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RE: **Impact of Options Data on Vendors and User Firms**

DA: July 17, 2001

CC: Members, SEC Market Information Advisory Committee
FISD Executive Committee

On request of the Securities & Exchange Commission and in preparation for the July 19 Market Information Advisory Committee meeting, FISD made some preliminary inquiries into the impact of options data on market data vendors and user firms.

In order to prepare this memo, I spoke with representatives from ADP, Bloomberg L.P., Bridge Information Systems, Fidelity Investments, Goldman Sachs, industry consultants R.T. Williams (SRI Consulting) and Charlotte Cooney (Financial Information Forum), Lazard Brothers, Merrill Lynch, MoneyLine, Reuters Ltd., Standard & Poor's Comstock, Telekurs Financial, Thomson Financial and UBS. I think it is important to note at the outset that our discussions with the industry were far from exhaustive. It is also important to note that I do not consider myself either an expert in the options industry or fully versed with the complex range of issues related to capacity management.

The points outlined in this memo, therefore, are simply a summary of my findings without personal judgement or organizational bias. The objective of my inquiry was to:

1. identify the issues associated with options capacity as it applies to distribution bandwidth and processing capabilities;
2. collect opinions on the value of an official national best bid/offer (NBBO) for options or other data elements required for transparency in the options market;
3. identify issues associated with the methods and approach to consolidation of data;
and
4. collect opinions on alternatives for consideration by both the Advisory Committee and the Commission.

In general, I found a significant degree of consensus among the vendors and users related to options data. There is a fairly high degree of concern among both vendors and users associated with the growth of options traffic as well as with the accuracy of projected capacity requirements. Both vendors and users are investing heavily in upgrading communications lines, increasing distribution bandwidth and upgrading internal processing capabilities to make sure they can meet SIAC projections. Please note the present tense of their response. It is fair to say that many Wall Street firms are not currently prepared to accept 24,000 MPS into their distribution platforms. They are still working to build that infrastructure.

With the exception of market makers and active options traders, most believe the majority of quotes – specifically “away from the market” and “out of the money” quotes -- account for a significant volume of options data (perhaps as much as 75%) and are considered not useful.

Many believe that exchange specific quotes are akin to “free advertising” and are also considered as not particularly useful.

Options Data Traffic Background

In the late 1970’s, two graduate students at the University of Chicago created a mathematical model for valuing options – known as the “Black-Scholes Model.” The Black-Scholes Model had two profound impacts. First, it created a way to use measurable market variables to create a theoretical value for an option that assisted in trading securities. The impact of the Black-Scholes Model (*and other strategies*) allowed the options market to grow quickly.

The second major effect was to create huge volumes of options market data. The reason is that there are many different options contracts (*both “put” and “call”*) on a single underlying contract. For each put and call there are a series of expiration months when the contract expires. For each put and call there are a number of “strike prices” (*typically three on either side of the current price when a new option begins trading*). For example if the price of a security is \$100 and a new options expiration month begins trading, there could be strike prices at 85, 90, 95, 100, 105, 110 and 115. After trading begins, if the price in the stock moves past 105, a new strike will be created automatically at 120, while the strike at 85 will continue to be active. In a very active stock there could be a huge number of active strikes. In addition, corporate action information such as splits and mergers will also have an impact on options pricing and options data maintenance.

The rules of the options exchanges require a market maker in an option to continuously provide quotes on all active strikes while the market is open. The burden of updating quotes on all active strikes led to the development of “auto quoting systems”. These systems take market data quotes from exchanges trading the underlying securities and feed them into a version of the Black-Scholes model to create a new theoretical value for each strike price.

Take the case of Yahoo in the late 1990s that had more than 900 active strikes at one point. In this case, each of the four (*at that time*) options exchanges would generate 900 new quotes every time Yahoo’s stock quote changed by one unit of pricing. In theory, that means that a one penny change in Yahoo stock would generate 4500 options quotes. And, for the day in question, Yahoo’s stock price moved from somewhere in the \$20s to around \$70. (*Note: in reality this was pre-decimalization and the actual price change was 1/16th*)

The other major impact on options pricing occurred in 1989 when the SEC removed the ban on “multiple listings.” The effect was that the unwritten agreement among exchanges not to multiply list instruments began to disintegrate. Beginning in 1998 the Department of Justice began to investigate options trading to determine if the lack of multiple listing in options constituted an informal agreement among exchanges in restraint of trade. This investigation prompted the exchanges to cease all joint discussions on capacity planning as well as a number of other options market coordination activities.

Key Options Data Statistics

- 3,255+ listed options underlyings accounting for about 150,000 individual options series.
- Options pricing accounts for somewhere between 70-80% of US market data traffic.

- Somewhere between 45-50% of options classes trade less than 50 contracts/day.
- Somewhere between 20-30% of options series has no open interest. Options with zero open interest and zero volume account for perhaps as much as 60% of traffic volume.
- Away from the market quotes resulting from elimination of the informal agreement on multiple listing account for perhaps as much as 25% of volume.
- The average number of quotes per trade is somewhere around 300/1 (*with fully electronic exchanges such as ISE accounting for significantly higher quote/trade ratio*). One of our members tracks the total number of contracts traded on each exchange on a daily basis. Currently, CBOE consistently trades more than 1,000,000 contracts per day (36% of total), AMEX trades approximately 750,000 (27%), PHLX and PCX each trade around 350,000 to 400,000 (14%), and ISE trades about 250,000 (9%). Conversely, ISE sends over 30% of the total message traffic (quotes and trades) from all OPRA contributors. This figure is up from around 15% in March 2001.
- Current OPRA capacity throttle is 24,000 MPS while the current peak is just over 7,000 MPS (*projected capacity is for 52,000 MPS by 2002*).

Implications to Vendors

Options traffic has two primary implications to vendors. The first is associated with the costs of data collection, processing and distribution. And while expensive (*for example one major vendor projects they will invest over \$15 million to upgrade systems to handle OPRA projections*) vendors admit that it is part of their business requirement to be able to collect and process all the data that's available. None of the vendors I spoke with complained about data collection burdens and all indicate they have built capacity to handle what's coming. Vendors did strongly indicate the desire for a more open dialogue with exchanges on the accuracy of capacity projections.

[NOTE: Questions were raised about the capability of some of the smaller vendors to handle capacity at the higher end of projections, but I have not been able to verify the statements.]

The primary concern of vendors relates to their desire for flexibility in creating useful services for their clients. Vendors indicate that most of their clients don't want the "raw OPRA feed" and many can't handle the volume of data*. Customers want the vendor to deal with data processing problems by filtering and delivering timely and accurate quotes on the contracts they are interested in – whether it be by exchange, by NBBO, by fresh prices, only by contracts where they have open interest or by any number of criteria. The key point is that vendors indicate the desire for flexibility to be able to tailor products based on the specialized needs of their customers rather than by regulatory mandate.

[* NOTE: This problem only exists in situations where the vendor delivers a feed of data to the customer for processing on the customer's LAN – i.e. the customer is responsible for serving internal information requirements. There seems to be no current capacity problems for vendors selling terminal products or for vendors providing a gateway from the customer site to the vendor's server.]

For data feed vendors, the core of the problem seems to be requests by data feed customers to see the detail on a specific options contract. In the Yahoo example above, they would get updates to

all 900 series not just those that can be seen on one screen. In a large trading room, the collective requests of a number of traders results in an opening of the “flood gate” of streaming updates. The following were identified as possible:

- Deliver the full spectrum of streaming updates and require the client to upgrade bandwidth and processing capabilities (*user firms indicate they are investing heavily in distribution and processing capabilities to meet capacity projections and to be able to handle the flow of data into databases and calculation, but don't really want to carry all of the "useless" data*);
- Vendor could “turn off” part of the data stream, filter the data for the customer or provide clients with “publish/subscribe” tools to manage the data and only view the specific data desired (*this option is not favored by options traders who use the full spectrum of updates for theoretical indications of the market and to meet regulatory requirements for valuation*);
- Vendor could determine and disseminate only primary market quotes;
- Vendor or (preferably) consolidator could calculate an “official NBBO” or create other customized products to filter out the “unnecessary data.”

Alternatives For Consideration

Virtually everyone I spoke with believes that there is a significant range of viable quote mitigation strategies that should be given serious consideration by the Commission. The most consistent recommendations (*in this order*) were:

1. Avoid penny MPV increments. No one we spoke with considered penny increments to be of value.
2. Create an official NBBO for options with the appropriate inter-market linkages and accurate size indicators based on order data. (*Note that NBBO actually increases the capacity problem unless vendors are permitted to distribute NBBO only and not individual exchange quotes*)
3. Consider suspension/modification of the firm quote rule to reduce the need for auto quoting for out of the money and away from the market quotes. Alternatively, set a minimum underlying price change to trigger option price recalculations.
4. Consider allowing for split service offerings from OPRA (*i.e. only NBBO versus full details or separation of the OPRA data stream into two lines based on activity*). Discussions indicate that there are only a few locations – perhaps as few as 100 – requiring the full OPRA feed. Note one customer could take the feed into multiple locations.
5. Consider possible strategies to prioritize the dissemination of options based on value to end-users such as “quote by request” of far out-of-the money, deep in-the-money, 4th expiration month and less active options.

6. Promote an open dialogue among exchanges and vendors on options traffic issues. Vendors indicate insufficient communication and a reluctance among exchanges to discuss either quote mitigation strategies or capacity projections. And projections are frequently well below actual levels.

[NOTE: The SRI Consulting Options Mitigation Study identified and analyzed a significant number of additional quote mitigation strategies for acceptability and impact. FISD has not been able to analyze the full report.]

I hope this memo is of use to the Advisory Committee as background for the July 19 meeting. Please don't hesitate to ask for clarification on any of the points raised in this memo. If we could be of additional service, FISD stands ready to conduct a more detailed analysis of the implications of options data on the market data industry.