



High-speed Trading: Is It Time to Apply the Brakes?

Jan 16, 2013 North America



How fast is high-frequency stock trading? In the time it takes to read this sentence, tens of thousands of high-speed, computer-automated transactions can occur. Winning traders edge out rivals by intervals measured in nanoseconds. Fans of the practice say that high-frequency traders add crucial liquidity to the stock market. Critics dispute that claim and highlight, instead, lurking perils for the global financial system.

High-frequency traders “can execute trades more quickly at better prices, but many investors worry that this has introduced additional fragility to the system,” says Wharton finance professor [Pavel Savor](#). “It’s also possible that high-frequency traders earn their profits at the expense of long-term investors.”

A series of costly glitches has added fuel to the arguments of those who oppose the practice, in addition to inviting renewed scrutiny by regulators. Last August, for example, faulty software used by high-frequency trading firm Knight Capital Group generated \$461 million in losses, nearly causing the firm to collapse. Shortly afterward, Knight was sold to Getco Holding, another high-frequency firm, for \$1.4 billion. The high price Getco paid for Knight sheds light on the value of high-frequency trading outfits, even those in difficulty. The stakes are high: For instance, Tactical Fund — the high-frequency trading unit of investment firm Citadel — recorded a 25.7% net return in 2012, *The New York Times* reported.

Despite the controversy surrounding it, high-speed trading now dominates the mainstream with enormous sums at stake. Indeed, high-frequency trades account for the vast majority of volume on major stock exchanges. On NASDAQ alone, daily trading volume approached \$50 billion in early January. Three other leading exchanges — NYSE/Euronext, BATS and Direct Edge — as well as “dark pools” run by banks and private equity firms outside public view trade millions more shares every day. The flood of high-frequency bids tests markets in search of price points. When not filled, the bids are cancelled instantly, adding market noise for everybody else.

The speediest traders exploit momentary “latency” gaps between nearly instantaneous access to market orders and when those orders become widely known. In those minute gaps, high-speed traders post orders for stock in front of other inbound orders. Hundredths of a second decide outcomes. In fact, shortening the lengths of fiber optic cables

that carry orders at the speed of light can make the difference between grasping market opportunities — or missing them.

Humans cannot possibly trade at this pace; instead, the trades are accomplished by computer algorithms geared to split-second investment decisions. As one visible sign of the rapid and thorough takeover by computers, traders buying and selling shares on the fabled floor of the New York Stock Exchange numbered 3,000 in 2007. According to the *New York Post*, today their population has dwindled to 300, with many serving as caretakers to their digital heirs. Some observers predict extinction for floor traders once antitrust officials approve the pending union between the NYSE and the highly automated, Atlanta-based Intercontinental Exchange (ICE), which was launched in 2000.

High-frequency traders collect more than capital gains on trades. Successful bids increase market liquidity that attracts listed companies and investors to exchanges. To incentivize bidders, exchanges pay rebates on successful bids. In this “maker-taker” arrangement, high-frequency traders can buy and sell a share of stock at the same price and still make profits by snaring rebates designed to lure traditional investors. Once shares move in less than the blink of an eye, high-frequency traders sell them to investors lined up to buy.

“Clearly, high-frequency trading has enhanced liquidity,” says Savor. While rigorous academic research on the practice is still in early stages, most studies suggest high-speed trading helps investors trade more quickly and at lower cost. However, visible benefits, Savor notes, do not rule out a paradox. It appears that high-frequency traders who enhance liquidity at times may, in fact, hurt liquidity when markets shudder and the traders instantaneously pull back. Legions of resilient 20th Century floor traders once stood their ground in up and down markets alike, usually to their economic benefit. Skittish high-frequency traders in duress simply unplug their computers.

Algorithms Gone Wild

Sometimes, however, they don’t unplug them soon enough — as Knight Capital illustrated when its algorithms began issuing orders at a relentless pace that no one could stop until its computers were shut down. Fears about potential catastrophes brought on by computer-generated errors were reinforced again earlier this month, when BATS Global Markets, the fourth-largest exchange in the U.S., admitted that a glitch in its system triggered 440,000 transactions since 2008 at prices lower than the national best bid and offer (NBBO). Despite the fact that investors lost money, BATS insisted that the mispriced transactions represented an infinitesimal fraction of total BATS trading volume.

Other events also have cast doubt on the reliability of high-frequency trading, starting with the 1987 stock market crash when computer-driven trading — then only in its infancy by today’s standards — caused record losses. More recently, the May 6, 2010, “Flash Crash” made high-frequency trading a headline — and a renewed target for critics and regulators. The market that day skidded 1,000 points and recovered in a matter of minutes, a fluctuation largely blamed on jumpy computer algorithms.

“The story of the Flash Crash is that the market failed that day,” write stockbrokers Joe Saluzzi and Sal Arnuk in their book, *Broken Markets*. High-frequency trading “was exposed as a conflicted and rigged game in which only the connected insiders stood a chance.... When one participant accounts for so much volume and has eclipsed so many other participants, and its trading styles and horizons prevail, the ecosystem is in disequilibrium. One of its more predatory species, such as a shark, has become overwhelmingly dominant. And it is unsustainable.”

Market participants who think that high-frequency trading keeps markets liquid at all times labor under a dangerous misconception, the authors argue. “The slightest hiccup and our new [high-frequency trading] market makers go

running for cover,” Arnuk and Saluzzi note. “They are not there to profit from the smooth flow of capital. They are there to profit by taking advantage of retail and institutional investors and by scalping wealth from IRAs, 401ks, and government and corporate pension funds.”

In calmer times, the authors add, high-frequency trading firms hold an insurmountable edge: They can see the future. “They know what the quote of any given stock will be microseconds before those looking at the SIP [the system that disseminates quotes to the public].” No wonder firms with deep pockets pay dearly to locate their servers as close to exchanges as possible.

So far, Arnuk notes, investors have been spared the worst effects of distortions that stem from high-frequency trading. But what if algorithms run amok when the marketplace is especially fragile — say, when a European government defaults?

Others say there may be no reversing course. “Technology is here to stay,” Lawrence Leibowitz, NYSE/Euronext chief operating officer, told a *Yahoo* interviewer. “The real question is, how do we regulate it and [monitor] it in a way that gives people the confidence that it is fair and that they have a chance?”

Applying the Brakes

Proposals abound for regulating high-frequency trades. According to Wharton finance professor and trading desk veteran [Krista Schwarz](#), all aim at applying the brakes: requiring high-frequency traders to honor bids for a half a second before withdrawing them; imposing fees when ratios of bids transacted exceed a ratio of bids withdrawn; introducing order cancellation fees; limiting the number of orders per second; levying taxes for intraday transactions; imposing size limits; or e

xpanding use of circuit breakers similar to those that NYSE/Euronext has introduced.

New rules could erase speed differentials between distribution of orders to public and private data feeds. Others might eliminate “phantom indexes” that represent only a quarter of trades that occur on exchanges. Comprehensive real-time identification would fetch trading data from exchanges and dark pools. And some critics have prioritized putting an end to the “maker-taker” model that rewards high-frequency trades with rebates.

“What you are looking for is to prevent the most extreme case scenario, a black swan,” says Schwarz. “If you don’t let prices move beyond certain points or percentages in certain periods of time, it at least slows things down and gives the market a chance to reassess.” Unfairness to traders who can’t compete with high-frequency counterparts is one issue; risk to the financial system quite another, many analysts contend.

Some argue that calls for regulation ignore the fact that markets have never been level playing fields. Professionals have always enjoyed advantages, and some professionals more so than others. One former NYSE specialist who spent decades on the stock exchange floor and has no stake today in high-frequency trading says that he wouldn’t turn the clock back. He recalls the open outcry auctions in his day, when floor specialists had a timing and information advantage over practically everyone else. “There is a desire by investors to slow the process down again to make it fairer. But the real question is, fairer to whom? The slow-witted and the lazy? People who prefer rotary phones?”

“Over and above clamping down on market manipulation, regulating high-frequency trading is misguided,” says Larry Tabb, CEO of the Tabb Group, a research and advisory firm focused on capital markets. “The problem is the

speed of light. People who are [physically] closer to the markets will always have a speed-of-light advantage”because their data has less distance to travel.

High-frequency trading might appear to pose threats on the horizon, notes Tabb, but hasty regulation is all but certain to trigger unintended consequences. “It could totally destroy the market,” he says. If rules lock a high-frequency investor into a bid of \$102 for even half a second when the market value is \$101, other investors could swoop in at \$101 and make a dollar a share on the incorrect price. This will create incentives not to quote or provide liquidity, making it harder and much more expensive to invest.

And while the specter of systemic risk looms large in many arguments against high-frequency trading, those in favor of the practice note that although Knight Capital blew up and the Flash Crash shook confidence, the market still rebounded on its own. It is easy to overestimate the true influence of high-frequency traders, says Savor. “They account for a lot of trading volume, but some of it is just trading with each other. That’s a lot of churn, but I’m not sure it impacts markets dramatically.”

If any reform is to come from the U.S. Commodity Futures Trading Commission (CFTC), which shares with the SEC regulatory oversight of high-frequency trading, expect to wait. CFTC commissioner Scott D. O’Malia, who heads the regulator’s technology task force, says action hinges on defining high-frequency trading itself. Does it mean all automated trading, trading subject to a certain threshold or some other measure? “There is currently no consensus among market participants as to the definition of high-frequency trading,” O’Malia said in May 2012.

While the debate simmers, high-frequency traders are enlisting influential allies in Washington. Republican members of Congress Jeb Hensarling of Texas and Spencer Bachus of Alabama are advocating a slow approach to any regulatory initiatives. In letters to the SEC and the House Financial Services Committee, both congressmen warned not to “shoot the computers first and ask questions later.”