

The Economics of Flash Orders

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December 4, 2009

1. Introduction

To better inform various parties interested in flash order trading, the Chicago Board Options Exchange, Inc. and the International Securities Exchange, Inc. asked me to write a short note describing flash orders and the effects they have on the options markets. This note presents my analyses and opinions only and does not necessarily represent the opinions of the sponsors of this project. Neither exchange has had any say over the content or the conclusions that I present. In the interest of full disclosure, the exchanges paid my normal hourly consulting fee for the production of this note, and I charged them only for the time I worked on it.

Following a short executive summary, the presentation appears in four sections. Section 2 provides a brief description of what flash orders are and how exchanges process them. The next section identifies the benefits that traders and exchanges obtain from flash order trading. Section 4 describes the controversies associated with flash order trading and evaluates the underlying concerns. This note concludes in Section 5 with some recommendations for SEC rulemaking.

1.1 *Executive summary*

The SEC in its comment release notes that flashing potentially involves three parties—the trader who submits the order, the trader who responds to the order in the flash system, and the trader who makes the best market to whom the order might be routed at another exchange. To simplify the discussion, I refer to these traders as the Submitter, the Responder, and the Maker, as does the CBOE in its comment letter.

Exchanges use their flash facilities to provide local executions for their customers who submit marketable orders (the Submitters) for which the exchanges cannot immediately match to orders and quotes on their order books. The exchanges expose such orders to a set of traders (the Responders) who may choose to fill the orders. If an order is not filled within a short flash period, the exchange to which the order was submitted routes the order for execution at another exchange where a Maker has posted the best bid or offer.

The use of the flash facility is voluntary. Depending on the exchange, Submitters either indicate that they wish to avail themselves of this service, or they can indicate that they do not want to use the service if orders route to the service by default. Submitters can opt out of flash handling by attaching an immediate-or-cancel instruction to their order.

Submitters allow exchanges to expose their orders to Responders because they expect to benefit from greater liquidity and faster executions. They also hope to avoid high access fees that make-or-take exchanges charge when filling marketable orders. Flash facilities often allow Submitters to obtain the benefit of the best market quote at a make-or-take exchange without paying an access fee. In which case, their flash executions receive price improvement relative to the net prices they would receive if their orders were routed out.

Exchanges benefit from flash trading because they can arrange more trades than they otherwise could be able to arrange. Their advantage comes from the increased liquidity that they can obtain for their customers from their Responders.

Flash order trading creates a potential for front-running by Responders. The potential depends on the degree of competition among liquidity-providing traders and on the size of the flash orders. To the extent that Submitters fear front-running losses, they must balance these fears against the benefits that they may obtain from using flash orders. Since flash exposure is voluntary and since institutional traders and retail brokers pay close attention to their transaction costs, regulators should presume that the benefits outweigh the costs of flash trading. Regulators can directly address the front-running issue through a simple regulation proposed below.

Flash trading raises some fairness issues. These issues are old issues that arise in all markets where some traders have privileges that other traders do not. The advantages may come from superior investments in technology, or exchanges may give them to members as incentives to provide liquidity services.

Flash trading reduces intermarket order routing and thereby reduces the benefits that Makers obtain from quoting aggressively at other exchanges. The importance of this issue for public welfare depends on several issues.

- If Makers at make-or-take exchanges quote aggressively because they receive liquidity rebates funded by high access fees, the access fees that Submitters (or their routing exchanges) must pay to access the better quotes reduce the benefit of these quotes. In the extreme, if the price improvement at the make-or-take exchange were equal to the exchange's access fee, Submitters would obtain no net benefit from the intermarket route.
- As brokerage order routing systems have developed, intermarket routing has become less important because Submitters can route their orders to better quotes themselves. Had the submitters wanted to access the better quote, they could have done so themselves.
- In markets where public traders supply substantial liquidity, the public interest in supporting these traders is greater than in markets where dealers supply most of the liquidity. In the latter markets, exchanges and dealers cooperate with each other to provide the best possible service to their clients. The development of flash order facilities is an example of such beneficial collaborations. Mandated order routing weakens these relationships.

The large numbers of options series that options exchanges list ensure that dealers supply most of the liquidity in these markets. Moreover, since customers benefit from the availability of firm quotes in all series, most of which rarely trade, exchanges work with dealers to ensure adequate coverage. In particular, exchanges commonly give special privileges to dealers in exchange for commitments from the dealers to post quotes that they otherwise would not offer. Access to flash order facilities is one such privilege. The elimination of flash trading in options markets would have a more detrimental impact on liquidity than in equity markets because the options markets are far more dependent on dealers.

Finally, regulators should recognize that mandated order routing creates problems when exchanges employ different pricing models for their services. The problem should concern regulators who worry about flash facilities because the alternative to using these facilities is to route orders. Mandated order routing creates cost liabilities over which no Submitter or

exchange has control. Problems arise when a traditional transaction fee exchange must route a marketable order to a make-or-take exchange that charges a higher access fee. Also, since the make-or-take model affects quoted bid/ask spreads without affecting the actual economic bid/ask spread (spread inclusive of access fees), the model unfairly forces routes to make-or-take exchanges.

2. Flash orders

Exchanges developed flash order handling procedures to match or improve upon better prices available on other exchanges in connection with the handling of actionable orders that are received when another exchange is displaying a better price than the receiving exchange. At some exchanges, Submitters must instruct the exchange to use the facility. At such exchanges, orders with such instructions attached are called flash orders. At other exchanges, flash order handling is a default procedure from which Submitters can opt out. The distinction is not important for this analysis since participation in the procedure is voluntary at either type of exchange.

To simplify the discussion, this note treats the flash procedure as a trader-specified procedure. The results apply equally to those exchanges for which the flash procedure is the default order handling procedure. At those exchanges, Submitters can opt out of the flash procedure by attaching an immediate-or-cancel instruction to their orders.

Upon receipt of an order, the exchange immediately attempts to fill the order to the greatest extent possible at the NBBO (subject to all other attached order execution instructions such as limit, market, all-or-none) against standing exposed and hidden orders (and quotes) that reside in its order book. The execution of the order is also subject to SEC regulation and common law agency principles that prevent exchanges from filling orders that would trade through electronically accessible exposed quotes at other exchanges in the national market system. Any unexecuted remainder of an order (after the NBBO has been exhausted at the receiving exchange) is cancelled if the order includes an immediate-or-cancel instruction. If the remainder is not marked immediate or cancel and is not marketable at the exposed quote of another exchange, the receiving exchange posts the remainder of the order to the exchange book.

If the remainder is not marked immediate or cancel and is marketable at another exchange, it is flashed before routing to the other exchange. The flash instruction then requires that the exchange expose the remainder of the order to a set of participating electronic traders (Responders) for a short period (depending on the exchange, between 30-150 milliseconds) using a facility that the exchange has developed for this purpose. The exchange exposes the remainder at the best quoted price available in the national market system. For example, a flash buy order limited at 22 will be exposed at 20 if the national best offer is 20.

Upon seeing the flash order, the Responders may choose to fill to the order at the exposed price or better. (Responders who are designated market makers may choose to provide price improvement to the order to improve their order execution quality ratings.) The first Responder to respond fills the order to the extent that it is willing. If the first Responder does not completely fill the order, the next respondent will fill the remainder of the order to the extent that it is willing. This process continues until the order is completely filled or until the flash period ends.

If the order is not completely filled at the end of the flash period, the exchange then routes the remainder of the order for execution at the exchange offering the best price if permitted.

3. Benefits

The flash order instruction provides Submitters who submit marketable orders with an opportunity to obtain executions that are cheaper, larger, more likely, faster, and occasionally at improved prices than they would receive if their orders were routed to other exchanges.

- Submitters obtain a better net price when a flash execution allows them to avoid paying an access fee to a make-or-take exchange.
- Responders often add liquidity when filling flash orders so that submitters receive larger executions than they might have received had the order been routed. Flash executions are often larger than the displayed size at the NBBO.
- Quotes often disappear between when an exchange routes an order to another exchange and when the other exchange receives and processes the order. In which case, the order must return to the original exchange for further processing as though it were a new order. Flash executions increase the likelihood that Submitter orders will fill by avoiding this problem.
- Depending on the length of the flash period, Submitters obtain faster executions through a flash facility than they would if the order were routed to another exchange. If the order does not execute, little time is lost because the flash period is short.
- Finally, the executions, if they occur, may occur at better prices if the Responders improve price.

Exchanges developed flash facilities to provide these benefits to their clients, and thereby attract and retain more order flow to their exchanges.

Flash facilities also allow Responders to avoid trading with large traders whose trades often move the market and thereby impose losses upon them. By avoiding these losses, Responders can offer more liquidity to retail Submitters.

In principle, flash facilities also allow Responders to avoid offering liquidity to high speed traders who have learned about material information moments before the Responders learn of it themselves. This information may include electronically transmitted headlines or information about the prices of correlated securities. In either event, liquidity suppliers who offer firm quotes risk losing to faster well-informed traders. Responders who can process information quickly can avoid these losses and thereby offer more liquidity—better prices or greater size—to retail Submitters.

4. Controversies

Flash facilities have garnered substantial attention during the last few months. Many observers have expressed reservations about whether they promote the public interest in fair and efficient trading markets.

Commentators have identified four major concerns about flash orders. They are concerned about front-running, fairness, competition within the national market system, and issues associated

with competing standards for pricing exchange services. This section discusses each of these concerns.

4.1 Front-running

Some commentators are concerned that flash orders create front-running opportunities for the Responders. In particular, they fear that Submitters who expose their orders to Responders risk that the Responders will not execute their orders, but instead, race to other markets to take the liquidity that would otherwise go to the Submitters when their orders route away. The Submitters then might be forced to fill their orders at inferior prices, and possibly with the same Responders who have front-run them. These concerns are credible because the flash period gives Responders a head start in the race to the other exchange and because their high speed trading technologies ensure that they will arrive at the other exchange before the routed orders do.

Several considerations mitigate these fears. First, the profitability of the front-running strategy depends on the number of competing Responders and their propensity to fill flash orders. If many Respondents compete to fill flash orders, front-running Responders will often obtain positions from which they cannot profitably exit. In particular, if the front-runner takes liquidity at another exchange at the same time that another Responder fills the Submitter's order, then the front-runner will not be able to exit by trading with the Submitter. Also, even if the flash order does not execute during the flash period, the front-runner will have to compete with other traders to fill the Submitter's order at the next inferior price, if indeed the Submitter will trade at that price. In general, the front-running strategy will be less profitable when the Responder faces much competition on the same side of the market.

Second, Submitters (or their agents) regularly monitor their transaction costs. If they find that they obtain inferior executions on average when they use flash orders, regardless of the reason, they will stop using flash orders. Since the front-running problem is most serious for large orders, Submitters may decide to flash only small orders, and they may decide to break large orders into smaller orders to obtain the benefits of flashing while minimizing front-running costs.

Finally, regulators can make it illegal for Responders to take liquidity on the same side at a price equal or better than the price of a flash order that they have seen within one second of seeing the order. This restriction would effectively address front-running concerns.

4.2 Fairness

Some commentators are concerned that flash orders are unfair because most exchanges expose flash orders only to Responders and not also to the market as a whole. Moreover, at those exchanges that expose broadly, only traders whose technology is sufficiently fast can access the orders.

Fairness is a value about which reasonable people can and do disagree. However, at least three significant considerations may influence how people perceive the fairness of flash order systems.

First, flash facilities merely codify into exchange electronic trading systems practices that always have been accepted in floor trading markets. In particular, floor traders routinely have the opportunity to fill incoming orders when no other orders are on the book at the same price. Before converting to automated trading systems, US floor-based equity exchanges routed orders

to other exchanges only if no floor traders were willing to fill them at the national best bid or offer, or better. The search for liquidity on the floor typically took 15-30 seconds or more, many times longer than the flash periods currently employed at electronic exchanges. The privilege of seeing orders and choosing whether to trade with them before routing them is widely accepted as a benefit of exchange membership. It is one of the benefits of membership that encourages traders to accept the responsibilities and restrictions of exchange membership, among which is public order precedence—the requirement that at a given price members must yield to nonmembers.

Second, traders have always competed on trading technologies to obtain an edge. Those who have created the best technologies historically have obtained better access to the markets. Traders who do not have such technologies can obtain them by developing them, by purchasing them, or by purchasing brokerage services from those that have developed these technologies. Since anyone can access advanced trading technologies by paying for them, the claim that flash facilities are unfair to slow traders is essentially equivalent to the claim that it is unfair that slow traders must invest to remain competitive. Such a view may have merit, especially if investments in new trading technologies do not significantly improve economic welfare. However, given the vast decrease in transaction costs over the last few years due to new trading technologies, drawing such a conclusion seems tenuous at best, at least with respect to trading technologies in general. With respect to flash technologies, the conclusion also seems tenuous given the benefits that Submitters obtain when their orders execute, as they often do.

If policymakers believe that flash facilities are unfair, they can prohibit them. Doing so will address concerns about flash facilities, but it will not address broader concerns about fairness of access to trading technologies. These concerns are extremely difficult to address because traders who invest in advanced trading technologies will always access, process, and act upon information faster than can other traders, regardless of whatever restrictions are placed on their activities. Accordingly, efforts to level the playing field for all traders regardless of their investments in trading technologies are essentially futile. Of course, those traders who have invested in trading technologies believe that the playing field is already level because anyone can choose to make these investments. Not surprisingly, many people associate attempts to regulate competitive advantage through technological innovation with similar efforts by the Luddites in the early nineteenth century.

Finally, some commentators may believe that flash facilities are unfair at those exchanges that only permit designated Responders to offer liquidity to flash orders because not all traders can access the flash orders even if they had the technology to do so. However, even at such exchanges, access generally is open to those traders who either pay for the privilege or who are willing to assume other market-making responsibilities. Such questions of fairness are not unique to the flash facility. They apply to all privileges that designated traders have, most of which are granted by exchanges to encourage traders to assume responsibilities that they otherwise would not take. In particular, most exchanges have always given dealers special privileges while requiring them to offer liquidity that they otherwise would not want to offer.

4.3 Competition within the national market system

Makers are willing to quote markets only when rewarded by order flow. Since flash trading at an exchange reduces the order flow routed to Makers quoting at other exchanges, flash facilities

disadvantage Makers who make markets at other exchanges. Flash trading thus reduces the incentives to post liquidity at exchanges that do not have substantial order flow, which diminishes the competition among exchanges, and thereby weakens the National Market System.

In contrast, flash trading improves the competition for best price among traders because flash facilities incent Submitters to route their marketable orders to the exchanges that attract the most order flow. At such exchanges, arranging trades on favorable terms is most likely.

The conflicting effects of flash trading on these two types of competition—the competition among exchanges to provide exchange services and the competition among traders for best price—ensure that flash facilities are not unambiguously pro- or anti-competitive. Regrettably, the tension between promoting these two competitions characterizes most public policy issues in market structure.

Past public policy decisions concerning the National Market System always have been determined by the extent to which Congress and the Securities and Exchange Commission then favored the competition for best price versus the competition among exchanges. Their assessments of the relative importance of these two competitions have varied over time.

Most recently, the SEC adopted Regulation NMS primarily to promote competition among equity exchanges with the understanding that developments in information technologies and order routing technologies have significantly reduced the costs of competing for best price across exchanges and alternative trading systems. The Commission adopted the NMS order routing rule to address two concerns. First, the Commission was concerned that retail market orders receive best execution in active markets—the Commission was aware that retail orders often traded through NBBO prices in Nasdaq stocks. Second, the Commission sought to increase the probability that Makers who post liquidity at secondary markets would be rewarded for their efforts.

Neither concern necessitates an intermarket order routing when Submitters easily can route to the best market themselves, and when brokers will do so on behalf of their clients. Under these conditions, Submitters generally will choose to route to the market with the best price so that exchanges will not need to route for them. Regulation NMS was adopted when brokerage routing technologies were not as well developed as they presently are. The SEC then saw intermarket routing as a valuable and cost-effective alternative to routing by brokers. The SEC also adopted the regulation because it apparently was unable or unwilling to effectively enforce best execution standards for retail equity traders in Nasdaq securities. The near universal use of electronic routing systems by retail brokers now substantially reduces the enforcement problem.

Concerns that flash order trading systems reduce intermarket routes should be weighed against the fact that Submitters now easily can route to the best market on their own. Developments in brokerage routing systems have reduced the economic value of intermarket order routing systems.

The impact of flash trading on the competition among exchanges depends on who primarily supplies liquidity in the security (or contract). At order-driven equity exchanges where public traders submitting limit orders post most liquidity, concerns about maintaining competition among exchanges may dominate concerns about consolidating trades into a single trading system since the former competition ensures that exchanges provide innovative high quality services at low prices to their public customers. However, in markets where dealers provide most of the

liquidity, public policy should favor improving the competition among dealers to serve public traders.

The huge number of options series listed in US options markets makes the options markets significantly different from the equity markets. Although the US options markets are nominally order-driven markets, unlike most equity markets, dealers are the primary suppliers of liquidity to public traders. The options exchanges compete with each other to attract dealers who will provide firm quotes not only for the most popular at-the-money, next month option series, but also for the hundreds of thousands of other series away-from-the-money or maturing in the back months. In the options markets, exchanges and dealers cooperate in their attempts to attract order flow by providing the best service possible to their clients. The flash facility is the latest manifestation of that competition.

4.4 Pricing standards

Mandated order routing among exchanges creates special problems when exchanges use different models for pricing their services. In particular, the make-or-take pricing model and the traditional transaction fee model cannot easily coexist when mandated order routes are common. These problems affect the incentives to use flash orders in ways that policymakers must consider.

In the make-or-take pricing model, an exchange charges an access fee for executing marketable orders and provides a liquidity rebate for executing standing orders. The difference between the access fee and the liquidity rebate is the net fee that the exchange earns for arranging trades. In contrast, exchanges that charge a transaction fee for arranging trades simply charge the buyer, the seller, or the member trader a fee for executed trades. The transaction fee and the net fee earned by make-or-take exchanges are of similar magnitude so that access fees are always greater than transaction fees.

A problem arises when an exchange using the transaction fee model must route a marketable order to an exchange using the make-or-take model. The routing exchange must pay the destination exchange the higher access fee. Some exchanges absorb the access fee while others pass this cost along to their customers. Those that pay the access fee and do not pass it along clearly are not happy about the access fee because they have no control over it. Moreover, they are exposed to customers who strategically route orders through them to avoid the access fee. Those exchanges that pass the fee along to their customers force their customers to pay fees that they generally do not expect and could only avoid by adding immediate-or-cancel instructions to their orders.

The effect that the make-or-take pricing model has on bid/ask spreads further exacerbates the problem faced by traditional transaction fee exchanges. To obtain liquidity rebates, Makers may price their orders more aggressively at make-or-take exchanges than they would at transaction fee exchanges. Market order submitters at make-or-take exchanges pay the high access fee only because they obtain better prices on average than they otherwise would. These relations hold because traders only care about the net prices that they pay or receive. Accordingly, the make-or-take pricing model causes average quoted bid/ask spreads to be smaller than they otherwise would be. The actual economic bid/ask spread at these exchanges is the quoted bid/ask spread plus twice the access fee. (This sum is the total cost of simultaneously buying and selling using marketable orders.) In competitive markets, the actual spread will not depend on how high the

access fees and liquidity rebates are, so long as the difference between them is constant. Traders simply adjust their quoted prices so that the net prices that they pay or receive are the same on average.

Liquidity rebates allow Makers to sometimes quote better prices at make-or-take exchanges than are available at transaction fee exchanges. When this happens, transaction fee exchanges must route orders. Their customers benefit because they receive better prices, possibly without paying the access fee. The transaction fee exchanges lose executions, pay the higher access fees which they may not pass on, and pay order routing fees to their order routing vendors as well.

These problems—fee losses on routed market orders, increased routing to markets with artificially narrowed spreads, and routing fees—hurt markets that use the transaction fee model and make flash facilities attractive. Any regulatory steps to address flash order issues also should address this exchange pricing issue.

Some commentators have suggested that during the period of the flash, a flashed buy order is effectively a bid at the National Best Offer and a flashed sell order is effectively an offer at the National Best Bid. Under this interpretation, flashed orders lock the market, which these commentators believe violates the principals of the National Market System. However, they do not recognize that if the best bid or offer is at a make-or-take exchange, the market is not truly locked in an economic sense because, on net, the access fee raises ask prices and lowers bid prices. For example, if the best ask is 20 at a make-or-take exchange that changes an access fee of 0.3, the economic cost of buying at the bid is 20.3, which is above the flash price of 20.

At first glance, the make-or-take pricing model appears attractive because it seems to reward Makers for good behavior—offering liquidity. It also appears attractive because it reduces bid/ask spreads on average. However, in competitive markets, on average, the access fee offsets the narrower average spreads so that market order submitters are no better or worse off. Likewise, on average, the liquidity rebate offsets the narrower spreads so that liquidity suppliers also are no better or worse off. The pricing model thus accomplishes nothing besides obfuscating the true economic spreads and creating routing inequities. Quoted spreads do not reflect actual spreads and routing decisions depend on exchange pricing models rather than on fundamental economic differences in quoted prices.

The transparency problem may be best understood by considering its analog in retail commerce conducted over the internet. Some retailers quote low prices for their products so that search engines rank their offers high. They then charge high shipping and handling fees so that their net prices are as high or higher than their competitors. Variation in shipping and handling fees that is unrelated to actual costs creates substantial price confusion and can lead to poor decisions by uninformed shoppers. Some internet search engines attempt to solve this problem by ranking offers by net price rather than quoted price.

In the financial markets, the net price solution would be unduly burdensome upon the information systems used to distribute financial market quotes and prices. Vendors would have to substantially modify these systems to present net prices, and they would have to present the prices in subpenny increments, which creates still more problems.

5. Recommendations for SEC rulemaking

1. **Voluntary flashes.** The SEC should ensure that Submitters are never compelled to expose their orders in flash facilities. Whether the order instruction is an opt-in instruction or an opt-out instruction is not important. If Submitters or their brokers regularly measure and act to control their transaction costs, they will determine whether flash orders are in their interest and act accordingly. This rule presently is unnecessary since all flash are voluntary or can be avoided by attaching an immediate or cancel instruction.
2. **Front-running.** With two exceptions, the SEC should make it illegal for Responders to take liquidity on the same side at a price equal or better than the price of a flash order that they have seen within one second of seeing that order. Responders should be exempt from this restriction if they filled the flash order or if they are trading to fill another flash order. This proscription would impose some programming burden on the Responders, but it should not have much effect on their legitimate business models since most of the time they make markets rather than take markets. A one-second delay in taking a market is not very constraining, especially when the Responders can take liquidity in correlated securities without restriction.
3. **Flash auctions.** The SEC should encourage exchanges to conduct a sealed bid auction among the Responders during the flash period to allocate the flash order to the Responder offering the best price rather than to the first Responder to respond. The bids should not be subject to any minimum price variation. This proposal would allow slower electronic traders in the flash facility to compete effectively and it would produce the best and fairest prices for Submitters.
4. **Best execution.** The SEC should continue to ensure that brokers route their agency orders based on careful and objective analyses of order performance. In particular, the SEC should ensure that routing decisions are not corrupted by agency practices that neglect best execution.
5. **Pricing standards.** To solve the exchange fee pricing problem, the SEC should establish a common pricing standard for collecting exchange fees. Such a standard would promote competition by ensuring that price quotes are comparable across exchanges and by ensuring that traders can compare exchange fees easily. Whether the Commission chooses the make-or-take model or the transaction fee model is less important than that it choose a common model so that exchanges (and traders) compete with each other on common bases.

Some commentators erroneously characterized past proposals to standardize how exchanges collect their fees as fee-setting regulatory interventions that would stifle competition. However, the establishment of a standard does not set fees, and competition is enhanced rather than stifled when everyone competes on the same basis. Exchange revenue is the same whether an exchange collects it as a fee per transaction or as the equivalent difference between an access fee and a liquidity rebate.

Although this equivalence ensures that the particular standard chosen will not matter much, two other considerations favor the transaction cost model. First, an elimination of access fees would cause securities markets to conform to common agency law. The

common law generally prevents agents from collecting fees from people seeking to do business with their clients because such fees inevitably reduce the value of the business that the clients receive. Second, an elimination of access fees would ensure that quoted spreads represent the actual costs of trading and not indications of cost that traders must adjust by adding access fees to arrive at actual costs.

If the SEC is unwilling to address the exchange pricing standard problem, then it should modify intermarket order routing rules to require routes based on net prices inclusive of access fees rather than only on quoted prices.

If the SEC is unwilling to take either action, then it should continue to permit flash facilities to operate so that traders at transaction fee exchanges can improve prices for their clients.

Failure to take either action would ensure that traders will continue to make important trading decisions based on quoted prices that do not reflect economic realities. Such decisions are inconsistent with the best execution principles that the SEC promotes and with fair competition among exchanges.

The inevitable result of a failure to act on this issue would be the universal adoption of make-or-take pricing models by all exchanges because intermarket routing rules and best execution standards as they are most commonly interpreted presently favor make-or-take exchanges. Quoted spreads in the resulting markets would be lower, but actual net spreads would remain essentially the same. No benefit would come of the additional complexity and many retail traders inevitably would be confused.

6. **Options markets versus equity markets.** The SEC should recognize that differences in the nature of options markets make flash trading more valuable to retail traders in options markets than in equity markets. In particular, retail traders depend on dealers to provide liquidity in the options markets to a far greater extent than they do in the equity markets. Accordingly, if the SEC chooses to prohibit flash trading in the equities markets, it can and should reasonably still permit flash orders in options markets. Flash trading does not disadvantage many public Makers in the options markets because few public traders supply liquidity in these markets.