



IFA OCIO • RESEARCH REPORT

Index Fund Advisors

THE ACADEMIC PAPERS THAT CHANGED INVESTING

The Academic Foundation

The Evidence and Research Behind IFA OCIO's Advice



The information presented in this document is for informational purposes only and does not constitute personalized investment advice. All investments involve risks, including the loss of principal. The academic research referenced herein represents historical findings and may not guarantee future results. The use of the term 'evidence-based investing' reflects a methodology informed by academic research, most of it peer-reviewed, but does not imply certainty of success or predictive accuracy. Mention of Nobel laureates or researchers is not an endorsement of Index Fund Advisors, Inc. strategies. Readers should consult with a qualified financial professional before making any investment decisions.

Introduction

We take an academic, research-driven approach to investing at IFA OCIO (Outsourced Chief Investment Officer), a division of Index Fund Advisors, Inc. We utilize an evidence-based strategy that relies on research, most of it peer-reviewed, published in academic financial and economic journals. Using this research, we have created portfolios designed to seek an expected return appropriate to the level of risk taken.

The peer-review process is intended to subject academic articles to rigorous scrutiny by qualified members of the profession within the relevant field before publication. After publication, these articles are further scrutinized by the journal's professional readership. Further research in subsequent years may confirm, modify, or refute prior findings. However, such research undergoes the peer-review process and publication in academic journals. This process helps to ensure that the research reflects the prevailing state of knowledge at the time of publication. Peer review does not guarantee that a study's conclusions are correct, and not every item summarized here is a peer-reviewed journal article; items that are not (for example, the Kauffman Foundation report, [item 23](#), and the S&P Dow Jones Indices report, [item 24](#)) are labeled as such.

Trustees and investment committees are tasked with investing assets in the best interest of others. In our opinion, an evidence-based strategy is one approach that endowments, foundations, and other institutional investors may wish to consider. Whether it is appropriate for a particular portfolio depends on that portfolio's investment policy, objectives, and legal and regulatory requirements, and each investor should consult its own legal and investment advisors.

In contrast, any Wall Street firm can publish "research reports" making unsubstantiated claims (e.g., "Apple's share price will hit \$1,000 by the end of the year"). Such forecasting "research" may be authored and published in a matter of days, compared to academic research which often takes years to complete, be reviewed, and published. Such industry-related, proprietary "research" is generally not subject to the peer-review process or published in reputable, academic journals. Because it is written and published by firms with commercial interests, readers should weigh it with those interests in mind.

Here we briefly review but a few of the seminal research papers from which IFA has developed its investment philosophy. While the research presented in these papers spans nearly seven decades, and has been subsequently refined, these publications remain influential in academic finance. Several have resulted in Nobel prizes for their authors.

After this review, we will explain how IFA has used such research to shape its investment policy and create portfolios of index funds that aim to deliver an expected return appropriate to the level of risk taken. We will also discuss why, in our opinion, those responsible for investing institutional assets may benefit from incorporating this approach into their investment plans.



Watch the series: *The Academic Papers that Changed Investing*

Sixteen of the papers reviewed here are the subject of short IFA videos. Where a video exists, a QR code appears beside the paper. Scan with a phone camera, or visit ifa.com/the-papers-that-changed-investing.

What the studies found

IFA's preference for primarily index-based, factor-based or passive funds, and its caution about active management and about alternatives such as private equity and venture capital, rests on the research summarized in this report. In brief:

Prices adjust quickly, which makes beating the market difficult to expect. The efficient-market research (items 4, 5 and 6) found that prices react rapidly to new information and that price changes are hard to predict. That view has been challenged, including by behavioral finance (see [item 8](#)).

The arithmetic favors low cost. Sharpe's argument ([item 10](#)) is that, before costs, the average actively managed dollar earns the market return and, after costs, which are higher for active management, it earns less than the average passively managed dollar. The arithmetic describes averages; individual managers can outperform in a given period.

Few active funds show skill after costs. Of 2,076 actively managed U.S. equity funds, Barras, Scaillet and Wermers estimated that 75.4% had a true alpha of zero after costs, 24.0% a negative alpha, and 0.6% a positive alpha that they considered statistically indistinguishable from zero ([item 18](#)). Fama and French found that the net returns of actively managed funds as a group were no better than chance would produce ([item 19](#)).

Past winners rarely keep winning, and active trading has been costly. In both S&P Dow Jones Indices studies ([item 24](#)), the share of winning funds that kept winning, averaged across starting dates, fell with each year and was below the level expected from chance, with some exceptions noted there. Newsletter market timers showed no evidence of systematically moving before market rises or declines ([item 13](#)), and the most active 20% of individual investors earned 11.4% a year against 17.9% for the market ([item 15](#)).

"...past performance did not typically help identify superior performing managers in advance."

S&P Dow Jones Indices, *Fleeting Alpha: The Challenge of Consistent Outperformance* (February 2020)

"...the average outperformance persistence in each of the subsequent three years fell rapidly."

S&P Dow Jones Indices, *Fleeting Alpha Scorecard Year-End 2020*

Hiring and firing managers has not added value. Plan sponsors hired managers after large positive excess returns, but the managers' later excess returns were statistically indistinguishable from zero, and the managers they replaced did no better or worse by a statistically meaningful margin ([item 16](#)). Plan-sponsor allocation changes added value over the next five years in only two of eighteen years ([item 17](#)).

"...this return chasing behavior does not deliver positive excess returns thereafter."

Amit Goyal and Sunil Wahal, *Journal of Finance* (2008)

Alternatives did not clearly reward the investors studied. Kaplan and Schoar found that, on average, private equity fund returns net of fees approximately equaled those of a large-company U.S. stock index from 1980 to 1997, and noted limitations in their conclusions ([item 22](#)). The Kauffman Foundation reported that, in its own venture capital portfolio through 2011, 50 of 99 funds had a net multiple below 1x and 25 of 96 funds beat a small-company U.S. stock index by about 3 percentage points a year or more ([item 23](#)). These are results for particular periods and, in the second case, for one investor.

Allocation and factor exposure matter more. Brinson, Hood and Beebower found that asset allocation accounted for approximately 94% of the variation in returns among 91 large pension plans ([item 9](#)). The factor research (items 11, 12, 14, 20 and 21) describes market, size, value and profitability premiums that IFA considers when building portfolios; each premium has been negative for extended periods.

In IFA's opinion, these findings support a preference for primarily index-based, factor-based or passive funds over active management and alternatives. They describe averages and specific periods; some managers and funds did outperform, and past performance does not guarantee future results.

Nearly seven decades of evidence

Twenty-four papers, in the order they were published. A video is marked “Yes” where IFA has one.

Year	Paper	Authors	Video	Page
1952	Portfolio Selection	Markowitz	Yes	5
1960	The Case for an Unmanaged Investment Company	Renshaw & Feldstein	Yes	6
1964	Capital Asset Prices (CAPM)	Sharpe	Yes	7
1965	The Behavior of Stock Market Prices	Fama	Yes	8
1965	Proof That Properly Anticipated Prices Fluctuate Randomly	Samuelson	Yes	8
1969	The Adjustment of Stock Prices to New Information	Fama, Fisher, Jensen & Roll	Yes	8
1976	Stocks, Bonds, Bills, and Inflation	Ibbotson & Sinquefeld	Yes	9
1979	Prospect Theory	Kahneman & Tversky	Yes	9
1986	Determinants of Portfolio Performance	Brinson, Hood & Beebower	Yes	10
1991	The Arithmetic of Active Management	Sharpe	Yes	10
1992	The Cross-Section of Expected Stock Returns	Fama & French	Yes	11
1993–95	Common Risk Factors · Size and Book-to-Market Factors	Fama & French		11
1996	Market Timing Ability in Investment Newsletters	Graham & Harvey	Yes	13
1998	Value Versus Growth: The International Evidence	Fama & French	Yes	13
2000	Trading Is Hazardous to Your Wealth	Barber & Odean	Yes	14
2005	Private Equity Performance	Kaplan & Schoar		18
2008	The Selection and Termination of Investment Managers	Goyal & Wahal	Yes	14
2009	Absence of Value	Stewart, Neumann, Knittel & Heisler		15
2010	False Discoveries in Mutual Fund Performance	Barras, Scaillet & Wermers	Yes	17

Year	Paper	Authors	Video	Page
2010	Luck Versus Skill in the Cross-Section of Mutual Fund Returns	Fama & French		5
2012	We Have Met the Enemy... and He Is Us	Mulcahy, Weeks & Bradley		5
2013	The Other Side of Value: The Gross Profitability Premium	Novy-Marx		5
2019	The Profitability and Investment Premium	Wahal		5
2020	Fleeting Alpha: The Challenge of Consistent Outperformance	Liu, Cairns & Sinha (S&P DJI)		5

The research behind the advice

1 1952 · NOBEL PRIZE TO AUTHOR, 1990 Portfolio Selection



Scan to watch

Harry Markowitz · *Journal of Finance*

This paper by Nobel laureate Harry Markowitz introduced the now widely accepted notion that when constructing a portfolio, it is not sufficient to focus on returns alone — risk must also be considered as well. Specifically, once we have available historical data, assumptions can be made about expected returns, variances, and correlations of different securities (or asset classes). Using these assumptions, a portfolio can be constructed to optimize expected return for a given level of risk, or minimize risk for a given level of required return. The set of portfolios that meets these criteria is known as “the efficient frontier.” As an aside, Markowitz was a former academic consultant to IFA. Markowitz has highlighted the importance of investors considering the insights of academics as a complement to, or in contrast with, those of Wall Street professionals.

ifa.com/harry-markowitz

Read the paper: doi.org/10.1111/j.1540-6261.1952.tb01525.x

Video: youtu.be/2s_3EHmgpCs

Markowitz in practice

The chart on the following page plots the hypothetical back-tested annualized return and risk (standard deviation) of each IFA Index Portfolio and IFA Index. The curve traced by the portfolios, from Index Portfolio 5 to Index Portfolio 100, is consistent with Markowitz’s insight: over the period shown, each step up in hypothetical back-tested return came with additional risk. Hypothetical results have inherent limitations and are not actual client performance.

2 1960

The Case for an Unmanaged Investment Company

Edward F. Renshaw and Paul J. Feldstein · *Financial Analysts Journal*



Scan to watch

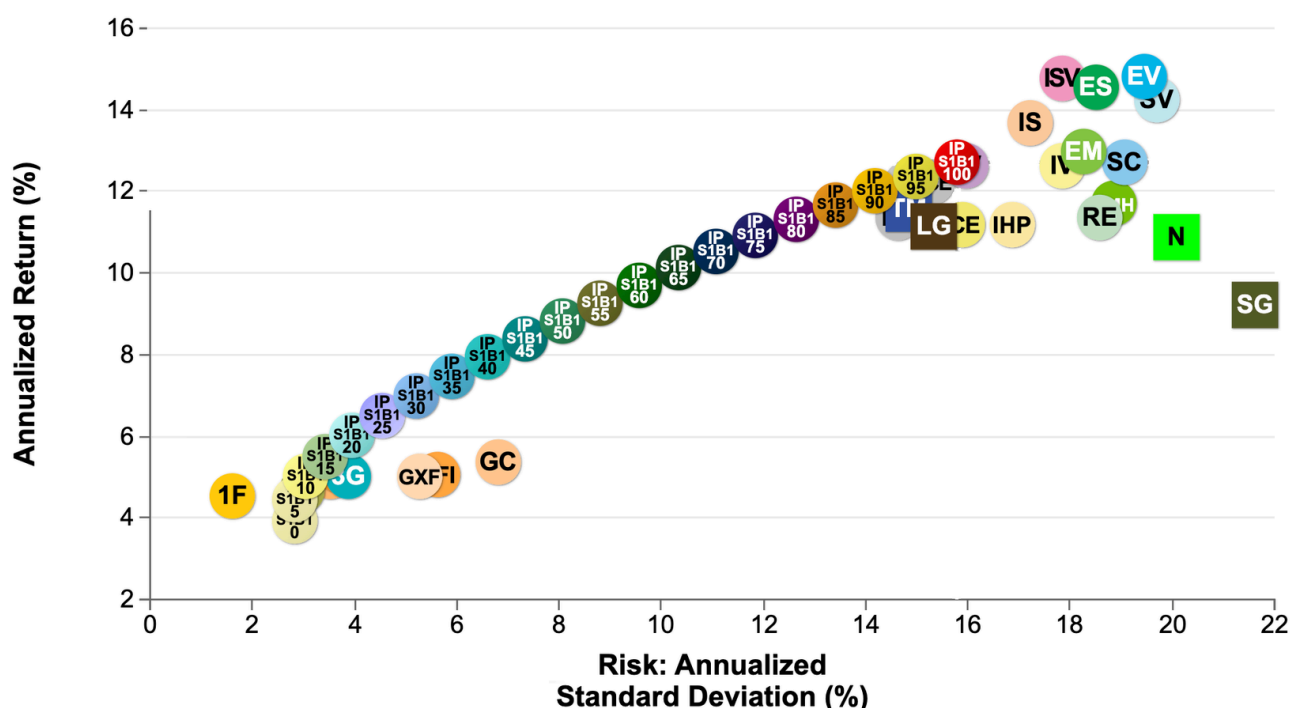
More than a decade before the first index fund was launched, the authors proposed an “unmanaged investment company” that would simply hold the stocks in a broad market average, such as the Dow Jones Industrial Average (a price-weighted average of 30 large U.S. companies; indexes are unmanaged and cannot be invested in directly), rather than pay a manager to select securities. Reviewing the record of managed funds against the market averages, they argued that many investors would be better served by a low-cost fund that owned the market. The proposal was largely dismissed at the time. It is widely recognized as an early intellectual foundation of index investing.

Read the paper: rpc.cfainstitute.org/.../1995/the-case-for-an-unmanaged-investment-company

Video: youtu.be/7f3e9QOet8s

Risk and return of IFA Index Portfolios and IFA Indexes

Hypothetical back-tested data · 75 years, 8 months (1/1/1951–8/31/2026) · Source: IFA, ifabt.com



IMPORTANT — HYPOTHETICAL BACK-TESTED RESULTS. These results are not based on an actual portfolio and are not actual client performance. They have inherent limitations: they were calculated with the benefit of hindsight, do not reflect how IFA might have reacted to economic or market events when managing client investments, and could be materially different from IFA's actual results over the same period if IFA manages client accounts in the same strategy. IFA Index Portfolios are shown net of IFA's 0.9% maximum advisory fee; IFA Indexes shown individually do not deduct IFA's advisory fee. Investing involves the potential for loss as well as profit. Past performance does not guarantee future results.



Explore this chart interactively. For the detailed interactive version of this chart, with button definitions and options to explore different time periods, scan the QR code or visit <https://www.ifa.com/charts/35h>. Some views in the interactive version do not deduct IFA's advisory fee; IFA Index Portfolios cannot be invested in without incurring an advisory fee.

This scatterplot is a type of chart that shows the relationship between historical return and risk as measured by standard deviation. Returns of less than 12 months are shown as total return. Indexes shown as squares are provided for informational purposes only and are excluded from IFA Index Portfolios. IFA/NSDQ Index is shown net dividend. For HYPOTHETICAL back-tested performance data shown in this chart, including sources, updates, and important disclosures, see ifabt.com. IFA Index Portfolios are labeled with numbers that refer to the percentage of stock indexes in the asset allocation, as opposed to the allocation of bond indexes. For example, IFA Index Portfolio 90 is 90% IFA stock indexes and 10% IFA bond indexes. IFA Indexes are labeled with letters to designate the index name and are defined at indexdescriptions.com. HYPOTHETICAL back-tested performance of IFA Index Portfolios assumes annual rebalancing of the indexes to the original allocation. The HYPOTHETICAL back-tested performance of the IFA Indexes and IFA Index Portfolios was achieved with the benefit of hindsight; it does not represent actual investment strategies for the entire period; and it does not reflect the impact that economic and market factors may have had on the advisor's decision-making if the advisor were

actually managing client money during the period shown. The performance of index portfolios does reflect the deduction of a 0.9% annual investment advisory fee, which is the maximum advisory fee charged by IFA, and the deduction of mutual fund fees associated with the management of an actual portfolio over the entire period. Unless indicated otherwise, the performance of the IFA Indexes when shown individually, does reflect the deduction of mutual fund fees, includes reinvestment of dividends and capital gains but does not include the deduction of IFA advisory fees, transaction costs or taxes, which if included, would lower performance. The IFA Indexes and IFA Index Portfolios were created by IFA in 2000. Please note that IFA Index Portfolios cannot be invested in without incurring an advisory fee. Past performance does not guarantee future results. Performance figures may contain both live and HYPOTHETICAL back-tested data. All data, including performance data, is provided for illustrative purposes only, it does not represent actual performance of any client portfolio or account and it should not be interpreted as an indication of such performance. IFA utilizes "standard deviation" as a quantification of risk, see the definition in the IFA glossary. - © 2026 Index Fund Advisors, Inc. (IFA.com)

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1964 • NOBEL PRIZE TO AUTHOR, 1990

Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk

William Sharpe • Journal of Finance



Scan to watch

This paper by Nobel laureate William Sharpe builds on Harry Markowitz's "Portfolio Selection." Instead of focusing on selecting an optimal portfolio of individual equities from the thousands of securities in the market, Sharpe demonstrated that investors may achieve efficiency by holding the entire market (that is, all equities offered) as the risky portion of their allocation. If markets are efficient and investors operate without constraints, the market portfolio, weighted by market capitalization, is considered to be one of the most efficient portfolios available under these conditions. This approach forms the basis of the model known as the Capital Asset Pricing Model (CAPM).

Read the paper: [jstor.org/stable/2977928](https://www.jstor.org/stable/2977928)

Video: youtu.be/MwoOAJcSkMI

4**1965 · NOBEL PRIZE TO AUTHOR, 2013**

The Behavior of Stock Market Prices

Eugene Fama · Journal of Business

Scan to watch

This seminal paper introduced the Efficient Market Hypothesis (EMH), which later earned Fama a Nobel Prize. EMH asserts that security prices incorporate all readily available information, making it difficult for investors to consistently achieve returns in excess of market average returns on a risk-adjusted basis. While EMH cannot be definitively proven, it remains a widely studied concept in academia, although it has been challenged by researchers, including those in behavioral finance (see [item 08](#)).

Read the paper: doi.org/10.1086/294743Video: youtu.be/GTRdm37I_ol

5**1965 · NOBEL PRIZE TO AUTHOR, 1970**

Proof That Properly Anticipated Prices Fluctuate Randomly

Paul A. Samuelson · Industrial Management Review

Scan to watch

Samuelson, the first American to receive the Nobel Prize in economics, supplied the mathematical foundation for market efficiency. He showed that if prices properly incorporate all available information and expectations, subsequent price changes must be unpredictable. The apparently random movement of stock prices is therefore not a sign of irrationality; it is the expected result of a competitive market in which informed participants act on what they know. The paper gave theoretical footing to the empirical work of Fama and others, and Samuelson himself became an early advocate of index investing (Samuelson, “Challenge to Judgment,” *Journal of Portfolio Management*, 1974).

Paper record (library access): proquest.com/docview/1302995663Video: youtu.be/GlQlbtQDPc

6**1969**

The Adjustment of Stock Prices to New Information

Eugene Fama, Lawrence Fisher, Michael Jensen and Richard Roll · International Economic Review

Scan to watch

This paper introduced the event study, a method now standard across empirical finance. Examining 940 stock splits on the New York Stock Exchange between 1927 and 1959, the authors found that prices adjusted to the information implied by a split quickly and without a lasting drift afterward. Their finding, that the market incorporates new information rapidly, provided some of the first direct empirical support for the Efficient Market Hypothesis.

Read the paper: doi.org/10.2307/2525569Video: youtu.be/gYBf1MxLGU

7

1976



Scan to watch

Stocks, Bonds, Bills, and Inflation: Year-by-Year Historical Returns (1926–1974)

Roger G. Ibbotson and Rex A. Sinquefeld · *Journal of Business*

The authors assembled a consistent, year-by-year record of returns for U.S. large-company stocks, small-company stocks, long-term corporate and government bonds, Treasury bills, and inflation, beginning in 1926. The series documented the long-run premium that stocks had earned over bills and bonds, and the additional premium earned by small-company stocks. Updated annually since, it became a standard historical reference for estimating expected returns and risk, and it is a cornerstone of the long-term historical data used throughout this document. Historical returns do not guarantee future results.

Read the paper (reprint): doi.org/10.1093/oso/9780195148145.003.0003

Video: youtu.be/YuEW_GlaCLc

8

1979 · NOBEL PRIZE TO KAHNEMAN, 2002



Scan to watch

Prospect Theory: An Analysis of Decision Under Risk

Daniel Kahneman and Amos Tversky · *Econometrica*

This paper established the field of behavioral economics and finance, earning Kahneman a Nobel Prize (Tversky was deceased by that time). It proposed that human beings are not the “super-rational utility maximizers” assumed under models like the EMH and CAPM. When faced with probabilities of different outcomes, people often make decisions inconsistent with purely mathematical analysis. Rather, they take extraordinary measures to avoid or limit losses, which reduce their ability to achieve gains – a tendency referred to as loss aversion or regret avoidance.

Some practitioners may claim that behavioral finance disproves the EMH, and that all sub-optimal behavior creates exploitable opportunities for gain. However, the EMH does not assume that the information investors act on is reliable or accurate, nor does it require investors to be rational in all actions. Instead, it asserts that investors collectively act on all the information that is available; and that individual investors (rational or not) should not be expected to consistently outperform the market. Andrew Lo (of Massachusetts Institute of Technology) has synthesized the two ideas in his adaptive market hypothesis.

Read the paper: bit.ly/44olhrs

Video: youtu.be/a-bBO_5AYjU

9

1986

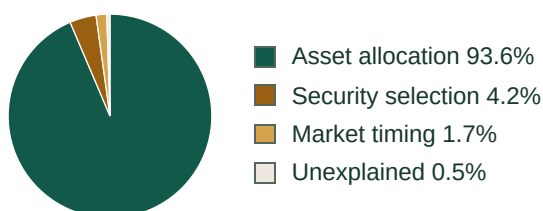
Determinants of Portfolio Performance



Scan to watch

Gary P. Brinson, L. Randolph Hood and Gilbert L. Beebower · *Financial Analysts Journal*

These authors asked a simple question: What factors explain the returns of managed portfolios, such as pensions and endowments? The possibilities they examined were security selection (stock-picking and bond-picking), market-timing, and asset allocation. By analyzing returns data for 91 large pension plans over a ten-year period, they concluded that asset allocation alone accounted for approximately 94% of the variation in returns (not to be confused with the absolute value or total return) of any particular fund. Roger Ibbotson and Paul Kaplan later expanded on this research, finding that asset allocation policy explained roughly 40% of the differences in returns among funds, while on average, 100% of the level of returns gross of fees across funds could be attributed to asset allocation policy.



Source: Brinson, Hood and Beebower, *Financial Analysts Journal* (1986). Share of variation in quarterly total returns of 91 large U.S. pension plans, 1974–1983. Ibbotson and Kaplan, “Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance?” *Financial Analysts Journal*, vol. 56, no. 1 (2000).

Read the paper: bit.ly/3E6Vn0y

Ibbotson and Kaplan (2000): rpc.cfainstitute.org/.../2000/does-asset-allocation-policy-explain-40-90-or-100-percent-of-performance

Video: youtu.be/SzECm9l1BEc

10

1991 · NOBEL PRIZE TO AUTHOR, 1990

The Arithmetic of Active Management



Scan to watch

William F. Sharpe · *Financial Analysts Journal*

In a brief article, Sharpe reduced the active-versus-passive debate to arithmetic. Because the market return is the asset-weighted average of all investors' returns, and passive investors by definition earn the market return, the average actively managed dollar must also earn the market return before costs. After costs, which are higher for active management, the average actively managed dollar must earn less than the average passively managed dollar. Sharpe argued that the arithmetic applies across markets and periods, and that it does not depend on markets being efficient. Individual active managers may still outperform in a given period; the arithmetic concerns the average.

Read the paper: web.stanford.edu/~wfs Sharpe/art/active/active.htm

Video: youtu.be/sPYqPi81ydk

11

1992

The Cross-Section of Expected Stock Returns



Scan to watch

Eugene Fama and Kenneth French · *Journal of Finance*

Testing the CAPM against decades of U.S. stock returns, Fama and French found that market beta alone did not explain differences in average returns across stocks. Two other characteristics did: company size, measured by market capitalization, and relative price, measured by the ratio of book value to market value. Small companies and “value” companies (high book-to-market) had earned higher average returns than large companies and “growth” companies. The paper set the stage for the multi-factor models that followed, summarized on the next page.

Read the paper: bit.ly/3k0lfRE

Video: youtu.be/AzXkqgSvVL0

12

1993 · 1995

Common Risk Factors in the Returns on Stocks and Bonds · Size and Book-to-Market Factors in Earnings and Returns

Eugene Fama and Kenneth French · *Journal of Financial Economics* (1993); *Journal of Finance* (1995)

This series of papers from Fama (University of Chicago) and French (Dartmouth College) introduced the 3-Factor Model for equity portfolios (market, size, and value factors), and the 5-Factor Model for balanced portfolios combining equities and bonds (the three equity factors plus two bond factors). In 2015, Fama and French extended the equity model with profitability and investment factors (“A Five-Factor Asset Pricing Model,” *Journal of Financial Economics*, 2015). That five-factor equity model holds that the expected return of a broadly diversified stock portfolio in excess of a risk-free rate is influenced by that portfolio’s sensitivity or exposure to five common risk factors:

1. a market factor, measured by the excess return of a broad equity market portfolio relative to a risk-free rate;
2. a size factor, measured by the difference between the returns of a portfolio of small-cap stocks and the returns of a portfolio of large-cap stocks;
3. a value factor, measured by the difference between the returns of a portfolio of high book-to-market (value) stocks and the returns of a portfolio of low book-to-market (growth) stocks;
4. a profitability factor, measured by the difference between the relative performance of high profitability stocks and the relative performance of low profitability stocks; and
5. an investment premium factor, measured by the difference between returns of a portfolio of low investment small cap stocks and the returns of a portfolio of high investment small cap stocks.

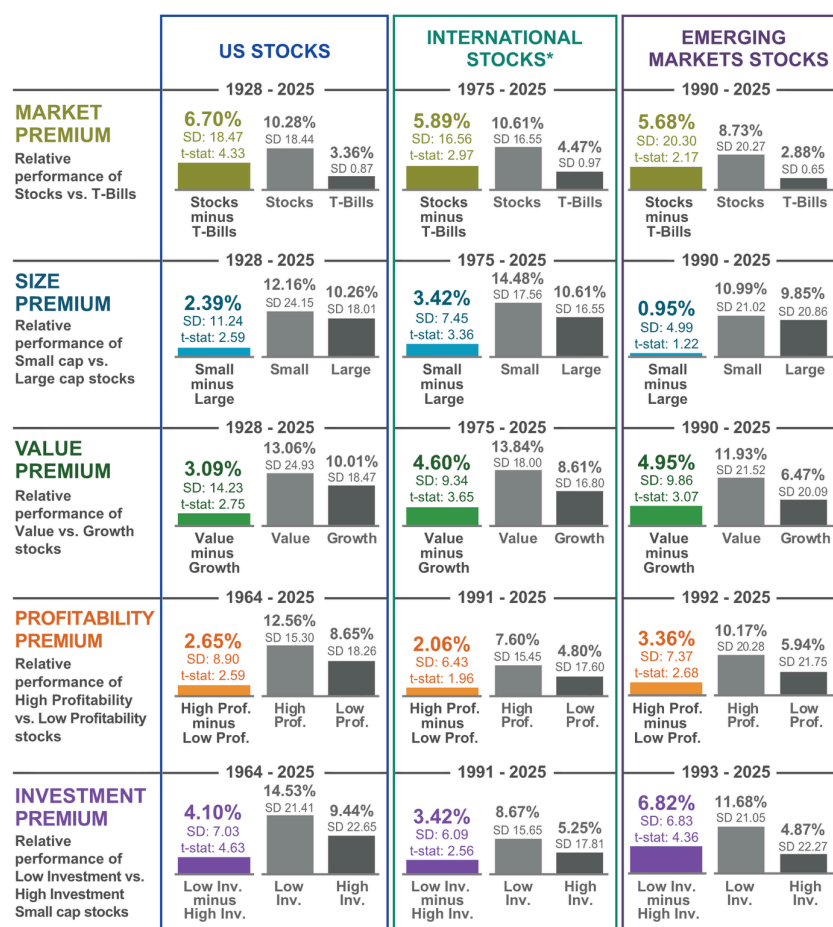
Read the papers (IFA links): bit.ly/2kBxSF3

bit.ly/3vupaM5

The chart on the following page shows the historical size of each premium in U.S., international developed, and emerging markets, together with the standard deviation and t-statistic of each. Premiums have been positive on average over long periods, but each has been negative for extended stretches, and past premiums do not guarantee future premiums.

Fama/French Five-Factor Model

Annualized premiums · Up to 98 years (1/1/1928–12/31/2025) · Source: Dimensional Fund Advisors LP, IFA



IMPORTANT — HYPOTHETICAL BACK-TESTED RESULTS. These results have inherent limitations: they were calculated with the benefit of hindsight, do not reflect how IFA might have reacted to economic or market events when managing client investments, and could be materially different from IFA's actual results over the same period if IFA manages client accounts in the same strategy. Each premium has been negative for extended periods, and investing involves the potential for loss as well as profit.

Information provided by Dimensional Fund Advisors LP. Indexes are shown as total return data and are in USD. Annualized or monthly returns can be selected with the buttons in top right corner. The paper that identified these factors can be read at this link: [A Five-Factor Asset Pricing Model by Fama and French](#). SD = Standard Deviation (%). SDs are calculated using either monthly premium data or for annualized from that monthly data. *Profitability is measured as operating income

before depreciation and amortization minus interest expense, scaled by book. International Stocks: Developed Countries, minus the United States. Premiums are calculated as the difference in annualized or monthly returns between the two indexes described over the period shown. The Dimensional and Fama /French Indices represent academic concepts that may be used in portfolio construction and are not available for direct investment or for use as a benchmark. Index returns are not

representative of actual portfolios and do not reflect costs and fees associated with an actual investment. Market Premium: F/F Total US Market Research Index vs. One-Month US Treasury Bills (T-Bills), F/F International Market Index vs. T-Bills, F/F Emerging Markets Index vs. T-Bills. Size Premium: Dimensional US Small Cap Index minus Dimensional US Large Cap Index. Value Premium: (F/F) US Value Research Index minus the F/F US Growth Research Index. Profitability Premium: F/F US High Profitability Index minus the F/F US Low Profitability Index. For developed ex US stocks, indices are used as follows. Small Cap minus Large Cap: Dimensional International Small Cap Index minus the F/F International Market Index. Value minus Growth: F/F International Value Index minus the F/F International Growth Index. High Prof minus Low Prof: F/F International High Profitability Index minus the F/F International Low Profitability Index. For Emerging Markets stocks, indices are used as follows. Small Cap minus Large Cap: Dimensional Emerging Markets Small Cap Index minus F/F Emerging Markets Index. Value minus Growth: F/F Emerging Markets Value Index minus F/F Emerging Markets Growth Index. High Prof minus Low Prof: F/F Emerging Markets High Profitability Index minus the F/F Emerging Markets Low Profitability Index. Investment Factor: F/F US Small Cap Low Investment Index vs. F/F US Small Cap High Investment Index F/F International Small Cap Low Investment Index vs. F/F International Small Cap High Investment Index F/F Emerging Markets Small Cap Low Investment Index vs. F/F Emerging

Markets Small Cap High Investment Index. The investment factor is included in any equity Dimensional strategy with exposure to small caps, such as core equity strategies (including Sustainability and Social Core) and component funds like small cap, small value and small growth. All rights reserved. See "Index Descriptions" in the appendix for descriptions of Dimensional and Fama /French index data. | Indexes are not available for direct investment and performance does not reflect the expenses of an actual portfolio. Unless indicated otherwise, the performance includes reinvestment of dividends and capital gains but does not include the deduction of IFA's advisory fees, transaction costs or taxes. Past performance is no guarantee of future results. Actual returns may be lower. For detailed information on the hypothetical backtested performance data in this chart, including sources, updates and important disclosures, see ifabt.com. See "Index Descriptions" at ifaindexes.com for descriptions of Dimensional and Fama/French index data. The "t-stat" tests whether or not a given sample mean is statistically different from zero. Generally, a sample mean with a t-stat of ≥ 1.96 or ≤ -1.96 (95% confidence level) indicates that the sample mean is significantly different from zero. HYPOTHETICAL backtested performance is provided for illustrative purposes only, it does not represent the actual performance of any client portfolio or account and it should not be interpreted as an indication of such past or future performance. © 2026 Index Fund Advisors, Inc. (IFA.com)

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1996

Market Timing Ability and Volatility Implied in Investment Newsletter Asset Allocation Recommendations



Scan to watch

John Graham and Campbell Harvey · Journal of Financial Economics (1996)

The authors analyzed the asset allocation recommendations of 237 investment newsletters from 1980 to 1992. They found no evidence that the newsletters systematically increased stock allocations before market rises or reduced them before market declines.

Read the working-paper version: nber.org/papers/w4890

Video: youtu.be/BWbY6fmLkSM

14

1998

Value Versus Growth: The International Evidence



Scan to watch

Eugene Fama and Kenneth French · Journal of Finance

This paper tested the applicability of the Fama-French Three-Factor Model to international equity returns. The study found support for the model in this context. Additionally, international equities were observed to have a higher expected return over time and a lower correlation with the U.S. market, which may provide a diversification benefit.

Read the paper: bit.ly/1rL6hfJ

Video: youtu.be/iwK0OrbRE7c

15

2000



Scan to watch

Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors

Brad M. Barber and Terrance Odean · *Journal of Finance*

Using the trading records of 66,465 households at a large discount brokerage from 1991 to 1996, the authors found that the investors who traded most earned the lowest net returns. The 20% of households that traded most actively earned an annual net return of 11.4%, versus 17.9% for the market over the same period; the average household also trailed the market. The shortfall was explained largely by the cumulative cost of trading itself rather than by poor security selection. The authors attributed the excessive trading to overconfidence.

Read the paper: doi.org/10.1111/0022-1082.00226

Video: youtu.be/wQRZv0rjieQ

16

2008



Scan to watch

The Selection and Termination of Investment Managers by Plan Sponsors

Amit Goyal and Sunil Wahal · *Journal of Finance*

The authors examined the performance of investment managers before and after they were hired or fired by institutional plan sponsors. The study covers 8,755 hiring decisions by 3,417 plan sponsors (1994 to 2003) and 869 firing decisions by 482 plan sponsors (1996 to 2003). Newly hired managers had large positive excess returns before they were hired (10.4% cumulative over the prior three years), but their excess returns afterward were statistically indistinguishable from zero (1.9% cumulative over the next three years).

In a sample of 412 round trips (one manager fired and another hired), the managers who were hired earned slightly less after the decision than the managers who were fired (a three-year cumulative difference of -1.0 percentage point). The standard error was 1.1 points, so the authors concluded that returns would have been no different had the sponsors stayed with the fired managers.

The paper's returns are reported by the managers before management fees, and they do not include the cost of moving assets. The authors discuss transition costs and cite estimates of 2% to 5% of the portfolio (press reports) and 1% to 2% (a transition management firm). The charts on the next page reduce the hired managers' after-decision returns by an assumed one-time transition cost of 0.5% of the assets moved, which is lower than the paper's cited estimates.

Read the paper: papers.ssrn.com/sol3/papers.cfm?abstract_id=890319

Video: youtu.be/ES6vpMj4CoU

Absence of Value: An Analysis of Investment Allocation Decisions by Institutional Plan Sponsors

Scott D. Stewart, John J. Neumann, Christopher R. Knittel and Jeffrey Heisler · *Financial Analysts Journal*

This study is similar to the Goyal and Wahal study described above. However, rather than looking at hiring and firing decisions, the authors examined changes in asset allocations made by plan sponsors. Such changes automatically necessitate hiring and firing decisions. The authors found that only in two out of the eighteen years from 1985 to 2002 did plan sponsor decisions add value over the next five years.

The authors identified performance-chasing as a potential explanation for this underperformance. The authors noted that plan sponsors are more likely to throw money at the asset class that has recently had high returns, only to be disappointed. The authors estimated the economic impact of these ill-fated decisions to be \$170.2 billion for the full sample period.

Read the paper: bit.ly/3YPn3AP

Before and after hiring or firing an investment manager

Cumulative excess returns (manager return minus benchmark), before management fees · Source: Goyal and Wahal (2008), Tables IV and X; IFA

Chart 1. Hired managers: before and after hiring · 8,755 hiring decisions by 3,417 plan sponsors, 1994–2003 ·

■ Hired managers*

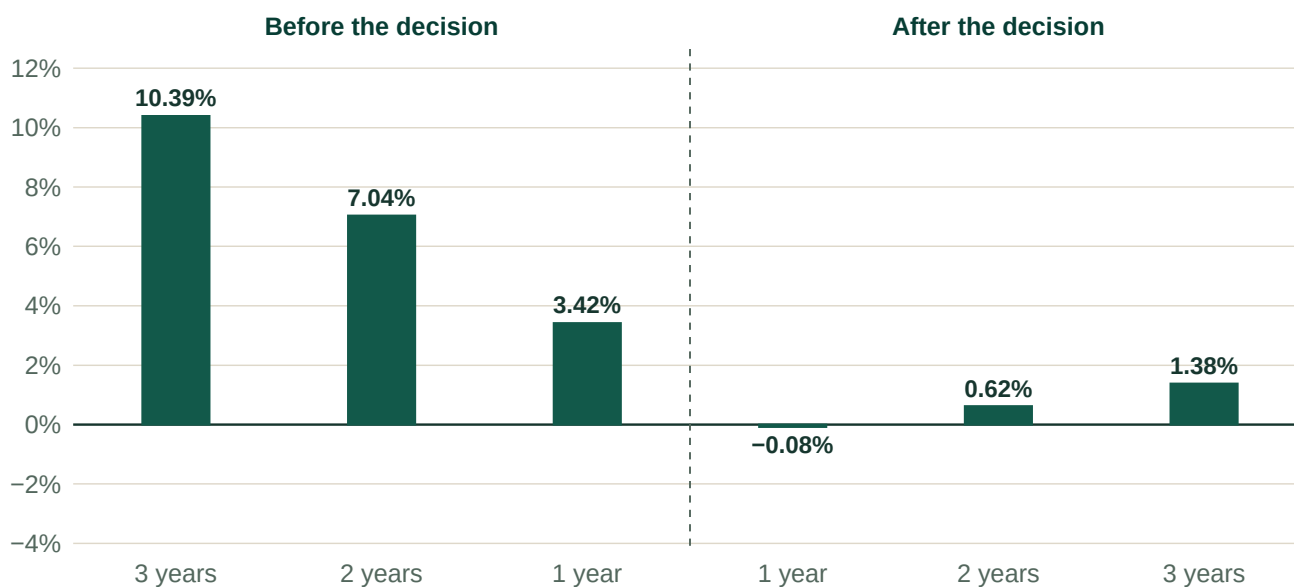
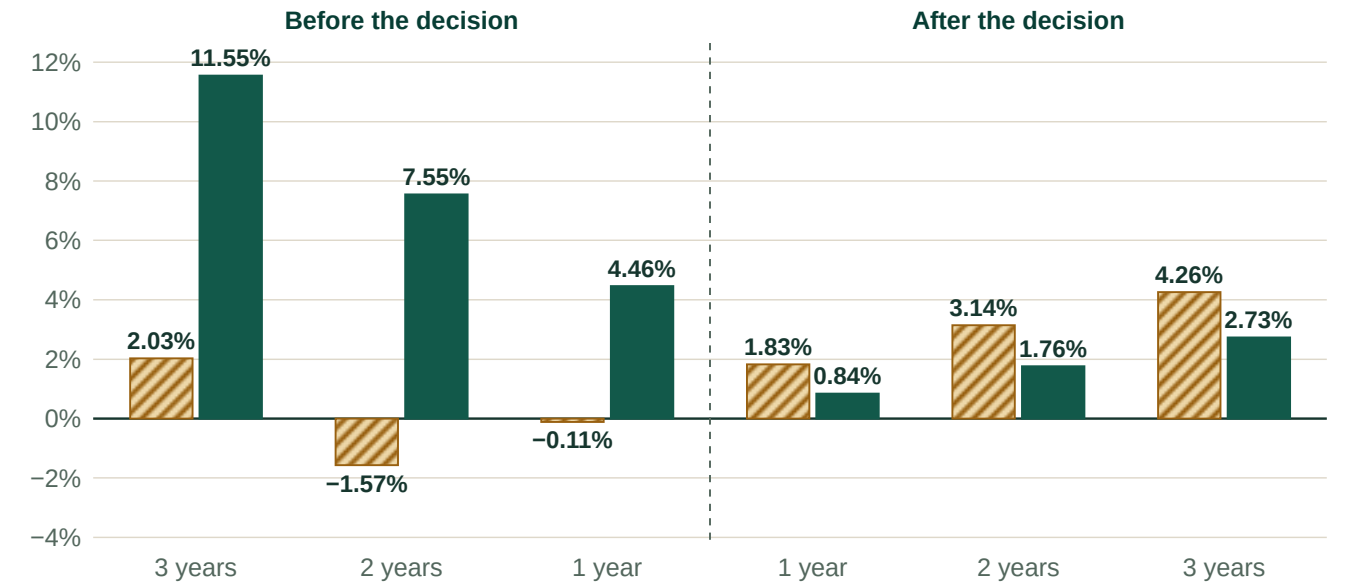


Chart 2. Round trips: managers fired versus managers hired to replace them · 412 round-trip decisions, 1996–2003 ·

■ Fired managers ■ Hired managers*



Hired minus fired, after the decision (standard error in parentheses)

	1 year	2 years	3 years
Paper's results (before the 0.5% assumption)	-0.48 (0.78)	-0.88 (1.33)	-1.03 (1.14)
After 0.5% transition cost*	-0.98 (0.78)	-1.38 (1.33)	-1.53 (1.14)

* After-decision bars for hired managers are the paper's results minus an assumed one-time transition cost of 0.5% of the assets moved. This is a hypothetical IFA assumption and is not a result in the paper. The paper's own estimates of transition costs are higher (1% to 2% from a transition management firm; 2% to 5% from press reports), and actual costs vary. The paper's unadjusted results appear in the table above. Fired managers' bars are unchanged, because they show what the fired managers earned without a transition. **Notes.** Cumulative excess return is the sum of quarterly returns minus the benchmark return, as defined in the paper. The returns are composite returns reported by the managers, before management fees. Standard errors in the paper are large: none of the post-decision differences between hired and fired managers is statistically significant, with or without the 0.5% assumption. These charts illustrate historical results from a published study. They are not IFA client performance. Past performance does not guarantee future results.

18**2010**

Scan to watch

False Discoveries in Mutual Fund Performance: Measuring Luck in Estimating Alphas

Laurent Barras, Olivier Scaillet and Russ Wermers · Journal of Finance

When a mutual fund manager has a statistically significant different performance than the fund's benchmark (i.e., a statistically significant positive or negative alpha), there are two possible explanations: skill or luck. The authors define a "false discovery" as a mutual fund that exhibits significant alpha by luck alone. Using a sample of 2,076 actively managed US equity funds between 1975 and 2006, the authors found that total observed alpha is consistent with the following breakdown: 75.4% of the funds had a true alpha of zero after costs. Also, 24.0% had a true alpha that was negative. That left only 0.6% with a true positive alpha, a number that the authors considered to be "statistically indistinguishable from zero."

Read the paper: bit.ly/3P83tw6Video: youtu.be/rHNFakxxBgA

19**2010**

Luck Versus Skill in the Cross-Section of Mutual Fund Returns

Eugene Fama and Kenneth French · Journal of Finance, Vol. LXV, No. 5

This study was influential in how we could decipher luck from skill in the context of the entire universe of actively managed mutual funds. Given the thousands of actively managed mutual funds that exist, there is the potential for extreme returns based on random chance alone. The authors examined the 3-Factor (Fama/French 3 Factor Model) adjusted excess returns (alpha) of 3,156 actively managed mutual funds between 1984 to 2006. They then compared these aggregate results to a distribution of potential 3-factor adjusted excess returns (alpha) based on random outcomes. They concluded that the net excess returns (after fees) of the active fund management community were no better than what would be expected by random chance. If there are some skilled managers who can produce enough risk-adjusted outperformance to cover their costs, they are hidden by the mass of managers with insufficient skill.

Read the paper: rb.gy/6zc9wv

20**2013**

The Other Side of Value: The Gross Profitability Premium

Robert Novy-Marx · Journal of Financial Economics

This article found an additional dimension of expected return using a proxy labeled "gross profitability." The author found that gross profitability, defined as gross profits-to-assets, had approximately the same power as book-to-market, a common proxy for "value," in predicting the cross-section of average returns. From a portfolio perspective, controlling for profitability was reported to increase the historical performance of value strategies, especially among the largest, most liquid stocks. Because strategies based on profitability are typically growth strategies, they may complement value strategies.

Read the paper: bit.ly/3QWYkbT

21 ²⁰¹⁹ The Profitability and Investment Premium: Pre-1963 Evidence

Sunil Wahal · *Journal of Financial Economics* (2019)

The author builds on the profitability and investment premium research done by Robert Novy-Marx, Eugene Fama, and Kenneth French by extending the sample time period back to 1940. Controlling for value, Mr. Wahal found that the profitability premium emerged as important in the earlier period, which IFA views as supporting, but not proving, that the profitability premium is not simply an artifact of sampling bias. He found no reliable relation between investment and returns in that period.

Read the abstract: ideas.repec.org/a/eee/jfinec/v131y2019i2p362-377.html

Private markets

22 ²⁰⁰⁵ Private Equity Performance: Returns, Persistence and Capital Flows

Steve Kaplan and Antoinette Schoar · *Journal of Finance* (2005)

The authors investigated the performance and capital flows of 746 private equity partnerships and concluded that the average fund returns (net of fees) approximately equal the S&P 500 (an index of 500 large U.S. companies; indexes are unmanaged and cannot be invested in directly) over the 18-year period from 1980 to 1997. Weighted by committed capital, venture funds outperform the S&P 500 before fees while buyout funds do not. The authors also acknowledge the limitations of their conclusions given problems arising from differences in market risk and the possibility of selection bias, a common problem also found when examining the performance of hedge funds.

Read the paper: bit.ly/3v1kcaE

We Have Met the Enemy... and He Is Us: Lessons from Twenty Years of the Kauffman Foundation's Investments in Venture Capital Funds and the Triumph of Hope over Experience

Diane Mulcahy, Bill Weeks and Harold S. Bradley · Ewing Marion Kauffman Foundation (report; not peer-reviewed)

The authors examined the Foundation's results in 99 venture capital funds, measured through the end of 2011. After fees and carried interest, 50 of the 99 funds had a net multiple below 1x (that is, had not yet returned the capital invested, counting the estimated value of unsold holdings), 16 reached 2x or better, and the average net multiple was 1.31x. Of 96 funds from 1989–2010 vintages, 25 beat the Russell 2000 Index (an index of smaller-capitalization U.S. public companies; indexes are unmanaged and cannot be invested in directly) by about 3 percentage points a year or more, net of fees and carry. These results are one investor's experience through 2011 and may not reflect more recent funds. Past performance does not guarantee future results.

Source: Kauffman Foundation, "We Have Met the Enemy... and He Is Us" (May 2012), pp. 18 and 45.

Read the paper: rb.gy/y2rgci

Fund persistence

24 ²⁰²⁰

Fleeting Alpha: The Challenge of Consistent Outperformance

Berlinda Liu and Andrew Cairns (February 2020); Berlinda Liu and Gaurav Sinha (Year-End 2020 scorecard) · S&P Dow Jones Indices (research reports; not peer-reviewed)

The authors studied whether U.S. actively managed equity funds that beat their benchmarks over three years went on to beat them in each of the next three one-year periods. Using the CRSP Survivorship-Bias-Free US Mutual Fund Database, a fund counted as a winner if its annualized three-year return, net of fees, beat its benchmark. S&P published two versions: a February 2020 report with data through September 2019, and a Year-End 2020 scorecard with data through December 2020. They differ in time windows and in how a fund's share class is chosen, so they are not directly comparable.

Averaged across quarterly starting dates, the share of winners that kept winning fell with each year and was below the level expected from chance alone (50%, 25% and 12.5% in years one, two and three). For all domestic equity funds the averages were 42.5%, 18.5% and 7.3% in the February 2020 report (2003 to 2019) and 39.5%, 16.3% and 8.1% in the Year-End 2020 scorecard (2011 to 2020). Across 22 fund categories, every one stayed below the chance level in every year in the first report; in the second, one did not (international small-cap funds in year three, at 14.1%).

Results for a single starting date can look very different. For winners identified at September 30, 2016, none of the 99 large-cap winners beat the S&P 500 Index (an index of 500 large U.S. companies; indexes are unmanaged and cannot be invested in directly) in each of the next three years, and 12 of 18 domestic categories had no such winners. For winners identified at December 31, 2017, 71 of 182 large-cap winners (39.0%) did, and 4 of 18 categories had none. The authors note that market conditions can influence a single snapshot, and the Year-End 2020 scorecard found that growth funds kept their edge longer than value funds (for large-cap funds, 25.0% against 1.3%).

A few categories showed more persistence, notably mid-cap growth and small-cap growth funds (each based on 9 to 25 winning funds) and, in the first report, real estate funds. The authors concluded that past outperformance was of limited help in identifying future outperformers. The data end in September 2019 and December 2020. Past performance does not guarantee future results.

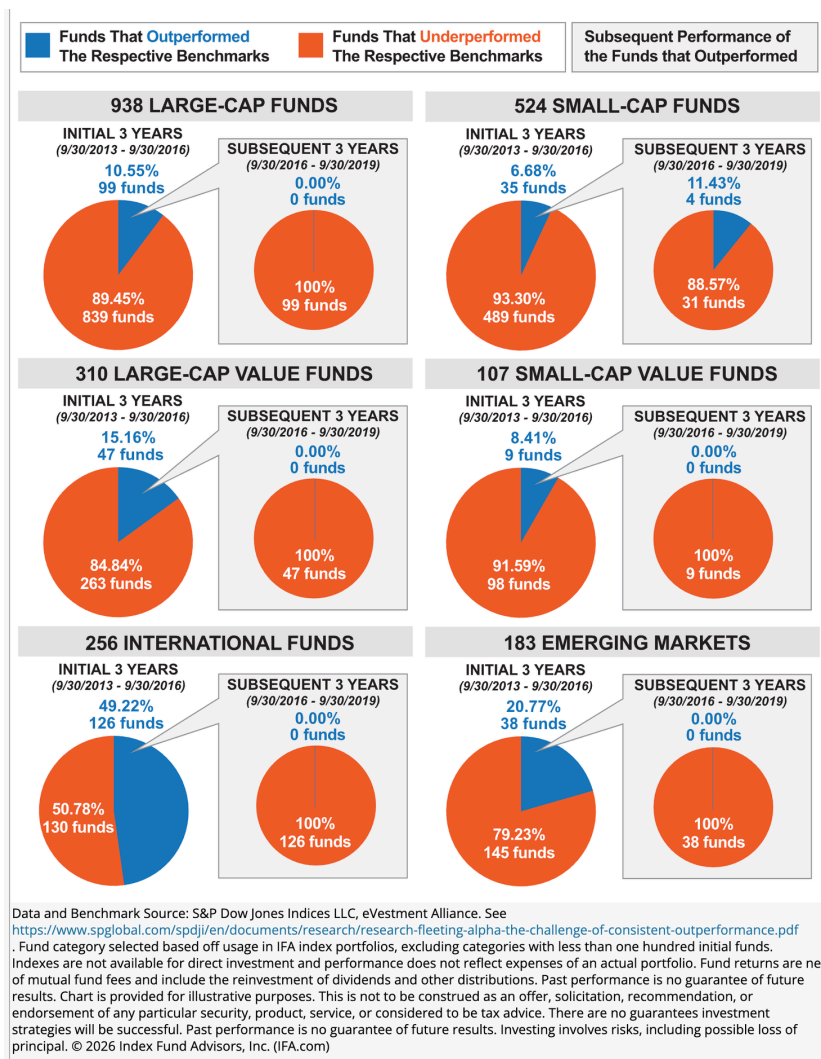
Source: S&P Dow Jones Indices LLC and CRSP, "Fleeting Alpha: The Challenge of Consistent Outperformance" (February 2020; data as of September 30, 2019) and "Fleeting Alpha Scorecard Year-End 2020" (data as of December 31, 2020). S&P Dow Jones Indices is an index provider that receives compensation from licensing its indices to third parties.

Read the February 2020 report: spglobal.com/spdji/en/research/article/fleeting-alpha-the-challenge-of-consistent-outperformance

Read the Year-End 2020 scorecard: spglobal.com/spdji/en/documents/research/research-fleeting-alpha-scorecard-year-end-2020.pdf

Lack of persistence of outperformance by actively managed funds

6 years (9/30/2013–9/30/2019) · Source: S&P Dow Jones Indices LLC; IFA



Note: This chart shows one starting cohort (winners identified 9/30/2016). S&P's Year-End 2020 scorecard, using a later cohort (winners identified 12/31/2017), shows higher three-year persistence in five of these six categories (for example, 39.0% of large-cap winners). Averages across many starting dates were similar in both studies. See [item 24](#) (page 5).



Explore this chart interactively. For the interactive version of this chart, scan the QR code or visit <https://www.ifa.com/charts/305h>. Chart is provided for illustrative purposes. Past performance does not guarantee future results.

Our philosophy

We believe the peer-reviewed academic research summarized above provides substantial support for IFA's investment philosophy.

From research to portfolio

IFA relies on Modern Portfolio Theory (MPT) in the construction of its portfolios. We begin with a default market portfolio (owning the entire market) and incrementally add asset classes that historically either increase expected returns or reduce risk. IFA does not utilize a technological “optimizer” or automatic algorithm in the construction of its portfolios. Any such resulting asset allocations would be extremely sensitive to the assumptions, which, if even slightly off, could lead to significantly different outcomes. IFA does not attempt to forecast future returns, risks, or correlations of different asset classes for institutional investors. While the efficient frontier is easily found in hindsight, it is unknowable in advance.

The Capital Asset Pricing Model (CAPM) affirms the fundamental principle that risk and return are inseparable. However, it does not fully explain the returns of diversified portfolios. Fama and French addressed this by noting the increased returns associated with small cap and value stocks. IFA incorporates a tilt toward small-cap and value stocks in its equity portfolios, based on the historical evidence on [page 12](#) that these stocks have had higher average returns than large-cap and growth stocks, respectively. That evidence also shows higher volatility, and the premiums have been negative for extended stretches. Tilted portfolios can underperform the market for extended periods, and past premiums do not guarantee future premiums.

Buy, hold, and rebalance

IFA adheres to the philosophy that once investors have implemented a risk-appropriate portfolio, IFA's preferred approach is to avoid short-term, emotionally driven decisions. Reacting to daily, weekly, or quarterly market fluctuations can result in behaviors that harm long-term investment outcomes.

Investment committee members should recognize that, historically, bearing appropriate risks has been associated with higher long-term returns, although risk premiums have been negative for extended stretches and are not guaranteed. In IFA's view, there is no excess return without risk. It is important to understand, however, that only some risks are compensated. IFA generally favors avoiding active strategies such as stock-picking, market timing, manager selection, or economic or political forecasting that are disproportionate to achieving consistent market returns.

“The investor’s chief problem—and even his worst enemy—is likely to be himself.”

Benjamin Graham, *The Intelligent Investor*

IFA takes the position that one of the most important decisions investment committee members can make is the asset allocation of their portfolios, guided by a written Investment Policy Statement (a useful resource is the 1985 book “Investment Policy,” by Charles D. Ellis). Security selection and market timing are, in our opinion, unlikely to add consistent value and may incur additional costs. Instead, IFA’s portfolios are designed to have exposure to the factors described by academics Fama and French; exposure to these factors does not assure that any premium will be earned in a given period.

IFA considers both the Fama French Five Factor Model for stocks and the Two Factor Model for bonds as ways to think about the expected returns of stocks and bonds.

IFA encourages investment committee members to avoid investment strategies involving stock picking, market timing, active manager selection, or style drifting strategies. In IFA’s opinion, the academic research summarized in this document indicates that, on average, these strategies have not provided consistent excess market returns after costs. In our opinion, one approach to consider is to buy, hold, and rebalance a globally diversified portfolio of index funds that matches the institution’s capacity for risk. Index funds do not assure a profit or protect against loss, and a buy-and-hold approach does not avoid market declines.

IFA will continue relying on long-term historical data and research such as those cited above to inform our evidence-based approach.

Focused on your mission. Grounded in evidence.

Index Fund Advisors, Inc.

19200 Von Karman Ave., Suite 150, Irvine, CA 92612

Tel (888) 643-3133 · Local (949) 502-0050 · ifa.com/ocio

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