

# Computerized Front Running and Financial Fraud

How a Computer Program Designed to Save the Free Market Turned Into a Monster

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While the SEC is busy investigating Goldman Sachs, it might want to look into another Goldman-dominated fraud: computerized front running using high-frequency trading programs.

Market commentators are fond of talking about “free market capitalism,” but according to Wall Street commentator Max Keiser, it is no more. It has morphed into what his TV co-host Stacy Herbert calls “rigged market capitalism”: all markets today are subject to manipulation for private gain.

Keiser isn’t just speculating about this. He claims to have invented one of the most widely used programs for doing the rigging. Not that that’s what he meant to invent. His patented program was designed to take the manipulation out of markets. It would do this by matching buyers with sellers automatically, eliminating “front running” – brokers buying or selling ahead of large orders coming in from their clients. The computer program was intended to remove the conflict of interest that exists when brokers who match buyers with sellers are also selling from their own accounts. But the program fell into the wrong hands and became the prototype for automated trading programs that actually facilitate front running.

Also called High Frequency Trading (HFT) or “black box trading,” automated program trading uses high-speed computers governed by complex algorithms (instructions to the computer) to analyze data and transact orders in massive quantities at very high speeds. Like the poker player peeking in a mirror to see his opponent’s cards, HFT allows the program trader to peek at major incoming orders and jump in front of them to skim profits off the top. Note that these large institutional orders are our money — our pension funds, mutual funds, and 401Ks.

When “market making” (matching buyers with sellers) was done strictly by human brokers on the floor of the stock exchange, manipulations and front running were considered an acceptable (if morally dubious) price to pay for continuously “liquid” markets. But front running by computer, using complex trading programs, is an entirely different species of fraud. A minor flaw in the system has morphed into a monster. Keiser maintains that computerized front running with HFT has become the principal business of Wall Street and the primary force driving most of the volume on exchanges, contributing not only to a large portion of trading profits but to the manipulation of markets for economic and political ends.

The “Virtual Specialist”: the Prototype for High Frequency Trading

Until recently, most market making was done by brokers called “[specialists](#),” those people you see on the floor of the New York Stock Exchange haggling over the price of stocks. The job of the specialist originated over a century ago, when the need was recognized for a system for continuous trading. That meant trading even when there was no “real” buyer or seller waiting to take the other side of the trade.

The specialist is a broker who deals in a specific stock and remains at one location on the floor holding an inventory of it. He posts the “bid” and “ask” prices, manages “limit” orders, executes trades, and is responsible for managing the uninterrupted flow of orders. If there is a large shift in demand on the “buy” side or the “sell” side, the specialist steps in and sells or buys out of his own inventory to meet the demand, until the gap has narrowed.

This gives him an opportunity to trade for himself, using his inside knowledge to book a profit. That practice is frowned on by the Securities Exchange Commission (SEC), but it has never been seriously regulated, because it has been considered necessary to keep markets “liquid.”

Keiser’s “Virtual Specialist Technology” (VST) was developed for the [Hollywood Stock Exchange](#) (HSX), a web-based, multiplayer simulation in which players use virtual money to buy and sell “shares” of actors, directors, upcoming films, and film-related options. The program determines the true market price automatically, by comparing “bids” with “asks” and weighting the proportion of each. Keiser and HSX co-founder Michael Burns applied for a patent for a “computer-implemented securities trading system with a virtual specialist function” in 1996, and [U.S. patent no. 5960176](#) was awarded in 1999.

But things went awry after the dot.com crash, when Keiser’s company HSX Holdings sold the VST patent to investment firm Cantor Fitzgerald, over his objection. Cantor Fitzgerald then put the part of the program that would have eliminated front-running on ice, just as drug companies buy up competing patents in order to take them off the market. Instead of preventing front-running, the program was altered so that it actually enhanced that fraudulent practice. Keiser (who is now based in Europe) notes that this sort of patent abuse is illegal under European Intellectual Property law.

Meanwhile, the design of the VST program remained on display at the patent office, giving other inventors ideas. To get a patent, applicants must list “prior art” and then prove that their patent is an improvement in some way. The listing for Keiser’s patent shows that it has been referenced by 132 others involving automated program trading or HFT.

HFT has quickly come to dominate the exchanges. High frequency trading firms now account for [73%](#) of all U.S. equity trades, although they represent only 2% of the approximately 20,000 firms in operation.

In 1998, the SEC allowed [online electronic communication networks](#), or alternative trading systems, to become full-fledged stock exchanges. [Alternative trading systems](#) (ATS) are computer-automated order-matching systems that offer exchange-like trading opportunities at lower costs but are often subject to lower disclosure requirements and different trading rules. Computer systems automatically match buy and sell orders that were themselves submitted through computers. Market making that was once done with a “specialist’s book” — something that could be examined and audited — is now done by an unseen, unaudited

“black box.”

For over a century, the stock market was a real market, with live traders hotly bidding against each other on the floor of the exchange. In only a decade, floor trading has been eliminated in all but the largest exchanges, such as the New York Stock Exchange (NYSE); and even in those markets, it now co-exists with electronic trading.

Alternative trading systems allow just about any sizable trader to place orders directly in the market, rather than routing them through investment dealers on the NYSE. They also allow any sizable trader with a sophisticated HFT program to front run trades.

### Flash Trades: How the Game Is Rigged

An integral component of computerized front running is a dubious practice called “[flash trades](#).” Flash orders are permitted by a regulatory loophole that allows exchanges to show orders to some traders ahead of others for a fee. At one time, the NYSE allowed specialists to benefit from an advance look at incoming orders; but it has now replaced that practice with a “level playing field” policy that gives all investors equal access to all price quotes. Some ATSS, however, which are hotly competing with the established exchanges for business, have adopted the use of flash trades to pull trading business away from the exchanges. An incoming order is revealed (or flashed) to a trader for a fraction of a second before being sent to the national market system. If the trader can match the best bid or offer in the system, he can then pick up that order before the rest of the market sees it.

The flash peek reveals the trade coming in but not the limit price – the maximum price at which the buyer or seller is willing to trade. This is what the HFT program figures out, and it is what gives the high-frequency trader the same sort of inside information available to the traditional market maker: he now gets to peek at the other player’s cards. That means high-frequency traders can do more than just skim hefty profits from other investors. They can actually manipulate markets.

How this is done was explained by [Karl Denninger](#) in an insightful post on Seeking Alpha in July 2009:

“Let’s say that there is a buyer willing to buy 100,000 shares of BRCM with a limit price of \$26.40. That is, the buyer will accept any price up to \$26.40. But the market at this particular moment in time is at \$26.10, or thirty cents lower.

“So the computers, having detected via their ‘flash orders’ (which ought to be illegal) that there is a desire for Broadcom shares, start to issue tiny (typically 100 share lots) ‘immediate or cancel’ orders – IOCs – to sell at \$26.20. If that order is ‘eaten’ the computer then issues an order at \$26.25, then \$26.30, then \$26.35, then \$26.40. When it tries \$26.45 it gets no bite and the order is immediately canceled.

“Now the flush of supply comes at, big coincidence, \$26.39, and the claim is made that the market has become ‘more efficient.’

“Nonsense; there was no ‘real seller’ at any of these prices! This pattern of

offering was intended to do one and only one thing — manipulate the market by discovering what is supposed to be a hidden piece of information — the other side's limit price!

"With normal order queues and flows the person with the limit order would see the offer at \$26.20 and might drop his limit. But the computers are so fast that unless you own one of the same speed you have no chance to do this — your order is immediately 'raped' at the full limit price! . . . [Y]ou got screwed for 29 cents per share which was quite literally stolen by the HFT firms that probed your book before you could detect the activity, determined your maximum price, and then sold to you as close to your maximum price as was possible."

The ostensible justification for high-frequency programs is that they "improve liquidity," but Denninger says, "Hogwash. They have turned the market into a rigged game where institutional orders (that's you, Mr. and Mrs. Joe Public, when you buy or sell mutual funds!) are routinely screwed for the benefit of a few major international banks."

In fact, high-frequency traders may be removing liquidity from the market. So argues [John Daly](#) in the U.K. Globe and Mail, citing Thomas Caldwell, CEO of Caldwell Securities Ltd.:

"Large institutional investors know that if they start trying to push through a large block of shares at a certain price - even if the block is broken into many small trades on several ATSS and markets — they can trigger a flood of high-frequency orders that immediately move market prices to the institution's disadvantage. . . . That's why institutions have flocked to so-called dark pools operated by ATSS such as Instinet, and individual dealers like Goldman Sachs. The pools allow traders to offer prices without publicly revealing their identities and tipping their hand."

Because these large, dark pools are opaque to other investors and to regulators, they inhibit the free and fair trade that depends on open and transparent auction markets to work.

The Notorious Market-Rigging Ringleader, Goldman Sachs

[Tyler Durden](#), writing on Zero Hedge, notes that the HFT game is dominated by Goldman Sachs, which he calls "a hedge fund in all but FDIC backing." Goldman was an investment bank until the fall of 2008, when it became a commercial bank overnight in order to capitalize on federal bailout benefits, including virtually [interest-free money](#) from the Fed that it can use to speculate on the opaque ATS exchanges where markets are manipulated and controlled.

Unlike the NYSE, which is open only from 10 am to 4 pm EST daily, ATSS trade around the clock; and they are particularly busy when the NYSE is closed, when stocks are thinly traded and easily manipulated. Tyler Durden writes:

"[A]s the market keeps going up day in and day out, regardless of the deteriorating economic conditions, it is just these HFT's that determine the overall market direction, usually without fundamental or technical reason. And based on a few lines of code, retail investors get suckered into a rising market that has nothing to do with green shoots or some Chinese firms buying a few hundred extra Intel servers: HFTs are merely perpetuating the same ponzi market mythology last seen in the Madoff case, but on a massively larger scale."

HFT rigging helps explain how Goldman Sachs earned at least [\\$100 million](#) per day from its trading division, day after day, on 116 out of 194 trading days through the end of September 2009. It's like taking candy from a baby, when you can see the other players' cards.

### Reviving the Free Market

So what can be done to restore free and fair markets? A step in the right direction would be to prohibit flash trades. The SEC is proposing such rules, but they haven't been effected yet.

Another proposed check on HFT is a [Tobin tax](#) – a very small tax on every financial trade. Proposals for the tax range [from .005% to 1%](#), so small that it would hardly be felt by legitimate “buy and hold” investors, but high enough to kill HFT, which skims a very tiny profit from a huge number of trades.

That is what proponents contend, but a tiny tax might not actually be enough to kill HFT. Consider Denninger's example, in which the high-frequency trader was making not just a few pennies but a full 29 cents per trade and had an opportunity to make this sum on 99,500 shares (100,000 shares less 5 100-lot trades at lesser sums). That's a \$28,855 profit on a \$2.63 million trade, not bad for a few milliseconds of work. Imposing a .1% Tobin tax on the \$2.63 million would reduce the profit to \$26,225, but that's still a nice return for a trade that takes less time than blinking.

The ideal solution would fix the problem at its source — the price-setting mechanism itself. Keiser says this could be done by banning HFT and installing his VST computer program in its original design in all the exchanges. The true market price would then be established automatically, foreclosing both human and electronic manipulation. He notes that the shareholders of his former firm have a good claim for voiding out the sale to Cantor Fitzgerald and retrieving the program, since the deal was never consummated and the investors in HSX Holdings have never received a penny for the sale.

There is just one problem with their legal claim: the paperwork proving it was shipped to Cantor Fitzgerald's offices in the World Trade Center several months before September 2001. Like free market capitalism itself, it seems, the evidence has gone up in smoke.

*Ellen Brown developed her research skills as an attorney practicing civil litigation in Los Angeles. In [Web of Debt](#), her latest of eleven books, she turns those skills to an analysis of the Federal Reserve and “the money trust.” She shows how this private cartel has usurped the power to create money from the people themselves, and how we the people can get it back. Her websites are [www.webofdebt.com](#), [www.ellenbrown.com](#), and [www.public-banking.com](#).*

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