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Informed Trading Special Issue

IEX – A Novel Type of Exchange?

Executive Summary

- During the first 25 trading days that IEX fully operated as an exchange, it executed 2.75B shares across more than 7600 unique symbols. IEX's volume-based market share was 1.57% overall, which was on par with IEX's monthly averages in July and August as an ATS. The new exchange ranked 9th among the 13 U.S. exchanges by traded volume.
- IEX features an extraordinarily high midpoint ratio for an exchange, with approximately 50% of its volume executing at midpoint. In overall midpoint volume executed, IEX trails only NASDAQ, already surpassing NYSE, ARCA and BATS.
- IEX additionally has remained a large source of hidden liquidity. According to its published statistics, only 26% of IEX trading volume involved a lit quote. Relatedly, IEX's quote statistics were inferior to most other exchanges. In particular, IEX's quotes matched the NBBO approximately 12% of the time.
- IEX exhibits a relatively stronger presence in high priced stocks in terms of both volume market share and relative percentage time at NBBO. Combined with its ample midpoint volume, IEX presents a unique liquidity profile in the crowded U.S. exchange space.
- Overall, IEX's average trade sizes are larger than those of most other exchanges, with the difference varying across liquidity and price ranges. It is clear that IEX's midpoint volume share drives its larger average trade size.
- Market share of IEX crept up since late September, almost surpassing its May – July level. There are no clear signs this upward trend accompanies changes in the lit-volume ratio, even though IEX's quotes became protected as of Sept. 15th. As more market participants analyze how best to utilize the new venue, with its unique liquidity profile and order types, we will see how successfully IEX can grow its market share.

Ninth Exchange by Volume with Largely Hidden Liquidity

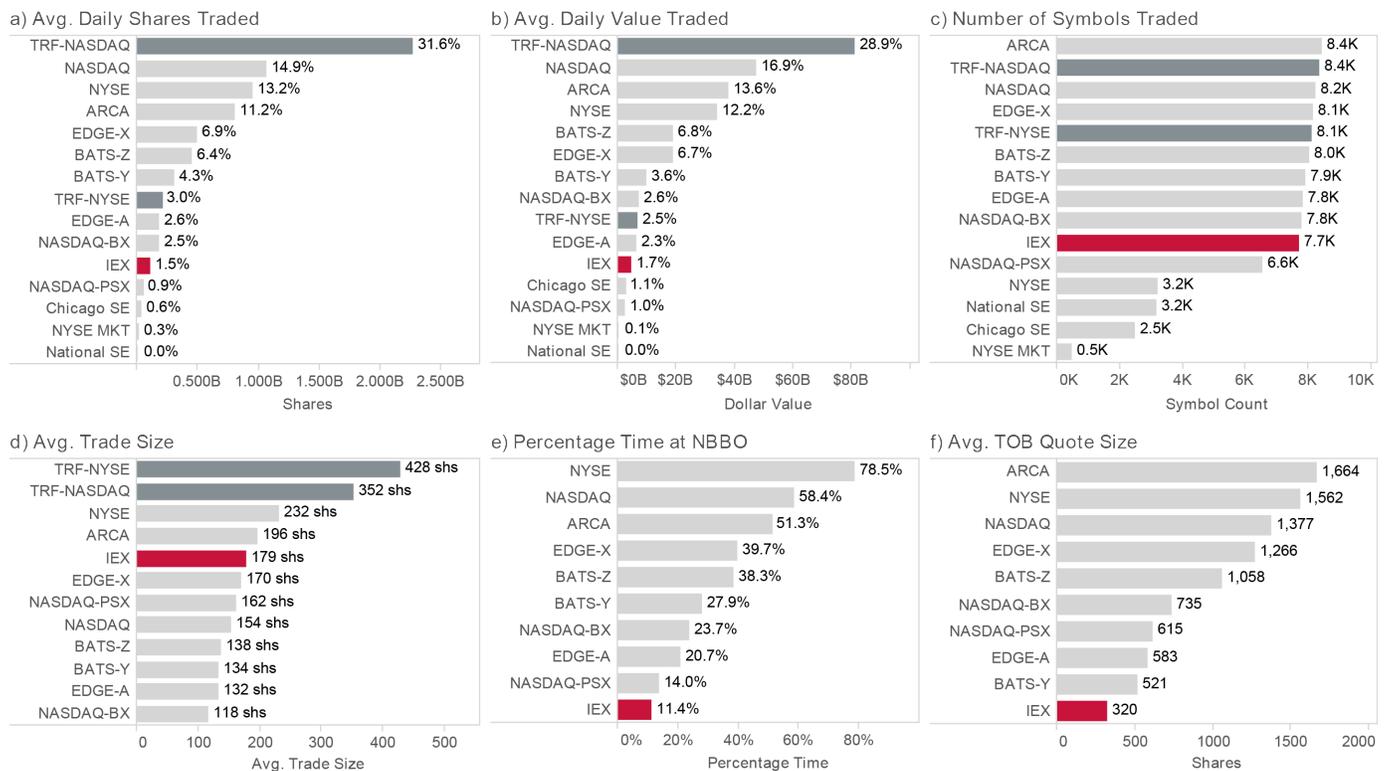
Following a phase-in period beginning August 19th, 2016, IEX successfully migrated all NMS stocks to its exchange platform on September 2nd, thus ceasing operation as an ATS. This was a much-anticipated transition, but how has the new exchange actually fared? During its first 25 trading days ending October 7th, IEX executed 2.75B shares across more than 7600 unique symbols. Its volume-based market share was approximately 1.57% overall, varying on a day-to-day basis from 1.33% (9/2) to 1.80% (10/4). The only major outlier was September 16th, when it dipped to 1.11%, as auction volumes were unusually large due to options expiry and index rebalance flow. Overall market share was consistent with IEX's monthly averages in July and August as an ATS.

Exhibit 1 provides an overview of how the new IEX exchange stands among its competitors in terms of trade and quote metrics.

- **(1a, 1b)** IEX is among the smallest exchanges by traded volume, only beating out NASDAQ-PSX and three other exchanges.
- **(1c)** However, it executed a wide range of stocks, amounting to ~90% of all the stocks traded during the period.
- **(1d)** IEX ranks 3rd in terms of average trade size in shares, albeit the differences versus other exchanges are rather small. This might indicate that it is following through on its promise to encourage greater execution sizes.
- **(1e, 1f)** show that displayed liquidity is relatively scarce at IEX. The venue ranks at the bottom for both the percentage of time each exchange provided the national best price and the average size of the exchange's top-of-book quote. These metrics reveal the nature of liquidity available at IEX, indicating that it has carried over some of its characteristics as an ATS.

Exhibit 1: IEX among 13 U.S. Exchanges

The figures are compiled from trade and quote data between Sept. 2nd and Oct. 7th, 2016. (a, b) Traded volumes are shown as daily averages, and percentages represent venues' market shares. (c) The number of symbols is the total symbol count traded at each venue during the data period. (d-f) NYSE MKT, Chicago and National Stock Exchanges are omitted as these exchange do not trade the majority of stocks. (d) Auction trades were excluded. Note that NYSE reports simultaneous trades as one; therefore, its average number may be artificially inflated. (e) Percentage time at NBBO is computed for each stock as the average of percentage time the exchange provided NBB/NBO, and then further averaged over all stocks traded at the exchange.



Source: Instinet

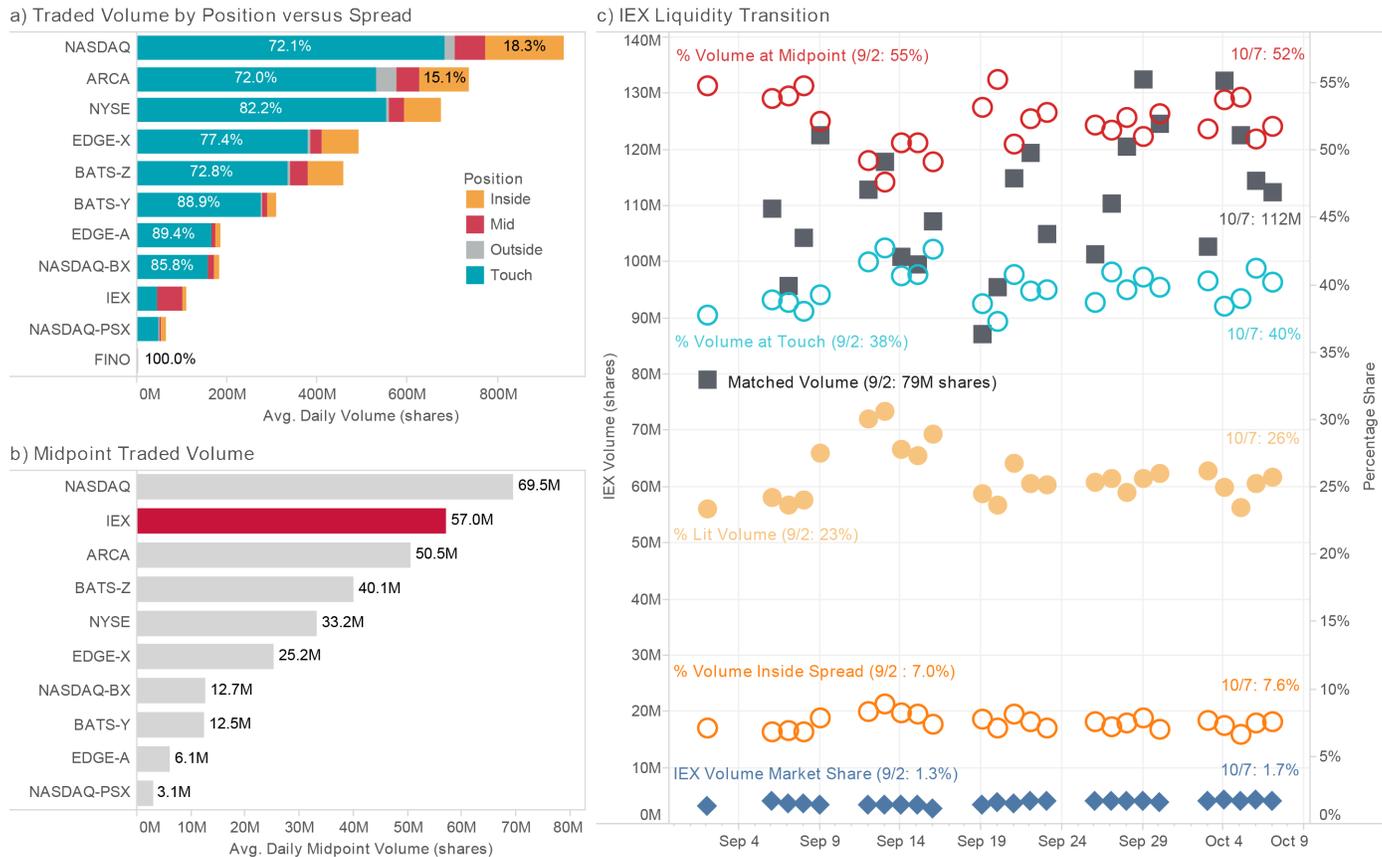
Rivals Giants by Midpoint Volume

Although among the smallest exchanges by total trading volume, as a former dark pool IEX appears to offer traders a distinct advantage versus the other exchanges: ample midpoint liquidity. **Exhibit 2a** shows exchange traded volume broken down by the trade position with respect to the NBBO at trade time. **Exhibit 2b** shows an exchange ranking by midpoint trading volume share.

- For all exchanges except IEX, the vast majority of trade volume is executed at the touch, *i.e.* either NBB or NBO, whereas for IEX, more than half of its volume is executed at midpoint.
- **Exhibit 2b** reveals an even more remarkable fact: at around 50MM shares per day, or \$2B/day, IEX rivalled even the largest exchange in terms of overall midpoint trading volume. This abundant midpoint liquidity, almost 80% that of NASDAQ, is a unique characteristic that IEX adds to the crowded U.S. equity exchange space.

Exhibit 2: Liquidity Breakdown and Developments

Trade position versus spread was inferred for each trade by comparing its price with the outstanding NBBO at trade time. Auction trades were excluded. IEX's volume, market share and lit-volume can be accessed on [its website](#)¹.



Sources: (a), (b) Instinet (c) IEX, Instinet

Exhibit 2c shows daily variations of IEX's liquidity breakdown. We can see that the lit-volume ratio and percentage volume at touch (*touch-ratio* hereafter) move in tandem while percentage volume at midpoint (*midpoint-ratio*) moves in the opposite direction.

In the week of September 12th, the lit-volume ratio and touch-ratio both increased by ~4 percentage points (pps) compared with the previous week. This coincided with a similar-sized decrease in midpoint ratio. As of the end of that week, we thought this trend would continue especially given the IEX's quotes became protected as of September 15th. We therefore thought that IEX would start receiving more marketable flow, which would in turn encourage more participants to switch their preferred order types away from midpoint orders to those providing full spread-saving opportunities, e.g. the [Discretionary Peg Order](#)². Intriguingly, this has not actually happened; the mid-point ratio

¹ <https://iextrading.com/stats/>

² <https://www.iextrading.com/trading/dpeg/>

instead went back up the following week, and has remained there since. This will no doubt merit further attention, as market participants adapt after the initial transition period.

Preferred Exchange for Higher Priced Stocks

Exhibit 3a shows IEX's dollar value-based market share broken down by stocks' traded value and price, in which we can see the market share is distributed between 0.9% and 2.5% across the groups. **Exhibit 3b** shows IEX's percentage time at NBBO normalized to the average across all exchanges. In those we can see another set of IEX's unique liquidity characteristics as a former dark pool.

- In every liquidity group but *Very Illiquid*, the market share turns out to be the greatest in the highest price band. This is not a surprise, as traders utilize dark pools to take advantage of their midpoint and intra-spread liquidity when trading higher-priced stocks. On the other hand, IEX's market share is consistently low at around 1.0% in the *Very Illiquid* groups irrespective of the price.
- Although less readily discernible, IEX's market shares are slightly higher in the lowest price band than those in the adjacent price band. In this price range, and particularly in liquid stocks, bid-ask spreads are constrained by the tick size; consequently, queue lengths become longer, thus creating tougher competition for better queue positions. This prompts liquidity providers to route their orders to inverted exchanges and dark pools, where they can expect faster execution at near touch in exchange for rebates at maker-taker exchanges. This is also likely the cause of IEX's slightly elevated market share in the lowest price band, given [its current access fee structure](#)³.
- In every stock group, IEX provided NBBO less time than the average exchange with the difference ranging from ~5 pps to ~40 pps. The trends observed in its market share, **Exhibit 3a**, are more or less mirrored here, as IEX shows stronger presence in higher price bands. The major difference is that IEX's percentage time at NBBO dips in the mid-price bands, where it is even lower than 10%.

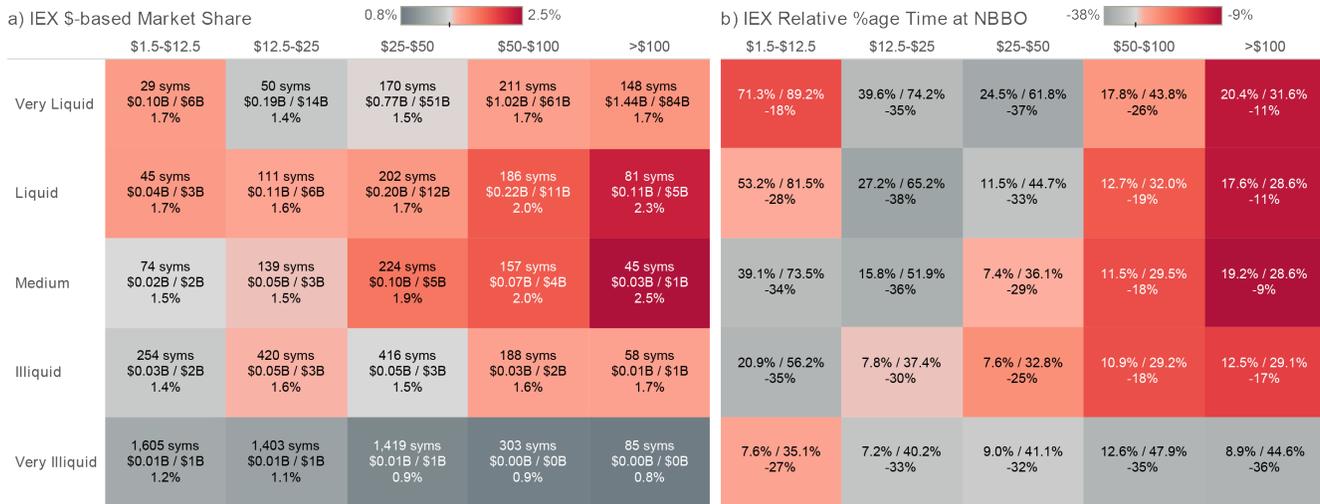
All in all, despite its new status as an exchange, the order flow IEX receives has apparently not changed dramatically. Market participants may still be trying to figure out the best way to interact with the IEX as an exchange. We will continue to monitor volume and quoting statistics to see how IEX changes over the coming weeks and months.

³ <https://iextrading.com/trading/#fee-schedule>

IEX – A Novel Type of Exchange?

Exhibit 3: IEX by Liquidity and Price

Very Liquid group consists of ~600 stocks in the top 10% by dollar-value traded, and collectively accounts for ~75% of total traded value. Liquid, Medium, and Illiquid groups consist of the next 10%, 10%, and 20% of symbols, respectively. Very Illiquid group includes the majority of stocks (~4700 symbols) but is only responsible for ~1% of total traded value. (a) Each cell shows four numbers in three rows: (top) the number of symbols in the group, (middle) IEX daily traded value / market daily traded value, and (bottom) IEX market share by dollar value. Cell color represents the IEX market share. (b) Each cell shows three numbers in two rows: (top) IEX's percentage time at NBBO / percentage time at NBBO averaged over all exchanges, and (bottom) their difference. Cell color represents the difference, or IEX's relative percentage time at NBBO.



Source: Instinet

Exhibit 4: IEX Trade Size by Liquidity and Price

Stock grouping was defined in the same way as it was in Exhibit 3. Auction trades were not included. (a) NYSE, NYSE MKT, Chicago and National Stock Exchanges are omitted, as these exchanges do not trade the majority of stocks (see Exhibit 1c). (b) Each cell shows five numbers in three rows: (top) IEX's dollar-based average trade size / dollar-based market average trade size, (middle) same as top but in number of shares, and (bottom) percentage difference of the dollar-based average trade sizes between IEX and market, which corresponds to the cell color. For market average trade sizes, only exchanges listed in (a) were used.



Source: Instinet

Trade Size Greater than Average, with Varying Degrees

Exhibit 4 compares IEX's average trade sizes with those of the other exchanges, for various ranges of liquidity and price. **Exhibit 4a** is an exchange ranking by dollar value-based trade size averaged over the entire stock universe. Note that NYSE, NYSE MKT, Chicago and National Stock Exchanges were not included in the subsequent analyses, as these exchanges only trade limited sets of stocks (see **Exhibit 1c**).

- IEX is placed 2nd in the ranking, beaten only by ARCA, which supports the view that the venue is encouraging greater execution sizes. In addition, the breakdown by stock liquidity and price (**Exhibit 4b**) reveals that the venue's average size beats the market average in most of liquidity-price combinations, albeit with varying degrees.
- In 11 of the 25 stock groups, IEX's average trade size is considerably greater, by more than 20% and up to even 50%. It is moderately greater (by 5 to 15%) in 6 groups; there is no material difference (within $\pm 5\%$) in 5 groups. IEX's average trade size was found to be smaller than the market average by more than 5% in only 3 groups.
- Comparing **Exhibit 4b** with **Exhibit 3b**, we notice that IEX's percentage time at the NBBO is particularly low in stock groups with large relative trade sizes. For example, the percentage time is even less than $\sim 10\%$ for *Liquid, Medium, Illiquid* groups in the \$25-\$50 band. This implies that IEX's greater average trade sizes are attributable to the fact that the liquidity available at the venue is still largely hidden and matched at midpoint.

Small Percentage of Odd Lots, Larger Trades at Midpoint

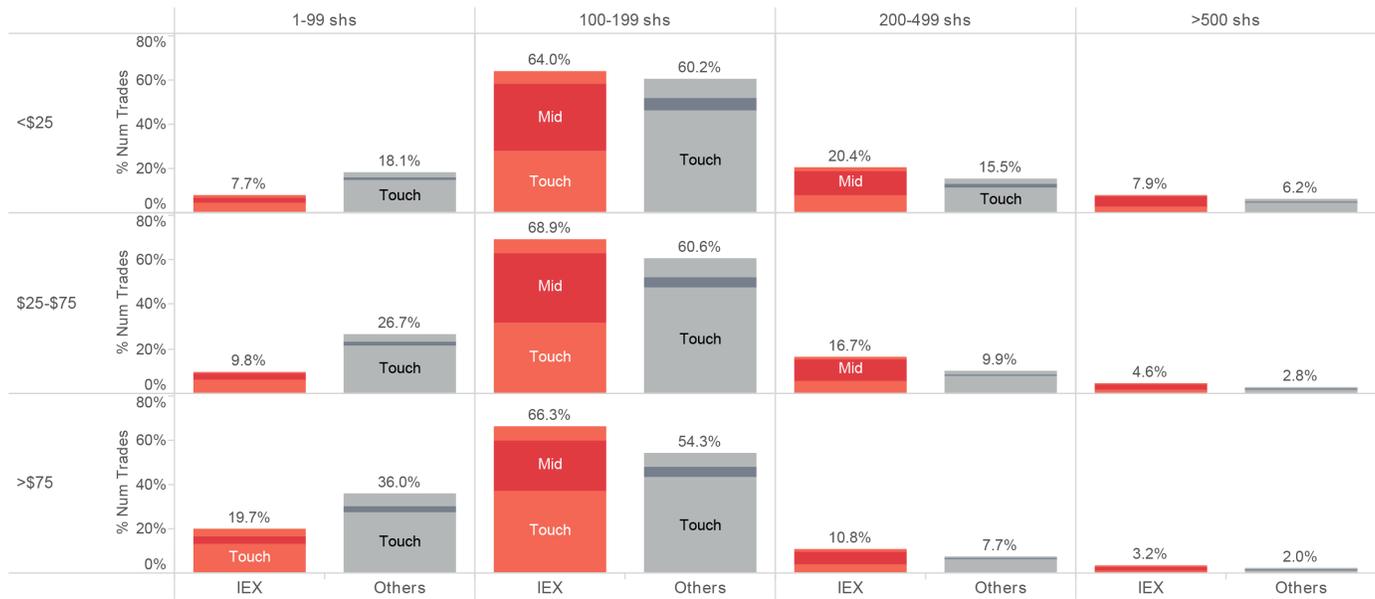
In the trade size distributions shown in **Exhibit 5**, IEX exhibits distinctively low odd-lot rates compared with the collective of the other exchanges, by as much as 10 to 17 pps, depending on the price range. Interestingly, the difference is made up not only by the 100 share-trades, but also by trades of larger sizes. In addition, it is apparent that midpoint executions prevail in the larger trade sizes at IEX: its midpoint ratios are 23% (1-99 shares), 44% (100-199 shares), 55% (200-499 shares), and 57% (>500 shares). This corroborates the idea described above and suggests that IEX is a destination providing hidden liquidity in larger chunks.

Summary and Future

Our observations of the first month of IEX suggest that this unique transition from a dark pool to a regulated exchange has been fairly successful so far, with no major disruption to the venue's operation or significant loss of its market share. IEX has materially retained the liquidity characteristics it offered as a dark pool, which might give it a unique competitive edge among more established giants. Most notably, IEX already provides ample midpoint liquidity, rivaling that of NASDAQ and ARCA. This is apparently helping IEX hold a stronger presence in higher priced stocks, whose trading tends to be characterized by greater portions of hidden and midpoint volume. In addition, IEX shows larger average trade sizes than most other exchanges across a wide spectrum of stocks. This also seems to be attributable to its abundant midpoint liquidity.

Exhibit 5: Trade Size Distribution, IEX versus Others

Others include all exchanges except IEX, NYSE, NYSE MKT, Chicago and National Stock Exchanges. Auction trades are not included in the analysis. The bar height shows the percentage of trades that fall in the corresponding size range for each exchange group (IEX or Others). Within each exchange group, midpoint trades are highlighted by a darker color.



Source: Instinet

Notwithstanding these unique and seemingly attractive features IEX is offering to the investors, it is still one of the smallest exchanges by overall market share. Since its inception as an ATS, IEX has touted its business model as trying to address some of what critics argue are problems inherent in U.S. equity trading. Whether the new exchange’s unique liquidity as well as its other innovative approaches — such as [the much-contested speed-bump⁴](#) and the D-Peg Order type — will actually add material value to the already crowded U.S. exchange space as it claims remains to be seen. If it indeed does, we would expect to see IEX’s market share grow considerably from its current level.

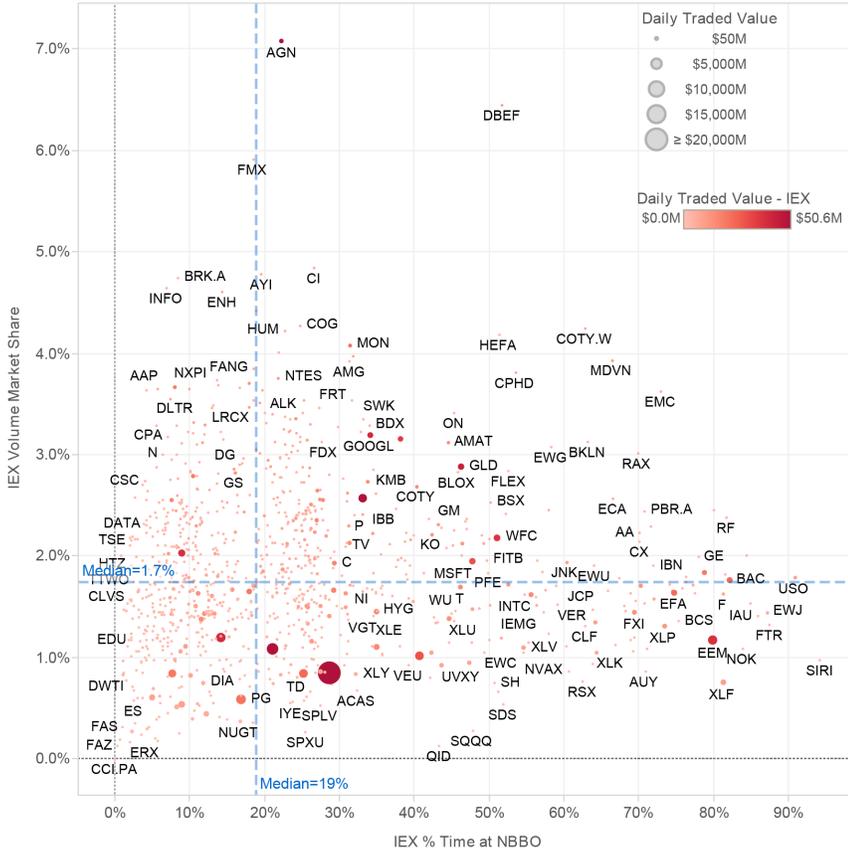
Seen in this light, it is worth noting that IEX’s market share crept up to 1.7–1.8% since the last week of September, and it is about to reach its historical monthly high recorded in February. This was not accompanied by any signs that its lit-volume ratio or midpoint ratio will change. This could be simply due to some participants returning to the venue after shying away during the transition period. Or this might also be an early indication that IEX is gaining momentum, as market participants start to discover ways to leverage the venue’s unique liquidity profile and order types. As we expect the shift to occur in the months to come, we will keep watching and updating our analyses to inform our clients and products.

⁴ <https://research.tabbgroup.com/report/v14-041-iex-exchange-8-consequences-investors>

Appendix A: IEX Market Share versus Percentage Time at NBBO for Individual Stocks

a) Circle size represents the stock's daily trading value in the market and color intensity represents the daily trading value at IEX. Only securities with average daily trading value of \$50M or greater are shown.

a) IEX Percentage Time at NBBO versus Volume Market Share



b) Top 30 Names by IEX Traded Value

Symbol	VWAP	Avg. Daily Traded Value - IEX	Value Traded % Mkt	% Time IEX at NBBO
SPY	\$215.2	\$195.8M	0.85%	29%
AMZN	\$801.3	\$70.6M	2.58%	33%
AAPL	\$111.5	\$54.9M	1.09%	21%
GLD	\$124.6	\$43.7M	2.88%	46%
GOOGL	\$801.8	\$41.1M	3.20%	34%
IWM	\$123.1	\$40.1M	1.20%	14%
BABA	\$104.8	\$39.0M	2.04%	9%
EEM	\$37.3	\$38.4M	1.18%	80%
WFC	\$45.8	\$36.7M	2.17%	51%
GOOG	\$773.9	\$35.3M	3.16%	38%
MSFT	\$57.3	\$30.1M	1.95%	48%
QQQ	\$117.2	\$29.1M	1.03%	41%
GDX	\$26.1	\$23.9M	0.85%	25%
BAC	\$15.7	\$23.5M	1.77%	82%
EFA	\$58.8	\$23.1M	1.65%	75%
PG	\$88.4	\$21.0M	0.59%	17%
FB	\$128.6	\$20.0M	0.85%	8%
CHTR	\$269.9	\$19.3M	1.64%	18%
GE	\$29.9	\$18.5M	1.85%	79%
JPM	\$66.9	\$17.3M	1.67%	29%
HYG	\$86.4	\$16.5M	1.46%	35%
INTC	\$37.0	\$15.2M	1.62%	56%
XLE	\$69.1	\$15.1M	1.11%	35%
XOM	\$85.7	\$14.3M	1.39%	11%
XLU	\$49.1	\$12.9M	1.39%	45%
XLF	\$21.2	\$9.1M	0.75%	81%
VXX	\$36.1	\$8.9M	0.53%	9%
TLT	\$136.4	\$8.4M	0.62%	5%
GDXJ	\$43.8	\$5.1M	0.44%	12%
XIV	\$35.9	\$4.8M	0.51%	8%

Source: Instinet

Appendix B: IEX Trade/Quote Statistics for Individual Stocks

Securities with average daily trading value less than \$50M are excluded from the ranking. Grand total calculation includes all securities irrespective of their trading value.

Trade and Quote Statistics for Top 30 Names by IEX Market Share

Symbol	VWAP	Avg. Daily Shares - IEX	Avg. Daily Shares - Market	Volume Market Share - IEX	Avg. Daily Trades - IEX	Avg. Daily Trades - Market	Num Trades IEX vs Market	Avg. Trade Size IEX	Avg. Trade Size Market	Avg. Quote Size IEX	Avg. NBBO Size	% Time IEX at NBBO
AGN	\$237.7	228.1K	3,222.9K	7.08%	1,056	28,030	3.77%	216	115	51	351	22%
DBEF	\$26.3	413.7K	6,420.9K	6.44%	386	9,304	4.15%	1,072	690	35,243	87,105	52%
FMX	\$91.3	42.5K	718.5K	5.92%	278	6,562	4.23%	153	109	161	390	19%
CI	\$129.3	51.3K	1,061.6K	4.84%	335	8,879	3.77%	153	120	71	362	27%
AYI	\$254.8	21.0K	438.9K	4.78%	166	5,101	3.25%	126	86	53	235	20%
BRK.A	\$218,387.2	0.0K	0.3K	4.74%	13	230	5.75%	1	1	1	1	8%
INFO	\$36.9	91.8K	1,975.1K	4.65%	308	10,641	2.90%	298	186	43	939	7%
ENH	\$88.8	76.4K	1,656.5K	4.61%	383	9,857	3.88%	200	168	160	1,219	14%
AXTA	\$27.8	79.8K	1,804.5K	4.42%	368	10,103	3.64%	217	179	138	1,661	19%
COG	\$25.3	254.7K	5,965.0K	4.27%	947	34,061	2.78%	269	175	141	3,784	25%
COTY.W	\$23.3	278.8K	6,565.2K	4.25%	1,493	24,032	6.21%	187	273	790	9,556	63%
HUM	\$176.3	31.2K	739.4K	4.22%	333	6,869	4.85%	94	108	58	272	23%
HEFA	\$24.6	93.0K	2,223.3K	4.18%	109	3,221	3.39%	852	690	12,212	71,819	51%
MON	\$104.6	210.7K	5,153.7K	4.09%	1,272	31,752	4.01%	166	162	243	655	31%
ROP	\$179.5	17.3K	431.2K	4.01%	177	4,952	3.57%	98	87	48	248	22%
RTN	\$138.2	62.3K	1,570.9K	3.97%	571	15,474	3.69%	109	102	89	407	32%
MDVN	\$81.1	137.1K	3,481.2K	3.94%	616	12,981	4.74%	223	268	2,332	38,455	66%
AMG	\$146.2	19.3K	493.1K	3.92%	228	6,312	3.62%	85	78	62	222	31%
FANG	\$92.3	46.6K	1,209.3K	3.85%	369	11,776	3.13%	126	103	35	308	19%
CPHD	\$52.4	142.8K	3,754.2K	3.80%	614	16,915	3.63%	233	222	763	8,852	54%
NTES	\$235.1	49.8K	1,325.6K	3.76%	368	12,957	2.84%	135	102	359	306	22%
SNA	\$150.1	16.2K	434.4K	3.74%	159	5,002	3.19%	102	87	31	283	14%
MCK	\$170.1	76.5K	2,063.1K	3.71%	541	18,689	2.89%	141	110	65	355	18%
CBOE	\$67.6	34.8K	945.3K	3.68%	258	8,219	3.14%	135	115	46	422	14%
NXPI	\$95.1	207.2K	5,647.9K	3.67%	1,065	40,090	2.66%	195	141	48	630	8%
CNQ	\$31.2	90.4K	2,469.4K	3.66%	385	17,453	2.21%	235	141	203	3,041	17%
AAP	\$153.2	37.8K	1,037.7K	3.64%	231	10,391	2.22%	164	100	22	361	6%
ZTS	\$51.3	126.0K	3,460.8K	3.64%	406	20,566	1.97%	310	168	59	1,746	10%
VMC	\$110.9	52.0K	1,431.1K	3.63%	403	12,913	3.12%	129	111	52	371	20%
EMC	\$28.9	192.4K	5,309.7K	3.62%	520	9,701	5.36%	370	547	2,562	84,003	73%
Grand Total	\$42.4	109,819.9K	1,288.4K	1.53%	613,372	5,841	1.90%	179	222	379	6,716	13%

Source: Instinet

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