

22 May 2008

**Justin Schack**  
Vice President  
[jschack@rblt.com](mailto:jschack@rblt.com)

**Joe Gawronski**  
President and COO  
[jgawronski@rblt.com](mailto:jgawronski@rblt.com)

Rosenblatt Securities  
20 Broad Street  
New York, NY 10005  
+1 212 607 3100  
[www.rblt.com](http://www.rblt.com)

# Trading Talk

## Market Structure Analysis & Trading Strategy

### LET THERE BE LIGHT

#### Rosenblatt's Monthly Dark Liquidity Tracker

*"Sometimes the light's all shining on me*

*Other times I can barely see"*

—Robert Hunter, 1970

Equity trading in the U.S. grew significantly darker last month. We estimate that 6.64% of consolidated volume was executed by 18 major non-displayed markets in April, up from a revised 5.38% in March (see table, page 2). This big increase follows a slight decline in the percentage of overall trading done by dark pools in March, which we detailed in [last month's dark liquidity tracker](#).

How to explain the month-to-month fluctuations? Like much else in the world of dark pools, definitive answers are hard to come by. But with every issue of Let There Be Light, we become more convinced that volatility is an important determinant of dark pools' collective market share.

When markets are swinging wildly and volumes soaring, often driven by hedge funds and other short-term players, traditional investment managers may react in two ways that affect dark pool volumes. One is to sit on the sidelines, trade only to avoid losses and hold off on potential purchases until the markets calm down. Another is to seek refuge in the price discovery of the primary markets, confident that working orders on exchanges and ECNs is safer than waiting for dark block executions that might look great one minute and awful the next because of large price moves. Both of these can depress the volumes of dark pools, especially those that rely heavily on flow from fundamentally driven, long-only institutions, though the evidence of this is admittedly more anecdotal than empirical. Additionally, overall volume spikes are often driven by high-frequency traders, whom we believe may account for two-thirds or more of total volume and generally avoid dark pools in favor of faster, more certain executions in the public markets. (The outsized presence of such traders in the market probably also means that the percentage of *traditional* institutional activity in dark pools is far higher than the 6.64% figure we cite above.)

In March the average daily closing price of the CBOE's Volatility Index (VIX) was 25.81, fueled largely by continued concerns over the housing-related credit crunch damaging the global financial system. That volatility helped drive consolidated volume to 8.3 billion shares per day, up from 7.2 billion in February. As things calmed down in April, the VIX's daily average closing price fell to 21.56 and consolidated volume declined to 6.7 billion shares per day, with a greater portion of that total executed in the dark. So while dark pool volumes generally continue to trend up as the number of venues expands — and as market participants seek to reduce transaction costs by keeping their intentions hidden — the conditions that make for optimal dark pool trading may be present during one day, week or month and vanish in the next, leaving traders feeling like the narrator in the above-quoted Grateful Dead ditty, "Truckin'."

**THE NUMBERS**

VENUE	Q108	MAR 08	APR 08	MAR 08 (Adjusted)	APR 08 (Adjusted)	CURRENT % OF CONSOLIDATED VOLUME
BIDS	21.5	22.7	23.6	11.4	11.8	0.17%
BNY CONVERGEX VORTEX <sup>a</sup>	11.9	13.5	13.5	~3.4	~3.4	0.05%
CITI MATCH	30.0	30.0	42.0	15.0	21.0	0.31%
CREDIT SUISSE CROSSFINDER <sup>b</sup>	95.5	120.6	122.0	~54.3	~54.9	0.81%
DIRECT EDGE ECN <sup>c</sup>	32.4	36.4	44.4	0.0	0.0	0.00%
GOLDMAN SACHS SIGMA X <sup>b</sup>	139.3	134.0	127.0	~60.3	~57.2	0.85%
INSTINET CBX	~38.3	~42.0	~34.6	~21.0	~17.3	0.26%
ITG POSIT <sup>d</sup>	55.0	~57.0	~48.0	~28.5	~24.0	0.36%
ISE MIDPOINT MATCH	14.2	18.0	18.0	18.0	18.0	0.27%
KNIGHT LINK	77.0	86.0	72.0	86.0	72.0	1.07%
LEHMAN LX	62.0	61.0	55.0	30.5	27.5	0.41%
LEVEL	41.9	46.2	58.0	23.1	29.0	0.43%
LIQUIDNET <sup>e</sup>	76.7	62.4	69.7	33.9	38.0	0.56%
MORGAN STANLEY MS POOL <sup>f</sup>			35.0		17.5	0.26%
NYFIX MILLENNIUM	49.3	47.1	47.2	23.6	23.6	0.35%
PIPELINE TRADING	30.8	~29.7	~25.7	~14.9	~12.9	0.19%
UBS PIN CROSS	33.0	48.0	40.0	24.0	20.0	0.30%
TOTAL	775.8	854.6	875.7	447.7	448.0	6.64%
CONSOLIDATED U.S. EQUITY VOLUME	8140.0	8315.0	6749.5	8315.0	6749.5	
% TOTAL VOLUME IN DARK POOLS	N/A	N/A	N/A	5.38%	6.64%	

*As volatility and consolidated volume fell in April, the level of all trading done in dark pools rose*

<sup>a</sup> To arrive at adjusted volume we exclude the approximately 50% of single-counted volume that is routed to other venues, then divide by two to adjust for double-counting.

<sup>b</sup> To arrive at adjusted volume we exclude the approximately 10% of single-counted volume that is routed to other venues, then divide by two to adjust for double-counting.

<sup>c</sup> Represents shares routed from Direct Edge's two displayed books to dark pools. Because these are counted by other pools, we adjust to zero.

<sup>d</sup> Includes volume of BlockAlert, a joint venture between ITG and Merrill Lynch that executed 11.4 million shares per day in the first quarter.

<sup>e</sup> Excludes trades executed in displayed markets through its Miletus algorithmic unit (Supernatural). Adjusted figures single-count flow executed in Liquidnet against H2O algorithmic partners.

<sup>f</sup> Does not solicit orders via IOIs

## Size Matters

Month-to-month average daily volume statistics are a useful measure of dark-pool liquidity, but not the only one. Another metric that more fully illustrates the nature of liquidity in various non-displayed markets is average trade size. The table below ranks most of the pools whose volume we track, in order of the average size of a transaction. It also reveals how dark pools have evolved in recent years. Leading the pack are older, independent pools (Liquidnet and Pipeline) that seek primarily to help institutions find single, natural counterparties for block trades. Among the pools at the bottom of the list are those that primarily serve big brokerages (CrossFinder) and market-making houses (Knight Link) or are facilities for integrating displayed and dark liquidity (ISE's MidPoint Match and Direct Edge's XLP program). Whereas once dark pools were thought of primarily as block crossing networks, now the average ticket on many of them is roughly comparable to the less than 300 shares per trade to be found on exchanges and ECNs.

VENUE	AVG TRADE SIZE IN APRIL (# Shares)	APRIL ADV (Adjusted, millions of shares)
LIQUIDNET	54,600	41.0
PIPELINE TRADING	46,000	12.9
ITG POSIT	~4,000-5,000 <sup>a</sup>	~24.0
GOLDMAN SACHS SIGMA X	600	57.2
BIDS	579	11.8
BNY CONVERGEX VORTEX	450	3.4
LEVEL ATS	414	29.0
NYFIX MILLENNIUM	402	23.6
LEHMAN LX	400	27.5
CITI MATCH	400	21.0
ISE MIDPOINT MATCH	350	18.0
KNIGHT LINK	328	72.0
INSTINET CBX	302 <sup>b</sup>	~17.3
DIRECT EDGE ECN	271	0.0 <sup>c</sup>
CREDIT SUISSE CROSSFINDER	220	54.9

<sup>a</sup> ITG's BlockAlert JV with Merrill Lynch averaged 42,000 shares per execution in the first quarter of 2008.

<sup>b</sup> For Instinet's CBX only; does not include other Instinet Crossing products (IDX, LDX, VWAPX).

<sup>c</sup> Direct Edge in April routed from its displayed books 44.4 million shares that were executed by dark pools; because these shares are counted by the destination pools we adjust Direct Edge's dark-pool volume to zero.

## Exchanges: "Hey, What About Us?"

Speaking of convergence between displayed and dark markets, there's been quite a bit of public discussion lately about the dark liquidity that is housed within exchanges and ECNs. In fact, Nasdaq OMX Group CEO Bob Greifeld claimed during an address at the Securities Industry and Financial Markets Association's market structure conference earlier this month that Nasdaq operated the country's biggest dark pool — and, much to his consternation, has not been getting

credit for that achievement. It's certainly true that so-called dark order types are prevalent on Nasdaq and other public markets. But this liquidity is arguably different from that in the ATSS we track in *Let There Be Light*. Many of these dark orders require, for instance, that a portion of the desired size be displayed at a limit price. And they interact directly with public quotes in ways that permit skilled traders to discern the presence of a large buyer or seller (to be sure, the "pinging" of certain dark pools poses the same risk if users fail to employ minimum order sizes and other countermeasures). That said, the various dark order types offered by displayed markets — reserves, hidden orders, midpoint pegs and the like — do offer a degree of protection against information leakage that can result in better executions for institutional orders. So even though we think it's important to segment dark ATSS from the non-displayed liquidity embedded in publicly quoted markets, we certainly agree that it's useful for institutions to know how much dark liquidity is available on exchanges and ECNs. Plus, we like Bob Greifeld and don't want to see a frown on his face because of all this. He lives in the same town as us, and we want to be good neighbors!

So we asked Nasdaq for some detail on its dark liquidity. And it is substantial: in April approximately 353 million shares per day, or 17.7 percent of Nasdaq's average daily volume, was executed through dark order types. This is in line with the 15-20% range we have mentioned previously. Excluding reserve orders, which require the display of a small portion of the available shares while the remainder is held on the side to replenish the public quote as it is traded against, 11 percent of Nasdaq's volume for the month (218 million shares per day) came from dark orders. Other major exchanges and ECNs also derive significant portions of their overall executions from non-displayed or partially displayed orders. About 11 percent of trades done on the BATS ECN, for instance, stem from dark order types. Add these figures together with the shares being routed to dark pools by displayed markets — Direct Edge last month sent 44.4 million shares per day to be executed on non-displayed markets through its external liquidity provider program, and Arca, BATS and Nasdaq all are following in its footsteps by introducing dark routing — and it's clear that exchanges, even though they've mostly failed to launch successful captive dark pools, are nonetheless attuned to the need for institutions to disguise their intentions when working large orders.

### Broker-Sponsored Pools: Not All the Same

Dark pools operated by big, full-service brokerage houses represent the single biggest category of non-displayed market today (see graph on page 7), controlling some 60 percent of all the category's volume in April. Three of these — Knight Capital Group's Knight Link, Lehman Brothers' Liquidity Cross (LX) and Morgan Stanley's MS POOL — are new to our volume table this month. Most broker-sponsored markets started with a common aim: to ensure that bulge-bracket firms would continue to be able to handle block orders — and cross them internally, avoiding exchange fees in the process — as trading went electronic and institutions flocked to direct-market-access and algorithmic technology. As they've evolved, however, significant differences have emerged that correspond generally to firms' business models and competitive positions. It's important for institutions to be familiar with those differences, so we'll spend some time explaining them now.

In some respects the broker pools can be seen along a continuum, from wide open and integrated on one end to very closed and cordoned off on the other. On the wide open side is Credit Suisse's CrossFinder, which, as we explained in [last month's edition of \*Let There Be Light\*](#) (see page 7), is

trying to lure as many types of participants as possible, from retail brokerages to sophisticated statistical arbitrageurs and other high-frequency proprietary trading shops. On May 13, for instance, Credit Suisse announced it would link CrossFinder directly with agency brokerage BNY ConvergeEx's VortEx pool. On the other end of the continuum is MS POOL, which, until its reciprocal agreements earlier this week to permit Goldman and UBS clients to access it through those firms' algorithms (more on these deals in the next section) was only open to Morgan Stanley's clients. MS POOL also does not permit the use of IOIs to solicit orders from other pools. Also in this general "closed" category are Lehman's LX, which is essentially a crossing facility for Lehman's own flow (though it is linked directly with Fidelity Brokerage's CrossStream pool, which does not handle significant volume) and PIN ATS, the new dark pool launched by UBS earlier this month. PIN ATS opens up to internal proprietary and principal traders the PIN Cross product that was only available to the firm's customers, and allows clients to enter resting orders instead of coming in through an algorithm. The longstanding appeal of PIN to institutions is that their orders can interact with UBS' captive retail flow — it has a long-term deal to serve as market maker for Charles Schwab & Co.'s market orders — and enjoy full spread capture rather than the midpoint pricing common on other platforms. That's particularly valuable for institutions playing in small caps, where retail flow can be heavy and spreads are generally wider. Somewhere in the middle of the two extremes is Goldman Sachs' Sigma X, which exists primarily to serve Goldman's existing client base but also permits, under certain circumstances, orders to be routed away and executed by other dark markets in response to indications of interest (IOIs).

Two other broker-sponsored pools are slightly different animals: Citigroup's Citi Match platform and Knight Capital Group's Knight Link offering. Knight Link is a layoff facility for Knight's huge electronic market making operation. The system relies almost entirely on IOIs sent to a network of liquidity partners, which are primarily bulge-bracket firms that also make markets. The IOIs are generated from Knight's principal positions and are incorporated into the smart routers of its partner firms, which then send orders to Knight Link. Knight won't disclose the pricing for these customers, but we believe it to be extremely low. The choice between executing in Knight Link and paying what we suspect are far higher exchange and ECN fees for the same orders is thus a very easy one for Knight's partners. With an adjusted 72 million shares traded per day in April, Knight Link is technically the single biggest U.S. dark pool, but there are some important differences between it and others. For starters, buy-side customers can't directly access Knight Link. The pool also derives one-third of its volume from what it calls "micro-cap" and "nano-cap" stocks, which often have very low share prices and thus generate outsize per-share volumes. Citi Match is also closely related to an electronic market maker, Citi's Automated Trading Desk subsidiary. While also open to Citi algorithmic flow, the ATS is a key source of liquidity for ATD, which, like Knight's partners, would much rather hit captive Citi orders for free than pay exchange and ECN fees.

### Thoughts on the Goldman-Morgan Stanley-UBS Linkage

On May 20 three of the biggest U.S. equity brokerage franchises — Goldman Sachs, Morgan Stanley and UBS — announced a series of bilateral agreements between them that provide each firm's algorithms with access to the dark pools run by the other two.

There are several reasons why the firms involved chose to enter these deals. For Goldman, particularly, the agreements strike us as a response to the recent advances of CrossFinder, which in less than one year has grown its volume by six-fold and come uncomfortably close to unseating

Sigma X as the biggest major-broker pool. Goldman's algorithmic customers also gain access to previously unseen crossing opportunities by interacting with flow from the huge retail brokerage systems of UBS and Morgan Stanley. Goldman has a strong base of high-net-worth brokerage and private banking clients, as do its new partners. But the nature of these investors' orders is different from those of the more garden-variety retail customers that also do business with UBS (through its Schwab deal and ownership of the former PaineWebber) and Morgan Stanley (which acquired the down-market Dean Witter network over a decade ago).

For all the firms, providing mutual access via algorithms, rather than by directly linking or merging their pools, is a relatively low-risk, low-cost way to partially address the fragmentation of the block market by nearly 20 pools that are handling significant volume — a problem that we in this space and many customers have noted as a major impediment to best execution. The buy-side has been clamoring for better aggregation, and these moves let the firms involved tell their clients they're trying to solve the problem. Arranging access through algorithms also avoids the potential regulatory problems of an outright merger of the pools. Last month the three venues in question executed approximately 1.41% of consolidated volume. Federal fair-access regulations require any market center that handles 5% or more of the volume in a given stock to display its prices for that stock to the rest of the market. If these pools continue to grow over time, together they would approach that threshold far more quickly than they would separately.

But because it is not a direct linkage or merger — resting orders entered into any one of these three ATSs will not be routed to the others — the series of deals constitutes but a small step toward aggregating the block market. Theoretically, each firm's algorithms may rest small slices of large orders simultaneously in the three pools, but depending on how the algos are written, they may also preference any one destination (including or not including the partners in these arrangements) over another and execute pieces of an order sequentially. The industry still has a very long way to go before the problem of fragmentation is adequately addressed.

**“The deals between Goldman, Morgan Stanley and UBS should result in less volume going to other dark pools.”**

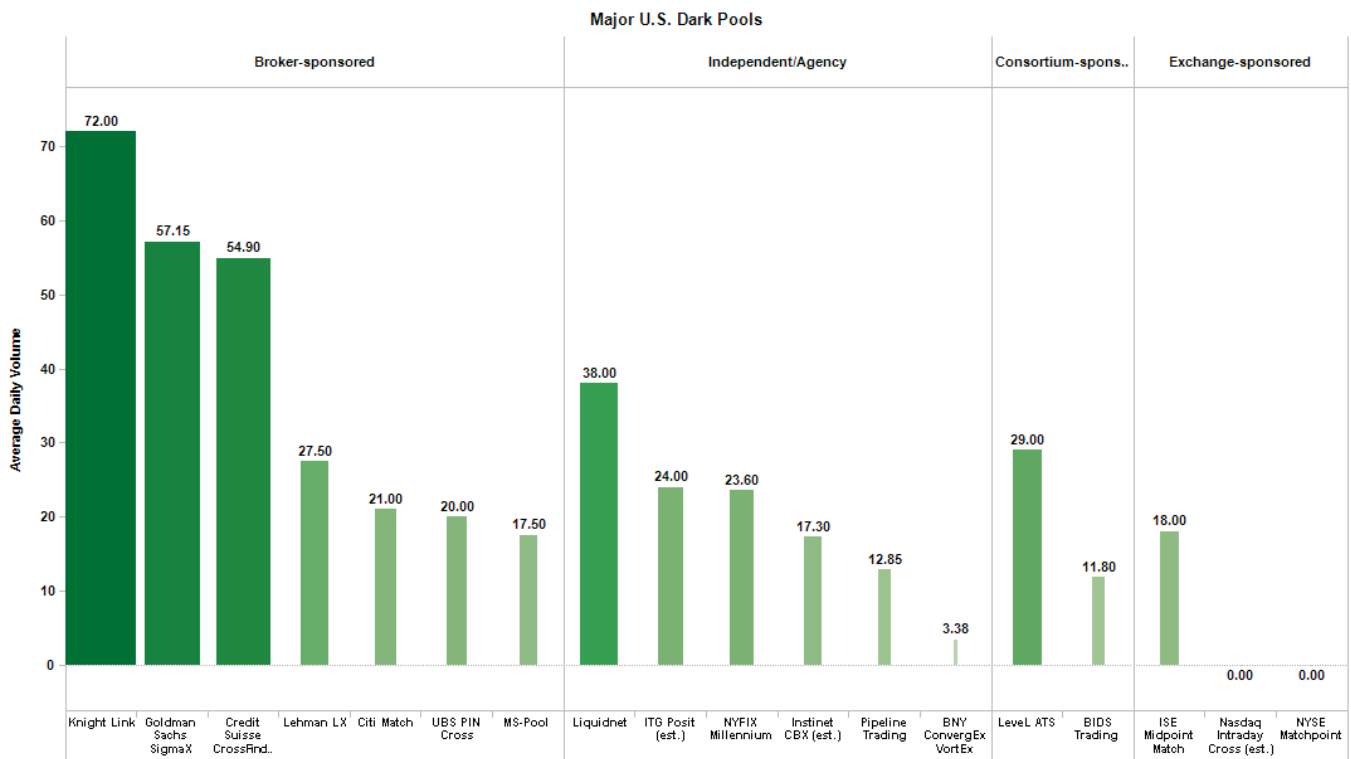
It will also be interesting to see how the agreements work in practice, from a business standpoint. Each of the bilateral deals was negotiated separately, with each party charging a distinct, negotiated rate to the other for orders executed in its pool. Should the coming months reveal that one firm is benefiting more from the other's flow, we would expect that the partners will seek to renegotiate the terms. However, if the deals work out in a satisfactory manner we expect new firms to be brought into the fold and similar agreements to also be implemented overseas.

Another interesting question these agreements raise is how they might affect BIDS and the Level ATS, the two major non-displayed markets sponsored by consortia of bulge-bracket firms that feed them orders. Goldman, Morgan Stanley and UBS are among the 13 owners of BIDS. Now, in addition to running their own internal pools they have devised a way to foster the interaction of their block liquidity separate from BIDS. If the future brings more arrangements like these, one would have to question whether the need for consortia still exists, though Level, with its utility-

like pricing, may be less exposed to any resulting damage. Luckily, BIDS' joint venture with the NYSE is, we hear, on track to launch in September.

That brings us to one fairly certain outcome: the deals should mean less volume going to other dark pools. Because each firm will access the others' pools through its algorithms — many of which also count other non-displayed venues as destinations — it's likely that orders that were once chopped up say, a dozen ways, will now be divided among 13 or 14 destinations. It's our understanding that the three firms will not give preference in their algorithms' routing tables to one another's pools simply because they are now business partners. But many of these tools obviously are programmed to send more "child" orders to those destinations that initially show the highest hit rates early in the life of a "parent" order. Considering that Sigma X, PIN and MS POOL all have higher volumes than many competitors, including BIDS, these arrangements and others that are likely to follow could start the long-awaited shakeout that begins to determine the long-term winners and losers among the dozens of dark pools competing today.

### Dark Pool Volumes by Type



Source: Rosenblatt Securities Monthly Dark Liquidity Tracker, 22 May 2008. (April 2008 ADV in millions of shares, adjusted)

Copyright 2008. Rosenblatt Securities Inc. All rights reserved. This material is not a research report and should not be construed as such. Neither the information contained herein, nor any opinion expressed herein, constitutes the recommendation or solicitation of the purchase or sale of any securities or commodities. The information herein was obtained from sources which Rosenblatt Securities Inc. believes reliable, but we do not guarantee its accuracy. No part of this material may be duplicated in any form by any means.