Citadel's Lawsuit Against the SEC Over IEX's D-Limit Order Type

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In one week, a panel of judges will hear oral arguments from Citadel, the SEC and IEX in a lawsuit that Citadel has brought AGAINST the SEC regarding the D-Limit order type. That's right - firms can (and do) sue their regulator when they don't like, or don't agree with rule approvals or disapprovals. It's worth mentioning that Virtu wrote a comment letter in support of D-Limit. I've interacted with Virtu quite a bit over the years, and I had generally found them to be flexible and supportive of innovative market structure efforts. I have not had much interaction with them after they acquired KCG and the PFOF/internalization group there. Take that as you will.

Do you know what Citadel will claim first and foremost in their presentation to the judges?

> "We are the leading destination for retail order flow"

> "[O]ver 50% of our trading activity on IEX is **on behalf of** retail investors."

This is from their comment letter on the order type:

- We are the leading destination for retail order flow and over 50% of our trading activity on IEX is on behalf of retail investors (and therefore we can readily appreciate the negative impact this Proposal will have on retail and institutional investors);

Does Citadel trade **on your behalf**? Do they represent retail investors or traders? Do you think the brokers that Citadel and other wholesalers pay for your order flow represent you either? Because Citadel and all of those brokers hold themselves out as the representatives of retail investors. As if they are incentivized to **protect** you, and ensure the market is designed **for your benefit**, rather than for theirs! This would be a hilarious joke if it wasn't the truth.

I can't stand when I see firms holding themselves out as representing interests that they so obviously don't represent. We also shouldn't forget that $22M fine Citadel paid to the SEC for "Misleading Clients About Pricing Trades." The only thing these firms represent is their P&L statement or their quarterly earnings for the publicly traded discount brokers. This happens **constantly** in market structure debates - there are no authoritative independent voices, and it's why I always try to make sure my biases are disclosed (for example, as I always state, I have a small equity position in IEX resulting from when I worked with them in 2012/2013, because I supported their mission and their approach). People's views are strictly a result of the chair they sit in, or the company issuing their annual bonus, or the company sponsoring their academic research. They'll make impassioned, coherent, intelligent arguments against a practice (such as PFOF and off-exchange internalization without meaningful price improvement) when they work at a stock exchange, or when they run a high-frequency trading firm that doesn't engage in the practice, and then they'll argue the complete opposite as soon as their annual bonus is contingent upon the practice. **It's disgusting.** But of course it shouldn't be surprising anymore.

What is the D-Limit Order Type?

To understand the D-Limit Order Type would take quite an extensive post on its own. There's so much background needed that it's hard to summarize, but I'll try. IEX as an exchange was built to counteract the impact of latency arbitrage (this is extremely overly simplistic). One of the ways this was accomplished was to coil a lot of fiber so that all data in and out of the exchange was delayed by 350 us (microseconds). To put this in perspective, I think I read somewhere that nerve impulses in our body take 80-120 milliseconds to get from your hand or eye, to your brain, aka 80,000 microseconds. So 350 microseconds is not a long time, and is a hard concept to understand at human scale. I used to run trading strategies 10 years ago that did everything they needed to do in 45 us, again for some perspective.

A primary reason for the 350us delay was so that the exchange pricing and matching systems were **always faster than the exchange's fastest participant**. One of the reasons for this was for pegged order types. A pegged order type is one that is dependent on the NBBO. For example, a midpoint peg is an order that executes at the midpoint of the NBBO. If the exchange is slower than the firms trading on it, those firms can use their speed to pick off stale midpoint peg orders when they see the NBBO change, but before the exchange has seen the change. This is complicated stuff, and it's one example of latency arbitrage - there are other types. However, it also speaks to incentives. IEX was funded in large part by asset managers, and so designed an exchange focused on protecting them. Other exchanges' focused on their best customers, meaning the firms that trade the most on those exchanges - high frequency trading firms.

So back to the IEX D-Limit order type. IEX developed something called a CQI (Crumbling Quote Indicator) and the math behind it looks VERY similar to the math that underlies many high-frequency trading models. For the mathematically inclined (there's a lot more detail in the paper):

$$\frac{1}{1+e^{-(c_0+c_1 bids+c_2 asks+c_3 BL+c_4 AA+c_5 EP+c_6 EN+c_7 EEP+c_8 EEN+c_9 D)}} > f(apx-bpx)$$

$$\text{where } c_0=-1.2867,\quad c_1=-0.7030,\quad c_2=0.0143, c_3=-0.2170,\quad c_4=0.1526,$$
$$c_5=-0.4771,\quad c_6=0.8703,\quad c_7=0.1830,\quad c_8=0.5122,\quad c_9=0.4645,$$
$$\text{and } f(apx-bpx)=\begin{cases} 0.39, & \text{if } apx-bpx \le \$0.01; \\ 0.45, & \text{else if } apx-bpx \le \$0.02; \\ 0.51, & \text{else if } apx-bpx \le \$0.03; \\ 0.39, & \text{otherwise.} \end{cases}$$

It watches price feeds and supply/demand in order to forecast when an impending price level change is coming. When the indicator fires, some IEX order types don't trade - they wait to be repriced to the new price level before being able to trade. This reduces the opportunities for latency arbitrage. The D-Limit order type is one of those order types - it is a tool IEX created to protect investors from latency arbitrage, and it uses the same technology that HFT firms use in order to do so.

Why is something like this important? You might be shocked (probably not) to learn that a HUGE amount of trading in markets takes place around these quote changes. Here's how IEX breaks it down in their comment letter (noting that CQI is only active for a handful of seconds during the trading day):

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]

Who Supports D-Limit?

So if Citadel is suing the SEC, there must be a lot of firms that oppose this order type? Nope. Was it a controversial approval when the SEC approved it? Nope - it was a unanimous vote by SEC commissioners. Not only that, the firms that support IEX in this innovation **actually** represent the interests of retail investors. Keep in mind that most of retail's wealth is in pension plans and mutual funds managed by large asset managers. These asset managers often are compensated as a % of Assets Under Management (AUM), meaning that when your retirement savings grow, so do their fees. If there's anyone incentivized to look out for long-term investors, it's the asset management community. This is from IEX's response, defending the D-Limit order type:

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

Here's a pretty robust cross-section of the industry supporting this feature (you might not like all of these firms, but it's a pretty diverse group - not just a single large market maker):

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]

Here's a quote from XTX Markets. XTX is one of the largest HFT firms in the world, and their CEO is fighting hard against PFOF and off-exchange internalization. Their quote talks directly about "high-speed information asymmetry advantages" (aka latency arbitrage) and how mitigating the harm of latency arbitrage will "incentivize liquidity providers to narrow spreads and display larger size"

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]

There are so many other quotes - I encourage you to read the [IEX Comment Letter](), pages 3-6 include quotes from so many different market participants.

What's The Point Dave??

First, I think it's important to understand the underlying issue, so I've probably spent a bit more time on it than necessary. I also wanted to show that support for the order type isn't just something coming from me personally, or from a small group of firms - it's a huge cross-section of the industry.

Most importantly, I want the community to see what is happening here. Citadel is holding themselves out to represent retail investors, even claiming that they trade "on behalf of retail investors." This sounds like a wolf in sheep's clothing situation to me. Citadel is trying to claim they advocate for retail, when all they really do is profit by trading against retail. Citadel has fought against IEX every step of the way, summarized well in the Better Markets brief supporting the SEC and IEX:

[5] These arguments from Citadel are true to form. It has a lengthy track record of making arguments that purportedly serve investors' interests, only to be proven wrong. For example, Citadel argued strenuously that approval of IEX's application to be a national security exchange, with its speed bump, would harm investors. *E.g.* Citadel Letter Re: IEX Application to Become a National Exchange, at 7 (Nov. 30, 2015), https://www.sec.gov/comments/10-222/10222-28.pdf. But, IEX has proven to be good for investors and the public interest. Edwin Hu, *Intentional Access Delays, Market Quality, and Price Discovery: Evidence from IEX Becoming an Exchange* (SEC DERA Working Paper Series Feb. 7, 2018), https://www.sec.gov/files/07feb18_hu_iex_becoming_an_exchange.pdf. Similarly, Citadel vigorously opposed approval of the D-Peg P-Peg order types, which are similarly designed to protect investors. And yet, as investors urged, these order types were approved, and are widely used to beneficial effect. IEX May 10 Letter at 14-15, https://www.sec.gov/comments/sr-iex-2019-15/sriex201915-7169827-216633.pdf.

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Here is the SEC's response to Citadel's claim that it trades "on behalf of" retail investors:

that the proposal would not target latency arbitrage. When considering this argument below, the Commission explained that Citadel's statement that it trades "on behalf of" retail investors was unclear; the Commission stated that it understood, from Citadel's own submissions, that Citadel "is not directly routing the customer's order to exchanges, but rather is, for example, buying shares for its own account and selling shares to the customer." JA__ (Order 9 n.38). Moreover,

Even the SEC isn't buying the idea that Citadel trades "on behalf of" investors. Citadel takes the other side of retail's trades. As the SEC explains above, Citadel literally trades against retail investors, but is claiming otherwise before this panel of judges. The SEC even states that Citadel couldn't even rule out the possibility that they engage in latency arbitrage:

2017 WL 129905 (Jan. 13, 2017). Citadel thus did not rule out the possibility that it was engaged in latency arbitrage when trading while the Indicator was on, let alone demonstrate that IEX's data was insufficient to establish latency arbitrage.

The SEC defends itself overall by explaining that it agrees with IEX that there is latency arbitrage, and that it is a problem for liquidity providers on IEX.

That's quite a ground-breaking admission in my eyes.

So back to the point - I think it's important that retail investors make their voice heard this week - and show that Citadel does not represent retail, as they will claim next week. There should be a lot more attention on this issue than there currently is, and I think that's because the specific issue is concerned with the minutiae of market structure complexity. But the overriding issue is one of incentives and representation, and it seems obvious to me that IEX deserves retail's support in this fight.

tldr; Citadel is suing the SEC over an IEX order type that mitigates the harm of latency arbitrage, and the hearing is next week. Citadel claims to represent retail investors. Most of the rest of the industry disagrees with them. I'd urge you to make your voice heard if you agree with IEX and to fight against the idea that Citadel represents retail investors.