

The authors believe that Efficient Market Theory is flawed.

Markets are risky and misleading—which is why investors are routinely wiped out.

The (Mis)Behavior of Markets—By Mandelbrot & Hudson

“We have been mis-measuring risk. The odds of financial ruin in a free, global-market economy have been grossly underestimated.” So say Benoit Mandelbrot and Richard Hudson in their book, *“The (Mis)Behavior of Markets”*. Mandelbrot, Sterling Professor of Mathematical Sciences at Yale University and a Fellow Emeritus at IBM’s Thomas J. Watson Laboratory, has long been viewed as a maverick in conventional financial circles. He is the inventor of a branch of mathematics known as fractal geometry. When applied to financial markets, fractal geometry produces results that clash with the mathematical theories that underlie the Efficient Market Hypothesis (EMH) upon which modern financial markets are built.

In their book, the authors argue that EMH and conventional finance theory is elegant but flawed. They cite the booms and busts of the 1990s as clear evidence of the failure of conventional finance. The old financial orthodoxy was founded on two critical assumptions in Bachelier’s key model developed in his PhD thesis, *The Theory of Speculation*, back in 1900 which provides the foundation for EMH. The two assumptions are: 1) prices changes are statistically independent, and 2) they are normally distributed. The facts, as many economists now acknowledge, show otherwise.

Examine the financial market data more carefully and you will find, say Mandelbrot and Hudson, a different kind of distribution than the bell curve. The tails do not become imperceptible but follow a “power law.” Power laws possess a unique property that mathematicians call self-similarity: If an input is rescaled (i.e., multiplied by a constant), the output is still proportional to the input, although the constant of proportionality differs (think of a set of Russian dolls that look exactly alike but get progressively smaller). Power law distributions are commonly found in nature. Scientists have found examples of self-similarity deeply hidden in the behavior of physical and biological systems.

Mandelbrot first provided evidence of a power law in financial markets back in 1962 when he analyzed cotton price movements. He then examined the behavior of wheat prices, interest rates, and railroad stocks. Since his work was first published, a similar power law pattern has been found in many other financial instruments.

Despite evidence of power laws in financial markets, the authors note that Wall Street continues to cling to the “classical” formulae of Bachelier and his heirs. Why? The old methods are easy and convenient. They work fine, their adherents say, for most market conditions. It is only in the infrequent moments of high turbulence that the theory founders. Mandelbrot says such reasoning is little comfort to those wiped out on one of those “*improbable*” trading days. His aim is to create a more robust theory that explains the realities of financial markets.

Mandelbrot argues that to be able to imitate reality is a form of understanding. The multifractal model he has developed already offers some immediate insights into how markets work. He has derived five “rules” of market behavior—concepts that can help lessen investor’s financial vulnerability. The five rules are: **1) Markets are risky.** Extreme price swings are the norm in financial markets—not the exception; **2) Trouble runs in streaks.** Market turbulence tends to cluster; **3) Markets have personality.** In substantial part, prices are determined by endogenous effects peculiar to the inner workings of the markets themselves, rather than solely by the exogenous action of outside events; **4) Markets mislead.** Patterns are the fool’s gold of financial markets. A financial market is especially prone to statistical mirages; **5) Market time is relative.** Markets operate on their own “trading time”—quite distinct from the linear “clock time” in which we normally think. In addition to these rules, fractal mathematics offers some potential new yardsticks to measure volatility and risk. The authors note that a few fund managers have experimented with multifractal models, but it is still early days and the research in this area has just begun. Reliable applications for investors, they tell us, are still a ways off in the future.

The (Mis)Behavior of Markets offers new and important ways of looking at the financial world. It is the kind of book that, if studied and applied, may well keep investors from losing their shirts in the future. If you are looking for some non-conventional insights into risk, we would recommend picking up a copy of the book.