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July 7, 2014

The Honorable Mark Warner
Chair, Subcommittee on Securities, Insurance, and Investment
United States Senate
Washington, DC 20510

The Honorable Michael Johanns
Ranking Member, Subcommittee on Securities, Insurance, and Investment
United States Senate
Washington, DC 20510

Dear Chairman Warner and Ranking Member Johanns:

Thank you again for the opportunity to offer my testimony at the Subcommittee's June 18, 2014 hearing on the impact of high frequency trading on investor confidence and capital formation in U.S. equity markets (the "hearing"). I would like to follow up on two points raised during the hearing. First, there has not been an increase in recent years in intraday stock volatility and no causal link between intraday stock volatility and investor trading costs has been established. Second, the successful track record of certain high frequency trading (HFT) firms, in particular Virtu Financial's claim of only experiencing trading losses on one day in the last four years, is not indicative of "fixed" markets.

1. Volatility

There is no study that makes a compelling case that intraday U.S. stock volatility has increased in recent years. On the contrary, academics have found that meaningful measures of volatility have decreased in recent years.[1] One-day stock volatility currently is at levels lower than the averages of the late 1990's, as shown in multiple studies including the Royal Bank of Canada study ("RBC study") referenced in Mr. Brooks' written testimony and mentioned by Senator Warner.[2] Thirty-day stock volatility, as evidenced by the VIX, has also substantially decreased in recent years.[3]

The RBC study attempts to contrast these traditional measures of volatility by examining the volatility of short-term market movements over five-minute intervals, finding that these movements have increased. However, this finding very likely can be explained by a narrowing of spreads, a positive improvement in market efficiency. When spreads were higher 10-15 years ago,

[1] *See* Angel, Harris, & Spatt, *Equity Trading in the 21st Century: An Update*, June 21, 2013.

[2] Bain, Mudassir, Hadiaris, & Liscombe, *The Impact of Intraday Volatility on Investor Costs: Insights into the Evolution of U.S. Market Structure*, RBC Capital Markets, May 2014; *also see* Angel, Harris, & Spatt, *Equity Trading in the 21st Century: An Update*, June 21, 2013.

5-minute fluctuations in the fair value of a stock were less likely to be represented in the quoted prices since those movements were contained within the larger spread. As spreads declined, the same 5-minute fluctuations were no longer hidden in the large spread, and can now be reflected in prices. One should also bear in mind that long-term investors care far less about 5-minute volatility than longer-term volatility, which has clearly declined by any metric. Moreover, all investors benefit from the improvement in market efficiency and price discovery that has accompanied the smaller spreads, which HFTs have helped to narrow.

The RBC study does not provide any evidence that HFT trading has increased volatility, whatever time period it is measured over. In fact, HFT activity actually *dampens* volatility as shown in recent academic studies.[4] Further, another study that shows HFT firms provide comparable amounts of liquidity during periods of high stock volatility as they do during periods of low stock volatility.[5] The RBC study's estimated cost of 5-minute volatility in 2012 was $6 billion out of roughly $11 trillion of trading volume.[6] This 5 basis point cost, even if attributed entirely to HFTs, is dwarfed by the gains attributable to the 30 basis point drop in spreads since 2002 also attributable to HFT, as noted in the RBC study.[7]

2. <u>"Fixed" Markets</u>

Another issue raised at the hearing concerned the recent IPO filing of Virtu Financial ("Virtu"), which brought to light Virtu's consistent record of daily trading profits over four years. Critics of HFT contend that consistent daily trading profits are evidence that HFT firms must have access to unfair trading advantages that effectively allow HFT firms to cheat investors.

Virtu earns profits by acting as a "passive" HFT market maker.[8] According to the SEC, passive HFT market makers, "appear to have beneficial effects on market quality, by reducing spreads and reducing intraday volatility on average," and profit by "earning a spread between bids and offers," not predicting directional price moves.[9]

Virtu and other HFT passive market makers earn consistent profits on trades by staying market neutral, being effective at gauging the supply and demand for a security, and constantly and quickly updating their quotes, so they can pocket the spread more often than they lose it. These strategies are profitable on a daily basis because of the law of large numbers, which states that if the sample gets sufficiently large, the individual trade winning percentage becomes a highly reliable indicator of the proportion of winning trades at the end of each trading day. For example, if an HFT firm gains the spread on 52.5% of trades, loses the spread on the other 47.5%, and does 10 trades a minute, it will have a losing <u>day</u> once every *eight years.* A winning percentage of 52.5% on each trade does not indicate an unfair market, but rather an appropriate fee earned by market makers for providing liquidity, which was the business model of market makers well before the emergence of HFTs. Furthermore, profitability on trades does not by itself insure profitability of the firm because this depends on whether trading profits exceed expenses, e.g.

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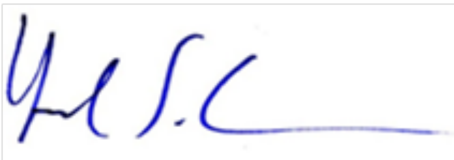
[4] *See* Hagstromer, Nordern, *The Diversity of High-Frequency Traders,* May 18, 2013; *also see* Brogaard, Hendershott & Riordan, *High-Frequency Trading and Price Discovery*, Rev. Finan. Stud., July 2014.
[5] Australian Securities & Investments Commission ("ASIC"), 2013, Report 331: Dark liquidity and high-frequency trading.
[6] *See* Bain et al. *supra* note 2.
[7] *Id.*
[8] Mehta, Hwang, *Market Maker Virtu Expands Globally as it Mulls Public Offering,* Bloomberg News, May 2013
[9] Staff of the Division of Trading and Markets, U.S. Securities and Exchange Commission, SEC Equity Market Structure Literature Review, Part II: High Frequency Trading, March 18, 2014 at 7.

overhead costs, such as salaries and infrastructure spending, and offer a sufficient return on investment.

Thank you again for the opportunity to testify and I hope this letter has thrown more light on a few of the outstanding issues.

Sincerely,



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