



May 10, 2020

Ms. Vanessa Countryman
Secretary
U.S. Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549-0609

Re: File No. SR-IEX-2019-15

Dear Ms. Countryman:

Investors Exchange LLC (“IEX”) is writing to respond to certain comment letters from Nasdaq, Inc. (“Nasdaq”), Citadel Securities (“Citadel”), and the FIA Principal Traders Group (“PTG”)¹ concerning IEX’s proposal to add a new Discretionary Limit order type (“D-Limit”).² This proposal, which is described in detail in the D-Limit Filing, is designed to provide protection to users of the order type from the harmful effects of specific latency arbitrage trading strategies. It would do so by automatically repricing the orders in the discrete moments when IEX’s Crumbling Quote Indicator (“CQI”) algorithm predicts the national best bid or offer (“NBBO”) for the relevant security will move in a way adverse to the submitter of the order within the next two milliseconds. These discrete moments, while the CQI is “on”, add up, on average, to only seconds of each trading day. At all other times, D-Limit orders would react like any other limit orders posted to IEX.³

Introduction and Recent Market Developments

What is the Issue?

The D-Limit proposal is an exchange innovation that is narrowly-tailored to address a clear and present issue in our equities markets: a decline in displayed liquidity and the impact of certain specific trading strategies that contribute to it. In our earlier response to comments,⁴ we described how long-term trends in the equity markets have created a barrier to entry and burden on competition, including a contraction in the number of market makers and a sharp decline in the amount of displayed trading liquidity. The Commission has recently explained how market structure changes over time have contributed to less displayed liquidity at the best prices.⁵ This is borne out by market analyses, including an alarming report published by the Wall Street Journal in January 2020, showing a greater than 90% reduction in the

¹ Letter from Joan Conley, Senior Vice President & Corporate Secretary, Nasdaq, Inc., to Vanessa Countryman, Secretary, SEC, dated March 26, 2020; Letter from John Berger, Managing Director, Citadel Securities, to Vanessa Countryman, Secretary, SEC, dated April 23, 2020; Letter from Joanna Mallers, Secretary, FIA Principal Traders Group, to Vanessa Countryman, Secretary, SEC, dated April 23, 2020 (“PTG Letter”).

² See Securities Exchange Act Release No. 87814 (December 29, 2019), 84 FR 71997 (December 30, 2019) (“D-Limit Filing”).

³ See generally the D-Limit Filing, 84 FR at 71999-72001.

⁴ Letter from John Ramsay, Chief Market Policy Officer, IEX, to Vanessa Countryman, Secretary, SEC, dated February 13, 2020 (“First Response Letter”).

⁵ Securities Exchange Act Release No. 88216 (February 14, 2020), 85 FR 16726, 16751 (March 24, 2020) (“Market Infrastructure Proposal”).

number of shares available at the best prices in the SPDR S&P 500 ETF from 2007 to 2018, as one example of the overall reduction in market liquidity.⁶

In recent weeks, as market volatility has increased dramatically in reaction to the COVID-19 outbreak, this problem has gotten worse. The markets have seen a further substantial decrease in the depth of liquidity at the NBBO. For S&P 500 stocks, the average displayed quote size declined by 69% from January to March 2020. For Russell 2000 stocks, the average decline was 46% over the same time period.⁷ In addition, a timely report titled “U.S Equity Liquidity in the COVID-19 Crisis” illustrated both a sharp decline in displayed liquidity and a corresponding sharp increase in spreads from January to the period from March 9 to 27, 2020.⁸ Institutional investors in particular are incurring substantially higher trading costs due to the lack of liquidity and wider spreads, coupled with the fact they are routing large orders over a longer time horizon.⁹ A recent study by Virtu Financial found that institutional costs surged 42% in the first quarter of this year compared to the prior quarter.¹⁰ Other studies have confirmed these findings.¹¹

One factor influencing the trend toward less displayed liquidity is the “structural tax” on liquidity providers from specific latency arbitrage strategies that leverage speed advantages held by a small number of trading firms. Fundamental participants, such as the largest agent brokers and institutional investors, by reason of their business models, do not have the tools to trade in microseconds so as to protect themselves from these strategies. In addition, many small to mid-size investors and brokers do not have the means to purchase the high-speed trading infrastructure necessary to protect their orders from latency arbitrage. Further, even high-speed market makers, due to the large number of displayed bids and offers they have in the market at any moment, are often unable to adjust these orders fast enough to protect against strategies that can choose to send “aggressive” orders in specific stocks when they detect that the market is moving in their favor, as reflected by supportive comment letters on D-Limit.¹² Recent research has confirmed the existence and impact of the structural tax of latency arbitrage imposed on liquidity providers,¹³ and market participants have explained its impact on their reduced willingness to contribute displayed orders.

Since well before the adoption of Regulation NMS in 2005, displayed liquidity has been an integral part of the price discovery process and the national market system overall. However, the only innovations

⁶ See Wall Street Journal, “Buying or Selling Stocks? It Isn’t Always Easy” (January 2, 2020).

⁷ IEX analysis of TAQ data.

⁸ Mittal, Saraiya, and Berkow, “U.S. Equity Liquidity in the COVID-19 Crisis”, avail. at <https://bestexresearch.com/wp-content/uploads/2020/04/BestEx-Research-Market-Impact-Analysis-20200331.pdf>, at 7-11. The authors calculate that normalized spreads increased 7.2 times for S&P 100 stocks and 4.1 times for Russell 2000 stocks.

⁹ *Id.* at 13-15.

¹⁰ See The Trade, “Virtu Financial study reveals surge in trading costs globally during March,” (April 16, 2020), avail. at <https://www.thetradenews.com/virtu-financial-study-reveals-surge-trading-costs-globally-march/>.

¹¹ See, e.g. RBC Capital Markets, Global Equities Algorithmic Execution (March 2020), avail. at https://www.rbccm.com/assets/rbccm/docs/housing-market/COVID_Expected_Cost.pdf: “Cost has tripled from 13 bps in pre-volatile period to 42 bps in the recent week when VIX reached 78.”

¹² Letter from Eric Swanson, CEO, XTX Markets LLC, to Vanessa Countryman, Secretary, SEC dated January 17, 2020 (“XTX Letter”); Letter from Thomas Merritt, Deputy General Counsel, Virtu Financial, to Vanessa Countryman, Secretary, SEC, dated January 16, 2020 (“Virtu Letter”).

¹³ Acquilina, Budish, and O’Neill, “Quantifying the High-Frequency Trading ‘Arms Race’: A Simple New Methodology and Estimates” (January 2020), avail. at <https://www.fca.org.uk/publications/occasional-papers/occasional-paper-no-50-quantifying-high-frequency-trading-arms-race-new-methodology> (“FCA Study”).

exchanges have created to encourage displayed trading over the past 15 years have primarily involved various adjustments to their transaction pricing schemes, including rebate pricing. In fact, over that period there have been far more exchange innovations to enable speed-based trading strategies (e.g., the introduction of microwave communication methods, new connectivity products).¹⁴ The current state of vanishing displayed liquidity and the rise of off-exchange trading venues is living proof that innovation is badly needed, as participants continue to seek ways to avoid trading on exchanges. IEX is encouraged by the overwhelming support we have received for this particular innovation from participants spanning pension funds, mutual funds, hedge funds, broker-dealers, and market makers, all of which would have greater incentive to contribute to displayed liquidity and price discovery if D-Limit is approved.

How Does D-Limit Address the Issue?

D-Limit would create an option to help participants avoid the impact of this structural tax and thus encourage greater provision of liquidity on IEX. It is unique in the following ways:

- It is narrowly-tailored to protect liquidity providers from the impact of speed-enabled trading strategies during brief moments in time during the trading day when participants using latency arbitrage strategies have the greatest advantage.
- It is available to all market participants, including both market makers and brokers acting on behalf of investors, without the need for any special trading technology.
- The protection would be managed by the exchange using a transparent and deterministic formula.
- It carefully balances the needs of market participants when they are providing liquidity and when they need to access it.
- It is backed up by substantial data showing how latency arbitrage impacts trading on IEX and how participants will benefit from use of the D-Limit option.

Most important, D-Limit reflects a private market innovation responding to a market problem that has emerged under the existing market structure and regulation. The nature and extent of the problem is clear from public reports and studies and the statements of market participants themselves. This one solution does not require any new regulation or changes to regulations, and IEX is not seeking any exemption from the existing rules. Allowing D-Limit to go forward also does not require any new type of government oversight to try to alter how participants engage in the capital markets.

Instead of limiting participant choice, our proposal expands the choices available by allowing an exchange to harness the technology and market information that is available to it, in real-time. Ultimately, market participants should determine whether and how D-Limit meets their needs, based on their individual experiences in interacting with our market. By giving this new option an opportunity to succeed, the Commission will help to promote its three-part mission to protect investors, maintain fair, orderly, and efficient markets, and facilitate the formation of capital.

Views of Market Participants

The need and demand for a private-market solution is shown by the level of interest and support for D-Limit by a broad cross-section of market participants that is rare, if not unprecedented, for a single exchange order type proposal. The written support comes from 33 asset managers, 14 pension funds and other investor associations representing well over \$13 trillion in assets, and broker-dealers, including

¹⁴ See Letter from Thomas Merritt, Deputy General Counsel, Virtu Financial, to Vanessa Countryman, Secretary, SEC, dated March 10, 2020, concerning NYSE proposal to impose new wireless connectivity fees.

electronic trading firms, trading for themselves and on behalf of clients, among others.¹⁵ The following are some excerpts from participants explaining how this problem impacts them and how D-Limit would help to address it:

Vanguard: “The repricing feature of D-Limit orders will benefit investors by addressing an important shortcoming in today’s equity markets – lack of diversity of liquidity provision...Organizations that do not pay for data products that provide unparalleled speed advantages are discouraged from posting liquidity on exchanges because they may receive unfavorable executions. The proposed D-Limit order offers these market participants a potential way to mitigate the risk of posting liquidity without participating in a costly high-speed race to minimize latency. Put simply, the D-Limit order type is pro-competitive.”¹⁶

Capital Group: “Capital Group and other investment firms like us have increased the use of non-displayed liquidity to implement long-term investment decisions. D-Limit is an innovation that is designed to ensure the equitable treatment of orders in the lit market, increase posting of displayed liquidity, and enhance price discovery.”¹⁷

Brandes Investment Partners, et al.: “In a trading environment that has increasingly gone dark, we believe the new order type proposed by IEX is a timely and badly needed innovation that goes to the heart of the market forces that have caused this shift and has market participants increasingly avoiding trading ‘out loud’ (therefore weakening the price discovery function of the markets).”¹⁸

Virtu Financial: “We believe that IEX's proposal is a highly innovative, market-based solution that will mitigate the negative effects of certain predatory trading behaviors that have been spawned by the latency arbitrage that exists in today's lightning speed markets.”¹⁹

Stephens Inc.: “It is now time to allow market participants to obtain the protections offered by CQI for orders with displayed liquidity. As others have noted, extending this functionality through the D-Limit Order Type would not only offer such protections but also allow for such orders to contribute to price discovery.”²⁰

Goldman Sachs: “IEX’s rule proposal has the potential to encourage the public display of limit orders...[W]e believe that the benefits derived by providing this limited protection for displayed liquidity will advance the goals of the national market system.”²¹

¹⁵ See generally SEC comment file at <https://www.sec.gov/comments/sr-iex-2019-15/sriex201915.htm>.

¹⁶ Letter from Gregory David, Managing Director and Chief Investment Officer, The Vanguard Group, Inc., to Vanessa Countryman, Secretary, SEC, dated April 23, 2020.

¹⁷ Letter from Peter D. Stutsman, Global Head of Trading, The Capital Group Companies, Inc., to Vanessa Countryman, Secretary, SEC, dated March 16, 2020.

¹⁸ Letter from Joseph Scafidi, Global Head of Trading and Carlos Oliveira, Head of Trading Analytics and Market Structure, Brandes Investment Partners, L.P., to Vanessa Countryman, Secretary, SEC, dated February 20, 2020 (“Brandes Letter”).

¹⁹ Virtu Letter.

²⁰ Letter from Curtis F. Bradbury, Jr., Chief Operating Officer, Stephens, Inc., to Vanessa Countryman, Secretary, SEC, dated February 28, 2020.

²¹ Letter from Philip Berlinski, Co-Chief Operating Officer, Equities, Global Markets, Goldman, Sachs & Co., LLC, to Vanessa Countryman, Secretary, SEC, dated February 26, 2020 (“Goldman Sachs Letter”).

Group Pension Fund Letter: “We believe that D-Limit will encourage greater amounts of displayed liquidity from a wide diversity of participants, to the benefit of the US equity market overall.”²²

The London Company: “The reality is that the displayed trading environment today is not a level playing field... This has resulted in a decline in displayed market liquidity and an increased reliance on off-exchange venues and liquidity providers, weakening the very aspect of the market that drives price discovery. In our opinion, D-Limit addresses this issue head-on in a fair and transparent manner and has the capacity to... improve the overall displayed trading environment for the benefit of all market participants.”²³

XTX Markets: “XTX Markets believes IEX’s D-Limit order will have the effect of mitigating the harm caused by aggressive liquidity-removing strategies that seek to exploit high-speed information asymmetry advantages and will thereby incentivize liquidity providers to narrow spreads and display larger size for the benefit of end investors.”²⁴

AJO: “Rarely do we come across a proposed order type or exchange mechanism that is truly accessible to all market participants and that aims to benefit all users who choose to employ it. We believe that D-Limit is unique in this regard, and we commend IEX’s continued effort to create a level playing field in our equity markets.”²⁵

Vontobel Asset Management: “The D-Limit order type proposes to extend these benefits to displayed orders, which is an area of the market driven primarily by other exchanges’ rebate structures... As a market participant, we have witnessed an ever-increasing amount of volume being traded off-exchange, which we and others believe has been driven by the poor experience of displaying orders on traditional exchanges.”²⁶

Clearpool Group: “[I]nvestors (and their broker-dealer counterparties) are proactively looking to avoid getting “picked off” on exchanges by predatory traders and trading practices. Clearpool has seen this firsthand; according to our own venue data analysis, adverse selection on ‘rest’ or ‘passive’ trading is significantly worse in lit order types versus dark order types... The D-Limit order type has the potential to... promote displayed liquidity and reduce adverse selection.”²⁷

AGF Management Ltd.: “[The rise of high-speed trading] has caused many investors to steer orders away from exchanges, which ultimately reduces the displayed liquidity in the markets... D-limit will provide a

²² Letter from Kevin Duggan, Managing Director, Capital Markets, Ontario Teachers' Pension Plan; Benoit Gauvin, Vice-President, CDPQ; and Alex Done, Deputy Comptroller, Office of New York City Comptroller, et al., to Vanessa Countryman, Secretary, SEC, dated February 24, 2020.

²³ Letter from David Brooks, Director of Trading, The London Company, to Vanessa Countryman, Secretary, SEC, dated February 20, 2020 (“The London Company Letter”).

²⁴ XTX Letter.

²⁵ Letter from Sean Taylor, Trader, AJO, L.P., to Vanessa Countryman, Secretary, SEC, dated February 10, 2020 (“AJO Letter”).

²⁶ Letter from Gary Thompson, Executive Director, Head of Global Trading, Vontobel Asset Management, Inc., to Vanessa Countryman, Secretary, SEC, dated February 14, 2020.

²⁷ Letter from Ray Ross, Chief Technology Officer, Clearpool Group, to Vanessa Countryman, Secretary, SEC, dated January 21, 2020 (“Clearpool Letter”).

direct, not theoretical, benefit to AGF and other institutional investors as well as market makers without requiring them to participate in the technology arms race required to compete today.”²⁸

Raymond James & Associates: “There is no practical reason why displayed orders must remain subject to potential adverse executions by low-latency traders, when non-displayed orders can avail themselves of the CQI feature. Extending this functionality to displayed orders through the D-limit order type would provide similar protections as the Discretionary Peg Order type but would allow for such orders to contribute to price discovery.”²⁹

Themis Trading: “Unlike many of the offerings on other exchanges, IEX’s Discretionary Limit will provide equal protection to all of its users and it will promote more displayed liquidity. IEX is trying to address the displayed limit order problem that has plagued the market for years. Their solution is truly innovative and we believe it will result in an increase in the amount of displayed limit orders and therefore will help contribute to the price discovery process.”³⁰

T. Rowe Price: “The disincentive to all market participants to provide displayed quotes in fear of getting “picked off” when the price is in transition to a new price level continues to plague displayed markets. We commend and support IEX for taking steps to address the speed and information asymmetry advantages that are utilized by a small subset of market participants to the disadvantage of asset managers and other institutional investors.”³¹

Council of Institutional Investors: “We believe the D-Limit order type could be a particularly useful tool to investors in light of the long-term decline in displayed liquidity in U.S. markets – a decline that has been exacerbated by the ongoing COVID-19 crisis.”³²

The Question Posed by the D-Limit Filing

In the securities markets, like other markets, participants that are able to do so generally seek to benefit from the opportunities that are provided to them, within the context of existing laws and regulations. Therefore, exchanges play a crucial role in shaping the opportunities that are available to all their members and other participants by the choices exchanges make in designing their markets and the products and services they offer. Not all members may agree with all the decisions made, but markets will never evolve effectively if exchanges are not able to make different choices and thus expand the range of choices available to both intermediaries and investors.

Like most meaningful innovations, D-Limit has been met with resistance from a narrow group of entrenched players who have the most to lose if it is allowed to be introduced. On the other hand, D-Limit has been supported by a much larger and broader set of participants who have the most to gain. It

²⁸ Letter from John Christofilos, Senior Vice President, Chief Trading Officer, AGF Management Ltd., to Vanessa Countryman, Secretary, SEC, dated February 11, 2020.

²⁹ Letter from David Cannizzo, Managing Director, Head, and Rich Delayo, Director, Electronic Trading and Market Structure, Raymond James & Associates, Inc., to Vanessa Countryman, Secretary, SEC, dated February 24, 2020.

³⁰ Letter from Sal Arnuk and Joseph Saluzzi, Partners and Co-Founders, Themis Trading LLC, to Vanessa Countryman, Secretary, SEC, dated February 6, 2020.

³¹ Letter from Mehmet Kinak, VP & Global Head of Systematic Trading & Market Structure and Jonathan D. Siegel, VP & Senior Legal Counsel - Legislative & Regulatory Affairs, T. Rowe Price, to Vanessa Countryman, Secretary, SEC, dated February 5, 2020 (“T. Rowe Price Letter”).

³² Letter from Jeff Mahoney, General Counsel, Council of Institutional Investors, to Vanessa Countryman, Secretary, SEC, dated April 23, 2020.

should be noted that these participants are not speaking on behalf of IEX; instead, they are speaking for themselves, from their own experience.

Thus, the real issue presented by our proposal is simply this: whether any exchange is able to innovate to address a clear and present problem in our capital markets – in this case, the continuing erosion of displayed liquidity and price discovery – by offering a carefully-tailored option that a wide coalition of participants are saying unequivocally is greatly needed.

We now address specific comments from Nasdaq, Citadel, and PTG. Throughout our response, we cite datapoints from the period spanning January to April of 2020 in order to supplement the metrics referenced in our prior response for two individual months in 2019. These metrics aim to encompass a longer and more recent period that represents the year-to-date 2020 trading environment. However, CQI-related activity remained consistent, and for the avoidance of doubt, we include an Appendix containing month-by-month metrics for 2020.

Response to Individual Comments

Comparisons to EDGA Proposal

Nasdaq, Citadel, and PTG each generally allege that D-Limit fails to satisfy the standards for approval for some of the same reasons identified by the Commission in its recent order disapproving a proposal by the EDGA Exchange (“EDGA”) to impose a 4-millisecond delay on all orders to take liquidity on its market.³³ Citadel specifically questions the data used to support the proposals, claims that IEX has failed to show the existence or impact of latency arbitrage on its market, claims that both proposals would require brokers to change their routing behavior, and suggests that D-Limit would provide benefits to “low-latency firms” without a corresponding obligation.

Response:

The EDGA proposal and IEX’s D-Limit order type are substantially different in multiple ways, and conflating the two proposals is an obvious red herring. In fact, the stark differences between the two proposals are clearly spelled out in comment letters from some market participants that had strongly opposed the EDGA proposal and are now strongly supporting D-Limit. In addition, the SEC’s own language in the EDGA Order reflects these significant differences and points to why D-Limit should be approved.

Among the commenters who have taken different views of the two proposals, Healthy Markets pointed out that EDGA would have essentially provided low-latency traders a free option to cancel their orders for 4 milliseconds before execution, whereas D-Limit would not provide any users with an option whether or not to execute, and that repricing of orders would be deterministic and transparent. Healthy Markets also pointed out that EDGA would have applied a delay throughout the trading day, impacting accessibility of quotations, while IEX “has offered a meaningful analysis” of the moments when the CQI is on, allowing institutional traders the ability to access liquidity.³⁴

³³ Securities Exchange Act Release No. 87814 (December 20, 2019), 84 FR 71997 (December 30, 2019) (“EDGA Order”).

³⁴ Letter from Tyler Gellasch, Executive Director, The Healthy Markets Association, to Vanessa Countryman, Secretary, SEC, dated February 14, 2020.

T. Rowe Price also noted that D-Limit applies consistently pursuant to a formula, while EDGA would have allowed traders to cancel for any reason for up to 4 milliseconds. It also said that D-Limit compares favorably in terms of accessibility to quotes because of the small amount of time the CQI is on and pointed out that investor order taking is driven by a fundamental demand for liquidity, not momentary price changes. Further, T. Rowe Price commented that D-Limit, as a protected quotation, would avoid the confusion and problems that could result from disseminating a non-protected quote, as proposed by EDGA, through the securities information processors.³⁵ Clearpool echoed the points about the significant differences in the design of the two proposals and added that D-limit would alleviate concerns about the impact of an unprotected quote on the national market system and on brokers' best execution responsibilities.³⁶

The Commission's EDGA Order itself also makes the differences very clear. The Commission noted that the EDGA delay was meant to address certain cross-asset trading strategies involving latency differences between Chicago and New Jersey but did not provide evidence of how these strategies affected trading on EDGA, "for example by providing an estimate of the percentage of activity effected by signals from the futures markets."³⁷ With regard to mark-out data, the Commission noted that EDGA provided data on three ETFs and three common stocks but did not explain why it chose those symbols, explain why they were representative, or provide data on the relative sizes of orders between the two groups.

In contrast, IEX has provided data drawn from the full spectrum of stocks – presently 8,600 different symbols³⁸ – traded on IEX, has shown how trading characteristics differ by type of firm, and has provided data comparing mark-outs based on actual trading experience with CQI, comparing results when the CQI is on, to the bulk of the day when it is off. Beyond that, we have provided further data analyzing the difference between high and low liquidity stocks and between high and low volatility periods. In addition, in this letter, we are supplementing the record with more data for resting orders during recent high volatility conditions, to show that even in the most extreme conditions, D-Limit orders will still remain available to investors and brokers. Further, because D-Limit would operate through a disclosed formula, participants could conduct their own analyses on how the CQI performs for different symbols in different time periods, something the EDGA proposal did not allow.

Second, the SEC determined that EDGA had not demonstrated its proposal was narrowly-tailored enough – why it was necessary to apply a delay to all taking orders rather than those related to latency arbitrage strategies, or why a delay of 4 milliseconds (keyed to the distance between Chicago and New Jersey) was appropriately applied to all orders to take liquidity, as opposed to tailoring a response to the identified activity.³⁹ In contrast, IEX has not sought to impose any delay on taking orders but has designed the D-Limit protection to apply only in the discrete moments when latency arbitrary strategies are most toxic. IEX has also shown through trading data that the vast majority of market participants are not seeking to trade in these moments, and brokers and institutional investors have said the same in their comments.

³⁵ T. Rowe Price Letter, note 31 *supra*.

³⁶ Clearpool Letter, note 27 *supra*.

³⁷ EDGA Order, at 11432.

³⁸ Unique symbols traded across January – April 2020 (<https://iextrading.com/stats/>)

³⁹ "The Exchange does not provide specific analysis as to why it is appropriate to apply the 4-millisecond delay to all incoming executable orders that would remove liquidity from the EDGA Book from all market participants as opposed to tailoring a response to target the trading of a relatively small number of market participants who engage in latency arbitrage." EDGA Order, at 11436.

Third, the SEC said that EDGA did not sufficiently address the concern that its delay would be unfairly discriminatory, given comments from institutional investors and agent brokers that they would not be able to make use of the delay when displaying orders themselves but instead would be forced to “bear the full brunt” of latency arbitrage strategies.⁴⁰ EDGA argued that any negative impact would be outweighed by increased liquidity on its market, which only implementation of the proposal could prove out. In contrast, D-Limit by its design is equally available to every member and will benefit investors directly because their brokers will be able to use it, without needing any special technology tools. Many long-term investors in their comment letters have made it clear they would welcome and use the order type, thereby enhancing displayed liquidity and the price discovery it provides.

With regard to how firms would route orders to access liquidity, EDGA acknowledged that brokers might need to alter the way they route orders to account for the 4-millisecond delay. As discussed in the First Response Letter and below, firms will not need to change how they route orders in response to D-Limit if a broker is using the same methods it uses now to maximize liquidity and minimize “slippage” as part of its best execution responsibility, by accounting for the existing latency differences among all exchanges.

With regard to the allegation that IEX has failed to provide evidence of the existence or impact of latency arbitrage on its market, we have provided substantial evidence of both existence and impact in the D-limit Filing and First Response Letter, and we are supplementing it with additional data in this letter.

With regard to the concern that EDGA might provide a benefit to a particular class of latency-sensitive trading firms without requiring a corresponding obligation, D-Limit is equally available to all participants and does not grant any firm discretion as to whether or when a repricing would occur. The benefit of avoiding adverse executions when the CQI is on would be especially helpful for participants who lack the technology tools typically possessed by electronic trading firms. Based on written comments from many of these firms, we believe this protection in turn will encourage a more diverse set of participants to post displayed quotes, helping to address the erosion of displayed liquidity generally.

In sum, the differences between the EDGA delay and D-Limit are stark and easily understood, and these differences point to why D-Limit should be approved. The EDGA delay would have operated for all six and one-half hours of the trading day and would have affected all orders to take liquidity; D-Limit orders would reprice only in moments that total seconds of the trading day. The EDGA delay would have provided discretion to providers whether to cancel; D-Limit provides no discretion. The EDGA delay was found to create a significant risk that investors would lose access to liquidity; D-Limit will not reduce access by investors to liquidity and in fact stands to increase the amount, and diversify the source, of liquidity available to investors, and both these conclusions are backed up by comments from market participants. The EDGA filing was supported by a limited data set; D-Limit is supported by a much wider and more diverse set of data drawn from actual trading experience under a transparent formula. The EDGA delay would have required brokers to change how they route their orders to account for the delay; D-Limit will not. The EDGA proposal created the potential for confusion and complexity in calculating the NBBO and meeting brokers’ best execution responsibilities by disseminating a non-protected quote through the securities information processors; D-Limit will not. The EDGA proposal was aimed specifically to benefit market making firms; the benefits of D-limit will be available to all participants equally.

⁴⁰ EDGA Order, at 11436.

D-Limit as a Protected Quote

Citadel repeats arguments made in some earlier letters that D-Limit orders should not qualify as protected quotes under Rule 611 because it claims the order type uses a delay to “frustrate market participant access to resting quotations,” referencing language in guidance (the “Automated Quotations Interpretation”) the SEC issued when it approved the IEX “speed bump”.⁴¹ In that interpretation, the SEC said that Rule 611 does not prevent an exchange from imposing a delay that is “de minimis” – “a delay so short as to not frustrate the purpose of Rule 611 by impairing fair and efficient access to an exchange’s quotations.”⁴² Citadel argues that D-Limit would impair fair and efficient access “for a very significant portion of total trading activity.” It further argues that even if D-Limit only applies to latency arbitrage activities, limiting the ability to use those strategies to access quotes is not allowed, because accessibility under Rule 611 is not “a relative term”.

Response:

Under the Automated Quotations Interpretation, the SEC focused on whether the length of the delay impedes access to quotations, considering the existing differences, including physical distances, that exist between all exchanges. It found that IEX’s 350 microsecond delay is well within the boundaries of these existing differences and “will not frustrate the purposes of Rule 611 by impairing fair and efficient access to IEX’s quotations.”⁴³ It did not say that a delay is permissible when applied to some order types but not permissible for others. Goldman Sachs made the point clearly:

The SEC has already analyzed IEX’s “speed bump” in the context of its Application for Registration as a National Securities Exchange under Section 6 of the Exchange Act and concluded that IEX is an automated trading center and that its quotes are entitled to protection under Rule 611. The introduction of D-Limit does not alter that analysis. There is no delay embedded within D-Limit Orders. Rather, a D-Limit Order, by design, updates its displayed price based on the operation of IEX’s CQI. This price update may occur before an incoming order is recognized and processed by the IEX matching engine. These circumstances can occur with any protected quotation. A displayed price may no longer be accessible for a number of reasons, including (1) it may have already been executed against; (2) it may have been cancelled before being executed against; or (3) the order may be pegged to the NBBO and the NBBO may update. In each of these scenarios, there is no doubt that the displayed order is considered accessible and protected as representing the best bid and offer on an exchange. D-Limit Orders are no different. They are as accessible as any other quote.⁴⁴

More to this point, the conclusion that access to protected quotes is relative, depending on the factors just cited and others, is not a matter of regulatory interpretation, it’s a simple statement of fact.

For similar reasons, D-Limit is also consistent with the Rule 602, the “Firm Quote Rule”, which prohibits brokers from “backing away” from their quotes when orders are presented to them. Brokers have no discretion as to whether, or when, a D-Limit order will be repriced, which is tightly controlled under a transparent formula. Also as explained in the Goldman Sachs Letter, an order will be “presented” for purposes of the rule only after it traverses IEX’s speed bump, is queued, and reaches the matching engine

⁴¹ Commission Interpretation Regarding Automated Quotations Under Regulation NMS, Securities Exchange Act Release No. 78102 (June 17, 2016), 81 FR 40785 (June 23, 2016).

⁴² *Id.* at 40792.

⁴³ Securities Exchange Act Release No. 78101 (June 17, 2016), 81 FR 41142, 41162 (June 23, 2016).

⁴⁴ Goldman Sachs Letter note 21 *supra*.

for execution. Any repricing of D-Limit orders due to the operation of the CQI would occur prior to this sequence in the same way that pricing of a “pegged” order may adjust before an incoming order is presented to it for execution.

In terms of fair and efficient access, the SEC has made clear that the entire purpose and premise of classifying automated quotes as “protected” was to serve the interests of investors and to encourage them to display their trading interest in greater size.⁴⁵ D-Limit is designed to promote fair and efficient access to quotes because it will allow all market participants to be on an equal footing in accessing quotes, and it will reduce the advantages, on at least one market, that allow the absolute fastest participants to profit in accessing quotes when prices are unstable. As the London Company put it: “The reality is that the displayed trading environment today is not a level playing field. Displayed quotes today are often fleeting and largely accessible only to the fastest participants when the market moves, with predictably unfavorable results *for liquidity providers and seekers* not quick enough to respond to sub-millisecond changes in market conditions.”⁴⁶ From the standpoint of fairness to liquidity providers, as CII put it, “it makes no sense to define as ‘protected’ only quotes that provide investors no protection against speed trading strategies.”⁴⁷

Citadel implies that “fair and efficient” means that only market participants with the advantage of superior speed and technology have the right to preferred access to liquidity on every exchange, and that no exchange can introduce an order type that could in any way affect that preference. The SEC has never taken that position, and in fact such a policy would make a mockery of the goals the Commission has set for the national market system.

The Existence and Impact of Latency Arbitrage Strategies

Nasdaq, Citadel, and PTG to various degrees all question whether IEX has sufficiently shown that latency arbitrage is occurring on its market, the impact of such strategies, and the benefits of D-Limit. Citadel and PTG question whether trading identified as resulting from such strategies may result from trading for retail investors, from intermarket sweep orders, or hedging by market makers. Citadel questions IEX’s method of classifying firms for these purposes, and it implies that a significant proportion of its trading on IEX involves retail orders and that most of these involve orders to take liquidity. Nasdaq suggests that, since only a small number of firms account for the bulk of all trades to take liquidity when the CQI is on, and because investors are not seeking to trade in these moments, the issue IEX is addressing must not be widespread. Finally, Nasdaq asserts that the FCA Study,⁴⁸ which determined that strategies designed to pick off displayed orders result in a multibillion-dollar tax on liquidity providers, relied on insufficient data and has no relevance to trading on IEX.

Response:

The conclusion that the preponderance of trading during a time the CQI is on results from deliberate proprietary trading strategies and not from other types of order flow is based on the following facts and data:

⁴⁵ See First Response Letter, at 5.

⁴⁶ The London Company Letter, note 21 *supra* (emphasis supplied).

⁴⁷ Letter from Kenneth A. Bertsch, Executive Director, and Jeff Mahoney, General Counsel, Council of Institutional Investors, to Vanessa Countryman, Secretary, SEC, dated February 11, 2020.

⁴⁸ See note 13 *supra*.

Orders sent in these moments are highly concentrated, requiring very low-latency tools.

Orders that are randomly submitted will not aggregate in such high numbers just in the moments when IEX's CQI signal is on. Since the signal is on for just seconds during the trading day, in terms of odds, if the signal for a symbol were on for 5 seconds, for example, an investor's marketable order for that stock arriving randomly to IEX would have a roughly 1 in 5,000 chance of arriving while the CQI is on, and even then, the order would receive an execution only if a contra-side order at the right price was available at that precise moment.

Indeed, numerous letters from investors and brokers confirm that D-Limit will not hinder their access to liquidity when they need it and will give them more incentive to supply it. We previously produced data showing that in two months in 2019, 33.7% of all marketable orders arrived in the two milliseconds after the CQI fires (of these nearly 90% were sent by proprietary trading firms), and such orders accounted for 24.8% of all trading volume involving displayed orders.⁴⁹ The datapoints were consistent across months, and the disparate time periods were only used because the two datapoints were provided in isolation and answered two different questions. Updating this data, in January - April of this year, 27.3% of all marketable orders to take liquidity, accounting for 22.9% of displayed volume, arrived in these moments. In contrast, the total percentage of trading volume resulting from orders to take *non-displayed* volume, which benefits from protections against adverse selection, during these moments was only 1.7%. As demonstrated in Appendix A, these datapoints are fairly consistent across months and are equally consistent in both highly volatile and non-volatile periods.⁵⁰

The ability to time orders to arrive with this level of precision requires very sophisticated, low-latency tools to aggregate data from all the markets and react to price changes in microseconds. Independent studies have documented the competition among proprietary firms using these strategies to be "first in line" to execute against a resting order.⁵¹ Since there can be only one winner of such a race, for latency arbitrage strategies, a small number of microseconds matters. The FCA study showed that the high-speed trading strategies that won these races did so with a typical margin of victory of between 5 to 10 microseconds.

Analysis of market data on IEX helps to demonstrate this point. We compared activity around trades that remove displayed liquidity during a CQI to ones that remove displayed liquidity when the CQI is "off". For the period of January - April 2020, we measured how often trades removing liquidity in a CQI are followed by aggressive orders, i.e., orders to "cross the spread", from distinct market participants (not the original order sender) in the same direction within the next 100 microseconds, compared to trades that remove liquidity outside of a CQI. **We found that aggressive orders followed CQI trades within just 100 microseconds 9.4 times more often than other, non-CQI trades.** This data also shows that these "follow-on" orders were not reacting to a report of a trade, but competing to execute against the displayed liquidity, since as a result of IEX's 350 microsecond speed bump, the follow-on orders would be received well before any trade report of the previous execution would be disseminated.

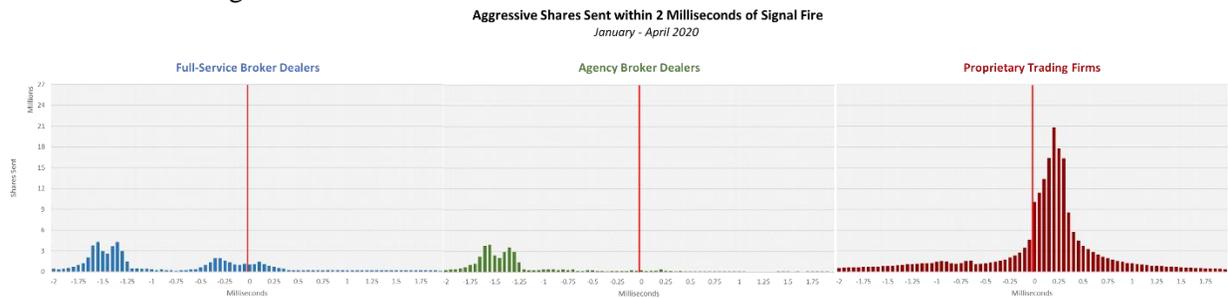
⁴⁹ Percentage of marketable orders arriving within 2 milliseconds of CQI fire as per September 2019; percentage of such orders compared to all displayed trading as per November 2019.

⁵⁰ See Appendix A for a month-by-month breakdown.

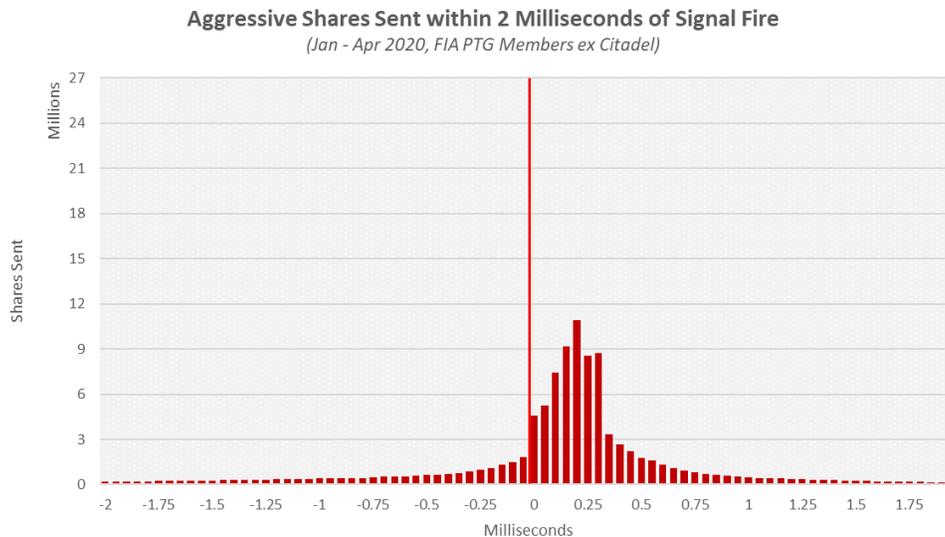
⁵¹ See, e.g., FCA Study; O'Hara, M., High Frequency Market Microstructure, Journal of Financial Economics (2015), avail. at http://statmath.wu.ac.at/~hauser/LVs/FinEtricsQF/References/oHara2015JFinEco_HighFrequ_Market_MicroStruct.pdf; Budish, Cramton, Shim, "The High-Frequency Arms Race: Frequent Batch Auctions as a Market Design Response, Quarterly Journal of Economics, Nov. 2015, avail. at <https://core.ac.uk/reader/45686230>.

Analysis of data segmented by firm type helps to confirm the conclusion.

We use the general classification of firms as full-service, agency, or proprietary to provide further support to the conclusion this concentrated order activity involves deliberate latency arbitrage strategies. The classifications are based on interactions of IEX employees with and input from our members, as well as generally available public information. Because these categories are used to support the conclusion, but do not drive it, they do not need to reflect all the order flow that comes from any one firm. Previously, we showed that almost all the aggressive taking orders within two milliseconds after the CQI fires results from the “proprietary” group. To update that data, we looked at trading for recent low and higher volatility periods, spanning January – April 2020. The results, shown below and expanded in Appendix A on a per-month basis, show that the preponderance of aggressive taking orders by firms in the proprietary category is practically identical for both these periods as well as the earlier period documented in the D-Limit Filing.



Next, we looked at the pattern of aggressive taking orders during a CQI, just for firms that are members of the PTG other than Citadel (which is a member of the PTG but has objected to its classification as a proprietary trading firm). On its website, PTG, the membership of which is public,⁵² describes itself as “an association of firms that trade their own capital on exchanges in futures, options and equities markets worldwide.”⁵³ Even excluding Citadel, the distribution and scale of aggressive taking interest precisely matches patterns seen for all firms classified as proprietary, as seen below. Like the previous datapoints provided, the below chart spans January – April 2020, while Appendix A has this data broken out monthly.



⁵² See <https://www.fia.org/membership-1>

⁵³ See <https://www.fia.org/about-fia-principal-traders-group>

This pattern is remarkably consistent with that shown for all Proprietary Trading Firms in another way. The “peak” for the distribution of aggressive shares sent within two milliseconds of the CQI firing comes *after* the signal fires, suggesting that both Proprietary Trading Firms as a group, as well as the FIA PTG subgroup, are *reacting* to another market occurrence. Conversely, both full-service and agency brokers experience their “peak” well before the signal fires, suggesting that they are causing the event that others are reacting to and therefore do not trigger the CQI. Finally, while the CQI predicts quote changes in a two-millisecond time window, in all these views, the bulk of all taking orders after the CQI fires occurs well under one millisecond, and the peak of those orders occurs in the range of 200-250 microseconds, a time frame that is less than the time required to traverse the IEX speed bump, as well as the time it would take for a market participant using a standard fiber connection, rather than the fastest technology, to send messages between the Cartaret and Mahwah data centers.⁵⁴

Claims about a negative impact on other types of orders are meritless.

It should be clear that most brokers, including brokers representing investor orders, are not able to compete in this way.⁵⁵ On the other hand, agent brokers and investors have made clear that they believe their interests and overall market quality are harmed by the use of these latency arbitrage strategies.

This is obviously also the case for individual retail investors, and nothing that Citadel insinuates about its own orders suggests that retail orders would be in any way negatively impacted by D-Limit. Citadel mentions the significant percentage of displayed resting orders on IEX that trade when the CQI is on based on IEX data and seemingly implies that a significant portion of their retail orders come to IEX to remove such lit orders in that short period of time. Looking more closely at its comments, Citadel is careful to write generally in terms of percentage of activity rather than volume and broadly refers to the majority of retail orders (80%) being liquidity takers without specifying whether or not those orders seek to trade against displayed IEX orders, seek to trade at the midpoint, or seek to trade with the far side of the NBBO when there is no displayed order on IEX. In fact, Citadel never mentions percentages of *volume* for any of its retail activity that generally or specifically relates to possible trading against displayed D-Limit orders.

The more credible comment on D-limit and retail orders came from AJO, which stated: “To suggest that retail orders would be adversely impacted by this proposal is unfair and misleading.”⁵⁶

Similar to the insinuation about retail orders, market makers sending orders to hedge their exposures are trading throughout the trading day as their positions and risks change on other markets. It is not credible to suppose that orders from market makers sent to hedge risks on various markets happen to converge at IEX in the tiny time increments when the CQI signal is on. And, in fact, D-Limit has been supported by market makers that rely on equities markets to hedge.⁵⁷ Further, market participants who rely on the ability to access liquidity through “intermarket sweep” orders have clearly said they do not believe D-Limit would limit their ability to access liquidity at displayed prices.

Finally, it should be noted this is not the first time Citadel has tried to argue that retail investors would be harmed by IEX order types that protect investors from speed advantages. In connection with our exchange application, Citadel said the following about our “D-Peg” and “P-Peg” order types, which use

⁵⁴ The fastest speed using a fiber connection we have found from provider Zayo is about 320 microseconds.

⁵⁵ See, e.g., T. Rowe Price Letter; Brandes Letter; AJO Letter.

⁵⁶ AJO Letter, note 25 *supra*.

⁵⁷ Virtu Letter; XTX Letter.

the CQI signal to protect non-displayed orders from speed-based trading strategies: “This pegged order repricing advantage would only serve to harm investors seeking liquidity on IEX, which would often include market orders from retail investors. The biggest beneficiary of the IEX pegged order latency arbitrage mechanism would be the sophisticated market participants that have the technology and resources to engage in clever inter-market latency arbitrage strategies.”⁵⁸

Fortunately, despite those predictions, which also conflicted at the time with the views of large numbers of investors, “D-Peg” and “P-Peg” were approved as part of IEX’s application and have since won widespread adoption by investors. D-Peg alone has executed over 111 billion shares of volume since IEX was approved as an exchange with over 90% of that volume from agency and full-service brokers. In retrospect, not only were investors not harmed by the approval of those orders types, as Citadel had predicted, their adoption and use demonstrated that investors were the primary beneficiaries of the functionality and the protection they offer. In addition, this history provides significant, practical evidence that investors will use an order type that they are willing to publicly support. In the case of D-Limit, investors with over \$13 trillion in assets under management have written in support, which provides an encouraging sign that investors, again, are looking for a free-market solution to a growing problem, and that D-Limit will in fact increase the amount of displayed liquidity from investors.

Response to Nasdaq Comments

As to Nasdaq’s comment on the amount of orders received when the CQI is on, the fact that a small number of firms account for this activity does not mean it is insignificant, only that it is concentrated. Moreover, it suggests that there is a limited number of firms specifically seeking to trade during this period of time, and that the vast majority of market participants would not be negatively impacted by D-Limit. The fact that the solution is tailored to those situations in which resting orders are most exposed is what distinguishes it from the EDGA proposals or other mechanisms that delay taking orders at all times during the trading day. Nasdaq contradicts itself by arguing, on the one hand, the fact that latency arbitrage orders come from relatively few firms “is hardly indicative of a widespread problem”, while also claiming that D-Limit would result in “quote fading” for a “significant volume of trading”, an argument that we are addressing, once again, below.

Concerning Nasdaq’s comments about the FCA Study, it was carefully designed using data from an exchange that has not been available before, i.e., timestamped exchange message data evidencing the race among trading firms to pick off resting orders and showing how often attempts to do so were successful compared to how often resting orders were able to cancel first. In terms of extrapolating the results to U.S. markets, the reasonable inference is that, if anything, the cost of this activity on U.S. markets is greater than would be suggested by a simple extrapolation based on trading volume. The study looked at trades on the one primary U.K. exchange market, the London Stock Exchange. The much more fragmented U.S. market, with 13 separate operating exchanges at present, provides proportionately more arbitrage opportunities among all the separate venues. Moreover, the FCA Study confirms the point that such profits (and losses to liquidity providers) increase with both higher volume and more volatile trading conditions.⁵⁹

Benefits of D-Limit

⁵⁸ Letter from John C. Nagel, Managing Director and Sr. Deputy General Counsel, Citadel LLC, to Brent J. Fields, Secretary, SEC, dated April 14, 2016.

⁵⁹FCA Study, at 35-36.

Citadel comments that IEX has not provided data to show the benefits of the proposal, and it states that when a quote on IEX is alone at the best price and is routed to first, the CQI signal would not provide protection. It argues that as a result, liquidity providers would not be expected to narrow the spread but would instead match the prices on other exchanges, and it references a speed bump implemented by the TSX Alpha Exchange in Canada.

Response:

The mark-out data provided in the D-Limit Filing shows there is a significant harm to resting orders, amounting to \$0.0081 per share after ten milliseconds, more than double the rate of the highest take fee exchanges are allowed to charge.⁶⁰ The comparable figure was \$0.0087 per share for the period from January to April 2020. The direct benefit from D-Limit is to protect resting orders from those systemic losses, occurring during the discrete moments when latency arbitrage strategies are most aggressive. Further, brokers and institutional investors have affirmed that these losses on equity markets reduce displayed liquidity and hurt price discovery, and that D-Limit would help to address this problem. Even if only a few of these participants make use of D-Limit to provide a more diverse and stable source of displayed liquidity on IEX, as indicated by their comments, this will provide an additional and significant net benefit to the market.

As to the scenario where IEX has a quote that is alone at the best price, a D-Limit order will perform much the same as a regular limit order. Under the CQI formula, price changes on multiple exchanges at the NBB or NBO are necessary to predict a change in the NBBO; it cannot be calculated based on activity on a single exchange. However, given the prevalence of pegging strategies offered by other exchanges, and the way in which market makers compete, a D-limit order that sets a new price level on IEX may encourage other orders to join at the new price, creating the conditions under which the CQI could offer protection to the D-Limit order, delivering a benefit to the price setter. In addition, the use of any limit order contributes to price discovery regardless of the price that is set, and many market participants supporting D-Limit have stated that they believe it will help add to healthy price discovery by encouraging more participation.

The experience with the TSX Alpha speed bump, whatever its merits, is inapposite. TSX Alpha introduced a randomized delay on all orders to take liquidity, and this mechanism is clearly distinguishable for many of the same reasons that distinguish D-Limit from the EDGA proposal, as detailed above.

CQI Performance during Unprecedented Volatility

In response to a previous comment from Nasdaq, IEX provided data concerning the performance of the CQI signal during a previous volatile trading month, compared to a relatively low-volatility month. Nasdaq in its most recent letter questioned how these periods were chosen and again suggested that D-Limit would perform poorly in volatile trading conditions. During the last two months, the markets, and the CQI signal, were subjected to a real-life and unprecedented “stress test” as a result of market volatility connected to the COVID-19 pandemic. Market-wide circuit breakers were triggered 4 times in the space of 8 trading days, and the VIX volatility index recorded its highest-ever value on March 16, as well as 4 of the 7 highest closing prices on record.

⁶⁰ D-Limit Filing, at 72002.

IEX has conducted extensive analysis of the performance of the CQI signal during this time. Looking at March 2020, one can see that the CQI was “on” for only 0.125% of the trading day on average. More important, this data shows that during one of the most volatile and unprecedented months in the history of the stock market, D-limit quotes would have been fully available at their specified limit prices for 99.875% of the trading day. For comparison, we show below the relevant statistic for each month, on a volume-weighted basis.

	Jan-20	Feb-20	Mar-20	Apr-20
Number of seconds CQI Signal is "On" per day (volume-weighted)	6.2	12.0	29.3	17.2
Number of seconds D-Limit Quote is available at limit price (out of 23,400)	23,393.8	23,388.0	23,370.7	23,382.8
% of the day CQI is "On" (volume-weighted)	0.026%	0.051%	0.125%	0.074%
% of the day D-Limit is available at specified limit price	99.974%	99.949%	99.875%	99.926%

The CQI was “on” longer in March because of the extraordinary increase in the number of quote changes per stock in that month. CQI is designed to scale in a linear way to the number of quote changes, which is why it continues to provide protection to resting orders, in proportion to the number of “adverse ticks” – a down tick in the best bid and an up tick in the best offer – experienced each day. The following table shows, for each month, the volume-weighted daily average number of adverse ticks per stock, and the ratio of CQI “fires” per adverse tick. As can be seen, this ratio is very close to 1:1 in each month.

	Jan-20	Feb-20	Mar-20	Apr-20
Avg "Adverse Ticks" per Symbol (volume-weighted)	10,715	21,150	58,631	27,153
CQI Fires per "Adverse Tick" (volume-weighted)	1.04	1.04	0.96	1.04

We also wanted to examine the proportion of displayed volume trading while the CQI was on in these ultra-volatile conditions compared to other months. The result, provided below, reveals that this proportion stayed remarkably consistent throughout the period, in a range of 22.0-24.4%. Obviously, the absolute number of trades, with associated losses to liquidity providers, was much higher in March and April than in the other two months.

	Jan-20	Feb-20	Mar-20	Apr-20
Percent of Displayed Volume traded during CQI	24.4%	23.9%	22.0%	22.3%

We believe that this data confirms that the CQI signal performs extremely well and consistently in extreme, and in “normal” market conditions.

Finally, to illuminate the displayed liquidity challenges that market participants face, we provide below the average quote size for S&P 500 and Russell 2000 stocks for each of the months from January to April 2020.

	Jan-20	Feb-20	Mar-20	Apr-20
Avg. displayed quote size for S&P 500 <i>duration-weighted by symbol, market cap weighted across index</i>	3,070	2,605	964	1,304
Avg. displayed quote size for Russell 2000 <i>duration-weighted by symbol, market cap weighted across index</i>	1,654	1,457	893	816

One can easily see that when liquidity was needed most, it was unfortunately also the hardest to find. Considering that “adverse ticks” increased by 447% from January to March, dramatically increasing the cost to provide liquidity, it is hardly surprising that brokers, market makers, and investors substantially withdrew from displaying their trading interest. We believe this is the most compelling evidence that a

market innovation designed to address declining liquidity by providing protection from latency arbitrage strategies is urgently needed now.

Comments Alleging Discrimination and “Quote Fading”

Citadel alleges that D-Limit will result in significant “quote fading” and a decline in fill rates, impacting all liquidity takers. It further argues that even if participants can “stage” intermarket sweep orders, this results in unfair discrimination by requiring participants to route to IEX first, which in turn would raise concerns about best execution, the need to delay routing while prices are changing, and implementation costs of making system changes. The PTG repeats these same concerns.

Nasdaq repeats concerns about “quote fading” for liquidity takers. It seeks to distinguish the inaccessibility on other exchanges that results from latency advantages provided to and held by the fastest traders, from the effects of repricing D-Limit orders, claiming the existing forms of quote inaccessibility are simply the “result of the trading process”. Similarly, it argues that “pegged orders”, by which exchanges reprice orders pegged to changes in the NBBO, are different because they change in response to a “shift in observed circumstances”, whereas D-Limit will reprice based on a “prediction of a change in circumstances”. Citadel similarly argues that pegged orders are different because they reprice based on what it calls an “objective fact”.

Response:

In its First Response Letter, IEX pointed out that exchange quotes are today less accessible to some participants, and investors in particular, compared to others, based on differences in connectivity to exchanges, the types of market data used, and communication protocols, among other factors.⁶¹ Further, for various reasons, agency brokers representing investors can never be as fast as the fastest traders, even if they can afford to buy the lowest-latency products. These reasons include geographic factors, the additional latency in their systems caused by configurations to comply with compliance and risk requirements when handling client orders, and the need to route orders in different ways to meet the varying needs of their clients. In short, they don’t have the flexibility to optimize their trading primarily based on speed. As noted earlier, many investors in their comment letters have affirmed that speed differences meaningfully impact their access to liquidity, based on their own experience.

Nasdaq’s argument that differences in access are simply a question of choice, based on decisions of which products to purchase, ignores the obvious business model differences between long-term investors, brokers, and high-speed traders, in addition to the enormous costs charged for the fastest connections and data, which many participants cannot afford. Therefore, the inaccessibility of exchange quotes under the existing market structure is not a natural result of “the trading process”, as Nasdaq states. Exchanges create this multi-tiered system through the choices they make in designing their markets and the products they sell to members. The point remains unrefuted that accessibility to quotes is relative and depends on how all these factors affect the capabilities of individual participants and that exchange quotes are substantially less accessible to participants that do not prioritize speed.

A repricing of pegged orders is made by an exchange in response to its unique view of the NBBO at a moment in time. The Commission reinforced this point in its recent market infrastructure proposal, noting that there is no single NBBO today.⁶² Therefore, repricing of D-Limit orders would be based on

⁶¹ First Response Letter, 2-4,7-8.

⁶² Market Infrastructure Proposal, supra note 5, 85 FR at 16774-6.

objectively observed changes in the prices of other exchanges as they are communicated to IEX. The fact that the repricing occurs under a transparent formula that predicts an imminent change in the NBBO based on IEX's objective observations of price changes does not result in quotes that are less accessible than pegged quotes, which an exchange similarly reprices continuously in response to its own unique observations of price changes.⁶³

Thus, when these commenters raise concerns about "quote fading," it seems their real complaint is that D-Limit quotes will not be as available to them in those moments when trading against those quotes is most profitable (and most costly to the provider). But, as others have pointed out, this is the case today for the great majority of participants. And, users of D-Limit will not be able to determine whether their orders reprice, because repricing by IEX will be tightly restricted under a transparent formula.

As explained in our First Response Letter, there is nothing about D-Limit that should change the way that brokers use intermarket sweep orders to access quotes on multiple exchanges. Today, a broker sending orders from the Carteret data center that is seeking to "sweep" quotes on multiple markets may time its order to IEX to account for the "speed bump", just as it may seek to account for the distance from Carteret to Mahwah, by timing the sending of its order to NYSE as part of the same "sweep". The speed bump that exists today will be the same one that exists tomorrow. It will take no longer to reach D-Limit orders than any other orders posted on IEX.

Similarly, as explained in the First Response Letter, a broker that is routing today in such a way as to maximize its ability to obtain all available liquidity will not thereby trigger the CQI by doing so. If D-Limit is approved, the same route to IEX will not trigger the CQI, since the CQI will not take account of transactions on other markets by the time the IEX piece of the order reaches our systems.⁶⁴ Again, the broker will be in the same position it is in today.

To sum up, D-Limit will allow IEX to protect resting orders from specific latency arbitrage strategies that operate in discrete moments when the parties providing liquidity face a systemic disadvantage in protecting themselves. Nasdaq, Citadel, and PTG purposely conflate the ability to use latency arbitrage strategies in these moments with the ability of investors to access liquidity when they need it, a proposition that is clearly rejected by the comment letters supporting D-Limit. These comments and the information provided by IEX demonstrate, conclusively, that these are two very different things.

Claim that D-Limit will be "Coercive"

Nasdaq alleges that offering D-Limit would be "coercive" because when several exchanges are quoting prices at the NBBO, the only way participants could mitigate the potential for missing liquidity would be to place IEX at the top of their routing tables, i.e., to access IEX quotes before those of other markets. Nasdaq further argues that users of other limit orders would be penalized and unable to compete effectively.

Response:

As just described, participants will not need to change their routing strategies in any way to access D-Limit quotes or other liquidity available on IEX. Today, a broker looking to "sweep" the market will already account for the various geographic and technological latency differences between exchanges and

⁶³ See also Goldman Sachs Letter, note 45 supra, and accompanying text.

⁶⁴ First Response Letter, at 8.

determine how to sequence orders so that they arrive as close in time as possible. This will not change as a result of D-Limit being available. Thus, a broker that is not executing a latency arbitrage strategy would not need to prioritize IEX over other venues to obtain all available liquidity.

Further, as explained in the First Response Letter, D-Limit would be available to all members equally, and users will not gain any impermissible advantage compared to other liquidity providers.⁶⁵ D-Limit orders will rank equally with other limit orders on a price/time priority basis, and any time a D-Limit order reprices, it will cede priority to other orders that are at the more passive price level. Further, when a participant's primary objective is to obtain a maximum fill of shares at a particular price, regardless of the possibility of a negative short-term mark-out, it would tend to prefer a standard limit order, because use of a D-Limit order would reduce the opportunities for execution.

Comments Concerning Market Competition

Liquidity Takers

Citadel reprises claims from some other commenters that D-Limit would create a "systematic advantage" for liquidity providers over liquidity takers. It again cites as support the experience of the TSX Alpha "speed bump", which it says caused profitability by liquidity providers to increase. It further states that IEX has failed to provide any supporting data on whether liquidity providers will use D-Limit to narrow spreads.

Response:

First, Citadel constructs a false dichotomy between "liquidity providers" and "liquidity takers." Participants that are active in the markets act as both on an ongoing basis. D-Limit will provide a net benefit to brokers and investors when posting liquidity by protecting their resting orders during discrete moments when latency arbitrage strategies are most aggressive. D-Limit will also provide a net benefit to investors and brokers from an increased supply of liquidity from a more diverse group of participants. Overall, market participants will benefit from an increase in more stable liquidity that is not driven by sub-millisecond price moves, whether they are "making" or "taking" liquidity.

As explained previously, quotes are not equally accessible to all participants. IEX data shows that liquidity providers are subject to repeated adverse selection when their orders are "picked off" while the CQI is on, reducing their willingness to quote. These losses are systematic, because when participants provide liquidity, particularly those making markets for hundreds to thousands of securities simultaneously, they cannot react to price changes as fast as the fastest traders can pick off a displayed order in a single stock. D-Limit is a solution designed to remove a systematic disadvantage that is eroding displayed liquidity, which is fundamentally different than providing an unwarranted advantage to a select group of members.

D-Limit is not intended to ensure that trades are profitable. Profitability for providers is subject to a host of factors. The test for approving an exchange order type does not require determining in advance how all the relevant factors would impact net profitability for any group of participants, only whether it is consistent with the standards of Section 6 of the Securities Exchange Act of 1934 ("Exchange Act").

Providers on Other Venues

⁶⁵ First Response Letter, at 5.

Next, Citadel contends that D-Limit would allow users of the order type to “free ride” on others’ quotes by posting prices equal to the NBBO and relying on IEX to avoid unfavorable executions. It claims other exchanges will face pressure to adopt a similar mechanism, which would raise concerns about the reliability of the NBBO and resiliency of liquidity. Nasdaq makes similar comments.

Response:

Numerous versions of “pegged” order types (both displayed and non-displayed) used by every exchange allow exchanges to adjust prices with each movement of the NBBO, and these have never been prohibited based on concerns about “free riding”. Unlike those order types, D-Limit orders will each be required to specify a limit price, which may or may not be equal to the NBBO. All such orders will contribute meaningfully to price discovery, as commenters have stated.

With respect to Citadel’s comment about the “resiliency of liquidity”, as discussed above, the CQI has performed well and consistently during the recent COVID-19 related volatility and its protections scale closely in line with the number of adverse price changes. Any other proposal would need to be fully vetted before it could be adopted, and if D-Limit wins market support because of its benefits to providers and takers of liquidity, extending the protection to more investors and brokers would yield market-wide benefits, including more stable and reliable sources of liquidity.

Member Firms

Citadel claims that D-Limit would give IEX an unfair competitive advantage over its own members, on the theory that parties using displayed orders other than D-Limit, including firms that want to use their own predictive models, would be at a material disadvantage.

Response:

D-Limit would be an option, not mandatory, and it makes no sense to say that members are at a disadvantage if they use it because they find it serves their purposes better than another order type. Also, for the reasons explained above, there are trade-offs between using D-Limit, as opposed to a pegged or standard limit order, including in cases where a firm’s priority is obtaining a faster execution rather than avoiding adverse selection. Further, the fact that various IEX members of different business types have written individually in support of D-Limit undercuts this assertion.

Finally, Citadel contradicts itself by suggesting that D-Limit would provide an advantage that no other order type could match, on the one hand, and questioning how useful it would be based on arguments about its predictive accuracy, on the other hand. Further, IEX review of CQI performance during January – April 2020 reflects that it accurately predicted the direction of the next price change (not time bound) in 75.5% of the cases, on a volume-weighted basis. This data is consistent throughout the volatility period and is broken out monthly in Appendix A.

In any event, D-Limit would be optional, not mandatory, and like any free-market solution, its usefulness should be determined by market participants based on their individual needs and experience.

Conclusion

Today, our capital markets are at an inflection point where investors and the people who represent them are hindered by “a trading environment that has increasingly gone dark.”⁶⁶ In times of economic stress and uncertainty, like the times we face today, displayed liquidity is more important than ever. But when investors most need liquidity, this downward trend has only gotten worse. A significant contributor to this problem is the emergence of latency arbitrage strategies that penalize participants willing to display their trading interest to the entire market. No one needs to take IEX’s word for that. It is evident from academic studies, and more important, by the words of dozens of asset managers, pension funds, and brokers representing the interests of millions of Main Street investors, all sounding the same themes, and drawn from their own experience.

In our capital markets ecosystem, we have a justifiable preference for market innovations to solve market problems and meet the needs of investors, wherever possible. Because exchanges are at the core of the system for discovering and disseminating stock prices, they must be a part of the solution. IEX has proposed one option to address the problem of declining liquidity that is narrowly-tailored, freely available to all market participants, and supported by data, and which operates through a transparent and predictable formula. We believe we have fully demonstrated that it surpasses the standards required for approval under the Exchange Act. The only remaining question for the Commission is whether all the asset managers, pension funds, brokers, and market makers who have forcefully spoken out for this option will have the chance to use it.

Sincerely,



John Ramsay
Chief Market Policy Officer, IEX

cc: The Hon. Jay Clayton, Chairman
The Hon. Hester M. Peirce, Commissioner
The Hon. Elad L. Roisman, Commissioner
The Hon. Allison Herren Lee, Commissioner

Brett Redfearn, Director, Division of Trading and Markets
Christian Sabella, Deputy Director, Division of Trading and Markets
David Shillman, Associate Director, Division of Trading and Markets
Richard Holley III, Assistant Director, Division of Trading and Markets

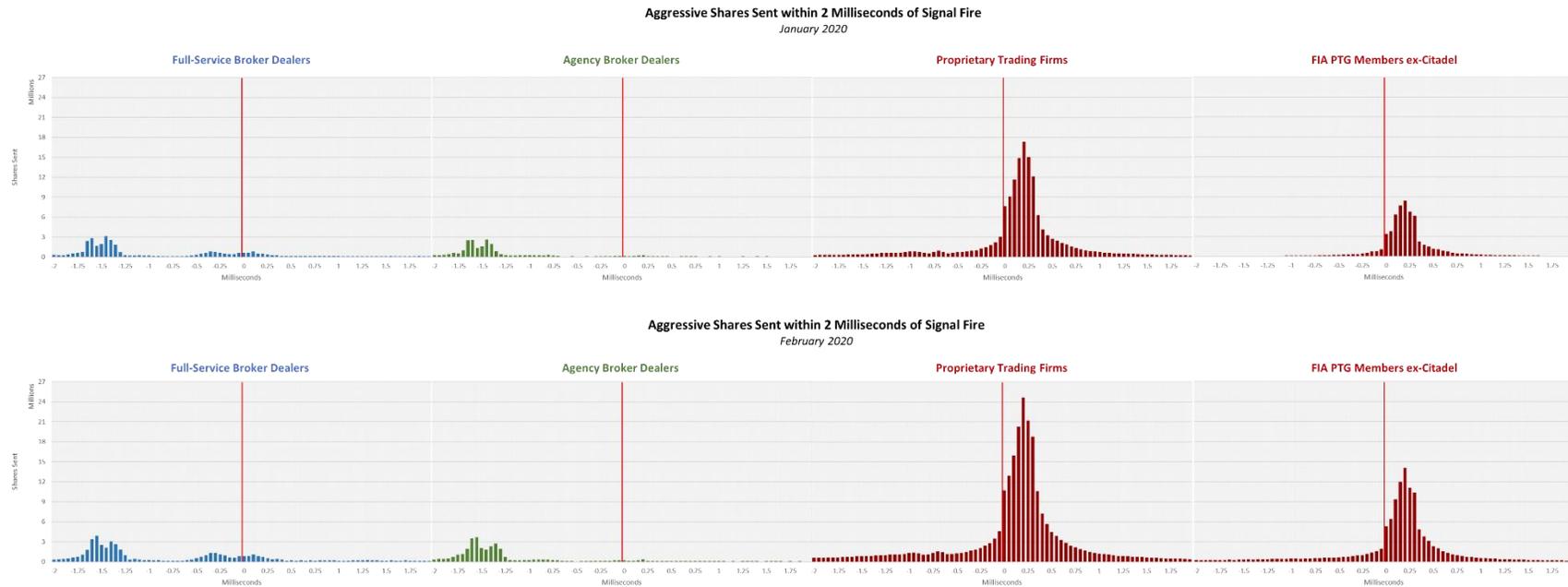
⁶⁶ Brandes Letter.

Appendix A

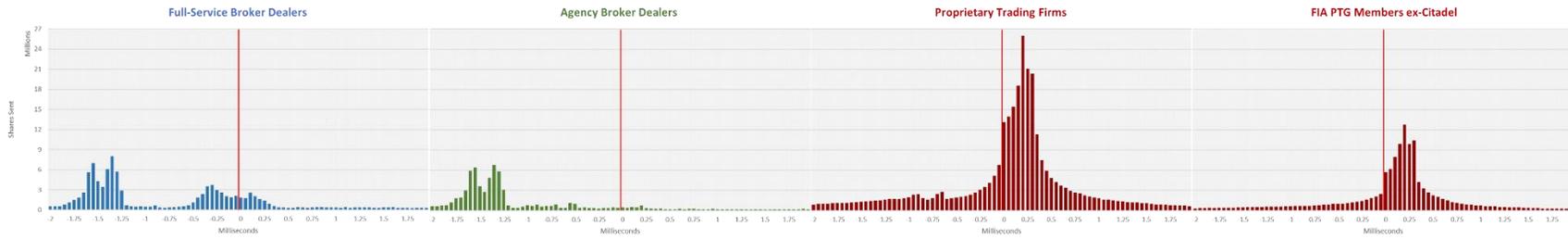
CQI-Related Metrics and Datapoints

	Jan-20	Feb-20	Mar-20	Apr-20
Percent of all marketable orders arriving while CQI is "On"	29.2%	30.3%	24.5%	27.6%
Percent of Displayed Volume traded during CQI	24.4%	23.9%	22.0%	22.3%
Percent of Non-Displayed Volume traded during CQI	2.0%	1.9%	1.6%	1.6%

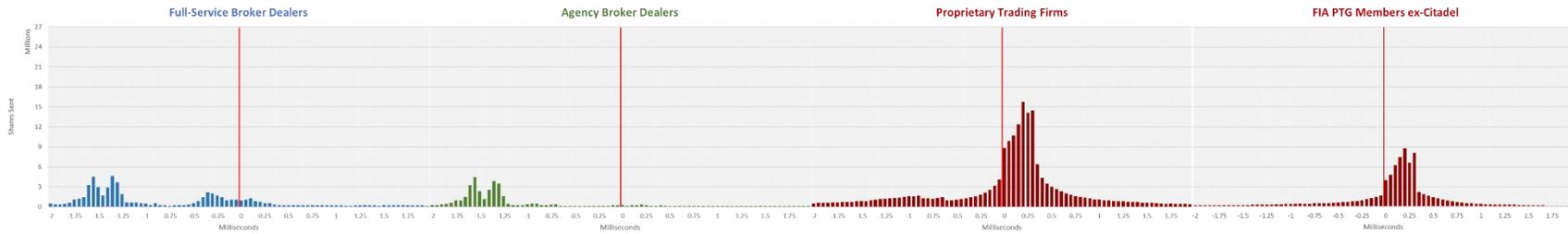
Monthly Distribution of Aggressive Shares Sent within 2 Milliseconds of Signal Fire



Aggressive Shares Sent within 2 Milliseconds of Signal Fire
March 2020



Aggressive Shares Sent within 2 Milliseconds of Signal Fire
April 2020



	Jan-20	Feb-20	Mar-20	Apr-20
Percent of accurately predicted direction of next tick (volume-weighted)	78.6%	76.5%	71.6%	75.5%