

How tools from ecology can help predict and prevent financial crashes

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A team of economists and scientists including SFI External Professor Doyne Farmer (INET at Oxford) have published a new study illustrating how tools from ecology can help us better understand financial markets.

In the work, which appears in the *Proceedings of the National Academy of Sciences (PNAS)*, the researchers argue that studying markets as [complex ecosystems](#) rather than perfectly efficient machines can help regulators guard against damaging market volatility. And they show that changes to the wealth invested via different strategies within a 'market ecology' can help predict market malfunctions like mispricings, bubbles, and crashes.

Using tools from ecology, they model different investor strategies—including non-professional investors, trend followers, and value investors—as different 'species' within a market ecology. They find that:

- Just as the status and health of biological ecosystems depend on the species present and their populations, the status and health of market ecosystems depend on market strategies and the wealth invested in them.
- Understanding the impact of, and interactions between, different investor species can help predict market malfunctions, just as understanding the impact and interactions of different biological species can help predict ecosystem instability or collapse.
- Similar to how [animal populations](#) within ecosystems can fluctuate indefinitely, market prices can stray very far from equilibrium and can also fluctuate indefinitely.

More information: Maarten P. Scholl et al, How market ecology explains market malfunction, *Proceedings of the National Academy of Sciences* (2021). [DOI: 10.1073/pnas.2015574118](https://doi.org/10.1073/pnas.2015574118)

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