

Since the bruising losses of the financial crisis investors have sought out novel and complex ways to play markets more safely. Many have increasingly turned to computer-driven “systematic” investment strategies that aim to maximise returns while mitigating risks — whatever the market conditions.

The attractions are understandable. Many traditional fund managers’ investment returns have consistently underperformed, though this has not diminished their hefty fees. This has burnished the appeal of the systematic investment industry, the creation of a new generation of scientist asset managers who use complex algorithms to beat the market. Freed from the shackles of human bias and slow reaction, their funds harness computer power to constantly and automatically exploit millions of minuscule investment opportunities, using sophisticated risk management tools that aim to tame volatility rather than be terrorised by it.

But the recent stock market turbulence has raised new concerns that these automated and algorithmically-driven strategies are compounding problems, not insulating investors from them. Some analysts and investors fret that the systematic strategies are a financial version of the Cobra Effect.

“We have been breeding cobras, and we are now releasing them into the wild,” says Andrew Lo, a finance professor at MIT’s Sloan School of Management. “We ought to be very concerned about this growing phenomenon . . . This is no longer a cottage industry.”

Some analysts fear that the rise of systematic investment strategies has made markets even less predictable, more volatile and potentially susceptible to sudden, inexplicable crashes should the role of algorithmic, automated trading continue to climb.

“Every investment cycle is defined by the collective desire to avoid the mistakes of the last one. Taken to extremes, that often becomes the catalyst for the next crisis,” warns Vadim Zlotnikov, chief strategist at AllianceBernstein, an asset manager.

Market panic

August was one of the most torrid months on record for global stock markets. Wall Street’s “fear gauge”, the Vix index that measures investor expectations of volatility, jumped to a six-year high. And the volatility of the volatility index (VVIX), which measures the rate of change of the fear index, hit its highest ever level. The turbulence continued into September, making the third quarter the worst for stocks since 2011. There were several fundamental reasons for the turbulence — notably a lack of confidence in the Chinese economy — but some analysts and fund managers have blamed systematic investment strategies for magnifying the severity of the crash.

There are no clean definitions, but systematic investing is a part of a broader “quantitative” finance industry, which relies on immense strides in computing power to mine markets for lucrative opportunities. Some of the high-profile proponents are Bridgewater and AQR, the two biggest hedge fund groups in the world; and in the UK Winton Capital and Man Group’s AHL arm.

One of the most popular risk mitigation techniques has attracted particular scrutiny. Many systematic funds target a specific level of volatility in markets, based on academic evidence that turmoil tends to breed more turmoil, and tranquillity tends to lead to more stability. So when markets turn choppy, volatility-targeting funds turn cautious, and when markets simmer down, systematic investors dive back in again.

For example, if a systematic equity fund is aiming to keep its volatility constant at 10 per cent, it has to use leverage to double its exposure if the average turbulence of stocks falls to 5 per cent. On the other hand, if stock market choppiness doubles, then they have to halve their exposure. This has proven a winning strategy for most of the past decade, helping investors dodge losses.

“If there is something better than targeting a fixed volatility target — short of trying tarot cards or astrology — then I’d be very interested in hearing it,” says the head of one systematic hedge fund.

Nonetheless, many analysts and rival fund managers fret that volatility-focused investment strategies actually exacerbate the turbulence they aim to sidestep, by automatically forcing funds to ratchet down exposure in the middle of a sell-off, worsening the volatility and creating a feedback loop.

“The machines seem to be taking over,” Leon Cooperman, a well-known hedge fund manager, told CNBC in early September. The Omega Advisors chief blamed what he termed “systemic/technical investors” for his poor performance in August, and argued these computer-driven strategies magnified the downturn. “In the world I grew up in, and the world Warren Buffett grew up in, when something went down you wanted to own more, and in the world that we’re in now, it goes up you want to own more and it goes down you want to own less, and that is just counter-intuitive,” he told the television channel. “It lacks common sense.”

Some fund managers and analysts are more reluctant to blame “the machines” for aggravating the August squall, but are increasingly spending more time trying to understand this new, more computer-driven reality. “The big question is what impact all these automated strategies have on the market. We just don’t know,” admits Luca Paolini, chief strategist at Pictet Asset Management. “We’re doing more work on this now.”

Rebalancing risk

A strategy known as “risk parity” has attracted particular attention. Risk parity funds invest a variety of asset classes according to their choppiness, aiming to keep the volatility contribution of each constant and equal to the next. The strategy has proven successful in recent decades, but some critics fear that by rebalancing in response to turbulence it can in fact accentuate market routs.

Some investment traditionalists even see parallels to “portfolio insurance”, another strategy that was designed to give investors more safety in the 1980s, but eventually helped fuel the “Black Monday” crash in 1987. “It’s an old idea in a new bottle,” argues

Ralph Segall, the chief investment officer of Segall Bryant & Hamill, an asset manager in Chicago. “Just like portfolio insurance, it works until it doesn’t work.”

Yet risk parity probably rebalances too slowly to have contributed meaningfully to last month’s carnage. Risk parity fund managers have fought hard against the allegations, with some pointing the finger towards another high-profile systematic investment industry — so-called “commodity trading advisers”.

Despite the name, CTAs are actually trend-following hedge funds that use algorithms and derivatives to play a variety of markets. Securities that have fallen tend to fall further, and those that are climbing tend to continue doing so, giving rise to the investment cliché that “the trend is your friend”. CTAs turn the truism into their core investment thesis.

The sector rejects the allegation that it makes markets more prone to wild swings. “It’s possible we’re breeding cobras, doing something that makes the system risky. I do think about that a lot. But I don’t think that’s the case,” says the head of one CTA. “We’re not stupid, we do try to minimise the impact.”

JPMorgan’s analysts reckon there is about \$500bn of assets in risk parity strategies globally, and another \$350bn in CTAs. But there is a potentially even bigger pool of money that even more swiftly responds to volatility spikes by selling, and to placid markets by buying.

Data on the broader pool of passive equity funds with some sort of a volatility targeting “overlay” is sparse, but JPMorgan estimates there is about \$360bn just in insurance products called “variable annuity” that target a certain level of turbulence and respond swiftly to turmoil. The overall universe of volatility-sensitive funds is probably much larger.

Nick Baltas, a UBS analyst, is sceptical that systematic funds played a major role in August’s crash. While they can “absolutely” exacerbate a crash in theory, in practice it is “highly questionable”, he argued in a recent report. But he offers up another potential culprit: high-frequency trading firms.

HFT groups also deploy ultra-fast algorithms to capitalise on fleeting price discrepancies, and have attracted regulatory scrutiny for their role in allegedly destabilising markets — most prominently in the “flash crash” of 2010. “In a turbulent period that lasted not more than two weeks, with significant intraday activity, we believe HFT funds could have played a role,” Mr Baltas wrote.

Human error

Systematic investment groups scoff at the accusations, arguing that analysts and rival fund managers grossly overestimate how responsive their algorithms are to spikes in volatility, their tendency to rebalance and their overall heft.

There is about \$18tn just in US mutual funds, compared to JPMorgan’s estimate of about \$1.2tn globally in volatility-sensitive strategies. Moreover, human investors are even more susceptible to turmoil-aggravating panic attacks.

“Equity mutual fund investors tend to sell in response to price declines because they get nervous, and they are much larger,” Bridgewater, the world’s biggest hedge fund group and inventor of risk parity, said in a recent report. “And, suppose they did tend to do that; what should be done about it — prevent those who want to sell when prices fall from doing that?”

Nonetheless, whether or not parts or all of the systematic, volatility-targeting investment universe is to blame for the stock market swings of August, analysts and fund managers say this is the new reality of markets that investors simply have to adapt to: choppy, more technically-driven, where algorithms are as important as a human trader sitting on the dealing floor of a Wall Street bank or Bostonian asset manager.

Not everyone is thrilled at the prospect. “Systematic trading is not inherently bad and it’s here to stay, but the issue is that no one is out there keeping an eye on this,” Sloan’s Mr Lo says. “We don’t have the regulatory framework to deal with this kind of trading. We need to address this urgently.”

Industry leaders: investment pioneers

The quantitative investment world is a big and broad church, but there are some fund managers that stand out.

**Renaissance Technologies** Possibly the most successful and secretive computer-driven hedge fund group, set up by former Pentagon codebreaker and mathematician James Simons.

**AHL** The flagship fund arm of Man Group, the world’s biggest listed hedge fund manager, has enjoyed a rebound lately after years of underwhelming performance. It manages more than \$12bn.

**Winton Capital** A \$30bn investment group founded by David Harding, a Cambridge-educated physicist who also helped set up AHL before selling it to Man Group and one of the founding fathers of the CTA strategy.

Hedge fund pioneers, from left: James Simons of Renaissance Technologies; Leda Braga of Systematica; and David Harding of Winton Capital©Bloomberg; FT

Hedge fund pioneers, from left: James Simons of Renaissance Technologies; Leda Braga of Systematica; and David Harding of Winton Capital

**Systematica Investments** Systematica is the result of the spin-off of BlueCrest’s leading quantitative fund led by Leda Braga, an engineering PhD and one of the most high-profile women in hedge funds. The standalone group’s assets under management are almost \$9bn.

**DE Shaw** This US hedge fund group was set up by computer scientist David Shaw in 1988, and now manages more than \$37bn. Fortune magazine has called Shaw the “king quant”.

**AQR** The firm founded by quantitative finance pioneer Clifford Asness is now one of the biggest investment groups, with \$130bn under management. Of that about \$30bn is in “risk parity” funds, but AQR also manages CTA and other quantitative funds.

**Bridgewater** Ray Dalio’s Bridgewater, the world’s largest hedge fund group, is mostly known for its classic macro fund Pure Alpha, but the success of its \$70bn All Weather risk parity fund has also helped swell Bridgewater’s size and fame.

**Two Sigma** A systematic investment group run by DE Shaw alumni David Siegel and John Overdeck, which now controls about \$25bn.

