Misbehaviour of markets pdf

Mandelbrot is recognized as the father of chaos theory ... he is, simply, very smart indeed. (Sunday Telegraph) The reader gets a clear picture of the history of financial theory ... the best financial read (Financial Times)Entertaining written ... this book is a brain opener that adds enormously to our total knowledge. (Director) Benoit Mandelbrot, father of fractal geometry, revolutionized our understanding of the models of modern financial theory. This new edition contains material about the current market crisis, and calls for an end to the tunnel vision of our bankers whose overtrust to their understanding of markets ended in disaster. Benoit Mandelbrot, father of fractal geometry, revolutionized our understanding of the models of modern financial theory. This new edition contains material about the current market crisis, and calls for an end to the tunnel vision of our bankers whose overtrust to their understanding of markets ended in disaster. This international bestseller, who foreshadowed a market crash, explains why it can happen again if we don't act now. Fractal geometry is the roughness mathematics: how to reduce the outline of an uneven blade or static in a computer connection to a few simple mathematical properties. With its fractal tools, Mandelbrot has gotten to the bottom of how financial markets really work. He finds that they have a changing sense of time and wild behavior that makes them volatile, dangerous - and beautiful. In their models, the complex gyrations of the FTSE 100 and exchange rates can be reduced to simple formulas that provide a much more accurate description of the risks involved. Benoit Mandelbrot is a sterling professor of mathematics at Yale University. Richard L. Hudson is a former managing editor of Wall Street Journal Europe. Top reviews Last Top Reviews Gavrilo Princip woke up with a short do-do list on June 28, 1914: murdering the Archduke. Franz Ferdinand parading through Sarajevo in a convertible and Princip and his friends were ready. Ferdinand's route was known beforehand, and one of the group's members threw a bomb in front of the archduke's car. The bomb went off, the parade was cancelled, and Princip went to a café after the failed assassination attempt. Later in the day, Ferdinand led the driver to a hospital to visit innocent victims of the bomb. The driver took the wrong turn. He turned around, the car stopped, and Princip looked up and saw the archduke a few feet away. He fired his gun and World War I began. Highly unlikely events occur in both life and financial markets. The Misbehavior of Markets by Benoit Mandelbrot is all about chance, volatility and how to better prepare a portfolio for the extreme. Here are my main takeaways of the book: Modern financial theory is flawed. Investors are not always rational - they can be insane. Investors don't have the same preferences - a person has a different portfolio target than a corporate cashier. Prices moving continuously – they gap up and down. Price behavior is not random – it depends on recent history. Source: Page 103 of The Misbehavior of Markets A complex pattern may seem to come out of a random series of events. Accepting chance is uncomfortable, but that's what most of short-term market action is. Financial media assigns meaning and narrative to the noise - not because it's right, but because a coherent story just sounds better. Source: Page 32 of The Misbehavior of Markets Volatility clusters together. The volatility in the stock market itself has been volatile. Markets alternate between periods of rapid action and slow trading. Some years are quiet (2017) and some are much risky (2008). Research has shown that volatility tends to occur more often when markets show negative momentum. Standard deviation does not accurately measure risk. Markowitz's modern portfolio theory, Sharpes beta and the Black-Scholes formula are all based on the assumption that prices are normally distributed. The Dow plunged 29.2% at 10/19/1987. Academic formulas said this should not have happened. Errors occur when standard deviation is used to calculate the probability of extreme events. Source: Page 77 of The Misbehavior of Markets Stock Risk Prize is not a mystery. Some economists are puzzled by the fact that stocks have consistently outperformed less risky assets. Why does it keep happening when everyone knows stocks are doing better? Real investors know better than economists. They know the stock market is very risky and natural demand (and often gets) a higher return. The share risk premium has historically been stable and positive in the United States. A global story paints a more sober picture - private investors in China and Russia were wiped out when their stock markets fell to zero. Skewed distributions are everywhere. Many words in the dictionary are rarely used (alsike, chersonese) and a few (it, and) are very common. The world's richest 26 billionaires are as wealthy as the poorest 3.8 billion. Market volatility is similar – large amounts of usual punctuated by short periods of abnormality. Source: Page 254 of The Misbehavior of Markets Greater knowledge of danger provides greater security. For centuries, shipbuilders have put care into the design of their hulls and sails. They know that the sea is typically calm, but hurricanes sometimes happen. Shipbuilders design in the case of these storms - despite the fact that the construction appears overkill for the typical day. Mandelbrot's finding that prices are not normally distributed means that markets are riskier than previously thought. Most investors are like shipbuilders ignoring extreme weather and optimizing a portfolio for 95% of the time the market is normal. I really liked this book. You can find used copies on Amazon for $10. And here's a link to a great interview with Mandelbrot right after the financial crisis. Get recommended reads, offers and more from Basic By clicking on 'Sign up', I acknowledge that I have read and agree to Hachette Book Group's Privacy policy and terms of use Of course, the root cause of the crash was purely human: overoptimism. But the credit crisis of 2007/8 was magnified by a phenomenon that is new to our generation: an over-confidence in our understanding of markets, as evidenced by the industry's increasingly sophisticated computer models. We have long had accurate measurements and elaborate physical theories for such basic experiences as heat, sound, color and movement. Until Mandelbrot, we never had a proper theory of irregular, rough-all of course, the root cause of the accident was purely human: over-optimism. But the credit crisis of 2007/8 was magnified by a phenomenon that is new to our generation: an over-confidence in our understanding of markets, as evidenced by the industry's increasingly sophisticated computer models. We have long had accurate measurements and elaborate physical theories for such basic experiences as heat, sound, color and movement. Until Mandelbrot, we never had a proper theory about the irregular, rough — all the annoying imperfections that we usually try to ignore in life. The roughness is at the uneven edge of a metal break, the rough coastline of the UK, the static on a phone line, the gusts of wind – even the irregular maps of a stock index or exchange rate. As he puts it, Roughness is the uncontrolled element of life. I agree with the orthodox economists that stock prices are probably not predictable in any useful sense of the term. The basic concept: Prices are not predictable, but their fluctuations can be described by the mathematical laws of chance. Therefore, the risk is measurable and manageable. This is now orthodoxy that I subscribe to – up to a point. The old financial orthodoxy was founded on two critical assumptions in Bachelier's key model: the price changes are statistically independent, and they are distributed normally. The facts, as I vehemently argued in the 1960s and many economists now acknowledge, show otherwise. First, price changes are not independent of each other. Research in recent decades, by me and then by others, shows that many economic price ranges have a memory, of sorts. Today actually affects tomorrow. If prices take a big leap up or down now, they are more likely to move just as violently the next day. The economic dislocations convinced many professional financiers that something was wrong. Warren E. Buffett, the famously successful investor and industrialist, said he wants to fund university chairs in effective market hypothesis so that professors would train even more misunderstood financiers whose money he could win. He called the orthodox theory foolish and simply wrong. Extreme price fluctuations are the norm in financial markets – not deviations that can Price movements do not follow the well-behaved bell curve assumed by modern modern they follow a more violent curve that makes an investor turn a lot bumpy. Patterns are the tussly gold in financial markets. The chance of coincidence is enough to create false patterns and pseudo-cycles that for the whole world seem predictable and bankable. But a financial market is particularly susceptible to such statistical mirages. My mathematical models can generate charts that – purely by the operation of random processes – seem to trend and cycle. They would deceive any professional chartist. Similarly, bubbles and crashes are inherent for markets. They are the inevitable consequence of the human need to find patterns in the patternless. This trading period increases the clock during periods of high volatility, slowing it down during periods of stability. I am, of course, a true believer in the power of probability. Seeing nature through the lens of probability theory is what mathematicians call stochastic vision. Finance is a black box covered in a veil. Anticipation is a function unique to economics. It's psychology, individual and mass — even harder to fathom than the paradoxes of quantum mechanics. Anticipation is the stuff of dreams and vapors. Yet the idea of randomness in markets is difficult to understand, perhaps because, unlike the anonymous particles of a magnet or molecules in a gas, millions of people who buy and sell securities are real individuals, complex and well-known. One of the founders of modern probability theory, the late Russian mathematician Andrei Nikolaievitch Kolmogorov, wrote: The epistemological value of probability theory is based on the fact that random phenomena, considered collectively and on a large scale, create a non-regular randomity. You can see analogues of this dichotomy around. In history, modernists argue that the course of human events is shaped by many trends, economic and social, adopted in the lives of millions of forgotten individuals; historian's task is to track these trends. However, traditionalists, who are now returning to fashion, argue that the story was shaped and dominated by a few great men, Caesar or Napoleon, Newton or Einstein, for example. There were problems, of course. First, as Markowitz himself pointed out, it is not certain that using the clock basket is the best way to measure stock market risk; it is simple, but not necessarily correct. Secondly, to build efficient portfolios you need good forecasts for earnings, stock prices and volatility for thousands of stocks. Otherwise garbage in, rubbish out. Finally, for each share, you must painstakingly calculate its covariance with, or how it swings towards, each other stock. So the market, though, made Markowitz calculations. It was the most powerful computer of all, producing the tick-by-tick the optimal investment fund. IF MONEY IS AN IDOL, then one of the greatest temple connections in this modern belief sits on a tight bend of the Thames, a few miles downstream from central London.All models at distorts reality in a way or is a rich vein of jokes about economists and their assumptions. Take the old one about the engineer, physicist and economist. They find themselves wrecked on a desert island with nothing to eat, but one sealed can beans. How to get at them? The engineer suggests breaking can open with a stone. The physicist suggests warming the can in the sun, until it cracks. Economist's approach: First, assume that we have a canopy. . . . The assumptions of orthodox financial theory are at least as absurd, seen in isolation. Think of someone: 1) Assumption: People are rational and aim only to get rich. Reality: People simply don't think when it comes to any theoretical utility measurable in dollars and cents, and are not always rational and self-interested. Over the past twenty-five years, the refusal of this one assumption of modern financial theory has created a fertile new field of inquiry, called behavioral economics. It studies how people misinterpret information, how their feelings distort their decisions, and how they miscalculate probabilities.2) Assumption: All investors are equal. Reality: Patent-wise, people aren't the same - even if differences in wealth are ignored. Some buy and hold shares for twenty years, for a pension fund; other flip stocks daily, speculating on the Internet. Some are value investors who look for shares in good companies temporarily out of fashion; others are growth investors trying to catch a ride on rising rockets. When you release the assumption of homogeneity, new and complicated things happen in your mathematical models of the market.3) Assumption: The price change is practically continuous.4) Assumption: Price changes follow a Brownian movement. The classical termetics resemble euclidic geometers in a non-Euclitic world that discovers that in experience, straight lines meet seemingly parallel often, rebuke the lines for not keeping right – as the only remedy for the unfortunate collisions that occur. Yet, in truth, there is no solution except to throw over the axiom of parallels and to train a non-Euclidic geometry. Something similar is required today in economics. – John Maynard Keynes The key is to see the regularity inside the irregular pattern in the shapeless. Simple rules build complex structures, and complex structures are deconstructed into simple rules. Markets are inherently uncertain, and bubbles are inevitable. Forecasting prices can be dangerous, but you can estimate the odds of future Volatility.In financial markets, the idea of Verdi has limited Value.As described previously, the most famous formula was published in 1973 by Fischer Black and Myron Scholes, and it has been known for years that it is simply wrong. It makes unrealistic assumptions. It claims that prices vary according to the clock curve; volatility does not change through the life of the option; prices do not jump; taxes and commissions do not exist; and so on. A fundamental problem is Black-Scholes' assumption of constant the essence, that the world does not change. ... More... More