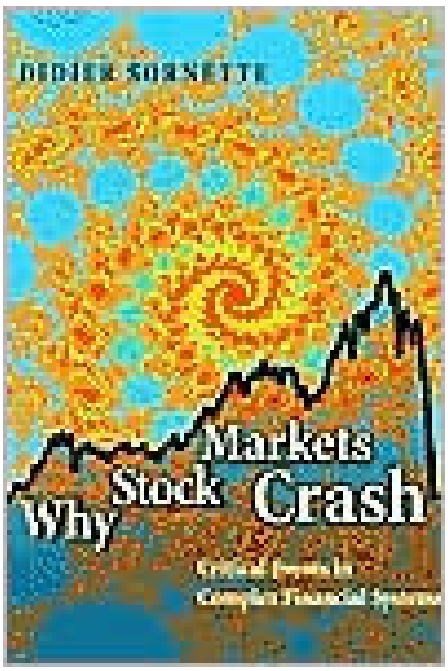

Why Stock Markets Crash: Critical Events in Complex Financial Systems

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The scientific study of complex systems has transformed a wide range of disciplines in recent years, enabling researchers in both the natural and social sciences to model and predict phenomena as diverse as earthquakes, global warming, demographic patterns, financial crises, and the failure of materials. In this book, Didier Sornette boldly applies his varied experience in these areas to propose a simple, powerful, and general theory of how, why, and when stock markets crash.
Most attempts to explain market failures seek to pinpoint triggering mechanisms that occur hours, days, or weeks before the collapse. Sornette proposes a radically different view: the underlying cause can be sought months and even years before the abrupt, catastrophic event in the build-up of cooperative speculation, which often translates into an accelerating rise of the market price, otherwise known as a "bubble." Anchoring his sophisticated, step-by-step analysis in leading-edge physical and statistical modeling techniques, he unearths remarkable insights and some predictions--among them, that the "end of the growth era" will occur around 2050.
Sornette probes major historical precedents, from the decades-long "tulip mania" in the Netherlands that wilted suddenly in 1637 to the South Sea Bubble that ended with the first huge market crash in England in 1720, to the Great Crash of October 1929 and Black Monday in 1987, to cite just a few. He concludes that most explanations other than cooperative self-organization fail to account for the subtle bubbles by which the markets lay the groundwork for catastrophe.
Any investor or investment professional who seeks a genuine understanding of looming financial disasters should read this book. Physicists, geologists, biologists, economists, and others will welcome "Why Stock Markets Crash" as a highly original "scientific tale," as Sornette aptly puts it, of the exciting and sometimes fearsome--but no longer quite so unfathomable--world of stock markets.

Why Stock Markets Crash: Critical Events in Complex Financial Systems Details

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Author	:	Didier Sornette
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From Reader Review Why Stock Markets Crash: Critical Events in Complex Financial Systems for online ebook

Ethan Drower says

I'd skip this one.

Jacob says

It is fair to compare this book to the Black Swan by Nassim Taleb. Here an attempt is made to analyze and quantity instabilities of the Black Swan variety; mostly the [stock] market(s) but the final chapter contains an analysis of civilization itself. The book is VERY rich in concepts and ideas, much more so than most books. It also assumes a lot from the reader. If, for example, Ising model, K-selected, or Polya's Urn doesn't ring a bell for you, this may be too difficult a read.

Chris says

http://seekingalpha.com/article/11887...

Andre Luis says

Não pude ler o livro todo. Muito matemático e demonstra muita confiança em equações baseadas em dados históricos.
Apresenta algumas argumentações interessantes sobre como modelar o mercado de capitais e sobre "rational expectations". Válido para lembrar sobre bolhas e seus efeitos.

Mario C says

Thoughts on what is a very interesting book on capital markets behavior that is not well understood.

Stock market crashes are caused by the slow build-up of long range correlations leading to a global cooperative behavior of the market and eventually resulting in a collapse in a short, critical time interval
• Crash may be caused by local self-reinforcing imitation between traders. If traders are more likely to imitate other traders which increases up to a certain point – critical point – by placing the same type of order – all buys or all sells – increases the probability of a crash. Frame work for understanding needs to be probabilistic b/c crashes are not certain outcomes
• Bubbles manifest themselves as overall super-exponential power-law acceleration in the price decorated by log-periodic precursors – a concept related to fractals
• Bubbles across epochs share a common underlying background as well as structure
o Rationale: rooted in the fact that humans are endowed with the same basic human emotions across history

– fear and greed.
• Large crashes are not the same as a single large decline – they are fundamentally different events. i.e. A 1% decline is not the same event as a 10% decline and cannot be modeled as such

Financial Crashes are Outliers

• In the Bachelier-Samuelson financial world, in which distributions are normally (Gaussian, bell shaped) distributed, all returns are scaled according to a fundamental "ruler" called Standard deviation
• In reality, returns are not Gaussian
• They are not far from exponential law
• Under Gaussian assumptions: Oct 19/1987 -22.6% & Oct 20, 1987 rebound +9.7% should not occur. They are essentially impossible
• Under exponential law: rebound of 9.7% less extraordinary, once every 22,026 days or 88 yrs, -22.6% should occur every 520 million yrs – still qualifies as an outlier
• Can't look at individual return data and assume that each successive return is uncorrelated. Drawdowns preserve the information in busts of activity that demonstrate local dependence.
• Body and tail of distributions are made up of 2 different populations that have different physics, scaling & properties.
• Large outliers are not scaled up versions of small fluctuations
o Distribution is made up of 2 different populations – the body & tail, which have different physics, scaling & properties
• Drawdown calculation, rather than daily or weekly returns or any other fixed time scale returns, are more adequate time-elastic measures of price moves
o Simply looking at daily returns and their distributions destroys information that the daily returns may correlated at specific times

Positive Feedbacks

• positive feedback asserts that the higher the price or the price return in the recent past, the higher will be the price growth in the future
• There is growing empirical evidence of the existence of herd or "crowd" behavior in speculative markets. It Is Optimal to Imitate When Lacking Information

Modeling Financial Bubbles and Market Crashes

Models are synthetic sets of rules, pictures, and algorithms providing us with useful representations of the world of our perceptions and of their patterns
• More correct – bounded rationality. They do not have perfect knowledge. "long list of irrational or anomalous behavior shown by human beings in certain specific systematic ways should not confuse us: the relevant task for understanding stock markets is not so much to focus on these irrationalities but rather to study how they aggregate in the complex, long-lasting, repetitive, and subtle environment of the market"

The Risk-Driven Model

• Models investor behaviours, developed to formalize herd behavior or mutual mimetic contagion in speculative markets
• The emergence of bubbles is explained as a self-organizing process of infection among traders
• Its key assumption is that a crash may be caused by local selfreinforcing imitation between traders. This self-reinforcing imitation process leads to the blossoming of a bubble. If the tendency for traders to "imitate" their "friends" increases up to a certain point called the "critical" point, many traders may place the same order (sell) at the same time, thus causing a crash. The interplay between the progressive strengthening of imitation and the ubiquity of noise requires a stochastic description: a crash is not certain but can be characterized by its hazard rate that is, the probability per unit time that the crash will happen in the next instant provided it has not happened yet.

• Since the crash is not a certain deterministic outcome of the bubble, it remains rational for traders to remain invested provided they are compensated by a higher rate of growth of the bubble for taking the risk of a crash, because there is a finite probability of “landing smoothly,” that is, of attaining the end of the bubble without crash. In this model, the ability to predict the critical date is perfectly consistent with the behavior of the rational agents: they all know this date, the crash may happen anyway, and they are unable to make any abnormal riskadjusted profits by using this information

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Richard Crowder says

Do not buy this as an e-book; a couple of Princeton e-books on mathematical subjects that I've bought had bad misprints in the formulas. For this book, I read the paperback 2017 edition with a new preface by the author.

Stock-market crashes generally take everyone by surprise--they feel like bolts from the blue. They're usually not. Sornette shows how the interplay of greed, fear, and imitation among investors and traders creates an accelerating rhythm of sudden rises alternating with increasingly brief pauses. This "mathematical signature" can begin months or years in advance, but its predictive value rises in the last year before the death of the bubble (which may be relatively calm, but usually is followed by a crash).

Sornette presents the results of several predictions made using this technique. While his track record is not perfect, it is strongly better than what could be expected from chance. Although the math is advanced, the discussion and the graphs make the argument clear to the lay reader.

What about the everyday investors who don’t have access to Sornette’s computational skills? The lesson is straightforward: as markets rise, and especially as they rise sharply, so does the danger of a crash. As they watch a sharp rise, investors should reduce their equity positions to capture gains made so far and limit the danger to their portfolios.

But let's assume that you're not in the stock market and don't plan to be. The last chapter broadens the discussion to consider a wide range of problems confronting the world in the period from the year of publication (2002) to the potential "end of the growth era" around 2050. Many of the trends described have only become more pressing since 2002. This book is both important and fascinating--not just for investors but also for citizens of an uncertain world.

Yates Buckley says

An important technical text that evalutes the dynamics of market crashes, through simulation and mathematical modeling.

Thr text is also confusignly written, disorienting in structure, so that by the end you are not sure what to take away to your everyday life.

Stephan Pire says

I greatly recommend this book. It goes from the history of crashes down to the detail on how to predict market events through physics (fractal)

Stevenglinert says

I read most of this while shit was running on my computer in the GSB library. I'm sure the MBAs love it. So, like Lacan always uses math terminology in this like weird bullshit way and this was similar.

This felt like a guy trying to rewrite Kindleberger with more complex math and a cool cover. Wow such fractal. But he's a geophysicist and like, his attempts at economics and social science came off as forced. Just read Kindleberger and Shiller's Irrational Exuberance and like don't bother.

Chang Lan says

Ising + Hierarchical Structure = Power Law + Log Periodic
