

Testimony of Robert Battalio

Conflicts of Interest in the U.S. Equity Markets

Before the U.S. Senate Permanent Subcommittee on Investigations
of the Committee on Homeland Security and Governmental Affairs

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I. Introduction

Chairman Levin and Ranking Member McCain, thank you for inviting me to testify today. It is an honor to have the opportunity to present my views on conflicts of interest in U.S. equity markets to the Senate Permanent Subcommittee on Investigations. I am a Professor of Finance in the Mendoza College of Business at the University of Notre Dame, where I have been a faculty member off and on since 1995. I am also a fellow at Notre Dame's Center for the Study of Financial Regulation. I served as Nasdaq's first Visiting Economist and have consulted for numerous firms on market structure issues. I currently have no consulting relationships related to my testimony. My expertise is the relationship between order flow inducements offered by dealers and exchanges and the quality of trade execution.

In preparation for my testimony today, I was asked to address three broad questions:

- (1) The conflicts of interest faced by retail brokers in determining how to route customer orders, as identified in my paper (coauthored with Shane Corwin and Robert Jennings) titled "Can Brokers have it All? On the Relation between Make-Take Fees and Limit Order Execution Quality";
- (2) Other market conditions that may create conflicts of interest affecting brokers deciding where to route institutional and retail customer orders; and
- (3) Any recommendations for policies that could reduce or eliminate those conflicts of interest and enhance public confidence in U.S. equity markets.

In consultation with my coauthors Shane Corwin and Robert Jennings, I have organized my testimony today around these three points. I begin with a brief background on the history of order flow inducements.

II. Background on order flow inducements.

The prevailing wisdom in academia is that dealers post bid and ask prices in a manner that allows them to generate enough revenue by trading with uninformed investors to recover the potential losses incurred from trading with better informed investors.¹ In other words, dealers will set wider

¹ See "Bid, Ask, and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders," by Lawrence Glosten and Paul Milgrom, published by the *Journal of Financial Economics* in 1985 and "Price,

quoted spreads in the presence of informed traders than they would in the absence of informed traders. By limiting exposure to informed traders, dealers can earn higher market making revenue, set narrower bid-ask spreads, or both. These incentives have led market participants to search for order characteristics or other means that allow them to separate uninformed and informed order flow. One common method to accomplish this is to separate retail order flow from institutional order flow, as retail order flow is generally considered uninformed and therefore less “toxic” to trade against. Many of the market structure issues I will discuss below are directly related to the goal of market participants to attract retail order flow.

In 1975 Congress instructed the Securities and Exchange Commission (SEC) to “amend any restrictions which imposed an unnecessary or inappropriate burden on competition” between domestic securities markets.² In response to this directive, the SEC mandated exchanges distribute real time trade and quote information to market participants. Beginning in 1982, market participants trading NYSE-listed securities could observe real-time quotes and trades that were recorded within 90 seconds of consummation. This was an important event for the retail investor. Prior to 1982, the NYSE’s competitors were unable to promise brokers that their customer orders would be treated at least as well as if they had been routed to the NYSE. As a result, 82% of all trades in NYSE-listed securities were executed on the NYSE in 1982.³ After 1982, market participants could guarantee that market orders would trade at prices that were equal to (or better than) the National Best Bid and Offer, allowing them to compete more directly with the NYSE.⁴

In the early eighties, in order to entice retail brokers to divert their marketable orders away from the NYSE, a few market makers began offering brokers \$0.01 to \$0.02 per share for their market orders. This is referred to as payment for order flow. In return, these market makers guaranteed immediate executions at the NBBO. Conversely, the NYSE charged retail brokers up to \$0.03 per share to execute customer orders. Thus, for many retail brokers, order routing transitioned from a cost center into a profit center. As competition for retail orders increased in the late eighties and early nineties, per share order flow payments also increased.

Despite the intense competition to attract market orders, competition for limit orders was affected by the mandated priority of retail orders over professional trading interests. As noted by Battalio, Greene, Hatch and Jennings (2002), dealers purchasing market orders could not exclude others from interacting with the purchased orders.⁵ FINRA Rule 5320 (previously referred to as the Manning Rule), states that “a member firm that accepts and holds an order in an equity security from its own customer or a customer of another broker-dealer without immediately executing the order is prohibited from trading that security on the same side of the market for its own account at

Trade Size, and Information in Securities Markets,” by David Easley and Maureen O’Hara, published by the *Journal of Financial Economics* in 1987.

² See SEC Release No. 20074.

³ See http://www.nyxdata.com/nysedata/asp/factbook/viewer_edition.asp?mode=table&key=129&category=4.

⁴ A market order is an order to buy or sell an asset at the best *available* price immediately. In fast-moving markets, a market order to purchase (sell) shares may execute at a price that is well above (below) the NBBO that was prevailing when the order was placed. See <https://www.sec.gov/answers/mktord.htm>.

⁵ See “Does the Limit Order Routing Decision Matter?,” by Robert Battalio, Jason Greene, Brian Hatch, and Robert Jennings published in 2002 by the *Review of Financial Studies*.

a price that would satisfy the customer order.”⁶ As a result, in the eighties and early nineties most dealers were unwilling to pay for standing limit orders. In addition, as noted by Battalio et al. (2002), brokers were reluctant to route market orders to one venue and limit orders to another for fear of attracting regulatory attention (see footnote 4).⁷ Things changed with the introduction of the SEC’s Order Handling Rules in 1997.

Prior to 1997, the public did not have access to the superior quotes that were often posted by market participants in electronic communication networks (ECNs).^{8,9} However, the Order Handling Rules allowed public limit orders to compete directly with dealers to provide liquidity, spurring the growth of ECNs. To attract liquidity, ECNs offered standing limit orders a rebate when they traded. To fund this rebate, ECNs charged liquidity demanders a fee that exceeded the rebate by a small amount. The difference between the fee and the rebate was the primary source of revenues for ECNs. Today, we refer to this type of pricing as maker-taker pricing. Among other things, the Order Handling Rules merged two distinct business models into the NBBO: a dealer market and an electronic limit order book with maker-taker pricing. A liquidity demander purchasing shares from a dealer pays the ask price, while a liquidity demander buying shares from a limit order resting on an ECN pays the ask price plus a take fee.

The proliferation of electronic limit order books that offered to pay for standing limit orders allowed brokers to further monetize their order flow. Since market makers pay for orders only when they can trade against them, brokers can obtain higher order flow payments by segregating their marketable and nonmarketable orders. One such strategy is to sell marketable orders to market makers and to route nonmarketable limit orders to venues offering high make rebates. Based on our analysis of Rule 606 filings, several brokers began routing their orders in this fashion between 2002 and 2004. Notably, if all brokers routed orders in this fashion, market makers could potentially interact with all of the brokers’ marketable orders (since public limit orders would not ‘get in the way’).

Regulation NMS, passed in 2005, made it possible for exchanges operating electronic limit order books to viably trade both NYSE- and Nasdaq-listed stocks.¹⁰ As competition to attract order flow increased, U.S. exchanges such as the NYSE switched to maker-taker pricing. Today all U.S. equity exchanges use some form of maker-taker pricing.¹¹ As was the case with the early ECNs,

⁶ See FINRA’s May 2011 Regulatory Notice 11-24., available at

<https://www.finra.org/web/groups/industry/@ip/@reg/@notice/documents/notices/p123669.pdf>.

⁷ A limit order is an order to buy or sell a stock at a specific price or better. For the sake of my testimony, there are two basic categories of limit orders: marketable and nonmarketable (or standing). A limit order is marketable if it generates a trade when it arrives at a trading venue. Otherwise, the order is not marketable and is placed onto the trading venue’s limit order book where it will remain until it cancels, expires, or trades.

⁸ For an in depth discussion and analysis of the SEC’s Order Handling Rules, see the “Effects of Market Reform on the Trading Costs and Depths of Nasdaq Stocks, by Michael Barclay, William Christie, Jeffrey Harris, Eugene Kandel, and Paul Schultz, published by the *Journal of Finance* in 1999.

⁹ ECNs were the precursor to today’s exchanges that operate electronic limit order books (e.g., BATS).

¹⁰ See SEC Release 51801.

¹¹ For an in depth discussion of make take fees in U.S. equity markets following the passage of Regulation NMS, see “Make and Take Fees in the U.S. Equity Market,” a Texas Tech working paper by Laura Cardella, Jia Hao, and Ivalina Kalcheva.

exchanges using the traditional maker-taker model charge liquidity demanding orders (i.e., marketable orders) a “take” fee and rebate a portion of that fee back to the liquidity supplying orders (i.e., nonmarketable limit orders). More recently, a few exchanges began using an inverted fee structure (sometimes referred to as “taker-maker”), whereby they charge liquidity suppliers a fee and pay a rebate to liquidity demanders. The maximum allowable take fee is currently \$0.30 per hundred shares, but there is considerable variation in take fees across venues. Given the competition among U.S. exchanges, there is also a high correlation between the level of an exchange’s fee and its rebate.

III. The conflicts of interest faced by retail brokers in determining how to route customer orders, as identified in my paper titled “Can Brokers have it All? On the Relation between Make-Take Fees and Limit Order Execution Quality,” coauthored with Shane Corwin and Robert Jennings.

Although the SEC’s Order Protection Rule establishes price priority in U.S. equity markets, the rule does not specify who trades first when multiple venues have the best posted price.¹² Angel, Harris, and Spatt (2011) note that across-exchange differences in fee schedules create situations in which equally priced, nonmarketable limit orders resting on separate exchanges have different ‘net price’ priority.¹³ All else equal, when two venues offer the best price, one expects liquidity demanders arriving in the marketplace to first route their orders to the venue with the lower take fee. Consider the case where two exchanges are at the national best bid. If sufficient selling demand arrives, sellers exhaust liquidity by walking down both exchange’s limit order books. In this situation, all limit orders at the original bid price execute and all suffer a short-term loss. However, if the stock price rises before liquidity is exhausted at the national best bid, limit orders on the venue with the higher take fee (and thus, the higher make rebate) can become isolated, missing out on profitable trading opportunities. Thus, on average, we expect that limit orders sent to venues with high take fees will have lower fill rates and suffer greater adverse selection costs – they are more likely to trade when the price moves against them and less likely to trade when prices move in their favor. This suggests that brokers routing limit orders to venues with the highest take fees (and make rebates) may not be obtaining best execution for their clients.¹⁴ It is

¹² Rule 611 of Regulation NMS (the order protection rule) requires market centers to put into place procedures to avoid trade-throughs. Rule 604 of Regulation NMS (the limit order display rule) requires exchange specialists and OTC market makers to display customer standing limit orders in their best-priced quotations. Together, these rules ensure that the market will exhaust all displayed liquidity at the national Best Bid or Offer before moving to the next (inferior) price. If all shares at a given price execute, the limit order routing decision should not influence limit order execution quality (as measured by the probability or profitability of the execution).

¹³ See “Equity Trading in the 21st Century,” by James Angel, Lawrence Harris, and Chester Spatt published in 2011 by the *Quarterly Journal of Finance*.

¹⁴ NASD Notice to Members 01-22 (NTM 01-22) states the SEC has articulated that, when evaluating its procedures for handling limit orders, the broker-dealer “must take into account any material differences in execution quality (e.g., the likelihood of execution) among various markets or market centers to which limit orders may be routed” when meeting its ‘regular and rigorous’ examination obligations. NTM 01-22 also notes that “broker-dealers must not allow an order routing inducement, such as payment for order flow or the opportunity to trade with that order as principal, to interfere with its duty of best execution.” See http://www.complinet.com/file_store/pdf/rulebooks/nasd_0122.pdf.

also important to note that investors whose orders go unfilled cannot be made whole through lower commissions, because their orders do not trade.

Why might brokers' and clients' interests diverge? Angel et al. (2011) note that if fees and rebates are passed through to clients, brokers would generally send limit orders to the venue that maximizes the likelihood of execution, as brokers receive commissions only when orders execute. The typical situation, however, is for the broker to offer a fixed commission schedule that reflects fees, rebates, and the other costs of doing business. All else equal, in a competitive market, brokers that pay the lowest fees to exchanges can offer the lowest commissions. If investors choose brokers based primarily on commissions (perhaps because they lack the sophistication and/or the necessary information to evaluate limit order execution quality), it may be profit maximizing for brokers to consider liquidity rebates rather than the probability of limit order execution when making routing decisions. Even if investors walk away from the market when their standing limit orders do not execute, depending upon differences in fill rates, it can be revenue maximizing for brokers to route to the venue with the higher rebate and lower fill rate.

In my paper with Shane Corwin and Robert Jennings, we present evidence from Rule 606 filings that four popular retail brokers made order routing decisions in the fourth quarter of 2012 that appear to maximize the liquidity rebates generated from limit order executions.¹⁵ Specifically, these brokers appear to route their customers' standing limit orders to a single exchange that pays the maximum liquidity rebate.¹⁶ To the best of our knowledge, none of these brokers makes it a practice to directly pass exchange fees/rebates through to their customers. As a result, we argue that limit order execution quality, not liquidity rebates, should determine where these brokers route their limit orders. Using both proprietary limit order data and publicly available trade and quote data, we next present evidence that limit orders routed to venues with lower take fees are executed faster and more frequently than orders on high fee venues and suffer less adverse selection. These results are consistent with Angel et al. (2011), who hypothesize that when multiple venues are displaying the best quote, limit orders resting on venues that pay low/negative liquidity rebates should execute before those on venues that offer high liquidity rebates. Our results suggest that the decision to use a single venue that offers the highest liquidity rebates is not consistent with the objective of obtaining best execution for customer limit orders.

IV. Other market conditions that may create conflicts of interest affecting brokers deciding where to route institutional and retail customer orders.

In addition to maker-taker fees, conflicts of interest between brokers and customers could also result from payment for order flow or other preferencing arrangements (such as soft dollars). As noted earlier, these arrangements have been in existence for many years and the potential agency conflict associated with the sale of customer market orders has attracted a lot of academic

¹⁵ Our paper is available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2367462.

¹⁶ Our conservative back of the envelope calculations using data from Rule 606 filings suggest that for the brokers we identify as routing orders to maximize rebates in the fourth quarter of 2012, standing limit orders comprise between 13% to 23% of their total order flow.

attention. Most empirical studies find that market order execution quality is better on venues that do not pay for marketable orders.¹⁷ However, these studies predominately focus on trade price rather than net price. In a research project with Robert Jennings and Jamie Selway, we sought to identify low-commission brokers that did not directly receive dealer revenue. After an exhaustive search that identified 40 low-commission brokers, only one was not directly or indirectly paid for its order flow. On the surface, this suggests a link between order flow payments and low commissions. Indeed, we found that that the net cost of liquidity (trade price plus commission) offered by some of the brokers who sold their market orders was cheaper than the cost of liquidity offered by the broker that did not sell orders.¹⁸

While inducements for market orders may occasionally result in conflicted market order routing, these payments appear to have resulted in some benefits for the average retail investor. Today, retail market orders are instantaneously executed, commissions have fallen, and executions outside of the NBBO are rare. This is not to say that inducements for marketable orders should not be monitored. It is possible that the effects of payment for order flow have changed since the pre-Reg. NMS environment that I and other academics have studied. For example, as part of a 2004 agreement to sell its capital market business to UBS, Charles Schwab & Co., Inc. “committed to route most orders in equity securities and listed options to UBS for order handling and execution, for a term of eight years.”¹⁹ More recently, as part of the sale of its market making unit G1X to an affiliate of Susquehanna International Group in February of 2014, E*Trade “entered into an order handling agreement whereby it will route 70 percent of its customer equity order flow to G1X over the next five years, subject to best execution standards.”²⁰ Whether or not long-term tie ups of order flow are consistent with best execution is an empirical question that is difficult to answer with data that are currently available to the public.

V. Policy considerations.

As described above, we believe that exchanges’ make-take rebates/fees create a potential conflict of interest between investors using nonmarketable limit orders and brokers hired to route those orders. We next will discuss three potential approaches to reduce or eliminate the agency conflict described above. Of the three, we believe the best approach is to enforce current best execution requirements on brokers, while also requiring additional disclosure. We believe that any rule change should be accompanied by the creation of data that will allow subsequent analyses of both the effectiveness and the unintended consequences of the new regulation.

¹⁷See, for example, “Market Integration and Price Execution for NYSE-Listed Securities,” by Charles Lee, published by the *Journal of Finance* in 1993 and, more recently, “Order Preferencing and Market Quality on U.S. Equity Exchanges, by Mark Peterson and Erik Sirri, published by the *Review of Financial Studies* in 2003.

¹⁸ See “The Relationship Among Market-Making Revenue, Payment for Order Flow, and Trading Costs for Market Orders,” by Robert Battalio, Robert Jennings, and Jamie Selway published by the *Journal of Financial Services Research* in 2001.

¹⁹ See <https://www.sec.gov/Archives/edgar/data/316709/000031670904000035/body.txt>.

²⁰ See <http://www.sec.gov/Archives/edgar/data/1015780/000115752314000543/a50801535.htm>.

1. *Elimination of make-take rebates and fees.*

The most aggressive approach to address this conflict is to completely eliminate make-take rebates and fees. However, while this approach might eliminate the conflict we address in our paper, it is quite possible that other (and potentially worse) conflicts could arise as a consequence.

Order flow is a valuable commodity. Payment for valuable order flow has a long history. For decades, actors in the U.S. equity markets have been actively seeking to segregate order flow into its most and least valuable components. Make-take rebates and fees and the variation in these rebates and fees across venues are part of the effort to attract order flow consistent with the venue's business model.

We believe that order flow will not lose its value should make-take rebates and fees be eliminated. We believe that the market will introduce other approaches to paying for the desired order flow. One advantage to the make-take model, in our opinion, is that the payments are reasonably transparent. If incentives to attract a particular type of order flow continued after the make-take model is regulated away (as we believe they would), then understanding what the replacement system of inducements might look like is important. It seems reasonable to wonder if the payments might be less transparent than the current system and, thus, harder to study/monitor.

We believe that the make-take model is only part of the effort to segregate order flow in today's equity marketplace. Two other examples are payment for order flow and dark pools. Without a comprehensive effort to address these order flow inducements, eliminating one aspect of them is ill advised.

If the approach of eliminating make-take fees is taken, we recommend that it not be done without a thorough evidence-based review of the potential unintended consequences. This could potentially be done in the form of an SEC pilot program related to make-take fees. However, careful consideration would have to be given to ensure that such a pilot is well-designed and to whether such a pilot could even be used to effectively study the alternative market structures that would develop in the absence of make-take fees.

2. *Requiring that rebates and fees be passed along to the customer.*

A second approach is to mandate that rebates and fees flow through to the investor. In theory, this would solve the conflict of interest we study. If fees and rebates are passed through to the customer, the broker would be concerned solely about receiving the commission, which is paid only if the order is filled. Thus, the broker would be motivated to maximize the fill rate.

Note, however, that the world we describe here is a simple one: there is an investor who gives an order to a single broker and the broker routes the order to a venue that pays/receives a single rebate or fee. In reality, orders can take a very circuitous route from initiation to

completion, potentially passing through multiple brokers and/or venues. Thus, in practice, it may be difficult to specify the pass-through rules that would solve this more complex problem.

In addition, it is unclear that investors want to move away from known, fixed commissions. Some retail brokers allow clients to select between a fixed commission and a “cost plus” model. It is our understanding that almost all select the fixed commission option. Institutional investors who trade for multiple accounts rely on the fixed commission model when allocating net trade prices from a given trade across accounts in real time. Without changes to billing and reporting systems, this would not be possible if fees and rebates were passed through to customers.²¹

3. *Enforce current best execution requirements on brokers and improve disclosure.*

The approach likely to have the fewest unintended consequences, and the approach that we recommend, is to enforce current best execution requirements on brokers and improve related disclosure. We believe that the current regulatory structure requires that brokers provide best execution for customers. In the discussion of best execution for limit orders, it seems to us that the likelihood of filling the order should be prominent. Requiring that brokers rigorously demonstrate that their routing practices insure best execution for their clients on a regular basis (as laid out in NASD Notice to Members 01-22) would be a good first step before initiating additional regulations. It seems unlikely to us that routing all nonmarketable orders to a single high rebate venue can be justified as best for the client.

If this approach is taken, it should be combined with additional disclosure by brokers regarding their routing decisions and the fees/rebates that they pay/earn. Some of this disclosure could be accomplished through improvements to the 606 reports. For example, brokers should be required to provide separate information for marketable and nonmarketable limit orders. Additional disclosure should also be provided to customers in the form of information on the routing path their order took before execution and the fees/rebates associated with the execution. Finally, Rule 605 reporting could be extended to individual brokers. Such a change would provide information to allow comparisons of execution quality across venues not just in the aggregate, but for orders routed from each individual broker.²²

²¹ For a more in depth discussion of the pitfalls associated with passing fees/rebates through to the customer, see section II of “The Maker-Taker Pricing Model and its Impact on the Securities Market Structure: A Can of Worms for Securities Fraud?,” by Stanislav Dolgoplov, forthcoming in the *Virginia Law & Business Review*.

²² In an April 21, 2010 comment letter on the equity market structure concept release, Ameritrade suggests the SEC should provide for a central repository so that investors may access Rule 606 reports from one location and that it should “consider requiring firms within their 606 reports to disclose 605 information relating to overall quality of execution received from those executing market centers.” Ameritrade notes that this would allow investors to make “apples-to-apples” comparisons. See <http://www.sec.gov/comments/s7-02-10/s70210-124.pdf>.