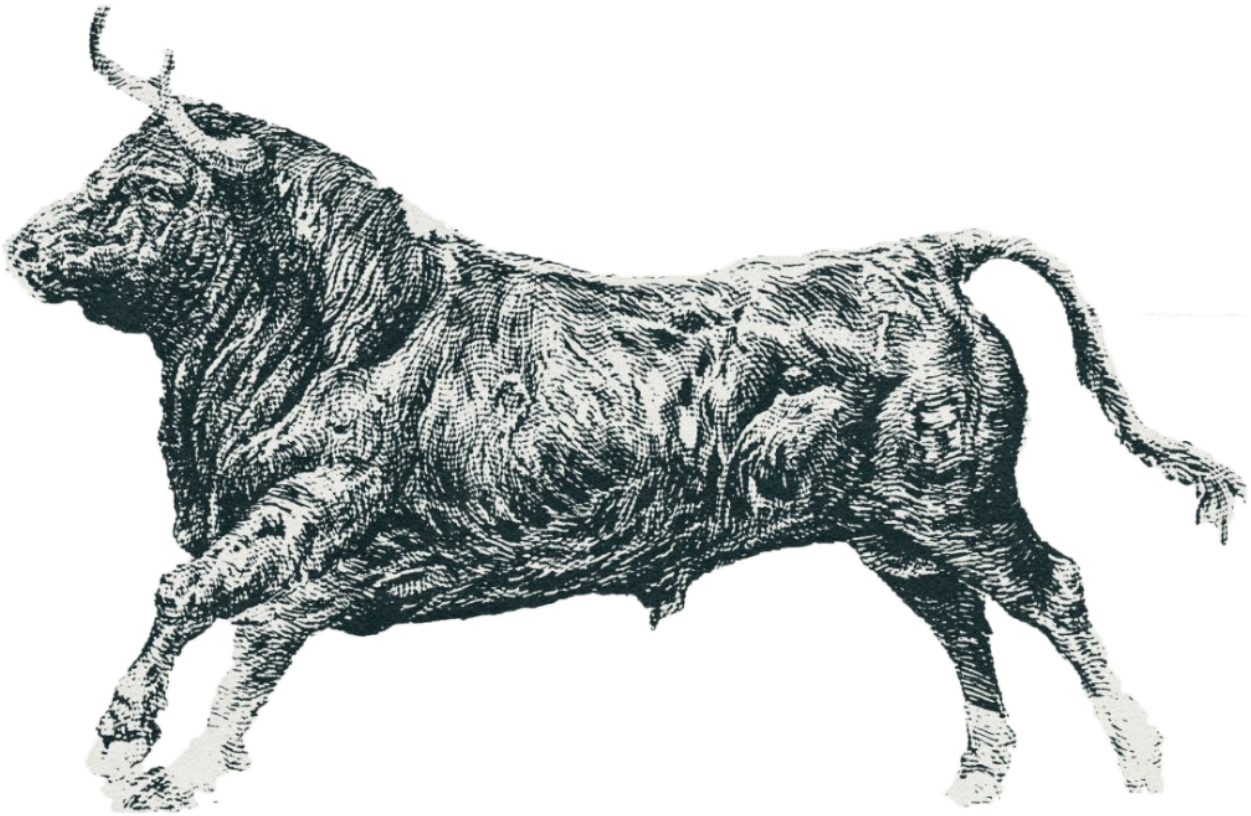
AJO VISTA

# PHILOSOPHY, PROCESS, PERFORMANCE, PEOPLE, PUBLICITY, PORTFOLIOS, PONTIFICATION . . . *AND MORE!*



## Preface

Established in 2021 — with 38 years of history — we are backed by AJO, HighVista Strategies, and Missouri LAGERS. We seek superior results in high alpha, difficult-to-trade equity strategies across the globe.

- Client-Driven + Owner-Operated
- Opportunity-Focused
- Well-Balanced + Beyond the Numbers
- Cost-Conscious + Communicative

| Eight clients* | $956 Million |
|---|---|
| International | $541 M |
| Emerging | $272 M |
| United States | $143 M |

As of 6/30/22
*Counts pooled funds as single clients.

# Firm Summary

**About us.** AJO Vista was founded in 2021, but our story actually began at the advent of the quant revolution.

Launched in 1984, AJO nearly closed its doors in 2020; instead, a persistent investor and former partner drove the idea of a combination with HighVista Systematic Strategies — after nine months of development, AJO Vista was born. We are an independent, registered investment adviser, employee-owned and backed by AJO, HighVista Strategies, and the persistent client, Missouri LAGERS. We have offices in Philadelphia and Boston, but most of the time we work virtually from wherever we want.

We seek superior results in high alpha, difficult-to-trade strategies across the globe and manage close to $1 billion in Emerging Markets Small Cap, International Small Cap, US Microcap, Global Amplified Opportunities, and bespoke strategies requested by our clients.

**Philosophy.** We believe an investment approach should be agile enough to react to the complexity of the equity markets. It should also be transparent and intuitive in the execution and explanation of investment decisions. Ultimately, the more direct the path to clarity and conviction, the better the opportunity for long-term success.

**Approach.** We invest in well-balanced companies with evidence of **value** *and* **quality** *and* **momentum** *and* **stability**. Our investment decisions are more productive when we use economically intuitive measures, think outside the "linear" box, and amplify what works within well-defined peer groups.

An investment can be right and still be risky. Leaning skeptically on optimizers and heavily on common sense, we choose where to diversify and what to avoid to minimize uncompensated risks.

We know transaction costs — the ultimate cost of implementing any investment strategy — are higher and more hidden than generally perceived. Controlling transaction costs according to the measure of "implementation shortfall" is our key to holding equity-market profits.

We prize markets complex enough to challenge the experienced investor, yet rich enough to reward success, and we encourage client-driven mandates tailored to meet specific needs.

## Investing & Leadership

**Ted Aronson**
Founder + Business Development

**Maarten Ballintijn**
Quantitative Analyst

**Jesse Barnes**
Founder + CEO

**Cortney Botsch**
Operations Analyst

**Chris Cardi**
Quantitative Analyst

**Chris Covington**
Founder + Head of Investments

**Grace Ecclestone**
Client Communications

**John Jacques**
Quantitative Analyst

**Paul Koehler**
Quantitative Analyst

**Ross Koval**
Quantitative Analyst

**Pete Landers**
Head of Trading

**Gina Moore**
Founder + Business Development

**Nik Takmopoulos**
CFO/COO

## The Rest of the Team

**Accounting**
Deloitte, Enfusion

**Back Office**
Constellation

**Compliance**
Optima

**Custodian**
Northern Trust

**Fund Admin**
SS&C

**IT**
Agio

**Legal**
Foley Hoag, Maples & Calder

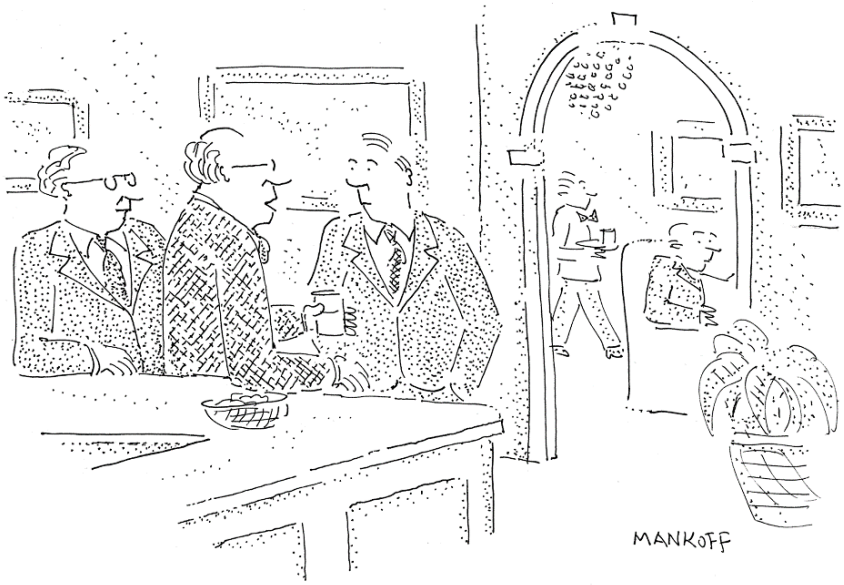
## OFFERINGS.

Our objectives for our marketed strategies follow. These objectives do NOT reflect actual account returns and are NOT guaranteed returns. Actual client returns may differ materially, and clients may —*gulp!* — lose money.

| | Objectives Return/Risk/Fee | | |
|---|---|---|---|
| **AJO Vista Emerging Markets Small Cap**<br>MSCI Emerging Markets Small Cap<br>December 2012<br><br>**AJO Vista US Micro Cap**<br>Russell Microcap<br>September 2019<br><br>**AJO Vista International Small Cap**<br>MSCI World ex USA Small Cap<br>June 2020 | 3.5% | 4.5% | 0.8% |
| **AJO Vista Amplified Opportunities**<br>MSCI ACWI IMI<br>April 2020 | 5.0% | 8.0% | PBF only<br>0.0%–2.5%* |

In addition to alpha, we offer client-aligned fees in a client-friendly atmosphere of transparency and candor. Performance-based fees, using a strategy's return objectives, are available and encouraged for the partnership they create.

**Our amplified opportunities work is only available with a performance-based fee: 0% base + 25% profit share; a total fee range of 0.0%–2.5%.*




*"Short-term I like cash; mid-term, bonds; long-term, AJO VISTA."*

# Philosophy

Our investment philosophy defines our view of the equity markets, how best to profit from them, how to hold onto profits, and how we run our business.

## Equity Markets

We believe the stock market is reasonably efficient but emotional enough to provide opportunities for the disciplined investor. We use modern investment technology and academic research to complement the wisdom of classical investment thinking, analysis, and experience.

An investment approach should be agile enough to react to the complexity of the equity markets. It should also be transparent and intuitive in the execution and explanation of investment decisions. The more direct the path to clarity and conviction, the better the opportunity for long-term success.

## Opportunity-Focused

We seek well-balanced companies with evidence of *value* and *quality* and *momentum* and *stability*. Our investment decisions are more productive when we use economically intuitive measures, think outside the "linear" box, and amplify what works within well-defined peer groups.

An investment can be right and still be risky. Leaning skeptically on optimizers and heavily on common sense, we choose where to diversify and what to avoid to minimize uncompensated risks.

We know transaction costs — the ultimate cost of implementing any investment strategy — are higher and more hidden than generally perceived. Controlling transaction costs is key to holding equity-market profits.

We prize markets complex enough to challenge the experienced investor, yet rich enough to reward success, and we encourage client-driven mandates tailored to meet specific needs.

## Management *Management*

Stan Calderwood, founder of Trinity Investment Management, coined the expression for the management of his firm. How we conduct our business is as important to us as how we invest — and, investing is our *only* business!

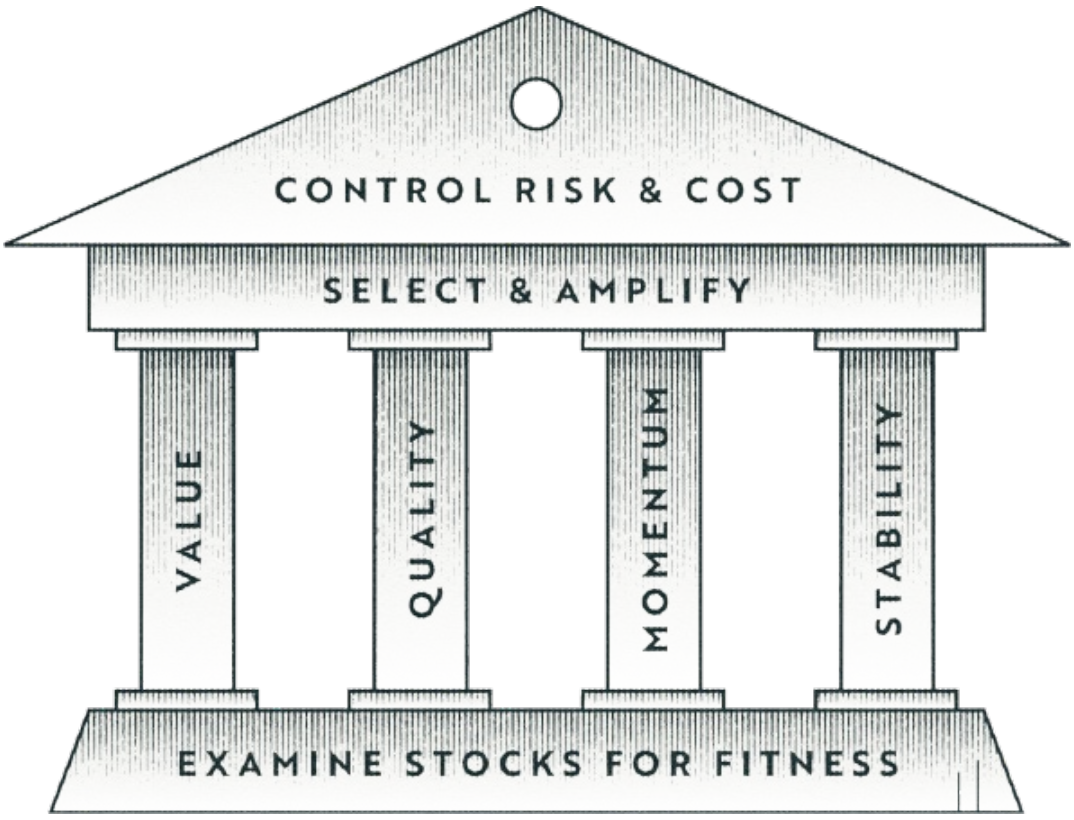
## AJO VISTA'S MANAGEMENT *MANAGEMENT*

- *We value candor.*
- *We seek diversity.*
- *We emphasize mutual respect.*
- *We exercise patience — with our investments and each other.*
- *We forge partnerships — with our clients and vendors.*
- *We practice frequent and complete communication.*
- *We invest in the future — with an emphasis on education.*
- *We prize humor!*

*"We study, we plan, we research. And yet, somehow, money still remains more of an art than a science."*

## Investment Process

We use a systematic, yet straightforward approach to find clarity in the complex picture of the equity market.




- Ensure stocks are suitable, liquid, well-balanced
- Identify what works, amplify what matters
- “Optimize” skeptically
- Recognize implementation shortfall

## Process Detail

Our approach to equity markets has three goals:

- *Profit*
- *Profit*
- *Profit*

(If there were a fourth, it would be, “don’t forget the first three goals!”)

We believe profitable results are more likely when focusing on well-balanced companies, with evidence of value and quality and momentum and stability. The combination of all four valuation metrics creates the balance in our stock selection.

Our investment decisions are more productive when we base them on economically intuitive measures, think outside the “linear” box, and amplify what works within well-defined peer groups.

An investment can be right and still be too risky. Leaning skeptically on optimizers and heavily on common sense, we choose where to diversify and what to avoid to minimize uncompensated risks.

We know transaction costs — the ultimate cost of implementing any investment strategy — are higher and more hidden than generally perceived. Controlling the “implementation shortfall” (Perold, ’88) is key to holding equity-market profits.

We focus on four well-known equity-market anomalies:

**Value** is revealed (or refuted) by the numbers and letters of the financial statements . . . and other financial filings.

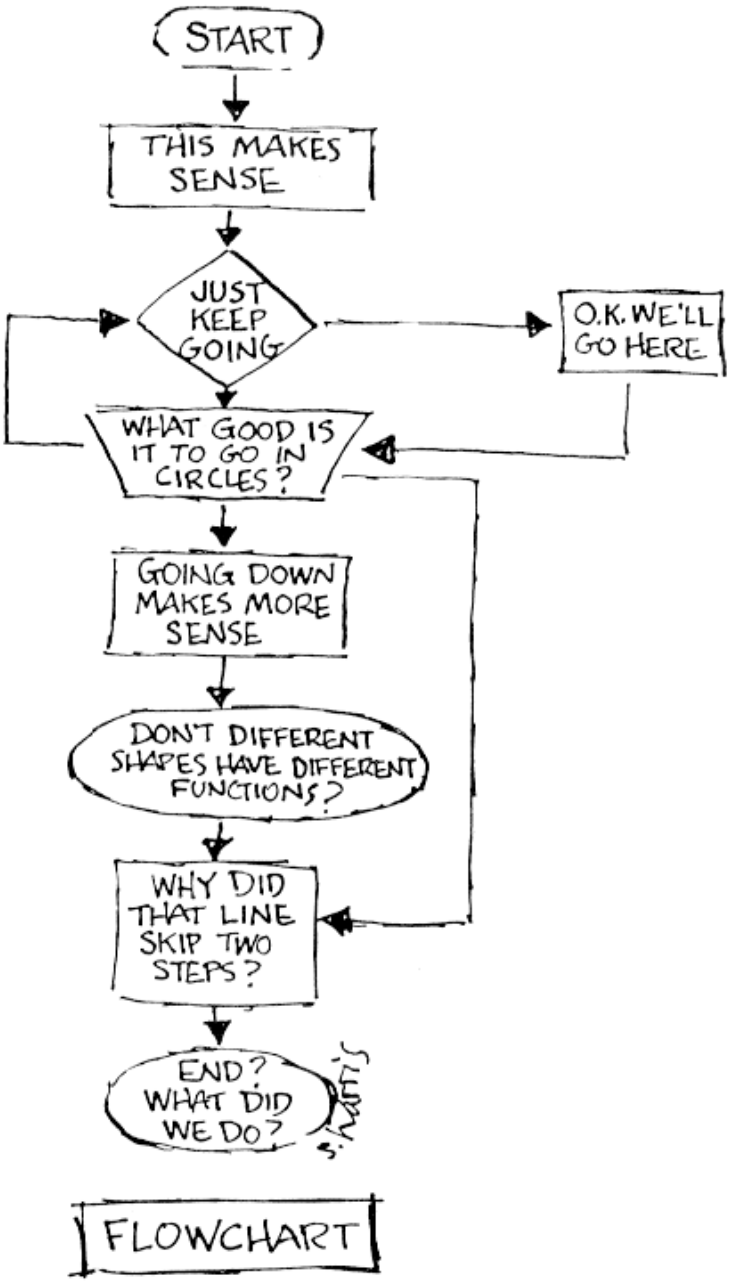
**Momentum** is evident in price, the modern equivalent of “Don’t fight the tape.”

**Quality** measures corporate fitness and sustains the potential for management success.

**Stability** reminds that higher risk doesn’t always mean higher reward.

## Art, Science, and Engineering

It is said that investment management is neither art nor science but more a matter of engineering. In that spirit (and with tongue firmly planted in cheek), we end this discussion of our disciplined investment process with a flow chart.



# OFFERINGS

We prize markets complex enough to challenge the experienced investor, yet rich enough to reward success, and we encourage client-driven mandates tailored to meet specific needs.

We market the following strategies:

| **Composite /** Benchmark | **Fee Schedule** | **Gross Prospective Added Value** | **Expected Tracking Error** | **Capacity ($b)** |
|---|---|---|---|---|
| **AJO Vista Emerging Markets Small Cap**<br>MSCI Emerging Markets Small Cap<br>December 2012 | 0.8%<br>on all assets | 3.5% | 4.5% | 1.0 |
| **AJO Vista US Micro Cap**<br>Russell Microcap<br>September 2019 | 0.8%<br>on all assets | 3.5% | 4.5% | 0.5 |
| **AJO Vista International Small Cap**<br>MSCI World ex USA Small Cap<br>June 2020 | 0.8%<br>on all assets | 3.5% | 4.5% | 1.0 |
| **AJO Vista Amplified Opportunities**<br>MSCI ACWI IMI<br>April 2020 | Performance-based fees only<br>0.0% base + 25% profit share | 5.0% | 8.0% | 1.0 |

These objectives do NOT reflect actual account returns and are NOT guaranteed. Actual client returns may differ materially, and clients may lose money. These return objectives are willingly used to craft performance-based fees for any strategy. They are, in fact, encouraged for all strategies for the partnership they create. Detailed examples are available.

*"We didn't underperform, you overexpected!"*

# People

## Leadership

### Jesse Barnes

*Founder & CEO*
*Firm Governing Board & Investment Committee*

- A founder of HighVista, managing partner
- The Investment Fund for Foundations (TIFF)
- Ph.D. candidate in economics at Harvard (Allyn Young teaching prize)
- BYU

### Chris Covington

*Founder & Head of Investments*
*Investment Committee*

- AJO, partner
- Numeric
- CFA
- Treasurer, Prison Society

### Nik Takmopoulos

*CFO/COO*

- Founder and CEO of LUX Technology
- Director of Operations, Plural Investments
- Goldman Sachs, Prime Brokerage
- Arthur Andersen, CPA

### Pete Landers

*Head of Trading*

- AJO, Glenmede, GMO
- Northeastern
- Capital Jury Project researcher (hmm, trend?)

### Ted Aronson

*Founder*
*Firm Governing Board & Investment Committee*
*Co-lead, business development*

- Founder and co-CEO of AJO
- Present at the start of the quant revolution (according to Peter Bernstein)
- Addison Capital, Drexel Burnham (a founder of Quantitative Equities Group)
- Managed first SEC-registered fund utilizing MPT
- Lecturer in Finance, Wharton School

### Gina Moore

*Founder*
*Firm Governing Board & Investment Committee*
*Co-lead, business development*

- Co-CEO of AJO
- Glenmede Trust, Brandywine, Scott Paper, Price Waterhouse
- CFA, CPA (inactive)
- Founder of Revolution School

# People

## Team

**Maarten Ballintijn**

*Quantitative analyst*

- ITG, Goldman Sachs
- CERN, MIT
- Ph.D., Free University of Amsterdam

**Cortney Botsch**

*Operations analyst*

- AJO, portfolio accounting
- Highfields Capital, State Street Bank

**Chris Cardi**

*Quantitative analyst*

- AJO, software engineer
- Proprietary options market-maker

**Grace Ecclestone**

*Client communications*

- AJO, partner
- Board Pensions PCUSA, Inst Int'l Research

**John Jacques**

*Quantitative analyst*

- Infrastructure, portfolio management
- Tufts, econ and computer science
- Wicked hurricane kick

**Paul Koehler**

*Quantitative analyst*

- AJO, research
- State Street Associates
- Ph.D., Boston University

**Ross Koval**

*Quantitative analyst*

- Goldman Sachs, quant strategies
- GS Equity Alpha Team!
- Columbia, Caltech


*"You'll love it! It's computer-driven but people enhanced."*

# Press — Extra! Extra! Read all about it!

### Wall Street Journal

- "The Man Who Returned $10 Billion," October 25, 2020
- "GameStop, AMC Drive Big Gains In Value Stocks," September 24, 2021
- "'God Told Me to Put Money Into Hertz': How Small Investors Are Upending Wall Street," May 27, 2021

### Pensions & Investments

- "AJO's Ted Aronson launching new firm with HighVista team," September 28, 2021
- "AJOVista is fourth manager backed by Missouri LAGERS," September 28, 2021

### Philadelphia Inquirer

- "A veteran Philly investor, down to his clients' last $10 billion, is closing his firm," October 15, 2020


*"At this time, Your Honor, my client wishes to enter a plea of 'No contest,' and throw himself on the mercy of the press."*

September 28, 2021 Plonline.com
Pensions & Investments
CRAIN
THE INTERNATIONAL NEWSPAPER OF MONEY MANAGEMENT

Money Management

# AJO's Ted Aronson launching new firm with HighVista team

By DOUGLAS APPELL

A year after quant manager AJO LP announced it would shut down and return roughly $11 billion to clients amid a crushing five-year drought for value stocks, Ted Aronson, the Philadelphia-based firm's founder, is launching a new boutique in tandem with Boston-based HighVista Strategies LLC's systematic investment team.

Mr. Aronson said in an interview that the new firm — AJOVista — is set to open its doors Oct. 1 with roughly $1 billion in client money, focusing on less efficient market segments such as emerging markets small-cap stocks and U.S. microcap stocks.

The firm is getting off the ground with the backing of a key institutional client, the $10.2 billion Missouri Local Government Employees Retirement System, Jefferson City, which is carrying over roughly $400 million in AJO mandates as well as taking a one-third stake in the venture.

Despite the similarity in names, AJOVista will look radically different from AJO, which at its peak before the global financial crisis had 74 people and $31 billion in assets under management — 90% in the firm's flagship U.S. large-cap value strategy.

This time around, "we're 15 people, all … involved with investing" — roughly equal in size to AJO's investment team. "Everything else is outsourced," Mr. Aronson said.

BACK IN PLAY: Ted Aronson's new firm, AJOVista, is set to open with $1 billion in assets under management, anchored by a Missouri pension plan.

Jesse Barnes, co-managing partner of HighVista, will become CEO of AJOVista, and Chris Covington — who played a key role in launching AJO's emerging markets small-cap strategy in 2013 before joining HighVista five years later to build out its systematic equity capabilities — will be chief investment officer.

Mr. Aronson and Gina Moore, his co-CEO at AJO, will be co-heads of business development and communication, as well as members of the new firm's investment committee.

The quick turnaround for AJO's founder owed a considerable amount to serendipity, with Mr. Covington playing a key role as go-between. He reached out to Mr. Aronson in October 2020 when news of AJO's looming shut down surfaced to ask about the emerging markets strategy he had helped set up there. "I wanted to be respectful of the situation and not come across as a vulture trying to pick over the carrion … but the emerging market process there has been great since day one (and) it would be a shame to see something like that go away," Mr. Covington said in an interview.

Mr. Aronson said AJO's emerging markets small-cap strategy accounted

for $1.2 billion of the firm's $10.6 billion in AUM when he and Ms. Moore decided to close the firm.

Brian K. Collett, CIO of Missouri LAGERS, said that his fund had $155 million allocated to AJO's emerging markets small-cap equities strategy — with annualized returns since inception of 335 basis points above the strategy's benchmark — when news of the firm's decision to close came out.

The pension fund's other mandate with AJO, meanwhile, came at the March 2020 depths of the pandemic sell-off when Mr. Collett — anticipating a short, if wrenching, "down and up" market — asked Mr. Aronson to transform an existing $86 million LAGERS allocation to mega U.S. value stocks into a "COVID fund" of companies with strong balance sheets "that were going to make it through this fine," he said in an interview.

AJO began shifting those funds the first week of April and the portfolio "did exactly what we thought it would do," Mr. Collett said. From the March lows through the end of 2020, the portfolio posted a return of 200% — or double the 100% gain for the benchmark Russell 2000 Value index over that period, Mr. Aronson said.

With that positive experience as a backdrop, Mr. Collett said he wasn't eager to take up Mr. Aronson's offer of a refund. Instead, the pension fund CIO urged the money management veteran to "figure out a way to keep the party going."

Mr. Collett told Mr. Aronson that LAGERS had backed other startup managers and it was prepared to back him if he could get enough people to keep LAGERS' two mandates with AJO going.

Or, as Mr. Aronson recalled it, "They said 'well, we're not leaving. We don't want to leave. You guys figure it out. Keep running our mandates and by the way, we wanna invest in your new firm as an equity partner.'"

That turn of events just opened up possibilities, said Mr. Aronson, adding "our heads were spinning."

For HighVista's part, Mr. Barnes, in a separate interview, said the Boston-based firm's roughly $600 million systematic business was "a little bit of an odd duck" vis-à-vis its more than $4 billion alternatives business and there was a sense that at some point down the line it would do better as a separate business.

The AJO "wind down" proved a catalyst, Mr. Barnes said. With the prospect of AJO's emerging markets baby being thrown out with the bath water, "we called them," initially with the thought of just taking it and running it.

But it soon became clear that the two sides "clicked," Mr. Barnes said, with a shared focus on niche segments like emerging markets small cap, EAFE small cap and U.S. microcap; performance-based fees to achieve better alignment with clients; and a belief that equity in the firm should be distributed broadly across the team.

With Mr. Covington having played a key role in both firms' systematic businesses, they had "the same DNA, a lot of cross pollination," Mr. Barnes noted. As the talks between AJO and HighVista progressed, a whole bunch of things quickly lined up, he said.

It was "kind of like a snowball that kept rolling downhill," getting bigger and bigger, Mr. Covington agreed. But he said for him, it was Missouri's decision, back in December, not only to extend mandates to the new venture but to invest in it as well that convinced him "this thing could really happen."

"Since then, we've been working feverishly" to get all of the new firm's ducks in a row and come the first of October, "we will be fully independent," Mr. Covington said.

The new firm, meanwhile, will keep its distance from the large-cap U.S. equity space that AJO built its franchise on from the firm's founding in 1984.

"Small, inefficient markets — that's where we want to make our money," as opposed to U.S. large cap where the eVestment database counts 1,200 active products, Mr. Covington said.

Mr. Aronson said AJOVista will get off the ground offering four main strategies — emerging markets small cap; EAFE small cap; U.S. microcap; and an opportunistic strategy built on the success AJO enjoyed setting up Missouri's COVID-19 fund — with a $1 billion capacity limit for each.

Messrs. Aronson, Barnes and Covington all agreed that those capacity limits shouldn't prove an obstacle to AJOVista building an attractive business.

The average fee for U.S. microcap, EAFE small cap and emerging markets small cap is about 1%, Mr. Barnes noted. Managing $2.5 billion at 70 or 80 basis points would translate to $20 million of revenues, depending on AJOVista's success in delivering alpha for clients — a formula for building a great business, he said.

Meanwhile, the new firm will put less emphasis on value as a factor than AJO did, Mr. Aronson noted. "Allowing value to go deeper and deeper and deeper in our portfolios as value got cheaper and cheaper and cheaper" was a fundamental mistake, which set the stage for "extended underperformance after the global financial crisis," he said.

"There are many dimensions that are worth pursuing and we will pursue more of them," Mr. Aronson said. "We will never again pursue value into a rat hole."

September 28, 2021 Plonline.com
Pensions & Investments
THE INTERNATIONAL NEWSPAPER OF MONEY MANAGEMENT

# AJOVista is fourth manager backed by Missouri LAGERS

By Douglas Appell

AJOVista LLC will be the fourth money management startup the $10.2 billion Missouri Local Government Employees Retirement System helps get off the ground, said Brian K. Collett, the Jefferson City-based pension fund's chief investment officer since 2005.

Every situation has been a little different, depending on the needs of the general partner, he said.

For Edwardsville, Ill.-based real estate investor Fireside Financial LLC, the first firm Missouri LAGERS backed in 2008, the pension fund didn't take a stake in the newly launched firm. Mr. Collett said in an interview at that point he was still thinking through how the fund could support an investment team it had worked with successfully that was looking to set up shop on its own because he had "never heard of anybody doing it before." Instead, Missouri LAGERS became the new firm's first institutional client, providing it a running start by accepting "normal fees" on its allocations rather than using its scale to squeeze out hefty discounts. Missouri LAGERS also provided Fireside Financial with advice on reporting requirements and "back-office stuff," he said.

For the subsequent three firms — Greenwich, Conn.-based real estate debt boutique Sound Mark Partners LLC in 2013, New York-based real estate equity shop Machine Investment Group LP in 2020 and Boston-based equity boutique AJOVista, which opened its doors on Oct. 1 — Missouri LAGERS acquired stakes of 10% to 33% for between $1 million and $6 million each, Mr. Collett said.

People are sometimes surprised that a public pension plan has the latitude to make such investments, but each plan's situation is different, Mr. Collett said. "Some are very political" but Missouri LAGERS isn't one of them, he said.

"The board has given me investment authority. I'm allowed to invest in equity and this is equity" — even if the fund expects the payoff for those investments to come in the form of alpha rather than capital gains, he said.

AJOVista, which got off the ground on Oct. 1 with roughly $1 billion in assets under management, is the first equity boutique Missouri LAGERS has backed.

If Missouri LAGERS initial backing of Fireside Financial in 2008 had proved problematic, it could have made subsequent efforts to back talented teams more difficult, said Mr. Collett. But instead, the firm ended up being "our best real estate manager," he said.

Helping talented teams garner "some capital to get the lights on … is a little bit like pre-paying fees," and the fund stands to enjoy some upside if firms it backs do well, he said.

With the addition of AJOVista, meanwhile, Missouri LAGERS will be investing roughly $850 million — or more than 8% of its portfolio — with managers the pension fund has backed. At present, it has allocations of roughly $400 million with AJOVista, $232 million with Fireside Financial, $204 million with Sound Mark and $28 million with Machine Investment.

NIMBLE: Brian K. Collett said the board gives investment staff a lot of flexibility.

Having the flexibility to take advantage of opportunities "describes us in lots of ways," Mr. Collett said. The board has given its investment team room to be "very nimble."

There's a "very large standard deviation" when it comes to how state plans in the U.S. are run, with some becoming investment shops, handling the vast majority of their investments themselves, he noted.

He called Missouri LAGERS a "hybrid, moving slowly to more in-house" investing. For example, he said, his pension plan manages roughly $1.5 billion in derivatives and another $1 billion in co-investments.

THE WALL STREET JOURNAL.
Saturday/Sunday, October 24-25, 2020
© 2020 Dow Jones & Company, Inc. All Rights Reserved.

THE INTELLIGENT INVESTOR | JASON ZWEIG

# The Man Who Returned $10 Billion

A value investor with a once-great record is calling it quits. What does that mean for bargain hunting?

You can complain about the death of value investing, or you can do something about it.

The discipline of buying cheap stocks, and holding them until they deliver superior returns, has lagged behind the market for so long that most of its practitioners seem to do little but talk about how bad it is and speculate about when it will get better.

Then there's Ted Aronson. He is giving back $10 billion to his investors and shutting down his Philadelphia-based value-investing firm, AJO. That is after more than 30 years in which AJO's returns were often among the best in the business of managing money for pension funds, university endowments and other institutions. They aren't among the best anymore.

"Our recent performance sucks," says Mr. Aronson. "And our record over most of the last five years has been so sucky that even if we outperformed mightily over the next five, we would still have—at best—a drab return looking back over those 10 years."

He concedes that he may be getting out of the business with "the exact wrong timing" and that the exit of a firm like his might well signal that value investing's long-awaited comeback is imminent. Even so, given AJO's recent results, Mr. Aronson says he had no choice but to give clients their money back.

How unusual is that? Asset managers return their investors' capital about as often as sharks regurgitate swimmers without a scratch.

Hedge funds sometimes hand money back to their investors. In early 2000, the last time value stocks performed this poorly, Julian Robertson of Tiger Management LLC shut his main fund and returned several billion dollars to outside clients. In 1969, after speculative stocks soared, Warren Buffett shuttered his partnership, returned his investors' capital and told them, "I don't want to spoil a decent record by trying to play a game I don't understand."

Value investors are running out of patience. Institutional clients have pulled $76 billion more out of U.S. value portfolios than out of growth portfolios since 2015, estimates eVestment, a research firm.

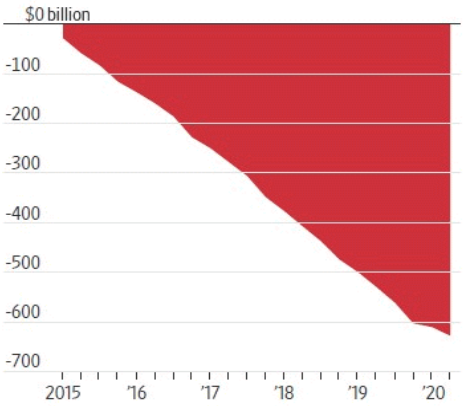
For many decades, value stocks tended to earn higher average returns than the shares of growth companies. Since the late 2000s, however, growth stocks have been beating value to a pulp.

RYAN STRAND GREENBERG FOR THE WALL STREET JOURNAL

'Our recent performance sucks,' says Ted Aronson, who is closing his Philadelphia-based firm, AJO.

**Exodus**

Money into and out of various U.S. value investing strategies




Note: Net money added to or subtracted from institutional long-only strategies investing in U.S. value stocks.
Source: eVestment

Low interest rates make investors less averse to holding assets that might not pay off for years to come. Just think of Tesla Inc.'s shares racing even as the company lost nearly $5.4 billion between 2015 and 2019. Only this week did it finally report a profit for the fifth quarter in a row.

And in this year of pandemic, growth industries like technology and health care still boomed, while such value sectors as real estate and financials have been clobbered.

So far in 2020, large U.S. growth stocks have beaten big value stocks by 36 percentage points, as measured by FTSE Russell indexes. That shatters all records: The widest such margin in a previous full year was 26 points in 1999, according to BofA Securities.

Value investors have suffered the anguish of missing out. Across all U.S. companies from large to small, $10,000 invested in growth stocks 10 years ago would have surpassed $47,000 this week. The same amount in value would be worth $25,400, according to FTSE Russell.

Mr. Aronson is a "quant," or quantitative investor, who doesn't analyze such fundamentals as the quality of a company's products, the skill of its executives, the loyalty of its customers or the strength of its competitors. Instead, he and his team look only at the numbers: more than a dozen measures of net income and asset values, profitability, earnings estimates, trading activity and other factors that decades of research has shown can identify cheap stocks.

So far in 2020, large U.S. growth stocks have beaten big value stocks by 36 percentage points.

As recently as 2015, according to AJO, every one of its 15 strategies was outperforming its benchmark since inception—often by at least two percentage points annually for decades.

In 2016, growth stocks started to pull away, and AJO's results never caught up. "Holy shit, it was painful," says Mr. Aronson. "It was all downhill from there—or should I say uphill." By this September, only six of AJO's remaining 13 strategies were beating their benchmarks since inception—and all but two were far behind over the past five years.

"You get to think that all these machines, all this technology, all the data, are the keys to the kingdom," says Mr. Aronson. "Not!"

He pauses, then says in a rush, "It can all work for years, for decades, until or except when the not-so-invisible hand comes down and slaps you and says, 'That's what worked in the past, but it's not going to work now, nope, not anymore.'"Although he is shutting down, Mr. Aronson is convinced value investing isn't dead. When will it come back to life? "All records have been broken, so past experience is meaningless," he says—"except in knowing the drought will end." He bears down hard on the word "except."

Mr. Aronson adds, "There's a lifetime left of finding real companies that continue to produce real stuff. They will retain earnings. They will pay dividends. They will make money."

After so long a run of growth-stock outperformance, "the sheer stretching of the rubber band is bound to make value companies worth buying," he says. "It has to."

THE WALL STREET JOURNAL.
Tuesday, September 14, 2021
© 2021 Dow Jones & Company, Inc. All Rights Reserved.

# GameStop, AMC Drive Big Gains In Value Stocks

BY GUNJAN BANERJI

Meme stocks are distorting the way some investors see parts of the market.

The Russell 2000 value index, designed to follow shares of small companies that are viewed as bargains relative to the rest of the market, is up 22% this year. Meanwhile, the Russell 2000 growth index, populated with companies whose earnings are expected to flourish faster than the rest of the market, has increased only 5.2%.

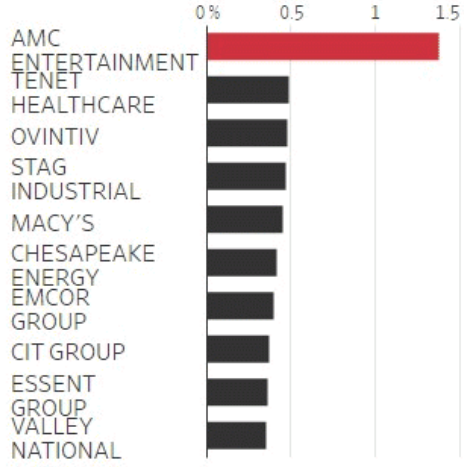
Look to another set of indexes, though, and a different picture emerges: The S&P 500 growth index, for example, is outperforming its value peer by around 6 percentage points in the year to date.

What gives? The Russell 2000 value index's gains this year have been powered by some meme stocks such as AMC Entertainment Holdings Inc. That stock's rally of more than 2,000% this year has helped the Russell 2000 value index outperform the Russell 2000 growth benchmark by the widest margin since 2002, according to Dow Jones Market Data.

Of course, many investors have embraced value stocks this year. They have snapped up shares of cyclical companies and ones in corners of the market benefiting from a booming economy. The S&P 500 value index is up around 15% this year.

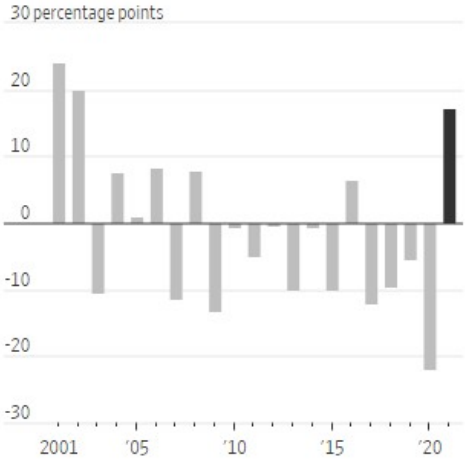
But the meme companies have had an outsize effect in some indexes. Take GameStop Corp., which became a battleground stockearlier this year as individual investors drove the retailers' shares ever higher. After those gains, GameStop was dropped from the Russell 2000 value index in June. Even so, it remains the second-biggest contributor to that index this year. AMC is first, according to calculations by investment firm AJOVista as of Friday. Small-cap value investors avoiding the two stocks would have trailed the value gauge by almost 2 percentage points in 2021.

**Biggest weightings in the iShares Russell 2000 Value ETF**




Note: Figures as of Sept. 9
Source: iShares

**Yearly spread between the Russell 2000 value index and Russell 2000 growth index**




Note: Figures are yearly through Sept. 13.
Source: Dow Jones Market Data, FactSet

AMC still belongs to the value index, puzzling some investors who say that it is a misfit. Shares of AMC already appear pricey after their meteoric gains this year, according to some investors.

"It doesn't make sense," said Chris Covington, head of investments at AJOVista. "It's really all a nuance of the index construction process."

FTSE Russell, the index provider, says in materials provided to investors that the value index is designed to include companies with lower price-to-book ratios and lower expected growth in the future.

A spokeswoman for the index provider didn't respond to a request for comment.

AMC's place in the value index means the movie giant's shares crop up in exchange-traded funds tracking value stocks. AMC is the biggest holding in the roughly $16 billion iShares Russell 2000 Value ETF—one of the biggest tracking the sector—and the roughly $1 billion Vanguard Russell 2000 Value ETF.

As of early September, the company's $22 billion market value made it almost 14 times bigger than the iShares fund's average holding, according to Dow Jones Market Data. It also is the largest holding in the iShares Russell 2000 ETF, which tracks small companies in the U.S. stock market regardless of whether they are considered value or growth stocks.


AMC rallied more than 2,000% this year and helped the Russell 2000 value index beat the Russell 2000 growth gauge by a wide margin.

JEENAH MOON/BLOOMBERG NEWS

A fact sheet for the Russell 2000 value index says the index is updated annually. "It is representative of market demand," said Stephanie Hill, head of index at Mellon, of meme stocks' growing influence on the benchmarks.

AMC's heft in the value index and several ETFs is the latest sign of how the meme stock craze has upended traditional investing.

GameStop's surge this year landed it a promotion to the Russell 1000 growth benchmark, sitting alongside tech heavyweights including Apple Inc., Tesla Inc. and Microsoft Corp.

The Philadelphia Inquirer

THURSDAY OCTOBER 15, 2020 BUSINESS INQUIRER.COM

PHILLY DEALS

# A veteran Philly investor, down to his clients' last $10 billion, is closing his firm

Ted Aronson (right), with John Bogle in 2017. Aronson says Bogle's index funds helped force him and other stock-pickers out of business. Aronson said $10B sounded like a lot of money,"but it wasn't working out. So we decided, 'Let's set the clients free.'" ERIN ARVEDLUND / Staff

JOSEPH N. DISTEFANO
@PhillyJoeD

Theodore "Ted" Aronson, one of the last of the bargain-hunting Philadelphia "value-stock" investors, is calling it quits.

"We will be shuttering [our firm] AJO on Dec. 31," Aronson, 68, wrote in a note Tuesday to clients who still hold $10 billion at his company on South Broad Street, though that's down from a peak of $30 billion in the early 2000s.

"Our record for the past five years sucks," Aronson added in an interview.

"A 44-person operation, even with $10 billion, sounds like a lot of money. But it wasn't working out. So we decided, 'Let's set the clients free.'"

Aronson said clients have sent mostly positive messages. "Money managers never do this," he said. "They stretch it out. They sell it. I'm looking for that graceful end."

What changed? Aronson, a "quantitative" stock picker, had been a pioneer at using modern computing to update an old strategy, popular at such Philadelphia trust companies as Provident. That approach conserved fortunes for heirs of the city's factory and railroad fortunes by identifying low-priced but solid companies likely to boost investor payouts and gain

share value.

He says he earned clients about $2 billion in above-market-index profits — what investors call “alpha” — from its founding in 1984 through 2015.

When he started in the business, Aronson said it was easy for a market-literate, computer-familiar professional to beat the crowds. In that era, he said, a savvy investor could spot a trend early, and watch the trades gain value as the market slowly caught up— trends that today are instantly exploited by high-speed, automated programs.

Aronson began his investment career at the former Philadelphia-based brokerage of Drexel Burnham, where his colleagues included future junk-bond king Michael Milken, and his interns included one Brian L. Roberts, the Comcast heir and future chief executive.

As a quantitative investor, or “quant,” focused on company, market and industry data, he avoiding the schmoozing with top executives that was elsewhere a ritual of big-league stock-picking.

“If CEOs’ lips move, it means they are lying,” Aronson liked to repeat. “Really, that’s a snotty things to say. Some of my best personal friends run elite corporations. They are honorable people. But honorable or not, sometimes the numbers work for an investment, and sometimes they do not.”

His firm’s rapid growth brought in such clients as colleges and the Florida, Oregon and City of Philadelphia pension systems, though the city terminated AJO for poor performance last year.

Aronson, a Wharton grad, was a leader in the Chartered Financial Analysts (CFA) organization and other industry groups. “Ted was an academic advisor for a generation of investment professionals who came out of Wharton,” succeeding the late John Neff, the market-beating stock-picker for the Vanguard Windsor fund, in that role, said Matthew Taylor, senior member at Permit Capital Advisors LLC, Conshohocken and a past fund manager.

The good years, especially, generated management fees that enabled him to hire dozens of analysts and business staff. In turn, Aronson’s share of the profits enabled him and his wife, Barbara, to back charitable causes such as WXPN radio and the Nature Conservancy, and to buy what was in 2010 the most expensive apartment in Philadelphia, the $12.5 million penthouse at 1706 Rittenhouse.

But by then, trends that were to make brave, brilliant stock-picking teams scarce were fast advancing. Automated trading programs and high-volume short-term trades as practiced by firms such as Bala Cynwyd-based Susquehanna International Group made it tougher to find bargains.

Managers also faced competition from low-fee, index-based mutual funds and exchange-traded funds offered by Malvern-based Vanguard Group, founded by Aronson’s longtime buddy John C. Bogle, Aronson’s frequent intellectual sparring partner at industry gatherings.

“If I were to start a firm today, I’d probably halve the expectations,” Aronson said. “That compression in value-added makes for a compression in fees. My late, great friend Jack Bogle had a hand in that. Bogle democratized the markets — he made it easy for investors to get market returns, and difficult to add value."

The stock market’s recent concentration on a handful of large, fast-growing tech companies, Amazon, Apple, Facebook, Google parent Alphabet, and Microsoft, has been hard on “value stocks,” which have fallen far behind. Aronson estimates that AJO accounts have trailed the markets by as much as $1.8 billion since 2015. Stopping now lets him retire with a net positive long-term record, though sharply below his peak.

“We built it by outperforming our benchmarks. We lost it the same way," he concluded. "The last five years have been so painful. ‘Value’ stocks will come back. But we are throwing in the towel.”

Aronson said his managers, including co-CEO Gina Moore and chief investment officer Greg McIntire, are talking about putting a new firm together.

But “AJO’s closing will mark the end of my career,” he concluded in his note to clients. “While I am hanging up my spurs, my partners and colleagues are not. I plan to support them as they prepare to ride again.”

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

FROM: Ted Aronson

DATE: June 4, 2021

RE: **GUILTY AS CHARGED!**

A money manager friend took umbrage that I called him a monkey. To save our friendship, I reminded him:

- *I called myself a monkey, too.*
- *The laws of evolution usually put the monkey on top.*

In any event, GameStop is now the largest name in the Russell 2000 Value Index.

Anyone for blindfolded monkeys throwing darts at a stock page?!

TRA
aronson@ajopartners.com

gce

THE WALL STREET JOURNAL.

Thursday, May 27, 2021
© 2021 Dow Jones & Company, Inc. All Rights Reserved.

# 'God Told Me to Put Money Into Hertz': How Small Investors Are Upending Wall Street

Spring resurgence in so-called meme stocks is latest triumph for retail traders long derided as 'dumb money'

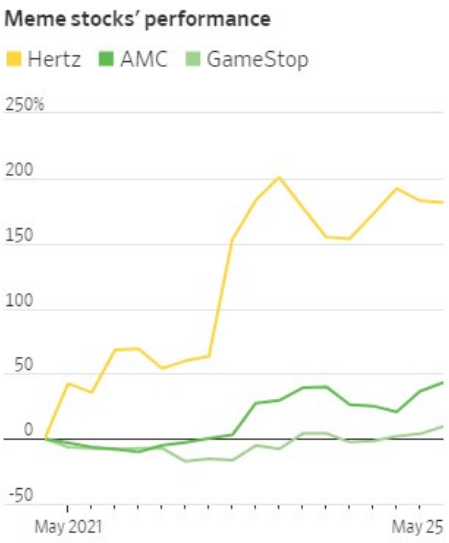
BY GUNJAN BANERJI AND ALEXANDER OSIPOVICH

Many small investors are beating Wall Street pros at their own game.

A basket of stocks favored by individuals has outperformed the broader market since March of last year, according to Vanda Research. This group, which includes behemoths like Apple Inc. and Tesla Inc. alongside electric-vehicle maker NIO Inc. and digital-payments company Square Inc., has gained 68% since the beginning of March 2020, far outpacing the S&P 500's roughly 36% climb.


Source: Vanda Research (retail basket), FactSet (S&P 500)

And meme stocks popular with individual investors have been on a tear again. Shares of movie-theater operator AMC Entertainment Holdings Inc. jumped 19% Wednesday, putting them on track to almost double this month. GameStop Corp. has advanced 40% this month, far outpacing the S&P 500's gain of 0.4%. Shares of Hertz Global Holdings Inc. have nearly tripled in May.




Source: FactSet

Short sellers who bet against GameStop, Hertz and AMC—a group targeted by many smaller investors who have favored these stocks—have lost more than $8 billion this year, according to data provider S3 Partners.

"It feels great," said Daniel Shin, a 35-year-old individual investor based in Edison, N.J., who bought shares of AMC in January and has added to his positions since. "It feels like us against them. Like retail against Wall Street."

This year's reversal has riveted the financial industry and fueled a surprising revival for some apparently moribund businesses, helping AMC narrowly avert bankruptcy and paving the way for GameStop to raise money by issuing shares. Those episodes were the ultimate victory for small Main Street investors who are often derided in markets as "dumb money."

Meanwhile, hedge funds—the "smart money" of years past—have continued to make a lackluster showing. From January through April, a weighted index tracking the performance after fees of about 1,300 hedge funds climbed 8.7%, according to data provider HFR. That lagged behind the S&P 500, which rose 11% over the same period.

The market's upside-down turn, featuring a sustained rally in smaller companies with shaky financials and easy fortunes made by some early buyers of these shares, doesn't make everyone happy. Analysts and portfolio managers recall that the market meltdowns of 2000 and 2008 were preceded by roaring bull markets in speculative areas such as dot-com startups and mortgage finance. When those manias ended, the broader economy paid the price.

Millions of individual investors stampeded into the market last year, enticed by zero-commission brokerages and easy-to-use investing apps, and their interest helped fuel the post-pandemic rally. That, and the fervor with which many small investors have piled into market winners, have potentially set the stage for severe selloffs if spooked investors flee hot stocks en masse.

That is in part because they are

riding one of the most powerful forces in markets over the past year: momentum investing, or buying assets simply because the price is rising. The rising prices of assets from dogecoin, a cryptocurrency created as a joke, to Hertz shares have attracted buyers, whose demand has driven prices even higher. That, in turn, has drawn even more buyers, in part because of a behavior dubbed FOMO—the fear of missing out.

Data from Vanda Research show individual investors tend to pour far more money into stocks with high momentum than low momentum.

Paktra Som, a 35-year-old pilot based in Los Angeles, said he jumped into the market for dogecoin in 2019 and has since kept buying, looking to ride its continued ascent. Dogecoin has skyrocketed more than 6700% this year despite a recent pullback.

"If there is a large increase in volume in something and there is a clear trend of direction that it is going…the result is typically rewarding as long as you know when to sell," Mr. Som said. "Dogecoin had no solid fundamentals to [base] my investing strategy on. But the volume of buyers was always there."

Other investors aren't tracking trading volumes or momentum. Rather, they are relying on their gut.

"God told me to put money into Hertz," said Damien Roscoe, a 42-year-old electronic technician in Glenwood, Ill. "I know it sounds crazy."

Mr. Roscoe says he made about $8,000 in profits from buying Hertz shares this spring.

The car-rental company has become one of the most unlikely success stories. Hertz declared bankruptcy last year as coronavirus lockdowns and travel restrictions devastated its business. Financial professionals fretted as individual investors snapped up the shares, warning that stock in insolvent companies usually ends up worthless.


A bankruptcy court recently approved a winning auction bid in which Hertz stockholders would get more than $7 a share. The stock was below $1 in March.

PHOTO: TAYLOR GLASCOCK FOR THE WALL STREET JOURNAL

But buyers had the last laugh after a bankruptcy court this month approved a winning auction bid in which Hertz stockholders would get more than $7 a share. The stock was trading at less than $1 in March.

"Everyone was, 'Y'all are stupid for buying stock in a bankrupt company,'" Mr. Roscoe said. "But driving around…I just believed in it."

In one sign of how powerful the run for meme stocks like Hertz has been, investors who didn't hold GameStop shares this year would have lagged behind the Russell 2000 value index by almost 1 percentage point even if they held every other stock in the gauge, according to Ted Aronson, a longtime value investor and founding partner of AJOvista, his new investment firm. Value investors seek to buy shares at a discount to their net worth, essentially sifting through out-of-favor assets for bargains.

Mr. Aronson gave $10 billion back to investors at AJO, his old firm, after a stretch of underperformance.

He compared the recent run in meme stocks and other speculative bets to the internet craze in the late 1990s.

"You just have the herd mentality bidding stuff up based on rumor or Reddit or TikTok," Mr. Aronson said. "This is just payback for a long time when we had it relatively easy, when value investing worked really well and any monkey could do it."

## Insights

AJO Vista tries to provide the age-old goal: Everything you always wanted to know about markets (but were afraid to ask).*

- First, we provide 68 global index returns on a monthly basis, going back almost 30 years (since January 1, 1994).
- Second, we frequently share ideas about portfolios (obvious!) and our industry, finance, and the world in general (usually other people's work).
- Examples follow . . . (articles are truncated; holler if you want full copies).

*Apologies to David Reuben!

AJO

# DECEMBER 2021 — VERY, VERY GOOD YEAR!

- If the past 10 years are *very* good (17% vs. 11% since '26), this year is *very, very* good.
- Growth/value, mega cap/small cap mixed — mega growth dominated, small-cap growth decimated.
- Most of the rest of the world more average, except for EM, which was down.
- Merry (belated) /happy!

SELECTED INDICES - TOTAL RETURN (%)
12/31/21

| | Month | 3 Months | YTD | 12 Months | |
|---|---|---|---|---|---|
| Dow Jones Industrials | 5.53 | 7.87 | 20.95 | 20.95 | |
| S&P 500 | 4.48 | 11.03 | 28.71 | 28.71 | ← *1926 - 2021 AVG RETURN = 10.6%* |
| S&P 500 (equal weighted) | 6.20 | 9.01 | 29.63 | 29.63 | |
| S&P MidCap | 5.08 | 8.00 | 24.76 | 24.76 | |
| S&P SmallCap | 4.53 | 5.64 | 26.82 | 26.82 | |
| S&P 500 Growth | 2.48 | 13.37 | 32.01 | 32.01 | |
| S&P 500 Value | 7.04 | 8.31 | 24.90 | 24.90 | |
| S&P MidCap 400 Growth | 4.12 | 8.00 | 18.90 | 18.90 | |
| S&P MidCap 400 Value | 5.91 | 7.97 | 30.65 | 30.65 | |
| S&P SmallCap 600 Growth | 4.77 | 6.86 | 22.62 | 22.62 | |
| S&P SmallCap 600 Value | 4.21 | 4.47 | 30.95 | 30.95 | |
| S&P US REIT | 8.77 | 16.41 | 43.05 | 43.05 | |
| Nasdaq Composite (price change) | 0.69 | 8.28 | 21.39 | 21.39 | |
| Russell Top 200 | 4.04 | 11.00 | 27.90 | 27.90 | |
| Russell 1000 | 4.05 | 9.78 | 26.45 | 26.45 | |
| Russell 3000 | 3.94 | 9.28 | 25.66 | 25.66 | |
| Russell Midcap | 4.08 | 6.44 | 22.58 | 22.58 | ← *SIZE MATTERS* |
| Russell SC Completeness | 1.16 | 1.32 | 12.64 | 12.64 | |
| Russell 2500 | 3.28 | 3.82 | 18.18 | 18.18 | |
| Russell 2000 | 2.23 | 2.14 | 14.82 | 14.82 | ← *1926 - 2020 AVG RETURN = 11.9%* |
| Russell Microcap | 0.50 | -2.66 | 19.34 | 19.34 | |
| Russell Top 200 Growth | 2.50 | 13.70 | 31.24 | 31.24 | |
| Russell Top 200 Value | 6.32 | 7.35 | 23.46 | 23.46 | |
| Russell 1000 Growth | 2.11 | 11.64 | 27.60 | 27.60 | |
| Russell 1000 Value | 6.31 | 7.77 | 25.16 | 25.16 | |
| Russell 3000 Growth | 2.02 | 10.89 | 25.85 | 25.85 | |
| Russell 3000 Value | 6.16 | 7.54 | 25.37 | 25.37 | ← *VALUE AHEAD ONLY AMONG SMALLER CAPS* |
| Russell Midcap Growth | 0.35 | 2.85 | 12.73 | 12.73 | |
| Russell Midcap Value | 6.28 | 8.54 | 28.34 | 28.34 | |
| Russell 2500 Growth | 0.49 | 0.20 | 5.04 | 5.04 | |
| Russell 2500 Value | 5.20 | 6.36 | 27.78 | 27.78 | |
| Russell 2000 Growth | 0.44 | 0.01 | 2.83 | 2.83 | |
| Russell 2000 Value | 4.08 | 4.36 | 28.27 | 28.27 | |
| MSCI USA Minimum Volatility | 6.79 | 10.41 | 21.01 | 21.01 | |
| MSCI All Country World Minimum Volatility | 5.71 | 6.29 | 13.94 | 13.94 | |
| MSCI All Country World | 4.00 | 6.68 | 18.54 | 18.54 | |
| MSCI All Country World ex USA | 4.13 | 1.82 | 7.82 | 7.82 | |
| MSCI World | 4.27 | 7.77 | 21.82 | 21.82 | |
| MSCI World ex USA | 5.08 | 3.14 | 12.62 | 12.62 | |
| MSCI World ex USA Growth | 4.15 | 4.27 | 11.57 | 11.57 | |
| MSCI World ex USA Value | 6.05 | 1.91 | 13.26 | 13.26 | |
| MSCI World Small Cap | 3.70 | 2.23 | 15.75 | 15.75 | |
| MSCI World ex USA Small Cap | 4.24 | 0.39 | 11.14 | 11.14 | |
| MSCI EAFE | 5.12 | 2.69 | 11.26 | 11.26 | |
| MSCI EAFE Small Cap | 4.36 | 0.07 | 10.10 | 10.10 | |
| MSCI Pacific ex Japan | 3.29 | -0.09 | 4.68 | 4.68 | |
| MSCI Canada | 4.72 | 7.18 | 25.98 | 25.98 | |
| MSCI Emerging Markets | 1.88 | -1.31 | -2.54 | -2.54 | |
| MSCI Emerging Markets Growth | 0.37 | -2.08 | -8.41 | -8.41 | |
| MSCI Emerging Markets Value | 3.55 | -0.41 | 4.00 | 4.00 | |
| MSCI Emerging Markets Equal Weighted | 1.90 | -0.72 | 4.05 | 4.05 | |
| MSCI Emerging Markets IMI | 2.17 | -0.98 | -0.28 | -0.28 | |
| MSCI Emerging Markets Small Cap | 4.21 | 1.33 | 18.75 | 18.75 | ← *EM SMALL CAPS SHINE* |
| MSCI Emerging Markets Asia | 1.47 | -0.98 | -5.08 | -5.08 | |
| MSCI Emerging Markets EMEA | 2.28 | -2.37 | 18.01 | 18.01 | |
| MSCI Emerging Markets Latin America | 5.94 | -2.69 | -8.09 | -8.09 | |
| MSCI China A | 1.38 | 3.15 | 3.20 | 3.20 | |
| Bloomberg Barclays US T-Bills (1-3 Month) | 0.00 | 0.01 | 0.04 | 0.04 | ← *1926 - 2020 AVG RETURN = 3.3%* |
| Bloomberg Barclays US Agg Gov't-Treasury-Long | -1.42 | 3.08 | -4.65 | -4.65 | ← *1926 - 2020 AVG RETURN = 5.7%* |
| Bloomberg Barclays US Agg Credit-Long | -0.37 | 1.52 | -1.18 | -1.18 | |
| Bloomberg Barclays Municipal Bond | 0.16 | 0.72 | 1.52 | 1.52 | |
| Bloomberg Barclays US Aggregate | -0.26 | 0.01 | -1.54 | -1.54 | |
| Bloomberg Barclays US Agg Corporate High Yield | 1.87 | 0.71 | 5.28 | 5.28 | |
| Alerian MLP ETF | 3.62 | 0.58 | 39.09 | 39.09 | ← *ENERGY!* |

*Comments: AJO (1/1/22)*
*Data: FactSet Research Systems (12/31/21)*

AJO

# DECEMBER 2021 — ALMOST MEDIUM-TERM RETURNS

| | Annualized Total Return (%) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 Yrs | 3 Yrs | 4 Yrs | 5 Yrs | 6 Yrs | 7 Yrs | 8 Yrs | 9 Yrs | 10 Yrs |
| Dow Jones Industrials | 15.20 | 18.49 | 12.57 | 15.51 | 15.68 | 13.33 | 12.91 | 14.66 | 14.21 |
| S&P 500 | 23.44 | 26.07 | 17.65 | 18.47 | 17.36 | 14.93 | 14.78 | 16.61 | 16.55 |
| S&P 500 (equal weighted) | 20.94 | 23.64 | 14.95 | 15.73 | 15.57 | 12.85 | 13.05 | 15.41 | 15.64 |
| S&P MidCap | 19.08 | 21.41 | 12.31 | 13.09 | 14.33 | 11.81 | 11.55 | 13.80 | 14.20 |
| S&P SmallCap | 18.80 | 20.11 | 12.22 | 12.42 | 14.66 | 12.12 | 11.31 | 14.30 | 14.50 |
| S&P 500 Growth | 32.74 | 32.20 | 23.29 | 24.11 | 21.06 | 18.70 | 18.22 | 19.75 | 19.23 |
| S&P 500 Value | 12.51 | 18.65 | 11.05 | 11.90 | 12.80 | 10.37 | 10.62 | 12.81 | 13.29 |
| S&P MidCap 400 Growth | 20.82 | 22.62 | 13.39 | 14.66 | 14.68 | 12.78 | 12.12 | 14.24 | 14.54 |
| S&P MidCap 400 Value | 16.42 | 19.55 | 10.78 | 11.08 | 13.52 | 10.39 | 10.60 | 13.01 | 13.55 |
| S&P SmallCap 600 Growth | 21.10 | 21.11 | 14.26 | 14.37 | 15.63 | 13.70 | 12.42 | 15.44 | 15.35 |
| S&P SmallCap 600 Value | 15.87 | 18.69 | 9.94 | 10.25 | 13.51 | 10.38 | 10.02 | 13.01 | 13.52 |
| S&P US REIT | 15.02 | 18.08 | 12.18 | 10.57 | 10.22 | 9.09 | 11.53 | 10.48 | 11.21 |
| Nasdaq Composite (price change) | 32.05 | 33.10 | 22.70 | 23.79 | 20.91 | 18.61 | 17.95 | 20.06 | 19.63 |
| Russell Top 200 | 25.10 | 27.28 | 18.90 | 19.70 | 18.26 | 15.85 | 15.52 | 17.28 | 17.16 |
| Russell 1000 | 23.68 | 26.21 | 17.62 | 18.43 | 17.34 | 14.84 | 14.64 | 16.56 | 16.54 |
| Russell 3000 | 23.25 | 25.79 | 17.19 | 17.97 | 17.08 | 14.55 | 14.30 | 16.29 | 16.30 |
| Russell Midcap | 19.81 | 23.29 | 14.26 | 15.10 | 14.88 | 12.23 | 12.35 | 14.64 | 14.91 |
| Russell SC Completeness | 22.34 | 24.21 | 14.85 | 15.53 | 15.70 | 12.76 | 12.07 | 14.74 | 15.07 |
| Russell 2500 | 19.08 | 21.91 | 13.00 | 13.75 | 14.38 | 11.74 | 11.14 | 13.74 | 14.15 |
| Russell 2000 | 17.36 | 20.02 | 11.37 | 12.02 | 13.52 | 10.76 | 10.01 | 12.89 | 13.23 |
| Russell Microcap | 20.15 | 20.90 | 11.33 | 11.69 | 13.09 | 10.29 | 9.43 | 12.96 | 13.62 |
| Russell Top 200 Growth | 35.23 | 35.65 | 25.53 | 26.78 | 23.24 | 20.96 | 20.01 | 21.36 | 20.71 |
| Russell Top 200 Value | 12.02 | 16.61 | 10.43 | 11.10 | 11.93 | 9.60 | 10.01 | 12.27 | 12.74 |
| Russell 1000 Growth | 32.93 | 34.08 | 24.12 | 25.32 | 22.08 | 19.58 | 18.75 | 20.30 | 19.79 |
| Russell 1000 Value | 13.43 | 17.64 | 10.55 | 11.16 | 12.17 | 9.73 | 10.19 | 12.47 | 12.97 |
| Russell 3000 Growth | 31.91 | 33.21 | 23.33 | 24.56 | 21.52 | 19.02 | 18.18 | 19.86 | 19.39 |
| Russell 3000 Value | 13.57 | 17.65 | 10.46 | 11.00 | 12.20 | 9.71 | 10.08 | 12.39 | 12.89 |
| Russell Midcap Growth | 23.63 | 27.46 | 18.51 | 19.83 | 17.65 | 14.92 | 14.53 | 16.72 | 16.63 |
| Russell Midcap Value | 16.06 | 19.62 | 10.69 | 11.22 | 12.63 | 9.96 | 10.55 | 12.89 | 13.44 |
| Russell 2500 Growth | 21.47 | 25.09 | 16.01 | 17.65 | 16.29 | 13.78 | 12.92 | 15.71 | 15.75 |
| Russell 2500 Value | 15.76 | 18.31 | 9.76 | 9.88 | 12.30 | 9.56 | 9.25 | 11.70 | 12.43 |
| Russell 2000 Growth | 17.66 | 21.17 | 12.70 | 14.53 | 13.99 | 11.66 | 10.88 | 14.09 | 14.14 |
| Russell 2000 Value | 15.85 | 17.99 | 9.38 | 9.07 | 12.56 | 9.45 | 8.78 | 11.38 | 12.03 |
| MSCI USA Minimum Volatility | 13.12 | 17.87 | 13.56 | 14.66 | 13.98 | 12.75 | 13.22 | 14.51 | 14.17 |
| MSCI All Country World Minimum Volatility | 8.17 | 12.31 | 8.66 | 10.46 | 9.95 | 8.89 | 9.15 | 9.98 | 9.99 |
| MSCI All Country World | 17.39 | 20.38 | 12.12 | 14.40 | 13.28 | 10.90 | 10.04 | 11.39 | 11.85 |
| MSCI All Country World ex USA | 9.23 | 13.18 | 5.61 | 9.61 | 8.74 | 6.56 | 5.19 | 6.27 | 7.28 |
| MSCI World | 18.82 | 21.70 | 13.26 | 15.03 | 13.74 | 11.53 | 10.68 | 12.36 | 12.70 |
| MSCI World ex USA | 10.08 | 14.07 | 6.26 | 9.63 | 8.45 | 6.73 | 5.28 | 6.93 | 7.84 |
| MSCI World ex USA Growth | 14.94 | 19.11 | 10.07 | 13.37 | 10.68 | 9.34 | 7.68 | 9.04 | 9.66 |
| MSCI World ex USA Value | 4.70 | 8.66 | 2.17 | 5.69 | 5.97 | 3.90 | 2.69 | 4.63 | 5.83 |
| MSCI World Small Cap | 15.86 | 19.20 | 9.91 | 12.35 | 12.41 | 10.50 | 9.38 | 11.73 | 12.30 |
| MSCI World ex USA Small Cap | 11.96 | 16.27 | 6.53 | 11.03 | 9.88 | 9.24 | 7.30 | 9.19 | 9.99 |
| MSCI EAFE | 9.53 | 13.54 | 5.99 | 9.55 | 8.08 | 6.76 | 5.23 | 7.04 | 8.03 |
| MSCI EAFE Small Cap | 11.22 | 15.62 | 6.14 | 11.04 | 9.51 | 9.52 | 7.60 | 9.82 | 10.80 |
| MSCI Pacific ex Japan | 5.61 | 9.70 | 4.32 | 8.31 | 8.23 | 5.67 | 4.88 | 4.95 | 6.77 |
| MSCI Canada | 15.19 | 19.15 | 8.79 | 10.21 | 12.48 | 6.32 | 5.71 | 5.70 | 6.03 |
| MSCI Emerging Markets | 7.38 | 10.94 | 3.92 | 9.87 | 10.09 | 6.11 | 5.04 | 4.16 | 5.49 |
| MSCI Emerging Markets Growth | 9.68 | 14.60 | 5.31 | 12.55 | 11.71 | 8.08 | 6.99 | 6.17 | 7.52 |
| MSCI Emerging Markets Value | 4.74 | 7.08 | 2.33 | 7.02 | 8.30 | 3.97 | 2.93 | 2.00 | 3.31 |
| MSCI Emerging Markets Equal Weighted | 10.14 | 11.88 | 3.70 | 8.64 | 8.62 | 4.68 | 4.03 | 3.20 | 4.94 |
| MSCI Emerging Markets IMI | 8.66 | 11.57 | 4.23 | 10.06 | 10.03 | 6.25 | 5.21 | 4.36 | 5.71 |
| MSCI Emerging Markets Small Cap | 19.02 | 16.46 | 6.49 | 11.47 | 9.88 | 7.32 | 6.51 | 5.89 | 7.42 |
| MSCI Emerging Markets Asia | 10.39 | 13.26 | 5.28 | 11.90 | 10.92 | 7.69 | 7.34 | 6.73 | 8.06 |
| MSCI Emerging Markets EMEA | 4.81 | 8.26 | 1.60 | 5.82 | 8.05 | 3.50 | 0.96 | 0.26 | 2.24 |
| MSCI Emerging Markets Latin America | -10.99 | -2.37 | -3.44 | 1.47 | 5.89 | -0.40 | -1.97 | -3.31 | -2.17 |
| MSCI China A | 21.57 | 26.23 | 8.81 | 12.72 | 7.45 | 6.85 | 11.32 | 9.55 | 9.73 |
| Bloomberg Barclays US T-Bills (1-3 Month) | 0.29 | 0.93 | 1.15 | 1.08 | 0.95 | 0.81 | 0.72 | 0.64 | 0.58 |
| Bloomberg Barclays US Agg Gov't-Treasury-Long | 5.94 | 8.82 | 6.05 | 6.54 | 5.66 | 4.65 | 7.01 | 4.62 | 4.51 |
| Bloomberg Barclays US Agg Credit-Long | 5.82 | 11.37 | 6.53 | 7.64 | 8.07 | 6.17 | 7.39 | 5.74 | 6.42 |
| Bloomberg Barclays Municipal Bond | 3.35 | 4.73 | 3.85 | 4.17 | 3.51 | 3.48 | 4.16 | 3.39 | 3.72 |
| Bloomberg Barclays US Aggregate | 2.88 | 4.79 | 3.58 | 3.57 | 3.41 | 3.00 | 3.37 | 2.75 | 2.90 |
| Bloomberg Barclays US Agg Corporate High Yield | 6.19 | 8.83 | 6.00 | 6.30 | 8.03 | 6.15 | 5.68 | 5.87 | 6.83 |
| Alerian MLP ETF | -2.94 | -0.06 | -3.37 | -4.30 | -1.22 | -5.18 | -3.99 | -1.75 | -1.36 |

*Data: FactSet Research Systems (12/31/21)*

AJO

# DECEMBER 2021 — BORDERING ON LONG-TERM RETURNS

| | Annualized Total Return (%) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 11 Yrs | 12 Yrs | 13 Yrs | 14 Yrs | 15 Yrs | 16 Yrs | 17 Yrs | 18 Yrs | 19 Yrs | 20 Yrs |
| Dow Jones Industrials | 13.67 | 13.70 | 14.37 | 10.21 | 10.12 | 10.66 | 10.11 | 9.84 | 10.74 | 9.28 |
| S&P 500 | 15.16 | 15.15 | 15.98 | 11.04 | 10.66 | 10.97 | 10.61 | 10.62 | 11.51 | 9.52 |
| S&P 500 (equal weighted) | 14.11 | 14.74 | 16.90 | 11.50 | 10.81 | 11.11 | 10.93 | 11.26 | 12.65 | 10.86 |
| S&P MidCap | 12.65 | 13.76 | 15.42 | 10.63 | 10.45 | 10.44 | 10.57 | 10.89 | 12.07 | 10.56 |
| S&P SmallCap | 13.20 | 14.24 | 15.07 | 10.94 | 10.15 | 10.46 | 10.29 | 10.94 | 12.26 | 10.73 |
| S&P 500 Growth | 17.82 | 17.59 | 18.61 | 13.63 | 13.33 | 13.18 | 12.62 | 12.25 | 12.92 | 10.73 |
| S&P 500 Value | 11.96 | 12.22 | 12.88 | 8.00 | 7.59 | 8.37 | 8.22 | 8.62 | 9.73 | 7.95 |
| S&P MidCap 400 Growth | 13.04 | 14.41 | 16.26 | 11.21 | 11.36 | 11.00 | 11.15 | 11.31 | 12.27 | 10.44 |
| S&P MidCap 400 Value | 12.00 | 12.86 | 14.34 | 9.83 | 9.34 | 9.66 | 9.77 | 10.26 | 11.66 | 10.46 |
| S&P SmallCap 600 Growth | 14.23 | 15.32 | 16.27 | 11.79 | 11.37 | 11.32 | 11.19 | 11.77 | 12.98 | 11.36 |
| S&P SmallCap 600 Value | 12.07 | 13.08 | 13.80 | 9.97 | 8.86 | 9.50 | 9.31 | 10.04 | 11.44 | 9.98 |
| S&P US REIT | 10.96 | 12.32 | 13.50 | 8.66 | 6.75 | 8.38 | 8.60 | 9.77 | 11.05 | 10.69 |
| Nasdaq Composite (price change) | 17.51 | 17.46 | 19.30 | 13.52 | 13.26 | 13.03 | 12.31 | 12.10 | 13.83 | 10.97 |
| Russell Top 200 | 15.78 | 15.50 | 16.15 | 11.30 | 10.93 | 11.21 | 10.76 | 10.62 | 11.41 | 9.35 |
| Russell 1000 | 15.09 | 15.17 | 16.14 | 11.10 | 10.74 | 11.03 | 10.74 | 10.78 | 11.71 | 9.75 |
| Russell 3000 | 14.82 | 15.00 | 15.97 | 10.99 | 10.59 | 10.90 | 10.62 | 10.69 | 11.68 | 9.72 |
| Russell Midcap | 13.30 | 14.27 | 16.10 | 10.56 | 10.22 | 10.53 | 10.65 | 11.16 | 12.52 | 10.88 |
| Russell SC Completeness | 13.20 | 14.26 | 15.91 | 10.72 | 10.32 | 10.60 | 10.54 | 10.94 | 12.43 | 10.51 |
| Russell 2500 | 12.52 | 13.64 | 15.12 | 10.29 | 9.67 | 10.07 | 9.95 | 10.40 | 12.01 | 10.30 |
| Russell 2000 | 11.53 | 12.73 | 13.78 | 9.46 | 8.69 | 9.27 | 8.99 | 9.49 | 11.21 | 9.36 |
| Russell Microcap | 11.32 | 12.69 | 13.76 | 8.71 | 7.51 | 8.05 | 7.72 | 8.07 | 10.55 | 9.04 |
| Russell Top 200 Growth | 19.16 | 18.65 | 19.76 | 14.51 | 14.35 | 13.98 | 13.30 | 12.75 | 13.44 | 10.89 |
| Russell Top 200 Value | 11.63 | 11.63 | 11.86 | 7.47 | 6.98 | 7.91 | 7.72 | 8.02 | 8.93 | 7.40 |
| Russell 1000 Growth | 18.12 | 18.00 | 19.38 | 13.86 | 13.72 | 13.43 | 12.93 | 12.55 | 13.40 | 10.86 |
| Russell 1000 Value | 11.76 | 12.07 | 12.64 | 8.08 | 7.51 | 8.37 | 8.29 | 8.73 | 9.76 | 8.34 |
| Russell 3000 Growth | 17.71 | 17.71 | 19.09 | 13.61 | 13.46 | 13.20 | 12.71 | 12.38 | 13.29 | 10.75 |
| Russell 3000 Value | 11.64 | 12.02 | 12.60 | 8.11 | 7.48 | 8.35 | 8.26 | 8.73 | 9.81 | 8.40 |
| Russell Midcap Growth | 14.83 | 15.75 | 17.86 | 11.71 | 11.69 | 11.63 | 11.65 | 11.86 | 13.31 | 10.81 |
| Russell Midcap Value | 12.00 | 13.01 | 14.52 | 9.55 | 8.78 | 9.46 | 9.65 | 10.39 | 11.69 | 10.52 |
| Russell 2500 Growth | 14.06 | 15.22 | 17.07 | 11.41 | 11.29 | 11.35 | 11.16 | 11.35 | 12.96 | 10.36 |
| Russell 2500 Value | 10.89 | 11.99 | 13.13 | 9.09 | 7.91 | 8.64 | 8.59 | 9.27 | 10.91 | 9.76 |
| Russell 2000 Growth | 12.47 | 13.77 | 15.24 | 10.18 | 9.97 | 10.18 | 9.81 | 10.06 | 11.81 | 9.20 |
| Russell 2000 Value | 10.31 | 11.43 | 12.11 | 8.52 | 7.19 | 8.14 | 7.94 | 8.69 | 10.39 | 9.18 |
| MSCI USA Minimum Volatility | 14.05 | 14.10 | 14.43 | 10.96 | 10.50 | 10.77 | 10.52 | 10.74 | 11.21 | 9.71 |
| MSCI All Country World Minimum Volatility | 9.56 | 9.95 | 10.49 | 7.41 | 7.38 | 8.40 | 8.43 | 9.12 | 10.02 | 8.81 |
| MSCI All Country World | 9.95 | 10.18 | 11.89 | 6.73 | 7.05 | 7.87 | 8.05 | 8.43 | 9.65 | 7.98 |
| MSCI All Country World ex USA | 5.18 | 5.66 | 8.06 | 2.90 | 3.77 | 5.07 | 5.71 | 6.51 | 8.08 | 6.80 |
| MSCI World | 10.90 | 10.98 | 12.33 | 7.32 | 7.43 | 8.18 | 8.26 | 8.61 | 9.78 | 8.06 |
| MSCI World ex USA | 5.84 | 6.10 | 8.00 | 3.11 | 3.70 | 4.96 | 5.50 | 6.27 | 7.80 | 6.48 |
| MSCI World ex USA Growth | 7.41 | 7.87 | 9.48 | 4.50 | 5.36 | 6.33 | 6.79 | 7.30 | 8.52 | 7.15 |
| MSCI World ex USA Value | 4.10 | 4.16 | 6.37 | 1.56 | 1.91 | 3.44 | 4.06 | 5.11 | 6.94 | 5.66 |
| MSCI World Small Cap | 10.16 | 11.41 | 13.64 | 8.33 | 7.81 | 8.37 | 8.79 | 9.60 | 11.72 | 10.14 |
| MSCI World ex USA Small Cap | 7.35 | 8.69 | 11.46 | 5.55 | 5.40 | 6.22 | 7.25 | 8.37 | 10.68 | 9.70 |
| MSCI EAFE | 6.02 | 6.16 | 7.94 | 3.08 | 3.60 | 4.89 | 5.38 | 6.16 | 7.66 | 6.33 |
| MSCI EAFE Small Cap | 8.05 | 9.15 | 11.67 | 5.88 | 5.58 | 6.39 | 7.46 | 8.64 | 10.92 | 9.90 |
| MSCI Pacific ex Japan | 4.82 | 5.78 | 9.85 | 3.77 | 5.38 | 6.87 | 7.27 | 8.35 | 10.06 | 9.17 |
| MSCI Canada | 4.17 | 5.44 | 8.68 | 3.45 | 5.01 | 5.77 | 6.98 | 7.77 | 9.84 | 8.55 |
| MSCI Emerging Markets | 3.05 | 4.29 | 8.69 | 2.32 | 4.45 | 6.00 | 7.47 | 8.40 | 10.49 | 9.59 |
| MSCI Emerging Markets Growth | 4.79 | 5.93 | 10.25 | 3.19 | 5.14 | 6.67 | 8.16 | 8.82 | 10.64 | 9.64 |
| MSCI Emerging Markets Value | 1.18 | 2.52 | 7.01 | 1.31 | 3.63 | 5.20 | 6.66 | 7.87 | 10.22 | 9.43 |
| MSCI Emerging Markets Equal Weighted | 2.06 | 3.64 | 8.75 | 2.51 | 4.69 | 6.32 | 7.32 | 8.23 | 10.85 | 10.28 |
| MSCI Emerging Markets IMI | 3.12 | 4.43 | 9.00 | 2.52 | 4.67 | 6.18 | 7.62 | 8.60 | 10.61 | 9.68 |
| MSCI Emerging Markets Small Cap | 3.69 | 5.47 | 11.36 | 3.83 | 6.03 | 7.51 | 8.68 | 9.51 | 11.73 | 11.03 |
| MSCI Emerging Markets Asia | 5.45 | 6.52 | 10.60 | 4.05 | 6.18 | 7.67 | 8.71 | 9.04 | 10.90 | 10.05 |
| MSCI Emerging Markets EMEA | -0.06 | 1.72 | 5.71 | -0.66 | 1.06 | 2.36 | 4.19 | 5.88 | 8.06 | 8.02 |
| MSCI Emerging Markets Latin America | -3.88 | -2.45 | 3.23 | -2.18 | 0.67 | 2.91 | 5.22 | 6.88 | 9.64 | 7.75 |
| MSCI China A | 6.95 | 5.20 | 9.74 | --- | --- | --- | --- | --- | --- | --- |
| Bloomberg Barclays US T-Bills (1-3 Month) | 0.54 | 0.50 | 0.48 | 0.57 | 0.84 | 1.09 | 1.20 | 1.20 | 1.19 | 1.22 |
| Bloomberg Barclays US Agg Gov't-Treasury-Long | 6.60 | 6.83 | 5.16 | 6.41 | 6.63 | 6.33 | 6.34 | 6.41 | 6.20 | 6.71 |
| Bloomberg Barclays US Agg Credit-Long | 7.35 | 7.62 | 8.30 | 7.38 | 7.12 | 6.89 | 6.71 | 6.85 | 7.04 | 7.28 |
| Bloomberg Barclays Municipal Bond | 4.34 | 4.17 | 4.82 | 4.28 | 4.22 | 4.26 | 4.22 | 4.23 | 4.29 | 4.55 |
| Bloomberg Barclays US Aggregate | 3.34 | 3.60 | 3.78 | 3.88 | 4.09 | 4.10 | 4.00 | 4.02 | 4.02 | 4.33 |
| Bloomberg Barclays US Agg Corporate High Yield | 6.66 | 7.34 | 10.59 | 7.45 | 7.07 | 7.36 | 7.08 | 7.30 | 8.35 | 7.84 |
| Alerian MLP ETF | -0.38 | --- | --- | --- | --- | --- | --- | --- | --- | --- |

*Data: FactSet Research Systems (12/31/21)*

AJO

# DECEMBER 2021 — REALLY LONG-TERM RETURNS

| | Annualized Total Return (%) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 21 Yrs | 22 Yrs | 23 Yrs | 24 Yrs | 25 Yrs | 30 Yrs | 35 Yrs | 40 Yrs | 45 Yrs | 50 Yrs |
| Dow Jones Industrials | 8.53 | 7.89 | 8.66 | 9.04 | 9.63 | 11.04 | --- | --- | --- | --- |
| S&P 500 | 8.40 | 7.53 | 8.09 | 8.87 | 9.76 | 10.65 | 11.31 | 12.35 | 11.87 | 11.15 |
| S&P 500 (equal weighted) | 10.30 | 10.27 | 10.35 | 10.42 | 11.11 | 11.93 | --- | --- | --- | --- |
| S&P MidCap | 10.00 | 10.33 | 10.52 | 10.87 | 11.65 | 12.03 | --- | --- | --- | --- |
| S&P SmallCap | 10.53 | 10.59 | 10.66 | 10.14 | 10.72 | --- | --- | --- | --- | --- |
| S&P 500 Growth | 9.49 | 7.81 | 8.62 | 9.85 | 10.81 | 11.26 | 12.15 | 12.77 | 12.06 | --- |
| S&P 500 Value | 6.93 | 6.89 | 7.13 | 7.44 | 8.26 | 9.64 | 10.07 | 11.51 | 11.25 | --- |
| S&P MidCap 400 Growth | 9.48 | 9.47 | 10.24 | 11.17 | 11.88 | 11.77 | --- | --- | --- | --- |
| S&P MidCap 400 Value | 10.30 | 11.04 | 10.65 | 10.39 | 11.26 | 12.02 | --- | --- | --- | --- |
| S&P SmallCap 600 Growth | 10.73 | 10.25 | 10.64 | 10.28 | 10.48 | --- | --- | --- | --- | --- |
| S&P SmallCap 600 Value | 10.12 | 10.59 | 10.25 | 9.57 | 10.53 | --- | --- | --- | --- | --- |
| S&P US REIT | 10.87 | 11.63 | 10.85 | 9.72 | 10.00 | 10.68 | --- | --- | --- | --- |
| Nasdaq Composite (price change) | 9.19 | 6.31 | 8.92 | 10.05 | 10.49 | 11.57 | 11.48 | --- | --- | --- |
| Russell Top 200 | 8.07 | 7.06 | 7.66 | 8.65 | 9.58 | 10.47 | 11.18 | 12.16 | --- | --- |
| Russell 1000 | 8.57 | 7.77 | 8.31 | 9.03 | 9.90 | 10.77 | 11.36 | 12.30 | --- | --- |
| Russell 3000 | 8.61 | 7.82 | 8.36 | 8.97 | 9.81 | 10.69 | 11.23 | 12.14 | --- | --- |
| Russell Midcap | 10.03 | 9.95 | 10.30 | 10.29 | 10.98 | 11.77 | 12.04 | 12.92 | --- | --- |
| Russell SC Completeness | 9.40 | 8.49 | --- | --- | --- | --- | --- | --- | --- | --- |
| Russell 2500 | 9.85 | 9.59 | 10.18 | 9.75 | 10.30 | 11.23 | 11.31 | 12.13 | --- | --- |
| Russell 2000 | 9.02 | 8.44 | 8.97 | 8.47 | 8.99 | 10.07 | 9.96 | 10.66 | --- | --- |
| Russell Microcap | 9.43 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Russell Top 200 Growth | 9.15 | 7.33 | 8.22 | 9.55 | 10.43 | 10.96 | 11.95 | --- | --- | --- |
| Russell Top 200 Value | 6.56 | 6.37 | 6.56 | 7.14 | 8.15 | 9.58 | 9.98 | --- | --- | --- |
| Russell 1000 Growth | 9.12 | 7.44 | 8.45 | 9.57 | 10.34 | 10.83 | 11.77 | 12.32 | --- | --- |
| Russell 1000 Value | 7.63 | 7.60 | 7.59 | 7.91 | 8.89 | 10.23 | 10.51 | 11.85 | --- | --- |
| Russell 3000 Growth | 9.07 | 7.40 | 8.43 | 9.43 | 10.14 | 10.64 | 11.52 | 12.03 | --- | --- |
| Russell 3000 Value | 7.75 | 7.77 | 7.72 | 7.95 | 8.92 | 10.28 | 10.51 | 11.85 | --- | --- |
| Russell Midcap Growth | 9.10 | 8.05 | 9.64 | 9.97 | 10.45 | 10.91 | 11.66 | --- | --- | --- |
| Russell Midcap Value | 10.11 | 10.51 | 10.02 | 9.81 | 10.70 | 11.80 | 11.77 | --- | --- | --- |
| Russell 2500 Growth | 9.25 | 7.94 | 9.67 | 9.39 | 9.60 | 10.07 | 10.56 | --- | --- | --- |
| Russell 2500 Value | 9.76 | 10.24 | 9.85 | 9.33 | 10.19 | 11.53 | 11.34 | --- | --- | --- |
| Russell 2000 Growth | 8.24 | 6.62 | 7.99 | 7.70 | 7.90 | 8.53 | 8.75 | 8.99 | --- | --- |
| Russell 2000 Value | 9.41 | 9.98 | 9.46 | 8.74 | 9.58 | 11.12 | 10.73 | 11.94 | --- | --- |
| MSCI USA Minimum Volatility | 8.80 | 8.52 | 8.49 | 9.06 | 9.84 | 10.45 | --- | --- | --- | --- |
| MSCI All Country World Minimum Volatility | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MSCI All Country World | 7.22 | 6.15 | 6.98 | 7.56 | 7.85 | 8.40 | --- | --- | --- | --- |
| MSCI All Country World ex USA | 5.81 | 4.76 | 5.78 | 6.12 | 5.96 | 6.37 | --- | --- | --- | --- |
| MSCI World | 6.72 | 5.73 | 6.50 | 7.19 | 7.52 | 8.06 | 8.39 | 10.10 | 10.00 | 9.29 |
| MSCI World ex USA | 4.95 | 4.04 | 4.98 | 5.52 | 5.39 | 5.85 | 6.25 | 8.51 | 9.17 | 8.84 |
| MSCI World ex USA Growth | 5.33 | 3.76 | 4.85 | 5.49 | 5.38 | 5.42 | 5.63 | 7.99 | 8.39 | --- |
| MSCI World ex USA Value | 4.41 | 4.11 | 4.89 | 5.34 | 5.19 | 6.10 | 6.80 | 9.20 | 9.98 | --- |
| MSCI World Small Cap | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MSCI World ex USA Small Cap | 8.63 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MSCI EAFE | 4.81 | 3.87 | 4.78 | 5.37 | 5.22 | 5.71 | 6.13 | 8.65 | 9.28 | 8.78 |
| MSCI EAFE Small Cap | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MSCI Pacific ex Japan | 8.17 | 6.96 | 8.31 | 7.64 | 5.74 | 7.61 | 8.40 | 8.42 | 9.70 | 9.15 |
| MSCI Canada | 6.96 | 6.89 | 8.59 | 7.93 | 8.12 | 8.23 | 8.46 | 8.55 | 9.13 | 8.51 |
| MSCI Emerging Markets | 9.33 | 7.10 | 9.17 | 7.45 | 6.62 | 7.60 | --- | --- | --- | --- |
| MSCI Emerging Markets Growth | 9.06 | 6.83 | 9.20 | 7.55 | 6.64 | --- | --- | --- | --- | --- |
| MSCI Emerging Markets Value | 9.50 | 7.21 | 8.97 | 7.20 | 6.44 | --- | --- | --- | --- | --- |
| MSCI Emerging Markets Equal Weighted | 9.67 | 7.30 | 9.49 | --- | --- | --- | --- | --- | --- | --- |
| MSCI Emerging Markets IMI | 9.10 | 6.54 | 8.51 | 6.57 | 5.37 | --- | --- | --- | --- | --- |
| MSCI Emerging Markets Small Cap | 10.49 | 7.82 | 9.07 | 7.87 | 5.73 | --- | --- | --- | --- | --- |
| MSCI Emerging Markets Asia | 10.23 | 7.08 | 9.24 | 8.31 | 5.16 | 6.67 | --- | --- | --- | --- |
| MSCI Emerging Markets EMEA | 6.95 | 5.49 | 7.74 | 6.04 | 6.49 | --- | --- | --- | --- | --- |
| MSCI Emerging Markets Latin America | 7.61 | 6.37 | 8.24 | 5.96 | 6.88 | 7.93 | --- | --- | --- | --- |
| MSCI China A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bloomberg Barclays US T-Bills (1-3 Month) | 1.35 | 1.56 | 1.70 | 1.84 | 1.98 | 2.38 | --- | --- | --- | --- |
| Bloomberg Barclays US Agg Gov't-Treasury-Long | 6.59 | 7.17 | 6.43 | 6.71 | 7.04 | 7.31 | 7.65 | 9.35 | 8.16 | --- |
| Bloomberg Barclays US Agg Credit-Long | 7.50 | 7.58 | 6.96 | 7.05 | 7.30 | 7.56 | 8.01 | 9.76 | 8.53 | --- |
| Bloomberg Barclays Municipal Bond | 4.57 | 4.89 | 4.58 | 4.65 | 4.83 | 5.24 | 5.67 | 7.28 | --- | --- |
| Bloomberg Barclays US Aggregate | 4.52 | 4.83 | 4.58 | 4.75 | 4.94 | 5.29 | 5.94 | 7.42 | 6.93 | --- |
| Bloomberg Barclays US Agg Corporate High Yield | 7.71 | 7.06 | 6.85 | 6.64 | 6.87 | 7.75 | 8.00 | --- | --- | --- |
| Alerian MLP ETF | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

*Data: FactSet Research Systems (12/31/21)*

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

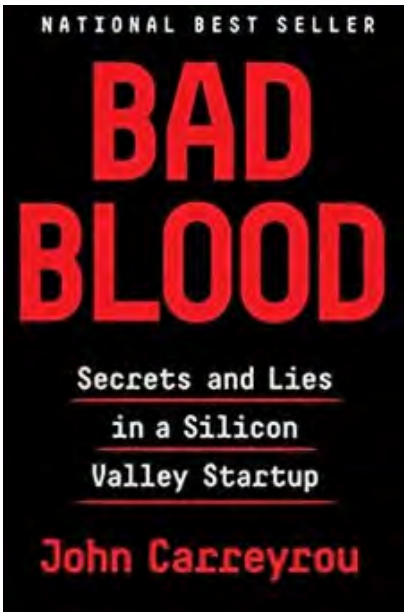
# MEMORANDUM

FROM: Ted Aronson

DATE: January 7, 2022

RE: **BAD BLOOD**

I've been obsessed with the Theranos trial for a number of reasons. Chief among them,




I loved the book. But post-verdict in the Holmes case, the coverage is heavy on quantity and light on insight. The following is an exception:

*Theranos Will Teach Silicon Valley Nothing* by Bethany McLean nails it!

TRA

aronson@ajopartners.com

The New York Times

Wednesday, January 5, 2022

**OPINION** | BETHANY McLEAN

# Theranos Will Teach Silicon Valley Nothing

Brittany Hosea-Small/Reuters

In his 1993 biography of Isaac Newton, Richard Westfall argues that parts of Newton's watershed work, the Principia, are "nothing short of deliberate fraud." True or not, it is clear that Newton made compromises in service to his vision. And he was not the only famous scientist who would do almost anything to make a breakthrough. Some would take drugs, follow mystical visions, lie and even cheat to make a discovery, as Michael Brooks notes in "Free Radicals: The Secret Anarchy of Science."

On Monday, after a nearly four-month trial and testimony from dozens of witnesses, the jury in the case against Elizabeth Holmes — the founder and former chief executive of Theranos — returned a mixed verdict, finding her guilty on just four of 11 charges. Prosecutors said the case was "about false statements made to investors, false statements made to patients." Ms. Holmes's lawyers argued that she was "building a company, not a criminal enterprise." The jurors seem to have agreed with some of each. They found that she was guilty of lying to some, but not all, of Theranos's investors. The jury couldn't reach a verdict on the remaining investors. As for the charges that she had defrauded patients, the jury found her not guilty.

It is tempting to see the outcome of this trial as a referendum on corporate greed or misbehavior. Many do. As Jason Calacanis wrote on Twitter after the verdict, "Reminder to Founders: Never lie, never bend the truth, always be honest … and oh yeah, don't be a sociopath with delusions of grandeur." As a CNN story put it, "The outcome of her case could serve as a cautionary tale for others in the Silicon Valley."

I'm not so sure there's any larger message in the Theranos saga. A brief history of prosecutions of suspected white-collar criminals — or the failure to prosecute them — shows that what happens in one case doesn't mean that much for other cases. Where juries, or even would-be prosecutors, draw the line between the Newtons and the P.T. Barnums, the visionaries and the fraudsters, the overly optimistic and the outright liars strikes me as haphazard, dependent on each set of circumstances, as well as on the ineffable mood of the world at large.

A jury's verdict is black-and-white, but the real story is rarely so simple. We think of visionaries and fraudsters as polar opposites. In reality, just like Newton, many of today's great entrepreneurs have some characteristics of both. "Scientists who fall deeply in love with their hypothesis are proportionately unwilling to take no as an experimental answer," the scientist Peter Medawar said, according to the book "Free Radicals." Today, you could swap out the word "scientists" for "entrepreneurs." It's a very American question about the price of success: What degree of dishonesty is acceptable, especially if the dishonesty is the result of a certain amount of self-delusion?

As a society, we're willing to tolerate this — to a point. Whether it's technology companies making promises about products that don't quite exist in their promised form to seduce customers or investors, or Elon Musk touting Tesla's "full self-driving" cars that do not actually drive themselves, the line between the visionary and the fraudster can be less a bright slash than it is a blur of dots. If Ms. Holmes's team had had a breakthrough right before Theranos's technology was rolled out in Walgreens across the country and her devices worked, would anyone have cared about the initial set of lies?

Where we draw the line can seem random, but there are a few constants. One is that we bring the full force of the law against the person who gets caught in the middle, awkwardly trying to straddle vision and reality. Those who are able to keep raising money get to keep trying, and sometimes, they go down in history as, well, visionaries.

Those who run out of money also run out of luck. Enron got caught in the aftermath of the dot-com bust, when skepticism was back in style. If Enron existed today, when capital is nearly free, few questions asked, the company might have been able to continue raising the billions it needed to paper over the holes in its finances. Enron's broadband business could have become Netflix. If years later someone had revealed all of the financial shenanigans Enron used to keep its stock price up, would anyone have cared about the deception it had taken to get there?

What we're willing to tolerate also comes down to who gets hurt. Those who fund the vision or fraud — the investors — aren't always sympathetic characters, at least not in the eyes of the law.

Take WeWork's Adam Neumann. "The lines between vision, bullsh*t and fraud are pretty narrow," the professor and author Scott Galloway wrote on his website No Mercy/No Malice in the fall

of 2019, when WeWork postponed its initial public offering of stock. “Something is wrong,” he wrote. “Something stinks. Something … Just. Doesn’t. Add. Up.” There were questions about how WeWork was classifying expenses and about the myriad ways in which Mr. Neumann used the company to enrich himself. He reportedly cashed out some $700 million through sales of stock and debt. (Ms. Holmes never cashed out.) But while Mr. Neumann was forced to leave the company, he never faced any allegation of criminal wrongdoing. After all, if investors suffered in part because of their own greed, unwilling to ask questions because they didn’t really want to know the answers, well, whose fault was that?

Then there’s Andy Fastow, Enron’s former chief financial officer. When he gives speeches today, he holds up the Excellence Award he received from CFO magazine in 1999 — and his prison ID card. He likes to say that he went to prison for the same actions for which he was once rewarded. It’s certainly true that investors were willing to look the other way and laud the complexity they were too lazy to understand, as long as they got the bottom line results they were promised — and as long as the stock was going in the right direction.

Mr. Fastow, unlike so many others, paid for his sins; he was sentenced to six years in prison. Part of the reason he pleaded guilty is that in addition to misleading investors, he stole from the company. And he was a pawn in the larger case against Enron’s top executives. But his sentence has no bearing on whether or not the next Andy Fastow, the next financial wizard who uses complex structures to present a picture to investors that is at odds with economic reality, will be prosecuted.

The size of the conflagration, and the era in which it occurs, also seems to affect our willingness even to bring charges, much less convict. Enron shocked us. A naïve nation that by the late 1990s had become dependent on company stock as a way to fund our retirements couldn’t believe a major company could simply go poof, leaving executives with millions and employees and investors with nothing. Enron was supposed to set a precedent about what we’d tolerate when it came to corporate misbehavior.

But if Enron had set any kind of precedent, would the financial crisis have happened? Enron’s former chief executives, Jeffrey Skilling and Kenneth Lay, were convicted in the spring of 2006, just as the fraud in the mortgage business that led to the financial crisis was reaching its apex. Part of the self-delusion that can set in for executives is that when everyone else is doing it, the behavior doesn’t seem wrong. That’s especially true when it’s being so richly rewarded.

Not only did Enron not prevent the financial crisis, but also in that disaster, which did far more widespread damage than Enron ever did, prosecutors brought charges against only minor players, not major executives. Indeed, while the Justice Department took a tough approach to Enron’s wrongdoing, after the financial crisis, department officials were hands-off with the financial services industry. Part of the thinking was that no one wanted to weaken the banks the government had just bailed out in 2008 by bringing criminal charges. The mood in the halls of power then was very different from what it was after Enron’s collapse.

While the financial crisis was less about vision gone wrong than it was about mass delusion and greed, it also sheds light on another factor that influences decisions to prosecute. When executives are separated by layers of lawyers and underlings from the actual wrongdoing, they can be kept at a remove from the gritty details of any actual fraud.

Angelo Mozilo, for example, the former chief executive of Countrywide, faced intense criticism for spreading bad mortgages across America. That’s true. That’s what Countrywide did. But he was not charged with the sale of mortgages of mass destruction because he wasn’t the one actually doing it. The dirty work was done by junior employees. Even at Enron, some of the most egregious behavior never resulted in criminal charges because lawyers and accountants signed off on it, thus insulating executives.

We’re also willing to throw the book at those who violate society’s unwritten laws, even when they can’t be charged with the crime for which we think they’re guilty. Take Martin Shkreli. Some called him the most hated man in America when he raised the price of the drug Daraprim, used mainly to treat a potentially fatal parasitic infection called toxoplasmosis, by 5,000 percent. That may be a moral crime, but it isn’t technically illegal. Yet he went to prison anyway — for defrauding investors in an entirely different incident, a case that might never have been brought had it not been for his actions with Daraprim.

Did his prosecution have any larger meaning? Did it even mean that we won’t tolerate people ripping off the system using lifesaving drugs? Well, no, it didn’t mean that at all. Big Pharma has continued to raise prices on its drugs aggressively, and because we spend so much more on drugs other than Daraprim, their actions have far more deleterious consequences for America’s out-of-control spending than Mr. Shkreli’s did.

Which brings us back to Elizabeth Holmes. For those who believed she was guilty of a great crime, it’s a disappointing verdict. The jury essentially said she was both visionary and fraudster. She was convicted of very specific lies but not of running a criminal enterprise writ large. In acquitting her of lying to patients and doctors, the jury seemed to believe that she had a right to rely on reassurances from some underlings that her technology worked. On the charges on which the jury deadlocked, at least one juror believed that in those instances, she didn’t lie to investors, either.

It was precisely the opposite of the verdict I’d expected — and frankly wanted. I thought she’d be convicted on the charges of lying to patients but found not guilty of the charges that she defrauded investors, who in my view should have done the homework that others who refused to give Theranos money did. Yes, even I wanted to send a larger message to entrepreneurs: that it wasn’t OK to lie to patients, who shouldn’t have to do any homework to make sure the provider of their blood tests isn’t lying to them.

But I didn’t get what I wanted, because the jury looked at the specific charges and the specific evidence and came to a different conclusion. The judge’s instructions to the jury did not say, “Please send a message to the world.” And there was no larger message, no attempt to punish her beyond what the jury thought the technical details of the law permitted.

Isn’t that precisely as the law should work? If you were charged with a crime, you wouldn’t want the jury to use your case to send a message to anyone, aside from the verdict it delivered to you.

---

**Bethany McLean** *is a contributing editor at Vanity Fair and a co-author of “The Smartest Guys in the Room.”*

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

FROM: Ted Aronson

DATE: November 1, 2021

RE: **DOW 36,000**

For some of us, "Dow 36,000" has special meaning — really special! AJO got miles out of the silliness over two decades ago.

Planning for this day consumed much of my attention. (No, I wasn't making a projection, but after all, momentum is part of our modeling!) Thankfully for you dear reader, Jason Zweig beat me to it. The link and reprint follow . . . .

[WSJ Dow 36,000]

TRA
aronson@ajopartners.com


*"I think you'll find this wine to be quite infuriating."*

THE WALL STREET JOURNAL.

Monday, November 1, 2021
© 2021 Dow Jones & Company, Inc. All Rights Reserved.

# Dow Crosses 36,000 — Making a Book's Prediction Just Two Decades Late

A 1999 book boldly proclaimed the index should hit that target 'immediately.' Now the authors have something to say.

**BY JASON ZWEIG**

This week, the book "Dow 36,000" by James Glassman and Kevin Hassett turned out to be prophetic.

The Dow Jones Industrial Average should hit that mark "very quickly," "immediately," even "today," the book had proclaimed. "The rational time frame is this afternoon," wrote Messrs. Glassman and Hassett, although they conceded it might take "three to five years."

The book was published Oct. 1, 1999, when the Dow closed at 10273. More than 22 years later, the index very briefly crossed the mark at 9:42 a.m. on Monday, in a moment barely noticed by investors. The book's prediction finally came true.

"Dow 36,000" is a reminder of a Wall Street maxim about market predictions: Forecast a number or a date, never both. Yet many have done just that anyway, and the index's long march to 36000 has made nearly all of those projections look ridiculous.

On Jan. 17, 2012, with the Dow at 12482 and used copies of "Dow 36,000" selling around that time for as little as one penny, a reviewer using the pseudonym "Annyong Bluth," a character from the television comedy "Arrested Development," gave the book a five-star review on Amazon.com.

It wasn't what most people would consider positive, though.

"I used the pages of this book to line the base of our two-month-old Rottweiler puppy's cage," the reviewer wrote. "I was struck by the moisture and odor-absorbing power of its pages. These super-absorbent sheets really took to canine urine and feces. And, at 1 penny for 294 pages, Dow 36,000 was such a steal! Highly recommended!"

James Glassman, co-author of 'Dow 36,000'
PHOTO: U.S. AGENCY FOR GLOBAL MEDIA

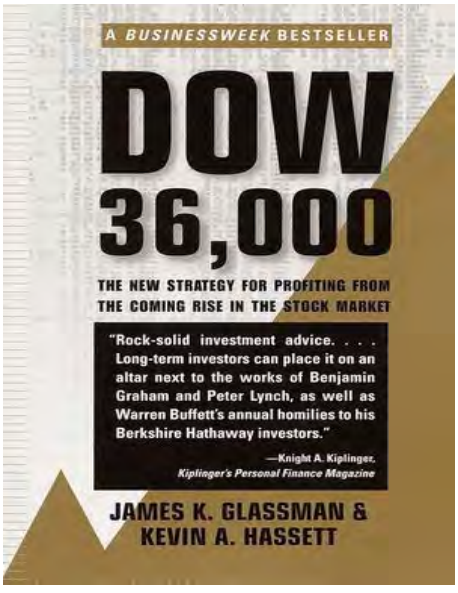
'Dow 36,000' co-author Kevin Hassett, outside the White House in 2019.
PHOTO: Andrew Harrer/Bloomberg News

The reviewer's real name and whether he or she had bought "Dow 36,000" couldn't be determined. It is the only Amazon review listed with that username.

In a recent interview, Mr. Glassman, one of the authors, shrugged off such reviews. "We went out into the wild blue yonder with our eyes wide open when we expressed our views in this book," he said. "We understand that some people will be upset with us. The nasty reviews don't bother me at all."

Mr. Glassman, 74 years old, is a journalist, a former undersecretary of state and the founding executive director of the George W. Bush Institute.

"On the one hand, I'm very happy" about the Dow finally hitting 36000, he said. "We dared to say this could happen at a time when many people didn't think it would ever be possible. On the other hand, it's very clear to me that the thesis



at the foundation of the book was faulty. People are afraid of stocks. We need to recognize that."

His co-author, Mr. Hassett, 59, is a former Federal Reserve economist who chaired the Council of Economic Advisers in the Trump administration. In an email, Mr. Hassett pointed out that an investor who had taken the duo's advice "beginning on March 30th, 1998, the day our first piece ran in the WSJ laying out the theory," would have earned more than a 500% cumulative return, including dividends, on the S&P 500 stock index by mid-August 2021.

The authors of "Dow 36,000: The New Strategy for Profiting from the Coming Rise in the Stock Market" deserve some credit for making so specific a prediction, said Philip Tetlock, a psychologist at the University of Pennsylvania's Wharton School who studies expert forecasting.

"People pay more attention when you make a bold and catchy and specific forecast than when you use vague verbiage," he said. "If you're wrong, the price you pay is ridicule and schadenfreude."

Two other books that came out in 1999 targeted big numbers: "Dow 40,000," by financial adviser David Elias, and "Dow 100,000: Fact or Fiction," by investment strategist Charles Kadlec.

Mr. Elias said his call for the Dow to hit 40000 by 2016 didn't provoke much criticism until late 2008, when the index sank to about 8000. "That's when I got my fanny spanked," he said in an interview. "I thought it would be at 40000 by now—but better late than never."

Mr. Kadlec's book had estimated the Dow could hit 40000 by 2012, 80000 by 2018 and 100,000 by 2020. This summer, Mr. Kadlec said he couldn't speak about his book until he retrieved his only remaining copy, which he had lent to a friend years ago.

In October, after he finally got the book back, Mr. Kadlec said: "The purpose [of the Dow 100,000 forecast] wasn't to make a point guarantee. I used that provocative approach to shift the audience's thinking from what's going to happen this week to a longer-term horizon."

He said he still thinks "it's reasonable" that the Dow will hit 100,000, probably by the early 2030s.

Hitting the 100,000 mark would also trigger the Journal to put a comma in the index value; attentive readers might notice that smaller values don't get a comma.

There's a method to the madness of making extreme market forecasts, said former analyst Henry Blodget, who in late 1998 called for Amazon.com Inc.'s stock to hit $400 within a year. Other analysts called the target "not realistic" and "irresponsible."

Amazon's shares hit $400 days later. The shares tanked in 2000 and bottomed in 2001, roughly 88% below their level the day of Mr. Blodget's prediction. Amazon's stock is now up approximately 6,900% since his original call.

In 2003, regulators barred Mr. Blodget from the securities industry and assessed $4 million in penalties and other sanctions, alleging he had made some stock recommendations without "a sound basis." He settled without admitting or denying the charges.

An extreme prediction is "supersimple, and it shows the magnitude of the possible opportunity," said Mr. Blodget, now chief executive of Insider Inc., the online news publisher. Investors, he said, don't benefit from generic forecasts: "What doesn't create value is saying the same thing everybody else is saying in the same way."

On Oct. 15, 1929, the pre-eminent economist in the U.S., Irving Fisher of Yale University, captured headlines by declaring stocks had reached "what looks like a permanently high plateau." That day, the Dow closed at 347.24. Less than two weeks later, the Crash of 1929 began. The Dow finally hit bedrock on July 8, 1932, at 41.22.

That was 88% below Mr. Fisher's permanently high plateau.

Mr. Fisher had borrowed money to invest on the basis of his own bullish forecast. Formerly wealthy, he ended up hundreds of thousands of dollars in debt, according to business historian Walter Friedman. By 1939, Mr. Fisher could no longer afford the rent payments on his home. He died in 1947.

On Jan. 7, 1981, the popular technical analyst Joe Granville told his newsletter subscribers to "sell everything." The Dow, then about 1000, tumbled 3.9% in two days on then-record trading volume.

Mr. Granville considered himself so prophetic that he titled his memoir "The Book of Granville" and often dressed up as Moses in front of live audiences.

His influence waned after he missed the epic bull market of the 1980s, calling it a "sucker's rally." In November 1985 he called for the Dow, then around 1400, to sink to "600 or lower" within six months. Instead the index shot above 1800.

Mr. Granville, who died in 2013, predicted he would win a Nobel Prize in economics for solving the mystery of the stock market. He never did.

In 2010, Robert Prechter, president of Elliott Wave International, a newsletter publisher and data service in Gainesville, Ga., called for the Dow (then around 10000) to fall below 1000 within six years.

Six years later, the index was at roughly 18000.

"Sticking my neck out a mile makes errors commensurate," Mr. Prechter said in a recent email. "Doing so has been rewarding when right, though." He pointed out that he turned bullish on stocks in early 2009 and in early 2016, when many others were bearish.

As for "Dow 36,000," after years of insisting that the book's thesis was correct, Mr. Glassman finally wrote in an opinion piece in the Journal in February 2011: "I was wrong."

Saying the world had become "a riskier place" since 1999, Mr. Glassman urged investors to scale back their stock holdings. The Dow closed at 12068.50 that day.

Since then, the Dow has tripled.

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

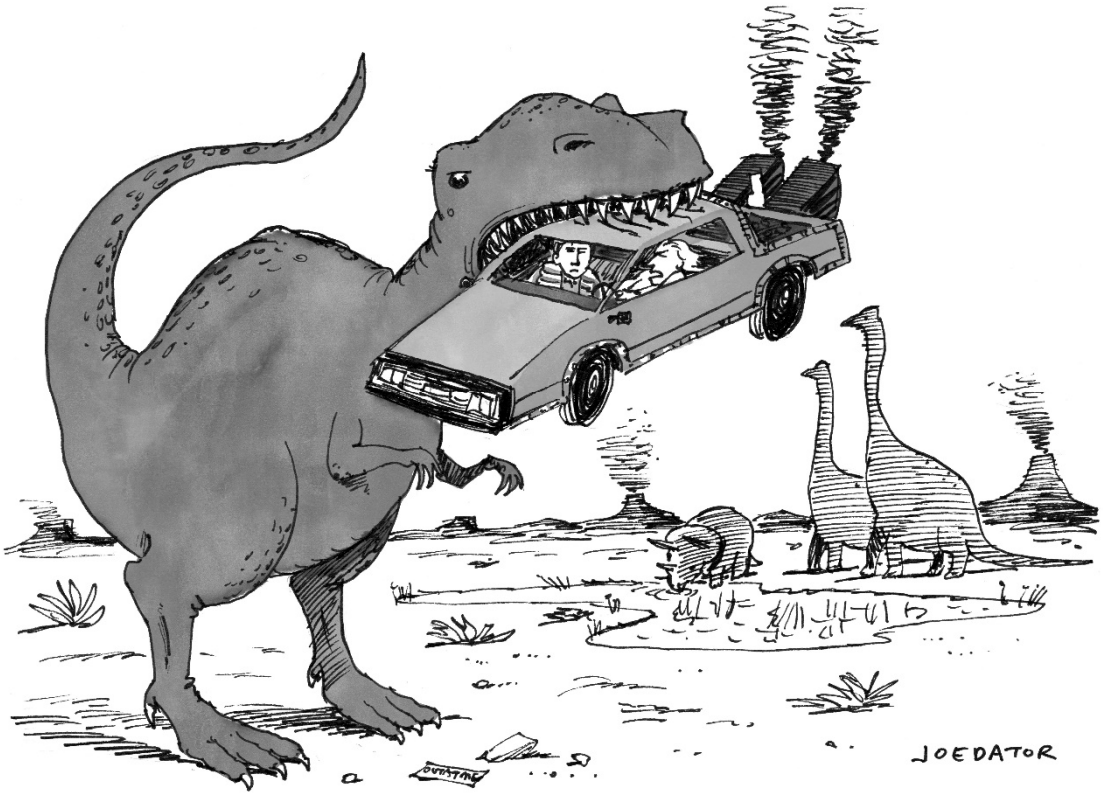
FROM: Gina Moore

DATE: August 10, 2021

RE: BACK TO THE FUTURE — A TRIP THROUGH THE PAST OF "BALONEY.COM"

It all started two decades ago when the TMT/Internet Bubble was in full swing . . .

It was February of 2000 and the trailing twelve-month performance of the Russell Midcap Growth outperformed Midcap Value by 93 *whole percentage* points. The "new-fangled" internet high-flyers were out of control. AJO's performance was lagging, to put it mildly, and we were desperate to illustrate the anti-value craze was both pervasive (not just a tech sector phenomenon) and unprecedented.




*"Yeah, whatever. At least we didn't go back to the TMT bubble."*

## The birth of Baloney.com

We grabbed data on the 2,000 or so largest stocks across all sectors as far back as 1962. We constructed a simple cheap/dear strategy — buying the cheapest 10% and shorting the richest 10% based on trailing price-to-earnings, rebalancing monthly. We ignored transaction costs (would have been gargantuan) and had no concern for reality (e.g., locates or shortability).

Our study tracked the path *and* trajectory of the returns to value over the past (then) thirty-eight years. The trajectory was impressive — an average of 5.5% annually, with a standard deviation of 13.3%, but as value investors that fact was not surprising. We wanted to better visualize the path of value — particularly *after* points of underperformance. In fact, four periods of significant underperformance preceded the Internet Bubble (aka Baloney.com). The most significant was the Great Garbage Market of '68 when value was down (25)%. Obviously, it could get ugly. In February of 2000, with value underperforming (54)%, we could only hope the end was in sight.

## Back to the future

Twenty years later, we have two more observations to include in the mix: the GFC — value down (22)%, and the latest, a four-year, four-month trouncing by the FAANGs (the internet stocks that actually made it to adulthood) punctuated by the global pandemic — value down (43)%. "The latest" is the longest anti-value period in our study. It is difficult to label because, well, how do you label anything punctuated by a global pandemic. And, it is not over yet . . .

After the Great Garbage Market value decline, it took two years to regain leadership; after the GFC, value was back in business one year and ten months later; when the TMT bubble burst, value roared back from its amazing fall in just twelve short months. Through June 30, "the latest" rebound value is twelve months and +32% in the making.

We have another 33% to go before value can consider itself *back to the future* — does anyone have a DeLorean?

GMM
moore@ajopartners.com

gce

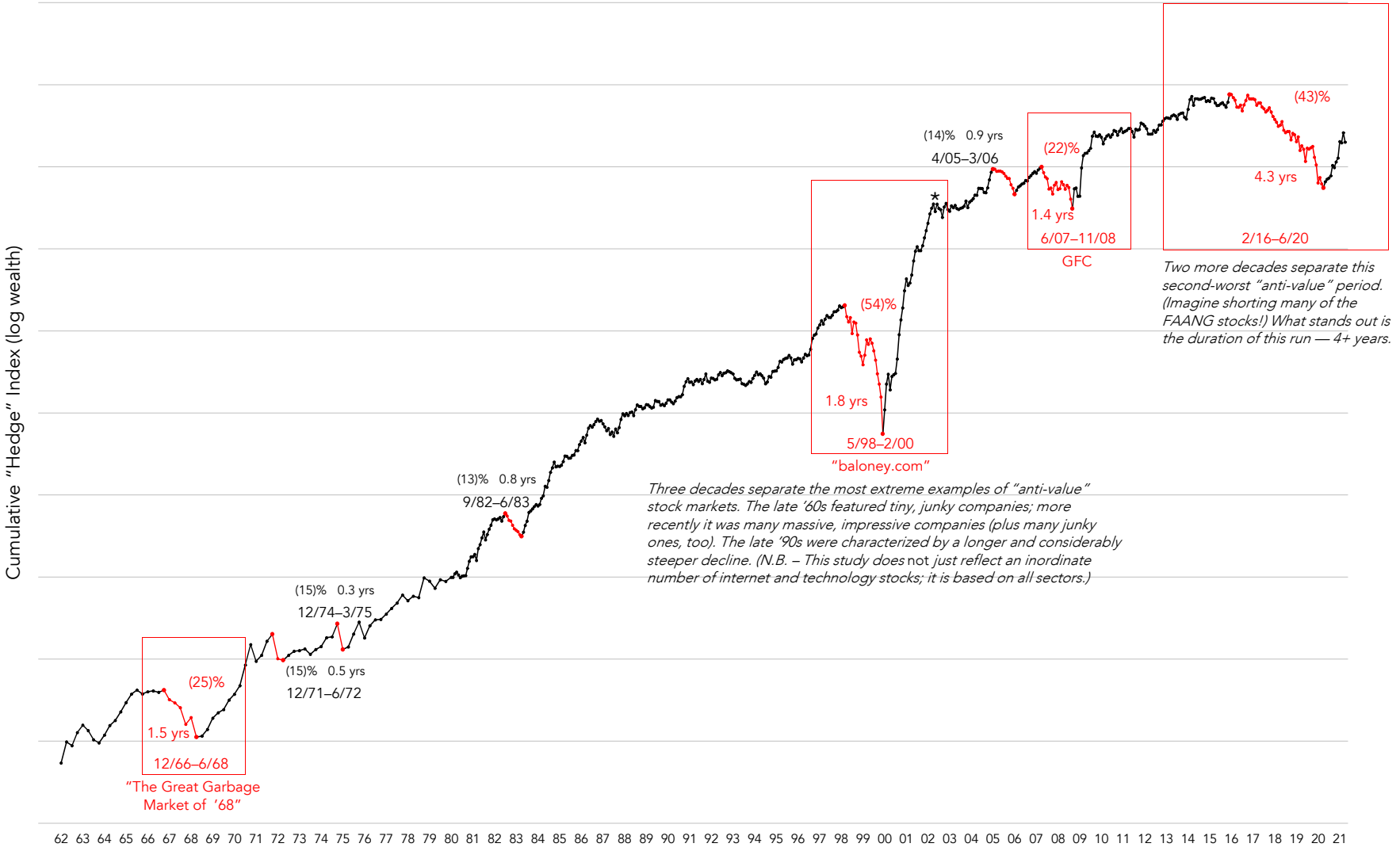
AJO

## Long Cheap Decile / Short Rich Decile

Trailing P/E: equal-weighted, sector-adjusted returns

March 1962–March 1980, quarterly; March 1980–June 2021, monthly

(N.B. – These paper-portfolio returns are the result of an academic exercise and are not the results of any strategy or investment recommendations made by AJO. They do not reflect gargantuan transaction costs.)




Sources: AJO, Compustat, FactSet, Wilshire Associates. Jason Zweig coined "baloney.com"; David Dreman coined "The Great Garbage Market of '68." Only loss periods that exceeded (10)% are identified. Over the 58-year history, the annual compound return is 5.3%, with a standard deviation of 13.7%. *The rebound to 6/02 was an astonishing 224% in 2.5 years!

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

FROM: Ted Aronson

DATE: June 10, 2021

RE: *ALTERNATIVE INVESTMENTS — LOVE 'EM OR HATE 'EM*

That's the way Larry Siegel opens the debate with Richard Ennis.

The topic? **The Endowment Model!**

Recently deceased David Swensen is uniquely central to the debate, because no one is more associated with the Endowment Model.

There's lots here, so let me explain the order:

- Immediately following are Will Goetzmann's and Jason Zweig's obits of Swensen.
- Then, three pieces from the *Journal of Portfolio Management* (Editors' Intro; Failure of the Endowment Model by Richard Ennis; Don't Give Up the Ship by Larry Siegel).
- Finally, a rebuttal from both authors (Burnishing the Endowment Myth by Richard; The Endowment Model is Just Active Management by Larry).

I love when two intellectuals spar — it helps that they are friends!


*"Hey, I like nuts, too. All I'm saying is maybe diversify your portfolio."*

TRA

aronson@ajopartners.com

Enterprising Investor

Practical analysis for investment professionals

CFA Institute

# In Memoriam: David Swensen

*By William N. Goetzmann*

**Posted In: Alternative Investments, Drivers of Value, Economics, History & Geopolitics, Leadership, Management & Communication Skills, Philosophy, Portfolio Management, Standards, Ethics & Regulations (SER)**

> "David was, simply, the best at what he did. He was to endowments what Jack Bogle was to funds — none better as a person or professional." — Steven M. Galbraith

David Swensen, who passed away last week, was among the most influential investors of his generation. As chief investment officer at Yale, Swensen pioneered the endowment model and changed the way institutions invest, moving them from a narrow focus on marketable securities to an extended diversification across a variety of unusual assets, including natural resource funds, private equity, venture capital, and absolute return strategies. He showed that these less-than-efficient markets offered opportunities for astute investors.

As a result, Swensen's approach was fundamentally humanistic: It centered on identifying, assessing, hiring, and developing talented individuals. The insight that investment management is as much about people as it is about statistics will be one of Swensen's legacies.

> "He showed that there was a way to compete hard and well in financial markets . . . but to have our lives be about something that mattered more." — Andrew K. Golden

The publication of his book *Pioneering Portfolio Management* in 2000 coincided with the turn of the millennium and a shift in the zeitgeist of institutional asset management away from passive investment management. This change was led by a handful of top university endowments — Yale, Harvard, Stanford, and Princeton. *Pioneering Portfolio Management* immediately

became the manual for a host of institutional investors seeking to improve performance.

At the outset, Swensen's foray into alternatives seemed risky. There was little reliable data about the performance of non-marketable assets and this uncertainty barred the path for many institutional managers. Yale's success was important proof of concept, and allowed many others to follow suit.

Swensen articulated the key maxims in *Pioneering Portfolio Management*: Equity generates superior returns over the long-term, a well-diversified portfolio requires investing beyond publicly traded securities, some active managers can add value in less-efficient markets, and patient investors have a relative advantage. While these maxims are straightforward, their implementation is not.

Swensen and his long-time collaborator Dean Takahashi developed a process that led to a deep understanding and appreciation of human potential, motivation, intelligence, character, and integrity. The Yale approach looks beyond the numbers into such things as the role that their businesses play in manager's lives and ambitions.

> "David was my first and greatest mentor and was like another father to me . . . I clung to every word he said, about investing and life." — Ted Seides, CFA

Swensen was also a dedicated educator. He and Takahashi regularly taught an investment course at Yale. Their students learned how to evaluate managers as people with individual skills, concerns, and interests. The course also provided the two a chance to evaluate talent for the Yale Investment Office itself.

The illustrious "alumni" of the Yale Investment Office, many of whom are graduates of Yale College and the Yale School of Management, have carried on Swensen's legacy as leaders in the practice of investment management. A list of some of the illustrious protégés of Swensen's can be found in the 2020 annual report of the Yale Investment Office. They have managed, the endowments of Princeton, MIT, the University of Pennsylvania, The Rockefeller Foundation, Rainwater Charitable Foundation, Wesleyan University, Smith College, The Kaufman Foundation, The Metropolitan Museum of Art, the Packard Foundation, the Carnegie Corporation, Bowdoin, Stanford, the New York Public Library, and Mount Holyoke College, among other institutions.

Swensen immersed himself in the life of the university and its community through teaching, mentorship, and interaction with faculty and students. I had the privilege to know him over much of his time at Yale, and to co-teach with

him on one occasion. Swensen's success in building Yale's portfolio of alternative asset classes, and a stable of active managers, spurred my personal curiosity and academic research into alternative assets. He will undoubtedly have a lasting impact on the practice of, and research about, investment management.

> "He has never had any interest in doing anything but running the endowment as well as he could . . . He has a passion for giving back to an institution with a higher purpose. He never aspired to more money or a higher position." — Stephen Swensen

I was honored to work with him on Yale's policies on socially responsible investing. He was deeply committed to the university's mission and to the idea of investment with a purpose. I deeply admired his perseverance and courage through his personal health struggles, and appreciate how much of himself he gave to Yale.

With David Swensen's passing, the financial community has lost one of the most important investors of modern times. His example will inspire investment professionals for years to come.

**About the Author**

William N. Goetzmann is the Edwin J. Beinecke Professor of Finance and Management Studies and Faculty Director of the International Center for Finance at the Yale School of Management and the Executive Editor of the CFA Institute *Financial Analysts Journal*. He is an expert on a diverse range of investments. His past work includes studies of stock market predictability, hedge funds, and survival biases in performance measurement. His current research focuses on alternative investing, factor investing, behavioral finance, and the art market. Goetzmann has written and co-authored a number of books, including *Modern Portfolio Theory and Investment Analysis*, *The Origins of Value: The Financial Innovations that Created Modern Capital Markets*, *The Great Mirror of Folly: Finance, Culture and the Crash of 1720*, and most recently, *Money Changes Everything: How Finance Made Civilization Possible*. He teaches portfolio management, alternative investments, real estate, and financial history at the Yale School of Management.

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

FROM: Ted Aronson

DATE: May 24, 2021

RE: **FINANCIAL FOLLY, RELIGIOUS FRENZY AND THE DELUSIONS OF CROWDS**

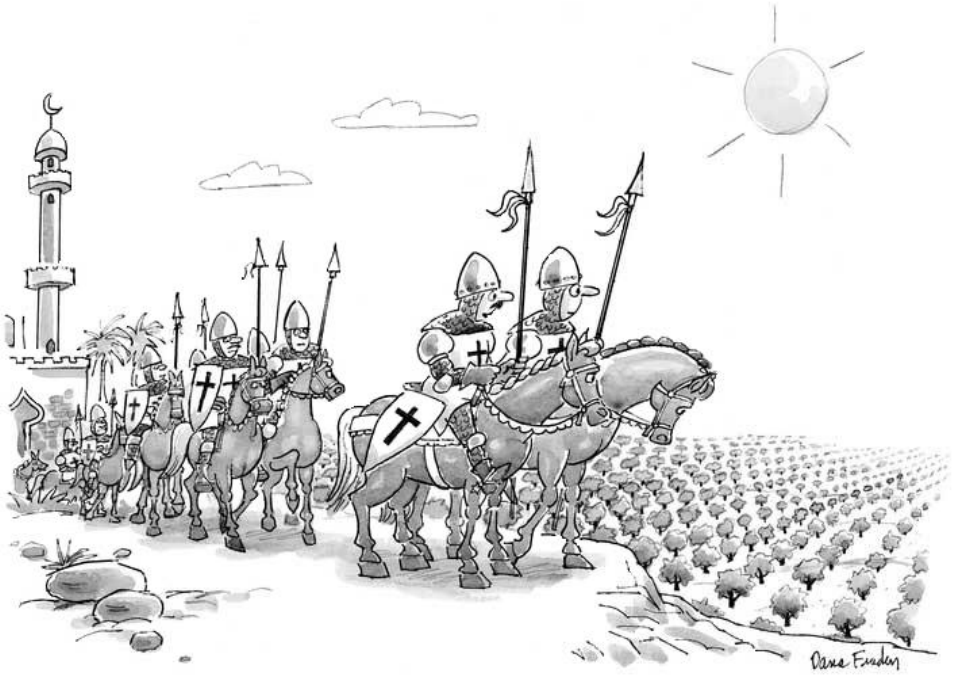
Now, this is getting interesting!

Larry Siegel reviews William Bernstein's latest efforts.* In it, Larry finds fault — or at least exaggeration — in Bill's linking "religious nuttiness and financial foolishness."

In my opinion, it's all about olive oil.

TRA
aronson@ajopartners.com

gce



*"Let's face it. It's all about olive oil."*

*Make sure to pay attention to Larry's footnotes.

AJO

# Financial Folly, Religious Frenzy and the Delusions of Crowds

Laurence B. Siegel

May 8, 2021

What do financial folly and religious frenzy have in common? This question has not been carefully explored since Charles Mackay's spectacular 1852 study, *Extraordinary Popular Delusions and the Madness of Crowds*.[1]

William J. Bernstein
Source

But, in a recent book, William Bernstein, a well-known economic historian, neurologist, and investment manager, makes the connection even more strongly than Mackay did. The title of his book, *The Delusions of Crowds,* explicitly pays homage to Mackay's classic. Bernstein's delightfully written book is as worthy a read as Mackay's.

## Why investors should care about irrational behavior

Investors should be keenly interested in irrationality — in all aspects of it. Classic finance theory assumes that people are hyperrational, selecting portfolios that are mathematically optimal in their balancing of risk, return, and correlation. From all possible optimal portfolios, they select the one that most closely maximizes their utility, taking into account their aversion to risk.[2] No one believes this, but the mistakes of millions of investors should cancel out, so that by analyzing markets *as if* people were rational, you should get a good approximation of reality.

Except when you don't.

Financial markets burgeon with bubbles, crashes, high-priced stocks of companies with no earnings or revenues, and investors who act against their own interest. The recent headlines about GameStop, Bitcoin, Ark Invest, and the use of highly leveraged options by individual investors are reminiscent of the stories told by Mackay and Bernstein. To understand markets, it's vitally important to figure out what's going on when prices depart – in either direction – from fundamental value by large amounts.

---

[1] Mackay, Charles. 1852. *[Memoirs of] Extraordinary Popular Delusions and the Madness of Crowds.* http://www.gutenberg.org/files/24518/24518-h/24518-h.htm#image07

[2] In a helpful simplification of this method, the capital asset pricing model, or CAPM, says that investors should simply form portfolios out of two assets: (1) the market capitalization-weighted portfolio of all risky securities, that is, an index fund; and (2) cash or some other asset deemed to be riskless.

*Semper Augustus* tulip
Source

And I'm not just talking about the stock market. Government bonds are priced in classic Mackay fashion — discounting the hereafter.[3] An Austrian government bond maturing in June 2120, almost 100 years from now, recently sold at a yield of 0.45%. Traders aptly call it the Semper Augustus bond in reference to a beautiful tulip involved in the Dutch tulip mania of 400 years ago.[4] A Semper Augustus tulip bulb briefly cost as much as a house.

## Religious frenzies and financial manias

It is timely to look not just at extreme behavior in financial markets but in other spheres of human activity. Bernstein's choice of religion as the comparable sphere is understandable, although I quarrel with some of the logic and tone. In particular, religion at its worst can be unbelievably destructive: The Thirty Years' War between Catholics and Protestants in 17th century Europe cost that *continent* about 20% of its population. Germany lost at least one-third of its citizens. In contrast, financial panics (the usual endgame of manias) almost always end in recovery and opportunity for investors. While I don't mean to trivialize losing one's money, there is a qualitative difference between that and losing one's life.

Yet there is something out of balance about Bernstein's demonization of religion. Religion may be based on an illusion of supernatural control over human affairs, but it is still on net a good thing. It evolved because it binds societies together with a common understanding of the world and human nature, and because it sets norms of behavior that are otherwise very difficult to enforce. Moreover, the greatest human need other than mere physical survival is community. Religion creates communities that are intermediate in size between families or villages at one end, and the entire human race at the other. While I believe that religion is a human invention, it is an incredibly valuable one if not perverted in some of the ways that Bernstein describes.

---

[3] In 1928, economist Max Winkler said the stock market was discounting not only the future but the hereafter. The quote has been repeated endlessly and has been attributed to just about every market sage and wag since that time.

[4] Bhansali, Vineer. 2021 (forthcoming). *The Incredible Upside-Down Fixed Income Market: Negative Interest Rates and Their Implications.* Charlottesville, VA: CFA Institute Research Foundation. When available, the book will be available as a free, ungated download at https://www.cfainstitute.org/en/research/foundation/publications.

## Religious madness: The Anabaptist insanity of 1533-1535

I start with religion because that is where Bernstein starts and where he places the greatest emphasis, unlike his previous books which are mostly about investing and the historical development of the world economy.[5]

An Anabaptist believes in adult baptism, on the ground that an infant cannot commit consciously to the Christian life; the word comes from the Latin for "second baptism." This doctrine sounds harmless and much less strange than many religious practices that are widely accepted. Yet, between 1533 and 1535, the "Anabaptist madness" seized northern Germany and let to an orgy of killing, by and of Anabaptists, that Bernstein chronicles in almost too-graphic detail as an iconic example of religious insanity.

A peaceful moment in the Anabaptist Rebellion c. 1535
*Jan van Leiden tauft ein Mädchen*
*(John of Leyden Baptizes a Maiden)*
Painted by Johann Karl Ulrich Bahr, Oil on canvas, 1840.
Source

What happened? In thrall to an end-times narrative that pops up repeatedly in the history of religion, the Anabaptists expected the world to end. As a portent, citizens of the Westphalian city of Münster reported seeing three suns.[6] The Book of Revelation indicates that, in the end times, a select group will be saved and another, much larger group will be destroyed.

The Anabaptists believed, naturally, that they would be among the select. So did their opponents. In addition, each wanted to do their opponents a favor by converting them, thereby saving them from eternal damnation. Convert or die; that is how religious wars "work."

---

[5] Bernstein's books on the economy are his most valuable, in particular *The Birth of Plenty: How the Prosperity of the Modern World was Created* (New York: McGraw-Hill, 2004), which was one of the inspirations for my book, *Fewer, Richer, Greener: Prospects for Humanity in an Age of Abundance* (Hoboken, NJ: Wiley, 2019); and *A Splendid Exchange: How Trade Shaped the World* (London: Atlantic Books, 2008). Previously, he wrote *The Four Pillars of Investing: Lessons for Building a Winning Portfolio* (New York: McGraw-Hill Education, 2002), which should be read by all investors. The pillars are theory, history, psychology, and "business" — the last one meaning that brokers and investment managers exist to make a profit.

[6] Anyone with a passing knowledge of atmospheric science knows that "sun dogs," a pair of bright sun-like lights in the sky appearing on each side of the actual Sun at a 22° distance, are an occasional local phenomenon due to refraction by ice crystals. I have seen them myself. So maybe the people of Münster saw three suns. Religious hustlers and other con men have always used rare astronomical or meteorological phenomena, such as eclipses and comets, to persuade others that something supernatural is taking place.

If, in our own culture, we have an impression of Anabaptists at all, it's usually a positive one; the peaceful and quaint Amish of my native Ohio, a subgroup of Anabaptists, are prosperous farmers who seem content to live and let live.[7] In contrast, the Anabaptists of the Münster rebellion were maniacs:

> Some lifted themselves up in crazy dances as if about to fly… Some collapsed face down on the ground… some lay in the soft mud, rolling themselves over and over… Some howled with gleaming eyes. Some frothed at the lips. Some made threats while shaking their heads and gnashing their teeth… Some cried, some laughed. We, on the other hand, did not so much laugh at their crazed madness but grieve.

wrote a young German, Hermann von Kerssenbock, quoted by Bernstein.

The Anabaptists also violently took over the city of Münster, prompting a year-long siege that resulted in starvation for the city's hapless citizens.

What was done *to* the Anabaptists after the city was taken by the besiegers at least matches what was done *by* the Anabaptists. The torture and execution of the Anabaptist leaders was unusually cruel, even for the late medieval/early modern culture that inspired *Game of Thrones*.

I tend to think of religious manias, and political ones such as the French Revolution, as being driven ultimately by earthly concerns. These typically include hunger, hatred of those in power, and fear of rapid change, as well as by hope for something better (usually rendered in the afterlife in the religious case, and in an earthly utopia in the political one). People are not necessarily crazy to react to their circumstances by holding extreme views. However, as we have seen, they can become crazy when reinforced through close proximity to a large number of other people sharing those views.

With the benefit of distance, we can laugh at the tulip bubble, internet bubble, and ridiculous pumping-and-dumping of GameStop. We can only shudder at the tale of the first Anabaptists.

## An "electric" example of financial engineering gone wrong

There is no example of financial irrationality that can match the worst instances of religious irrationality. Financial chaos can lead to death: The suicides of Jesse Livermore, Madoff fraud victim Thierry Magon de La Villehuchet, and 20-year-old Robinhood customer Alexander Kearns were tragic.[8] But most episodes of financial folly are transient and do little lasting damage; the worst ones, such as the crash of 1929, are more enduring but still end in recovery.[9] More typically, the impact of a

---

[7] Today, there are many other Anabaptist groups in the U.S. and Europe, including the Mennonites and the Church of the Brethren. They number about 4 million and are all peaceful.

[8] I'm leaving out examples where the decedent was, or appeared to be, guilty of a major crime.

[9] The Great Depression was an economic crisis, not strictly a financial crisis. Historians are still unsure whether a sharp turndown in the real economy caused the stock market crash of 1929-1932, or the reverse. So I differentiate between the Depression and the market crash.

financial bubble or crash is exaggerated by the lurid stories told by those who were most deeply involved.

Let's look at one of Bernstein's examples. Everyone knows about 1929, the dot-com bubble, the crash of 2007-2009, and the recent melt-up in stock prices. Historically minded investors are also aware of tulips, John Law's Mississippi Company bubble, and the South Sea Bubble. (The South Sea Company had nothing to do with exploiting the riches of the South Pacific; it had the appalling objective of transporting African slaves across the South Atlantic.) Bernstein tantalizes us with just a few bumps in the history of capitalism, preferring to dwell on religious frenzies. But, to tie the narrative back to investing, I'll focus on a lesser-known financial episode that he chronicles: the decline and fall of Samuel Insull and his tangle of electric utility companies.

Insull's biographer Gary Hoover writes,[10]

> Few business leaders or entrepreneurs in American history have done more to enable progress and prosperity than Samuel Insull, a name little known today. Yet eighty years ago, he was one of the most famous people in America and Europe – and one of the most despised… He did more to bring electricity to America than any person outside its inventors. Sam Insull put together an energy empire worth billions, only to see it disappear from his grasp in the Great Depression. What happened then is one of the great tragedies of business history.

Samuel Insull (right) in better days, with Thomas Edison
Source

Associated with Thomas Edison from an early age, the English-born Insull cobbled together a portfolio of electric utilities that boggled the mind. Bernstein describes it: "He stacked hundreds of companies into layers, with the bottom layers sometimes owning pieces of those at the top of the structure." The layers included "'superrich cream' and 'super-superrich cream' that came from stacking multiple organizational levels." Does this sound like a 2008-style mortgage pool? Or is it more like a fund of funds of hedge funds, a so-called f-cubed?

From 1929 to 1932, electric utilities performed like the Dow Industrials: down almost 90%. A company would have to be entirely unleveraged to survive this. But many companies did. Market researcher Michael Painchaud identified stocks that were

[10] Hoover, Gary E. 2021. "From Hero to Hated: America's Most Tragic Entrepreneur," American Business History Center (website, January 14), https://americanbusinesshistory.org/from-hero-to-hated-americas-most-tragic-entrepreneur/.

winners over the brutal 1929-1931 period.[11] There was one electric utility common stock (American Electric Power), three utility preferreds, and a host of familiar industrial names, many of which survive today. But Insull's conglomerate did not survive. Bernstein recounts:

> In April 1932, just three months before the…market…bottomed, his bankers summoned him to a New York office and informed him that they would not support him further. "Does this mean receivership?" he asked. "Yes, Mr. Insull, I'm afraid it does." The damage to the investing public was immense…by 1946…amount[ing] to $638 million. By that year, the stock market had largely recovered.

Furious investors, opportunistic politicians, and the media ganged up on Insull, who was indicted on dubious charges of fraud and embezzlement. He and his wife quietly fled to Paris. "ALL EUROPE HUNTING INSULL," screamed the *Chicago Daily Tribune*. He was extradited to America and placed on trial. Ten days before his 75th birthday, Insull was acquitted. He stood trial two more times on other charges and, again, was acquitted. He died in Paris four years later. Hoover concludes:

> Investors who held onto their Insull securities generally turned out okay…. [W]hen the Depression finally ended and stocks rebounded, the total losses on all Insull securities were about 24 percent of the amount invested. None of the companies went bankrupt. The strongest company, Commonwealth Edison, never missed a dividend. Today the company has morphed into Exelon, America's largest electric company …[with] revenues exceeding $30 billion per year.

Hoover's comments about Insull's sad end are well worth repeating:

> Sam's wealth had fallen from a peak of $150 million to a mere $10,000.
>
> On July 16, 1938, seventy-eight-year-old Samuel Insull died of a heart attack while awaiting a train in a Paris Metro (subway) station. Since he had no wallet and no money, the newspapers declared that he had died a pauper. Yet everyone who knew Sam knew he went nowhere without his wallet, usually with perhaps $1,000 in cash in it. So Sam's body had been robbed. Biographer Forrest McDonald closes his story with the line, "And so, in his death, as in his life, Samuel Insull was robbed, and nobody got the story straight."
>
> The Lord gave, and the Lord hath taken away. –Job 1:21

Insull left behind Chicago's beautiful Civic Opera Building, large donations to African American charities, parts of Chicago's elevated and electric interurban railways, and a company (Commonwealth Edison) that was one of the first to provide the package of employee benefits now standard. This in addition to the

[11] https://www.cnbc.com/id/27404980

electric infrastructure that was his main business. The moral lesson: Even a company that improves society in profound ways, run by a brilliant businessman and generous philanthropist, can ruin some investors if its *financial* structure, the liability side, is no good. As with most financial disasters, the culprit was leverage. The same tale would be told, with different characters, countless times over the subsequent century.

The other moral lesson: Life isn't fair.

## Some concerns about the message of the book

Bernstein provides entertainment, education, and erudition. Who else could name-drop Abraham, Jesus, the monk Joachim of Fiore (1135-1202), the mathematician Eric Temple Bell, Pythagoras, Francis Bacon, and science writer Michael Shermer in one page (page 38)?

But Bernstein should not equate all religious feeling with its worst examples. If one judges Jews by the most shocking parts of Deuteronomy (many too distasteful to mention here), or Muslims by the political/military rather than the spiritual definition of *jihad*, the results are not pretty. One should avoid judging any large group by the actions of a tiny number of fanatics, past or present. That is not how Jews and Muslims conduct themselves.

### *Bernstein versus the dispensationalists…and Ronald Reagan*

Yet Bernstein holds a view of "dispensational" Protestant Christians that resembles what we might think of Jews and Muslims who act on the weird exhortations in their ancient texts literally. (A dispensational Christian believes that history and the future are divided into about seven distinct periods, the last one being a 1,000-year reign of Christ on Earth — the Millennium — as promised in the Book of Revelation. This reign will end in "God's final judgment" and the end of earthly existence. According to this belief system, we are now in the period just before the millennium, which is supposed to end with a "great tribulation," or time of trouble, before the reign of Christ begins.)

Obviously, we'd want to keep a close watch on political and religious leaders who believe this literally, because we have the technological power to end the world as we know it, and someone might want to hurry the process along.

In this vein, Bernstein tars Ronald Reagan with the dispensationalist brush. There is some evidence that Reagan held those views with varying degrees of seriousness over his lifetime, including when he was president. But the Reagan I remember was a tolerant man and responsible president, owing much more philosophically to William F. Buckley than to any religious figure. While the most extreme of Reagan's religious beliefs may have spooked secular observers, Reagan the president governed without a hint of them influencing his decisions. He was a very conventional secular conservative.

In a lengthy and detailed study of Reagan's religious convictions and their influence on his policies, James Green, a British history student and now a barrister, writes:[12]

---

[12] Green, James. 2009. "Reagan, Armageddon, and the 1984 Presidential Debate: On the Overlap of Political and Apocalyptic Discourses in America." University of Bristol, Department of Historical Studies, http://www.bristol.ac.uk/history/media/docs/ug-dissertations/2009green.pdf

> Reagan's rhetoric [has] been labelled "cold war fundamentalism," comprising an emotional patriotism and portrayal of the conflict in absolute terms. [This] yielded apocalyptic language, and parallels to dispensationalist discourse about foreign policy. However, the symbolic language he deployed did not…define his political behaviour; neither direct military conflict nor a nuclear apocalypse ever came... Indeed, his policies were…more nuanced…than his rousing speeches…; although Reagan did pursue a military build-up in his first term, he later…cultivate[d] more amiable relations with Russia than had existed for decades, including steps towards nuclear disarmament.

Reagan later sought nuclear disarmament of the whole world. I wish he had succeeded.

Bernstein's attack on Reagan weakens his brief against religion. Many people are religious. Most of them are utterly harmless and do good things. Reagan kept his beliefs a private matter, and cooperated effectively with people whose religious views were fundamentally different than his own.

### *The red calf*

*The Delusions of Crowds* is worth the purchase price if only for the chapter title Apocalypse Cow. It refers to a holy cow (sorry, couldn't resist) that was born with an unusual red coloration in Israel in 2018. Some ancient Jews errantly worshiped a golden calf; a few modern ones, plus some Christians, briefly believed that a red one signaled the fulfillment of a Biblical prophecy of the end of days. As always, the end came and went without incident.

Still, the episode forced the question: Are we as gullible as we were 3,500 years ago? I don't think so; red cow disease appears to infect only a tiny minority of human beings, and is far less dangerous than the real mad cow disease.

### *Concluding thoughts on religion*

The beliefs of evangelical Christians sound wildly fanciful and dangerous when rendered literally, but so do the beliefs of all religions, including my own (Judaism). The story of Abraham and Isaac, the cornerstone of three major world religions representing 55% of the world's population, is one of the most distasteful in all of literature. Polytheistic religions are no less fanciful, and more fun to read about — their gods are some bad actors. Behind all this wildness is the necessity of leaders, in trying to bind their people to a religion, to make extreme demands of their followers. That is the only way they can divert the people from going about their business, ignoring religious leaders' commands to do good or evil.[13]

And, as all religions start out extreme, they all become more moderate as they adjust to the realities of living in this world — Judaism in the sixth century A.D. and Christianity gradually in the centuries leading up to the Enlightenment. Islam began to modernize in the 19th century, then reversed in the last 50 years. When the Muslim reformation takes place, we'll say we saw it coming all along.

---

[13] https://www.bbc.com/future/article/20190418-how-and-why-did-religion-evolve.

*Contra* Bernstein, then, religion is a two-sided coin, inducing good and harm that must be weighed against each other.

## Advice for investors

Bernstein writes so skillfully and vividly that he can convince readers of almost anything. I believe that religious nuttiness and financial foolishness are separate phenomena, linked by the fact that human nature is inherently flawed but otherwise quite dissimilar. Neither problem is about to disappear even as we learn more about our psyches.

But financial recklessness is easier for an investor or advisor to avoid than religious folly. If you don't understand or don't like the valuation, leverage, or underlying business of a security or fund, don't buy it.

*Laurence B. Siegel is the Gary P. Brinson Director of Research at the CFA Institute Research Foundation, the author of* Fewer, Richer, Greener: Prospects for Humanity in an Age of Abundance, *and an independent consultant. He may be reached at lbsiegel@uchicago.edu. His website is http://www.larrysiegel.org.*

*His new book,* Unknown Knowns: On Economics, Investing, Progress, and Folly, *containing many of his articles previously published in* Advisor Perspectives *and/or distributed by AJO, will be released in late spring 2021 and will be offered in multiple formats at his website and on Amazon.*

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

FROM: Ted Aronson

DATE: February 19, 2021

RE: **CARTOONS**

*The New Yorker* is the source of 99% of the cartoons we share (www.cartoonbank.com). The weekly magazine hooked so many of its readers on its cartoons, there's a weekly contest inviting readers to submit captions to accompany the artwork. A recent contest caught my eye. The caption-finalists all made me laugh (or wince):


*"You were right — putting him on commission changed his attitude."*

*"Now he breaks stereotypes instead."*

*"He doesn't charge as much as he used to."*

The winning caption is the first listed above.

TRA

aronson@ajopartners.com

gce

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

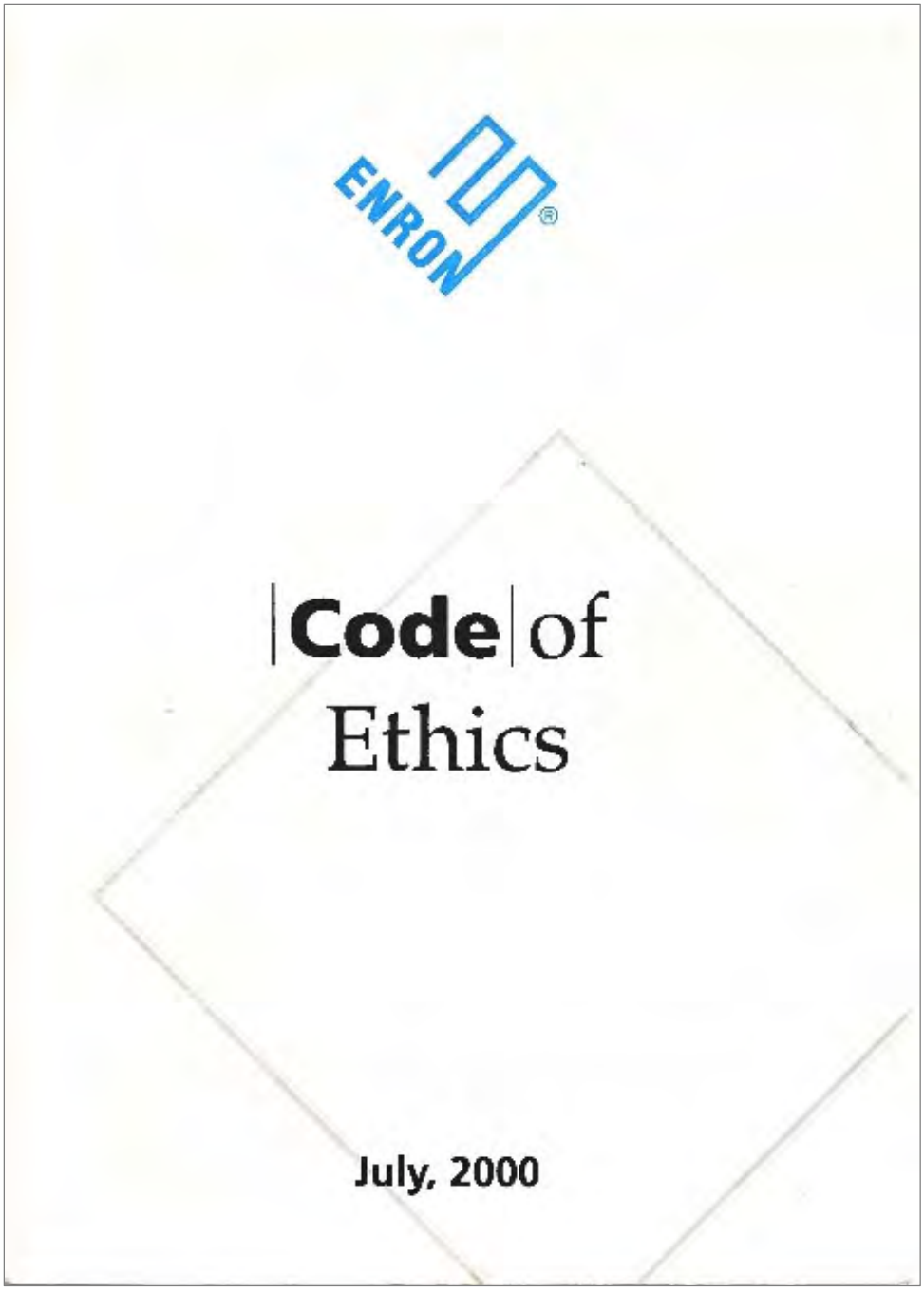
# MEMORANDUM

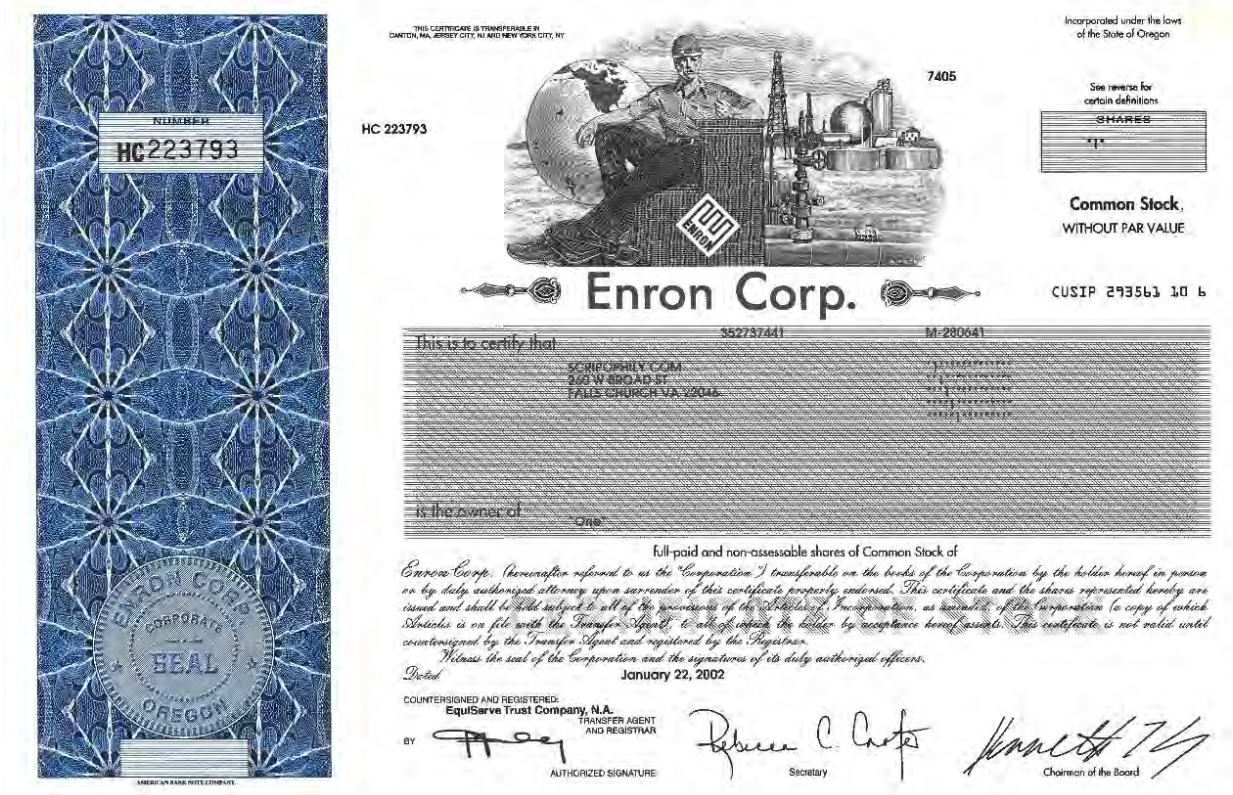
FROM: Ted Aronson

DATE: November 29, 2021

RE: **HAPPY ANNIVERSARY, ENRON!**

Here's what greets visitors to our Philadelphia offices.






Enron fascinates us for a number of reasons (massive fraud* aside):

- Largest bankruptcy in its day
- Outstanding example of AJO's stock selection
- AJO was "short" (not held) and short (where clients allowed)

The following from today's *BARRON'S* nicely summarizes Enron's infamy. Twenty years ago? Seems like last week to me.

Then again, a number of my younger colleagues have never heard of Enron.

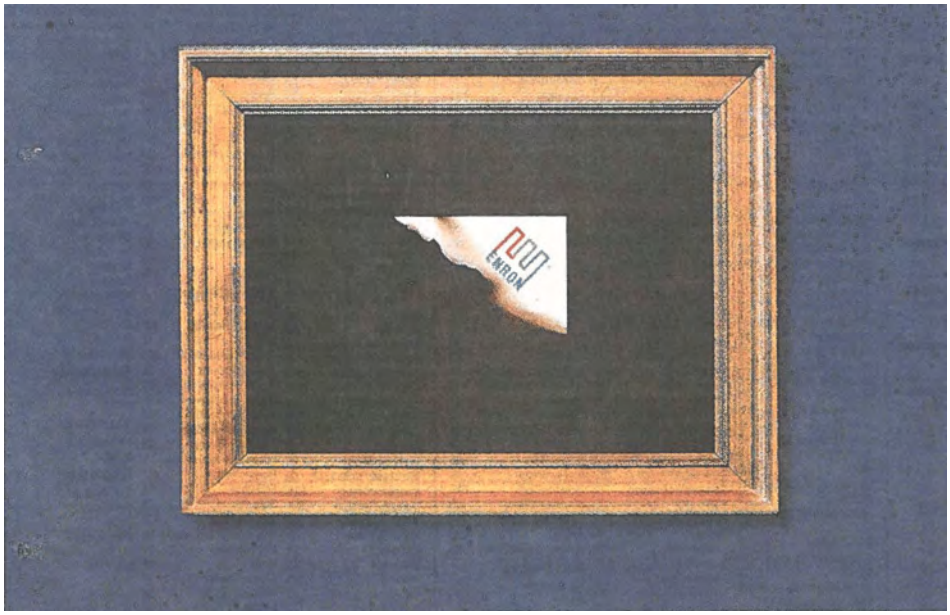
No kidding!

TRA
aronson@ajopartners.com

*Reminds me of the quip: except for that, Mrs. Lincoln, how'd you like the play?!

BARRON'S

Monday, November 29, 2021
© 2021 Dow Jones & Company, Inc. All Rights Reserved.




# Why Enron Still Matters After 20 Years

**BY MICHAEL W. PEREGRINE**

Thursday, Dec. 2 marks the 20th anniversary of Enron's bankruptcy, a date that shall live in American financial infamy.

At the time it was the largest bankruptcy in U.S. history and the first in a series of financial catastrophes that threatened to destabilize the economy. Investments evaporated; jobs were lost; reputations were destroyed; a famous accounting firm collapsed; people went to jail. The perceived failures of Enron's board and executives served as a primary impetus for the Sarbanes-Oxley Act and the corporate responsibility movement.

As such, Enron remains one of the most consequential corporate governance and finance developments in history. It's a development with which the new generation of corporate leaders—the ones who have entered the boardroom since then—may not be fully familiar. But to them, their colleagues, their advisors, and their investors, Enron still matters.

The Enron saga began with its creation as an electricity and natural gas pipeline company that, through mergers and diversification, transformed into an energy-based trading and data management enterprise engaged in various forms of highly complex transactions. Among these were a series of unusual and complicated limited-liability, related-party transactions in which some members of Enron's financial management team held lucrative financial interests, and which allowed the company to transfer certain liabilities off its financial statements.

As the company's stock price reached its highest levels in August 2000, some Enron executives began to sell their stock, allegedly on the basis of inside information regarding undisclosed losses. At the same time many investment advisors still continued to recommend Enron stock to their clients. By March 2001, a series of media reports began to question the sustainability of Enron's stock price, including a prominent article in Fortune that identified potential financial reporting problems.

Over the next several months, the company's stock price collapsed; multiple years of its financial statements were restated; its CEO resigned; a bailout merger failed; its credit was downgraded; and the Securities and Exchange Commission began an investigation of the company's dealings with related parties. On Dec. 2 it declared bankruptcy. Multiple regulatory investigations followed, several criminal convictions were obtained, and Sarbanes-Oxley was ultimately enacted to curb the perceived abuses arising from the Enron accounting scandal and several similar ones.

The shocking costs of Enron's collapse were spread broadly among a number of interests: the company's shareholders, most of whom lost the bulk of their investments; the employees, many based in Houston, who lost their jobs; the investment analysts who were misled by the Enron financials; the executives who received prison sentences; and Enron's auditor, the venerable Arthur Andersen, which collapsed following an obstruction-of-justice conviction

(ultimately reversed by the U.S. Supreme Court).

The abuses that prompted the catastrophe were multifold. They included an intricate business model that made external monitoring difficult. Complex financial statements confused stockholders and analysts alike. There were also highly aggressive revenue recognition and "mark-to-market accounting" practices, speculative special-purpose entities and the management conflicts they presented, a governance structure that lacked the expertise necessary to properly monitor the business and its financial practices, and an overly aggressive corporate culture that placed little value on ethics and compliance.

These abuses were "front and center" to the drafters of the subsequently enacted Sarbanes-Oxley Act. Legislative responses to the various transgressions can be found throughout the act, including its treatment of oversight of the accounting profession, auditor independence, the credibility of the board's audit committee, the integrity of financial statements, the ethics of financial officers, whistleblower protections, and preservation of documents. The Enron abuses also prompted substantial enhancements to governance principles and to the professional ethic obligations of attorneys.

But no combination of legislation, law enforcement, professional regulation, and best practices can provide assurances to any company or board of directors that the "smartest people in the room" won't resurface in any business, at any time. It's human nature. Some people will be "pushing the edge of the (business) envelope" all the time; most in the best interests of the company but some, not so much.

These past abuses are worthwhile lessons for today's corporate leaders, many of whom weren't serving in similar positions 20 years ago. These current leaders likely lack the near-visceral reaction to the word "Enron" that more senior, and perhaps now retired, leaders retain. There's a reason why "Enron" is a metaphor for mega-scandal.

The more familiar that corporate leaders are with the Enron saga, the more likely they are to support the integrity of financial statements and effective corporate governance. Leaders who understand how financials can and have been manipulated are more likely to insist on their accuracy. Leaders who understand the rationale for a company's governance policies are more likely to follow than dismiss them. Leaders who are familiar with the failures of the Enron board are more likely to recognize indicators of similar conduct on their own board.

For them, their companies, and their stakeholders, Enron still matters.

---

Michael W. Peregrine is a law partner in the Chicago office of international law firm McDermott Will & Emery.

The Economist

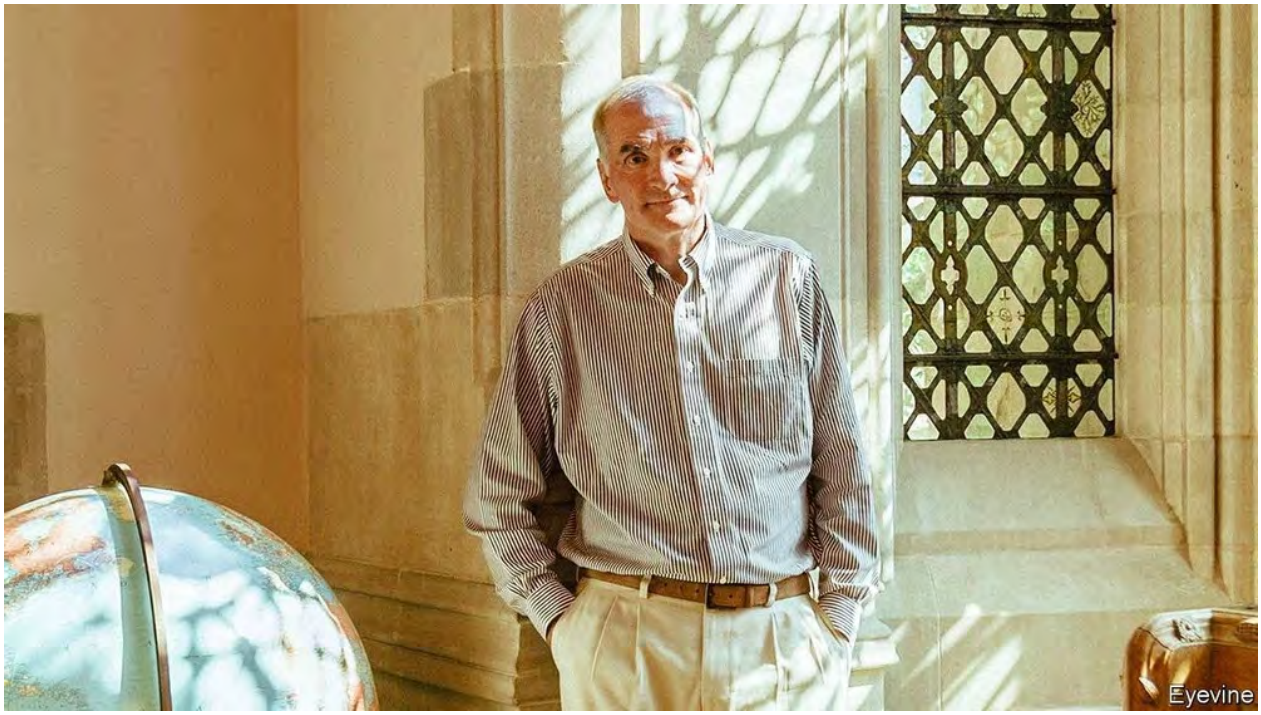
Finance & economics

May 15th 2021 edition

The holly and the ivy

# David Swensen, an influential investor, died on May 5th

At Yale, Mr Swensen perfected the modern endowment model




STARTING IN THE 1980S, the endowments of a handful of big American universities began to divert their investments away from publicly traded equities and bonds towards "alternative" assets, such as venture capital and private equity. David Swensen, who died on May 5th aged 67, perfected the approach. Referred to variously as the endowment, Yale or Swensen model, it has since been copied—by family offices, sovereign-wealth funds and, more recently, by big pension funds.

In 1985 Mr Swensen was persuaded by James Tobin, a Nobel-prizewinning Yale economist, to give up a lucrative career on Wall Street to return to his former university to run its investment office. Yale's endowment was then worth around $1bn. By the middle of last year the figure had risen to $31bn. Even this astonishing growth understates Mr Swensen's influence. He was responsible for developing a stream of talented asset managers at Yale. And in two best-selling books, he set down his investment philosophy for a wider audience.

Three pillars of this thinking stand out. The first concerns time horizon. Because endowments have obligations stretching far into the future, they can take a long-term view. They can sacrifice the ease of trading in public markets for the better returns promised in private equity. By doing so, they can earn an illiquidity premium—a reward for giving up the ability to sell out easily.

The second pillar concerns information. It is hard to find mispriced stocks in the public markets, because news about listed companies travels fast and is quickly incorporated into prices. But investors in private markets who do their homework are more likely to be rewarded. That is because reliable data and analysis are much harder to come by.

The third pillar is the importance of a contrarian mindset. Mr Swensen had a chance early on to demonstrate his. Following the stockmarket crash in October 1987, he had loaded up on company shares, which had become much cheaper, by selling bonds, which had risen in price. This rebalancing was in line with the fund's agreed policy. But set against the prevailing market gloom, it looked rash. His investment committee was worried. One member warned that there would be "hell to pay" if Yale got it wrong. But Mr Swensen stuck to his guns. The decision stood—and paid off handsomely.

These days, the Swensen model is often reduced to an asset-allocation decision: hold alternatives. But as money has flooded into private-equity funds, average returns have converged on the returns in public markets. There is no longer an obvious illiquidity premium. But Mr Swensen's point about information remains relevant. The dispersion of returns—the gap between the best and worst funds—is far higher in private than in public equity. Selecting the right private-equity manager takes expertise. Yale has some advantages: it can, say, tap into its alumni network for access to the better-run funds.

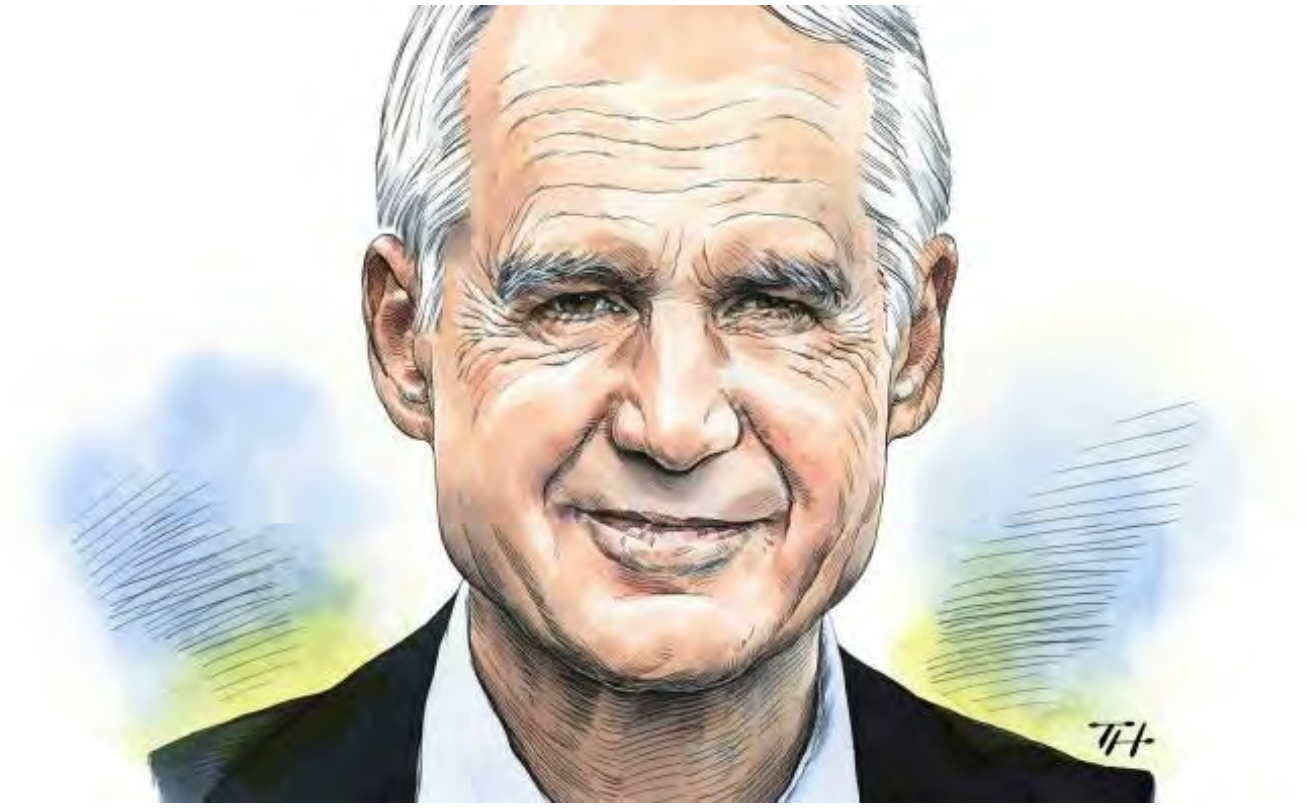
Mr Swensen is given too much credit in one regard. Endowments had a history of innovation before his return to Yale. Harvard's was already changing. And endowments had previously been pioneers in asset allocation: the Ivy League funds shifted markedly from bonds into equities from the 1930s. In other respects Mr Swensen gets too little credit. Star investors are generally not good at mentoring others. But Swensen alumni have regularly turned up in senior jobs at other endowments. "He was a smart player but also an incredibly good coach," says a colleague. In this, as in other matters of investment practice, David Swensen was a true outlier. ■

FINANCIAL TIMES

Fund management

# Yale endowment model architect Hunter Lewis calls time on it

Co-founder of Wall Street gatekeeper Cambridge Associates says famed investment strategy is 'backward looking, outdated and worn out'



Hunter Lewis: 'It doesn't mean that individual private equity deals don't make sense because they can. But as an area . . . the fees are too high. The competition is too great' © Tony Healey

Aziza Kasumov APRIL 25 2021

The famed university endowment investment model is "backward looking, outdated and worn out," says Hunter Lewis, the co-founder of Cambridge Associates, a Wall Street gatekeeper advising on half a trillion dollars worth of institutional assets.

He should know — he was one of its architects.

The model, which came into existence almost half a century ago, is defined by a heavy equities weighting and chunky allocations to private equity, venture capital and hedge funds. Such was its success early on that it was widely adopted, including by pensions funds, private foundations and family offices.

But Lewis now believes parts of the framework — which is sometimes called the "Yale model" for the involvement of the Ivy League university's legendary chief investment officer David Swensen in shaping it — have failed to keep up with the times. Lewis argues that private equity and venture capital have become too crowded and the so-called illiquidity premiums have been eaten up by large fees, casting "doubts that this is the way to go for the future".

As universities and pensions adopted the endowment model, demand for private equity and venture capital exploded. As of last year, the largest university endowments with more than $1bn in assets, had, on average, more than a quarter of their portfolios sitting in such funds, according to the National Association of College and University Business Officers. Calpers, the largest public pension in the US, has been eager to boost its 8 per cent target allocation to private equity further.

But at the same time, returns from the asset class have converged significantly with those of public equity markets, which are cheaper and easier to access. For the period ending June 2019, the S&P 500's 10-year annualised performance beat buyout funds for the first time in a

decade, according to a report from Bain, the consultancy.

"It doesn't mean that individual private equity deals don't make sense because they can. But as an area . . . the fees are too high. The competition is too great," says Lewis, who retired from Cambridge in 2018 and has since focused on his family office. "These pension funds that are thinking this is going to solve our problem — well, it's not."

At his family office, which last year opened up to outside investors, Lewis says he tackles the problem by directly investing in venture deals instead of investing via funds. To date, the fledgling firm has invested in Sudoc, which uses technology to cut hazardous chemical contaminants, and in a regenerative farm in Alabama.

For Yale, large allocations to private investment funds have fared well, Lewis says, but not necessarily for other institutions.

"First of all, it's run by David Swensen, who is a genius at this," says Lewis. Beyond that, Yale has a vast alumni network in investment circles, and fund managers "want to be associated with Yale, which can lead [them] to offer lower fees".

Beyond the private equity conundrum, Lewis also warns that universities and other investors do not have sufficient inflation hedges in place to protect them against one of Wall Street's most fretted over risks at the moment.

"I never know about the next few months, but I do think that all investors need a bigger inflation hedge," Lewis says.

Lewis was instrumental in shaping the beginnings of the endowment model when he and his then-roommate and later Cambridge Associates co-founder James Bailey overhauled the Harvard endowment in 1973.

While a Harvard undergraduate, Lewis spent his time outside of class working as a journalist, landing interviews with then New York City mayor John Lindsay for Playboy magazine, and Martin Luther King Jr shortly before his assassination. That work ended when Lewis joined the Marine Reserves in 1969.

## Hunter Lewis LLC

**Established** 2018

**Assets** Not disclosed

**Headquarters** Charlottesville, Virginia

**Employees** 12

**Ownership** Family Trust

After six months of active duty, he joined asset manager Boston Company. Three years into the job, Lewis and Bailey, who also attended Harvard, secured a deal with their alma mater's treasurer, George Putnam, to review how the endowment allocated its assets.

Most schools back then stuck to a simple, domestic stocks-and-bonds portfolio. The duo recommended a larger allocation to equities, including into global stocks and illiquid parts of the asset class, such as venture capital and private equity. Not long after, other universities, including Yale and Massachusetts Institute of Technology, made contact and Cambridge Associates was born.

"When we started working with Harvard, nobody thought of universities as leaders in the investment field," Lewis says. The endowment model, he adds "all really began there, and then it evolved over time, until David Swensen came along at Yale and perfected it."

## CV

**Born** 1947, Dayton, Ohio

**Education** Groton School, Harvard University

**Total pay** Not disclosed

Career

1970–73 Corporate vice-president, Boston Company

1973–2018 Co-founder, Co-CEO, CEO, Cambridge Associates

2020–present Founder and chief executive, Hunter Lewis LLC

Lewis grew Cambridge into a global institutional gatekeeper that today advises universities and other institutions on how to invest assets worth $503bn. He stepped away from day-to-day operations in 2000 and since retiring from the business in 2018, his investment thesis has diverged from the business he founded.

Cambridge remains a strong advocate for the model, often recommending heavy allocations to illiquid funds through its network of private and venture fund managers. To wealthy clients, Cambridge recommends they consider allocating north of 40 per cent of their portfolios to private equity and venture capital, if they can tolerate their capital being locked up for years.

For his new venture, Lewis has been pitching a different approach to clients, via video chat from the farm on which he's been sitting out the pandemic. Despite the challenges of bringing on new clients remotely, he says he's thankful that he got to spend the past year surrounded by plenty of space and nature.

"It's a lot harder when you're in the middle of New York City, on the top of a high rise," he said. "I'm very lucky."

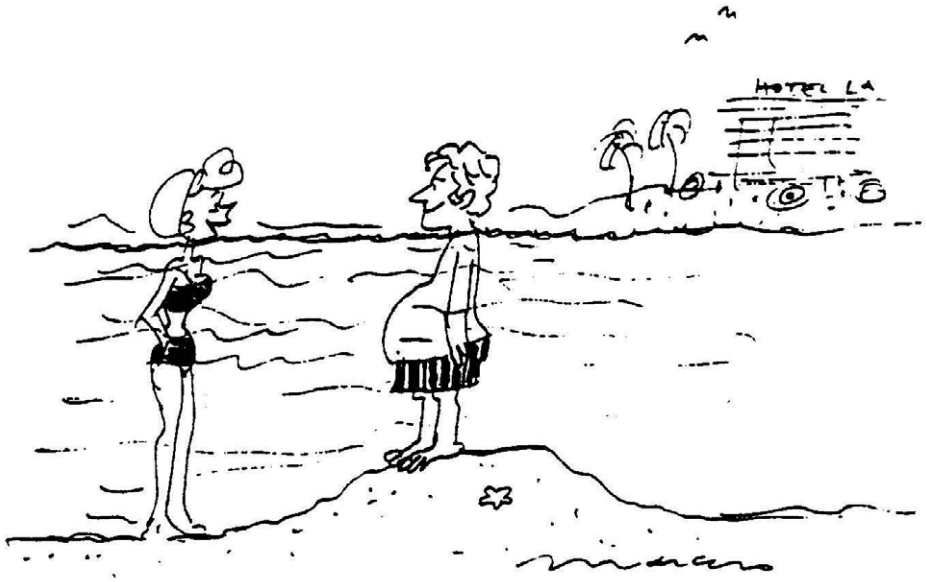
AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 USA | 215.546.7500/7506 FAX | AJOPARTNERS.COM

FROM: Ted Aronson RE: HFT DATE: 4/26/13

This mercifully brief piece on high-frequency trading (HFT) goes to the heart of the matter — *valuable* HFT, *harmful* HFT, and *very harmful* HFT.

Larry Harris provides some helpful suggestions (and warnings) about moves to improve already helpful HFT.

Costs of trading are utterly important. Ferreting them out is difficult, because the vast majority of them are below the waterline:




*"Hello, Handsome!"*


GUEST EDITORIAL

Larry Harris, CFA
*Fred V. Keenan Professor of Finance*
*Marshall School of Business, University of Southern California*
Los Angeles

# What to Do about High-Frequency Trading

Like powerful tools or drugs, high-frequency trading (HFT) is both extraordinarily valuable and incredibly dangerous. Although HFT greatly reduces average trading costs for investors, it also poses systemic risks to the markets, hurts investors through front running, and decreases investor confidence.

Concerns about the potential damage from HFT have produced many high-frequency complainers, especially among buy-side traders. Their concerns are real, and regulators must address them.

But regulators also must be careful. Poorly conceived policies could easily hurt the markets. For example, current proposals to require minimum resting times for orders would damage markets without producing much benefit.

The debate about HFT has been quite emotional, in large part because people naturally fear what they do not understand well.

A seemingly obvious but incorrect argument has also influenced the debate: Many people believe that restrictions on HFT cannot harm the markets because investment decisions are not made over one-second intervals, much less over millisecond intervals. The premise of this argument is right, but the conclusion is wrong. HFT promotes markets by making them more liquid and thus ultimately lowers corporate costs of capital. High-frequency traders need to submit and cancel their orders quickly to provide liquidity cheaply.

The most pressing danger that the markets face from HFT is least recognized: High-frequency traders are engaged in a costly technology arms race that will not end well for investors if regulators do not act soon. Fortunately, a simple change in order-handling procedures—described herein—can sensibly stop this race.

Identifying what regulators should and should not do about HFT requires some understanding of what high-frequency traders do.

## A Quick Brief

HFT is trading for which success depends critically on low-latency communications and decision making. High-frequency traders use computers to process electronic data feeds, make trading decisions, and convey orders to electronic exchanges over intervals measured in micro- and milliseconds. HFT has grown with the electronic exchanges that enable it.

HFT strategies vary considerably. Most high-frequency traders use dealing and arbitrage strategies to offer liquidity or to move liquidity among markets. Some high-frequency traders trade on news feeds about fundamental values. Lastly, a few high-frequency traders actively front-run other traders.

**Valuable HFT.** High-frequency traders who use dealing and arbitrage strategies make markets liquid by providing investors with opportunities to trade. Numerous reliable studies have shown that transaction costs for both retail and institutional traders have decreased substantially with the growth of HFT.

The cost savings are easy to understand. In comparison with human dealers, computers

- have perfect attention spans,
- follow instructions exactly,
- do not allow emotion to cloud their judgment,
- can watch and learn from thousands of sources of information simultaneously,
- do not cheat, and
- cost less and require smaller offices.

These advantages have greatly reduced transaction costs because many high-frequency traders compete with each other to provide liquidity. High-frequency traders have largely displaced traditional human dealers when they compete in the same markets.

Regulators must be very careful that they do not inadvertently harm the high-frequency traders who make markets liquid.

*Guest Editorial is an occasional feature of the* Financial Analysts Journal.
*This piece reflects the views of the author and does not represent the official views of the* FAJ *or CFA Institute.*


©2013 CFA Institute

**Harmful HFT.** Some high-frequency traders use computers to monitor and interpret electronic news feeds. When they identify material information, they immediately trade on the favored side. These traders cause prices to reflect information about fundamental values faster than the prices otherwise would.

Traders who post standing limit orders that do not yet reflect the changes in value implied by news lose to high-frequency traders. These liquidity-supplying traders include dealers (most of whom are also high-frequency traders) and patient investors. Investors have always lost to better-informed traders, but many resent that they lose simply because they cannot learn about important events as quickly as high-frequency traders can.

The incremental economic benefit of prices made more efficient by seconds is hardly meaningful: Corporations do not make operating decisions that depend on informative stock prices—for example, decisions about capital structure or compensation—in the seconds immediately following news releases.

Regulators should protect investors from these losses by requiring companies to notify exchanges when they expect material information will be revealed during trading hours so that the exchanges can halt trading before the news arrives. Many already do. For the same reason, many governments release major information only when the markets are closed or at pre-announced times, before which liquidity suppliers generally cancel their standing orders.

**Very Harmful HFT.** A few high-frequency traders front-run buy-side traders who are working orders, thereby making the latter's trades more expensive. Such activities are legal if the high-frequency traders do not improperly obtain information about the orders they front-run.

Regulators would like to stop this type of HFT, but most policies that they might implement would have serious unintended consequences.

The strategies that high-frequency traders use to front-run other traders vary by whether they front-run orders that they expect traders to submit (order anticipation) or standing orders that traders have already posted (quote matching).

Order anticipators examine trades and quotes to detect when traders are using algorithms to split up large orders that will move the market. They then trade ahead of such orders to profit from expected price changes. The successful implementation of this strategy depends less on low-latency communications than on high-quality pattern-recognition algorithms. The order anticipation problem is thus not really an HFT problem. This strategy is ancient. Like poker players, traders have always watched each other carefully to identify what they might do next. Computers are now essential to the successful implementation of order anticipation strategies because they can often recognize certain patterns faster and more accurately than people can and because much trading is now electronic.

Regulators can do little to protect buy-side traders from order anticipators without delaying or reducing the dissemination of quotes or trade reports. Either solution would make it harder to predict future orders, but both would make markets substantially less transparent, which would hurt investors.

The best hope for protecting large, algorithmic buy-side traders is to reduce the information about trade sizes that markets disseminate. In particular, instead of reporting actual trade sizes, markets should report only approximate trade sizes within various buckets or report only aggregated volumes at intervals of 5–10 minutes. These changes, together with the use of hidden orders and dark pools by large traders, would substantially reduce the ability of traders to identify future orders.

Quote matchers profit by extracting option values from standing limit orders submitted by slower traders. They trade ahead of such orders by improving prices slightly or by trading in another venue. If prices then change in their favor, they profit. But if they expect prices to move against them—perhaps because the prices of correlated securities or indices have changed—they immediately exit their positions by trading with the standing limit orders. The traders who issue the standing orders thus fail to trade when they wish they had and trade when they wish they had not.

Like order anticipation, quote matching has always been a problem for large buy-side traders. It was a primary source of profit for exchange specialists before electronic trading became common.

The success of the quote-matching strategy depends on how quickly traders can (1) cancel their unexecuted orders when the standing orders that they are front-running are canceled or filled and (2) trade with these standing orders when they want to exit their positions before the orders are canceled or filled by other traders. Low-latency high-frequency traders have thus come to dominate this strategy.

Regulators could protect buy-side traders from quote-matching high-frequency traders by prohibiting high-frequency traders from canceling their orders too quickly. A minimum resting time would cause high-frequency traders to lose more often when markets move against them while they are trying to establish their positions.

Unfortunately, this rule—which regulators are actively considering—would also cause liquidity-supplying high-frequency traders to lose more often when offering liquidity, which would ultimately increase investor transaction costs. The harm done to market liquidity would be much greater than the benefit obtained from discouraging quote-matching high-frequency traders because they trade much less often than liquidity-supplying high-frequency traders.

## The Technology Arms Race

High-frequency traders are engaged in an arms race.[1] To beat their competitors, each trader is spending increasingly large sums on expensive technologies to speed their trading. If actions are not taken to stop this arms race, investors will be worse off and economic welfare will decline.

High-frequency traders compete by offering better prices or more size when quoting to trade. They also quickly cancel their orders to avoid losing when market conditions change, and they occasionally initiate trades with other traders when attractive opportunities appear.

Being very fast is not enough to be a profitable high-frequency trader. Such traders must be faster than their competitors. The fastest high-frequency traders get the best places in line when quoting to trade, avoid trading when they no longer want to trade, and take valuable trading opportunities when they first arise. Slower high-frequency traders lose because they have to stand in line behind their faster competitors, because those competitors often trade with the slower traders to their disadvantage when market conditions change, and because those competitors take valuable trading opportunities before the slower traders can.

High-frequency traders go to great lengths to be faster than their competitors. They locate their servers next to exchange servers to minimize communication times. They pay for special high-speed data feeds and for the shortest communication lines between exchanges. They use extremely fast computers. They write hyperefficient computer code. And increasingly, they even hard-code their software onto silicon chips to minimize response times.

The long-run implications of this arms race are not yet well appreciated: The fastest high-frequency traders will eventually drive out their slower competitors, and only a few HFT firms offering liquidity—perhaps just one or two—will survive. The high costs of acquiring the technologies needed to be fast enough to compete successfully will become an insurmountable barrier to new competitors. Indeed, these costs already block all but the most wealthy and wildly optimistic potential competitors.

Decreased competition among high-frequency traders will be a troubling outcome of this winner-take-all arms race. When the competition among high-frequency traders thins out, the remaining traders will no longer have to quote aggressive prices to obtain order flow. Investors will have to pay higher prices when they buy, and they will receive lower prices when they sell. The costs of trading will rise.

Economic welfare will suffer because high trading costs make investing less attractive to investors. Corporations that need to raise capital for new projects will have to sell securities at lower prices to attract investors, which will increase their capital costs. Fewer projects will be funded, and fewer jobs will be created. Everyone will be worse off if this arms race is not stopped.

Fortunately, a small and easily implemented change in exchange rules could substantially reduce the incentives to acquire the expensive trading technologies now required to compete successfully as a high-frequency trader. Regulators should simply require all exchanges to delay the processing of every order instruction they receive by a random period of between 0 and 10 milliseconds.

Without this rule, any high-frequency trader with merely a one-millisecond advantage over a competitor will always beat that competitor. With this rule, the faster high-frequency trader will beat the slower one only 59.5% of the time. (If the two high-frequency traders were equally fast, the rate would be 50%.) Both traders would still want to be faster, but the benefits of speed would be greatly reduced.

This small change would substantially reduce technology expenditures by high-frequency traders without any negative effect on the quality of the markets. Instead, by lowering the costs of entry, it would ensure that HFT remains a highly competitive business in which traders primarily compete against each other by improving prices and quoted sizes. The current competition—in which high-frequency traders invest in technologies whose only benefit is to give them an advantage over their competitors—provides no benefit to public investors.

## Systemic Problems

Poorly designed or poorly used electronic trading systems pose systemic risks. In particular, trading systems that demand too much liquidity too quickly can cause prices to fall or rise to unreasonable levels. Many electronic trading systems can also generate so much order flow that they clog order-routing/processing systems and thereby


©2013 CFA Institute

deny market access to other traders. These problems may arise when

1. an algorithm goes out of control and submits unanticipated orders (Knight Capital),
2. a trader misuses an algorithm by setting parameters that cause it to trade too aggressively (the May 2010 Flash Crash in U.S. equities),
3. the algorithms that traders simultaneously use get into a negative feedback loop in which they take turns responding to each other, or
4. terrorists, anarchists, national enemies, disgruntled employees, or mentally unstable traders obtain and exercise malicious control over an order-generating/routing system.

Although market destabilizing, the first two of these scenarios are self-correcting because they invariably lead to unacceptable losses to the traders ultimately responsible for the unintended orders. For example, the trader who used an algorithm to sell $4.1 billion of S&P 500 Index e-mini futures contracts (thereby precipitating the Flash Crash) lost about $150 million of his clients' assets in only 10 minutes. Fears of such losses cause well-run firms to devote substantial resources to avoiding them.

The greater problem for markets lies in algorithmic feedback because it is more likely to lead to excess order traffic that disrupts markets than to large trading losses that traders seek to avoid.

Regardless of their origins, these events all cause external damage to other traders (and to market confidence in general), for which the responsible traders are not penalized. Thus, expected trading losses may not provide sufficient incentive to reduce the incidence of such events, especially for poorly run firms in which those responsible for avoiding trading losses do not fully appreciate all trading risks. Indeed, the number of recent problems caused by algorithms suggests that firms have not paid sufficient attention to these issues.

Regulators should intervene by requiring that all firms that generate electronic orders have a kill switch. This proposal is reasonable: Firms that create orders by identifying various patterns in market data certainly can, and should, examine their own outgoing order flow to identify patterns inconsistent with their business models.

Preventing the malicious use of trading systems requires a different solution because anyone who can control a trading system may also be able to disable its kill switch. To avoid these problems, all exchanges must monitor their incoming order flow to kill any inappropriate orders, or they must regularly inspect the kill switches to ensure that they have not been tampered with.

## Conclusion

The vast majority of high-frequency traders benefit investors by creating more-liquid markets. Despite this well-documented fact, many commentators have called for slowing HFT by imposing minimum standing times for orders. However, faced with this constraint, high-frequency traders would quote less aggressive prices for smaller sizes to avoid losses to better-informed traders. This policy would have the unintended effect of increasing transaction costs for public investors.

Markets need to be slowed, but not because HFT is dangerous. Markets need to be slowed slightly to wisely stop an arms race that will eventually decrease competition among high-frequency traders and thereby increase investor transaction costs. Minimum standing times would not address this problem. Instead, we should delay the processing of all orders by a trivially short, random period of between 0 and 10 milliseconds, which would ensure that high-frequency traders always provide markets with very low transaction costs.

Why do buy-side traders complain so much about HFT? Perhaps because they are often caught between their portfolio managers and the markets in which they trade. All portfolio managers want better executions for their orders. When pressed about a disappointing execution, traders often find it easier to blame the markets than to accept responsibility.

Regulators give much credence to the opinions of buy-side traders on market structure issues because they are expert traders working in the trenches on behalf of public investors. But regulators should also remember that traders have complained about market structures for years. They have often been right, but not always.

HFT has made markets more liquid than ever by substantially reducing the costs of dealing. Regulators must act to protect this liquidity by ensuring that many high-frequency traders will always compete to fill the orders of public investors.

## Notes

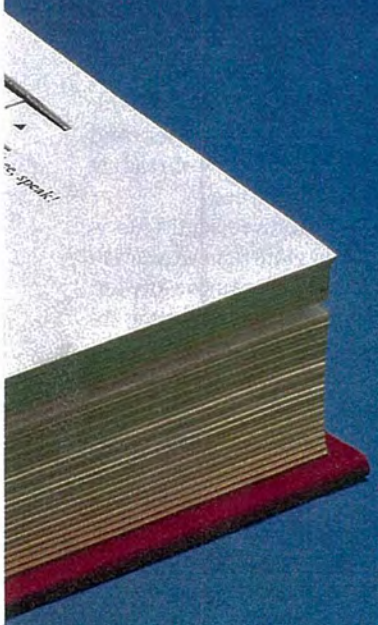
1. This section borrows from my recent op-ed in the *Financial Times*, "Stop the High-Frequency Trader Arms Race" (27 December 2012).

MIND

# Why the Brain Prefers Paper

E-readers and tablets are becoming more popular as such technologies improve, but reading on paper still has its advantages

*By Ferris Jabr*

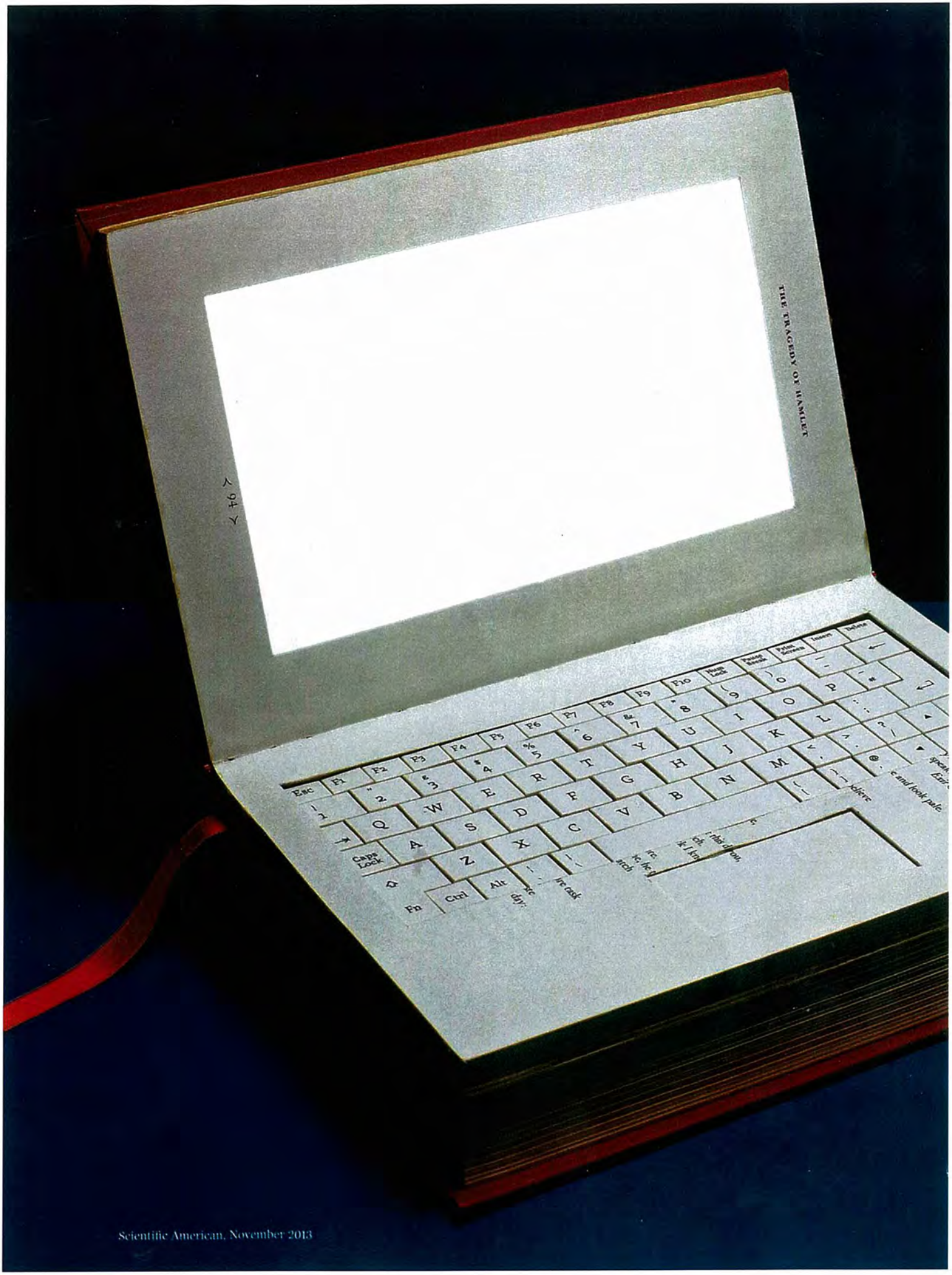


**IN BRIEF**

**Studies** in the past two decades indicate that people often understand and remember text on paper better than on a screen. Screens may inhibit comprehension by preventing people from intuitively navigating and mentally mapping long texts.

**In general, screens** are also more cognitively and physically taxing than paper. Scrolling demands constant conscious effort, and LCD screens on tablets and laptops can strain the eyes and cause headaches by shining light directly on people's faces.

**Preliminary research** suggests that even so-called digital natives are more likely to recall the gist of a story when they read it on paper because enhanced e-books and e-readers themselves are too distracting. Paper's greatest strength may be its simplicity.


THE TRAGEDY OF HAMLET
94

**One of the most provocative** viral YouTube videos in the past two years begins mundanely enough: a one-year-old girl plays with an iPad, sweeping her fingers across its touch screen and shuffling groups of icons. In following scenes, she appears to pinch, swipe and prod the pages of paper magazines as though they, too, are screens. Melodramatically, the video replays these gestures in close-up.

For the girl's father, the video—*A Magazine Is an iPad That Does Not Work*—is evidence of a generational transition. In an accompanying description, he writes, "Magazines are now useless and impossible to understand, for digital natives"—that is, for people who have been interacting with digital technologies from a very early age, surrounded not only by paper books and magazines but also by smartphones, Kindles and iPads.

Whether or not his daughter truly expected the magazines to behave like an iPad, the video brings into focus a question that is relevant to far more than the youngest among us: How exactly does the technology we use to read change the way we read?

Since at least the 1980s researchers in psychology, computer engineering, and library and information science have published more than 100 studies exploring differences in how people read on paper and on screens. Before 1992 most experiments concluded that people read stories and articles on screens more slowly and remember less about them. As the resolution of screens on all kinds of devices sharpened, however, a more mixed set of findings began to emerge. Recent surveys suggest that although most people still prefer paper—especially when they need to concentrate for a long time—attitudes are changing as tablets and e-reading technology improve and as reading digital texts for facts and fun becomes more common. In the U.S., e-books currently make up more than 20 percent of all books sold to the general public.

Despite all the increasingly user-friendly and popular technology, most studies published since the early 1990s confirm earlier conclusions: paper still has advantages over screens as a reading medium. Together laboratory experiments, polls and consumer reports indicate that digital devices prevent people from efficiently navigating long texts, which may subtly inhibit reading comprehension. Compared with paper, screens may also drain more of our mental resources while we are reading and make it a little harder to remember what we read when we are done. Whether they realize it or not, people often approach computers and tablets with a state of mind less conducive to learning than the one they bring to paper. And e-readers fail to re-create certain tactile experiences of reading on paper, the absence of which some find unsettling.

"There is physicality in reading," says cognitive scientist Maryanne Wolf of Tufts University, "maybe even more than we want to think about as we lurch into digital reading—as we move forward perhaps with too little reflection. I would like to preserve the absolute best of older forms but know when to use the new."

## TEXTUAL LANDSCAPES

UNDERSTANDING HOW READING on paper differs from reading on screens requires some explanation of how the human brain interprets written language. Although letters and words are symbols representing sounds and ideas, the brain also regards them as physical objects. As Wolf explains in her 2007 book *Proust and the Squid*, we are not born with brain circuits dedicated to reading, because we did not invent writing until relatively recently in our evolutionary history, around the fourth millennium B.C. So in childhood, the brain improvises a brand-new circuit for reading by weaving together various ribbons of neural tissue devoted to other abilities, such as speaking, motor coordination and vision.

Some of these repurposed brain regions specialize in object recognition: they help us instantly distinguish an apple from an orange, for example, based on their distinct features, yet classify both as fruit. Similarly, when we learn to read and write, we begin

PRECEDING PAGES: KYLE BEAN

to recognize letters by their particular arrangements of lines, curves and hollow spaces—a tactile learning process that requires both our eyes and hands. In recent research by Karin James of Indiana University Bloomington, the reading circuits of five-year-old children crackled with activity when they practiced writing letters by hand but not when they typed letters on a keyboard. And when people read cursive writing or intricate characters such as Japanese *kanji*, the brain literally goes through the motions of writing, even if the hands are empty.

Beyond treating individual letters as physical objects, the human brain may also perceive a text in its entirety as a kind of physical landscape. When we read, we construct a mental representation of the text. The exact nature of such representations remains unclear, but some researchers think they are similar to the mental maps we create of terrain—such as mountains and trails—and of indoor physical spaces, such as apartments and offices. Both anecdotally and in published studies, people report that when trying to locate a particular passage in a book, they often remember where in the text it appeared. Much as we might recall that we passed the red farmhouse near the start of a hiking trail before we started climbing uphill through the forest, we remember that we read about Mr. Darcy rebuffing Elizabeth Bennett at a dance on the bottom left corner of the left-hand page in one of the earlier chapters of Jane Austen's *Pride and Prejudice*.

**The human brain may perceive a text in its entirety as a kind of physical landscape. When we read, we construct a mental representation of the text that is likely similar to the mental maps we create of terrain and indoor spaces.**

In most cases, paper books have more obvious topography than on-screen text. An open paper book presents a reader with two clearly defined domains—the left- and right-hand pages—and a total of eight corners with which to orient oneself. You can focus on a single page of a paper book without losing awareness of the whole text. You can even feel the thickness of the pages you have read in one hand and the pages you have yet to read in the other. Turning the pages of a paper book is like leaving one footprint after another on a trail—there is a rhythm to it and a visible record of how far one has traveled. All these features not only make the text in a paper book easily navigable, they also make it easier to form a coherent mental map of that text.

In contrast, most digital devices interfere with intuitive navigation of a text and inhibit people from mapping the journey in their mind. A reader of digital text might scroll through a seamless stream of words, tap forward one page at a time or use the search function to immediately locate a particular phrase—but it is difficult to see any one passage in the context of the entire text. As an analogy, imagine if Google Maps allowed people to navigate street by individual street, as well as to teleport to any specific address, but prevented them from zooming out to see a neighborhood, state or country. Likewise, glancing at a progress bar gives a far more vague sense of place than feeling the weight of read and unread pages. And although e-readers and tablets replicate pagination, the displayed pages are ephemeral. Once read, those pages vanish. Instead of hiking the trail yourself, you watch the trees, rocks and moss pass by in flashes, with no tangible trace of what came before and no easy way to see what lies ahead.

"The implicit feel of where you are in a physical book turns out to be more important than we realized," says Abigail J. Sellen of Microsoft Research Cambridge in England, who co-authored the 2001 book *The Myth of the Paperless Office*. "Only when you get an e-book do you start to miss it. I don't think e-book manufacturers have thought enough about how you might visualize where you are in a book."

### EXHAUSTIVE READING

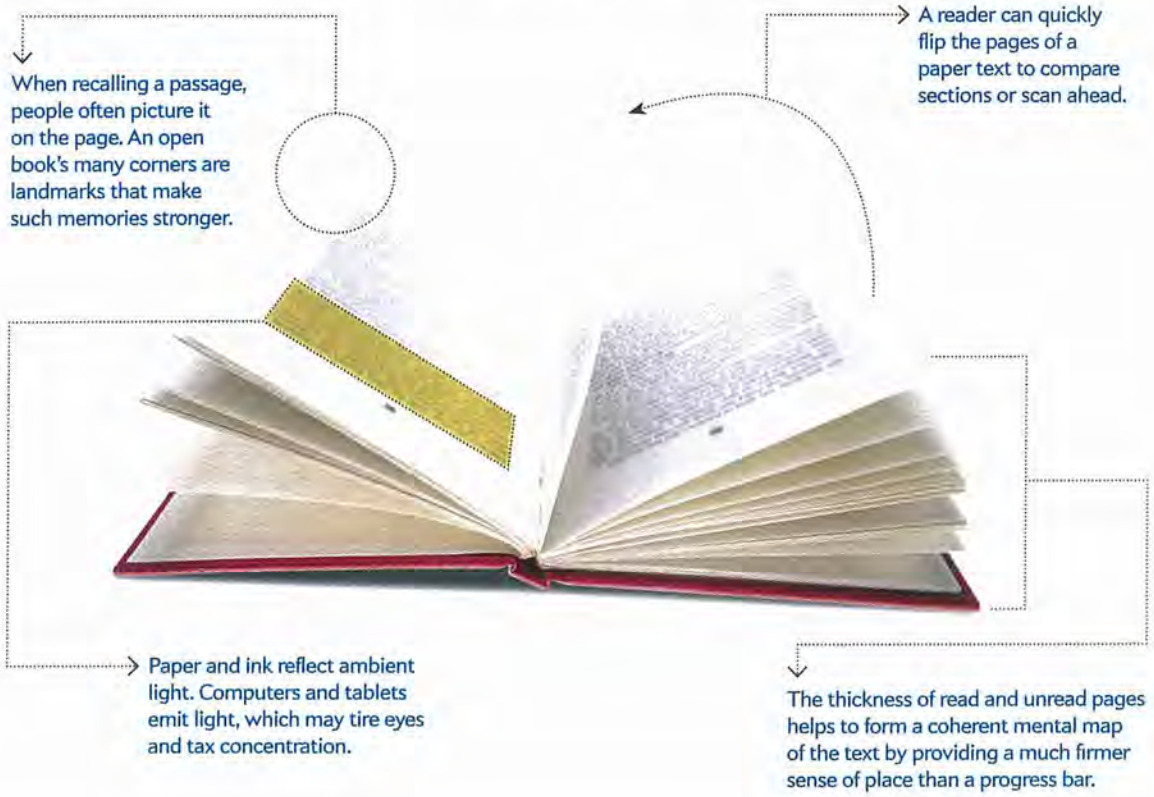
AT LEAST A FEW STUDIES suggest that screens sometimes impair comprehension precisely because they distort people's sense of place in a text. In a January 2013 study by Anne Mangen of the University of Stavanger in Norway and her colleagues, 72 10th grade students studied one narrative and one expository text. Half the students read on paper, and half read PDF files on computers. Afterward, students completed reading comprehension tests, during which they had access to the texts. Students who read the texts on computers performed a little worse, most likely because they had to scroll or click through the PDFs one section at a time, whereas students reading on paper held the entire texts in their hands and quickly switched between different pages. "The ease with which you can find out the beginning, end, and everything in between and the constant connection to your path, your progress in the text, might be some way of making it less taxing cognitively," Mangen says. "You have more free capacity for comprehension."

Other researchers agree that screen-based reading can dull comprehension because it is more mentally taxing and even physically tiring than reading on paper. E-ink reflects ambient light just like the ink on a paper book, but computer screens, smartphones and tablets shine light directly on people's faces. Today's LCDs are certainly gentler on eyes than their predecessor, cathode-ray tube (CRT) screens, but prolonged reading on glossy, self-illuminated screens can cause eyestrain, headaches and blurred vision. In an experiment by Erik Wästlund, then at Karlstad University in Sweden, people who took a reading comprehension test on a computer scored lower and reported higher levels of stress and tiredness than people who completed it on paper.

In a related set of Wästlund's experiments, 82 volunteers completed the same reading comprehension test on computers, either as a paginated document or as a continuous piece of text. Afterward, researchers assessed the students' attention and working memory—a collection of mental talents allowing people to temporarily store and manipulate information in their mind. Volunteers had to quickly close a series of pop-up windows, for example, or remember digits that flashed on a screen. Like many cognitive abilities, working memory is a finite resource that diminishes with exertion.

# Weighing Paper against Pixel

In many studies people understand and remember what they read on paper better than what they read on screens. Researchers think the physicality of paper explains this discrepancy.




Although people in both groups performed equally well, those who had to scroll through the unbroken text did worse on the attention and working memory tests. Wästlund thinks that scrolling—which requires readers to consciously focus on both the text and how they are moving it—drains more mental resources than turning or clicking a page, which are simpler and more automatic gestures. The more attention is diverted to moving through a text, the less is available for understanding it. A 2004 study conducted at the University of Central Florida reached similar conclusions.

An emerging collection of studies emphasizes that in addition to screens possibly leeching more attention than paper, people do not always bring as much mental effort to screens in the first place. Based on a detailed 2005 survey of 113 people in northern California, Ziming Liu of San Jose State University concluded that those reading on screens take a lot of shortcuts—they spend more time browsing, scanning and hunting for keywords compared with people reading on paper and are more likely to read a document once and only once.

When reading on screens, individuals seem less inclined to engage in what psychologists call metacognitive learning regulation—setting specific goals, rereading difficult sections and checking how much one has understood along the way. In a 2011 experiment at the Technion–Israel Institute of Technology, college students took multiple-choice exams about expository texts either on computers or on paper. Researchers limited half the volunteers to a meager seven minutes of study time; the other half could review the text for as long as they liked. When under pressure to read quickly, students using computers and paper performed equally well. When managing their own study time, however, volunteers using paper scored about 10 percentage points higher. Presumably, students using paper approached the exam with a more studious attitude than their screen-reading peers and more effectively directed their attention and working memory.

Even when studies find few differences in reading comprehension between screens and paper, screen readers may not remember a text as thoroughly in the long run. In a 2003 study Kate Garland, then at the University of Leicester in England, and her team asked 50 British college students to read documents from an introductory economics course either on a computer monitor or in a spiral-bound booklet. After 20 minutes of reading, Garland and her colleagues quizzed the students. Participants scored equally well regardless of the medium but differed in how they remembered the information.

Psychologists distinguish between remembering something—

ISTOCKPHOTO

a relatively weak form of memory in which someone recalls a piece of information, along with contextual details, such as where and when one learned it—and knowing something: a stronger form of memory defined as certainty that something is true. While taking the quiz, Garland's volunteers marked both their answer and whether they "remembered" or "knew" the answer. Students who had read study material on a screen relied much more on remembering than on knowing, whereas students who read on paper depended equally on the two forms of memory. Garland and her colleagues think that students who read on paper learned the study material more thoroughly more quickly; they did not have to spend a lot of time searching their mind for information from the text—they often just knew the answers.

Perhaps any discrepancies in reading comprehension between paper and screens will shrink as people's attitudes continue to change. Maybe the star of *A Magazine Is an iPad That Does Not Work* will grow up without the subtle bias against screens that seems to lurk among older generations. The latest research suggests, however, that substituting screens for paper at an early age has disadvantages that we should not write off so easily. A 2012 study at the Joan Ganz Cooney Center in New York City recruited 32 pairs of parents and three- to six-year-old children. Kids remembered more details from stories they read on paper than ones they read in e-books enhanced with interactive animations, videos and games. These bells and whistles deflected attention away from the narrative toward the device itself. In a follow-up survey of 1,226 parents, the majority reported that they and their children prefer print books over e-books when reading together.

Nearly identical results followed two studies, described this past September in *Mind, Brain, and Education*, by Julia Parrish-Morris, now at the University of Pennsylvania, and her colleagues. When reading paper books to their three- and five-year-old children, parents helpfully related the story to their child's life. But when reading a then popular electric console book with sound effects, parents frequently had to interrupt their usual "dialogic reading" to stop the child from fiddling with buttons and losing track of the narrative. Such distractions ultimately prevented the three-year-olds from understanding even the gist of the stories, but all the children followed the stories in paper books just fine.

Such preliminary research on early readers underscores a quality of paper that may be its greatest strength as a reading medium: its modesty. Admittedly, digital texts offer clear advantages in many different situations. When one is researching under deadline, the convenience of quickly accessing hundreds of keyword-searchable online documents vastly outweighs the benefits in comprehension and retention that come with dutifully locating and rifling through paper books one at a time in a library. And for people with poor vision, adjustable font size and the sharp contrast of an LCD screen are godsends. Yet paper, unlike screens, rarely calls attention to itself or shifts focus away from the text. Because of its simplicity, paper is "a still point, an anchor for the consciousness," as William Powers writes in his 2006 essay "Hamlet's Blackberry: Why Paper Is Eternal." People consistently report that when they really want to focus on a text, they read it on paper. In a 2011 survey of graduate students at National Taiwan University, the majority reported browsing a few paragraphs of an item online before printing out the whole text for more in-depth reading. And in a 2003 survey at the National Autonomous University of Mexico, nearly 80 percent of 687 students preferred to read text on paper rather than on a screen to "understand it with clarity."

Beyond pragmatic considerations, the way we feel about a paper book or an e-reader—and the way it feels in our hands—also determines whether we buy a best-selling book in hardcover at a local bookstore or download it from Amazon. Surveys and consumer reports suggest that the sensory aspects of reading on paper matter to people more than one might assume: the feel of paper and ink; the option to smooth or fold a page with one's fingers; the distinctive sound a page makes when turned. So far digital texts have not satisfyingly replicated such sensations. Paper books also have an immediately discernible size, shape and weight. We might refer to a hardcover edition of Leo Tolstoy's *War and Peace* as a "hefty tome" or to a paperback of Joseph Conrad's *Heart of Darkness* as a "slim volume." In contrast, although a digital text has a length that may be represented with a scroll or progress bar, it has no obvious shape or thickness. An e-reader always weighs the same, regardless of whether you are reading Marcel Proust's magnum opus or one of Ernest Hemingway's short stories. Some researchers have found that these discrepancies create enough so-called haptic dissonance to dissuade some people from using e-readers.

To amend this sensory incongruity, many designers have worked hard to make the e-reader or tablet experience as close to reading on paper as possible. E-ink resembles typical chemical ink, and the simple layout of the Kindle's screen looks remarkably like a page in a paper book. Likewise, Apple's iBooks app attempts to simulate somewhat realistic page turning. So far such gestures have been more aesthetic than pragmatic. E-books still prevent people from quickly scanning ahead on a whim or easily flipping to a previous chapter when a sentence surfaces a memory of something they read earlier.

Some digital innovators are not confining themselves to imitations of paper books. Instead they are evolving screen-based reading into something else entirely. Scrolling may not be the ideal way to navigate a text as long and dense as Herman Melville's *Moby Dick*, but the *New York Times*, the *Washington Post*, ESPN and other media outlets have created beautiful, highly visual articles that could not appear in print because they blend text with movies and embedded sound clips and depend entirely on scrolling to create a cinematic experience. Robin Sloan has pioneered the tap essay, which relies on physical interaction to set the pace and tone, unveiling new words, sentences and images only when someone taps a phone or a tablet's touch screen. And some writers are pairing up with computer programmers to produce ever more sophisticated interactive fiction and nonfiction in which one's choices determine what one reads, hears and sees next.

When it comes to intensively reading long pieces of unembellished text, paper and ink may still have the advantage. But plain text is not the only way to read.

*Ferris Jabr is an associate editor at* Scientific American.

MORE TO EXPLORE

The Myth of the Paperless Office. Abigail J. Sellen and Richard H. R. Harper. MIT Press, 2001.

Proust and the Squid. Maryanne Wolf. Harper, 2007.

**SCIENTIFIC AMERICAN ONLINE**

View a poll about people's reading habits at ScientificAmerican.com/nov2013/read-poll

LIFE

COLOR SPACE PHOTOS—AN EXCLUSIVE ARTICLE

# BY SCOTT CARPENTER
# HIS FULL PERSONAL STORY OF THE ORBIT

ALSO THIS WEEK

## WHAT WENT WRONG IN
# THE WILD STOCK MARKET
## WHAT IT MEANS TO THE U.S.

## DEAN RUSK
## The Captain's Pilot
BY THEODORE H. WHITE

JUNE 8 · 1962 · 20¢

®

AJO 230 SOUTH BROAD STREET, 20TH FLOOR | PHILADELPHIA, PA 19102-4102 | 215.546.7500/7506 FAX | AJOPARTNERS.COM

# MEMORANDUM

FROM: Ted Aronson

DATE: August 5, 2003

RE: THE COGNITIVE STYLE OF POWERPOINT

After reading this, you'll never feel the same sitting through a PowerPoint presentation — guaranteed.

Edward Tufte, "the Leonardo DaVinci of data" according to *The New York Times*, takes aim at the cognitive style of PowerPoint and blasts it off the screen. For instance, here's how he describes the standard statistical graphics that purport to represent a straightforward table of cancer survival rates (page 14):

> *Everything is wrong with these smarmy, incoherent graphs: uncomparative, thin data-density, chartjunk, encoded legends, meaningless color, logotype branding, indifferent to content and evidence. Chartjunk is a clear sign of statistical stupidity; use these designs in your presentation, and your audience will quickly and correctly conclude that you don't know much about data and evidence. Poking a finger into the eye of thought, these data graphics would turn into a nasty travesty if used for a serious purpose, such as cancer patients seeking to assess their survival chances. To deal with a product that messes up data with such systematic intensity must require an enormous insulation from statistical integrity and statistical reasoning by Microsoft PP executives and programmers, PP textbook writers, and presenters of such chartjunk.*

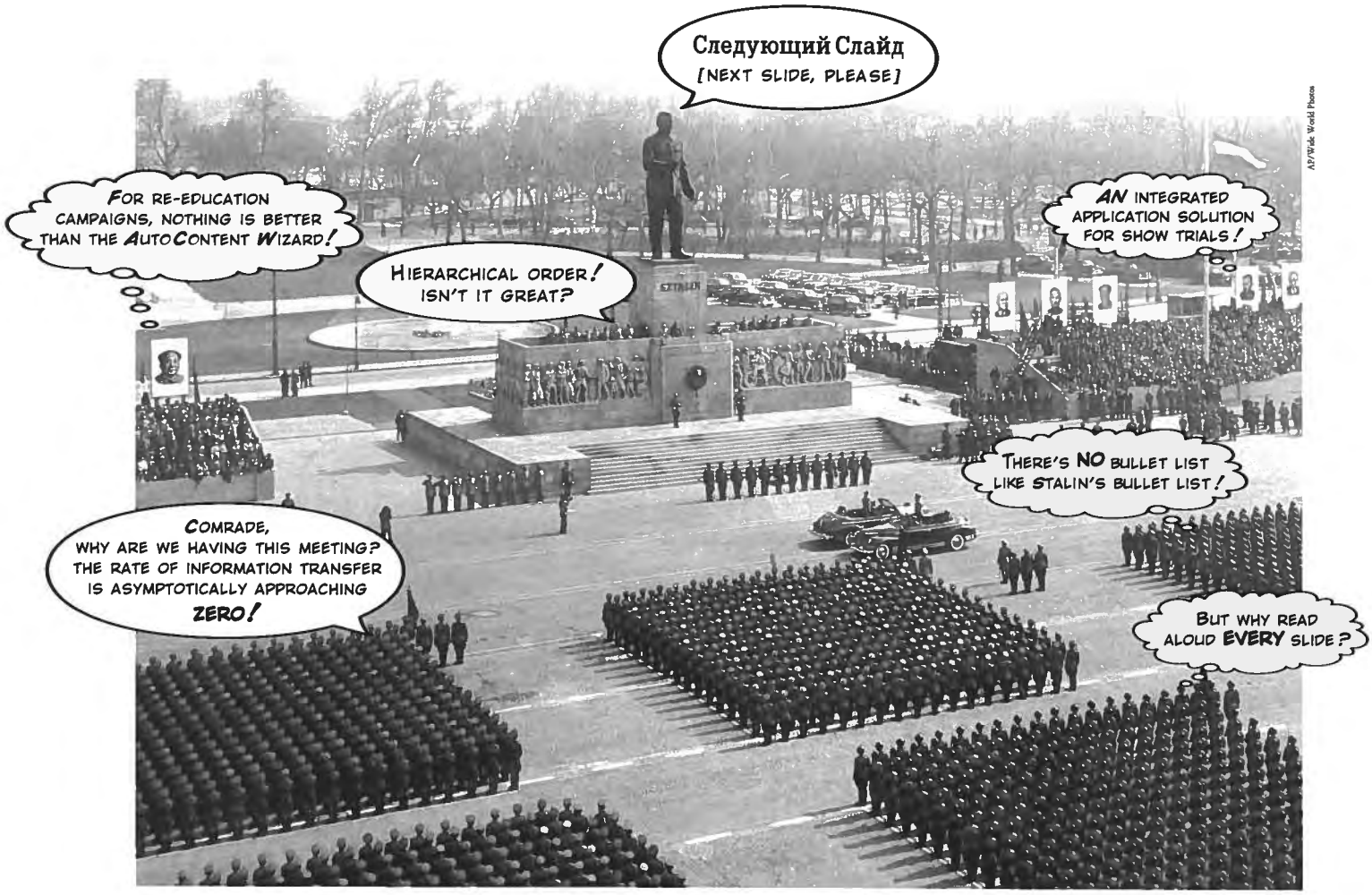
Whoa, Ed — tell us how you really feel!

TRA
aronson@ajopartners.com

P.S. Tufte's major works are shown on the back cover. His first, *The Visual Display of Quantitative Information*, cannot be too highly recommended.

*Edward R. Tufte*

# *The Cognitive Style of PowerPoint: Pitching Out Corrupts Within*




Military parade, Stalin Square, Budapest, April 4, 1956.

Copyright © 2006 by Edward R. Tufte. All rights reserved.
Second edition, third printing, March 2016
Published by Graphics Press LLC P.O. Box 430 Cheshire, Connecticut 06410 www.tufte.com

AJO 230 South Broad Street, 20th Floor | Philadelphia, PA 19102-4102 | 215.546.7500/7506 fax | ajopartners.com

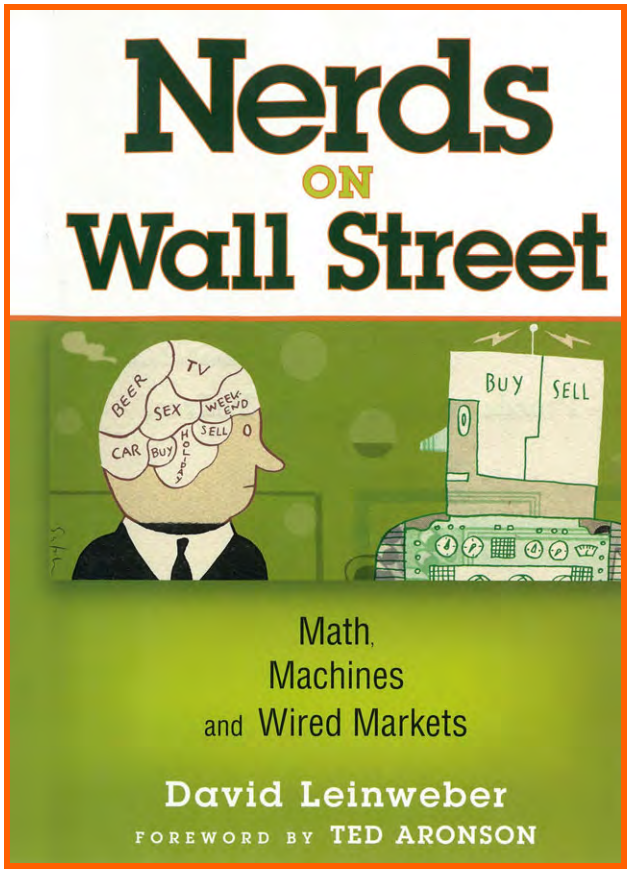
# Memorandum

FROM: Ted Aronson

DATE: April 21, 2017

RE: **DAVE LEINWEBER (WALL STREET NERD)**

A number of years ago, Dave Leinweber published an informative, entertaining book, *Nerds on Wall Street*.




(I wrote the foreword, which highlighted Dave's delightful sense of humor.)

Dave has reprised his theses with "Fintech Codgers Look Back 25 Years." (I appear yet again in Dave's work, this time reflecting AJO's sense of humor!)

TRA
aronson@ajopartners.com

gce

THE JOURNAL OF

# INVESTING

THEORY & PRACTICE FOR FUND MANAGERS | SPRING 2017 Volume 26 Number 1

25th

anniversary issue | 1992–2017

## Fintech Codgers Look Back 25 Years

DAVID LEINWEBER

IIJ Institutional Investor Journals

The Voices *of* Influence | iijournals.com

# Performance — Returns & Risk

## AJO Vista Emerging Markets Small Cap
## Gross Composite Results (%)
## June 30, 2022

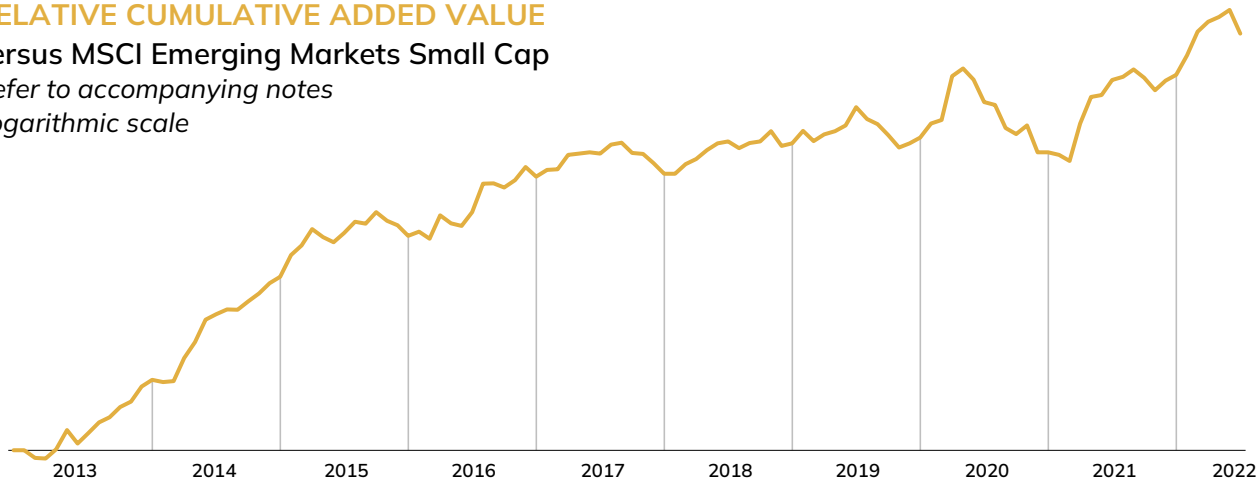
| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista Emerging Markets SC | (17.4) | (16.5) | (16.7) | 8.6 | 6.2 | — | 8.0 | | 9.5 | 2 |
| MSCI Emerging Markets SC | (16.4) | (20.0) | (20.7) | 5.8 | 3.5 | 4.3 | 3.1 | | 12/12 | 130 |
| **Added Value** | **(1.0)** | **3.5** | **4.0** | **2.8** | **2.7** | **—** | **4.9** | 4.4 | | |

### RELATIVE CUMULATIVE ADDED VALUE

versus MSCI Emerging Markets Small Cap

*Refer to accompanying notes*

*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | MSCI EM SC | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (16.5) | (20.0) | **3.5** |
| 2021 | 29.0 | 18.8 | **10.2** |
| 2020 | 17.4 | 19.3 | **(1.9)** |
| 2019 | 12.2 | 11.5 | **0.7** |
| 2018 | (15.9) | (18.6) | **2.7** |
| 2017 | 34.3 | 33.8 | **0.5** |
| 2016 | 8.9 | 2.3 | **6.6** |
| 2015 | (2.7) | (6.8) | **4.1** |
| 2014 | 12.7 | 1.0 | **11.7** |
| 2013 | 8.9 | 1.0 | **7.9** |
| Annualized | 8.0 | 3.1 | **4.9** |
| Std deviation | 17.0 | 17.3 | 4.4* |

*tracking error

The composite is comprised of separately managed portfolios of institutional investors, including our Emerging Markets Small Cap Fund offering (a private investment fund).

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | MSCI EM SC | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 08/20 | 17.8 | 24.0 | **(6.2)** |
| | 07/20 | 17.3 | 21.9 | **(4.6)** |
| Best | 05/21 | 18.4 | 10.4 | **8.0** |
| | 04/21 | 21.3 | 14.1 | **7.2** |
| ONE YEAR | | | | |
| Worst | 03/21 | 78.0 | 87.1 | **(9.1)** |
| | 02/21 | 35.7 | 41.8 | **(6.1)** |
| Best | 02/15 | 19.4 | 3.4 | **16.0** |
| | 06/14 | 29.5 | 14.2 | **15.3** |
| THREE YEARS | | | | |
| Worst | 02/21 | 4.3 | 4.2 | **0.1** |
| | 11/20 | 1.8 | 1.4 | **0.4** |
| Best | 08/16 | 11.9 | 3.0 | **8.9** |
| | 07/16 | 10.1 | 1.2 | **8.9** |
| FIVE YEARS | | | | |
| Worst | 11/20 | 8.3 | 6.6 | **1.7** |
| | 02/21 | 13.2 | 11.4 | **1.8** |
| Best | 05/18 | 10.7 | 3.8 | **6.9** |
| | 02/18 | 11.7 | 4.9 | **6.8** |

N.B. – Periods greater than one year are annualized.

# Performance — Returns & Risk

## AJO Vista Emerging Markets Small Cap
## Net Composite Results (%)
## June 30, 2022

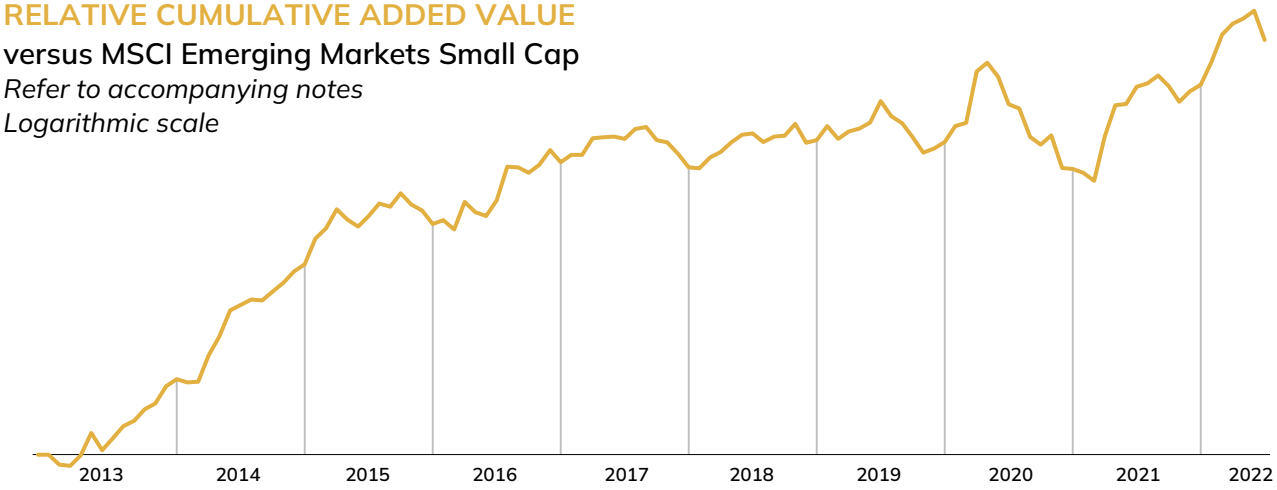
| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista Emerging Markets SC | (17.6) | (16.8) | (17.4) | 7.7 | 5.3 | — | 7.2 | | 9.5 | 2 |
| MSCI Emerging Markets SC | (16.4) | (20.0) | (20.7) | 5.8 | 3.5 | 4.3 | 3.1 | | 12/12 | 130 |
| **Added Value** | **(1.2)** | **3.2** | **3.3** | **1.9** | **1.8** | **—** | **4.1** | 4.4 | | |

### RELATIVE CUMULATIVE ADDED VALUE

versus MSCI Emerging Markets Small Cap

*Refer to accompanying notes*

*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | MSCI EM SC | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (16.8) | (20.0) | **3.2** |
| 2021 | 27.9 | 18.8 | **9.1** |
| 2020 | 16.5 | 19.3 | **(2.8)** |
| 2019 | 11.3 | 11.5 | **(0.2)** |
| 2018 | (16.6) | (18.6) | **2.0** |
| 2017 | 33.2 | 33.8 | **(0.6)** |
| 2016 | 8.0 | 2.3 | **5.7** |
| 2015 | (3.5) | (6.8) | **3.3** |
| 2014 | 11.8 | 1.0 | **10.8** |
| 2013 | 8.0 | 1.0 | **7.0** |
| Annualized | 7.2 | 3.1 | **4.1** |
| Std deviation | 17.0 | 17.3 | 4.4* |

*tracking error

The composite is comprised of separately managed portfolios of institutional investors, including our Emerging Markets Small Cap Fund offering (a private investment fund).

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | MSCI EM SC | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 08/20 | 17.5 | 24.0 | **(6.5)** |
| | 07/20 | 17.1 | 21.9 | **(4.8)** |
| Best | 05/21 | 18.1 | 10.4 | **7.7** |
| | 04/21 | 21.1 | 14.1 | **7.0** |
| ONE YEAR | | | | |
| Worst | 03/21 | 76.6 | 87.1 | **(10.5)** |
| | 02/21 | 34.7 | 41.8 | **(7.1)** |
| Best | 02/15 | 18.4 | 3.4 | **15.0** |
| | 02/22 | 18.8 | 4.4 | **14.4** |
| THREE YEARS | | | | |
| Worst | 02/21 | 3.5 | 4.2 | **(0.7)** |
| | 11/20 | 1.0 | 1.4 | **(0.4)** |
| Best | 07/16 | 9.3 | 1.2 | **8.1** |
| | 08/16 | 11.0 | 3.0 | **8.0** |
| FIVE YEARS | | | | |
| Worst | 11/20 | 7.4 | 6.6 | **0.8** |
| | 02/21 | 12.3 | 11.4 | **0.9** |
| Best | 05/18 | 9.8 | 3.8 | **6.0** |
| | 02/18 | 10.8 | 4.9 | **5.9** |

N.B. – Periods greater than one year are annualized.

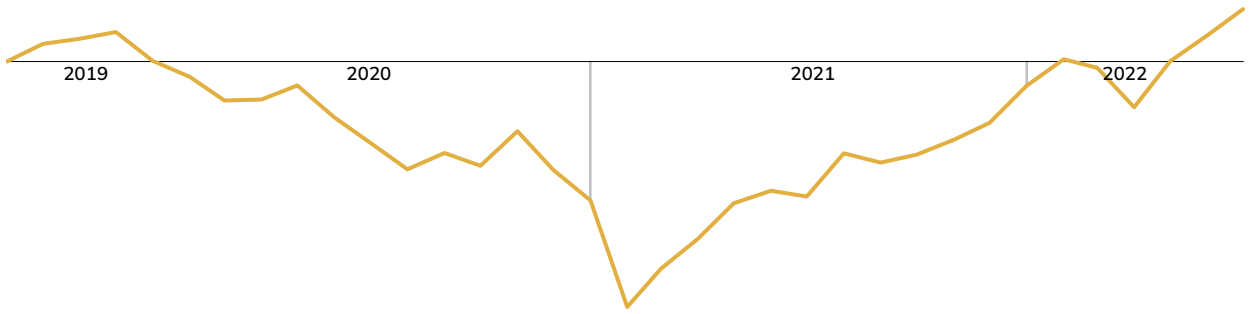
# Performance — Returns & Risk

AJO Vista US Micro Cap
Gross Composite Results (%)
June 30, 2022

| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista US Micro Cap | (13.3) | (21.1) | (21.2) | — | — | — | 8.0 | | 2.8 | 1 |
| Russell Microcap | (19.0) | (25.1) | (30.7) | 5.1 | 4.5 | 9.0 | 6.6 | | 09/19 | 15 |
| **Added Value** | **5.7** | **4.0** | **9.5** | **—** | **—** | **—** | **1.4** | 7.9 | | |

## RELATIVE CUMULATIVE ADDED VALUE

versus Russell Microcap
*Refer to accompanying notes*
*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | Russell Microcap | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (21.1) | (25.1) | **4.0** |
| 2021 | 29.1 | 19.3 | **9.8** |
| 2020 | 9.9 | 21.0 | **(11.1)** |
| 2019 (since 9/11) | 11.0 | 11.0 | **0.0** |
| Annualized | 8.0 | 6.6 | **1.4** |
| Std deviation | 25.4 | 27.8 | 7.9* |

*tracking error

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | Russell Microcap | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 01/21 | 31.3 | 48.2 | **(16.9)** |
| | 02/21 | 21.8 | 30.4 | **(8.6)** |
| Best | 04/21 | 16.8 | 8.8 | **8.0** |
| | 05/21 | 10.0 | 4.3 | **5.7** |
| ONE YEAR | | | | |
| Worst | 01/21 | 23.7 | 44.9 | **(21.2)** |
| | 03/21 | 100.2 | 120.3 | **(20.1)** |
| Best | 01/22 | 11.8 | (5.7) | **17.5** |
| | 02/22 | 3.1 | (10.2) | **13.3** |

N.B. – Periods greater than one year are annualized.

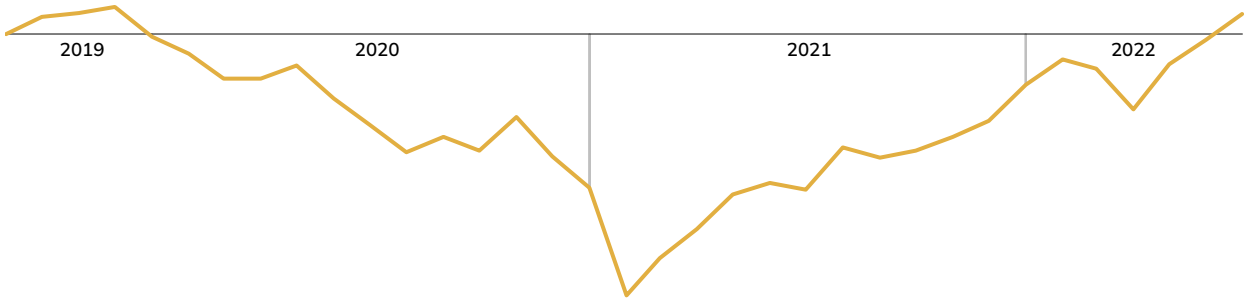
# Performance — Returns & Risk

AJO Vista US Micro Cap
Net Composite Results (%)
June 30, 2022

| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista US Micro Cap | (13.5) | (21.4) | (21.9) | — | — | — | 7.2 | | 2.8 | 1 |
| Russell Microcap | (19.0) | (25.1) | (30.7) | 5.1 | 4.5 | 9.0 | 6.6 | | 09/19 | 15 |
| **Added Value** | **5.5** | **3.7** | **8.8** | **—** | **—** | **—** | **0.6** | 7.9 | | |

## RELATIVE CUMULATIVE ADDED VALUE

versus Russell Microcap
*Refer to accompanying notes*
*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | Russell Microcap | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (21.4) | (25.1) | **3.7** |
| 2021 | 28.1 | 19.3 | **8.8** |
| 2020 | 9.0 | 21.0 | **(12.0)** |
| 2019 (since 9/11) | 10.8 | 11.0 | **(0.2)** |
| Annualized | 7.2 | 6.6 | **0.6** |
| Std deviation | 25.4 | 27.8 | 7.9* |

*tracking error

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | Russell Microcap | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 01/21 | 31.1 | 48.2 | **(17.1)** |
| | 02/21 | 21.6 | 30.4 | **(8.8)** |
| Best | 04/21 | 16.6 | 8.8 | **7.8** |
| | 05/21 | 9.8 | 4.3 | **5.5** |
| ONE YEAR | | | | |
| Worst | 01/21 | 22.7 | 44.9 | **(22.2)** |
| | 03/21 | 98.7 | 120.3 | **(21.6)** |
| Best | 01/22 | 10.9 | (5.7) | **16.6** |
| | 02/22 | 2.3 | (10.2) | **12.5** |

N.B. – Periods greater than one year are annualized.

# Performance — Returns & Risk

## AJO Vista International Small Cap
## Gross Composite Results (%)
## June 30, 2022

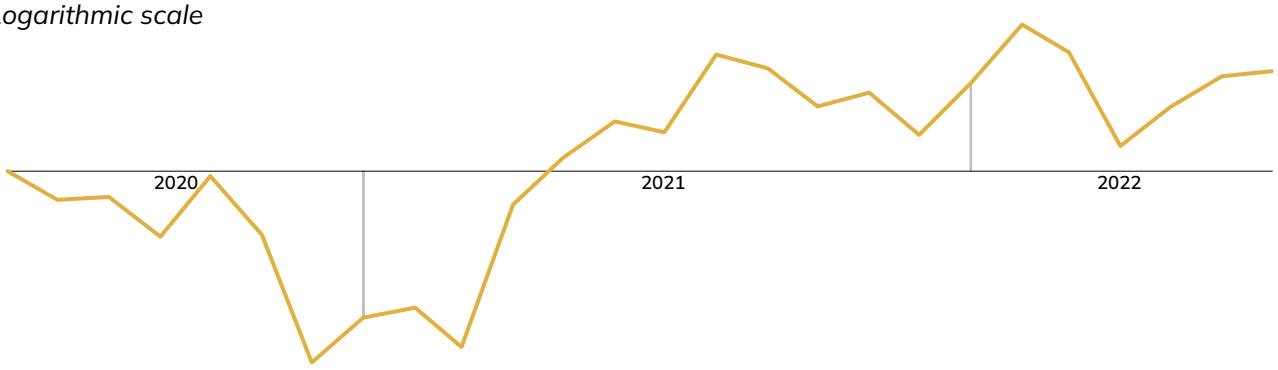
| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista International Small Cap | (16.8) | (23.7) | (22.1) | — | — | — | 6.3 | | 2.0 | 1 |
| MSCI World ex USA Small Cap | (17.9) | (23.9) | (23.0) | 2.0 | 2.2 | 6.7 | 5.4 | | 06/20 | 15 |
| **Added Value** | **1.1** | **0.2** | **0.9** | **—** | **—** | **—** | **0.9** | 3.9 | | |

### RELATIVE CUMULATIVE ADDED VALUE

versus MSCI World ex USA Small Cap

*Refer to accompanying notes*

*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | MSCI World ex USA SC | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (23.7) | (23.9) | **0.2** |
| 2021 | 16.1 | 11.1 | **5.0** |
| 2020 (since 6/1) | 28.2 | 31.7 | **(3.5)** |
| Annualized | 6.3 | 5.4 | **0.9** |
| Std deviation | 17.6 | 18.0 | 3.9* |

*tracking error

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | MSCI World ex USA SC | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 12/20 | 14.5 | 17.5 | **(3.0)** |
| | 11/20 | 6.3 | 8.8 | **(2.5)** |
| Best | 05/21 | 13.5 | 8.8 | **4.7** |
| | 04/21 | 12.6 | 9.5 | **3.1** |
| ONE YEAR | | | | |
| Worst | 05/22 | (13.9) | (14.7) | **0.8** |
| | 06/22 | (22.1) | (23.0) | **0.9** |
| Best | 01/22 | 9.5 | 3.8 | **5.7** |
| | 02/22 | 5.7 | 0.0 | **5.7** |

N.B. – Periods greater than one year are annualized.

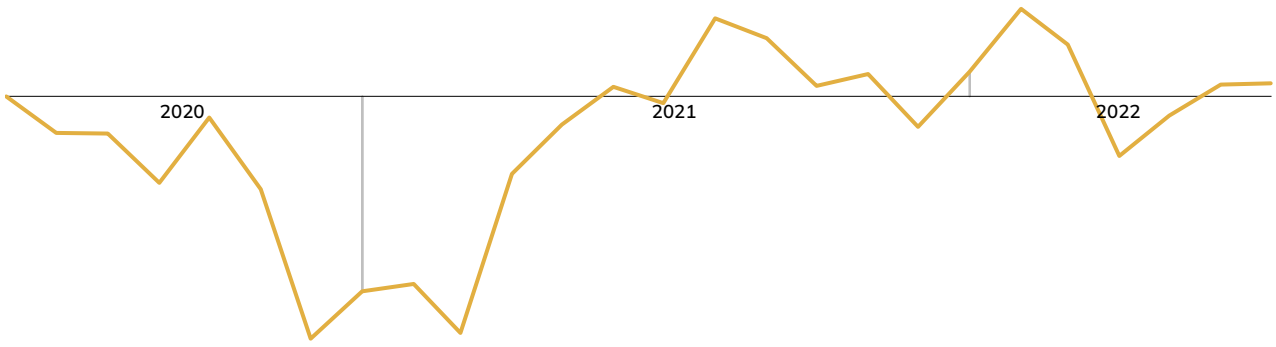
# Performance — Returns & Risk

AJO Vista International Small Cap
Net Composite Results (%)
June 30, 2022

| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista International Small Cap | (17.0) | (24.0) | (22.8) | — | — | — | 5.5 | | 2.0 | 1 |
| MSCI World ex USA Small Cap | (17.9) | (23.9) | (23.0) | 2.0 | 2.2 | 6.7 | 5.4 | | 06/20 | 15 |
| **Added Value** | **0.9** | **(0.1)** | **0.2** | **—** | **—** | **—** | **0.1** | 3.9 | | |

## RELATIVE CUMULATIVE ADDED VALUE

versus MSCI World ex USA Small Cap
*Refer to accompanying notes*
*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | MSCI World ex USA SC | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (24.0) | (23.9) | **(0.1)** |
| 2021 | 15.2 | 11.1 | **4.1** |
| 2020 (since 6/1) | 27.6 | 31.7 | **(4.1)** |
| Annualized | 5.5 | 5.4 | **0.1** |
| Std deviation | 17.6 | 18.0 | 3.9* |

*tracking error

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | MSCI World ex USA SC | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 12/20 | 14.2 | 17.5 | **(3.3)** |
| | 11/20 | 6.1 | 8.8 | **(2.7)** |
| Best | 05/21 | 13.3 | 8.8 | **4.5** |
| | 04/21 | 12.4 | 9.5 | **2.9** |
| ONE YEAR | | | | |
| Worst | 05/22 | (14.6) | (14.7) | **0.1** |
| | 06/22 | (22.8) | (23.0) | **0.2** |
| Best | 01/22 | 8.6 | 3.8 | **4.8** |
| | 02/22 | 4.8 | 0.0 | **4.8** |

N.B. – Periods greater than one year are annualized.

# Performance — Returns & Risk

## AJO Vista Amplified Opportunities
## Gross Composite Results (%)
## June 30, 2022

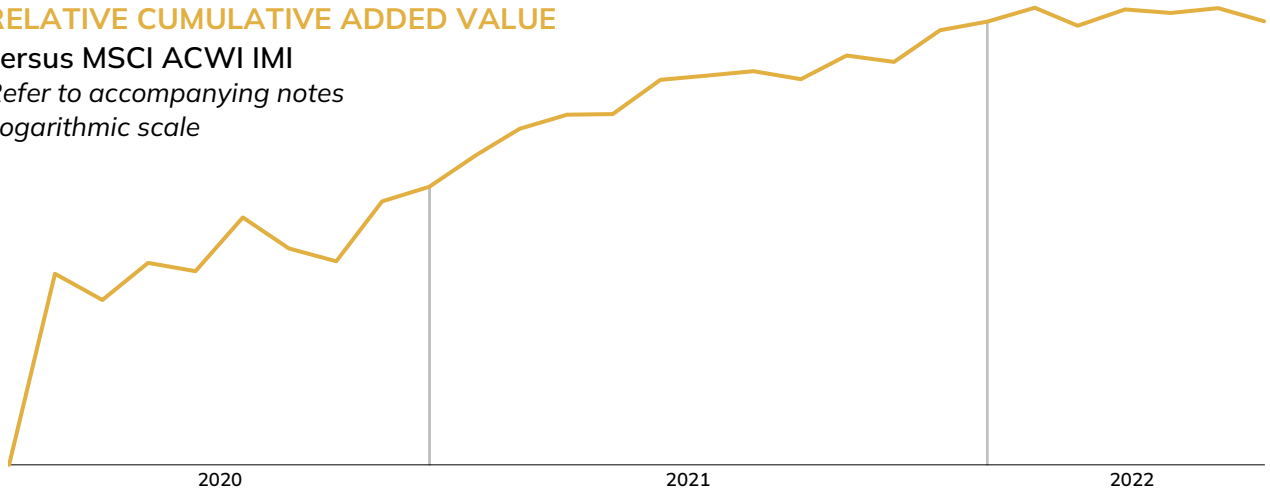
| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista Amplified Opportunities | (15.3) | (15.9) | (7.9) | — | — | — | 70.5 | | 2.2 | 1 |
| MSCI ACWI IMI | (13.9) | (15.9) | (14.9) | 6.8 | 5.2 | 9.2 | 28.4 | | 04/20 | 114 |
| **Added Value** | **(1.4)** | **0.0** | **7.0** | **—** | **—** | **—** | **42.1** | 25.8 | | |

### RELATIVE CUMULATIVE ADDED VALUE

versus MSCI ACWI IMI

*Refer to accompanying notes*

*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | MSCI ACWI IMI | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (15.9) | (15.9) | **0.0** |
| 2021 | 62.7 | 28.3 | **34.4** |
| 2020 (since 4/1) | 142.6 | 62.6 | **80.0** |
| Annualized | 70.5 | 28.4 | **42.1** |
| Std deviation | 40.9 | 20.8 | 25.8* |

*tracking error

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | MSCI ACWI IMI | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 06/22 | (15.3) | (13.9) | **(1.4)** |
| | 04/22 | (5.1) | (4.4) | **(0.7)** |
| Best | 06/20 | 59.0 | 18.9 | **40.1** |
| | 01/21 | 58.0 | 35.5 | **22.5** |
| ONE YEAR | | | | |
| Worst | 06/22 | (7.9) | (14.9) | **7.0** |
| | 05/22 | 2.6 | (7.4) | **10.0** |
| Best | 03/21 | 226.2 | 97.1 | **129.1** |
| | 05/21 | 146.2 | 79.4 | **66.8** |

N.B. – Periods greater than one year are annualized.

# Performance — Returns & Risk

## AJO Vista Amplified Opportunities
## Net Composite Results (%)
## June 30, 2022

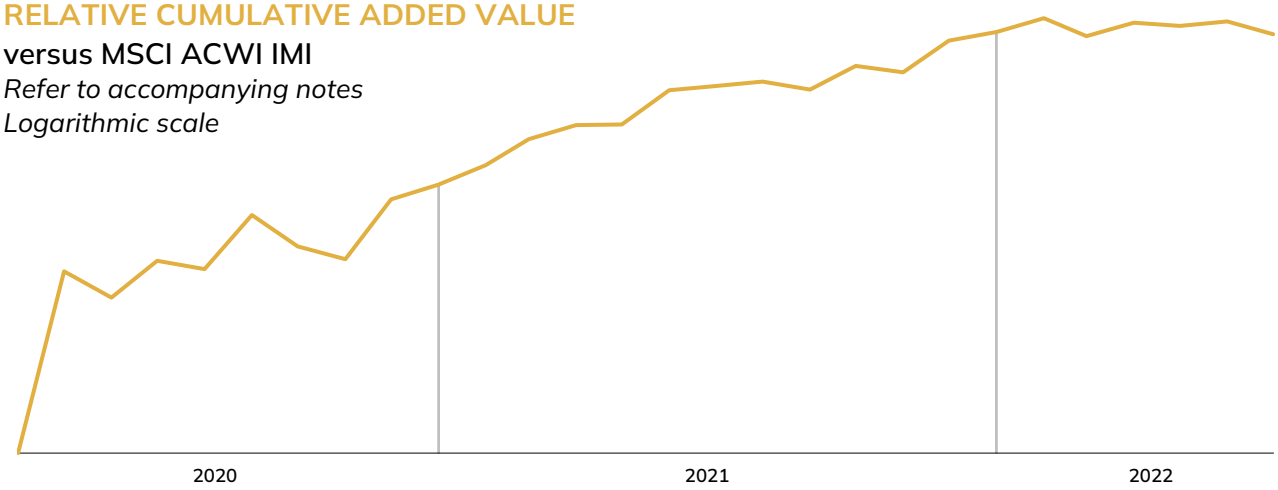
| Composite/ Benchmark | Qtr | YTD | Annualized 1 Year | 3 Years | 5 Years | 10 Years | Since Incep | Tracking Error | Years/ Incep | Clients/ $mm |
|---|---|---|---|---|---|---|---|---|---|---|
| AJO Vista Amplified Opportunities | (15.3) | (16.2) | (8.3) | — | — | — | 67.8 | | 2.2 | 1 |
| MSCI ACWI IMI | (13.9) | (15.9) | (14.9) | 6.8 | 5.2 | 9.2 | 28.4 | | 04/20 | 114 |
| **Added Value** | **(1.4)** | **(0.3)** | **6.6** | **—** | **—** | **—** | **39.4** | 24.5 | | |

### RELATIVE CUMULATIVE ADDED VALUE

versus MSCI ACWI IMI

*Refer to accompanying notes*

*Logarithmic scale*




### CALENDAR YEARS

| | AJO Vista | MSCI ACWI IMI | Added Value |
|---|---|---|---|
| 2022 (to 6/30) | (16.2) | (15.9) | **(0.3)** |
| 2021 | 59.8 | 28.3 | **31.5** |
| 2020 (since 4/1) | 139.3 | 62.6 | **76.7** |
| Annualized | 67.8 | 28.4 | **39.4** |
| Std deviation | 39.9 | 20.8 | 24.5* |

*tracking error

This presentation does not constitute an offer to sell, a solicitation to buy, or a recommendation of any fund or security, or an offer to provide investment advisory or other services by AJO Vista.

Please refer to accompanying Notes.

### WORST/BEST

| | | AJO Vista | MSCI ACWI IMI | Added Value |
|---|---|---|---|---|
| THREE MONTHS | | | | |
| Worst | 06/22 | (15.3) | (13.9) | **(1.4)** |
| | 04/22 | (5.5) | (4.4) | **(1.1)** |
| Best | 06/20 | 56.8 | 18.9 | **37.9** |
| | 01/21 | 55.2 | 35.5 | **19.7** |
| ONE YEAR | | | | |
| Worst | 06/22 | (8.3) | (14.9) | **6.6** |
| | 05/22 | 2.2 | (7.4) | **9.6** |
| Best | 03/21 | 215.9 | 97.1 | **118.8** |
| | 05/21 | 141.8 | 79.4 | **62.4** |

N.B. – Periods greater than one year are annualized.

# Portfolio Characteristics

June 30, 2022

| | AJO Vista Emerging Markets Small Cap | MSCI Emerging Markets Small Cap |
|---|---|---|
| **Number of securities** | **390** | 1,827 |
| **Number of countries** | **22** | 24 |
| **Top 10 holdings (%)** | **11.9%** | 2.8% |
| **Active share** | **84.7%** | |
| **Average market cap ($m)** | **$2,118** | $1,536 |
| **Median market cap ($m)** | **$1,322** | $855 |
| **Beta (1y, weekly)** | **0.90** | |
| **Tracking error (3y, weekly)** | **4.7%** | |
| **Market Cap Distribution** | | |
| < $100 million | **0.0%** | 0.1% |
| $100 – $500 million | **9.3** | 7.3 |
| $500 – $1000 million | **23.5** | 28.9 |
| $1000 – $5000 million | **54.7** | 62.9 |
| > $5000 million | **12.5** | 0.8 |
| **Value** | | |
| Dividend yield | **6.0%** | 3.1% |
| Earnings yield | **16.4** | 9.4 |
| EBITDA/Enterprise value | **19.8** | 12.0 |
| Cash flow yield | **26.0** | 15.6 |
| **Growth** | | |
| Asset growth | **15.8%** | 15.0% |
| Earnings growth | **57.3** | 41.2 |
| **Momentum** | | |
| Average tr-12 stock return | **6.0%** | -0.7% |
| **Risk** | | |
| Average tr-12 stock volatility | **38.9%** | 40.5% |
| Leverage | **25.6** | 26.5 |
| Earnings risk | **2.4** | 2.5 |
| **Quality** | | |
| Operating margin | **32.6%** | 28.1% |
| Return on equity | **24.1** | 15.0 |
| **Sector Exposure** | | |
| Communication services | **4.3%** | 3.6% |
| Consumer discretionary | **10.5** | 11.8 |
| Consumer staples | **5.1** | 6.4 |
| Energy | **3.8** | 2.4 |
| Financials | **11.1** | 10.5 |
| Health care | **7.6** | 8.8 |
| Industrials | **16.9** | 15.3 |
| Information technology | **19.4** | 17.4 |
| Materials | **13.6** | 13.1 |
| Real estate | **5.4** | 7.0 |
| Utilities | **2.5** | 3.6 |
| **Country Exposure — Min/Max** | | |
| Min: India | **20.4%** | 21.5% |
| Max: Taiwan | **22.3%** | 20.9% |

# Portfolio Characteristics

June 30, 2022

| | AJO Vista US Micro Cap | Russell Microcap |
|---|---|---|
| **Number of securities** | **305** | 1,804 |
| **Number of countries** | **1** | 1 |
| **Top 10 holdings (%)** | **10.7%** | 3.1% |
| **Active share** | **75.7%** | |
| **Average market cap ($m)** | **$759** | $560 |
| **Median market cap ($m)** | **$533** | $212 |
| **Beta (1y, weekly)** | **0.91** | |
| **Tracking error (ITD, weekly)** | **7.5%** | |
| **Market Cap Distribution** | | |
| < $100 million | **2.7%** | 4.8% |
| $100 – $500 million | **39.0** | 40.8 |
| $500 – $1000 million | **38.8** | 45.8 |
| $1000 – $5000 million | **19.5** | 8.6 |
| > $5000 million | **0.0** | 0.0 |
| **Value** | | |
| Dividend yield | **1.5%** | 1.1% |
| Earnings yield | **15.0** | 11.0 |
| EBITDA/Enterprise value | **17.1** | 11.9 |
| Cash flow yield | **21.4** | 16.7 |
| **Growth** | | |
| Asset growth | **23.4%** | 24.1% |
| Earnings growth | **56.0** | 38.5 |
| **Momentum** | | |
| Average tr-12 stock return | **6.8%** | -17.4% |
| **Risk** | | |
| Average tr-12 stock volatility | **50.4%** | 55.0% |
| Leverage | **27.1** | 27.9 |
| Earnings risk | **4.3** | 4.5 |
| **Quality** | | |
| Operating margin | **25.6%** | 25.4% |
| Return on equity | **7.0** | -14.7 |
| **Sector Exposure** | | |
| Communication services | **1.2%** | 2.8% |
| Consumer discretionary | **11.1** | 10.1 |
| Consumer staples | **2.5** | 2.7 |
| Energy | **9.9** | 4.8 |
| Financials | **21.5** | 21.6 |
| Health care | **24.9** | 26.8 |
| Industrials | **12.6** | 10.9 |
| Information technology | **7.9** | 11.7 |
| Materials | **5.8** | 3.5 |
| Real estate | **2.6** | 4.2 |
| Utilities | **0.0** | 0.8 |

# Portfolio Characteristics

June 30, 2022

| | AJO Vista International Small Cap | MSCI World ex USA Small Cap |
|---|---|---|
| **Number of securities** | **354** | 2,586 |
| **Number of countries** | **22** | 23 |
| **Top 10 holdings (%)** | **9.6%** | 2.2% |
| **Active share** | **82.2%** | |
| **Average market cap ($m)** | **$2,477** | $2,441 |
| **Median market cap ($m)** | **$1,564** | $1,128 |
| **Beta (1y, weekly)** | **0.96** | |
| **Tracking error (ITD, weekly)** | **3.5%** | |
| **Market Cap Distribution** | | |
| < $100 million | **0.0%** | 0.0% |
| $100 – $500 million | **3.5** | 3.5 |
| $500 – $1000 million | **18.6** | 14.4 |
| $1000 – $5000 million | **66.9** | 75.9 |
| > $5000 million | **11.0** | 6.2 |
| **Value** | | |
| Dividend yield | **3.9%** | 2.9% |
| Earnings yield | **10.7** | 8.0 |
| EBITDA/Enterprise value | **16.1** | 12.5 |
| Cash flow yield | **17.6** | 13.7 |
| **Growth** | | |
| Asset growth | **11.7%** | 12.9% |
| Earnings growth | **48.7** | 36.7 |
| **Momentum** | | |
| Average tr-12 stock return | **8.3%** | -6.1% |
| **Risk** | | |
| Average tr-12 stock volatility | **35.0%** | 36.2% |
| Leverage | **31.9** | 32.0 |
| Earnings risk | **2.1** | 2.1 |
| **Quality** | | |
| Operating margin | **32.2%** | 31.3% |
| Return on equity | **20.4** | 12.8 |
| **Sector Exposure** | | |
| Communication services | **3.3%** | 4.0% |
| Consumer discretionary | **9.3** | 11.2 |
| Consumer staples | **6.6** | 6.3 |
| Energy | **6.1** | 4.4 |
| Financials | **11.9** | 11.0 |
| Health care | **4.2** | 6.4 |
| Industrials | **20.1** | 21.1 |
| Information technology | **8.8** | 8.9 |
| Materials | **12.5** | 10.9 |
| Real estate | **11.2** | 12.0 |
| Utilities | **5.9** | 3.7 |
| **Country Exposure — Min/Max** | | |
| Min: Japan | **24.8%** | 27.3% |
| Max: Germany | **5.7%** | 4.2% |

# Portfolio Characteristics

June 30, 2022

| | AJO Vista Amplified Opportunities | MSCI ACWI IMI |
|---|---|---|
| **Number of securities** | **291** | 9,292 |
| **Number of countries** | **1** | 1 |
| **Top 10 holdings (%)** | **36.8%** | 13.7% |
| **Active share** | **57.5%** | |
| **Average market cap ($m)** | **$256,415** | $276,118 |
| **Median market cap ($m)** | **$10,402** | $1,956 |
| **Beta (1y, weekly)** | **1.07** | |
| **Tracking error (ITD, weekly)** | **20.2%** | |
| **Market Cap Distribution** | | |
| < $5 billion | **19.2%** | 10.7% |
| $5 – $25 billion | **25.0** | 20.8 |
| $25 – $100 billion | **24.9** | 28.7 |
| $100 – $250 million | **9.0** | 16.1 |
| > $250 billion | **21.9** | 23.7 |
| **Value** | | |
| Dividend yield | **2.2%** | 2.2% |
| Earnings yield | **9.8** | 6.8 |
| EBITDA/Enterprise value | **11.9** | 8.6 |
| Cash flow yield | **14.5** | 10.5 |
| **Growth** | | |
| Asset growth | **14.1%** | 12.4% |
| Earnings growth | **46.3** | 35.9 |
| **Momentum** | | |
| Average tr-12 stock return | **19.2%** | 0.1% |
| **Risk** | | |
| Average tr-12 stock volatility | **37.9%** | 32.6% |
| Leverage | **36.6** | 38.0 |
| Earnings risk | **2.1** | 1.6 |
| **Quality** | | |
| Operating margin | **31.3%** | 31.4% |
| Return on equity | **23.0** | 21.8 |
| **Sector Exposure** | | |
| Communication services | **6.2%** | 7.3% |
| Consumer discretionary | **8.6** | 11.2 |
| Consumer staples | **5.9** | 7.3 |
| Energy | **10.1** | 4.9 |
| Financials | **12.2** | 14.4 |
| Health care | **9.5** | 12.6 |
| Industrials | **10.8** | 10.4 |
| Information technology | **20.3** | 19.8 |
| Materials | **8.2** | 5.2 |
| Real estate | **5.5** | 3.6 |
| Utilities | **2.6** | 3.2 |

# Notes

AJO Vista, LLC is an independent, registered investment adviser, registered with the SEC on 8/13/21. AJO Vista was formed from the combination of AJO, LP, registered with the SEC from 1984 through 2021, and HighVista Systematic Strategies, a former subsidiary of HighVista Strategies registered since 2004. AJO Vista claims compliance with the Global Investment Performance Standards (GIPS®) and has presented and prepared this report in compliance with the GIPS standards. AJO Vista has not been independently verified. AJO Vista has engaged ACA Group to conduct an independent verification. Prior to 5/1/21, the AJO Vista Emerging Markets Small Cap record was associated with AJO, LP and had been independently verified by Ashland Partners for the period 1/1/13 through 6/30/16 and by ACA Performance Services for the period 7/1/16 through 4/30/21. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firmwide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards.

The verification and performance examination reports are available upon request.

All composites listed are calculated in US$, asset-weighted, and presented gross and net of investment management fees. All portfolios are fee-paying, fully discretionary accounts included from the first full month following completion of initial funding to the present or to the month prior to termination. The performance impact of flows are mitigated using a temporary new-account methodology. The quantitative investment process of AJO Vista's Emerging Markets Small Cap record is supported by proprietary computer code, third-party software, and ongoing data feeds from third-party data providers, and may not operate correctly in all market conditions. As with any data-driven model, errors may occur in coding, software, and/or data feeds.

Composite creation date is inception date. Returns use trade-date accounting and are time-weighted total returns including cash and equivalents and reinvestment of income for portfolios that reinvest. Annual composite dispersion reflects the high-low return spread among portfolios invested for the full year. Tracking error is the annualized standard deviation of monthly value-added relative to the benchmark. When rolling-three-year standard deviation is not presented, it is because the composite does not have a three-year history.

A portfolio's gross return considers transaction costs but not investment management fees and other expenses incurred in account management. Net returns reflect the deduction of actual investment management and performance-based fees, which are recorded on an accrual basis. For example, based on the Emerging Markets Small Cap investment strategy, with an 8-year track record as of 12/31/20, investment management fees would reduce cumulative returns from 93.5% to 88.1%, or 17.4% to 17.2% on an annualized basis. For certain periods, accruals for performance-based-fee accounts may cause net returns to be under- or overstated or to exceed gross returns. The fee schedule associated with the strategy through 12/31/20 was 0.70% on all assets. The updated fees are reflected below.

Benchmark returns are total returns per the benchmark source. Source for MSCI returns is MSCI. The MSCI Emerging Markets Small Cap index contains approximately 2000 constituents and covers approximately 15% of the free float-adjusted market capitalization in each of the 25 emerging market countries it currently represents. It is a net total return index that reinvests dividends after the deduction of withholding taxes, using a tax rate applicable to non-resident institutional investors who do not benefit from double-taxation treaties. MSCI makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This presentation is not approved, reviewed, or produced by MSCI.

AJO Vista employees have personal assets invested in the Emerging Markets Small Cap composite.

To receive a complete list and description of AJO Vista's composites and details regarding policies for valuing portfolios, the treatment of cash flows, calculating performance, and preparing compliant presentations, or for a copy of AJO Vista's verification and performance examination reports, please contact Nik Takmopoulos at 917.596.5219 or at info@ajovista.com.

**Returns represent past performance and are not indicative of future results.** Accompanying performance presentations are intended only for the recipient.

## Fees

Performance-based fees are available, and their structure is negotiable.

**AJO Vista Emerging Markets Small Cap**
**AJO Vista US Micro Cap**
**AJO Vista International Small Cap**
0.80% on all assets

**AJO Vista Amplified Opportunities**
Performance-based fees only
Total fee range of 0.0%–2.5%

## Composite History

| | | Annual Total Return (%) | | | Rolling 3-Year Standard Dev (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Composite / Inception / *Benchmark* | Year | AJO Vista | AJO Vista Net | Bench | AJO Vista Gross | Bench | Accounts (#) | Clients (#) | Assets ($mm) | Firm Assets ($mm) | Firm Assets (%) | Carve-Outs (%) |
| AJO Vista Emerging Markets Small Cap | 2021 | 29.0 | 27.9 | 18.8 | 20.8 | 22.2 | 2 | 2 | 135 | 967 | 14 | 0 |
| 12/31/12 | 2020 | 17.4 | 16.5 | 19.3 | 21.5 | 23.8 | 1 | 1 | 189 | — | — | 0 |
| *MSCI Emerging Markets Small Cap* | 2019 | 12.2 | 11.3 | 11.5 | 13.2 | 13.2 | 2 | 2 | 398 | — | — | 0 |
| | 2018 | (15.9) | (16.6) | (18.6) | 14.8 | 14.2 | 3 | 3 | 410 | — | — | 0 |
| | 2017 | 34.3 | 33.2 | 33.8 | 15.4 | 14.6 | 3 | 3 | 480 | — | — | 0 |
| | 2016 | 8.9 | 8.0 | 2.3 | 15.6 | 14.5 | 4 | 3 | 483 | — | — | 0 |
| | 2015 | (2.7) | (3.5) | (6.8) | 13.9 | 13.7 | 4 | 3 | 391 | — | — | 0 |
| | 2014 | 12.7 | 11.8 | 1.0 | — | — | 2 | 2 | 165 | — | — | 0 |
| | 2013 | 8.9 | 8.0 | 1.0 | — | — | 2 | 2 | 166 | — | — | 0 |
| AJO Vista US Micro Cap | 2021 | 29.1 | 28.1 | 19.3 | — | — | 1 | 1 | 9 | 967 | 1 | 100 |
| 9/11/19 | 2020 | 9.9 | 9.0 | 21.0 | — | — | 1 | 1 | 25 | — | — | 100 |
| *Russell Microcap* | 2019 | 11.0 | 10.8 | 11.0 | — | — | 1 | 1 | 23 | — | — | 100 |
| AJO Vista International Small Cap | 2021 | 16.1 | 15.2 | 11.1 | — | — | 1 | 1 | 10 | 967 | 1 | 100 |
| 6/1/20 | 2020 | 28.2 | 27.6 | 31.7 | — | — | 1 | 1 | 13 | — | — | 100 |
| *MSCI World ex USA Small Cap* | | | | | | | | | | | | |
| AJO Vista Amplified Opportunities | 2021 | 62.7 | 59.8 | 28.3 | — | — | 1 | 1 | 136 | 967 | 14 | 0 |
| 4/1/20 | 2020 | 142.6 | 139.3 | 62.6 | — | — | 1 | 1 | 150 | — | — | 0 |
| *MSCI ACWI IMI* | | | | | | | | | | | | |