

# TUNE OUT THE NOISE

**An Errol Morris Film**

FOURTH FLOOR PRODUCTIONS AND MOXIE PICTURES PRESENT AN ERROL MORRIS FILM "TUNE OUT THE NOISE" FEATURING DAVID BOOTH REX SINQUEFIELD EUGENE FAMA MYRON SCHOLES  
ROBERT C. MERTON ROGER IBBOTSON KENNETH FRENCH JOHN "MAC" MCQUOWN JEANNE SINQUEFIELD GERARD O'REILLY SAVINA RIZOVA DAVID BUTLER MARK HEBNER NORM MINDEL  
BILL BRADLEY CO-PRODUCERS JOSHUA KEARNEY MOLLY ROKOSZ DINA ALEXANDER PISCATELLI GRAPHICS JEREMY LANDMAN MUSIC BY PAUL LEONARD-MORGAN EDITOR STEVEN HATHAWAY  
DIRECTOR OF PHOTOGRAPHY IGOR MARTINOVIC PRODUCERS JULIE BILSON AHLBERG ROBERT FERNANDEZ DIRECTED BY ERROL MORRIS COPYRIGHT © 2023 BRAIN TRUST LLC. ALL RIGHTS RESERVED.

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When it comes to investing,  
*data doesn't lie.*

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**At Dimensional, we often say our story  
is bigger than the firm itself.**

It's a story about how finance became a science and challenged the traditional methods of investing. That, in turn, led to the invention of index funds, the founding of Dimensional Fund Advisors, and the evolution of client-focused advice—advances that have benefited generations of investors.

Dimensional believes these developments can help even more investors have the experience they deserve. That is why we worked with Academy Award-winning filmmaker Errol Morris on *Tune Out the Noise*. Our hope is that the documentary will show people around the world that there's a better way to invest.



## Errol Morris on the Art and Science of Markets

In learning about markets,  
I'm confronted with questions:  
What governs their behavior?  
What do they really represent?  
What are they telling us?  
What do they *mean*?

Couple these quandaries with the deep human need to learn something from the past, not just make sense out of it. What governs boom and bust? Why one price rather than another? And one of the deepest questions: Can we predict the future? The 1950s and '60s saw as great a revolution in finance as the one in science during the early Renaissance. We've witnessed the growth of computers and come to the realization that the markets themselves might be a real-world computer, with investors playing the role of processors.

What science does is try to make visible the hidden, the unknown, the potentially indecipherable. People are always hoping that scientists will reveal to them the true meaning of things. But even if science takes us

deeper into the behavior of the world around us, it does not reveal deeper meaning. Why do things behave the way they do? Why do certain phenomena commandeer our attention, directing it to hidden patterns cloaked in the ubiquity of noise? As in art, so in science that eternal question remains: What is defined by us and what is out there to be discovered by us?

We're trying to discover a reality beyond what is manifest. We're learning to look at the world in a different way than the familiar or the expected—realizing that subtle shapes and strange forms can often reveal something new and unexpected. Art and science show us that there is often something beyond our ken, beyond our reach. Ironically, modern finance doesn't tell us about what will happen next. It takes us into that mystery.

—Errol Morris

## Featured in the Film

The 15 people interviewed in *Tune Out the Noise*, in order of appearance.

### David Booth

When he sold shoes on commission as a teenager in Lawrence, Kansas, David Booth refused to shade the truth just to make a sale. Booth eventually built a global investment firm based on the reality of market pricing instead of the mirage of stock picking. "It's not about being big," says the Founder and Chairman of Dimensional Fund Advisors. "It's about doing things the right way."

### Rex Sinquefeld

A ruptured aorta took his dad's life in 1950, when Rex Sinquefeld was 5 years old. He grew up in a St. Louis orphanage and was drafted into the military before landing in the legendary Merton Miller's class at the University of Chicago, where he first learned about efficient markets. Sinquefeld and fellow UChicago PhD student David Booth would go on to found Dimensional in 1981.

### Eugene Fama

Gene Fama, "a poor kid from Malden," a working-class town in eastern Massachusetts, at first majored in French when he enrolled at Tufts, his local university, in the 1950s. But he soon discovered economics and fell in love with it. Fama, a 2013 Nobel laureate, is regarded as the father of the efficient market hypothesis.

### Myron Scholes

One of the first computer programmers at the University of Chicago in the early 1960s, Myron Scholes soon earned a scholarship to the PhD program at the Graduate School of Business. Fischer Black and Scholes developed the option pricing framework in the early 1970s, and Scholes was named a Nobel laureate in 1997 (with Robert Merton; Black had passed away in 1995) for creating a groundbreaking method to determine the value of derivatives.

### Robert Merton

At 10 years old, Robert Merton bought his first stock (General Motors). In the next two decades, painstaking work by researchers who studied stock price data revolutionized finance into a science—and Merton's own scientific work in dynamic portfolio theory and the pricing of derivatives paved the way for industry-leading advances in risk management.

### Roger Ibbotson

Not "mechanically inclined," Roger Ibbotson knew he wasn't cut out for his family's HVAC business. So he went to the University of Chicago to study economics. Ibbotson and another UChicago alum, Rex Sinquefeld, transformed voluminous data generated by the Center for Research in Security Prices (CRSP) into *Stocks, Bonds, Bills, and Inflation*, their influential 1977 study of major US asset class returns.

### Ken French

While studying finance as a PhD student at the University of Rochester in the early 1980s, Ken French realized that the names of most mutual funds told investors almost nothing about their underlying investments. A decade later, trailblazing research by Fama and French on factors that explain stock and bond returns forever changed the mutual fund landscape and the fundamentals of portfolio management.



### John "Mac" McQuown

A farm boy from Sandwich, Illinois, John "Mac" McQuown grew up understanding that agriculture was a numbers game. His dedication to data analysis eventually led to a position created just for him at Wells Fargo Bank in 1964. A decade later, McQuown and Booth created one of the first S&P 500 index funds. When Booth launched Dimensional, McQuown became a founding board member.

### Jeanne Sinquefeld

Dimensional needed to hire somebody to manage trading when the firm began. At the time, Rex's wife, Jeanne Sinquefeld, who had a PhD and an MBA from the University of Chicago, was designing options for the Chicago Board of Trade. A self-described "data freak," Jeanne took the job at Dimensional, where she ended up wearing numerous hats, including training all traders and portfolio managers. She served as Executive Vice President and Head of Trading until retiring in 2005.

### Gerard O'Reilly

At age 16, when most teens are just thinking about college, Ireland native Gerard O'Reilly was studying for a BA in theoretical physics at Trinity College Dublin. An MS in high-performance computing followed, then a PhD in aeronautics from Caltech in 2004. The next milestone for this rocket scientist: researcher at Dimensional, where he would later rise to Chief Investment Officer. In 2017, O'Reilly became the firm's Co-CEO.

### Savina Rizova

Born in Bulgaria, a communist country at the time, Savina Rizova came to Dartmouth College to study finance and became a research assistant for Professor Ken French. Now Global Head of Research at Dimensional, Rizova was named one of *Barron's* "100 Most Influential Women in US Finance" in 2022 and 2023.

### Dave Butler

Following a decorated college basketball career at the University of California, Berkeley, and a few years as a pro, Dave Butler joined a big Wall Street firm. He would soon lose a significant amount of his net worth on a stock (Boston Chicken) recommended by his broker. It was one of several "aha" moments that led Butler, now Co-CEO of Dimensional, to become a champion of "holistic wealth management."

### Mark Hebner

After big success in the pharmaceutical industry, Mark Hebner retired at age 32. Then a cold-calling broker persuaded him to buy a bunch of individual municipal bonds and stocks. Compared to investing in a portfolio of passively managed or index funds, that sales pitch led to his missing out on millions in potential gains. To help other investors avoid his error, Hebner created one of the first web-based advisory firms, Index Fund Advisors.

### Norm Mindel

A cofounder of Forum Financial Management, Norm Mindel is a renowned financial advisor, attorney, CPA, CFP®, author, and public speaker. Working with Dimensional changed his professional career and helped his clients and family achieve their financial goals through a long-term, disciplined investment approach.

### Senator Bill Bradley

A financial advisor once told former US Senator Bill Bradley, "Not many people have access to something so intimate as people's dreams. That's what I have." The lesson, Bradley says, is that achieving any dream—a vacation home, a beautiful painting, sending children to college—depends on how people invest. Bradley, a two-time NBA champion with the New York Knicks, is a consultant to Dimensional.

# Milestones of Modern Finance

1952

**1952**  
Harry Markowitz develops **Modern Portfolio Theory**, which shows that portfolio diversification reduces risk.

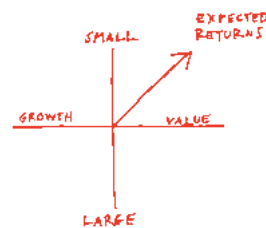


**1957**  
The **Fortran programming language** and **IBM 709 computer**, both instrumental in Eugene Fama's doctoral research, are developed.



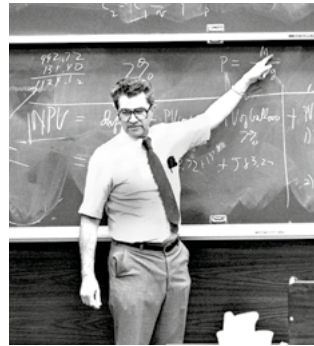
**1992**  
Fama and Ken French publish "**The Cross-Section of Expected Stock Returns**," their pathbreaking paper pointing to company size and relative price as the principal drivers of equity returns.

**1993**  
Fama and French develop the **three-factor model** to explain the behavior of stock returns, and additionally show term and credit factors that explain most bond returns.



**1997**  
**Merton and Scholes** are named **Nobel laureates** for developing a new method to determine the value of derivatives.

**1997**  
Fama and French show that **value stocks have higher returns than growth stocks** historically in 12 of 13 international markets.



**1958**  
Merton Miller and Franco Modigliani develop the **Modigliani-Miller theorem**, showing that a firm's dividend policy is an unreliable guide for stock selection.

**1960**  
James Lorie and Lawrence Fisher launch the **Center for Research in Security Prices (CRSP)** at the University of Chicago.

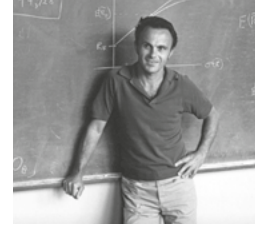


**1964**  
William Sharpe develops the **Capital Asset Pricing Model**, a method for evaluating the expected return and risk of securities and portfolios.

**1964**  
The **first CRSP stock market database is completed**, allowing the average rate of return on US equities from 1926-1960 to be measured for the first time.

**1965**  
Fama's historic *Financial Analysts Journal* paper, "**Random Walks in Stock Market Prices**," defines the concept of an efficient market, in which the market price is a good estimate of a security's worth.

**1965**  
**Paul Samuelson**, in a pioneering academic paper, posits that changes in security prices follow random patterns and that **future share prices are unpredictable**.



**1969**  
**David Booth enrolls as a PhD candidate** at the University of Chicago Graduate School of Business.

**1968**  
Michael Jensen, in the **first major study of mutual funds**, shows that active managers typically underperform simply buying and holding the market.

**2006**  
Fama and French test the relation between a company's profitability and investment on stock returns.

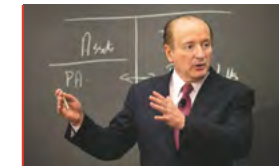


**2008**  
The University of Chicago Graduate School of Business is renamed the **University of Chicago Booth School of Business** in honor of alumnus David Booth, who makes a donation valued at \$300 million.

**1970**  
Fama publishes "**Efficient Capital Markets: A Review of Theory and Empirical Work**," which offers the first comprehensive review of efficient-markets research.

**1971**  
**John "Mac" McQuown** at Wells Fargo Bank **recruits Booth** to help develop the first index portfolio.

**1972**  
**Rex Sinquefeld** graduates from the University of Chicago Graduate School of Business.



**2009**  
**Merton joins Dimensional** as Resident Scientist.

**2010**  
Fama and French find that mutual fund investors in aggregate **realize net returns that underperform benchmarks** by about the same amount as costs in expense ratios.

**1973**  
Burton G. Malkiel publishes **A Random Walk Down Wall Street**.

**1973**  
McQuown and Booth at Wells Fargo and Sinquefeld at American National Bank **launch some of the first portfolios based on the S&P 500**.

**1973**  
Fischer Black, Robert Merton, and Myron Scholes develop the **Options Pricing Model**, which shows new ways to segment, quantify, and manage risk.

**2013**  
**Robert Novy-Marx's research** shows how **profitability** helps explain differences in stock returns.

**2013**  
**Fama wins the Nobel Prize** in Economic Sciences for his empirical analysis of asset prices.



**1977**  
Roger Ibbotson and Sinquefeld publish **Stocks, Bonds, Bills, and Inflation**, their influential study of major US asset class returns since 1926.



**1981**  
**Dimensional is founded** from a spare bedroom in Booth's Brooklyn brownstone. Fama and McQuown become founding corporate directors, while Ibbotson, Miller, and Scholes become founding independent directors of the US mutual funds board.

**1981**  
Rolf Banz's research shows that **small companies have higher expected returns**.

**1984**  
Fama publishes groundbreaking bond research titled "**The Information in the Term Structure**."



**2022**  
Chicago Booth professor **Douglas Diamond**, lead Independent Director on the Dimensional US fund board, **receives the Nobel Prize in Economic Sciences** for research on banks and financial crises.

2023





45°, 90°, 180°  
2017-19  
Michael Heizer



Zig Zag, 1995  
Sol LeWitt  
2022 The LeWitt Estate / Artists Rights Society  
(ARS), New York



Anda, 2015  
James Turrell



## About the Art in the Film

David Booth, the Founder and Chairman of Dimensional, is an avid art collector. The grounds of Booth's residence along Lake Austin in Austin, Texas, are home to the numerous paintings, sculptures, and other pieces featured in *Tune Out the Noise*.

Art and investing may seem like strange bedfellows. Booth sees it differently.

"People say, 'Well, what kind of art do you like to collect?'... It's very similar to my view of economics and investing. I like simple ideas well executed," he explains in the film.

"My view of life is there's no evidence that complexity adds a lot of value."

As a philanthropist, Booth has participated in and donated to artistic initiatives across the US. The David Booth Conservation Center and Department is responsible for the preservation of the Museum of Modern Art (MoMA) collection in New York. In 2022, Booth received MoMA's David Rockefeller Award, presented annually to "an individual from the business community who exemplifies enlightened generosity and effective advocacy of cultural and civic endeavors."

In the future, Booth plans to convert his property for civic use, making the artwork there accessible to the public.

Opposite page:  
*Pacific Red*, 2016-17  
Larry Bell

This page:  
*Untitled*, 2015  
Joel Shapiro

Photo credit:  
Casey Dunn



## Paul Leonard-Morgan on Composing the Film's Score

Collaborating with Errol is always a unique process. Music drives the momentum and energy of many of his films. When he approached me about his film on the world of finance, it got my brain going overtime.

The thought of stock tickers, the tapes printing out—it gave me this thought of creating a real energy and hustle and bustle to the music. The momentum of these images was what I tried to transfer into musical motifs, so in all the tracks there are perpetual-motion rhythms and polyrhythms. There's a real pace and flow to the music, though one never fully settles into it. Every time you feel the music getting into a groove, it takes you in a different direction, so you're never sitting comfortably—the same frenetic feeling I would imagine one finds on the stock-market floor.



Recording the orchestra in Nashville really brought these tracks to life. This kind of music is incredibly tough to play, with the wind playing arpeggiated motifs in different time to the strings—all these rhythms driving the pace of the film and helping the story on its journey, the same way that the tickers create an energy. The musicians did a phenomenal job.

—Paul Leonard-Morgan



### About the Director

Errol Morris's films have won many awards, including an Oscar for *The Fog of War*, the Grand Jury Prize at the Sundance Film Festival for *A Brief History of Time*, the Silver Bear at the Berlin International Film Festival for *Standard Operating Procedure*, and the Edgar from the Mystery Writers of America for *The Thin Blue Line*.

His films have been honored by the National Society of Film Critics and the National Board of Review. Morris's work is in the permanent collection of the Museum of Modern Art (MoMA). Roger Ebert called his first film, *Gates of Heaven*, one of the 10 best films of all time. Morris is also the author of two *New York Times* bestsellers, *Believing Is Seeing* and *A Wilderness of Error*. Morris has directed over 1,000 television commercials, including campaigns for Apple, Levi's, Nike, Target, Citibank, and Miller High Life. He has directed short films for the 2002 and 2007 Academy Awards, ESPN, and many charitable and political organizations. In 2001, Morris won an Emmy for "Photobooth," a commercial for PBS.

Morris has received fellowships from the National Endowment for the Arts, a Guggenheim Fellowship, and a MacArthur Fellowship. In 2007, he was inducted into the American Academy of Arts and Sciences. He is a graduate of the University of Wisconsin-Madison and was a graduate student at Princeton University and the University of California, Berkeley. He has received the Columbia Journalism Award and honorary degrees from the University of Wisconsin-Madison, Brandeis University, and Middlebury College.

### About the Composer

Paul Leonard-Morgan is a BAFTA award-winning and Emmy-nominated composer whose unique cinematic style fuses orchestra with electronica. He has worked with director Errol Morris on a string of projects including the documentary features *The B-Side* and *American Dharma*, and the Netflix series *Wormwood*.

Prior to working in film, he produced and arranged for musical acts including Belle and Sebastian, Snow Patrol, Mogwai, and No Doubt. His groundbreaking score for 2011's *Limitless* solidified him as a major player in the film music industry. In 2012, his work for the film *Dredd* was widely recognized as launching a new generation of hybrid scores. Other screen credits include the documentary *The Quiet One*, the feature *Last Breath*, the hit series reboot *Dynasty*, Netflix's *Designated Survivor*, and the feature *The Tomorrow Man*, which debuted at the 2019 Sundance Film Festival. He co-scored Amazon's 2020 sci-fi series *Tales from the Loop* with composer Philip Glass. He also worked on three short *Minions* films and the animated *Walking with Dinosaurs 3D*. His work in video games includes music for *Cyberpunk 2077*, *Warhammer 40,000: Dawn of War III*, and *Battlefield Hardline*.





MRK \$64.67

GE \$167.90

IBM \$117.95

HLT \$10

XOM \$46

8h

No compensation other than travel reimbursement, as described below, was paid to the participants in this film, but each of the participants has ties to Dimensional and certain participants are investors in the Dimensional Funds.

Rex Sinquefeld retired from Dimensional in 2005, and Jeanne Sinquefeld also retired from Dimensional in 2005; they are shareholders in Dimensional. Myron Scholes was an independent director of the Dimensional US Mutual Funds from 1981 to 2021. Robert Ibbotson was an independent director of the Dimensional U.S. Mutual Funds from 1981 to 2021. The Dimensional US Mutual Funds include all funds of DFA Investment Dimensions Group Inc., Dimensional Investment Group Inc., the DFA Investment Trust Company, and Dimensional Emerging Markets Value Fund. Robert Merton and Senator Bill Bradley are paid consultants to and equity holders of Dimensional. Eugene Fama and Ken French are members of the Board of Directors of the general partner of, and provide consulting services to, Dimensional Fund Advisors LP.

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