Briefing: Computer traders blamed for Wall Street crash

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When the Dow Jones stock market index suffered its largest ever single-day drop last week, fingers were soon pointing at the high-frequency traders and the computer programs they rely on. Are computers now too powerful to be allowed in financial markets?

Could computer traders bring down Wall Street?

It certainly seemed plausible at 2.30 pm in New York on 6 May. Traders went into a panic as the Dow Jones index, which follows 30 large publicly traded companies plunged an unprecedented 6 per cent in 20 minutes – for no apparent reason.

Such a drop represents billions of dollars being wiped off a company’s value, although in this case prices quickly bounced back. The reasons for the plunge remain unclear, but high-frequency traders – who use powerful computer algorithms – are in the frame.

The traders use computers to profit from short-lived fluctuations in markets. An algorithm might, for example, watch for large transactions from institutional investors that could affect a stock’s price and make trades before the rest of the market has time to react. That and similar strategies have created a market for high-frequency traders in which transactions amounted to around $8 billion last year.

These near-instantaneous trades make some economists nervous. They fear that the algorithms could interact to create a feedback loop of continuous selling, driving market prices off a cliff. Although the cause of last week’s volatility is still unclear, it seems that algorithmic trading played a role.

But computer trading has been around for years. Why the growing concern?

Algorithmic trading is well established, but the speed at which trades are executed – usually milliseconds – is shrinking fast: by a factor of 10 since 2007, says Kevin McPartland at Tabb Group, a firm based in Westborough, Massachusetts, that studies financial markets.
These lightning-fast speeds are due to investment in dedicated optical-fibre networks and faster routing devices. Speed is so critical that high-frequency traders must have their computers physically as close to markets as possible. It takes over 0.01 seconds for a signal to travel to Chicago to New York and back via optical fibre, a delay that Chicago-based high-frequency traders cannot afford.

“Everybody has relocated,” says Bernard Donefer, a finance professor at Baruch College in New York. “Not doing it means you’re behind the curve. Nobody will do business with you.”

Should high-frequency traders be banned?

In any market, buyers need to find sellers and vice versa. And if traders can’t find a partner, funds stay locked up in existing investments when they could be used elsewhere instead. That’s why all markets want more of what economists call “liquidity” – the more liquidity there is, the easier it is for traders to do business.

High-frequency traders are valued by the companies who run markets because they buy and sell large volumes every day, which adds liquidity to the system. The number of trades on the New York Stock Exchange rose from 3 million per day in 2005 to 22 million by 2009, largely thanks to the rise of high-frequency trading.

Meanwhile, transaction times have been dropping: the average execution time for one class of small trade on the New York stock exchange fell from 10 seconds to 0.7 seconds between 2005 and 2009.

What can be done to improve market stability?

“The big problem,” says James Angel, who studies financial markets at Georgetown University in Washington DC, “is that US exchanges have no real-time safeguard against extreme malfunction.” If a mistake in an algorithm – or even deliberate sabotage – were to set off a wave of selling, the people tasked with suspending markets in the event of dangerous trading would not be able to react quick enough.

“We could see a major crash within milliseconds,” says Angel. “Is this a high-probability scenario? No. But can it happen? Yes.” He proposes that the US Securities and Exchange Commission require that all markets incorporate a “circuit-breaker” which would suspend trading on signs of an algorithm-driven crash.

High-frequency trading should be allowed to continue in the meantime, say most financial researchers. But much about the practice remains to be understood. Donefer backs a proposed SEC rule that would require firms to identify the type of strategy – the market condition the algorithm is designed to exploit – behind each trade. The information would be seen only by the commission, which would use it to study the positive and negative effects of different trading strategies. Armed with that information, regulators might be able to do a more thorough post-mortem next time the Dow takes a plunge.