

Report Concerning Examinations of Options Order Routing and Execution



**Office of Compliance Inspections and Examinations
Division of Market Regulation
Office of Economic Analysis
United States Securities and Exchange Commission**

March 8, 2007

Report Concerning Examinations of Options Order Routing and Execution March 8, 2007

I. INTRODUCTION

Staff from the Office of Compliance Inspections and Examinations (“Staff”) conducted a series of examinations of the options order routing practices of eight broker-dealers that have a significant amount of retail options order flow.¹ Staff from the Division of Market Regulation also participated in these examinations. The primary purpose of the examinations was to determine whether the broker-dealers were fulfilling their duty of best execution in their handling of customer options orders. The Staff also sought to determine whether order routing practices have changed since December 2000, when Commission staff completed a series of examinations and reported results in a public report entitled *Payment for Order Flow and Internalization in the Options Markets* (“2000 Staff Report”).² Finally, the Staff sought assistance from the Office of Economic Analysis (“OEA”) to analyze quote competition among the options markets.

In the 2000 Staff Report, following the listing of many options on more than one market, the Staff found increased competition for options orders, but also found that the introduction of payments for order flow (including exchange-sponsored programs), internalization, and other inducements to firms to route their customer orders to particular markets had an impact on order routing decisions. In fact, the Staff found that firms that accepted payments for order flow routed orders to specialists that paid for order flow more often than firms that did not. The Staff also found inadequacies in the comparability of data that limited the ability of order routing firms to measure the quality of competing markets. The Commission previously has expressed concern that payment for order flow and internalization in the markets contribute to an environment in which quote competition is not always rewarded, thereby discouraging the display of aggressively priced quotes, and impeding investors’ ability to obtain better prices.³

II. SUMMARY OF SIGNIFICANT FINDINGS

The Staff’s recent examinations revealed that there has been improvement over the last six years in order routing firms’ processes to obtain best execution for their retail customers’ options orders. The Staff found that many firms have begun to utilize order routing technology – often called “*smart routers*” – to ensure that marketable retail customer options orders are sent to the market displaying the best price. Because multiple market centers often display the same best price, however, the Staff found that firms rely on other competitive factors to determine to which

¹ The findings in this report are based on the Staff’s examinations and are not findings of the Commission.

² “*Payment for Order Flow and Internalization in the Options Markets*,” Office of Compliance Inspections and Examinations and the Office of Economic Analysis (December 2000), [available at http://www.sec.gov/news/studies/ordpay.htm](http://www.sec.gov/news/studies/ordpay.htm) [hereinafter, “2000 Staff Report”]. The 2000 Staff Report stated that the Staff intended to continue to monitor execution quality and the order routing patterns of firms that accept payments for order flow.

³ See, e.g., Disclosure of Order Execution and Routing Practices, Securities Exchange Act Release No. 43590 (November 17, 2000), [available at http://www.sec.gov/rules/final/34-43590.htm](http://www.sec.gov/rules/final/34-43590.htm).

market center, among those displaying the best price, to route customer orders.⁴ Moreover, because most options prices continue to be quoted in 5¢ and 10¢ increments, spreads remain artificially wide and the excess dealer profits often are shared with order flow providers through payment arrangements. Consequently, factors such as payment for order flow and other inducements continue to play a substantial role in broker-dealers' order routing decisions.

Indeed, in the recent examinations the Staff found that payment for order flow and internalization practices have become more pervasive than they were in 2000, which is in contrast to the experience in the equities markets, where payment for order flow decreased substantially following the move to quoting in penny increments. Additionally, although three exchanges – the Boston Options Exchange (“BOX”), the International Securities Exchange (“ISE”), and the Chicago Board Options Exchange (“CBOE”) – have improved price competition by offering opportunities for customer options orders to trade in pennies at prices better than the displayed national best bid or offer, the “NBBO,” the Staff found that most firms examined have been unwilling to pursue such better prices for a meaningful amount of order flow.

These examinations were conducted in late 2005 and early 2006 and preceded the current “penny pilot” program. The “penny pilot,” which began on January 26, 2007, is a six month pilot program in which the options exchanges are quoting certain series of 13 options classes in pennies.⁵

III. BACKGROUND

The Staff prepared the 2000 Staff Report concerning payment for order flow and internalization in the options markets in response to the multiple-listing of options in August 1999. Prior to August 1999, most listed options traded on only one exchange so brokers had no choice with respect to where to send customers' orders. As a result, prior to 1999, inducements such as payment for order flow and internalization were not relevant to order routing decisions in the options market.

Once multiple listing increased, many options classes, particularly the most actively-traded classes, traded on all four options exchanges: the American Stock Exchange (“AMEX”), the Chicago Board Options Exchange (“CBOE”), the Pacific Exchange (“PCX”), and the Philadelphia Stock Exchange (“PHLX”).⁶ Broker-dealers were provided with a choice of where to send customer options orders and in response, many specialist firms, as well as the exchanges themselves, introduced payment for order flow programs in an effort to induce order routing broker-dealers

⁴ OEA analyzed quotation data from July 19, 2005 and March 8, 2006 and determined that, for the 1,000 most active options series (representing 41% and 38%, respectively, of the total options trades for the day), there were at least four exchanges quoting at the inside over half of the trading day. In addition, OEA found that the NBBO in these series was at the minimum increment for a significant portion of the trading day.

⁵ See <http://www.sec.gov/news/press/2007/2007-10.htm>.

⁶ Currently there are six registered options exchanges. In addition to the four mentioned above, the ISE began trading in June 2000, and the BOX began trading in February 2004. In addition, the PCX is now known as NYSE Arca, Inc.

to send them their retail order flow. Alternatively, broker-dealers would route orders to affiliated specialists or market makers, which is often referred to as “internalization.” The development of these practices raised concerns about the execution quality of customer options orders. For these reasons, in July 2000, the Staff was asked to examine and report on payment for order flow and internalization practices in the options markets, and evaluate how those practices affected order routing decisions and the execution quality of customer options orders.⁷ The Staff found that payment for order flow programs (including exchange-sponsored programs), internalization, and other inducements increased substantially after multiple-listing in August 1999 and impacted firms’ order routing decisions. Specifically, the Staff found that most of the firms that accepted payment for order flow began routing customer orders to markets that paid for order flow instead of routing to markets that did not pay.

Since the 2000 Staff Report, there have been important changes in the options markets, many of which are discussed in the Commission’s February 2004 concept release.⁸ The *Options Concept Release* discussed the evolution of the options market, highlighted a number of regulatory initiatives, and identified several concerns relating to payment for order flow, specialist guarantees, and internalization practices. The *Options Concept Release* also requested comment on whether the Commission should extend the existing rules requiring disclosure of execution quality in the stock markets to the options market⁹ or require the options markets to quote in penny increments.

IV. RECENT EXAMINATION FINDINGS

In conducting the examinations of the eight broker-dealers, the Staff requested information related to each firm’s options order routing and execution practices. The Staff requested a description of the factors the firms consider in determining where to route customer options orders. The Staff also conducted interviews with each firm’s compliance personnel, employees responsible for making routing decisions, and members of the firm’s best execution committee. Summarized below are the Staff’s findings related to: (1) the use of *smart routing* technology; (2) the prevalence of payment for order flow and other routing inducements in the options market; (3) the opportunity to receive price improvement in the options market; and (4) the “regular and rigorous reviews of execution quality” conducted by these firms.¹⁰

⁷ See 2000 Staff Report, *supra* note 2.

⁸ See Competitive Developments in the Options Markets, Securities Exchange Act Release No. 49175 (February 3, 2004), 69 FR 6124 (February 9, 2004) [hereinafter, “*Options Concept Release*”].

⁹ Currently, Rule 605 requires markets for NMS stocks to make publicly available, on a monthly basis, standardized execution quality statistics categorized by order type, individual security, and order size. 17 C.F.R. § 242.605 (2005). NMS stocks are defined as equity securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan.

¹⁰ Broker-dealers are required to conduct such reviews pursuant to their duty to seek best execution of customers’ orders. *Order Execution Obligations*, Securities Exchange Act Release No. 37619A (September 6, 1996), 61 FR 48290 at 48323 (September 12, 1996) [hereinafter, “*Order Handling Rules*”] (“In conducting the requisite evaluation of its internal order handling procedures, a broker-dealer must regularly and rigorously examine execution quality likely to be obtained from the different markets or market makers trading a security.”)

A. Use of Smart Routing Technology

The Staff found that, increasingly, broker-dealers are relying on *smart router* technology or intermediaries with *smart router* technology to route their customer orders to a market displaying the best price. *Smart routers* are generally designed to immediately review the displayed price and size of quotes at all six options exchanges and then route marketable orders to a market center that is displaying the best price.¹¹ Because multiple markets are often quoting the same best price, however, other factors, including order routing inducements, continue to play a substantial role in order routing decisions.

The Staff found that six of the eight broker-dealers examined utilize *smart router* technology for at least a portion of their retail options order flow. At the time of the inspection, two broker-dealers did not use *smart routing* technology for their retail order flow, but stated that they were in the process of incorporating this functionality into their routing systems.¹²

The Staff found that some firms with *smart router* capabilities provided their broker-dealer customers with the option of selecting their own routing hierarchies when multiple markets were displaying the NBBO with sufficient size to satisfy the order. Otherwise, the *smart router* firms routed orders based upon their own internally-created hierarchy table.

B. Payment for Order Flow and Other Inducements

1. Payment for Order Flow

Over the last several years, all of the options exchanges except the BOX adopted rules establishing exchange-sponsored payment for order flow programs. Under these programs, the exchanges impose fees upon their members to fund payment for order flow collectively. Such exchange fees were designed to require all market makers that trade with customer order flow on the exchange to contribute to the cost of attracting that order flow. The exchanges collect the fees and allow the specialist firms to direct payments to order routing firms as they deem appropriate.

Typically, payments by specialists to broker-dealers for order flow are made pursuant to informal agreements and are not guaranteed. Although nearly all payment for order flow arrangements are coordinated through the exchange-sponsored programs, some broker-dealers also pay for order flow outside of an exchange-sponsored program. They do so because they know that they will be able to profitably trade with a portion of all incoming orders. For example, three firms examined act as consolidators, *i.e.*, they receive order flow from other broker-dealers, and pay the other broker-dealers for their order flow. All three firms have affiliated specialist or market making operations on the various exchanges. The three firms acknowledged that they use the

¹¹ *Smart routers* generally route non-marketable orders to the market ranked first in the firm's hierarchy table.

¹² In contrast, the Staff notes that both of these firms already used *smart routing* for portions of their institutional customer order flow.

funds they receive from the exchange-sponsored programs to make payments to the routing broker-dealers, and one firm stated that it often pays out more than it receives.

The Staff found that six of the eight firms examined accept payment for order flow in exchange for routing retail customer orders. While all firms that accept payment stated that the payments do not improperly influence their order routing decisions, the firms did state that if all things are equal, they will route orders to the market center that pays the most for order flow. Even firms that use *smart routers* are able to factor payment for order flow into their routing decisions. For example, two firms send significant portions of their order flow to a consolidating broker-dealer that uses a smart router to send orders to the market center displaying the best price. If multiple market centers are displaying the best price, the consolidating broker-dealer provides the two firms with the ability to establish their own routing hierarchy tables, which can take payment for order flow into account.

2. Routing to Affiliated Dealers and Ownership Interests in Exchanges

The Staff found that five of the eight firms routed significant order flow to affiliated specialists or market makers. Routing to an affiliate is an alternative to receiving payment for order flow and allows the firm to capture the profit a dealer makes on a trade. The Staff also found that seven of the eight broker-dealers included in these examinations have an ownership interest in one or more exchanges, and that these ownership interests appear to influence where a firm routes customer orders.¹³

C. Price Improvement Opportunities in the Options Markets

“Price improvement” means obtaining an execution at a price better than the current NBBO. Currently, there are few opportunities to obtain price improvement on executions of retail-sized orders in the options markets. According to the broker-dealers we examined, most retail-sized orders are electronically routed to options exchanges and executed at the NBBO via the options exchanges’ automatic execution systems.

For most retail-sized orders to receive price improvement, the order must be submitted to a special electronic mini-auction at one of the three exchanges offering such price improvement. The BOX, ISE, and the CBOE have developed electronic price improvement mini-auctions called the *Price Improvement Period* (“PIP”), *Price Improvement Mechanism* (“PIM”), and *Automated Improvement Mechanism* (“AIM”), respectively. Generally, the PIP, PIM, and AIM operate as follows: A market participant initiates the price improvement auction, which lasts for three seconds, by submitting a customer order along with a matching proprietary order priced at

¹³ In late 2005, the Phlx reported a sharp increase in trading volume after six firms purchased an equity interest in the exchange. According to news articles, some market participants attributed the growth in Phlx’s volume to new order flow being routed to the exchange from the six firms that took an ownership interest. See Veronica Belitski, *Phlx Nipping at Amex’s Heels*, Wall Street Letter, Nov. 18, 2005. Each of the six firms that took an ownership interest in the Phlx received warrants to acquire additional shares of the Phlx. These warrants were exercisable if the firms met specific performance requirements, which included routing a certain amount of options volume to the Phlx. On July 18, 2006, the Phlx announced that all six firms had met their performance requirements and exercised their warrants in full.

least a penny better than the NBBO. The auction is electronically announced to the other participants who may then compete for the customer order by entering orders to match or improve upon the price of the initial improvement order. At the end of the three second auction, the customer order is matched to the best priced improvement order with time priority, subject to certain enumerated exceptions.¹⁴

Most of the broker-dealers examined by the Staff expressed reservations about sending orders to the price improvement mini-auctions. Most firms did not have a clear understanding of the mechanics of the price improvement mini-auctions. In addition, most firms expressed reservations about directing orders to a particular market maker because they felt that the market maker would gain an informational advantage over the rest of the market. Several firms stated that they thought that orders should be exposed to the entire market, and that limiting exposure would reduce market quality in the long run. Two of the firms we examined, however, stated that they regularly direct orders to the price improvement mini-auctions.

D. “Regular and Rigorous Review”

The duty of best execution requires a broker-dealer to execute customers’ trades at the most favorable terms reasonably available under the circumstances, *i.e.*, at the best reasonably available price.¹⁵ To make order routing decisions, broker-dealers must periodically assess the quality of competing markets to assure that order flow is directed to the markets providing the most beneficial terms for their customer orders. Broker-dealers must examine their procedures for seeking to obtain best execution in light of market and technology changes and must take into account price improvement opportunities.¹⁶

The Staff found that all eight firms examined conduct a periodic review (at least quarterly) in an effort to evaluate the quality of the executions they have received, and to make going-forward order routing decisions based on those assessments. However, the Staff found that most firms engage in reviews that do not allow them to completely assess the quality of executions in options on each exchange.

Unlike the equity markets, the options markets are not required to make available execution quality information in a standardized form. Thus, a large part of the firms’ quarterly “regular and rigorous review” involves the review of the quality of executions that their own orders

¹⁴ See Securities Exchange Act Release No. 50819 (Dec. 8, 2004); Securities Exchange Act Release No. 49068 (Jan. 13, 2004); and Securities Exchange Act Release No. 53222 (Feb. 3, 2006). The Commission has also approved CBOE’s Simple Action Liaison System (“SAL”), Securities Exchange Release No. 54229 (July 27, 2006), which is a price improvement auction that, once implemented, will not require exchange members to guarantee the customer order a price better than the NBBO. Instead, SAL will automatically initiate an auction for orders when the CBOE is at the NBBO. The BOX has proposed a similar system. See Securities Exchange Act Release No. 55230 (Feb. 2, 2007) (notice of BOX’s UPIP system).

¹⁵ Regulation NMS Adopting Release, Securities Exchange Act Release No. 51808, 70 FR 37496, at 37537-37538 (citing *Newton v. Merrill, Lynch, Pierce, Fenner & Smith, Inc.*, 135 F.3d 266 (3d Cir.), *cert. denied*, 525 U.S. 811 (1988) [hereinafter “Regulation NMS Release”]).

¹⁶ Regulation NMS Release, 70 FR at 37538; *Order Handling Rules*, *supra* note 10.

received on each exchange. If a firm does not route customer orders to a particular exchange(s), that market is not included in the review. Only one firm evaluates execution quality for options across all exchanges, though it uses only its own executions in the evaluation.

The Staff found that the lack of standardized, widely-available information concerning execution quality may affect firms' ability to conduct robust reviews of execution quality.

V. OEA ANALYSIS OF QUOTATION ACTIVITY

As noted above, the order routing firms that accepted payment for order flow stated that if all things are equal, they will route to the market center that pays the most for order flow. These firms also stated that generally there are multiple market centers quoting at the NBBO. To determine the level of quote competition among the options markets, and to determine the extent to which the spread may be constrained by the minimum increment, the Staff requested assistance from OEA.

OEA analyzed quotation activity on two sample days (July 19, 2005 and March 8, 2006) in the 1,000 most actively-traded options series. The sample was split into three groups, and statistics are presented below for the 100 most active series, the next 400 most active series, and the next 500 most active series. These 1,000 series collectively accounted for 41% and 38%, respectively, of the total number of option trades on the sample days.

OEA analyzed the percentage of the trading day that multiple markets were quoting at the inside bid or ask.¹⁷ For the top 100 most actively-traded options series, four or more exchanges were quoting at the inside bid for more than 77% of the trading day on both sample days, and four or more exchanges were quoting at the inside ask for more than 74% of the trading day on both sample days. Similarly, for the 1,000 most actively-traded series, three or more exchanges were quoting at the inside bid for more than 84% of the trading day on March 8, 2006, while three or more exchanges were quoting at the inside ask for more than 84% of that same trading day.

At Inside Bid

Percent of Day Number of Exchanges are at the Inside Bid								
Most Active Series	1 Exchange at Inside Bid		2 or More Exchanges at Bid		3 or More Exchanges at Bid		4 or More Exchanges at Bid	
	7/19/2005	3/8/2006	7/19/2005	3/8/2006	7/19/2005	3/8/2006	7/19/2005	3/8/2006
Top 100	9.2%	11.3%	90.8%	88.7%	84.7%	82.0%	77.4%	77.1%
101-500	15.6%	9.0%	84.4%	91.0%	76.5%	86.6%	68.3%	81.1%
501-1000	15.1%	10.7%	84.9%	89.3%	77.3%	83.3%	68.3%	76.5%
Combined	14.7%	10.0%	85.3%	89.9%	77.7%	84.5%	69.2%	78.4%

¹⁷ The percentage was calculated for each options series and was then averaged across series. Options series were ranked by the number of trades on July 19, 2005 and March 8, 2006, respectively.

At Inside Ask

Percent of Day Number of Exchanges are at the Inside Ask								
Most Active Series	1 Exchange at Inside Ask		2 or More Exchanges at Ask		3 or More Exchanges at Ask		4 or More Exchanges at Ask	
	7/19/2005	3/8/2006	7/19/2005	3/8/2006	7/19/2005	3/8/2006	7/19/2005	3/8/2006
Top 100	11.6%	11.7%	88.3%	88.3%	81.1%	82.3%	74.3%	78.0%
101-500	19.0%	9.8%	81.0%	90.2%	72.0%	85.7%	63.1%	80.9%
501-1000	17.5%	10.4%	82.5%	89.6%	73.6%	84.3%	64.5%	78.0%
Combined	17.5%	10.3%	82.5%	89.7%	73.7%	84.6%	64.9%	79.2%

OEA also analyzed the percentage of the trading day during which the inside spread was equal to the minimum quotation increment.¹⁸ The analysis shows that for the top 1,000 most actively-traded series, the inside spread was at the minimum increment for more than 50% of the trading day on July 19, 2005 and more than 38% of the trading day on March 8, 2006. Moreover, for the top 100 most actively-traded series, the inside spread was at the minimum increment for approximately 73% of the trading day on July 19, 2005 and approximately 54% of the trading day on March 8, 2006.

Percent of Day the Inside Spread Equals the Minimum Tick, July 19, 2005				
Series Priced:	Top 100	Top 101-500	Top 501-1000	Combined
Below \$3.00 (min=.05)	79.9% (n=81)	58.8% (n=322)	53.8% (n=385)	58.5% (n=788)
\$3.00-\$5.00 (min=.10)	69.3% (n=7)	47.7% (n=40)	51.6% (n=66)	51.3% (n=113)
Over \$5.00 (min=.10)	27.8% (n=12)	15.8% (n=38)	15.7% (n=49)	17.2% (n=99)
Combined	72.9% (n=100)	53.6% (n=400)	49.8% (n=500)	53.6% (n=1000)

Percent of Day the Inside Spread Equals the Minimum Tick, March 8, 2006				
Series Priced:	Top 100	Top 101-500	Top 501-1000	Combined
Below \$3.00 (min=.05)	60.3% (n=85)	44.0% (n=313)	37.4% (n=369)	42.6% (n=767)
\$3.00-\$5.00 (min=.10)	48.9% (n=5)	39.2% (n=43)	29.8% (n=62)	34.3% (n=110)
Over \$5.00 (min=.10)	10.1% (n=10)	12.6% (n=44)	13.7% (n=69)	13.0% (n=123)
Combined	54.7% (n=100)	40.0% (n=400)	33.2% (n=500)	38.1% (n=1000)

¹⁸

Id.

Thus, OEA concluded that, for the most actively-traded options series, it appears that quotation spreads may be constrained by the minimum quotation increment.

VI. CONCLUSION

The amount of quote competition in the options markets has increased since 2000. For the most actively-traded options series, there are at least four exchanges quoting at the NBBO for more than half of the trading day, and the NBBO is at the minimum increment for a significant portion of the trading day.

The Staff found that while there has been improvement over the last six years in order routing firms' processes to seek and obtain best execution for their retail customers' options orders, factors such as payment for order flow and other inducements continue to play a substantial role in broker-dealers' order routing decisions.

The Staff also found that because standardized execution quality statistics are not provided by each of the options exchanges, most firms analyze only the execution quality provided to their own customer orders. The lack of standardized, widely available execution quality data may affect thorough best execution reviews by firms.

These findings support the Commission's efforts to encourage the options markets to quote in penny increments and support the need for standardized execution quality data in best execution analyses for the options market.
