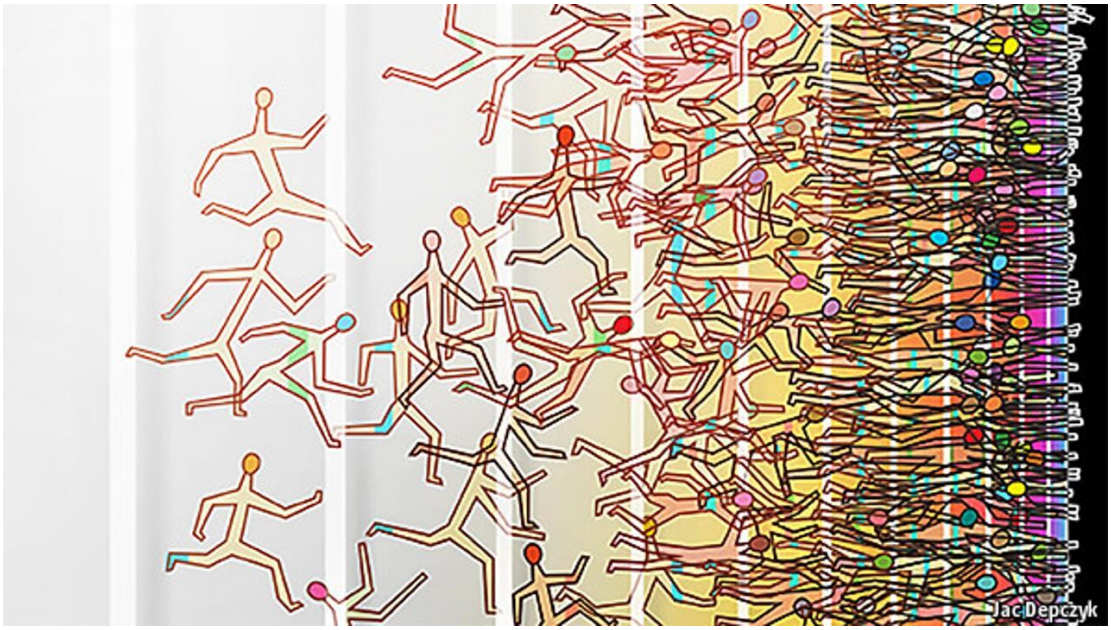
Free exchange

Frequent but inefficient

High-frequency trading might reduce liquidity, not boost it as its defenders claim



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IN THE wake of the publication earlier this year of "Flash Boys", a book that criticised high-frequency trading (HFT)—the use of algorithms to buy and sell shares and other financial assets at vanishingly short intervals—regulators and investors have been debating whether and how to curb it. One mooted response is to introduce deliberate delays before trades are executed. Another is to shuffle the order in which they are processed. HFT firms maintain that no change is needed, on the grounds that they help to lubricate markets by increasing volumes and ironing out inconsistencies in prices. But a recent paper argues that they do indeed create inefficiencies and suggests a more fundamental reform to how markets operate in order to stave them off.*

"Flash Boys" took HFT firms to task for a strategy called front-running. When an investor is buying or selling a big block of shares, it is common to split the order across multiple exchanges (say, the NASDAQ and the NYSE) in search of a better

to the sluggish investor at a higher price.

HFT's supporters retort that it boosts liquidity (the ability to buy or sell an asset without moving its price). One measure of liquidity is the "bid-ask spread": the difference between what traders must pay to buy a stock (the "ask") and what they get if they sell it (the "bid"). This difference represents the price of trading, and is earned by marketmakers—traders who always quote both a bid and an ask. The more liquidity, the more trades take place, and so the lower the bid-ask spread needs to be for marketmaking to be worthwhile. HFT now accounts for as much as half of all stockmarket trading in America; its rise has coincided with a marked narrowing of the bid-ask spread.

But Eric Budish, Peter Cramton and John Shim argue that HFT can sap liquidity as well as create it. One reason marketmakers need to charge a bid-ask spread is to insure themselves against being the "dumb money" in the deal. If an investor takes up a marketmaker's offer, they probably have some reason to think it good value. The bid-ask spread compensates marketmakers for the risk that the customers who choose to transact are those with private information, a problem known as "adverse selection". The authors argue that HFT can make adverse selection worse.

Suppose Apple announces that sales of iPhones have been higher than expected, boosting the underlying value of its shares. HFT firms will take up "stale" offers of marketmakers to sell Apple stock—which now look a bargain—before there is time to withdraw them. This is known as "sniping". In the authors' model, sniping pushes up bid-ask spreads, as marketmakers must insure themselves against it. The effect also reduces market "thickness": the volume of shares marketmakers are prepared to buy or sell. This is because the cost of thickness—the risk of being sniped on a large scale—increases proportionally with the size of marketmakers' quotes but the benefits do not: there are usually only a few investors who want to trade in big volumes. In a less thick market, a big institution may find that the overall cost of doing a deal has increased, because the price impact of a large trade is greater.

One response available to marketmakers is to invest in speed too. Indeed, many marketmakers are themselves HFT firms. And HFT firms are constantly trying to find faster ways to trade. The latest innovation—using microwaves to link financial centres—has cut by over 25% the plodding 13 milliseconds it takes to relay an order from New York to Chicago by fibre-optic cable. It is hard to see how society gains from this arms race. It does not even benefit the firms involved for long, since new technology is inevitably quickly superseded. But it is hard to escape, given the costs of unilateral disarmament.

The authors' solution is a fundamental change in market structure. Currently, markets are continuous: trades are executed as soon as technology allows. The authors want to instead divide the day into short trading intervals. Within these intervals of, say, a second, the stockmarket would operate like an auction, with traders making secret bids. Buyers and sellers would automatically be paired with those that made the best offer, not those that were the quickest to bid.

As to how long the interval should be, the authors are agnostic. Taken to one extreme, it is obvious that a very long interval—say, one day—would inhibit efficiency, as it would take longer for new information to filter through markets. Yet at the other extreme, it seems unlikely that investors benefit much from waiting only a microsecond rather than a millisecond to trade.

Common but untraceable

However, plausible as the claim that HFT pushes up the bid-ask spread may be, the authors cannot prove it. Stockmarkets do not categorise trades as high-frequency or low, and HFT is a secretive business, so analysing its impact is difficult. For the most heavily traded stocks—such as Apple or Google—it definitely is not true, since they tend to have a bid-ask spread of only one "tick": the smallest unit of currency permitted on the exchange. It would therefore be impossible to lower spreads on these stocks (at least in normal times) without reducing the tick size.

By the same token, it is impossible to tell whether the surge in liquidity that has

computing power. For instance, algorithms which detect inefficiencies have improved, as has traders' ability to run complex simulations and process very large quantities of data. All this reduces the cost of investing and makes markets more efficient, without relying on lightning-fast speed.

***Studies cited in this article**

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