we provide two specific comments regarding the economic justification for the proposed best execution rule.

First, we document that the SEC's own analysis supports the view that PFOF has almost no economically meaningful impact on execution. Total transaction costs for wholesaler trading can be estimated at $2,690 million per year. Using the SEC's regression framework, we provide estimates of the economic magnitude of the PFOF effect on the order of $29 million per year only. If the proposal assumes that reductions in PFOF will improve order execution, these results suggest that the benefits would be mild.

We also show that there is no additional order-by-order conflict for brokers with unaffiliated wholesalers and that brokers are currently incentivized to provide best execution to their clients. We expect that this will further improve if the "Proposed Disclosure of Order Execution Information" (S7-29-22) is adopted, because this added transparency will create more competition between brokers.

Overall, we are concerned that the enhanced scrutiny of PFOF could instead lead to "reduction in conflicted transactions that would occur on the proposal" that "the Commission cannot quantify". Individual investors are greatly benefiting from the current environment with zero commissions, which have been spurred by the more widespread use of PFOF.

Sincerely,

Professor Christopher Schwarz, University of California, Irvine
Professor Philippe Jorion, University of California, Irvine