

March 31, 2023

VIA E-MAIL

Ms. Vanessa A. Countryman, Secretary
U. S. Securities and Exchange Commission
100 F Street NE
Washington, DC 20549-1090

Re: Equity Market Structure Proposals
(File Numbers S7-29-22, S7-30-22, S7-31- 22, and S7-32-22)

From: Barbara Rindi and Giuliano Graziani, Bocconi University

Dear Ms. Countryman:

As academics working in market microstructure we write to express our concerns about a potential rule proposal related to the Release No.34-96494 on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders. In particular, we express our concerns about the proposed changes to Rule 612 on the tick size regime.

Our comments are based on our paper on the Optimal Tick Size ([Graziani and Rindi \(2023\)](#)) where we show that when traders are allowed to undercut and/or queue behind existing limit orders, the optimal tick size should be set by the regulator as a positive function of the asset price, and as a negative function of the liquidity of the instrument.

Given that the objective of the regulator is to optimize the demand and the supply of liquidity, he sets the tick size to balance the effects of excessive undercutting and of excessive queuing on the traders' incentive to offer and to take liquidity.

When the stock price increases, the potential gains from trade relative to the tick size increase, traders become more aggressive and their incentive to undercut existing limit orders also increases. The result is that traders' incentive to post limit orders (supply liquidity) decreases. The optimal tick size should therefore increase to make undercutting more expensive and avoid excessive undercutting.

When liquidity increases, traders compete for the provision of liquidity more intensely and therefore tend to cluster at the inside spreads. The optimal tick size should therefore decrease to reduce the minimum inside spread and avoid excessive queuing.

Taken together these results indicate that the optimal tick size should be set to balance on the one hand the issue of excessive queuing that leads to tick size constrained stocks, and on the other hand the issue of excessive undercutting that undermines the incentive of traders to post limit orders in high priced stocks. We believe the SEC proposal takes care of the first issue but not of the second one.

More in details, our comments regarding the proposed change in the tick size regime of the U.S. equity market are the following:

- We strongly support the proposal of moving from a binary tick size regime (the current Reg. NMS Rule 612) to a dynamic stock-dependent tick size regime - an approach adopted in most trading venues worldwide (Table 1.A, [Graziani and Rindi \(2023\)](#)). However, we strongly disagree that a change in the tick size should only concern stocks with an average spread smaller than \$0.04. We argue that, to foster market quality, the tick size should be increased for stocks with both a large price and a wide inside spread.
- The reason why we advocate a change in the proposal is that it does not fully consider the important trade-off between queuing and undercutting for all the stocks traded in the U.S. equity markets.

The proposal goes in the right direction for small stocks which are tick size constrained. As these stocks suffer from excessive queuing, a reduction in the tick size is likely to be beneficial for market quality.

However, the proposal fails to consider that for many high priced stocks that are not tick size constrained, a small (relative) tick size makes undercutting almost costless thus reducing the incentive for investors to post limit orders, hence to provide liquidity.

- All in all, the SEC proposal aims to address the issue of the tick size just for a limited number of stocks. By considering Table 8 on page 188 of the [SEC \(2022\)](#) proposal, we

observe that the 64% of all of the stocks considered in the sample does not qualify for the proposed change in the tick size, and that such group counts for almost 40% of the dollar volume within the U.S. equity market. By using data from NASDAQ’s Economic Research Team, we show that high-priced stocks have inside spreads exponentially larger than \$0.04 (Table 7, [Graziani and Rindi \(2023\)](#)). In addition, even by taking into account the mechanical reduction in spreads induced by odd-lot trading, we argue that for stocks priced \$1,000 – \$10,000 the quoted spread is about 210 times larger than the tick size (and for stocks priced \$250 – \$1,000 it is about 30 times larger).¹

Therefore, the current SEC proposal does not take into account that such a distorted and disproportional ratio makes overbidding almost costless for a highly representative group of U.S. stocks, harming market quality and reducing the probability of execution of submitted limit orders.

- Even though it is common practice to think that a larger tick size necessarily harms liquidity takers, especially retail investors, as crossing the spread mechanically increases when the tick size increases, there is robust evidence that the above logic has a flaw when the tick-to-price ratio is excessively small. When the relative tick size is so small that undercutting resting orders becomes inexpensive, the value of time priority decreases, thus eliminating the incentive to supply liquidity by posting patient limit orders. If the incentive to post patient limit orders declines, spreads widen, and liquidity worsens.

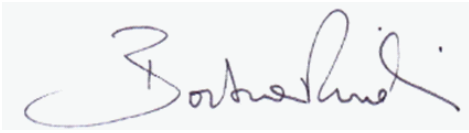
Our theoretical and empirical results are corroborated by previous academic studies and by practitioners’ proposals and analyses. Using NYSE data, [O’Hara, Saar, and Zhong \(2019\)](#) show that in a tick-unconstrained environment stocks with a small tick-to-price ratio have smaller depth. Examining a cryptocurrency market with infinitesimal tick

¹The results here reported are obtained from a back of envelope calculation: [SEC \(2022\)](#) in footnote 607 on page 237 report that the average quoted spread for stocks priced \$1,000 – \$10,000 is \$2.90, which should be reduced by 28% when including Odd-Lot Data. The average quoted spread for stocks priced \$250 – \$1,000 is \$0.35, which should be reduced on average by 15% when including Odd-Lot Data. Therefore, the quoted spread to tick is equal to $210 \approx \frac{2.90 \times (1 - 0.28\%)}{0.01}$ for stocks priced \$1,000 – \$10,000, and to $30 \approx \frac{0.35 \times (1 - 0.15\%)}{0.01}$ for stocks priced \$250 – \$1,000.

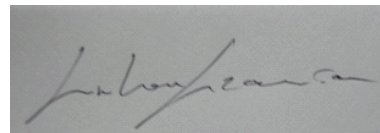
sizes, [Dyhrberg, Foley, and Svec \(2019\)](#) show that, when the cost of undercutting limit orders is economically insignificant, an increase in the tick size reduces undercutting, improves market quality, and therefore increases liquidity provision and quoted depth. This reduces transactions costs for both institutional and retail-sized trades while simultaneously decreasing short-term volatility. On the institutional side, in 2019 the Nasdaq issued a proposal amending Rule 612 of Reg NMS to adopt an "Intelligent Ticks" regime with a schedule of tick sizes that are adjusted regularly, based on stock-specific trading conditions ([Nasdaq \(2019\)](#)).² Along these same lines, in Europe in 2018 ESMA provided the European markets with a tick size model embedding precise guidelines in relation to how the tick size should be set, based on both the price and the liquidity of the instruments ([ESMA \(2017\)](#)). Before the release of Article 49 of MiFID II, which includes the ESMA table on the new tick size regime, [AMF \(2013\)](#) singled out the trade-off that should govern the choice of the optimal tick size: *[t]oo big, a tick size can discourage investors from placing orders at the best bid/offer prices as the queuing time at these limits becomes longer, which in turn increases implementation risk. A smaller tick size, [instead], increases the room to overbid, and reduces the cost of overbidding.* Following the MiFID II revision and the release of the ESMA table on the new tick size regime, [AMF \(2018\)](#) presented empirical evidence showing that the new regime adopted in Europe had the desired effect on order lifetime (order-to-trade ratio), transaction size and indicators of market quality.

²An adjustment of the tick size, with a potential increase of the tick for giant stocks, is the argument of several articles of the NASDAQ Research Group, see for example [Mackintosh \(2022\)](#), [Mackintosh \(2020\)](#) and [Mackintosh \(2023\)](#)

Respectfully,



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cc: The Honorable Gary Gensler, Chair
The Honorable Hester M. Peirce, Commissioner
The Honorable Caroline A. Crenshaw, Commissioner
The Honorable Mark T. Uyeda, Commissioner
The Honorable Jaime E. Lizarraga, Commissioner
Dr. Haoxiang Zhu, Director, Division of Trading and Markets

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