The financial meltdown forecasters

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Editorial: "Time for banks to show us the money"

FORGET "too big to fail" - what really matters is how connected financial institutions are.

Two new systems offer the promise that financial systems could be monitored in real time, allowing early signs of a crash to be detected in time to avert it. Crucially, both eschew the "too big" refrain - the idea that some companies carry too many assets to be allowed to go under.

When the relatively small Lehman Brothers was allowed to go bankrupt in September 2008, it proved just how misleading this thinking can be. The company turned out to be intricately connected to so many others that its downfall signalled the onset of a global financial crisis from which the world is still reeling.

A team of economists who last year showed how a small number of companies wield disproportionate power over the global economy (New Scientist, 22 October, p 8) has now produced a simple visual tool that can identify companies that are highly connected and in a precarious position - as Lehman Brothers was.

DebtRank is being evaluated by banks and regulators including the European Central Bank (ECB). Another real-time monitoring system is being piloted in India and assessed by the International Monetary Fund (IMF).

DebtRank is the brainchild of Stefano Battiston at the Swiss Federal Institute in Zurich, and his colleagues. It attributes a score of between 0 and 1 to individual companies and banks, reflecting how their financial fragility affects others. A company with a ranking of 0 would have no effect on others if it went bust. A company with a value of 1, however, would bring down the whole network if it failed.

Battiston and colleagues tested DebtRank on the 2008 financial crisis. They obtained previously confidential data covering 1000 days as the crisis developed. The data gave a detailed picture of the debt of 407 financial institutions that collectively borrowed $1.2 trillion from the US Federal Reserve Bank to keep themselves afloat. From this, 22 emerged that collectively borrowed three-quarters of this money (Nature Scientific Reports, DOI: 10.1038/srep00541).

Plotting the 22 on a spiral - where low scores place them on the perimeter and a score of 1 lands them dead centre - shows how the crisis unfolded, and identifies apparently vulnerable companies (see diagrams). At the peak of the crisis, several of the 22 tightly interconnected institutions on their own could have wiped out more than 70 per cent of the total value of that tight network, had they failed, Battiston claims.
"For the first time, we have a network indicator that can be monitored in real time," he says. Battiston claims that in terms of its predictive power, DebtRank outperformed other monitoring systems currently in operation. Most of them only react when a bank actually defaults, rather than seeing it coming, he says. His team is collaborating with the ECB and other European central banks through a programme called Forecasting Financial Crises to develop and test the system further.

Self-reinforcing burden

The concept also earned support this week from Andy Haldane, executive director of financial stability at the Bank of England. "There is no bigger problem in global finance than 'too big to fail' or, as this analysis shows, 'too connected to fail," he says. "As this crisis has shown, these institutions create an enormous and self-reinforcing burden on the taxpayer through central-bank and finance-ministry bailouts."

Others are more cautious about Battiston's analysis. According to Sheri Markose at the University of Essex in Colchester, UK, the results are misleading because the study calculates risk based on the amount of money companies borrowed from the Federal Reserve. This is "good" borrowing, she argues: companies did it to save themselves, and those that did not were more likely to collapse and cause further chaos. The root of the problem was the money banks had already borrowed from each other.

Markose has developed another monitoring tool that looks at that. Her Multi-Agent Financial Network (MAFN) model is being piloted in India, and she reckons it could give two years' warning of a crisis.

With Simone Giansante at the University of Bath, UK, Markose used MAFN to model the 2008 crisis. They focused on a form of debt insurance called credit default swaps, in which one bank promises to cover another's debt if they cannot pay it, in exchange for an upfront fee.

From 2007 onwards, a small group of major banks became densely interconnected through their credit default swaps. J. P. Morgan was the most connected, making it a "superspreader" that would have caused havoc had it defaulted, Markose claims. Several other banks were also too connected to fail (Journal of Economic Behavior & Organization, DOI: 10.1016/j.jebo.2012.05.016).

"The approach is sound and data-driven," says Edward Tsang of the University of Essex. Models like MAFN and DebtRank could also allow regulators to test potential interventions to see if they are likely to work. Markose and Giansante used MAFN to model a superspreader tax, which forces highly connected companies to pay into a bailout fund designed to protect the system if they fail. In the model, such a tax raised enough cash to cover the losses that would have ensued had J. P. Morgan collapsed.

Tsang warns that to really understand what's happening, we must monitor every transaction type. For that, banks must disclose all the information needed to detect trouble brewing.

It's unclear whether banks would agree to this. New Scientist contacted the International Banking Federation, which represents global banks, but it declined to comment. The US Federal Reserve and
the UK’s Financial Services Authority also declined to comment on the systems. The Reserve Bank of India, however, has incorporated MAFN into its twice-yearly financial stability reports.

Battiston says that at present, most global financial transactions are confidential, and any regulation is at national level. "The police are local, but the transactions international," he says.

"Someone needs to keep track of the big picture," says Laura Kodres, chief of the IMF’s global financial stability analysis division. Until then, another meltdown could be just around the corner.