

Toxic Equity Trading Order Flow on Wall Street

The Real Force Behind the Explosion in Volume and Volatility

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INTRODUCTION

Retail and institutional investors have been stunned at recent stock market volatility. The general thinking is that everything is related to the global financial crisis, starting, for the most part, in August 2007, when the Volatility Index, or VIX, started to climb. We believe, however, that there are more fundamental reasons behind the explosion in trading volume and the speed at which stock prices and indexes are changing. It has to do with the way electronic trading, the new for-profit exchanges and ECNs, the NYSE Hybrid and the SEC's Regulation NMS have all come together in unexpected ways, starting, coincidentally, in late summer of 2007.

This has resulted in the proliferation of a new generation of very profitable, high-speed, computerized trading firms and methods that are causing retail and institutional investors to chase artificial prices. These high frequency traders make tiny amounts of money per share, on a huge volume of small trades, taking advantage of the fact that all listed stocks are now available for electronic trading, thanks to Reg NMS and the NYSE Hybrid. Now that it has become so profitable, according to *Traders Magazine*, more such firms are starting up, funded by hedge funds and private equity (only \$10 million to \$100 million is needed), and the exchanges and ECNs are courting their business.

This paper will explain how these traders – namely liquidity rebate traders, predatory algorithmic traders, automated market makers, and program traders – are exploiting the new market dynamics and negatively affecting real investors. We conclude with suggestions on what can be done to mitigate or reduce these effects.

To illustrate most situations, we will use a hypothetical institutional order to buy 10,000 shares of a stock at \$20.00 that has been input into algorithmic trading systems, which most buy side traders use. Algorithmic or “algo” trading systems chop up big orders into hundreds of smaller ones that are fed into the market as the orders are filled or in line with the volume of the stock in question. Typically, such orders are easy to spot as they commonly show that the trader has 100 or 500 shares to sell or buy.

LIQUIDITY REBATE TRADERS

To attract volume, all market centers (the exchanges and the ECNs) now offer rebates of about ¼ penny a share to broker dealers who post orders. It can be a buy or sell order, as long as it is offering to do something on the exchange or ECN in question. If the order is filled, the market center pays the broker dealer a rebate and charges a larger amount to the

broker dealer who took liquidity away from the market. This has led to trading strategies solely designed to obtain the liquidity rebate.

In this case, our institutional investor is willing to buy shares in a price range of \$20.00 to \$20.05. The algo gets hit, and buys 100 shares at \$20.00. Next, it shows it wants to buy 500 shares. It gets hit on that, and buys 500 more shares. Based on that information, a rebate trading computer program can spot the institution as having an algo order. Then, the rebate trading computer goes ahead of the algo by a penny, placing a bid to buy 100 shares at \$20.01. Whoever had been selling to the institutional investor at \$20.00 is likely to sell to the rebate trading computer at \$20.01. That happens, and the rebate trading computer is now long 100 shares at \$20.01 and has collected a rebate of ¼ penny a share. Then, the computer immediately turns around and offers to sell its 100 shares at \$20.01. Chances are that the institutional algo will take them.

The rebate trading computer makes no money on the shares, but collects another ¼ penny for making the second offer. Net, net, the rebate trading computer makes a ½ penny per share, and has caused the institutional investor to pay a penny higher per share.

PREDATORY ALGOS

More than half of all institutional algo orders are “pegged” to the National Best Bid or Offer (NBBO). The problem is, if one trader jumps ahead of another in price, it can cause a second trader to go along side of the first one. Very quickly, every algo trading order in a given stock is following each other up or down (or down and up), creating huge, whip like price movements on relatively little volume.

This has led to the development of predatory algo trading strategies. These strategies are designed to cause institutional algo orders to buy or sell shares at prices higher or lower than where the stock had been trading, creating a situation where the predatory algo can lock in a profit from the artificial increase or decrease in the price.

To illustrate, let's use an institutional algo order pegged to the NBBO with discretion to pay up to \$20.10. First, the predatory algo uses methods similar to the liquidity rebate trader to spot this as an institutional algo order. Next, with a bid of \$20.01, the predatory algo goes on the attack. The institutional algo immediately goes to \$20.01. Then, the predatory algo goes \$20.02, and the institutional algo follows. In similar fashion, the predatory algo runs up the institutional algo to its \$20.10 limit. At that point, the predatory algo sells the stock short at \$20.10 to the institutional algo, knowing it is highly likely that the price of the stock will fall. When it does, the predatory algo covers.

This is how a stock can move 10 or 15 cents on a handful of 100 or 500 share trades.

AUTOMATED MARKET MAKERS

Automated market maker (AMM) firms run trading programs that ostensibly provide liquidity to the NYSE, NASDAQ and ECNs. AMMs are supposed to function like computerized specialists or market makers, stepping in to provide inside buy and sells, to make it easier for retail and institutional investors to trade.

AMMs, however, often work counter to real investors. AMMs have the ability to “ping” stocks to identify reserve book orders. In pinging, an AMM issues an order ultra fast, and if nothing happens, it cancels it. But if it is successful, the AMM learns a tremendous amount of hidden information that it can use to its advantage.

To show how this works, this time our institutional trader has input discretion into the algo to buy shares up to \$20.03, but nobody in the outside world knows that. First, the AMM spots the institution as an algo order. Next, the AMM starts to ping the algo. The AMM offers 100 shares at \$20.05. Nothing happens, and it immediately cancels. It offers \$20.04. Nothing happens, and it immediately cancels.

Then it offers \$20.03 – and the institutional algo buys. Now, the AMM knows it has found a reserve book buyer willing to pay up to \$20.03. The AMM quickly goes back to a penny above the institution’s original \$20.00 bid, buys more shares at \$20.01 before the institutional algo can, and then sell those shares to the institution at \$20.03.

PROGRAM TRADERS

Program traders buy or sell small quantities of a large number of stocks at the same time, to trigger NBBO or discretionary algo orders, so as to quickly juice a market already moving up or down into a major drop or spike up.

Because so many algo orders are pegged and are being pushed around by other high frequency traders, program traders are like a fuse. When they light it, that’s when things get really going. This is especially so in volatile markets when things are very shaky and people are very nervous like they are now. Keep in mind that many algo orders must achieve a percentage of volume that matches the market in the stock. So if the program traders can increase the volume on an individual stock just enough, they will trigger even more algo buying or selling.

Program traders profit by having an option on the market. Their objective is to push that option into the money by a greater amount than what they used to get the market moving.

MARKET CENTER INDUCEMENTS FOR HIGH FREQUENCY TRADERS

Most high frequency trading strategies are effective because they can take advantage of three major inducements offered by the market centers and not typically accessible to retail or institutional investors.

1. Rebate traders trade for free. Because they are considered to be adding liquidity, exchanges and ECNs cover their commission costs and exchange fees. This makes it worthwhile for rebate traders to buy and sell shares at the same price, in order to generate their ¼ penny per share liquidity rebate on each trade. Exchanges and ECNs view the order maker as a loss leader in order to attract the order taker. In addition, the more volume at different prices, even if that means moving back and forth a penny, the more money the market center makes from tape revenue. Tape revenue is generated by exchanges and ECNs from the sale of data to third party vendors, such as Bloomberg for professional investors, and Yahoo for retail investors.

2. Automated market makers co-locate their servers in the NASDAQ or the NYSE building, right next to the exchanges' servers. AMMs already have faster servers than most institutional and retail investors. But because they are co-located, their servers can react even faster. That's how AMMs are can issue IOC orders – immediate or cancel – sometimes known as “cancel and replace.” They issue the order immediately, and if nothing is there, it is canceled. And that's how AMMs get the trades faster than any other investor, even though AMMs are offering the same price. AMMs pay large fees to the exchanges to co-locate, but it obviously has a decent return on investment. According to *Traders Magazine*, the number of firms that co-locate at NASDAQ has doubled over the last year.
3. People often wonder whether it is fair or legal for program traders to move the market the way they do. Everybody forgets, however, that in October 2007, just a little more than a year ago, the NYSE very publicly removed curbs that shut down program trading if the market moved more than 2% in any direction. The NYSE said it was making the change because “it does not appear that the approach to market volatility envisioned by the use of these ‘collars’ is as meaningful today as when the Rule was formalized in the late 1980s.” On a more commercial level, the NYSE had been at a competitive disadvantage because other market centers that didn't have curbs were getting the program trading business.

What Is The Effect of All This Toxic Trading?

1. Volume has exploded, particularly in NYSE stocks. But you can't look at NYSE volume on the NYSE. The NYSE only executes 25% of the volume in NYSE stocks. You've got to look at NYSE listed shares across all market centers, such as ECNs, like the NYSE's own ARCA, or dark pools, like LiquidNet. *Traders Magazine* estimates high frequency traders may account for more than half the volume on all U.S. market centers.
2. The number of quote changes has exploded. The reason is high frequency traders searching for hidden liquidity. Some estimates are that these traders enter anywhere from several hundred to one million orders for every 100 trades they actually execute. This has significantly raised the bar for all firms on Wall Street to invest in the computers, storage and routing to handle all the message traffic.
3. NYSE specialists no longer provide price stability. With the advent NYSE Hybrid, specialist market share has dropped from 80% to 25%. With specialists out of the way, the floodgates have been opened to high frequency traders who find it easier to make money with more liquid listed shares.
4. Volatility has skyrocketed. The markets' average daily price swing year to date is about 4% versus 1% last year. According to recent findings by Goldman Sachs, spreads on S&P 500 stocks have doubled in October 2008 as compared to earlier in the year. Spreads in Russell 2000 stocks have tripled and quoted depth has been cut in half.

5. High frequency trading strategies have become a stealth tax on retail and institutional investors. While stock prices will probably go where they would have gone anyway, toxic trading takes money from real investors and gives it to the high frequency trader who has the best computer. The exchanges, ECNs and high frequency traders are slowly bleeding investors, causing their transaction costs to rise, and the investors don't even know it.

WHAT CAN BE DONE?

Forget about short sale restrictions. From a regulatory point of view, we believe two simple, but powerful rules would help to eliminate much of the problem.

1. Make orders valid for at least one second. That will eliminate the pinging. High frequency traders will expose themselves. One second would destroy their ability to immediately cancel it if nothing is there.
2. Reinstate the 2% curb on program trading. When the market is down 3% or 4%, that's when the program traders can really juice it. The SEC, however, has to institute the curb across the board so no market center has an advantage over another.

With these two rules, at least half the volume of the exchanges and ECNs might go away. The market centers, however, will surely fight it because they don't want to lose the trading volume and the resultant tape revenue.

Until then, what can investors do?

While there's little action that retail investors can take, we urge institutional investors to not "walk away from the machine" after they have entered an algo order.

Algo and other electronic trading systems have lulled many institutional traders into a false sense of security. These traders like the electronics because they can enter orders directly and they don't have to bother with sell-side brokers. The trades are cheaper, at 1-2 cents per share versus 4-5 cents. And the performance seems adequate, in that the trades get done in line with standard metrics, such as the VWAP (the volume weighted average price). These traders, however, may not realize that the VWAP itself might have been 1 to 3 cents per share higher or lower because of toxic order flow. So in the end, institutions might be really paying 5 cents per share or more for their trades.

We also recommend that institutions use algo systems only for the most liquid of stocks. Anything less must be worked, the same as in the "old days." Institutions need to re-learn how to "watch the tape" and take advantage of, or work around, high frequency traders.

Achieving best execution has never been more challenging.

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Notes:

- This paper was first published December 2008
- *Traders Magazine* article mentioned: “At the Speed of Light,” *Traders Magazine*, October 2008; <http://www.tradersmagazine.com/issues/20_287/102252-1.html>, December 15, 2008