Trading

Putting the hammer to high-frequency traders

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Kelly Reynolds has found a way to turn the tables on high-frequency traders who have been using their speed advantage to grab profits from slower investors.

As the head trader at Hillsdale Investment Management in Toronto, she sees a lot of offers to buy or sell stocks that she knows are from high-frequency traders, firms that use ultra-fast computers to trade stocks thousands of times a day to make money from tiny market changes. She also knows that the HFTs are bluffing: their orders are an attempt to get her to reveal what she wants to buy and sell.

High-frequency traders can then use their faster computers to exploit that information. Once they know Ms. Reynolds or any other investor wants to buy shares of a particular company, they can quickly pull back their offer to sell it to them – only to resubmit it later a fraction of a second later at a less attractive price.

Such bait-and-switch strategies, often grouped under the fancy term “latency arbitrage,” are believed to generate billions a year in profit for high-frequency traders. Critics say those profits come at the expense of longer-term investors such as mutual funds that don’t have the technology to match the speed of high-speed trading firms, which now account for an estimated 30 per cent of stock trading in Canada, and more than 50 per cent in the U.S.

Ms. Reynolds, however, is a test user of a new technology that is just being unveiled by the brokerage arm of Royal Bank of Canada (RY-T54.040.150.28%) that she says has neutralized that strategy. The new system is built as a specific countermeasure to high-frequency traders, and Ms. Reynolds says that she’s now able to grab those bluff orders before the HFTs can withdraw them – every time. The RBC system is “very, very impressive,” she says.

RBC has applied for a patent on the system, known as Thor. The system has been in development for two years, with RBC adding about 80 people to its electronic trading team as part of the initiative, including some people from the HFT industry.

The HFT strategy of placing and then cancelling orders to gain an information advantage “just created an un-level playing field,” said Greg Mills, head of RBC’s global equity division. “We sought to build a product to try to solve” the unfair advantage.

The result, Thor, is a new twist on a stock-market technology called a smart order router.

In these days of multiple stock markets in every country, brokers such as RBC use smart order routers to blast out orders to all of the trading venues. Want to buy 10,000 shares of XYZ Co. at $10? The router scours the Toronto Stock Exchange, Alpha, Pure and other Canadian markets to

find any shares that are on offer at that price. One common type of router, the spray router, then sends out orders for stock on offer on different markets simultaneously.

However, those orders don't all get to markets at the same time. Some have longer distances to travel. Others travel down slower wires. As a result, the orders arrive in each market at a different time. The differences are only thousandths of a second, but the technology used by high-frequency traders is so fast that their computers can see orders hitting one market and jump ahead to adjust bids and offers on other markets, in order to buy or sell at a better price.

"As a trader, there's a frustration around feeling like you're being gamed," and that led to the research that resulted in the Thor system, said Brad Katsuyama, RBC's head of global electronic sales and trading and one of the developers.

The Thor system counteracts that gaming by staggering the orders it sends out to ensure they arrive at every market as close to simultaneously as possible. That gives the HFTs no chance to react.

The system continually monitors the time it takes for an order to get from RBC's computers to five Canadian markets, as well as 13 U.S. markets, and adjusts the timing of orders to compensate for variances. In Canada, the difference between the fastest and the slowest is as little as 10 one-thousandths of a second. Thor has been able to shrink that to as little as 350 millionths of a second, Mr. Mills said. RBC hopes the technology will allow it to gain market share in the business of trading equities.

Still, it's an open question how long it can stay ahead in the technology arms race with the high-frequency traders, who focus on technology first and foremost. The whole HFT business is built around being faster and on continually improving technology, meaning Thor may not be enough to neutralize HFTs for long.

"It probably won't be long-lived," Hillsdale's Ms. Reynolds said. "Everybody is going to have to get to this point, where their routers are as capable as the high-frequency traders out there [but] they're going to keep developing better and better technology."

Mr. Mills said he recognizes that, but already RBC has managed to get the difference in arrival times at different exchanges down close to a limit that nobody, not even high-frequency traders, has found a way around.

"It's rapidly approaching the speed of light," he said.

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