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The Central Limit Order Book (CLOB) Option for Linking U.S. Stock Markets

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Summary

A central limit order book, or "CLOB", is a policy option currently under consideration by the Securities and Exchange Commission. A CLOB is an electronic system that would link the various stock markets (exchanges, market makers, and alternative systems) in an attempt to correct some of the problems that have emerged because of the proliferation of trading venues in recent years. As envisioned by some, a CLOB could allow the centralized display of investors' offers to trade stocks which are listed on various stock exchanges. CLOBs also tends to be conceptualized as an order display device that would allow those who first submit a stock trade to receive execution priority over similar, but subsequent orders. CLOB detractors, however, say that it could impede innovation and subject U.S. stock markets to systemic risk. In the summer of 2000, the SEC abandoned the idea of imposing a CLOB.

Background

The idea of a Central Limit Order Book (CLOB) has been around the since the 1970s when the Securities and Exchange Commission (SEC) broached the idea and met opposition from stock exchanges. But, there are some new concerns over the issue of market fragmentation and the idea of a CLOB is receiving renewed interest as a possible antidote to it. Consider this illustration:

> A stock that you like is offered on your screen for $20.25. You don't want to pay that, so you give your discount broker an order to buy 500 shares at $20.125. Your bid pops up on the screen: it's now the highest in the market, and you figure it's only a matter of time. Then you see 500 shares trade at $20.125. Then another at the same price. And, another. Still, you don't get any stock. Then your broker buys 200 shares from another investor paying $20.1875, a smidgeon above your bid. The stock rallies, and your broker unloads the shares he bought. Frustrated, you cancel your first order and enter another with no preset limit. Five seconds later, your broker confirms you

bought 500 shares at $20.375. You paid $125 more than you expected, but at least you paid just $10 in *commission*.[1]

What happened? Many students of the markets consider that this not uncommon scenario is basically a byproduct of the isolated or fragmented relationship among the various market centers that execute trades for stocks listed on the New York Stock Exchange (NYSE), or for stocks that are traded through the computer screen-linked Nasdaq, or that are traded through the growing electronic communications networks also known as *Alternative Trading Systems* (ATS).

At present, how your shares are traded depends on what stock you want and through whom you purchase them. For any of the 5,000 stocks listed on the Nasdaq, your broker could send your order 1) to a market maker who will fill your order using his own capital or inventory (called "trading against"), 2) to any of nine ATS which will provide totally automated order matching, primarily for "limit" orders,[2] or 3) to the trading desk of the same broker-dealer to whom you submitted your order (called "internalization"). For NYSE-listed stock, your broker can forward your order 1) to the single specialist on the NYSE floor who will make your trade by matching your order with another, 2) to market makers on one of the five regional exchanges,[3] or 3) to one of the Nasdaq market makers who also trade in NYSE-listed stocks (the "third market").

While there are some links among these market alternatives that allow them to share information on the best prices available to stock investors, the dispersion of market centers may cause some retail limit orders to be isolated, perhaps resulting in orders not being executed. For investors there is a clear opportunity cost from losing an order. Should it happen often enough, investors may become less willing to submit "price-improving" orders. Fragmentation may also undermine efficiency by constricting order interaction, limiting stock price competition, and constraining the "price-discovery process" through which large numbers of buyers and sellers in particular securities tend to converge toward optimal share prices.

Fragmentation does not present only problems, however. Many securities industry observers regard the notion of market fragmentation as just another way of characterizing the beneficial widening of competition in U.S. securities markets for the surging volumes of retail order flow, particularly in Nasdaq-listed stocks. By various accounts, the rise in the number of market centers competing for trade execution order flow has helped produce a significant reduction in what retail investors pay to their broker-dealers.[4] Moreover, ATS give retail customers the benefit of unprecedentedly cheap and fast stock

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[1] Taken from: Ip, Greg. Sweeping Change in Market Structure Sought. *Wall Street Journal*, February 29, 2000.

[2] Limit orders are offers to buy shares up to a price ceiling or sell shares at a threshold price or greater. Market orders are to buy or sell at current market price. About two-thirds of trading volume is in limit orders.

[3] The regionals are the Cincinnati, Pacific, Philadelphia, Boston, and Chicago Exchanges.

[4] A broker-dealer is a firm that in its capacity as a broker brings the buyers and sellers of securities together and which in its dealer capacity buys securities for and sells securities from its own portfolio. The term broker-dealer is often synonymous with brokerage firm and broker.

trade executions. It has also been argued that the existence of multiple venues that compete for investor order flow means that individual investor desires for varying kinds of trades can be more fully met.[5] Some observers also contend that competition for investor order flow, which is the very basis of the fragmentation, tends to foster innovation in trading technologies as trading venues seek a competitive edge.

Congressional Interest. The Senate Banking and the House Commerce Committees held a number of oversight hearings during the fall of 1999 and the winter and spring of 2000, that touched on fragmentation-related issues. Senator Gramm, Chairman of the Senate Banking Committee, has indicated his concern that a centralized market facility like a CLOB might curb innovation and limit newly competing entrants.[6] But, Banking Committee member, Senator Charles Schumer has appeared to be more supportive of a proposal like a CLOB, noting that "We've had situations before where there isn't openness, which fragmentation inveighs against.... Unless there [are] some changes, smaller investors, particularly, can be taken advantage of in little corners of the world."[7]

Recent Developments

For years, the SEC has observed that market fragmentation confers both benefits and costs on investors and markets. As recently as 1994, when the principal focus was fragmentation in the market for NYSE-listed stocks, the SEC concluded that market fragmentation conferred net benefits.[8] However, recent developments have led the agency to reassess the issue. Key developments giving impetus to this reexamination include the rise in the number of ATS (to nine) and the decision by the NYSE to rescind "Rule 390." With certain exceptions, Rule 390 had barred the 23% of NYSE-listed stocks (accounting for about 46% of its trading volume)[9] that were listed prior to April 26, 1979 from being traded outside of the NYSE or the five regional exchanges.[10]

The SEC observed that the rescission of Rule 390 appeared to open the door to greater potential market fragmentation in NYSE-listed stocks. It reasoned that trading venues like ATS and broker-dealers (through internalization) might exploit the new trading opportunities, thus further fragmenting the market in NYSE-listed stocks. In February 2000, the SEC issued a "public policy think piece" known as a *concept release* on the topic of market fragmentation. In addition to soliciting public comment on various

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[5] For example, some traders may place a premium on fast execution, while others place a premium on the trading venue's ability to improve on the prevailing stock price for a market order.

[6] Mulligan, Thomas. Market Savvy. *Los Angeles Times*, March 1, 2000.

[7] Hansard, Sara. Hiring the Best Friends Money Can Buy: Washington Insiders Cash in on Centralized Trading Fight. *Investment News*, April 3, 20000.

[8] *Market 2000, an Examination of Current Equity Market Developments.* SEC. Washington, 1994.

[9] New York Stock Exchange Asks for Customer protection Rule. *Daily Report for Executives*, December 6, 1999. p. A-12.

[10] As noted previously, the regional exchanges are the Cincinnati, the Pacific, the Philadelphia, the Boston, and the Chicago.

questions concerning the costs and benefits of fragmentation, the release also requested input on several policy options being considered for mitigating some of fragmentation's potentially less desirable aspects.[11]

The CLOB was by far the most sweeping, controversial, and commented-upon policy option posed. The SEC version would create a linked system to provide market centers with displays that show pending limit orders from all the various market centers in stocks listed on the different exchanges. The initial and primary interest would be in stocks listed on the NYSE and the Nasdaq. This consolidated, multiple exchange display system would constitute the *central* aspect of the central limit order book, and would stand in contrast to the current convention in which the systems that disseminate and display market orders and limit orders for stocks listed on the Nasdaq and the NYSE to their respective traders are totally separate.[12]

The other key attribute of the CLOB is that it would have a trading protocol known as price-time priority. Under price-time priority, trading priority would be assured the first trader who improves on the best displayed bid (offer to buy) or offer (offer to sell) for a given stock. The first party to improve on the best prevailing stock price offer would then be first in line to trade with anyone. In other words, the investor in the illustration (cited on page 1) would not be stranded.

At present, there is a different kind of trading protocol: suppose an investor's limit order for a Nasdaq-listed stock is initially received and displayed by one of (on average) 12 independent dealers who trade in that particular stock.[13] If the investor's limit order establishes a new best price, all of the dealers who trade in the stock must honor that price. But, those other dealers do not have to trade with the investor's order. Instead, they are permitted to match the investor's price, using the price as a basis for subsequent trades with their own investor order flow (until the emergence of a new best bid or best offer price). Under price-time priority, which a CLOB makes possible and could enforce, Dealer B could no longer match the price of Dealer A's investor order that had established the best prevailing bid or offer price. If Dealer B wants that price, B must trade directly with the investor's order.[14]

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[11] *Self-Regulatory Organizations: Notice of Filing of Proposed Rule Change by the New York Stock Exchange, Inc. To Rescind Exchange Rule 390; Commission Request for Comment on Issues Relating to Market Fragmentation.* SEC Concept Release, February 23, 2000

[12] Additional questions concerning the CLOB design would include: Would it also display market orders? Would it also be used for automatic order execution as well as order display? And, would it only display the best dealer orders or would it have greater depth of display?.

[13] The separate order display linkages that exist between the dealers in Nasdaq stock and the dealers in NYSE-listed stocks provide each set of dealers with continual information on the prevailing best bid and best offer for the various stocks.

[14] The same scenario applies to the intermarket trading protocol between the various market centers in NYSE-listed stock: the NYSE itself; market makers on the five regional exchanges; and various dealers in the "third market" (Nasdaq dealers who also trade NYSE-listed stock).

Potential Advantages of a CLOB

A CLOB could address a number of concerns that various observers have had with the stock trading status quo. For some trades, the major cost of placing a limit order is the opportunity cost of not having the trade executed. Limit orders may not receive execution for a number of reasons, including lack of realism on the part of the investor, the presence of a highly volatile market in the stock, or breakdowns or delays in the trading infrastructure. There are, however, additional concerns over the role that the lack of price-time priority may have in isolating some of the orders that establish new best prices. As we described earlier, the orders may simply go unexecuted when dealers in other market centers match their prices, but do not interact with them. And, generally, the more active an investor is, the more important a CLOB might be in helping to reduce the costs associated with isolated and unexecuted orders.

SEC officials, among others, have raised a number of issues in this regard. One concern is that unexecuted limit orders may discourage investors from future market enhancing offers to improve on prevailing stock prices. There are additional concerns over the fairness of other dealers "free riding" on prices that they did not establish. A CLOB could remedy these. In addition, because it would provide a consolidated display of limit orders for both NYSE-listed and Nasdaq-listed stocks, a CLOB could help lower search costs for traders who trade in both markets.

A number of observers have also voiced some concerns about the vulnerability, in the event of a market crisis, of the smaller and more isolated fragmented pools to illiquidity. A good argument could be made that a CLOB's centralized order flow would provide the markets with what some analysts call "macroliquidity" (a centralized "deep pocket" of liquidity) that would be better able to withstand any drying up of market liquidity during times of severe market stress.

Key Criticisms of a CLOB

CLOB detractors make three main arguments against creating such structure, part from the critical questions of how such a system would be designed, administered, regulated and who and how it would be financed. (The systems that currently link various parts of the markets are industry financed and self-regulated, with SEC oversight, by organized consortiums composed of representatives from the linked trading venues.) The three main criticisms are: 1) that a CLOB is inherently anti-competitive and would harm innovation; 2) that it would probably "commodify" investors' stock orders (see below); and 3) that it is unnecessary because market fragmentation will decline over time, even without it.

Many think that a CLOB would have the effect of discouraging market centers from actively competing for investor order flow. This could occur because, under a CLOB, market centers would lose control over their ability to make a profit by trading with the orders that may be initially routed to them. Orders would be immediately routed to the CLOB's centralized display where they could be "picked off" (traded with) by any market center. As a consequence, market centers could lose some motivation to compete for order flow and be less driven to innovate new technologies in competition for that flow.

The second concern is attendant to the first: that a CLOB would thereby "commodify" investor order flow, leading to elimination of the valuable array of unique and differentiated investor/dealer relationships and networks.

The third concern is related to the notion of systemic risk: because a CLOB would provide for a single point of interaction for stock orders, system disruptions or its outright failure could pose serious overall problems for the markets. Thus imposing a CLOB, rather than letting markets develop their own organization, is neither necessary nor particularly effective. And there is a widely-held perception that, over time, investors will want to trade where there is an abundance of other trades. Once a market center attracts a certain "critical mass" of liquidity, it is inclined to attract even more trading volume.[15] In other words, market centers may have certain scale economies in stock order flow. If true, over time, this would imply a natural tendency toward greater consolidation. It is this kind of reasoning that has led some observers, such as Federal Reserve Chairman Alan Greenspan, to reject the need for a CLOB.[16]

Major Market Participants and a CLOB

Entities who are actively involved in the trading of stocks and/or the execution of stock orders have generally questioned the need for a CLOB. Included among these critics are various ATS; various Nasdaq dealers; the brokerage firm of Charles Schwab (heavily involved in trading via internalized orders); some online brokerages (some of whom internalize some of their order flow); the National Association of Securities Dealers (NASD, the parent company of the Nasdaq); the NYSE; and some regional exchanges which trade NYSE-listed stock. At a minimum, a CLOB with price-time priority could make their or their members' revenue flows from order execution and/or actual stock trading less certain and more unstable.

The most visible advocates of a CLOB have largely come from the ranks of traditional Wall Street brokerage firms. Earlier this year, five large brokerages – ABN Amro North America Inc., Edward Jones, Goldman Sachs & Co., Merrill Lynch & Co., and Morgan Stanley Dean Witter – signed a "white paper" asking the SEC to support a CLOB with price-time priority. (Subsequently, a couple of these firms appear to have softened their stances on the position.) A not unreasonable argument could be made that a CLOB might particularly benefit large, traditional Wall Street brokerage firms with comparatively large trading desks; large trading capacities could provide them with greater capability to "pick off" orders displayed on a CLOB. A number of the Wall Street firms champion a CLOB with an exemption for block trades – the institutional investor trades of 10,000 shares or more – which are generally handled outside normal trading systems now, and in which these firms are actively involved. NYSE officials, among others, say that this would result in a bifurcated and discriminatory stock market. In late July 2000, the SEC announced that it had rejected the idea of a CLOB and instead was proposing (much less controversial) greater disclosure requirements by brokerage firms and equity market centers concerning their order routing practices and execution quality.

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[15] For example, see: The Battle for Efficient Markets. *The Economist*, June 17, 2000. p.6.

[16] *Testimony of Alan Greenspan before the Senate Committee on Banking, Housing, and Urban Affairs*. April 13, 2000.