September 22, 2017

Brent J. Fields
Secretary
U.S. Securities and Exchange Commission
100 F Street, NE
Washington, D.C. 20549

Re: Investors Exchange LLC; Notice of Filing and Immediate Effectiveness of Proposed Rule Change Related to Transaction Fees Pursuant to Rule 15.110 (Release No. 34-81484; SR-IEX-2017-27)

Dear Mr. Fields:

Hudson River Trading LLC ("Hudson River Trading") appreciates the opportunity to comment on IEX's immediately effective rule filing for the so-called Crumbling Quote Remove Fee. Hudson River Trading is a global, multi-asset class quantitative trading firm that develops automated trading strategies that provide liquidity and facilitate price discovery on exchanges and alternative trading systems. Our affiliate, HRT Financial LLC, is a member of all U.S. equities exchanges and is a registered market maker in over 3,000 stocks and exchange-traded funds.

Hudson River Trading believes it is critical that the Securities and Exchange Commission ("Commission") ensures fair, orderly and efficient markets. Exchanges, particularly those with significant displayed liquidity, play a critical role in the price discovery mechanism for U.S. equity securities. The Exchange Act requires that exchange rules be designed to remove impediments to a free and open market; not permit unfair discrimination; not impose a burden on competition that is not necessary and appropriate; and provide for the equitable allocation of reasonable fees.[1] The IEX Crumbling Quote Remove Fee is designed to achieve goals contrary to those tenets of the Exchange Act.

IEX has proposed to increase fees to the maximum allowed pursuant to Regulation NMS to a select group of members that remove liquidity when the Crumbling Quote Indicator[2] ("CQI") is active, if such executions constitute over 1,000,000 shares in a month and at least 5% of the member's volume executed on IEX. The Crumbling Quote Remove Fee is designed to discriminate against certain IEX members by charging them punitive fees relative to other members and thereby alter the competitive dynamics among them. The Crumbling Quote Remove Fee is further designed to discourage price discovery and market efficiency by imposing a burden on some firms that send orders when those firms believe the prevailing market price is

[1] See Section 6(b) of the Exchange Act of 1934.
[2] IEX Rule 11.19(g).

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overvalued or undervalued.[3] The Crumbling Quote Remove Fee does not meet the requirements set forth in the Exchange Act. Given the issues the filing raises with respect to fair competition among brokers and dealers, potential harm to market efficiency, unfair discrimination among members, and unfair allocation of fees among members, the Crumbling Quote Remove Fee should be abrogated by the Commission.

The CQI is an algorithm that IEX devised that aims to predict when the prevailing bid or offer price for a stock is about to change. IEX currently uses the CQI for altering the prices associated with Discretionary Peg ("D-peg") orders. D-peg orders are hidden pegged orders with broker-like discretion to alter the price from the midpoint to the full spread based on the CQI.[4] When the CQI determines that a price is "stable," the D-peg is available to execute at the midpoint. When the CQI determines that the price is "unstable," the D-peg is available to execute at the bid for buys and the offer for sells. Because the D-peg is hidden, it trades after displayed orders at that price. This creates a difficult environment for displayed liquidity providers on IEX. When IEX predicts that the price is stable, D-Pegs opportunistically trade before displayed prices at the midpoint (a subpenny price generally not available to displayed orders under Regulation NMS). When IEX predicts that the price is unstable, D-Pegs opportunistically trade after displayed prices at the full spread.

Approximately 75% of IEX's matched volume is hidden, though IEX does not make public what portion of its volume is from D-peg orders.[5] However, given the large percentage of hidden volume, it appears that a significant amount of IEX's liquidity opportunistically changes price based on market conditions to the detriment of displayed liquidity providers on IEX. IEX members have a choice when attempting to trade passively with respect to whether they use D-pegs, pegged orders, explicitly priced hidden limit orders, or displayed limit orders. As such, firms can make their own determination as to whether or not using D-pegs enhances their execution quality. So while the D-peg order type raises issues with regard to market efficiency and price discovery, the order type itself is currently available to all members on equal terms. However, using an algorithm that attempts to predict price changes in order to alter the limit price of an order is fundamentally different than using it to determine a member's fees when accessing protected quotes.

Price prediction algorithms are highly likely to be wrong a meaningful portion of the time. In fact, CQI is targeted at approximately 50% accuracy. As IEX puts it, "We have found experimentally that roughly 50% accuracy is a sweet spot."[6] Given the discriminatory nature of the fee and its attempt to inhibit access to protected quotations, applying fees based on an algorithm that is so inaccurate is arbitrary and unfairly discriminatory.[7]

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[3] See SR-IEX-2017-27, page 17. Ironically, IEX is seeking to implement a punitive fee on firms that attempt to predict price changes while IEX operates Discretionary Pegs, an order type that attempts to predict price changes.
[4] Unlike its broker-dealer members, IEX's D-peg order is not subject to the IEX speed bump when altering prices, allowing it an unfair advantage over brokers attempting to offer comparable functionality.
[5] See https://iextrading.com/stats/
[6] See https://www.iextrading.com/docs/The%20Evolution%20of%20the%20Crumbling%20Quote%20Signal.pdf
[7] To the extent that the Commission approves a fee based on CQI, it is important to note that CQI is a complex formula with several variables, coefficients, and thresholds. It will be impossible for members to audit that the fee is being applied correctly and difficult and expensive for the Commission to audit that the fee is being applied correctly. Further, any change in the formula or its parameters would require further review of any fees based on

IEX's proposal raises the question of whether another, more accurate markout[8] algorithm would be fair. We believe that any such algorithm raises similar concerns with respect to unfair allocation of fees, a burden on competition, and potentially unfair access to the exchange. Different firms will exhibit different markout characteristics -- some firms may have positive markouts over short timeframes such as 1-2 seconds, but negative markouts over longer timeframes such as 30-60 seconds, whereas other firms could have the opposite characteristics. Any fee based on markouts would result in the exchange picking winners and losers based on its decision about its preferred markout characteristics. Such decisions inherently reflect subjective decisions by the exchange operator and alter the competitive dynamic among exchange members. Approving any such change would open the door to outright discrimination by exchanges. Further, such fee schedules would allow exchanges to appropriate some or all of a firms trading revenue.

In its fee filing, IEX attempts to justify the fee by noting the different markout characteristics of liquidity removers and liquidity providers when CQI is active and inactive. It notes that its liquidity providers have negative one second markouts[9] 75.6% of the time when CQI is active, but only 23.9% of the time when CQI is inactive. These statistics justify a punitive fee for liquidity providers when CQI is inactive as much as they justify a punitive fee for liquidity removers when CQI is active. IEX appears to believe it is good that their liquidity providers are profitable about 75% of the time when CQI is inactive, but believes it is a problem when liquidity removers are profitable 75% of the time when CQI is active. IEX's proposed fee schedule seems designed to help its liquidity providers be more profitable at the expense of its liquidity removers, harming the latter to the benefit of the former.[10]

Furthermore, if CQI is active and predicting the offer is about to increase, IEX seeks to charge a punitive fee for firms that seek to buy on the offer. However, IEX does not seek to charge a higher fee to firms that may opportunistically seek to buy on the bid or buy at the midpoint when CQI is active, even though those firms are likely to have much higher one second markouts than liquidity removers that buy on the offer. Thus IEX's proposed fee schedule is not the result of a logical or rational principle being fairly applied to its members; it is instead a rationalization for an arbitrary and inappropriate allocation of fees purposefully designed to alter the competitive dynamic on their market in favor of some members at the expense of others. IEX has offered no justification for altering the competitive dynamic in this way.

Exchanges play a critical role of bringing buyers and sellers together to facilitate price discovery. IEX is seeking to inhibit efficient price discovery by implementing a punitive fee on some firms that often trade during price transitions. Given the opaque nature of the CQI, firms will not

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CQI by the Commission as these changes would affect the application of fees and potentially lead to an inequitable allocation of fees or other potential abuse.

[8] See SR-IEX-2017-27, page 4. IEX describes markouts as "The term markouts refers to changes in the midpoint of the NBBO measured from the perspective of either the liquidity providing resting order or liquidity removing taking order over a specified period of time following the time of execution."

[9] IEX has offered no explanation about why one second markouts are appropriate as opposed to less than a second, multiple seconds, or minutes.

[10] The fee aims to indirectly benefit liquidity providers by discouraging trading. It is unclear what impact the fee will have in practice. IEX will keep the punitive remove fee so IEX will be the primary beneficiary.

know the fee associated with orders prior to sending them, and thus it will discourage firms from sending orders to IEX at any time, further harming price discovery. Raising the cost of trading during price transitions in order to degrade price discovery has a broader harm to market participants that rely on accurate bid and offer and last sale prices, such as dark pool users and retail investors that may trade at inaccurate reference prices for longer periods of time.[11] IEX is seeking to delay price discovery to the benefit of its liquidity providers to the detriment of all other market participants.

IEX does not seek to simply charge liquidity removing orders a punitive fee when CQI is active. It instead seeks to use its CQI, combined with a volume metric and percentage of an MPID's volume in order to charge only certain members more for trading when CQI is active. IEX "narrowly tailored"[12] these metrics in order to ensure that only the firms it intends to discriminate against are subject to the higher fee. Given the discriminatory nature of the Crumbling Quote Remove Fee, one would expect greater assurances that the fee is fair than that it will not charge some members "the fee for executions of this type that are ***more likely*** [emphasis added] to be incidental to broader trading activity by the Member and not part of a specific trading strategy."[13]

While it would be unfair to charge any member for trading while CQI is active, IEX doesn't explain why it further "narrowly tailored" the Crumbling Quote Remove Fee to only a limited number of firms. If IEX believes that trading when the CQI is active is detrimental to market efficiency, why does it not charge all members $0.003 per share during those times? In the absence of any explanation, it is possible that IEX reverse-engineered its selection criteria in order to capture the firms it intended to capture based on its analysis of their order flow. IEX does not explain why a firm executing 5% of its volume when CQI is active demonstrates a "specific trading strategy" whereas 3% does not. Nor is it clear why a 10% or 25% threshold is not a more appropriate threshold. In addition, the criteria IEX uses to tailor the fee allows firms to continue trading while CQI is active at the lower fee as long as those firms also trade at other times or trade passively on IEX. If a firm has several strategies or routes flow away from other exchanges, it can reduce or eliminate the Crumbling Quote Remove Fee.

Many firms operate routing logic that prioritizes markets based on several factors, including fees, liquidity, fill rates, etc. CQI could have the effect of applying more often to firms that route to IEX later in their intermarket priority as opposed to firms that route to IEX early in their intermarket priority. If a firm routes to IEX's quote first, IEX may not detect a CQI as the other exchanges' quotes will not have been accessed when IEX processes an order. Whereas, if a firm routes to other exchanges first, IEX may detect the price change and apply a punitive fee to the firm sending the order.

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[11] See Alan, Nazli Silva and Schwartz, Robert A. "Price Discovery: The Economic Function of a Stock Exchange." Journal of Portfolio Management, Fall 2013. "Trading at disequilibrium prices is a trading cost; noisy price discovery obfuscates market transparency; price discovery is more apt to spin out of control in a fragile marketplace; and poorly discovered prices are fair neither to active traders nor to the broad market that uses exchange prices for a spectrum of non-trading purposes."

[12] See SR-IEX-2017-27, page 6.

[13] *Ibid*.

IEX also attempts to justify the Crumbling Quote Remove Fee by noting that other exchanges have volume tiers and that Nasdaq charges for excessive messaging. However, the fees IEX references share little in common with the Crumbling Quote Remove Fee and in no way justify its approval. Further, IEX acknowledges that attracting liquidity providers is challenging and that since it has decided not to rebate liquidity providers that it must take alternative means to attract liquidity providers. So instead of rewarding liquidity providers, it seeks to punish some firms that access liquidity on IEX. While IEX claims that rebates add needless complexity, it instead proposes a fee schedule based on a complex and non-transparent formula. Firms have no means to ensure that the fee is being applied correctly as IEX does not make the CQI publicly available. Hudson River Trading believes that the allocation of fees should be based on simple, transparent rules.

IEX has created a market structure that prioritizes dark liquidity and makes it difficult for liquidity providers to display competitive prices because its hidden D-Peg orders opportunistically trade ahead of displayed prices at the midpoint when market conditions are stable, but trade after displayed prices when prices are moving against the liquidity provider. Instead of making its market more attractive to displayed liquidity providers, IEX instead has chosen to propose a punitive fee on firms that attempt to access IEX's quote when IEX guesses the price is about to change. The Crumbling Quote Remove Fee is designed to discriminate against certain IEX members by charging them punitive fees relative to other members, which will alter the competitive dynamic among firms. It discourages price discovery and market efficiency by imposing a burden on some firms that send orders when those firms believe the prevailing market price is over or undervalued. The Crumbling Quote Remove Fee does not meet the requirements set forth in the Exchange Act. Given the issues the filing raises with respect to fair competition among brokers and dealers, potential harm to market efficiency, unfair discrimination among members, and unfair allocation of fees among members, the Crumbling Quote Remove Fee should be abrogated by the Commission.

Please do not hesitate to contact me if you have any questions or would like to discuss this letter.

Sincerely,

/s/ Adam Nunes

Adam Nunes
Head of Business Development