



the reading room the (mis)behaviour of markets

By Benoit B. Mandelbrot
& Richard Hudson
Profile Books 328 pages

review rating



Benoit Mandelbrot (BM) is the Sterling Professor of Mathematical Science at Yale and a Fellow Emeritus at IBM's Thomas J. Watson Laboratory. He was the inventor of fractal geometry and has received many significant academic prizes and awards in the field of mathematics. He is now 80 years old, and has written this book with Richard Hudson, an experienced science journalist (past managing editor of the Wall Street Journal European edition) who is a graduate of Harvard and MIT.

BM has been studying the underlying mathematics of finance and investment for forty years. This book represents his current assessment of market volatility and related matters going to valuation, and what has become generally called, modern portfolio theory. It is comforting to see the return of the first person "I" in this text, which refers throughout to MB's views – the impression is that Richard Hudson penned most of the text for his older co-author scientist. The dustcover makes a big claim: "The (mis) Behaviour of Markets is a revolutionary re-evaluation of the standard tools and models of modern financial theory. For millions who have been led to underestimate the real risks of financial markets it will ensure that they never see things in quite the same way again." Thus, my expectation level was high on starting this book, but having read it, I still see markets in the same way.

Behind this text are very complex and demanding mathematical theories, and to their credit, the authors spare us of these in the main body of the text. Thus, the book is not replete with algebraic formulae, although these are cited to some extent in the 25 pages of Notes, commencing at page 277. There are no footnotes as such in the main text, but the Notes amplify and provide greater detail in key areas, by picking up italicized keywords from the text – a novel approach which works.

History of finance and personal knowledge of the players

The book is divided into Part 1: The Old Way, Part 2: The New Way, and Part 3: The Way Ahead. It starts with a background on BM, and the dual author approach enables Hudson to claim that "What Mandelbrot has to say is important and immediately relevant to every professional in finance, every investor in the market, anyone who just wants to understand how money gets lost with such frightening rapidity." Reading this book, we are told, will not make you rich, but it will "make you wiser – and may thereby save you from getting poorer." Given this reviewer's unending quest for wisdom in finance and investment, expectations were again heightened, especially given the academic standing and experience of BM.

Fractal maths is about "roughness", which extends to all matters in life, and for our purposes, is said to apply to the irregular performance of financial markets. BM's ideas in the study of fractals were adopted by another scientific

movement: chaos theory. BM was studying financial charts in the 1960s, and indeed although his fractal theories as applied to investment cannot be categorised as ordinary "charting" or technical analysis, in one way they are concerned with charts, in that the maths, when applied, are designed to uncover the irregular roughness of market performance. Further, he does see incidence of "long term memory through which the past continues to influence the random fluctuations of the present." This early work, led to the study of "power-law distributions", his 1962 argument that prices vary far more than the standard model allows – that their distributions have "fat tails", which is now widely accepted by econometricians. These findings are used, to deprecate the universally accepted industry yardstick of risk, ie the standard deviation model – which he explains very well to the lay reader. By 1966 he had development models which explain how rational market mechanisms can generate price "bubbles". From there he moved to theories of "scaling", multifractal analysis and to "long-term dependence" – the latter being the idea that prices today are not independent of those of yesterday, as historical pricing endures to impact future trading, this being counter to modern portfolio theory.

As expectations grew, the appreciation also developed that whilst these views/theories are radical, they are not exactly new – they have been around for 30 to 40 years. Why have I not heard of them before? It took another 200 pages before the answer to this became evident.

In chapters 1 to 5 dealing with the Old Way there is an excellent exposition of how modern portfolio/finance theory developed, and there are intimate insights into the key players of the day. They are all there, within proper context: schools, agendas, Nobel prizes, and follies (eg LTCM). Immediately, I picked up that Eugene Fama had been a student of BM as his thesis adviser. For those who already hold some knowledge of the subject, this account provides a subtle and interesting personal gloss not found in standard academic works – eg, Fischer Black (of the option pricing model fame) as a lecturer gained a reputation for stopping mid-sentence, "falling silent, and taking notes" due to his concerns of a poor memory – even the greats have this problem, it is comforting to see.

BM starts with the foundations provided by Louis Bachelier, and steps from there into each new mainstream financial theorem, and how each builds upon the other, and how this re-enforcing edifice was constructed over the twentieth century: bell curve distributions; beta determination and use, CAPM, EMH (efficient market hypothesis and the intellectual foundation for index funds), Black-Scholes option pricing etc. During this explanation there does appear novel and fundamental insights, that perhaps many appreciate implicitly or unconsciously, but which do warrant articulation and further thought.

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Take this example: “Anticipation is a feature unique to economics. It is psychological, individual and mass – even harder to fathom than the paradoxes of quantum mechanics. Anticipation is the stuff of dreams and vapours” – and this buttresses his view that market volatility is greater than many appreciate, and serves to amplify the folly in trying to forecast market movements – for one is forecasting the mass psychology of millions of other market participants. But see below re market timing. Nevertheless, he contends that probability theory is the only tool at our disposal – which itself leads to an explanation of modern probability theory, and how the bell curve distribution model does not adequately allow for “fat tails” and “outliers”.

Doubts start to form

For me, disappointment and scepticism started to arise by page 77, where work of the likes of Sharpe, Markowitz, Scholes and Merton (all Nobels) is brought into question, if not proved to be wrong, by the crash of October 1987 when the Dow fell 29% on one day. This, seeming catastrophic event, (which, in time, proved to be not much more than an uncomfortable blip) is somehow used as evidence that modern portfolio theory, is but an “intellectual edifice ... an extraordinary testament to human ingenuity” – and that it is wrong. Thus “began a search for new ideas. It continues to this day.” As is now outlined below in this review, there is not a great deal of justification for this implicit contention, including in the next chapter 5, The Case Against Modern Theory of Finance – at least none that this reviewer could readily understand. The reference to Peter Lynch being so successful in the Magellan Fund (thus gainsaying EMH) is particularly unconvincing, when one considers the record of Peter Lynch after he left Magellan – see pp 175/176 of The Unbeatable Market, reviewed in this web site.

In the New Way (chapters 6 to 11) there is a demanding explanation of how fractal theories are applied to multifractal market models and how these mathematical models can mimic the “real thing”. “Multifractals make turbulence a fundamentally new way of analysing finance”, it is said. The upshot of this work: “A new tool to measure, not how long, heavy, hot or loud something is, but how convoluted and irregular it is. It provides science with its first yardstick for roughness.” – so that we can see that the contour of the Australian coastline is less rugged than that of Cornwall, and BM provides calculated fractal dimensions for this. This leads to the conclusion that the equity market is very risky, but not a great deal more than this, in practical terms.

Real world relevance and application?

By chapter 11 the reader might question how factual theories can be applied to investment in a practical way. Seeds are planted under the sub-heading Beyond Cartoons: The Multifractal Model with No Grids, as it seems that application has been largely in the academic field – certainly in relation to

currency markets.

In the Way Ahead (chapters 12 and 13) he cites the Ten Heresies of Finance and again traverses much of the ground covered in earlier chapters – eg, markets are turbulent and much riskier than most appreciate. The third heresy tested this reviewer’s patience, in that it contends that “market ‘timing’ matters greatly”. Here BM cites accurate data for the USD/Yen from 1986 to 2003, which explains that nearly half of the depreciation of the USD against the Yen occurred within just ten of the 4,695 trading days. And, in the 1980s, fully 40% of the positive return from the S & P 500 came during ten days – about 0.5% of the time. So, he questions, what is the investor to do? This is the advice:

“Broker’s often advise their clients to buy and hold. Focus on the average annual increases in stock prices, they say. Do not try to ‘time the market’, seeking the golden moment to buy or sell. But this is wishful thinking. What matters is the particular, not the average. Some of the most successful investors are those who did, in fact, get the timing right. In the space of just two turbulent weeks in 1992, George Soros famously profited about \$2 billion by betting against the British pound. Now, very few of us are in that league, but we can in our modest way take cognizance of concentrations. Suppose big news inflated a stock price by 40% in a week, more than twice its normal volatility. What are the odds that, anytime soon, yet another 40% run will occur? Not impossible, of course, but certainly not large. A prudent investor would do as the Wall street pros: take a profit.”

A book review is not the place to open contentious debate. Suffice to say, that this admonition conveniently ignores the market plays of Mr Soros for the past decade, and in any event, no private investor should be betting and trading in this way – the evidence of market timing delivering abnormal returns is overwhelmingly negative. From thereon, I found it very difficult to take the fractal theories seriously, and this doubt became bolstered in the final pages, where one hoped to find real world application.

In the final chapter, BM exhorts finance to “abandon its bad habits and to adopt a scientific method”. Although, he does not “claim to have the answers.” After 40 years of work, lecturing and publication, there are now “perhaps one hundred serious students of fractal financial and economic analysis around the world.” Most are in academia. He instances two small hedge/currency funds that are using the factual approach within their businesses, but these are, it might be fairly said, not within the mainstream. He opines that it is still premature to be hoping for serious gains from fractal finance, and that “clearly, fractal investment analysis has more questions than answers today, and that should be no surprise.” It was a surprise to this reviewer, as the initial promise implied greater delivery than this.

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Whilst seeing some benefit in the questioning of current fundamental financial theories, there is to my mind, nothing here to replace them with. If one wishes to appreciate that markets are risky, best to study 1929 and 1987 (eg, see the Great Crash 1929, reviewed this web site), and then look ahead as to what Climate Change might have in store for us. Most US investors who lost, say, 40% in equity portfolios (including index funds) circa 1999/2003 already have some appreciation of market volatility. Whether multifractal models will provide any more appreciation than this, is at least open to doubt in my mind.

It is difficult to see how the average Australian investor could glean a lot from this text – unless they are both versed in and very interested in pure mathematics, which I confess considerable ignorance of. For these reasons, it is rated modestly at 4.

MARTIN EARP

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