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Mr. Jonathan G. Katz, Secretary
Securities and Exchange Commission
450 Fifth Street, NW
Washington, DC 20549-0609

April 7, 2004

Re: File No. S7-07-04, Concept Release: Competitive Developments in the Options Markets, Release No. 34-49175 (February 3, 2004)

Dear Mr. Katz:

I respectfully submit my comments on the following questions posed in the U.S. Securities and Exchange Commission's Concept Release on Competitive Developments in the Options Markets.

Question 7. Do market makers establish the price and size of their public quote based on the assumption that they may trade with an informed professional, which involves more risk than trading with an uninformed non-professional?

Question 8. If commenters agree that public quotes are based on the assumption that the market maker may trade with a professional, are such quotes wider than they would be if market makers only received uninformed, non-professional orders?

Question 9. Are market makers willing to trade with non-professional orders at prices better than their quote?

My expertise rests on my forthcoming publication on the relationship between informed / professional trading and the bid-ask spread quoted by a market maker.[1]

The Concept of Adverse Selection in Market Making

[1] Stanislav Dolgopolov, *Insider Trading and the Bid-Ask Spread: A Critical Evaluation of Adverse Selection in Market Making*, 32 CAP. U. L. REV. (forthcoming Fall 2004).

The questions posed by the Commission refer to the concept of the "adverse selection" cost borne by market makers, such as exchange specialists or OTC dealers. Because market makers are said to lose from trading with better informed counterparties, such as corporate insiders engaging in illegal insider trading or sophisticated securities analysts / "professionals," this allegedly increases the bid-ask spread.[2] In essence, it is argued that market makers must recoup their losses from trading with insiders / professional traders by charging everyone a greater spread – a cost mostly borne by uninformed traders that decreases liquidity. This analysis may be applied both to the equity and option markets.

The adverse selection argument has been widely accepted in the economics / finance and legal literature, although some empirical studies questioned the magnitude of the adverse selection component of the bid-ask spread. The U.S. Securities and Exchange Commission has similarly endorsed the adverse selection model of market making in two pivotal regulations, *Selective Disclosure and Insider Trading* (Regulation FD) and *Disclosure of Order Execution and Routing Practices*. The analysis of the adverse selection argument also has important implication for such issues as market fragmentation, securities transaction taxes, and payment for order flow.

Market Makers' Inventories and Their Losses to Informed Traders

It has been often presumed that market makers lose because of frequently and consistently buying "high" from and selling "low" to informed / more sophisticated traders. However, such losses may arise only at the time of the revision of the market expectations about a security's price – not at the time of a transaction. But providers of liquidity do not passively absorb order imbalances but continuously manage their inventory by adjusting the width and the midpoint of the bid-ask spread or by selectively initiating orders. Often, it has been theorized that providers of liquidity try to maintain some "preferred" level of inventory and thus manage their quotes accordingly.[3] A

[2] A possible relation between informed trading and the bid-ask spread was first discussed in Walter Bagehot (pseud. for Jack L. Treynor), *The Only Game in Town*, FIN. ANALYSTS J., Mar.–Apr. 1971, at 12. For formal models that consider this relation, see E. Copeland & Dan Galai, *Information Effects on the Bid-Ask Spread*, 38 J. FIN. 1457 (1983); Lawrence R. Glosten & Paul R. Milgrom, *Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders*, 14 J. FIN. ECON. 71 (1985); I.R.C. Hirst, *A Model of Market-Making with Imperfect Information*, 1 MANAGERIAL & DECISION ECON. 12 (1980).

[3] Empirical studies that documented market makers' inventory management practices mostly considered equity or futures – not option – markets. *See* Oliver Hansch et al., *Do Inventories Matter in Dealership Markets? Evidence from the London Stock Exchange*, 53 J. FIN. 1623 (1998); Ananth Madhavan & Seymour Smidt, *An Analysis of Changes in Specialist Inventories and Quotations*, 48 J. FIN. 1595 (1993); Steven Manaster & Steven C. Mann, *Life in the Pits: Competitive Market Making and Inventory Control*, 9 REV. FIN. STUD. 953 (1996); William L. Silber, *Marketmaker Behavior in an Auction Market: An Analysis of Scalpers in Futures Markets*, 39 J. FIN. 937 (1984); Andy Snell & Ian Tonks, *Determinants of Quote Price Revisions on the London Stock Exchange*, 105 ECON. J. 77 (1995); Yuiman Tse, *Market Microstructure of FT-SE 100 Index Futures: An Intraday Empirical Analysis*, 19 J. FUTURES MARKETS 31 (1999). At the same time, one study documented relatively high spreads on the Chicago Board of Options Exchange due to difficulties of "rebalancing of the market maker's portfolio." Mel Jameson & William Wilhelm, *Market Making in the Options Markets and the Costs of Discrete Hedge Rebalancing*, 47 J. FIN. 765, 777 (1992).

consequence of the "preferred" inventory hypothesis is that the adjustment to the "true" price due to the disclosure or some other event may have the same effect on the market maker's inventory regardless of whether he had been previously dealing with insiders / professional traders or not.

While it is true that informed trades have an impact on the overall order flow imbalance, it should be recognized that, in isolation, an informed trade of an insider / professional trader does not necessarily increase the order imbalance or pushes a market maker away from his preferred inventory level. It also should be considered that

> [m]arket makers are concerned with order imbalances over very short horizons (often less than an hour), and these need not correspond to the creation of new information about the firm or the trading by investors with special knowledge about the firm. Even if information about the firm is one cause for these order flow imbalances, its effects may be miniscule relative to other factors that influence minute-by-minute trading.[4]

Liquidity providers may even benefit from observing informed trades, as this would help them to anticipate the future price trends and adjust their inventory position accordingly. There is empirical evidence suggesting that, in some instances, market makers are interested in attracting informed trades.[5] But, at the same time, special information-motivated transactions shortly before public disclosure or large informed trades could harm a market maker, as he would have limited opportunities to readjust his inventories.

To address Question 9, it could be said that a market maker would be interested in detecting informed trading in general and specific informed trades in order to infer and profit on the future price movements and price-discriminate among traders, as informed transactors would accept a higher transaction fee. In this sense, liquidity provider could charge professional traders a greater fee or offer price improvement to non-professional retail trades. But such increased profits from price discrimination would not necessarily lead to improvements in liquidity.

Informed Trading and Market Option Makers

It is often suggested that informed traders prefer to use option markets, as they provide more financial leverage, lower implicit interest rates, and more opportunities to

[4] Gideon Saar & Lei Yu, Information Asymmetry about the Firm and the Permanent Price Impact of Trades: Is There a Connection? 31-32 (July 2002) (unpublished manuscript, on file with author).

[5] "One way [for liquidity providers] to acquire information quickly is to temporary increase spreads and thereby discourage uninformed or noise trading." Raymond M. Brooks et al., *Large Price Movements and Short-Lived Changes in Spreads, Volume, and Selling Pressure*, 39 Q. REV. ECON. & FIN. 303, 305 (1999).

circumvent short-selling restrictions.[6] Indeed, there is evidence that, in some instances, the derivatives markets are the preferred venue for informed trading.[7]

There is some evidence that option market makers are harmed by illegal insider trading.[8] On the other hand, it is possible that a liquidity provider could hedge the informed trading risk. One study posits and presents supporting empirical evidence that "[i]n a perfect hedge world, spreads [quoted by an option market maker] arise from the illiquidity of the underlying market, rather than from inventory risk or informed trading in the options market itself."[9]

Some empirical studies attempted to estimate the magnitude of the adverse selection problem for option markets. Anand Vijh found the adverse selection component of the bid-ask spreads of CBOE options to be 2%.[10] In contrast, Jason Lee and Cheong H. Yi estimated this component of the CBOE spreads at 38%[11] and criticized the results obtained by Vijh on the grounds that his study focused more on larger option trades that are less likely to be informed.[12] However, it should be noted that the econometric methodologies for decomposing the bid-ask spread into various components (such as order processing, inventory holding, and adverse selection costs) have been proven to be quite unreliable.[13]

I have no knowledge of any study that isolates the impact of professional trading – as opposed to illegal insider trading – on the bid-ask spread quoted by option market

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[6] Raman Kumar et al., *The Impact of Options Trading on the Market Quality of the Underlying Security: An Empirical Analysis*, 53 J. FIN. 717, 718-19 (1998).

[7] David Easley et al., *Option Volume and Stock Prices: Evidence on Where Informed Traders Trade*, 53 J. FIN. 431 (1998); Jason Lee & Cheong H. Yi, *Trade Size and Information-Motivated Trading in the Options and Stock Markets*, 36 J. FIN. & QUANTITATIVE ANALYSIS 485 (2001).

[8] Prime Markets Group v. Masters Capital Management, No. 01 C 6840, 2003 U.S. Dist. LEXIS 7928 (N.D. Ill. E. Div. May 7, 2003) (CBOE options market makers alleging harm from insider trading in connection with an upcoming merger announcement); Abrams v. Prudential Securities, No. 99 C 3884, Mar. 20, 2000 U.S. Dist. LEXIS 18541 (N.D. Ill. E. Div. 2000) (same); Goldsmith v. Pinez, 84 F. Supp. 2d 228 (D. Mass. 2000) (same); Rosenbaum v. Myers, No. 97-824, 1997 U.S. Dist. LEXIS (E.D. Pa. Oct. 9, 1997) (Philadelphia Stock Exchange options market makers alleging harm from insider trading in connection with an upcoming acquisition announcement); SEC v. Certain Unknown Purchasers, No. 81 Civ. 6553, 1983 LEXIS 15226 (S.D.N.Y. July 25, 1983) (a Pacific Stock Exchange options market maker alleging harm from insider trading in connection with an upcoming acquisition announcement).

[9] YOUNG-HYE CHO & ROBERT F. ENGLE, MODELING THE IMPACTS OF MARKET ACTIVITY ON BID-ASK SPREADS ON THE OPTION MARKET 29 (Nat'l Bureau of Econ. Research, Working Paper No. 7331, Sept. 1999). For an earlier discussion of hedging the risk of insider trading by option writers, see HENRY G. MANNE, INSIDER TRADING AND THE STOCK MARKET 46, 251 n.9 (1966).

[10] Anand M. Vijh, *Liquidity of the CBOE Equity Options*, 45 J. FIN. 1157, 1177 (1990).

[11] Lee & Yi, *supra* note 7, at 496.

[12] *Id*., at 487.

[13] Raymond Brooks & Jean Masson, *Performance of Stoll's Spread Component Estimator: Evidence from Simulations, Time-Series, and Cross-Sectional Data*, 19 J. FIN. RES. 459 (1996); Hasung Jang & P.C. Venkatesh, *Consistency between Predicted and Actual Bid-Ask Quote-Revisions*, 46 J. FIN. 433 (1991); Robert Neal & Simon M. Wheatley, *Adverse Selection and Bid-Ask Spreads*, 1 J. FIN. MARKETS 121 (1998); Bonnie F. Van Ness et al., *How Well Do Adverse Selection Components Measure Adverse Selection?*, FIN. MGMT., Autumn 2001, at 77. It seems that the estimate for the adverse selection component of the bid-ask spread really captures the impact of stock price volatility – not informed trading as such.

makers. However, it should be noted that one may expect a significant divergence of opinion among securities analysts and other professional traders – not unlike the divergence of opinion among small uninformed traders. This diversity, in turn, could boost the trading volume and thus increase the revenues of the option market maker in question – contrasted to the hypothetical with no professional trading. The possibility that a liquidity provider itself could be a part of an integrated securities firm with extensive research capabilities should also be considered, even though this may raise some regulatory issues pertaining to "Chinese Walls."

"Cream-Skimming" and Payment for Order Flow

An implication of the adverse selection model is that market makers should refrain from dealing with informed traders or engage in some form of price discrimination. Consequently, some market practices of liquidity providers, such as "cream-skimming" and payment for order flow were used to support the model's validity.

The "cream-skimming" hypothesis suggests that some market makers, such as dealers or specialists on "satellite" exchanges and "third market" dealers, actively seek to obtain uninformed orders by attracting small retail trades and, thus, leaving informed trades to be executed on the dominant exchange.[14] "[T]he burden of adverse selection falls disproportionately on the primary exchange specialist, who loses the 'safe' business of the retail customer but must accept the problematic trades of the professional."[15]

In the same fashion, it is argued that the adverse selection rationale may lay behind the phenomenon of "payment for order flow," i.e., the practice of payments by dealers to retail brokers for the diverted order flow: "If the market maker could be assured of obtaining primarily the order flow of uninformed traders, that market maker would face smaller losses to informed traders than implicit in the displayed spread, making it again profitable to pay for order flow."[16]

At the same time, there is extensive evidence from the equity markets indicating that the adverse selection argument does not explain neither "cream-skimming" nor payment for order flow. The dominant exchanges still tend to have smaller bid-ask spreads, and

[14] For instance, see OFFICE OF ECON. ANALYSIS & OFFICE OF COMPLIANCE INSPECTIONS, U.S. SECURITIES AND EXCHANGE COMM'N, SPECIAL STUDY: PAYMENT FOR ORDER FLOW AND INTERNALIZATION IN THE OPTIONS MARKET (Dec. 2000), *available at* http://www.sec.gov/news/studies/ordpay.htm ("Retail customer options orders are considered the most profitable because these orders are often 'uninformed.'").

[15] John C. Coffee, Jr., *Comment*, *in* THE INDUSTRIAL ORGANIZATION AND REGULATION OF THE SECURITIES INDUSTRY 82 (Andrew W. Lo ed., 1996).

[16] Marshall E. Blume & Michael A. Goldstein, *Quotes, Order Flow, and Price Discovery*, 52 J. FIN. 221, 226 (1997). However, an authoritative industry-originated report on the inducements for order flow by a committee chaired by David S. Ruder did not mention the adverse selection argument. *See* THE PAYMENT FOR ORDER FLOW COMM., INDUCEMENTS FOR ORDER FLOW: A REPORT TO THE NASD BOARD OF GOVERNORS (July 1991), *available at* http://www.academic.nasdaq.com/docs/wp91_1.pdf.

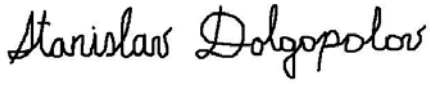
market fragmentation does not worsen the execution quality of the central trading venue.[17] Probably, the same empirical results would be found for option markets as well.

Implications of the Presented Analysis

My analysis of adverse selection in market making suggests that the impact of professional trading on the bid-ask spread is rather uncertain. There are reasons to believe that the retail-professional order flow mix may not have a significant effect on the market liquidity in the option markets. In many instances, the losses suffered by a liquidity provider due to a trade with a better-informed counterparty are illusory. However, it is not always the case, and informed trading on the basis of firm-specific information of major significance (such as illegal insider trading on an upcoming acquisition announcement, for instance) can damage an option market maker.

The evidence from equity markets also raises doubts that "cream-skimming" and payment for order flow can be explained by the fact that small / "retail" orders are uninformed. These phenomena may be explained by the fact that some dealers have the comparative advantage in attracting smaller trades.

Sincerely,



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[17] Robert H. Battalio, *Third Market Broker-Dealers: Cost Competitors or Cream Skimmers*?, 52 J. FIN. 341 (1997); Robert Battalio et al., *Do Competing Specialists and Preferencing Dealers Affect Market Quality?*, 10 REV. FIN. STUD. 969 (1997); Mark A. Peterson & Erik R. Sirri, *Order Preferencing and Market Quality on U.S. Equity Exchanges*, 16 REV. FIN. STUD. 385 (2003).