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Book Review

Donald Mackenzie, *An Engine, Not a Camera: How Financial Models Shape Markets*, MIT Press (Inside Technology Series), 2008, 389pp., £31.95 ($43.00). ISBN: 9780262134606

Robert Peston, the BBC's Business Editor who broke the news of the Credit Crisis to the British public in 2007, has said that in the months leading up to the crisis he had tried to report on Collateralized Debt Obligations but had not been able to find a banker who could explain them to him. This point gets to the crux of the Credit Crisis, "no one" saw it coming and the responses of the US and UK governments was inadequate because there had been no public discussion of developments in finance, as there are of developments in, for example, energy, nano or genetic technologies. The result was that society was completely unprepared for what would unfold in 2007–2008.

In writing *An Engine not a Camera*, Donald MacKenzie, a sociologist working in 'Science and Technology Studies', hopes that there will be "richer conversations" about financial markets, and out of these discussions a better, and stronger, financial system will emerge. Science and Technology Studies examines how social factors affect technological progress and one of its pioneers was Robert K. Merton, father of one Robert C. Merton. While STS is not popular amongst many physical scientists who like to believe their knowledge is based on indisputable fact, there are numerous financial mathematicians who, following Poincaré, see facts in the context of theory, which is constructed in a social context.

The central thesis presented by MacKenzie is that modern financial markets 'perform' financial theory. That is, finance practitioners have been trained by universities to believe a set of cohesive ideas which they then, on graduation, employ in the markets. Since the ideas are the same, whether presented in Europe or in salt-water or fresh-water universities in the US, the heterogeneity of countless individual agents is replaced by a single *Homo economicus*. The immediate consequence of this is the commoditisation of finance theory; models are 'shrink wrapped' and become 'black boxes' with the subtleties of their underlying assumptions irrelevant. The more dramatic result is that, eventually, the 'performed' markets become so far removed from the reality of finance that they collapse in an episode of 'counter-performativity'. MacKenzie describes in detail two examples of what he sees as counter-perfomativity, Black Monday in 1987 and the failure of Long Term Capital Management eleven years later.

In support of this hypothesis MacKenzie discusses in detail how modern derivative markets emerged and how, alongside the evolving markets, modern finance theory was created. His history of the development of finance theory, between 1950 and the 1990s is possibly unrivalled being based on extensive interviews with pretty much everyone who has made a significant contribution, including Markowitz, Samuelson, Friedman, Merton, Scholes, and Harrison. Underpinning these narratives is a discussion of the relationship between the 'practice' of finance and the academic theory, and it is in this context that MacKenzie offers an explanation why Black-Scholes-Merton received the Nobel Prize while Thorp and Kassouf have been generally ignored in the university classroom.

While a reader may have an issue with MacKenzie's core hypothesis, his account of how finance has developed makes the book essential reading for anyone who is seriously interested in modern financial theory.

The book's weakness is that it was written in the aftermath of the failure of LTCM, a time when the importance of the martingale approach to derivative pricing was only beginning to be understood. While the text does discuss the work of Harrison, Kreps and Pliska it does not go on to discuss the importance of the 'Fundamental Theorem' (that a market is arbitrage free if a risk neutral pricing measure exists, and complete if the measure is unique). Ironically for sociologists, the Fundamental Theorem is based on Black and Scholes's observation that it should not be possible to make a riskless profit, which is almost a statement of commercial morality and so is socially constructed.

The strength of the book is that it highlights the dangers of adopting financial models as black-boxes rather than crafting solutions relevant to specific situations. This is highlighted in his analysis of the failure of LTCM, where MacKenzie rejects many of the popular explanations for the fund's failure, making the observation that criticising hedge funds for taking on risk is rather like criticising aeroplanes for leaving the ground. While the events of 1998 may seem irrelevant in the aftermath of 2007, MacKenzie has undertaken a similarly comprehensive review of the Credit Crisis in the context of performativity and counter-performativity and his analysis is available on his website at the University of Edinburgh. Again the message he delivers is to employ fundamental skills that can question the received wisdom of the dominant models, a message that finance would do well to heed.

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