Mandelbrot, Benoit & Hudson, Richard L. – The (Mis)behaviour of Markets: A Fractal View of Risk, Ruin and Reward, *Basic Books, 2004, [Finance]* Grade 

Fractals. This seems to have been Benoit Mandelbrot's premier professional passion in life. A fractal has been defined as "a rough or fragmented geometric shape that can be split into parts, each of which is (at least approximately) a reduced-size copy of the whole." While fractals are a mathematical construct, they are found in nature. They are useful in medicine, soil mechanics, seismology, and market research.

I have never been a believer in the Efficient Market Hypothesis (EMH), but after reading this book it's easy to go from having an abstract hypothesis, based from market experience, to being convinced. Mandelbrot's writing is compelling, the logic is obvious, and the graphs are truly marvelous. You just need to watch them to be certain the markets are not bell-shaped. The basic assumptions behind EMH are shaky to say the least. Especially the assumption that price changes follow a Brownian motion – independent, stationary and normally distributed - is most clearly contradicted by the facts. And this underpins almost every tool of modern finance. We are mis-measuring risk.

The late Benoit Mandelbrot was a modern renaissance man, making his career by going against the prevailing fashions in science. This instinct – not always popular in the scholarly world - is probably why he chose to spend the major part of his career in the IBM Research center, doing industrial research. But he also taught Economics at Harvard and Mathematical Sciences at Yale. Math was the starting point in most of his work. Some evidence of this is the Mandelbrot set, which is a particular mathematical set of points whose boundary is a distinctive and easily recognizable two-dimensional fractal shape.

This book is a true masterpiece, well written with the assistance of former Wall Street Journal editor Richard Hudson, and leaves you feeling elated. But it's not a handbook in outperforming the markets; rather, it's a warning to be careful with risks. The book is divided into three parts with rather self-explanatory titles: The Old Way, The New Way and The Way Ahead. Mandelbrot handles many topics including roughness, the power of power laws, different pace of price swings, long-term dependence and the multi-fractal nature of trading time, all of which makes you feel that you are in the forefront of market research.

My favorite chapter is called "Ten Heresis of Finance". Some conclusions: Markets are turbulent. Markets are very, very risky – more risky than the standard theories imagine. Market timing matters greatly – big gains and losses concentrate into small packages of time. Prices often leap, not glide, which adds to the risk. In markets, time is flexible. Markets in all places and ages work alike. Markets are inherently uncertain and bubbles are inevitable.

Markets are deceptive. Forecasting prices may be perilous, but you can estimate the odds of future volatility. And finally, in financial markets, the idea of "value" has limited value. It may be easy for the experienced professionals to believe these are old truths, but I promise "aha" moments.

I reread this book on a semi-annual basis without hesitation.

Michael Persson, January 4, 2012

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