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December 19, 2018

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

Re: Proposed Transaction Fee Pilot (Release No. 34-82873; File No. S7-05-18)

Dear Mr. Fields:

Nasdaq is pleased to submit the attached document, entitled *Risks and Incentives for Market Makers in US Equities*, by its Chief Economist, Phil Mackintosh, to the comment file for the Commission's proposed Transaction Fee Pilot for NMS Stocks. This report further demonstrates that:

- liquidity incentives benefit issuers and shareholders by promoting better market making and improving market quality, increasing liquidity, and reducing effective spreads;

- reducing liquidity incentives harms market quality, as was the case recently when the stock of Interactive Brokers switched listings from a primary market that offers liqudity incentives to another that does not; and

- the Commission proposal will likely exacerbate volatility on days when markets are experiencing stress, and the Commission has not ruled out the possibility that its proposal may cause more such events to occur.

The data contained in the attached report is available to the Commission and could have been used by the Commission's Division of Economic and Risk Analysis as part of the cost-benefit analysis required by the Administrative Procedures Act.

Sincerely,

Jeffrey S. Davis

cc: Chairman Jay Clayton
Commissioner Robert J. Jackson, Jr.
Commissioner Hester M. Peirce
Commissioner Elad L. Roisman
Commissioner Kara M. Stein
Brett Redfearn, Director, Division of Trading and Markets

RISKS AND INCENTIVES FOR MARKET MAKERS IN US EQUITIES

NASDAQ ECONOMIC RESEARCH

December 2018

Executive Summary

The quality of US stock markets is especially important to attracting capital formation to US exchanges. That, in turn, benefits US households whose equity investments are generally restricted to listed securities.

Data shows that incentives offered to market makers are important to delivering the tight spreads and actionable liquidity that creates a high-quality market experience for investors. Data also shows that achieving good market quality in smaller capitalization growth companies is difficult and requires, at times, bundled incentives to market makers.

Moreover, analysis of market maker behavior in highly stressed markets provides two important warnings.

1. Market makers will exit markets when the risks of providing liquidity outweigh the benefits. Reducing the benefits therefore is expected to reduce the number of liquidity providers.
2. Market makers are unable to quickly adapt to a new market paradigm. This will become important in a stressed environment if market incentives have been removed and liquidity provision strategies have reduced.

Given that, the recent Access Fee Pilot proposal by the SEC looks to present significant risks to the market. By removing liquidity incentives from a comprehensive list of stocks on a pilot basis, and potentially indefinitely, there is a risk that we see a material degradation in market quality for US growth stocks which rely on cross-market incentives for competitive quotes. That, in turn, would harm the ability for the US equity capital market to attract and retain IPOs.

In our opinion, data show that there are significant downside risks and no clear upside benefits to the pilot.

Especially with the recent increase in economic uncertainty, accompanied by broad market volatility, we caution against such an experiment on the US Equity markets.

Background

The US markets are the envy of the world, with superior liquidity and transparency leading to the lowest investor costs.[1]

However, market quality is not consistent across the capital spectrum. It is widely acknowledged that tradability and market depth is more difficult to achieve naturally in thinly-traded stocks. Importantly, this is the spectrum of the market that emerging growth stocks fall into, making it a complicating factor attracting IPOs to the US equity markets.

Congress and the SEC have recognized this in numerous instances, including the development of the recent Tick Size Pilot Program[2] and this year's SEC roundtable on Thinly-Traded stocks[3].

The topic of how to improve trading of thinly-traded securities was also discussed at the SEC's HFT panel.[4] Notably, experts on that panel pointed to the need for sufficient incentives to market makers and other liquidity providers.

Who Pays for Market Makers?

Independent studies have shown that "natural" investors are surprisingly unlikely to be trading against each other at the same time.[5]

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[1] *ITG 4Q17 Global Cost Review.*

[2] *https://www.sec.gov/ticksizepilot.*

[3] *SEC Roundtable on Market Structure for Thinly-Traded Securities. April 23, 2018. Also see transcript.*

[4] *SEC HFT Panel, Sept 21, 2018.*

[5] *FT, July 13, 2016, Imagine there's no HFT.*

That makes market makers an especially important part of the trading ecosystem, particularly when the quality of the US OTC market also rests on the quality of exchange traded prices.

The business of a market maker is to post buy and sell orders simultaneously, and profit from capturing spread. Although that sounds easy, with spreads on US stocks as low as 0.02%, it is often more likely that a market maker will be "adversely selected." Adverse selection happens when a market maker is filled (say) on the offer as the price is moved higher by a larger or better informed investor, often an institutional investor.[6] The result of this trade is a loss, which if not covered quickly, can add to more than 1x spread.

Essentially a market maker is writing (selling) options to the market at the bid and the offer – collecting a small premium (the spread) with unlimited downside (if the price gaps through their limit prices). For this reason, market makers are among the fastest participants in the market, as they need to ensure their prices include all current information (are not "stale") and therefore too attractive to trade against.

To encourage market makers to post two sided markets, incentives are typically used. These are designed to offset some of the potential losses from adverse selection.

In Europe, the costs of incentivizing market making activity is borne by corporates.[7] Although this gives corporates control over the level, and cost, of their market quality – it also results in a suboptimal allocation of economic costs and benefits. Smaller companies are typically subject to relatively higher costs, while traders, who also benefit from tight spreads, pay nothing.

In any case, in the US corporates are *not allowed* to incentivize market making activities as that is seen as a potential conflict that might make it easier for management to engage in stock price manipulation.

Instead, the US market has developed a system of rebates paid to any trading firm that provides publicly accessible and transparent quotes on "lit" exchanges. We call them "lit quotes" because they are distributed to millions of investors instantaneously through exchange data feeds, and they are accessible for instant execution. These rebates are paid for primarily by charging liquidity takers to "access" the liquidity. However, we highlight that by subsidizing lit quotes, the economic effect of rebates is to compress spreads which offsets some of the taker costs. Importantly, the market mechanism will operate to optimize the way rebates are shared between liquidity providers and takers, as we discuss below.

Incentivizing broad market quality

Although rebate programs offer economic incentives to all providers of liquidity, there is a risk that incentives only accumulate to economic level for liquid stocks where significant trading occurs.

However, listing exchanges are able to (and do) offer additional incentives to market makers who provide two-sided markets in more stocks, supporting market making in emerging growth companies that are typically thinly-traded stocks. Exchanges are in a unique position to use liquidity incentives to transfer trading revenues from liquid stocks where market quality is good to thinly-traded stocks, to benefit all investors.

Do Rebates Affect Stocks?

There is already a significant amount of data about the impact of liquidity incentives on different stocks. We can use this to show that the liquidity incentives are indeed important to incent two sided markets, which in turn result in competition for the NBBO, which in turn results in the tightest spreads for investors.

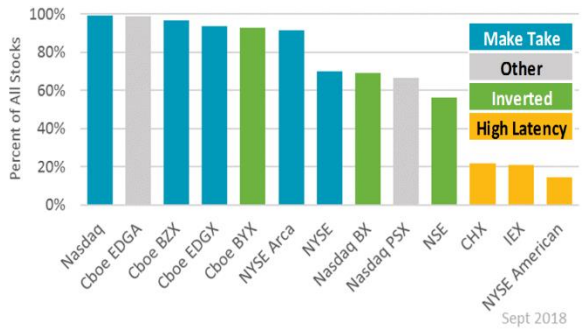
[6] *Ohara, High Frequency Market Structure, 2014.*

7 *Why do listed firms pay for market making in their own stock? Norges Bank 2013*

Incentivizing bids and offers

In our first chart (below), we focus on how many stocks have two-sided markets most of the time. This shows that markets with liquidity incentives (so called maker-taker markets) are able to incentivize bids and offers across the full market cap spectrum, with a bid and offer for over 90% of tickers more than half the time. Importantly, this level of performance mostly holds even if we increase the market quality threshold to as high as 90% of the time.

Chart 1: Time at best quote across S&P500 stocks, by venue



Source: Nasdaq Economic Research

Importantly, this chart is not showing the existence of a "marketable" quote. It is just showing the existence of a bid and offer at *any* price.

Given that, the difference in market quality for higher latency venues is stark. Both IEX and American have small (350µs) but intentional speed bumps, while Chicago (CHX) is more between 4-7ms away from all other venues. This delays the confirmation of trades and cancelations, which increases the risks and costs for market makers. Although this seems like a small 'disincentive' to market makers, its impact on market quality is significant – less than 20% of tickers, typically liquid stocks, have a two-sided market most of the day.

Incentivizing competitive bids and offers

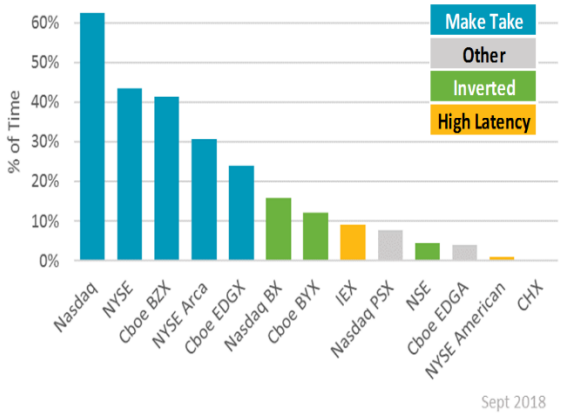
The National Best Bid and Offer (NBBO) is used to control execution quality across exchanges and also off exchange trading. That makes it especially important to retail and dark pool orders – where most trading is in fact done off-exchange.

Robust competition for the NBBO is the best way to encourage an optimally priced spread for all stocks.

Data in the chart below shows that markets with liquidity incentives do in fact have liquidity at the NBBO significantly more than other markets.

However, we highlight that even with incentives, no exchange is able to incentivize posting at the NBBO more than around 2/3rds of the time even for the most liquid S&P500 stocks. This would seem to indicate that even with the current incentive regime, the benefits to liquidity providers are not so large as to support 1-tick spreads on all stocks at all times.

Chart 2: Time at best quote across S&P500 stocks, by venue



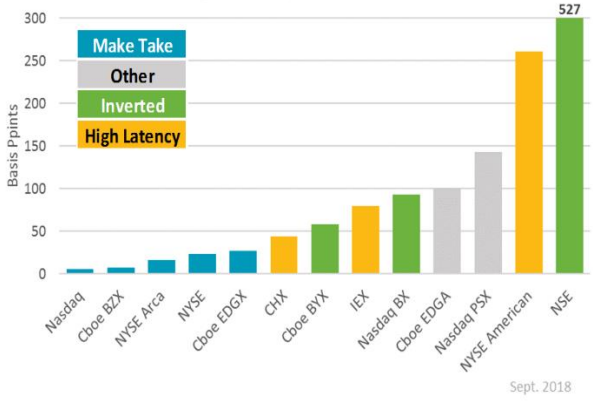
Source: Nasdaq Economic Research

Incentivizing tight spreads

Finally, to show the true difference in market quality that incentives provide, we look at the average spreads across venues.

Here, the data clearly shows that markets with liquidity incentive programs provide materially better spreads and liquidity.

Chart 3: Average spread across S&P500 stocks, by venue



Source: Nasdaq Economic Research

A market without incentives

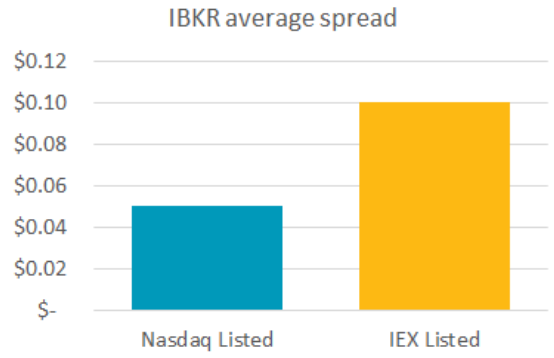
A different way to look at the impact of removing incentives is to view the spread of IBKR over the past few months.

Before October 5th, Interactive Brokers Group Inc.'s (IBKR) primary listing was Nasdaq, a market that provides incentive programs for liquidity providers and market makers.

On October 5th, IBKR moved their listing to IEX, a market that promotes its speed bump and mid-point DPEG order type, but has been publicly anti-rebate. We also note that, in fact, rather than subsidizing liquidity providers, their business model subsidizes data and colocation – and in fact charges traders to provide liquidity.

The combination of speed bump and charges to trade act as a significant economic disincentive to provide tight quotes. Not surprisingly, the quotes for IBKR have widened significantly.

Chart 4: IBKR NBBO spread with and without market maker incentives



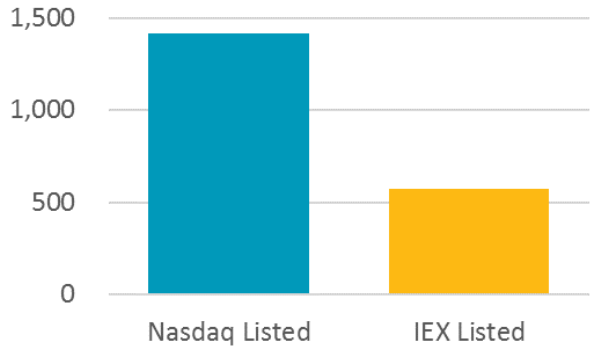
Source: Nasdaq Economic Research (Oct 2018)

Importantly, tick pilot stocks where spreads were *forced* wider, saw depth increase to largely offset the wider spreads.[8]

However, to prove that wider IBKR spreads are a *natural* result of different economics to liquidity providers, we see that the liquidity near the inside has, in fact, significantly declined since incentives were removed from their primary listing venue.

Importantly, this has in fact increased the cost to trade 500 shares by $17.50, much more than the $1.65 difference in incentives offered.

Chart 5: IBKR NBBO depth with and without market maker incentives (IBKR shares executed at an average cost from mid of 5cents)



Source: Nasdaq Economic Research

[8] *See Rosenblatt Tick Pilot Study (page 14).*

Overall, existing data from stable markets shows that markets with liquidity incentives provide more two-sided quotes, across more stocks, more of the time, resulting in more competitive and tighter spreads. Analysis of IBRK seems to confirm not that the economic incentives matter, but that they can actually result in better outcomes for all investors, and especially the roughly 40% of volume that trades off exchange.

Another market without incentives

Results from a study of our European markets shows that markets with less incentives for liquidity providers can evolve to have less participants tuned to provide liquidity.

Although companies *can* pay for market makers in Europe, many choose not to. That may be because they don't want to bear the full economic cost of supporting traders.

What our research shows is that in the European market there are relatively few Proprietary Trading Firms (PTFs) that are tuned to provider liquidity.

This presents an additional risk when the market demands liquidity provision or support.

Chart 6: 2018 volatility is elevated vs 2017

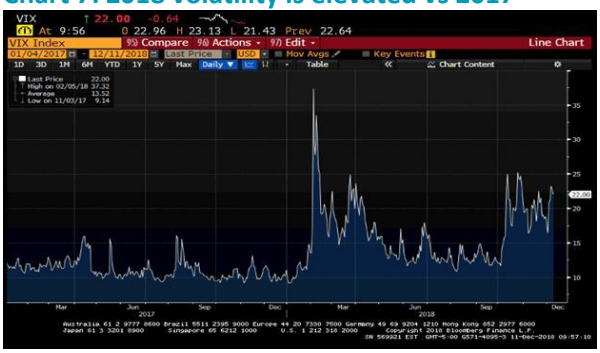
Source: Nasdaq Economic Research

A risky time to experiment

Trading dislocations can happen at any time, but are more likely when volatility is elevated.

We highlight that the recent deterioration in global economic conditions and increase in geopolitical risks have already lifted volatility in US markets.

Chart 7: 2018 volatility is elevated vs 2017



Source: Bloomberg

In addition, as US rates rise, corporate debt spreads are implying an expected increase in defaults. Current conditions show the market pricing in elevated risks of a contagion style event.

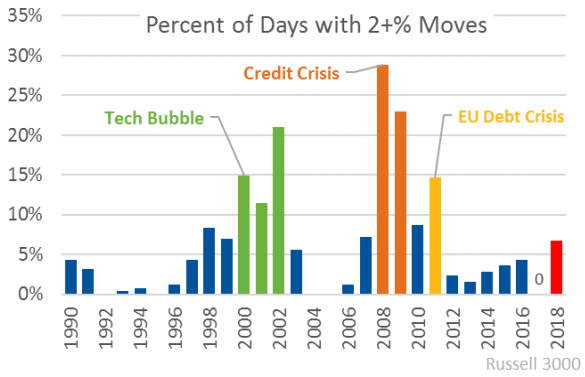
This adds to the risk of running a pilot that will reduce the economic incentive to provide liquidity and two sided quotes, and many expect will weaken liquidity provision.

Contagion can happen at any time

Because a bid-offer spreads represents an option to liquidity takers, spreads should widen when volatility increases. However, market dislocations – where prices gap and investors often suffer losses – can occur at any time.

As chart 8 shows, years with significant number of high-volatility days tend do cluster. It also shows 2018 is approaching levels associated with other crisis periods.

Chart 8: Large market moves by year



Source: FRED, Nasdaq Economic Research

The data in Table 1 shows that some of the most significant market dislocations occurred in relatively calm years.

Evidence from Stressed Markets

The Flash Crash of 2010 and August 24, 2015 trading provide additional insight into market structure and the importance of incentives to liquidity providers.

The primary observation is that in today's highly automated and efficient US Equity markets, market makers are almost always automated, so called "HFT", participants. This fact was clear from the participants on the SEC's recent HFT panels.[4]

This means their strategies are also systematic and consistent. Consequently, in times of extreme stress, it is important to have a depth of liquidity provision and risk transfer strategies in place. As our study of European customers in Chart 6 shows, reducing liquidity incentives reduces the participants tuned to provide liquidity.

May 6, 2010: "Flash Crash"

A detailed analysis of the so called Flash Crash was performed by the CFTC and SEC.[9] One of their key findings was that the selling pressure on that day was initially absorbed by HFTs and arbitrageurs.

Our interpretation of this is that these automated strategies were pre-disposed to provide liquidity – and only modified their behavior after position risks and momentum became excessive. Specifically the Joint Study found "While the withdrawal of a single participant may not significantly impact the entire market, a liquidity crisis can develop if many market participants withdraw at the same time. This, in turn, can lead to the breakdown of a fair and orderly price-discovery process". We contend that the same risk remains in orderly markets - on a smaller scale.

Table 1: Select Significant Market Dislocations

Date	Event
Sept 1998	**LTCM:** Spread reversals following the Russian financial crisis caused margin squeeze and liquidation of LTCM positions.
Aug 6-9, 2007	**Quant Meltdown[10]:** long/short hedge funds experienced unprecedented losses leading to margin calls and liquidations
Jan 21, 2008	**SocGen Rogue Trader:** European stock markets fell about 6% which led to an emergency cut in the federal funds rate
May 6, 2010	**Flash Crash**: A short sharp sell-off triggered by a large Futures trade
Aug 8, 2011	**US Debt Downgrade:** Market down 634 points or 5.55%
Jan 13, 2015	**Oil selloff:** Global growth fears drive oil price touches multiyear lows, causing volatility.
July 7, 2015	**Greek default volatility**
Aug 24, 2015	**Open Meltdown**: China data sent futures limit-down pre-open, NYSE manually held up some opens until almost 10am, causing S&P to miscalculated MWCB, resulting in no halt and hundreds of stock LULD events.
June 24, 2016	**Brexit Vote:** Market down 610 or 3.39%
Feb 5, 2018	**Volmageddon**: VIX spikes 20+ points causing the closure of XIV ETF. Market swings in 1596 range, closes down 1175

August 24, 2015

On the morning of August 24, 2015, liquidity providers and arbitrageurs were unable to participate because of cross-market structural problems. The result was a large gapping of prices in some stocks and a lack of risk and liquidity transfer.

Recall[11] that on the morning of August 24, Futures were limit down before US Equity markets opened. Then stocks on the NYSE

[9] *Summary Joint CFTC-SEC Findings regarding the events of May 6, 2010 on the events of May 6, 2010.*

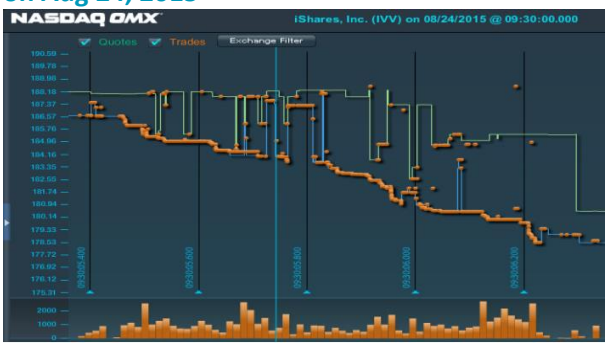
[10] *What Happened To The Quants, Khadani/Low (2007).*

[11] *Examination of August 24 Market Volatility (KCG (2015).*

opened in a staggered fashion, with some not opening until after 9:45 am.

Combined, this limited the number of automated liquidity providing strategies that worked. All futures trading, most ETF pricing, and some single stock arbitrage was effectively disabled. Consequently, the liquidity and risk transfer those strategies normally provided was severely limited[12] – just when it was needed most.

Chart 9: Trades and quotes in IVV around open on Aug 24, 2015



Note that the blue line is the best bid, the green line is the best offer and orange dots represent trades, which were overwhelmingly to sell (traded on the bid).

Source: FRED, Nasdaq Economic Research

However one of the key observations many missed from August 24 was that although the market sold off quickly, once again market makers were again net buyers to absorb the net selling. Note that the chart below shows an overwhelming proportion of sell trades at the bid (many orange circles on the blue line, few on the green line) – but there were trades are almost every price level as the market sold off.

More risk than reward

We highlight that the Tick Pilot was, in many respects, relatively small. Although it covered 1200 stocks, they were all mid-small capitalization. Consequently the tick pilot only affected 2.5% of all liquidity in the US market.

Despite that it still cost investors an estimated $300m[13] over the life of the pilot.

A broad test with small benefits

In contrast, the Access Fee Pilot, as proposed by the SEC, covers 3000 stocks, almost 50% of all tickers. Moreover, for 1000 of those stocks the proposal is to effectively do-away with liquidity provision incentives completely.

The purported benefits of the pilot are also likely overestimated. Our own analysis[14] shows that most routes incur *no cost* from the agency conflict between brokers and investors. In addition, the investors with bundled commissions represent just 20% of all US trading.[15] Finally, if rebates contribute to lower commissions, the investors this pilot is trying to benefit may already be economically better off.[16]

In short, there has been no attempt to quantify the true cost to the small proportion of traders who are affected by this – despite the high potential costs to all traders and issuers under the pilot.

A proposal that will eliminate support for thinly traded, emerging growth, stocks

However, based on the data above, the potential risks to US equity markets of a change like this is significant. Those with market making strategies will likely recalibrate toward liquidity removal. It is widely acknowledged that spreads will widen and depth will likely thin for all traders.

We believe it is not prudent, nor in the interests of emerging growth companies, to remove liquidity incentives given their important role in providing superior market quality.

Conclusion

Our overall conclusion is that this appears to be a particularly inopportune and risky time to run

[12] *August 24 was an Equity, not an ETF, Problem (KCG, 2015).*
[13] *Pragma, Tick Size Pilot – Evaluating the Effect of the Pilot Program on Execution Quality (2018).*

[14] Routing 101: Identifying the cost of routing decisions, Nasdaq (2018)
[15] *Blackrock Index investing Supports Vibrant Capital markets (2017).*
[16] *Pragma SEC comment letter.*

an experiment that is likely to degrade market quality and liquidity.

Data shows that this is especially important for thinly traded, emerging growth companies – which in turn will make it even harder to attract new IPOs to US equities markets.

The risks of the Access Fee Pilot seem to be far greater than the as yet unquantified potential benefits.