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## **Spoofing**

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On April 21, the west London financial trader, Navinder Singh Sarao, was arrested. The US Justice Department alleges that he was in the habit of 'spoofing' futures markets, by entering orders without genuinely intending to buy or sell; Mr Sarao denies wrongdoing. Spoofing isn't new, and is indeed quite common, so what is striking about Mr Sarao's arrest is that – as far as I can discover – this is only the second time that criminal charges have been brought in any jurisdiction against an alleged spoofing. The first was in October 2014; those charges concern a New Jersey futures trader, Michael Coscia.

The trading of shares and futures is now anonymous and electronic. You no longer stand in a crowded trading pit, shouting and gesticulating frenetically. You sit quietly at your computer – often it's doing the trading for you – and enter bids to buy or offers to sell. Those bids and offers are transmitted electronically to the exchange's computer system, which maintains what traders call 'the order book'. This is essentially simply a list of all the bids to buy or offers to sell a particular stock or other financial asset that have neither been executed nor cancelled. Bids and offers get executed when the exchange's system finds a bid to buy and an offer to sell at the same price.

Experienced human traders and sophisticated computer-trading algorithms pay close attention to the order book, because it gives a sense of supply and demand. If, for example, the order book contains a lot more offers to sell than bids to buy, then supply seems to exceed demand, and it looks likely that prices are about to fall. The human beings and algorithms that are trying to sell will often then reduce their asking prices a little to attract buyers, so prices do indeed fall.

The salience of the order book gives spoofers, human or algorithmic, their opportunity. Here's an example of how. Start by selling, let's say, five S&P500 index futures at the current market price. (These are contracts tied to the level of the S&P500 share index. Five of them – a small trade by futures-market standards – are the equivalent of shares worth around \$500,000.) Then enter one or more very large offers to sell, but at prices slightly higher than the market price, so they won't be executed.

That will cause supply apparently to exceed demand, so prices will probably fall a little. Now cancel your big spoofing offers, which have done their job, and simultaneously buy five futures for less than you sold them for a few seconds ago. You've made a profit: most likely not huge, but repeatable.

Of course, spoofing isn't as easy as I've made it sound. You need steady nerves, intense concentration and quick reflexes to do it yourself with keyboard and mouse. Doing it by computer means either writing a program or modifying a

commercially available one, though of course you can pay someone to do that for you. There's also always the risk that the big bids or offers you intend to cancel might get executed before you're able to do that, and this could leave you nursing a large loss.

What you didn't have to fear, until very recently, was going to jail. You might well have received the kind of message that the Chicago Mercantile Exchange sent Mr Sarao, reminding him that orders 'are expected to be entered in good faith for the purpose of executing bona fide transactions'. If you repeatedly received these warnings and ignored them, an exchange or a regulator might have taken administrative action against you. That could mean a financial penalty (possibly substantial), and perhaps even loss of one's licence to trade, but it wasn't a criminal matter.

Why has spoofing become criminal? There have been suggestions of a connection between Mr Sarao's trading and the wild market convulsions on 6 May 2010 that have become known as the 'flash crash'. The Justice Department alleges that between 11:17 am and 1:40 pm (Chicago time) a fifth or more of all the orders to sell S&P500 index futures were Mr Sarao's. It's very striking if a single trader, operating on his own, could constitute so much of one of the world's most important markets. However, the Justice Department also says that Mr Sarao cancelled his main sell orders at about 1:40:12.553 pm, although he kept active on a smaller scale over the next five minutes. The millisecond time stamp

matters, because that was around a minute *before* the worst of the big plunge in prices. Wholesale cancellation of sell orders would have lessened, not increased, the chances of a plunge, and so at the very least other forces must have been at work.

Rather, the explanation of the criminalisation of spoofing is that attitudes to it have changed. Spoofing was harder when attempted in the public arena of a Chicago trading pit, but if you successfully did it you weren't punished, even informally. As a former pit trader said to me, 'it was just thought of as "boys will be boys" and [as in a] poker game, bluffing was not something that was thought of as wrong, immoral or illegal. In fact it was in some ways admired.'

That attitude survived the early years of electronic trading. Jakob Arnoldi of Aarhus University interviewed an exchange's head of surveillance for an insightful article in the journal, *Theory, Culture & Society*. Arnoldi was told: 'Five years ago, everybody would say: where's the problem? Why are you programming these stupid algos [algorithms that can easily be spoofed]? It's your fault. But now it is market manipulation.'

Arnoldi concludes that regulators are trying to make the world safe for algorithms. That's part of the story, but it's also important that few markets have ever been places of untrammelled competition; they nearly always contain at least fragments of moral order. That was certainly true of Chicago's trading pits.

Spoofing might have been acceptable, but if you reneged even once on a deal with another pit trader (deals were either verbal or agreed by eye contact and hand signal, and thus not realistically enforceable in law), you risked being informally shut out from trading by everyone else, perhaps permanently.

Instead of face-to-face markets, replete with direct human interaction, we now have markets that look more like the 'perfect markets' of some economists' imaginations: individualistic, atomistic, anonymous. Moral questions, however, have been displaced, not eliminated. There is a growing sense that the electronic order book, precisely because it is now the heart of many financial markets, has to be pure and pristine. All orders must be 'entered in good faith'; the poker player has no place.

We can no longer rely on face-to-face monitoring and retribution (others turning their backs on you, hard punches on the shoulder) to police matters of this kind. But formal regulation and the criminal law may be insufficient. Good faith is a matter of intent, and intent is hard to prove; that difficulty helps explain the dearth of prosecutions. Behaviour in markets is subtle, nuanced and complicated. It's not possible exhaustively to specify the boundaries beyond which clever, flexible strategy becomes demonstrable bad faith, and bad faith becomes crime. It's a deep and difficult issue, almost worthy of that old Marxist word: contradiction.