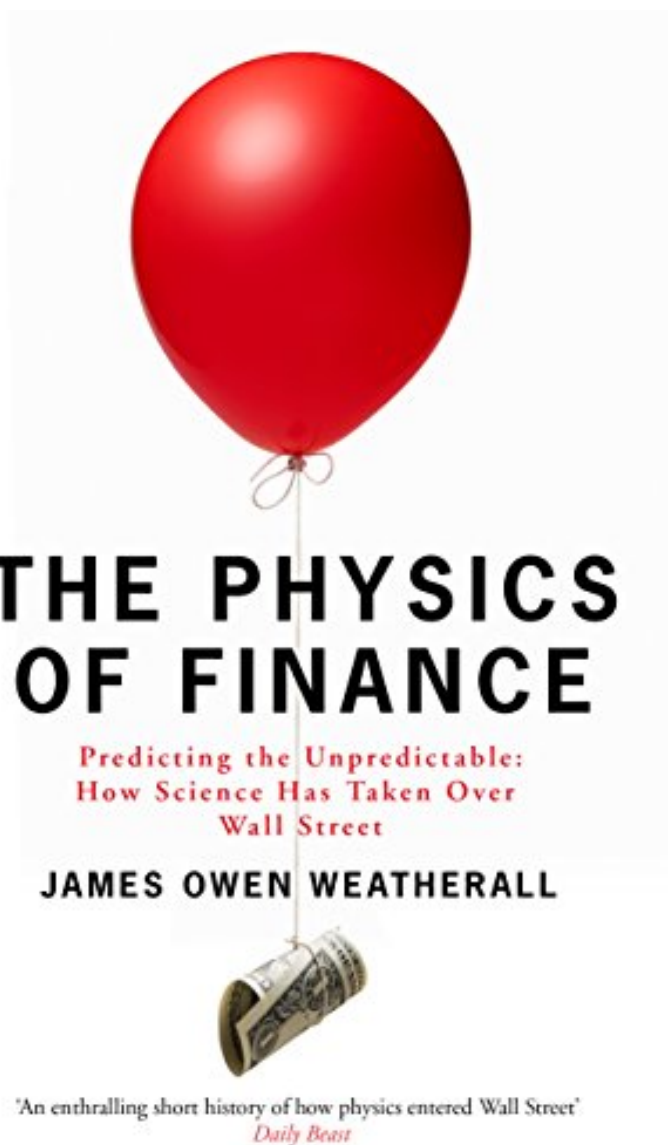


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The Physics of Finance: Predicting the Unpredictable: How Science Has Taken Over Wall Street



Par James Owen Weatherall
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Description :

Prsentation de l'diteurA book which reveals the people and ideas on the cusp of a new era in finance... After the economic meltdown of 2008, many pundits placed the blame on "complex financial instruments" like derivatives, and the physicists and mathematicians who dreamed them up. But a young academic named

James Owen Weatherall quickly began to question this narrative. Were the physicists really at fault? In this important and engaging book, Weatherall tells the story of how physicists came to Wall Street and how their ideas changed finance forever. Taking us from fin-de-sicle Paris to Rat Pack-era Las Vegas, from wartime government labs to Yippie communes, he shows how physicists successfully brought their science to bear on some of the thorniest problems in economics, from options pricing to bubbles. The trouble is that models—whether in science or finance—have limitations; they break down under certain conditions. And in 2008, sophisticated models fell into the hands of people who didn't understand their purpose, and didn't care. It was a catastrophic misuse of science. The solution, Weatherall argues in this brilliantly entertaining book, is not to give up on models; it is to simply make them better.

Revue de presse An enthralling short history of how physics entered Wall Street - *The Daily Beast* Fascinating history... Happily, the author has a gift for making complex concepts clear to lay readers -- *Booklist* A lively account of physicists in finance... An enjoyable debut appropriate for both specialists and general readers -- *Kirkus* Anyone interested in how markets work will appreciate this serious hypothesis -- *Publishers Weekly* Beautifully written, with clarity, understanding, and a broad view that is rare in these domains. Even those of us who are unconvinced physics has played an important role in finance will be carried along and learn from this engaging book. -- *Stephen M. Stigler*, Ernest DeWitt Burton Distinguished Service Professor of Statistics, University of Chicago

James Weatherall channels the sheer intellectual excitement of unlocking the secrets of nature, whether they relate to fundamental particles or financial markets -- *Hans Halvorson*, professor of philosophy, Princeton University

Weatherall has a rare talent for making the complex comprehensible, and he puts it to excellent use explaining the role of physics and mathematics in financial markets. This is a book anyone concerned with the unforeseen consequences of financial innovations will want to read -- *Lee Smolin*, author of *The Trouble with Physics*

Weatherall probes an epochal shift in financial strategizing with lucidity, explaining how it occurred and what it means for modern finance -- *Peter Galison*, author of *Einstein's Clocks, Poincaré's Maps*

Weatherall's rollicking tale of science and profit has relevance to us all. He goes beyond the Frankenstein's monster cliché to argue that mathematical models are an essential foundation of a saner future -- *William Poundstone*, author of *Fortune's Formula*

James Weatherall has announced his arrival as one of our leading young science writers. This smart, fast-paced history of ideas which is packed with vivid portraits of brainiacs famous and obscure and offers a provocative analysis of our current economic woes should appeal to a broad range of readers, from hard-core science junkies to business folks trying to make sense of modern finance -- *John Horgan*, Director, Center for Science Writings, Stevens Institute of Technology

This book will lead you to reexamine what you thought you knew about the financial markets, and why it is so important for the economists to actually listen to what the physicists have been trying to tell them -- *Bill Maurer*, director of the Institute for Money, Technology and Financial Inclusion, University of California, Irvine

A compelling case for models in economics and an important book for anyone who embraces the scientific method for improving the lot of mankind -- *Michael Brown*, former CFO of Microsoft Corporation, past chairman of NASDAQ

Q. What is *The Physics of Finance* all about?
A. Over the past few years, we've heard a lot about a new kind of Wall Street elite known as "quants". These are often physicists and mathematicians who have moved to finance and brought radically new ideas along with them. This book is an attempt to understand these quants and the mathematical models they use to predict market behavior. It's two parts history and one part argument: I tell the surprisingly fun story of how physicists and their ideas made it to Wall Street in the first place, and along the way I argue that this history reveals something important about how we should think about the models and practices they have introduced--especially in light of the 2007-2008 financial crisis.

Q. You say the history is surprisingly fun. Can you give an example?
A. The physicists and mathematicians I write about in the book are (or were) very smart, creative people who put their scientific training to use in surprising new ways. Their stories are fascinating. For instance, Edward Thorp, who invented the modern quantitative hedge fund, was also the first person to prove that card counting could be used to reliably get an edge in blackjack. He spent a good amount of time working the card tables in Las Vegas. And Norman Packard and Dooyne Farmer, who started a pioneering financial services firm in the early 1990s, spent their graduate school years at UC Santa Cruz inventing the new science of chaos theory while trying to build a computer to beat the odds in roulette--the profits from which were intended to start a yippie commune in the Pacific Northwest.

Q. What surprised you most about the history you uncovered?
A. One thing that surprised me was that derivatives contracts such as options, futures, and swaps, which are often discussed as though they were a troubling new innovation, have actually been around for thousands of years. For example, scientists have

found cuneiform tablets containing records of futures traded by ancient Sumerians. Even the idea of using mathematical methods to price options is quite old. I pick up the story in 1900, with the visionary work of a French physicist named Louis Bachelier, but some strands go back further, to the mid-nineteenth century.

Plus, there are some striking historical connections in the book. For instance, I explain the relationship between the invention of nylon and the development of the atomic bomb--and how both influenced at least one physicist's to switch to a financial career. And I tell the story of how the space race and the Vietnam War were partly responsible for many physicists moving to Wall Street banks in the 1980s. ---Q. What can this history teach us about models used in finance?A. If you look at how the physicists and mathematicians who came up with the earliest financial models thought about what they were doing, the role of simplifying assumptions and idealizations becomes very clear. The goal was to get a toehold on some very hard problems, and not to come up with a final, overarching theory of financial markets. Making simplified assumptions can lead to the solution of a problem that you otherwise couldn't solve--but that solution is only going to be a reliable guide to how the world works when the assumptions you've made are approximately true. The important question, and the one that physicists are always trained to ask, is when do your assumptions fail and what happens when they do? I don't think the importance of this question has been recognized as widely as it should be among the traders who rely on these models.Q. At the end of the book, you describe an "Economic Manhattan Project." What would that be like?A. The Economic Manhattan Project was proposed in 2008 by the mathematical physicist and hedge fund manager Eric Weinstein. The idea is that economic and financial security--that is, regulating the economy to avoid future calamities--should be at the very top of our agenda. Yet the resources we devote to physical security, to military technology and defense, far outstrip what we spend on developing better economic theories. In the past, America has set goals--for the original Manhattan Project, the race to the moon, and others--when we have funneled resources into serious innovation. And whenever we have done so, we have succeeded in accomplishing great things. I think it is time to make a similar kind of commitment to developing the next generation of economic models, with the goal of finding radical new ideas to make the economy safer and more robust.Q. You're a philosophy professor. Why did you write a book about finance?A. The short answer is simply that I find the history and the ideas fascinating. I have a Ph.D. in physics and I like thinking about how physics can be applied to novel problems. The longer answer is that the issues in this book aren't so far removed from philosophy. Philosophers spend a lot of time thinking about what we can know about the world and how to deal with fundamental uncertainty. Philosophy has a reputation for being abstract and distant from everyday concerns. And sometimes it is. But when it comes to mathematical models, philosophical issues really matter for how we make important economic and financial decisions--decisions that have significant real-world ramifications. And for me, at least, the most interesting and important philosophical questions are those that we face as practicing scientists and policymakers--and even as investors. ---Prsentation de l'diteurA book which reveals the people and ideas on the cusp of a new era in finance... After the economic meltdown of 2008, many pundits placed the blame on "complex financial instruments" like derivatives, and the physicists and mathematicians who dreamed them up. But a young academic named James Owen Weatherall quickly began to question this narrative. Were the physicists really at fault? In this important and engaging book, Weatherall tells the story of how physicists came to Wall Street and how their ideas changed finance forever. Taking us from fin-de-sicle Paris to Rat Pack-era Las Vegas, from wartime government labs to Yippie communes, he shows how physicists successfully brought their science to bear on some of the thorniest problems in economics, from options pricing to bubbles. The trouble is that modelswhether in science or financehave limitations; they break down under certain conditions. And in 2008, sophisticated models fell into the hands of people who didn't understand their purpose, and didn't care. It was a catastrophic misuse of science. The solution, Weatherall argues in this brilliantly entertaining book, is not to give up on models; it is to simply make them better.