A Crisis of Beliefs: Investor Psychology and Financial Fragility, **by Nicola Gennaioli and Andrei Shleifer. Oxford: Princeton University Press, 2018. 244 pp. ISBN: 978-0-691-20223-5**

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The main achievements of this book are the authors' progression of behavioural finance beyond analysis of isolated behavioural tendencies and predispositions, and their attempt to explain when investors become susceptible to certain biases. They rightly highlight these as two shortcomings of much of the behavioural finance literature. In the introduction, the authors list three goals: Firstly, to show that surveys of expectations are a valid, and useful, source of information for economic research. Secondly, to provide a "psychologically grounded formal model of expectation formation that can be used in a variety of domains." (Pg. 4) Thirdly, to use this model to account for the central features of the 2008 crisis. The book could have dealt with each of these aims in turn; beginning with a defence of the use of survey data, then outlining their model and concluding with a demonstration of its applicability to the 2008 crisis. With the present order, the book risks being seen primarily as an analysis of this crisis while, in fact, it is much more than this.

The authors' defence of the use of survey data appears in Chapters 2 and 4. In Chapter 2 they show that both homeowners and macro-economic forecasters thought that rapid house price appreciation, and GDP growth, would continue. After home prices began to fall, markets remained calm. The authors' belief is that this is because market participants failed to appreciate the risks inherent in the financial system. Chapter 4 argues that survey data shows that many financial market participants had unrealistic expectations of market performance. More generally, the authors find that analysts, investors, and professional managers are "excessively optimistic about the future in good times and excessively pessimistic in bad times." (Pg. 111) The authors use the results of these surveys to argue that two standard explanations of the crisis- the 'too big to fail' and 'fraudulent practices' explanations, are unconvincing because they fail to take account of the beliefs of market participants. The 'too big to fail' explanation is that banks understood the true risks in mortgage securities, but believed that they would not be allowed to fail. The 'fraudulent practices' argument says that banks were aware of risks inherent in the products they were selling, but sold them to clients anyway. The survey data suggests that banks were no more accurate in their assessment of risks than investors, or anyone else.

The merits of using survey data to reveal beliefs are clear. Most of those surveyed were wrong about future house prices, defaults, and market returns. It is notable, however, that the expectations of aggregate stock market performance are from individual investors, rather than professional asset managers. It would be useful to expand the surveys of expected market performance to include professional investors to highlight any differences among types of investors. Furthermore, some of the evidence of what market participants believed is taken from publications that banks circulated to clients (for example Lehman's mortgage default forecasts on Pg. 52). It is possible that such reports do not reveal what market participants really thought, but reflected what they wanted their clients to believe. Nevertheless, the authors make a convincing case for the use of survey data, and any shortcoming of these surveys indicate the need for more surveys.

The survey evidence is also relevant for analysis of the moral aspects of the crisis because it suggests that the 'fraudulent practices' explanation is too simplistic. This data needs to be taken into account, but it is equally important that surveys are not over weighted in judgements of moral culpability. This is where more, and more nuanced surveys would be helpful, as is an understanding of the circumstances under which official forecasts and projections were made, and who they were intended for. This book therefore makes an interesting contribution to financial ethics and provides an impetus for further research.

The authors' second aim is to provide a formal model. In Chapter 3, they develop a model of financial fragility with two inputs: demand for safe assets, and neglect of downside risk. In brief, when downside risks are neglected, the financial sector over expands. In Chapter 5, the authors try to unify the biases they highlight- the neglect of downside risk, and the tendency to extrapolate from past data, into a single framework.

They begin with the Representativeness Heuristic. The Representativeness Heuristic is the tendency for people to judge likelihood by similarity. It is usually illustrated with the 'Linda' example. When presented with a description of 'Linda' and asked whether she is more likely to be a bank teller, or a feminist bank teller people respond that she is more likely to be a feminist bank teller, despite the set of feminist bank tellers being smaller than the set of bank tellers. People make this mistake because they judge which description is most similar to Linda, rather than which is most likely. Representativeness is linked to beliefs because it influences people's probability assessments "through limited and selective memory." (Pg. 147)

The application to financial cases is as follows. Market participants revise their estimates of future payoffs in the light of new information. However, representativeness affects how beliefs change. Favourable news increases the probability of high payoffs. Firstly, because it raises the probability of high payoffs; secondly, because it makes high payoffs more representative. This means that high payoffs become more heavily weighted in expectations than low payoffs. The distribution of expected returns shifts too far to the right. This explains the excessive optimism and neglect of downside risk prior to the financial crisis. The authors call this Diagnostic Expectations.

One of the benefits of this model is that it generates different results depending on underlying conditions. During a poor economic environment, bad news will also be subject to representativeness, and lead to investors' expected return distributions shifting too far to the left. This, they argue, is what happened after the Lehman crisis when investors liquidated assets at very low prices. Chapter 6 summarises how Diagnostic Expectations applies to credit cycles and explains the boom and bust pattern they exhibit. Excessive optimism builds up during periods dominated by good news. Once investors realise this optimism is unrealistic, excessive pessimism takes over. This model overcomes the weakness the authors highlight in the introduction- representativeness is not an isolated bias; their model shows how representativeness affects the formation of expectations. Furthermore, this model also illustrates how the same bias can lead to different phenomena- both over and underreaction.

The third aim of the book is to use the Diagnostic Expectations model to account for the 2008 financial crisis. Chapter 1 reviews the events surrounding the collapse of Lehman Brothers in 2008. The authors aim to explain what it was about Lehman's bankruptcy that led to the collapse of the international monetary system. As they correctly note, worries about the state of the US housing market and the financial health of Lehman existed before Lehman's collapse. This chapter is a succinct summary, and helpful for anyone looking for a review of the main events. The insights of later chapters are applied to the crisis primarily in Chapters 5 and 6. The authors use their Diagnostic Expectations model to account for the relative calm in the period between the bursting of the housing bubble, and the collapse of Lehman. Despite warning signs that asset prices were likely to enter a downward trend investors initially retained their faith in diversification and the security built into structured products. Once Lehman went bankrupt, the neglected downside risks came into focus.

Chapter 6 discusses open questions and potential further work. The authors note that their model uses fundamental information, not information about price trends. Bubbles in financial assets are usually understood to be a reaction to price changes, as well as to fundamentals, so the authors are right to note that it would be beneficial to incorporate this. This would mean broadening the definition of 'information', but is also relevant for discussion of rationality in financial markets. The authors don't analyse rationality in any great detail in this book. Nevertheless, markets are not just a function of beliefs, but of behaviour, which can sometimes be at odds with beliefs. The Rational Expectations Hypothesis holds that "economic agents use all the information they have to make statistically optimal forecasts." (Pg. 110) If information about prices, and other investors' beliefs are accepted as 'information', then it is less clear what a 'statistically optimal forecast' is. Although the authors describe assets as 'over' or 'under' valued they hint that discovering a 'correct' valuation of financial assets is difficult when they write that, "it is very hard to tell whether a price increase in a major credit class is really a bubble or just good fundamentals." (Pg. 198) A further interesting avenue for research is the link between beliefs and behaviour. The authors establish an interesting symmetry between retail investors market return forecasts and mutual fund flows (Pg. 116). However, the link between beliefs and behaviour is not likely to always be this simple. For example, a professional investor who believes a market to be overvalued may nevertheless remain invested because of pressure from clients, or because they will be penalised if they sell too soon.

In summary, this book presents an interesting model that succeeds in progressing behavioural finance beyond analysis of isolated biases, and integrates representativeness into the formation of expectations. It also makes a convincing case for the use of surveys to gauge beliefs.

Biography

Catherine Greene is currently a Research Associate at the Centre for the Philosophy of Natural and Social Sciences (CPNSS) at the London School of Economics. Before leaving finance to study for a PhD she was Director of Alternative Assets at Prudential M&G. Her academic research interests include the nature of information in financial markets, and research methodologies in the Social Sciences more generally. She also writes about ethics in finance from a virtue ethics perspective. www.catherinegreene.co.uk