

Summary of Public Comments on "Optimization of Tick Sizes for Medium Liquidity Stocks" and TSE Responses

March 8, 2023
Tokyo Stock Exchange, Inc.

Tokyo Stock Exchange, Inc. (TSE) released the outline of "Optimization of Tick Sizes for Medium Liquidity Stocks" on December 22, 2022 and sought public comments until January 21, 2023. TSE appreciates the cooperation of those who gave their comments in reviewing this matter.

The following is a summary of the comments received and responses from TSE.

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1	<p><Market Microstructure: Tick Sizes></p> <ul style="list-style-type: none">• XTX Markets ("XTX") believes that appropriate tick size increments are important in all electronic markets globally. This allows liquidity to cluster at a price point and ensure market makers are taking meaningful risk when improving an existing price.• A tick size that is too small results in a lack of depth, flickering in the order book and fragmentation of liquidity across too many price levels. A tick size that is too large results in end users (such as pension funds and retail traders) crossing unnecessarily wide bid-ask spreads and paying	<ul style="list-style-type: none">• As you mentioned, these revisions should reduce the effective spread for issues with a 1-tick bid-ask spread and allow investors to trade at a better price.• We will continue to discuss the unification of tick sizes across cash equity markets in Japan with market users from the perspective of ensuring a fair competitive environment and eliminating complexity in the market.• Tick sizes for cash equities are currently determined according to price and index categories for the sake of clarity. However, we will continue to consider

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	<p>inflated transaction costs.</p> <ul style="list-style-type: none"> • Venues should seek a balance to find the optimal tick size using quantitative orderbook data. An optimal tick size improves price discovery and reduces transaction costs. <p><Previous TSE Tick Size Optimisations Have Been Successful></p> <ol style="list-style-type: none"> 1. TOPIX 100: <ul style="list-style-type: none"> • The tick size pilot program launched for TOPIX 100 constituents (the “TOPIX 100 tick size regime”) was very successful and as per the study published by the TSE, the “effective spread, or spread cost actually borne by investors, has decreased significantly” and the “average quoted spread decreased across all TOPIX 100 constituents”¹ 2. Extending the “TOPIX 100 tick size regime” to ETFs: <ul style="list-style-type: none"> • Based on data analysed internally by XTX², the volume weighted spread across in-scope ETFs reduced from 6.5bps prior to the change to 4.5bps after the change, which is a significant decrease in spread crossing costs for end 	<p>improvements to the system with regard to the scope of issues to which the tick size table for TOPIX 100 constituents is applied, while also examining the impact of these revisions.</p>

¹ https://www.jpx.co.jp/files/tse/rules-participants/public-comment/data/b7gje6000005712m-att/201412_kabuso_d.pdf

² Based on analysis of data for ETFs with a price greater than JPY 5,000 from 2021-08-30 to 2021-11-26 and 2021-11-29 to 2022-02-25

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	<p>investors. Additionally, the amount of time on average that in-scope ETFs had a 1-tick bid ask spread decreased from 89.2% of trading hours to 79.6% of trading hours after the change.</p> <p><Japan TOPIX 400 Tick Size Enhancements on TSE></p> <ul style="list-style-type: none"> • Following the successful roll out of more optimal tick sizes for TOPIX 100 stocks and ETFs, XTX is supportive of the “TOPIX 100 tick size regime” being extended to TOPIX 400 stocks. <ul style="list-style-type: none"> ➢ Many TOPIX 400 constituents have a tick size on TSE that is too large ➢ 13 of the top 20 traded TOPIX 400 constituents have a 1-tick bid-ask spread for over 90% of trading hours³ ➢ Over half of all TOPIX 400 constituents have a 1-tick bid-ask spread for over 80% of trading hours³ <p><Other Suggestions></p> <ol style="list-style-type: none"> 1. Harmonised Tick Size Regime across Cash Equity Venues <ul style="list-style-type: none"> • We believe that all cash equity venues in Japan (TSE and 	

³ Based on analysis of data from 2022-10-17 to 2023-01-13

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	<p>PTS') should adopt a harmonised tick size regime. This helps prevent a race to the bottom as outlined in a paper published by the Government Office for Science in the UK; "In a competitive exchange environment, a new trading platform may compete by offering a smaller tick size than the existing exchanges. This would allow traders to bypass the queue at the other markets by placing limit orders with limit prices just a tiny bit better than existing limit orders already displayed in the market. Brokers attempting to get best execution for their clients would have send their orders to the market with the best price, even if that best price was only infinitesimally better than in other exchanges. This competition forces exchanges to match each other on tick size, resulting in a race to the bottom"⁴.</p> <ul style="list-style-type: none"> • Cash equity markets in both Europe and the US, each have their own harmonised tick size regime today. <p>2. Adopting a Tick Size Regime that Considers both Prices and Liquidity</p>	

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/289037/12-1068-eia7-tick-size-regulation-costs-benefits.pdf

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	<ul style="list-style-type: none"> • Adopting a tick size regime that considers both price and the liquidity profile of each stock would further optimise tick sizes in Japan, versus the current regime in Japan that only considers price. • This is the approach taken in the UK and Europe, where in 2018 ESMA successfully implemented a tick size table methodology based on price and ADNT (Average Daily Number of Transactions). Incorporating volume traded is important because it helps normalise for liquidity of a stock; differentiating between a stock with a high price that is illiquid and infrequently traded (hence requiring a larger tick size) and a stock with a high price that is liquid and frequently traded (hence requiring a smaller tick size). • Thus, we think that the TSE implementing a tick size table similar to the MIFID II tick size regime would be beneficial for the market. Additionally, we believe this will allow the TSE to roll out this enhanced tick size regime to all stocks. 	
2	<p>1. TSE's proposal for tick size optimisation on medium liquidity stocks</p> <ul style="list-style-type: none"> • Optiver is supportive of TSE's proposal to optimise the medium liquidity stocks tick sizes in line with the TOPIX 100 	<ul style="list-style-type: none"> • These revisions should allow investors to trade at better prices for medium liquidity stocks for which the costs associated with tick sizes are high from a global perspective.

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	<p>stocks.</p> <ul style="list-style-type: none"> • Optiver believes that the magnitude of the changes to the TOPIX 100 tick size table from the existing tick size table are gradual enough and therefore should be well received by the market (i.e., market participants will be able to adequately make adjustments to their systems, models, algorithms, strategies to not be significantly impacted). • Overall, Optiver sees it as a natural step to standardise these stocks to the TOPIX 100 stocks tick size table and it also follows the direction of many markets / products globally where tick sizes have been optimised (and often reduced). <p>2. Expected impact on liquidity</p> <ul style="list-style-type: none"> • Tighter spreads – Optiver’s expectation is that smaller tick sizes across the TOPIX mid 400 stocks will result in tighter spreads. • Spread out liquidity – Optiver also expects that with a smaller tick size, the liquidity shown per level will be significantly smaller. This could increase the cost for executing larger orders as participants would need to pay through multiple levels (i.e., they are not able to get their size 	<ul style="list-style-type: none"> • We will continue to assess the impact of these revisions, including that from the liquidity diversification as you mentioned, and will continue discussions with market users to further improve the system.

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	<p>done at the top level of the book). Given the expected reduced top-level liquidity, it could also increase the tick volatility of the stock.</p> <p>3. TSE's areas to focus</p> <ul style="list-style-type: none"> • Liquidity – due to the change, TSE should continue to engage with market participants including market makers/liquidity providers and end investors to ensure that the optimised tick sizes for these stocks results in better execution overall for all participants and that liquidity provision is not adversely impacted. • Additional data – Optiver also suggests for TSE to publish data over time to display the impact of this market microstructure change. 	
3	<ul style="list-style-type: none"> • We agree with the purpose of the proposed revisions for the optimization of tick sizes for medium liquidity stocks, as it is in line with recent trends and aims to make investments more convenient. • The proposed revisions are expected to reduce execution costs by applying the tick sizes for TOPIX 100 constituents to TOPIX Mid 400 constituents, which are medium liquidity 	<ul style="list-style-type: none"> • These revisions should allow all investors, including retail investors, to trade a wider range of stocks at better prices. • As suggested, we will determine the implementation date based on the time required to inform market users as well as allow trading participants to modify their systems in response to these revisions.

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	<p>stocks. In addition to the previous revisions, the proposed revisions will also make investing more convenient for a wider range of issues, so we consider this outline of revisions appropriate.</p> <ul style="list-style-type: none"> We hope that these revisions will be implemented at the right time, in consideration of the time required to inform market users as well as allow trading participants to modify their systems in response to these revisions. 	
4	<ul style="list-style-type: none"> We are broadly supportive of the proposal and note that reducing tick sizes is likely to result in narrower effective spreads for many of the stocks. This should have the net/ aggregate effect of reducing transaction costs for trading Japan mid 400 stocks. 	<ul style="list-style-type: none"> These revisions should allow investors to trade at better prices for medium liquidity stocks for which the costs associated with tick sizes are high from a global perspective. We will continue to assess the impact of these revisions, including the reduction in effective spreads.
5	<ul style="list-style-type: none"> Spreads for TOPIX 100 constituents have already been affected. Applying the same tick sizes to the top 500 issues would be a desirable change from the perspective of execution costs. However, on the other hand, given the work required when there is a change in constituents (when a stock is removed from the top 500 issues), including going through the 	<ul style="list-style-type: none"> These revisions aim to optimize tick sizes for medium liquidity stocks for which the costs associated with tick sizes are high from a global perspective, in consideration of liquidity in actual trading and clarity of the rules. Tick sizes need to be optimized appropriately in consideration of liquidity and product characteristics.

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	<p>necessary procedures as well as system setup and management, it would be best to apply the same tick sizes to all TOPIX constituents for the sake of consistency, since the top 500 issues already account for approximately 25% of the index.</p>	<p>We will consider expanding issues subject to these revisions, taking into account the impact of these revisions on variables such as liquidity and trading conditions for other issues.</p>
6	<ul style="list-style-type: none"> • Citadel Securities welcomes the opportunity to provide feedback on the Tokyo Stock Exchange’s consultation on “Optimization of Tick Sizes for Medium Liquidity Stocks”. In the context of this consultation, tick sizes refer to the minimum increment at which bids and offers (collectively, quotes) entered into, and displayed by, an exchange or other lit trading venue, can be priced. • Establishing optimal tick sizes for instruments that are quoted on exchanges and other lit trading venues is an essential component of an efficient market structure. Tick sizes that are too large may lead to artificially wide bid-ask spreads that increase the costs of trading for all market participants. On the other hand, tick sizes that are too small may diminish market depth by fragmenting displayed liquidity across too many price points. This can make it 	<ul style="list-style-type: none"> • As indicated, tick sizes that are too large or too small can adversely affect investors. Therefore, taking into account liquidity in actual trading and clarity of the rules, we will optimize tick sizes for medium liquidity stocks for which the costs associated with tick sizes are high from a global perspective. • We will continue to discuss the unification of tick sizes across cash equity markets in Japan with market users from the perspective of ensuring a fair competitive environment and eliminating complexity in the market.

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	<p>difficult for market participants to execute trades of any meaningful size, as well as discourage the display of liquidity by allowing market participants to gain queue priority with only de minimis changes to the prices of resting bids and offers. Determining optimal tick sizes should therefore be a data-driven exercise that properly accounts for and balances these factors.</p> <ul style="list-style-type: none"> • It is likewise essential to have consistent tick sizes across different trading venues that display quotes for a given instrument. In particular, tick sizes for a given instrument should be harmonized across exchanges and lit proprietary trading systems (PTSs). This consistency would be highly beneficial for the market, as the existence of different tick sizes for the same instrument across different trading venues that display quotes leads to an unlevel playing field and creates operational complexity for both investors and market makers. Again, given the importance of establishing optimal tick sizes, tick size changes should be effected on a market-wide basis following a data-driven exercise. By contrast, individual trading venues should not 	

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	<p>be permitted to independently modify tick sizes as a competitive tool, as this risks creating a race to bottom that does not properly balance the factors outlined above.</p>	
7	<ul style="list-style-type: none"> • Tick sizes for medium liquidity stocks on TSE should be optimized, as it will reduce execution costs for investors. • In addition, having different tick sizes for each exchange and PTS makes it difficult for retail investors to understand. Taking into consideration amendments to the best execution policy, tick sizes for exchanges and PTSs should be made uniform. • In order to increase the number of retail investors, we hope that the rules will continue to be reviewed based on fairness (balance between lowering execution costs and securing liquidity) and for clarity. 	<ul style="list-style-type: none"> • These revisions should allow all investors, including retail investors, to trade a wider range of stocks at better prices. • With regard to different tick sizes across markets, excessively small tick sizes will undermine investors' interests mainly because (1) it allows investors to get ahead of other investors just with economically meaningless price differences, (2) it causes a loss of depth in the order book, and (3) it causes confusion among investors due to frequent quote renewals. We understand that for these reasons, there are regulations on minimum tick sizes in the US and European markets. • We will continue to discuss the unification of tick sizes across cash equity markets in Japan with market users from the perspective of ensuring a fair competitive environment and eliminating complexity in the market.

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8	<ul style="list-style-type: none"> • In July 2021 when TSE optimized tick sizes for ETFs, we also hoped the same would be done for TOPIX Mid 400 constituents as soon as possible. We are so excited to see it finally happening. Thank you very much for your tireless and thoughtful effort to align diverse perspectives of market participants and other stakeholders to make this critical change happen. • We support your continued effort in taking further step to optimize tick sizes of stocks outside of TOPIX Mid 400 constituents. 	<ul style="list-style-type: none"> • Tick sizes need to be optimized appropriately in consideration of liquidity and product characteristics. We will consider expanding issues subject to these revisions, taking into account the impact of these revisions on variables such as liquidity and trading conditions of other issues.
9	<ul style="list-style-type: none"> • As we explained in the previous revisions of tick sizes for ETFs, a stock market, in whatever form it takes, must absolutely guarantee to all investors the fairness and transparency of opportunities for trading in the market and the reliability and appropriateness of prices. • Recently, there has been much discussion about market competition. As a retail investor, my main concern would be that market competition would improve the speed of placing and executing orders, fund settlements, and rights processing, and would increase the number of attractive listed issues. 	<ul style="list-style-type: none"> • These revisions should allow all investors, including retail investors, to trade a wider range of stocks at better prices. • With regard to different tick sizes across markets, we understand that there are regulations on minimum tick sizes in the US and European markets. • We will continue to discuss the unification of tick sizes across cash equity markets in Japan with market users from the perspective of ensuring a fair competitive environment and eliminating complexity in the market.

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	<ul style="list-style-type: none"> • So, we consider the original purpose for competition is to enhance the market's own attractiveness and encourage investors to use the market by differentiating its function and products it handles. • This is our second comment to be submitted. It is also about tick sizes across markets. • In conclusion, tick sizes for the same issues should be the same in all cash equity markets. In the previous comment, we suggested that tick sizes for the same issues should be the same across markets because in terms of the relationship between investors and arbitrage traders, the current situation contradicts the principle of fairness and transparency in trading. This time, we would like to propose that tick sizes for the same issues should be the same across markets in order to promote legitimate competition among markets. • This is because the illusion created by the current rules for best execution which focus only on execution price can distort the conditions for market selection. In particular, if an SOR system with a condition for automatic market selection to "place an order in the market with the better 	

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	<p>quote, even only by JPY 0.1," the order will be automatically placed even if the number of shares per tick size is completely unbalanced with that of the order. If you were to take advantage of this order placement system and intentionally present the best quote among markets for investors with a minimum volume, then you would be able to solicit orders through an SOR on your own market.</p> <ul style="list-style-type: none"> • This is when the damage is done. For example, if an issue is quoted at a JPY 1 bid and JPY 2 offer on another market, 100 shares of the same issue could be quoted in your own market at a JPY 1.2 bid and JPY 1.8 offer in order to solicit orders in your market. • If orders involve a purchase of 5,000 shares and sale of 4,000 shares, a purchase and sale of 100 shares each will be immediately executed, and your market will succeed in soliciting the orders as intended. However, orders involving 4,900 shares at a JPY 1.8 bid and 3,900 shares at a JPY 1.2 offer will remain unexecuted. At this moment, the market will turn into a battlefield for arbitrage traders, and orders of 3,900 shares at a JPY 1.2 bid and 3,900 shares at a JPY 1.8 offer will be placed and executed in a few millionths of a 	

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	<p>second, resulting in a profit of 3,900 times the price of JPY 0.6 for arbitrage traders. The JPY 1 bid and JPY 2 offer will serve as a decoy to solicit orders to a certain market and for the sake of arbitrage traders. This is a special kind of fraud in which victims are unaware of the damage being done.</p> <ul style="list-style-type: none"> • To promote fair and legitimate competition among markets, tick sizes for the same issue should be the same in any market. 	
10	<ul style="list-style-type: none"> • These revisions to reduce tick sizes for medium liquidity stocks, which follows the reduction in tick sizes for ETFs, is useful for responding to the needs of investors who wish to trade at appropriate execution prices. At the same time, a reduction in tick sizes should be considered not only to see whether it will reduce overall execution costs, but also whether its benefits can be widely enjoyed by a diverse range of market participants, including retail investors. In determining the appropriate tick sizes, we hope that careful consideration will be given to the above aspects. • Also, from the standpoint of retail investors, different tick size tables applied to different issues and those applied to TSE and proprietary trading systems (PTSs) would lead to 	<ul style="list-style-type: none"> • Tick sizes are currently determined according to price and index categories for cash equities for the sake of clarity, and we will continue to consider improvements to the rules with regard to the scope of issues to which the tick size table for TOPIX 100 constituents is applied, while also examining the impact of these revisions. • We will continue to discuss the unification of tick sizes across cash equity markets in Japan with market users from the perspective of ensuring a fair competitive environment and eliminating complexity in the market. • With regard to different tick sizes among markets,

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	<p>confusion. It would be desirable to establish a rule that requires applying a common table and not separating tick size tables for each issue and/or exchange (PTS).</p> <ul style="list-style-type: none"> In addition, since competition that excessively reduces tick sizes could lead to investor confusion, we request that TSE consider implementing uniform rules among cash equity markets in Japan and issues going forward, taking into consideration simplicity and convenience for investors. 	<p>excessively small tick sizes will undermine investors' interests mainly because (1) it allows investors to get ahead of other investors with economically meaningless price differences, (2) it causes a loss of depth in the order book, and (3) it causes confusion among investors due to frequent quote renewals. We understand that for these reasons, there are regulations on minimum tick sizes in the US and European markets.</p>

Comments No. 1 from XTX Markets Limited; No. 2. from Optiver Australia Pty Limited; No. 3. from Kyokuto Securities Co., Ltd.; No. 4. from Credit Suisse Securities (Japan) Limited; No. 5. from JPMorgan Securities Japan Co., Ltd.; No. 6 from Citadel Securities (Hong Kong) Limited; No. 7. from Tachibana Securities Co., Ltd.; No. 8. from Barclays Securities Japan Limited; No. 9. from THE HIKARI SECURITIES CO., LTD.; and No. 10. from Monex, Inc.