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# The M6 Forecasting Competition: Bridging the gap between forecasting and investment decisions

# Top 5 Positions in Warren Buffett's Portfolio

By RICHARD BEST Updated August 05, 2023

Reviewed by MICHAEL J BOYLE

Fact checked by VIKKI VELASQUEZ

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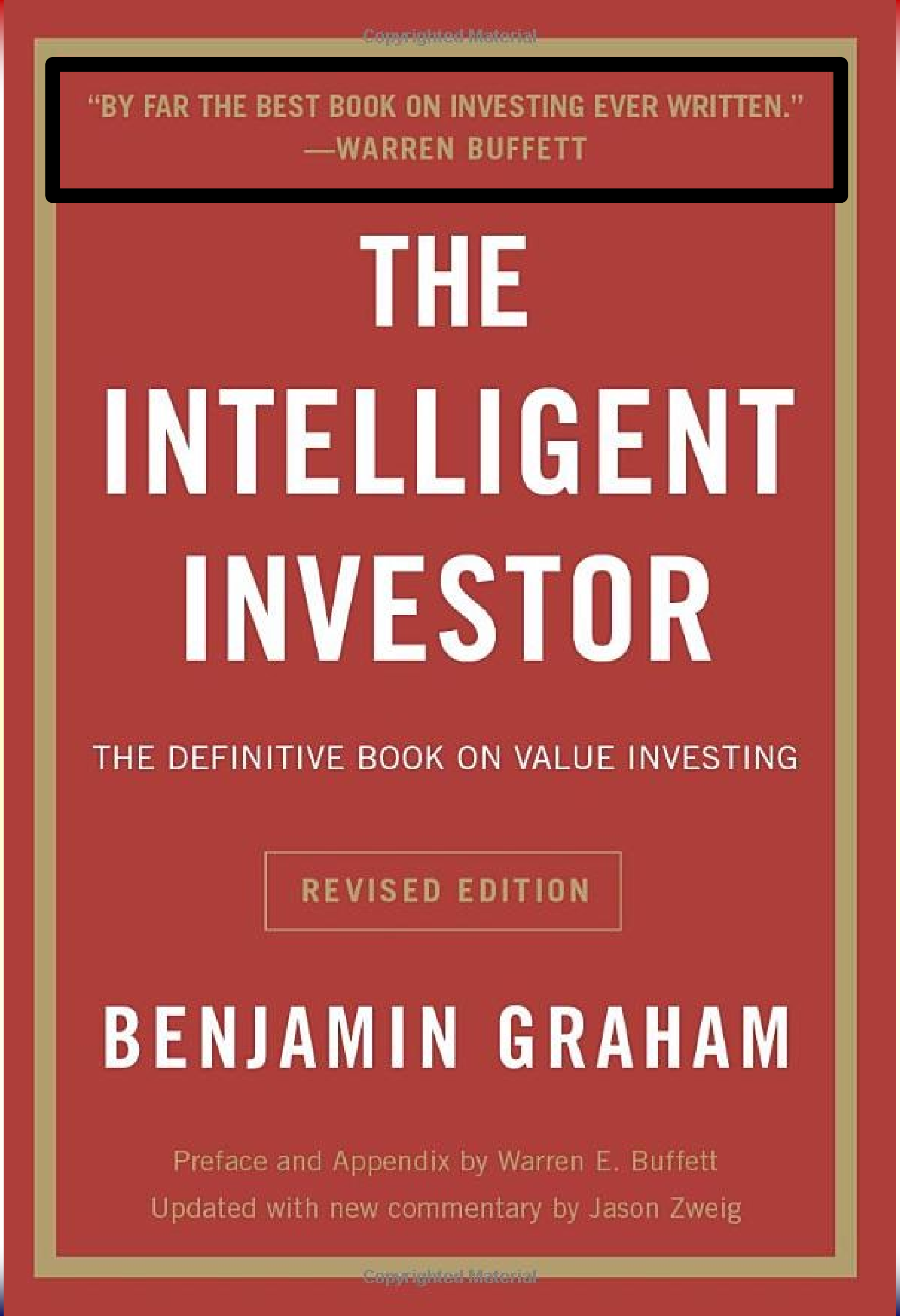
Warren Buffett is undeniably the most famous and influential investor in modern history, based on his extraordinary performance record. Not surprisingly, the investment portfolio of Berkshire Hathaway Inc. (BRK.A), the holding company employing the Oracle of Omaha as chairman and CEO, receives wide media attention and scrutiny, even though Buffett is no longer making every investment decision. [1] [2]

Despite his unparalleled success, Buffett's investment model has long been transparent, straightforward, and consistent. He invests in large, blue-chip companies with strong balance sheets and attractive valuations. Buffett often invests for the long term, but he's never been afraid to make significant new investments or drop longtime holdings.

KEY TAKEAWAYS

- Berkshire Hathaway's portfolio's five largest positions are in Apple Inc. (AAPL), Bank of America Corp (BAC), Chevron (CVX), The Coca-Cola Company (KO), and American Express Company (AXP).
- Apple is Berkshire's largest holding, accounting for 50% of its stock portfolio.
- The top 5 holdings account for about 78% of the portfolio. [3]

First edition published in 1949




Graham introduced the idea of value investing as an alternative to engaging in market speculation and focusing on short-term price fluctuations

# Advice of Warren Buffett to his wife trustee for investing her money

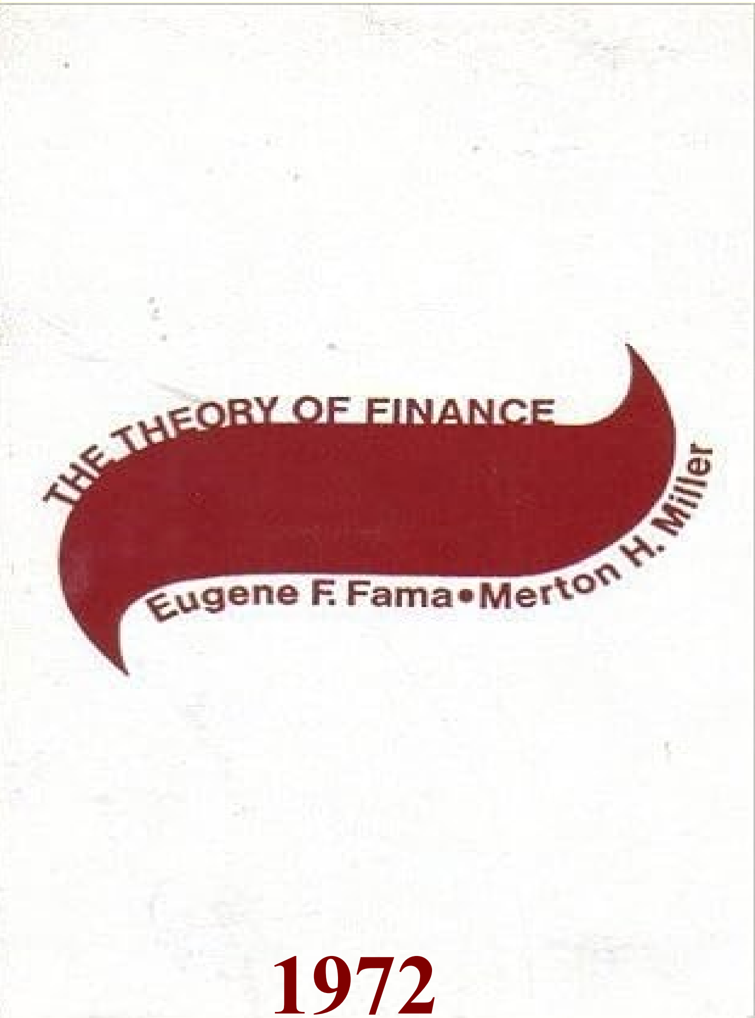
"What I advise here is essentially identical to certain instructions I've laid out in my will. One bequest provides that cash will be delivered to a trustee for my wife's benefit. . . . My advice to the trustee could not be more simple: **Put 10% of the cash in short-term government bonds and 90% in a very low-cost S&P 500 index fund. (I suggest Vanguard's.)** I believe the trust's long-term results from this policy will be **superior** to those attained by most investors . . ."

Efficient Capital Markets: A Review of Theory and Empirical Work

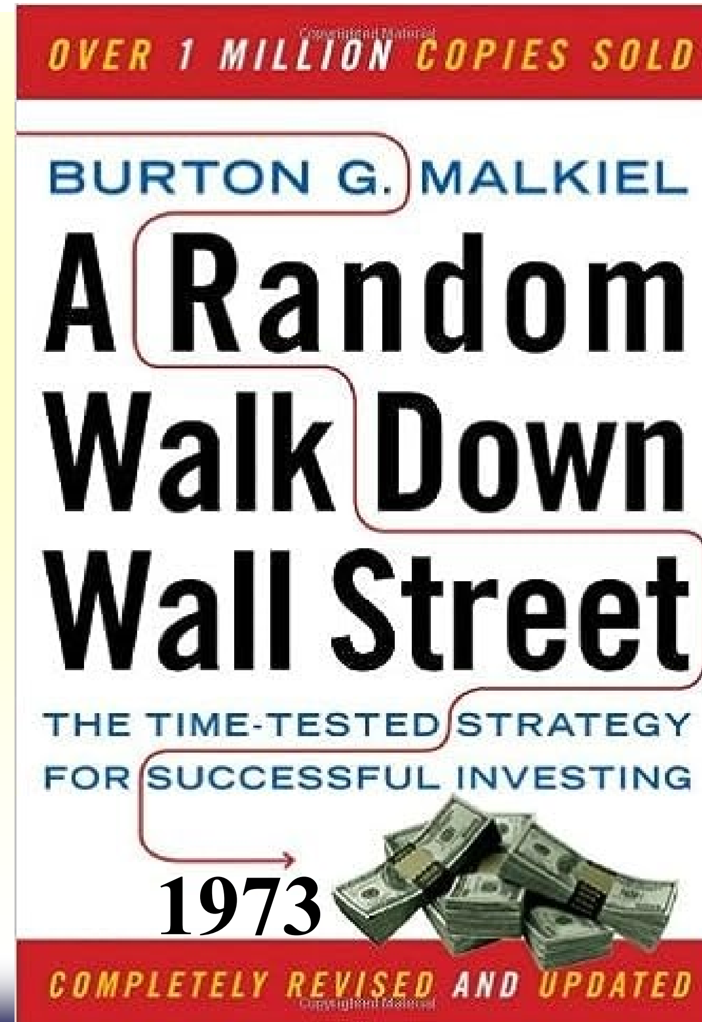
Author(s): Eugene F. Fama

Source: *The Journal of Finance*, May, 1970, Vol. 25, No. 2, Papers and Proceedings of the Twenty-Eighth Annual Meeting of the American Finance Association New York, N.Y. December, 28-30, 1969 (May, 1970), pp. 383-417

Published by: Wiley for the American Finance Association




1972




1973

# The Efficient Market Hypothesis (EMH)

- The EMH simply states that asset prices fully reflect all available information, making it impossible to consistently outperform the market through stock picking or market timing.
- Empirical evidence suggests that the success of active funds diminishes considerably in comparison to corresponding market averages as the time horizon of evaluation increases.

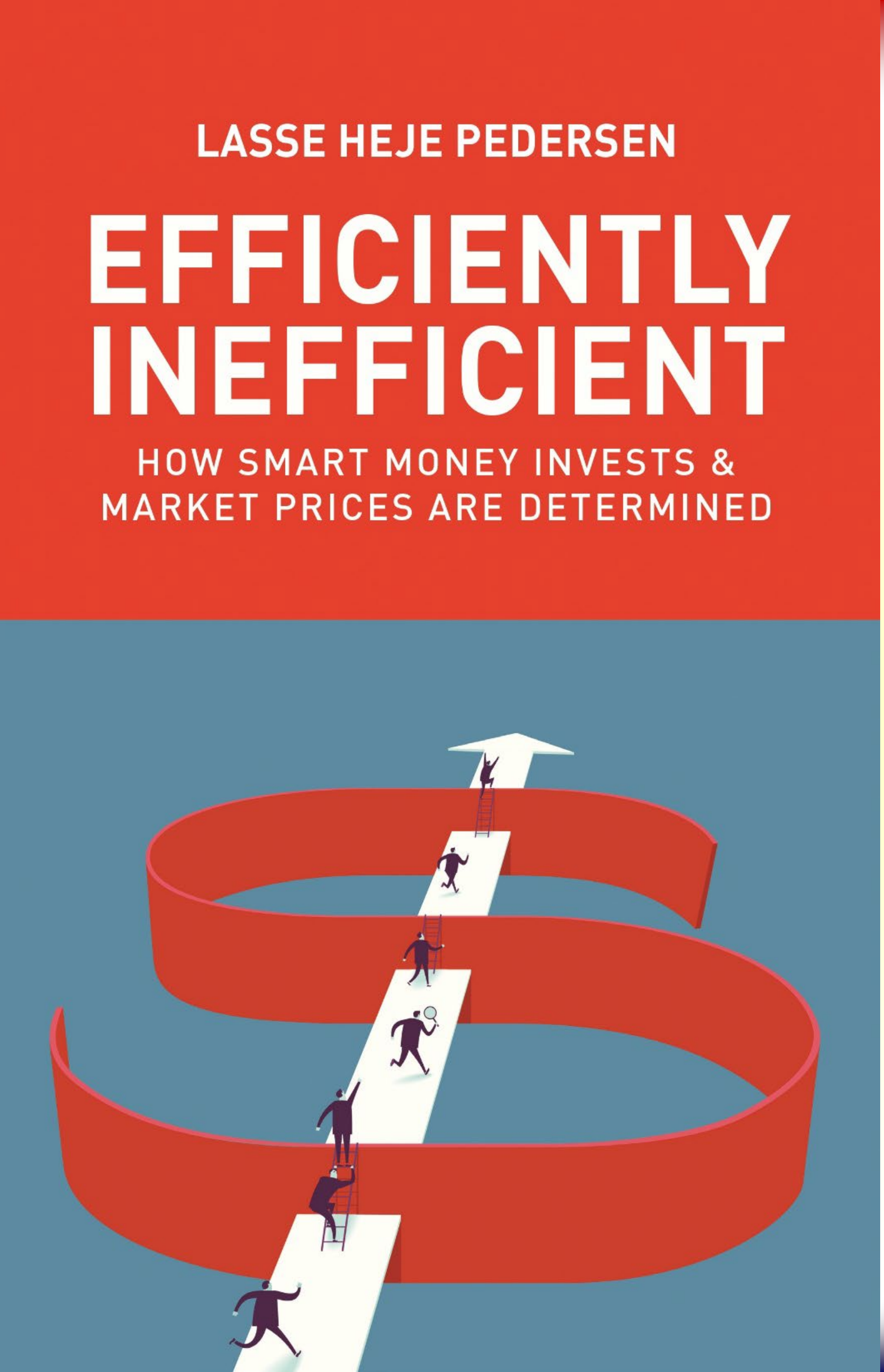
# Active Funds' Success Rate by Category (%)

| Category | 1-Year | 3-Year | 5-Year | 10-Year | 15-Year | 20-Year | 10-Year (Lowest Cost) * | 10-Year (Highest Cost) |
|---|---|---|---|---|---|---|---|---|
| U.S. Large Blend | 54.1 | 38.1 | 30.1 | 13.1 | 9.3 | 8.7 | 25.7 | 6.7 |
| U.S. Large Value | 47.2 | 41.5 | 30.9 | 11.4 | 10.9 | 19.5 | 20.3 | 3.3 |
| U.S. Large Growth | 37.5 | 23.4 | 21.6 | 7.0 | 3.0 | 4.7 | 15.3 | 1.1 |
| U.S. Mid Blend | 50.5 | 46.5 | 31.6 | 18.1 | 10.6 | 12.7 | 31.8 | 0.0 |
| U.S. Mid Value | 39.6 | 50.5 | 31.5 | 4.6 | 17.2 | — | 4.8 | 0.0 |
| U.S. Mid Growth | 46.5 | 47.7 | 60.1 | 39.8 | 23.3 | — | 47.7 | 25.0 |
| U.S. Small Blend | 52.9 | 52.6 | 34.7 | 27.2 | 23.5 | 19.8 | 47.2 | 21.1 |
| U.S. Small Value | 61.0 | 44.2 | 43.8 | 32.7 | 15.8 | 22.1 | 40.0 | 19.0 |
| U.S. Small Growth | 56.9 | 50.3 | 57.6 | 46.4 | 26.6 | — | 48.7 | 43.9 |
| Foreign Large Blend | 36.8 | 43.6 | 31.5 | 29.9 | 24.1 | 18.9 | 42.4 | 27.8 |
| Foreign Large Value | 29.4 | 46.6 | 14.6 | 17.2 | 17.9 | — | 26.3 | 0.0 |
| Foreign Small-Mid Blend | 44.0 | 37.5 | 36.4 | 41.7 | — | — | 60.0 | 33.3 |
| World Large-Blend | 56.0 | 31.8 | 22.1 | 22.8 | — | — | 16.7 | 16.7 |
| Diversified Emerging Markets | 23.4 | 32.9 | 26.2 | 32.7 | 38.4 | — | 55.2 | 35.5 |
| Europe Stock | 25.0 | 47.1 | 25.0 | 38.1 | 40.9 | 15.7 | 75.0 | 20.0 |
| U.S. Real Estate | 42.9 | 74.2 | 62.7 | 52.3 | 25.7 | 23.6 | 58.3 | 35.7 |
| Global Real Estate | 20.0 | 69.8 | 63.8 | 56.9 | — | — | 62.5 | 45.5 |
| Intermediate Core Bond | 37.9 | 57.1 | 38.7 | 35.8 | 23.0 | 16.1 | 60.0 | 19.4 |
| Corporate Bond | 22.6 | 32.1 | 25.0 | 53.5 | — | — | 50.0 | 44.4 |
| High-Yield Bond | 27.2 | 42.6 | 47.4 | 49.4 | — | — | 70.4 | 16.7 |

Source: Morningstar. Data and calculations as of Dec. 31, 2022. *Green/red shading indicates that active funds in this fee quintile had above/below-average success rates.

# The Efficient Market Hypothesis (EMH)

- The EMH simply states that asset prices fully reflect all available information, making it impossible to consistently outperform the market through stock picking or market timing.
- Empirical evidence suggests that the success of active funds diminishes considerably in comparison to corresponding market averages as the time horizon of evaluation increases.
- Yet there are a few investors and firms that seem to consistently outperform the market benchmarks, generating positive alphas, by stock picking or by exploiting a number of market inefficiencies.




# Key reasons leading to inefficiencies

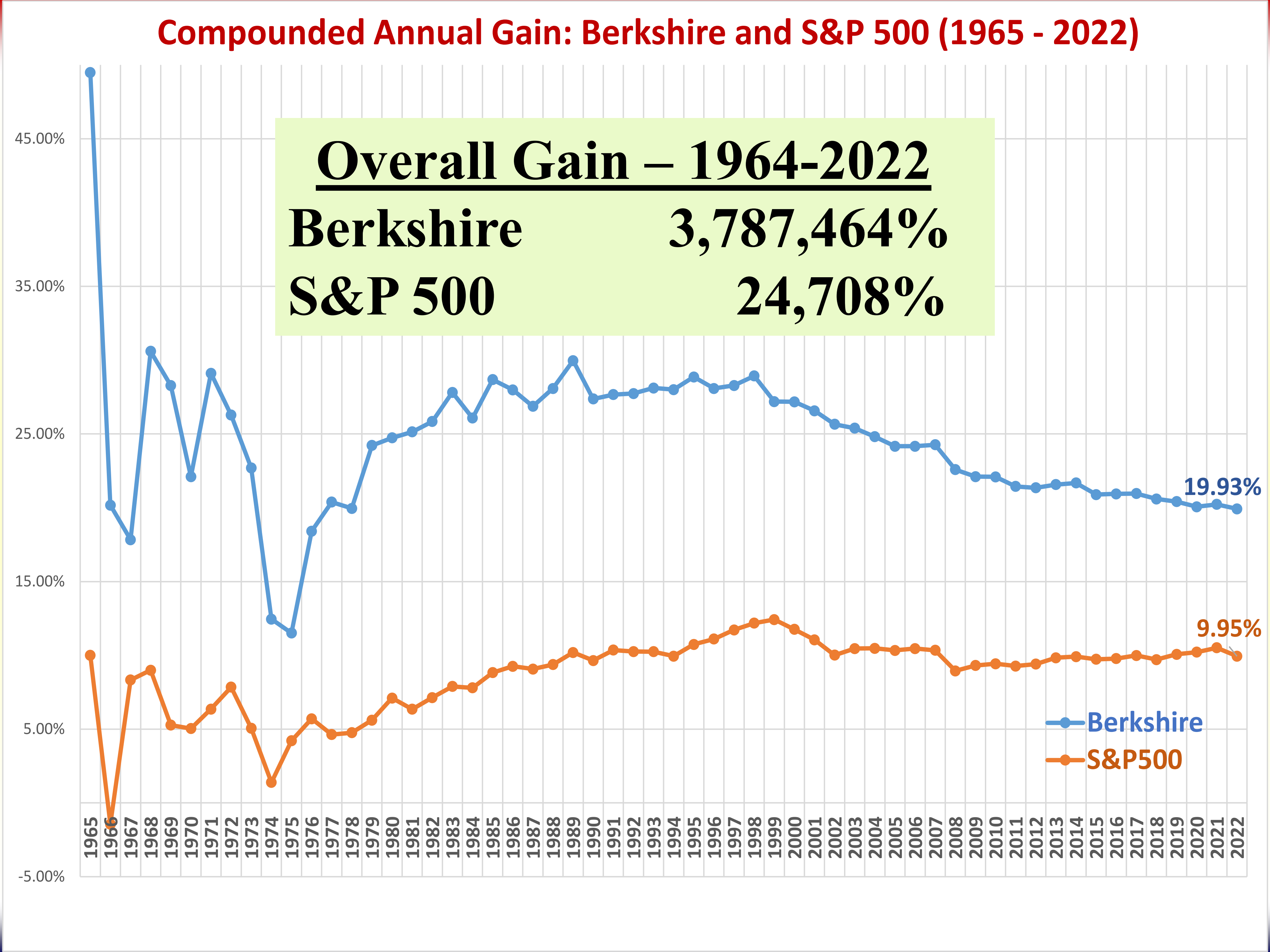
- Efficiently inefficient markets
- Investor heterogeneity
- Risk and returns
- Quantitative and behavioral strategies
- Complexity of market Dynamics
- Mispricing and market corrections
- Risks of active investing
- Interplay of information
- Behavioral finance insights

# The two major objectives of the M6 competition

- Investigate the Efficient Market Hypothesis (EMH)
- Explore the connection between forecasting accuracy and investment returns

# Warren Buffett the Oracle of Omaha

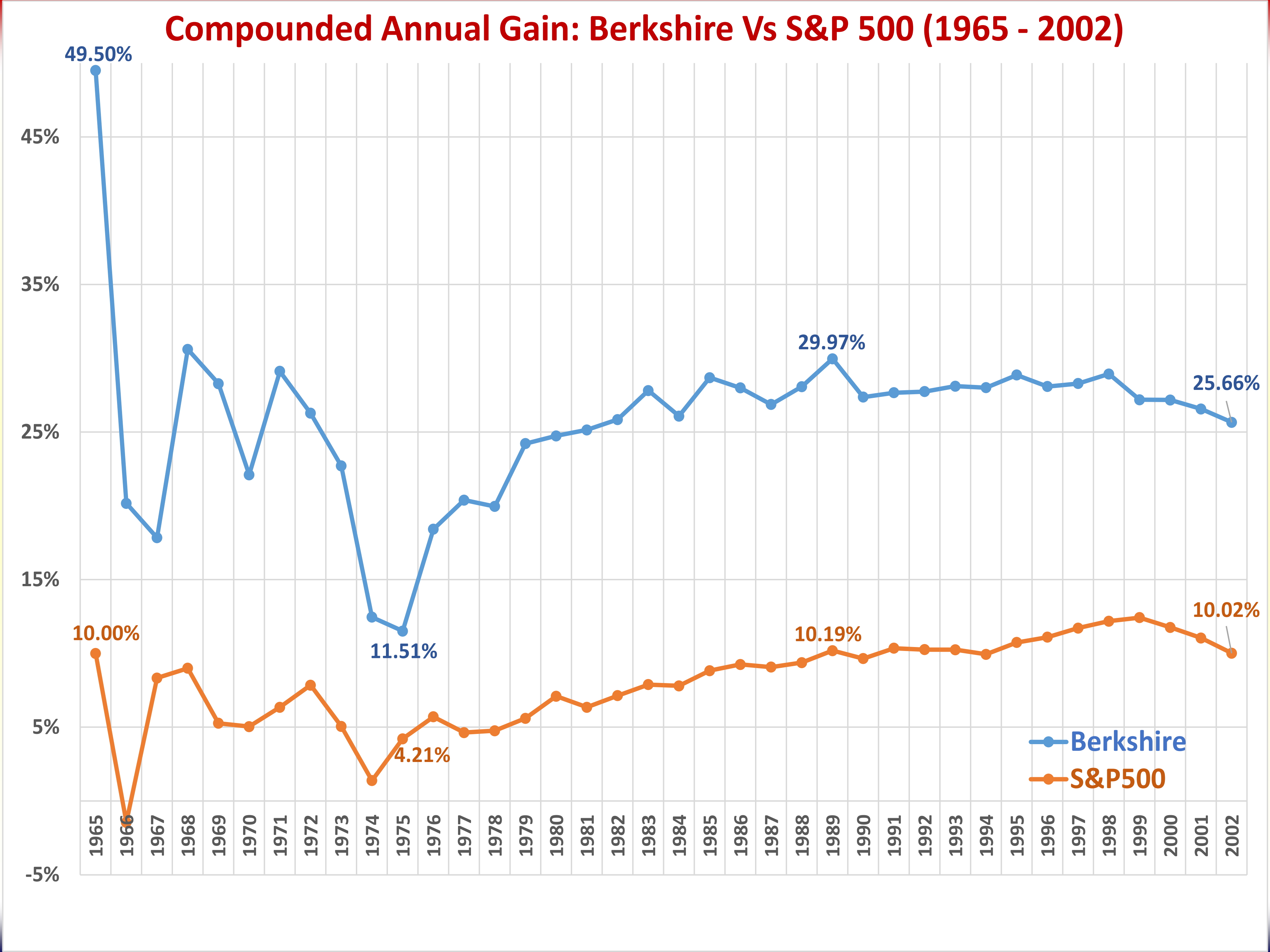
**Buffett combines Graham's value investing with his own insights and adaptations by selecting companies with strong fundamentals, durable competitive advantages and long-term growth prospects.**


Compounded Annual Gain: Berkshire and S&P 500 (1965 - 2022)
Overall Gain – 1964-2022
Berkshire 3,787,464%
S&P 500 24,708%
45.00%
35.00%
25.00%
15.00%
5.00%
-5.00%
19.93%
9.95%
Berkshire
S&P500
1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

# Buffett's Alpha

**Buffett’s returns appear to be neither luck nor magic, but, rather, reward for leveraging cheap, safe, quality stocks. Decomposing Berkshires’ portfolio into ownership in publicly traded stocks versus wholly-owned private companies, we find that the former performs the best, suggesting that Buffett’s returns are more due to stock selection than to his effect on management.**

Frazzini, Andrea and Kabiller, David and Pedersen, Lasse Heje, Buffett's Alpha (January 9, 2019). Financial Analysts Journal, 2018, 74 (4): 35-55, Available at SSRN: https://ssrn.com/abstract=3197185 or http://dx.doi.org/10.2139/ssrn.3197185



Compounded Annual Gain: Berkshire Vs S&P 500 (1965 - 2002)
49.50%
29.97%
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15%
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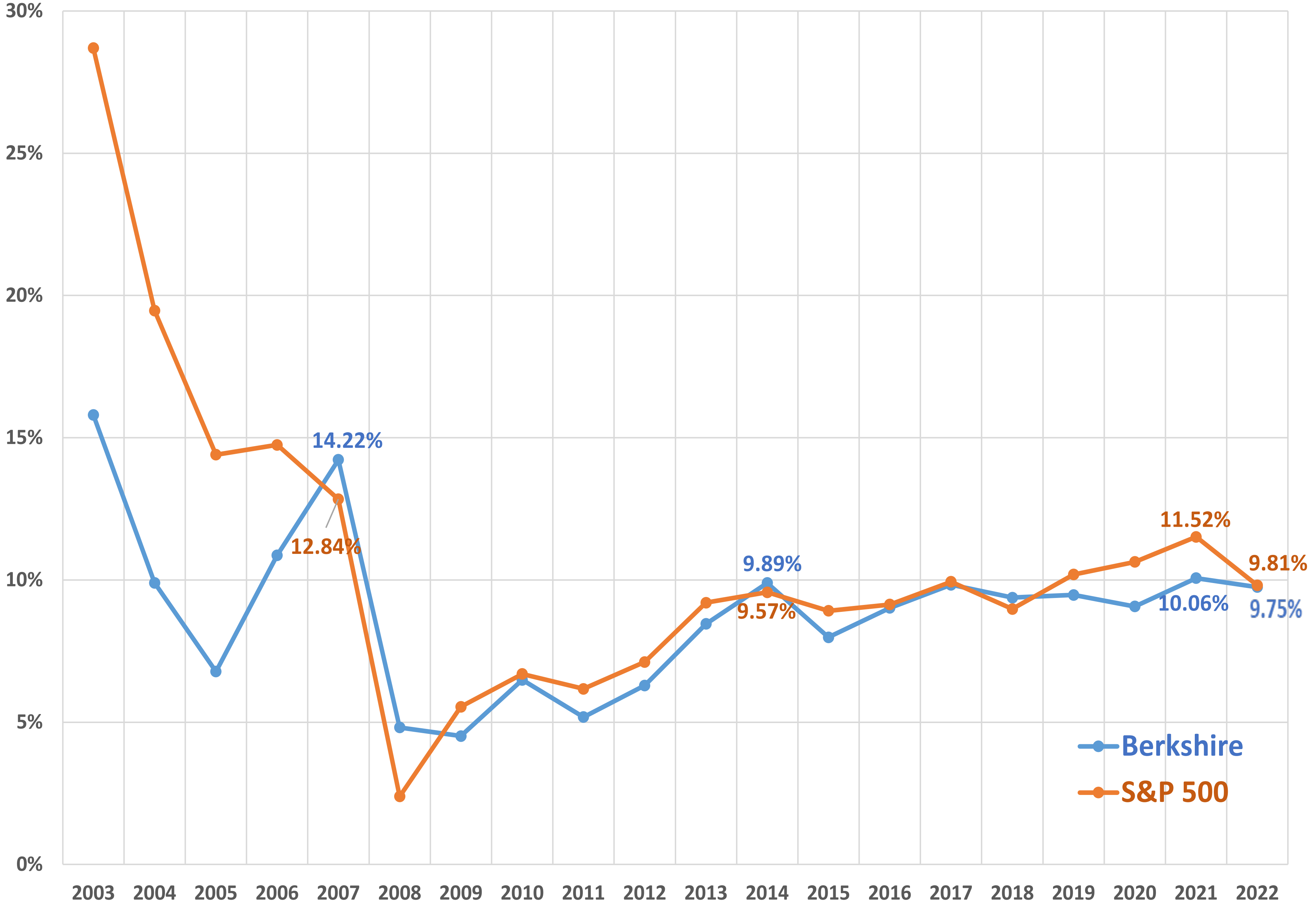
Berkshire
S&P500

# Compounded Annual Gain: Berkshire Vs S&P 500 (2003 - 2022)



# Charlie Munger says investing has grown 'much harder' and even wealth managers now have almost zero chance of outperforming the S&P 500 — but you may still have a shot if you follow his rules

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Bethan Moorcraft

Wed, October 25, 2023 at 3:00 PM GMT+3 · 5 min read

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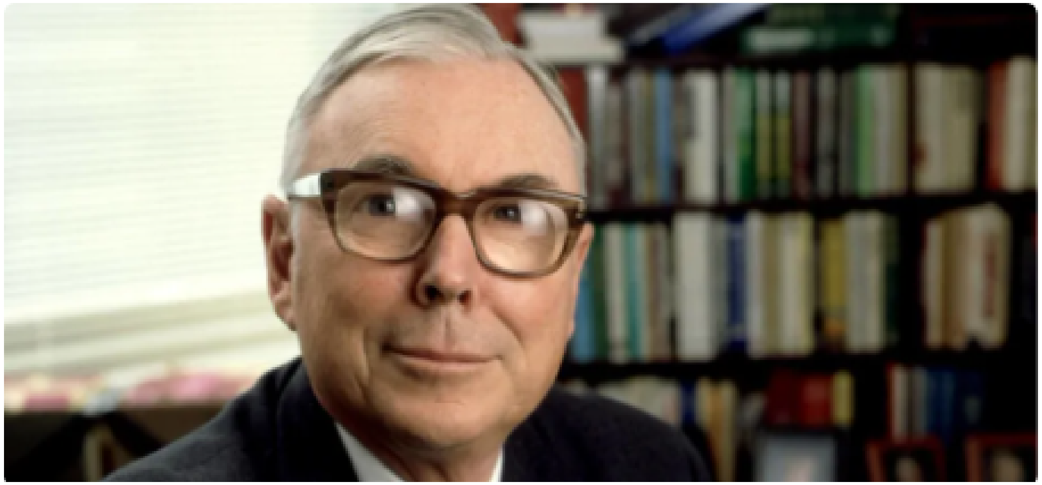


Quote Lookup

Recently Viewed ›

| Symbol | Last Price | Change | % Chang |
|---|---|---|---|
| ^GSPC S&P 500 | 4,186.77 | -80.91 | -1.43 |

## TRENDING

1. Explainer-Vietnam's real estate woes: how much worse can they get?
2. FOREX-Yen on intervention watch afte drop to one-year low, dollar strong
3. Stellantis Plugs China Hole With $1.1 Billion Leapmotor Deal
4. Stock market today: World shares slide after Wall St rout driven by high yields, mixed earnings

CORRECTED-UPDATE 1-Zambia

The 99-year-old reflected back on simpler days: "In my lifetime, a guy who just bought the best common stocks and sat on his a-- would have made about 10% per round before inflation, maybe 8% after inflation. That is not the standard return that someone can expect from an investment.

# M6: Major findings/insights

- The challenging task of forecasting the relative performance of assets

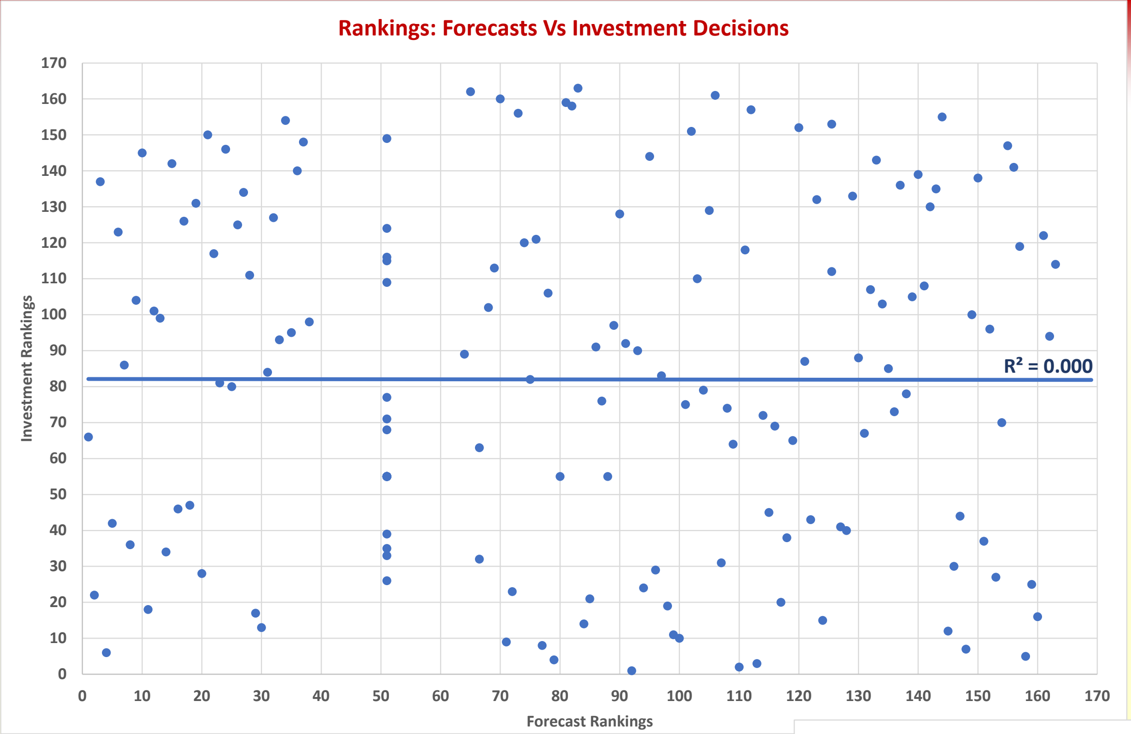
  ( Only 25% of participants beat the forecasting benchmark)

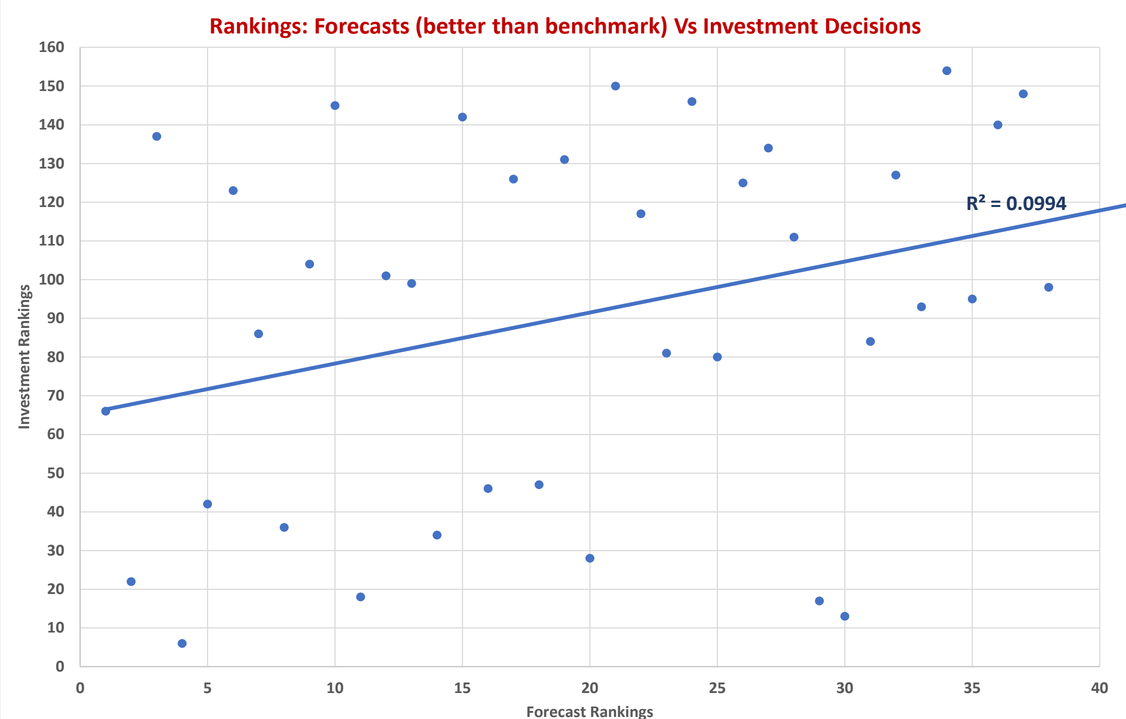
- The difficulty of consistently outperforming the market

  (Only 30% of participants beat the investment return benchmark. None of the teams achieved higher IR than the benchmark in all 12 months and just 4 beat the market in more than 8 months)

- The limited connection between the submitted forecasts and the investment decisions and the benefits of their association

  (Only 7% of participants beat both the forecasting and the investment return benchmarks)


Rankings: Forecasts Vs Investment Decisions
Investment Rankings
Forecast Rankings
R² = 0.000


Rankings: Forecasts (better than benchmark) Vs Investment Decisions
Investment Rankings
Forecast Rankings
R² = 0.0994

# M6: Major findings/insights (continue)

- **The value added by information exchange and the “wisdom” of crowds”**

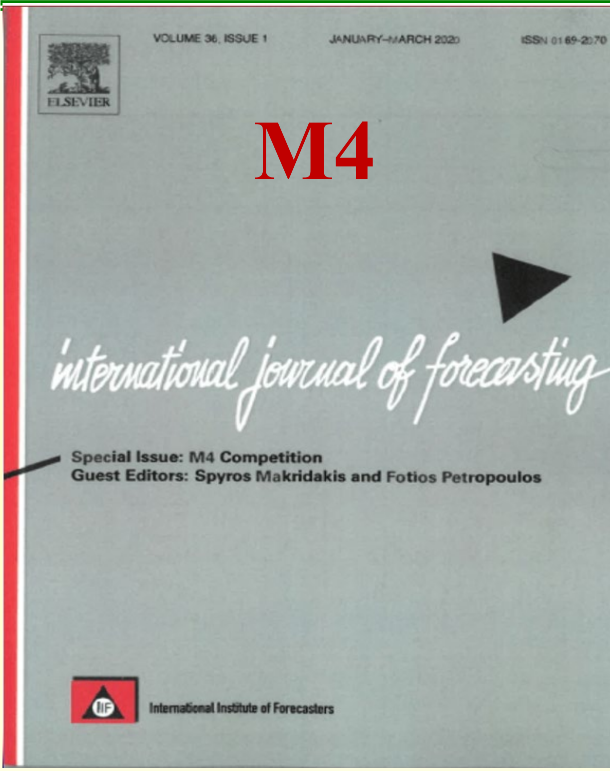
  **(Averaging the forecasts and/or the investment decisions of the top performing teams outperforms the forecasts made by the best performing participants)**

- **The positive effects of adapting to change**

  **(Teams that updated their submissions on a regular basis tended to perform better than those that did not.**

  **All five winners in the forecasting track and four of the five winners in the investment track updated their submission at every single round, while the same was  true for most of the duathlon winners)**

# Special issues of the IJF exclusively devoted to the M competitions





https://arxiv.org/abs/2310.13357

**The M6 forecasting competition: Bridging the gap between forecasting and investment decisions**

Spyros Makridakis, Evangelos Spiliotis, Ross Hollyman, Fotios Petropoulos, Norman Swanson, Anil Gaba

The M6 forecasting competition, the sixth in the Makridakis' competition sequence, is focused on financial forecasting. A key objective of the M6 competition was to contribute to the d
why market participants make investment decisions. To address these objectives, the M6 competition investigated forecasting accuracy and investment performance on a universe of
across multiple periods, a cross-sectional setting where participants predicted asset performance relative to that of other assets, and a direct evaluation of the utility of forecasts. In thi
the importance of forecasting when making investment decisions. Our findings highlight the challenges that participants faced when attempting to accurately forecast the relative perfo
outperform the market, the limited connection between submitted forecasts and investment decisions, the value added by information exchange and the "wisdom of crowds", and the
decisions