

**Challenging the Conventional Wisdom on Active Management:  
A Review of the Past 20 Years of Academic Literature on Actively  
Managed Mutual Funds**

K.J. Martijn Cremers  
mcremers@nd.edu

Mendoza College of Business  
University of Notre Dame  
Notre Dame, IN 46556

Jon A. Fulkerson  
jfulkerson1@udayton.edu

School of Business Administration  
University of Dayton  
Dayton, OH 45469

Timothy B. Riley  
tbriley@uark.edu

Sam M. Walton College of Business  
University of Arkansas  
Fayetteville, AR 72701

May 31, 2019<sup>\*,+</sup>

*Financial Analysts Journal*, forthcoming

---

\* Disclosure: This research was supported by the Investment Adviser Association's Active Managers Council. Martijn Cremers currently serves as an independent director at Ariel Investments and a consultant to Touchstone Investments and State Street Associates.

+ We thank Karen Barr, Brigitte Dooley, Theresa Hamacher, Yuekun Liu, and Qing Yan for their comments, suggestions, and citation assistance. We also thank executive editor Stephen Brown, associate editor Steven Thorley, and our two reviewers at the *Financial Analysts Journal* for their thorough feedback. All errors are our own.

# **Challenging the Conventional Wisdom on Active Management: A Review of the Past 20 Years of Academic Literature on Actively Managed Mutual Funds**

## **Abstract**

Just over 20 years have passed since the publication of Carhart's landmark 1997 study on mutual funds. Its conclusion—that the data did “not support the existence of skilled or informed mutual fund portfolio managers”—was the capstone of an academic literature beginning with Jensen (1968) that formed the ‘conventional wisdom’ that active management does not create value for investors. In this paper, we review the literature on active mutual fund management since the publication of Carhart (1997) to assess the extent to which current research still supports the conventional wisdom. Our review of the most recent literature suggests that the conventional wisdom is too negative on the value of active management.

# **Challenging the Conventional Wisdom on Active Management: A Review of the Past 20 Years of Academic Literature on Actively Managed Mutual Funds**

## **Executive Summary**

Just over 20 years have passed since the publication of Carhart’s landmark study on mutual funds (Carhart, 1997). Its conclusion—that the data did “not support the existence of skilled or informed mutual fund portfolio managers”—supported a broad academic literature that began with Jensen (1968) and helped form the ‘conventional wisdom’ that active management does not create value for investors. In this paper, we review the literature on active mutual fund management since the publication of Carhart (1997) to assess the extent to which current research still supports the conventional wisdom.

We begin by noting important changes in the mutual fund industry over the past two decades. In the United States, assets have shifted away from actively managed funds and towards passively managed index funds and ETFs; specifically, less than 8% of the assets in equity funds were passively managed in 1997, but over 40% were passively managed in 2017. Over the same period, the average fee paid by investors in active funds decreased by about 20%. Actively managed mutual funds today face a significantly more competitive environment than they did 20 years ago. These changes in the industry alone suggest that a reevaluation of the conventional wisdom is needed.

Next, we revisit the findings that support the conventional wisdom, particularly research showing that:

- (1) The average fund underperforms after fees.
- (2) The performance of the best funds does not persist.
- (3) Some fund managers are skilled, but few have skill in excess of costs.

Each of these components of the conventional wisdom has support in the academic literature. Sharpe (1991) claims that, mathematically, the average active investor is guaranteed to underperform after fees, and several papers show empirically that the average actively managed mutual fund underperforms. Carhart (1997), among others, shows that active funds that have outperformed in the past cannot be expected to outperform in the future. Fama and French (2010) find that many managers beat the market before costs, but that few do so after costs. These well-known studies provide support for the general conclusion that active management in mutual funds does not create value for investors.

However, our review of the current academic literature on mutual funds also finds a substantial body of research that disagrees with the conventional wisdom. Regarding average performance, Berk and van Binsbergen (2015) find the average active fund outperforms an equivalent index

fund by 36 basis points per year, while Cremers, Petajisto, and Zitzewitz (2012) and Linnainmaa (2013) show that standard approaches to estimating average fund performance can be biased against finding that active management adds value. Considering performance persistence, Bollen and Busse (2005) and Kosowski, Timmermann, Wermers, and White (2006) both find some evidence of persistence among top-performing funds.

Several studies identify groups of funds that appear to have skill in excess of costs. For example, Cremers and Petajisto (2009) show that funds with ‘high active share,’ meaning funds with holdings that greatly differ from their benchmark, tend to outperform their benchmark. They also show that the performance of funds with low active share drives the results of previous studies indicating that the average actively managed fund underperforms. Similarly, Amihud and Goyenko (2013) show that funds with past performance that is not readily explained by common factors, such as the performance of large-cap stocks versus small-cap stocks, perform well in the future.

The research has also considered how the actions of active managers create value in different ways. Wermers (2000), among others, shows that many funds select stocks that outperform the market, while Kaplan and Sensoy (2005) and Jiang, Yao, and Yu (2007) show that some funds can correctly time the market. Other research finds that active managers create value through corporate oversight (Iliev and Lowry, 2015) and tax management (Sialm and Starks, 2012). The returns on these activities vary; Pastor, Stambaugh, and Taylor (2017) and von Reibnitz (2018) show that the amount of value creation depends on market conditions.

Like the academic literature itself, our review focuses primarily on U.S. equity mutual funds, but we also consider active management in other asset classes. After equity funds, bond funds have received the most attention. They have been shown to outperform before costs, though not after costs. However, the lack of a generally-accepted model for measuring bond fund performance makes it difficult to draw strong conclusions about their value creation. We also briefly review the literature on hybrid, socially responsible, target date, real estate investment trust (REIT), sector, and international funds. Arguments both for and against the conventional wisdom can be found in that research, but drawing robust conclusions is difficult given the limited research in these areas.

Our review concludes by considering current research challenges. One challenge arises from the recent rapid evolution of asset pricing models, which may have important implications for mutual fund performance evaluation. A second challenge is the result of data limitations that prevent researchers from developing a complete picture of any fund’s investment process. For example, fund trading behavior can typically only be inferred by studying changes in quarterly holdings reports. Finally, because of the many regulatory constraints faced by mutual funds, we consider the degree to which mutual fund findings can be extrapolated to all active management.

Taken as a whole, our review of the most recent academic literature suggests that the conventional wisdom is too negative on the value of active management. The literature that followed the period between Jensen (1968) and Carhart (1997) has documented that active managers have a variety of skills and tend to make value-added decisions, such that, after accounting for all costs, many actively managed funds appear to generate positive value for investors. While the debate between active and passive is not settled and many research challenges remain, we conclude that the current academic literature finds active management more promising for investors than the conventional wisdom claims.

## Challenging the Conventional Wisdom on Active Management:

### A Review of the Past 20 Years of Academic Literature on Actively Managed Mutual Funds

#### Introduction

Active management was once the default choice for investors looking for external money managers. It was effectively the only choice open to them until the first index mutual funds were made available in the late 1970s.<sup>1</sup>

Since then, the value of active management has become a heavily studied question, especially given the rise of passive management and the growing popularity of index funds and ETFs. Using empirically-validated models of risk, researchers could quickly and robustly evaluate the performance of many different investment products. Because of their structure, their popularity, and readily available data about them, mutual funds became a focal point of this area of research.

Beginning with Jensen (1968), the academic literature has been centered on U.S. equity mutual funds, which remain the largest segment of actively managed funds in terms of both numbers and assets. Sharpe (1966) notes that “the traditional view” was “that the search for securities whose prices diverge from their intrinsic values is worth the expense required.” However, the early findings of the literature were that these funds, on average, do not ‘beat the market’ net of fees and that few—if any—individual funds consistently outperform. From these studies, a new consensus arose that the value created by most managers is offset—or more than offset—by their fees. This new ‘conventional wisdom’ is perhaps best summarized by the conclusion of the seminal study of Carhart (1997): “the results do not support the existence of skilled or informed mutual fund portfolio managers.”<sup>2</sup>

This literature review provides an overview of the considerable body of academic research on the value of active management that has been published since Carhart’s study. After exploring the broad changes in the industry over the past 20 years, we first discuss studies that support the conventional wisdom. We then consider the more recent literature, which in many ways challenge that conventional wisdom. Our focus is primarily on U.S. equity funds, but we also consider active management in other asset classes, such as bond and hybrid funds. Finally, we discuss limitations and challenges in the current literature, important open questions, and the degree to which active management in equity mutual funds can be extrapolated to all active managers.

Overall, our review of the literature suggests that the conventional wisdom judges active management too negatively. We conclude that the academic literature over the past 20 years shows that active managers have a variety of skills and, in many cases, tend to make value-added decisions. In other words, many funds do appear to create value for investors even after accounting for fees. While many challenges remain, we believe the conventional wisdom fails to account for the more positive findings of recent research on active manager skill.

---

<sup>1</sup>See, *The First Index Mutual Fund: A History of Vanguard Index Trust and the Vanguard Index Strategy* [https://www.vanguard.com/bogle\\_site/lib/sp19970401.html](https://www.vanguard.com/bogle_site/lib/sp19970401.html)

<sup>2</sup>Carhart (1997) has 14,440 citations according to Google Scholar (as of April 17, 2019).

## 1. Modern Trends in the Mutual Fund Industry<sup>3</sup>

The mutual fund industry has undergone significant shifts in the past two decades. This section highlights the overall growth of the industry, the increased market share of passively managed investments, and the decreasing costs of investing.

The composition of the U.S. mutual fund industry changed dramatically between 1998 and 2017. Net assets of all registered investment companies have nearly quadrupled (from \$5.8 trillion to \$22.5 trillion), but the assets managed by traditional open-end mutual funds have only tripled to \$18.8 trillion. The difference in growth rates is due, in large part, to the rise of exchange-traded funds (ETFs), which added \$3.4 trillion in new assets over the period.

The growth in ETFs parallels the growth in the market share of traditional index funds. In 1997, 7.5% of domestic equity mutual fund assets were held in traditional index funds, compared to 29.6% in 2017. Most net cash flow has gone into passive strategies. Between 1997 and 2017, domestic equity index funds had a net cash inflow of \$639 billion, while active funds had a net outflow of \$975 billion over the same period. These trends have been less pronounced in bond and hybrid mutual funds, where index funds represented only 11.2% of \$5.6 trillion in 2017.

During this same time, the cost of active management has declined. In terms of direct expenses to investors, the average mutual fund expense ratio has fallen significantly. The asset-weighted average expense ratio for actively managed equity funds fell from 1.06% in 2000 to 0.78% in 2017, while the average expense ratio for bond funds also decreased from 0.78% to 0.55%. This decline is partly due to a reallocation by fund investors to lower cost funds and share classes, such that assets are increasingly concentrated in funds and share classes with lower expense ratios, but it is also the result of a general decrease in the average expense ratio of active mutual funds.

The indirect cost to investors of trading within actively managed funds has also fallen. Active managers trade less than they did in the past (as shown by Cremers and Pareek, 2016), and they incur lower transaction costs per trade. Specifically, as of 2016, the average turnover experienced by investors was only 34% for active equity funds. Further, Hasbrouck (2009) and Bessembinder, Maxwell, and Venkataraman (2006) show that the transactional cost of trades has declined in both equity and bond markets.

As a result, the active managers of today operate in a far different environment than the managers considered in older academic literature. Today's active manager faces rising competition from both active and passive products and brings in less revenue per dollar managed. Given these trends, it is important to consider the degree to which the conventional wisdom on active management articulated in the period between Jensen (1968) and Carhart (1997) still applies. The next section considers the research that is most often used in support of the conventional wisdom, while the subsequent sections examine more recent research on the value added by active management.

---

<sup>3</sup>All data in this section has been sourced from the 2017 and 2018 ICI handbooks except where noted.

## 2. The Conventional Wisdom on Actively Managed U.S. Equity Mutual Funds

The conventional wisdom on actively managed equity mutual funds states that, on average, there is little value to active management for investors. That wisdom is based on the findings that:

- (1) The average fund underperforms after fees.
- (2) The performance of the best funds does not persist.
- (3) Some fund managers are skilled, but few have skill in excess of costs.

This section addresses each of these broad claims by summarizing the best-known studies that support them.

The first component of the conventional wisdom—that the average fund underperforms after fees—argues that the average actively managed fund underperforms a passively managed fund which follows the same investment style or mandate. In theory, the underperformance of the average active investor is guaranteed, because active management is a zero-sum game before costs, meaning that any gain on a trade for one manager generates an offsetting loss for another manager. Therefore, active management becomes a negative-sum game after costs are considered. Sharpe (1991, 2013) calls this the “arithmetic of active management,” while Bogle (2005) refers to this as “the relentless rules of humble arithmetic.” Based on this argument, French (2008) concludes that “in aggregate, the search of trading gains is doomed,” and Buffett (2006) states that “a record portion of earnings that would go in their entirety to owners... is now going to a swelling army of helpers.”

Several papers support the claim that the average actively managed U.S. equity fund underperforms after fees. Jensen (1968), Ippolito (1989), and Gruber (1996) study the average performance of mutual funds from 1945 through 1994 using non-overlapping periods and find that the average fund generates a negative alpha after fees. Similarly, Davis (2001) finds that no equity style from 1965 through 1998 earns a positive alpha after deducting fees. Wermers (2000) indicates that actively managed mutual funds may not be engaged in a zero-sum game before costs, because the stocks held by the average actively managed fund outperform by 1.3% per year; however, after trading, distribution, operational, and other costs, he finds that the average fund underperforms by about 1% per year.

The second component—that the performance of the best funds does not persist—addresses the issue of luck versus skill. Consider a manager who has outperformed the market in the past. If that manager is skilled, outperformance should be expected to persist into the future. However, if that manager was merely ‘lucky’ in the past, that outperformance should not be expected to continue. If all outperformance is simply luck, not skill, then it does not make sense to invest in even the best-performing actively managed funds.

While some early papers find persistence in performance, Carhart (1997) shows that apparent ‘hot hand’ effects can be explained by common factors in stock returns, particularly the Jegadeesh and Titman (1993) momentum factor (i.e., the returns on stocks that have performed relatively well in

the past compared to the returns on stocks that performed poorly).<sup>4</sup> Carhart only finds persistence among the worst-performing funds and concludes that his “results do not support the existence of skilled or informed mutual fund portfolio managers.” Carhart’s conclusions are also notable because he was one of the first to use a survivorship bias-free database, meaning one that includes funds regardless of whether the funds are still in operation. Elton, Gruber, and Blake (1996a) show that studies that only look at surviving funds will inaccurately find evidence of performance persistence because surviving funds are more likely to have outperformed, and Brown, Goetzmann, Ibbotson, and Ross (1992) show that “the relationship between volatility and returns” in a sample with survivorship bias can give the false appearance of persistent performance.

Other research published at around the same time supports Carhart’s conclusion. Malkiel (1995) shows the importance of accounting for survivorship bias and finds no evidence of performance persistence after the 1970s. Phelps and Detzel (1997) find that any evidence of persistence disappears when either risk is better measured or when more recent time periods are examined.

The third component of the conventional wisdom—that some fund managers are skilled, but few have skill in excess of costs—does not imply that active managers have no skill. Rather, it claims that the cost to investors to gain access to that skill offsets, or more than offsets, its value. Fama and French (2010) find that many managers can beat the market before costs, but that “few funds produce benchmark-adjusted expected returns sufficient to cover their costs.” Barras, Scaillet, and Wermers (2010) argue that only 0.6% of funds have skill in excess of fees and that 75.4% of funds have some skill but that they “extract all of the rents generated by these abilities through fees.” Furthermore, they “observe that the proportion of skilled funds decreases from 14.4% in early 1990 to 0.6% in late 2006.”

The downward trend in persistence is an important element of the conventional wisdom, since the often-cited explanations for the decline suggest that it is unlikely to reverse. Bernstein (1998) attributes the downward trend to the “ever-increasing efficiency in the equity markets,” because as market efficiency increases, active managers will find fewer profitable investment opportunities that will allow them to offset their fees. Chordia, Roll, and Subrahmanyam (2008, 2011) and Conrad, Wahal, and Xiang (2015) show evidence of increasing efficiency in equity markets in recent years. Grossman and Stiglitz (1980) theorize that markets may never become fully efficient because those engaged in gathering information will only continue to do so if they are compensated for their costs. However, the number of profitable opportunities may become ever smaller as gathering information becomes easier and cheaper.

Another explanation for the decline in the number of investment opportunities is increasing competition among active managers. Pastor, Stambaugh, and Taylor (2015) find that managers are becoming more skilled over time, but that greater competition among active managers prevents their increased skill from leading to improved fund performance. Dyck, Lins, and Pomorski (2013) support that result by showing that active management generates greater value in less-competitive asset markets outside of the United States, particularly the emerging markets. Along a similar line, Hoberg, Kumar, and Prabhala (2018) show that active funds investing in the United States tend to

---

<sup>4</sup>See Grinblatt and Titman (1992); Elton, Gruber, Das, and Hlavka (1993); Hendricks, Patel, and Zeckhauser (1993); Goetzmann and Ibbotson (1994); Brown and Goetzmann (1995); Elton, Gruber, and Blake (1996b); and Wermers (1997) for early evidence of persistence.

perform better when they face less competition from other active funds investing in the United States.

Our discussion of research related to the conventional wisdom comes with an important caveat. The publication processes across many fields privilege statistically significant results that provide new insights. Accordingly, papers confirming (or failing to find evidence against) the conventional wisdom will be difficult to publish. Rosenthal (1979) writes that an extreme version of privileging statistically significant results would cause journals to be “filled with the 5% of the studies that show Type I errors” (i.e., false positives), while the insignificant results would end up hidden from observation in “the file drawer.” Galiani, Gertler, and Romero (2017) further note that “replication is the exception rather than the rule in economics.” Finally, in fields of study with “a greater number... of tested relationships” and “greater flexibility in designs, definitions, outcomes and analytical modes”, any given research finding is less likely to be true (Ioannidis, 2005). The number of possible relationships in finance is very high, and most research on active management has enough latitude to allow for flexible designs when testing relationships. With respect to our study, this situation suggests (i) that we are highly unlikely to observe all of the papers that support the conventional wisdom and (ii) that some of the results in the papers that run counter to the conventional wisdom may be false positives.

### **3. Recent Research on Actively Managed U.S. Equity Mutual Funds**

While the conventional wisdom has some support in the recent academic literature, a large portion of that same literature challenges it. Recent research finds that many active managers have significant observable skills, that those skills create real value for investors, and that those skills persist over time. These new lines of research have often employed new measures (e.g., Berk and van Binsbergen’s, 2015, ‘value added’ measure) or applied novel methods (e.g., Barras, Scaillet, and Wermers’, 2010, use of the ‘false discoveries’ technique). Other research, like Daniel, Grinblatt, Titman, and Wermers (1997), has made use of relatively new data like individual fund holdings. This section summarizes recent studies related to U.S. equity mutual funds, while the subsequent section considers other mutual fund asset classes.

#### **3.1. Measuring skill**

Almost all academic papers measure the skill of an active manager as the net alpha of the fund, which is the return of the fund after fees compared to a benchmark. In most cases, this benchmark is either a single passive index (such as the S&P 500), a multi-factor model (as in Carhart, 1997), or a portfolio constructed based on the individual holdings of the fund (as in Daniel, Grinblatt, Titman, and Wermers, 1997). Both the choice of benchmark model and the quality of data available for analysis using that model have a large impact on conclusions about the net alphas of funds, and in turn, on conclusions about the skill of active managers.

Several studies consider the impact of the benchmark model chosen. Kothari and Warner (2001) and Glode (2011) highlight the limitations of current models in evaluating the value of active management and show that common performance measures can often underestimate the value of active management. Notably, Glode (2011) argues that, if the model does not properly account for the economic state (recession or expansion), then skilled managers “will (wrongly) appear to

underperform passive investment strategies net of fees.” Moreover, Huij and Verbeerk (2009) and Cremers, Petajisto, and Zitzewitz (2012) both argue that the multi-factor models that are ubiquitous in academic research have systematic biases and, as a result, are poor benchmarks for evaluating mutual fund performance.<sup>5</sup>

With respect to data, Linnainmaa (2013) shows that, while data with survivorship bias can overstate active manager skill, data without survivorship bias can understate active manager skill because of ‘reverse survivorship bias.’ Reverse survivorship bias occurs because poorly performing funds often close; however, their poor performance is frequently due to bad luck, rather than low skill. Because the unlucky funds would likely have performed better in their future, the skill of their managers is understated by the available data. Therefore, using the average alpha across all funds as a measure of average skill understates the true average skill. Linnainmaa finds that the true alpha of the average fund is 43 basis points per year higher than the average alpha calculated without accounting for reverse survivorship bias.

### **3.2. Can insiders with private information identify skilled managers?**

The behavior of industry participants, who may have significant private information about managers, indicates that some fund managers are skilled. Berk, van Binsbergen, and Liu (2017) show that investment management firms seem to have private information about their managers, because they are able to efficiently reallocate capital between them. This reallocation “amounts to over 30% of the total value added of the industry.” Fang, Kempt, and Trapp (2014) find that fund families efficiently allocate managers by moving “their most skilled managers to market segments in which manager skill is rewarded best,” while Porter and Trifts (2014) find that underperforming managers are more likely to lose their job. Gallo and Lockwood (1999) show that after a management change the risk-adjusted performance of a fund improves by an average of 2% per year, and Khorana (2001) shows “significant improvements in post-replacement performance relative to the past performance of the fund.”

Fund families make significant efforts to keep skilled managers within the family. Deuskar, Pollet, Wang, and Zhang (2011) find that funds retain top managers “in the face of competition from a growing hedge fund industry.” One method of retention is to provide managers with a hedge fund to manage side-by-side with their mutual fund. Nohel, Wang, and Zheng (2010) find that these side-by-side managers outperform their peers which is “consistent with this privilege being granted primarily to star performers.” However, overall evidence on side-by-side management is mixed. Chen and Chen (2009) find that mutual fund managers with a side-by-side hedge fund tend to outperform, but Cici, Gibson, and Moussawi (2010) and Del Guercio, Genc, and Tran (2018) find those same mutual funds tend to underperform.

This information about manager skill does not appear to be held by other professionals within the industry but outside of the fund family. Goyal and Wahal (2008) find that plan sponsors do not experience improved performance after firing one manager and hiring another; Kostovetsky and Warner (2015) find no performance improvement after external subadvisor managers are replaced;

---

<sup>5</sup>In Section 5.1, we discuss in detail the merits of each of the common benchmarking approaches.

and Phillips, Pukthuanthong, and Rau (2014) find that fund managers are not able to accurately identify which of their rivals are the best managers.

### **3.3. Can investors identify skilled managers using public information?**

While the prior section considers the ability of insiders to evaluate managers, substantial research has considered whether investors can identify skilled funds in advance using public information. Kosowski, Timmermann, Wermers, and White (2006) “find that a sizable minority of managers pick stocks well enough to more than cover their costs,” and several measures have been identified that appear to help investors identify those funds in advance.<sup>6</sup> These measures are typically derived from past fund returns, past fund holdings, or a combination of the two.

In contrast to research discussed previously, some studies find that fund performance is somewhat predictable using past performance alone. For example, Bollen and Busse (2005) demonstrate persistence using daily returns—although it is “observable only when funds are evaluated several times a year”—and Kosowski, Timmermann, Wermers, and White (2006) demonstrate persistence by following Carhart’s (1997) procedure while using a more robust technique for evaluating statistical significance.

However, many studies use other information derived from past returns, either in isolation or in conjunction with estimates of past performance, to predict future performance. Amihud and Goyenko (2013) examine the percentage of a fund’s returns that can be explained by common factors, such as the performance of large-cap versus small-cap stocks. They find that, on average, funds with both a low percentage of their past returns attributable to common factors and strong past performance outperform by 3.8% per year in the future. Massa and Yadav (2015) use past returns to measure a fund’s sentiment beta, which is its level of exposure to high sentiment stocks, and show that funds with low sentiment betas subsequently outperform funds with high sentiment betas.

Other studies have applied complex statistical techniques to returns. Barras, Scaillet, and Wermers (2010) use a ‘false discoveries’ technique adapted from medical research to separate funds with skill from those that have generated strong performance through luck, while Busse and Irvine (2006); Avramov and Wermers (2006); and Huij and Verbeek (2007) apply Bayesian probability approaches to successfully predict future performance.<sup>7</sup> Mamaysky, Spiegel, and Zhang (2007) find groups of funds with alphas “of over 4% per annum” after applying filters to control for estimation errors that commonly occur in return-based analyses. Baks, Metrick, and Wachter (2001) and Pastor and Stambaugh (2002) demonstrate that actively managed funds should be part of an investor’s optimal portfolio even if that investor strongly doubts such funds can outperform the market.

Fund holdings can also predict future performance. Cremers and Petajisto (2009) show that funds with high active share (meaning funds with portfolios that differ greatly from their benchmarks)

---

<sup>6</sup> Riley (2019) closely replicates the procedure that Kosowski, Timmermann, Wermers, and White (2006) used to draw that particular conclusion and finds “no evidence of stock selection ability in excess of costs” in more recent years.

<sup>7</sup> Andrikogiannopoulou and Papakonstantinou (2019) find that the ‘false discoveries’ technique “underestimates the proportion of nonzero-alpha funds” because of “the low signal-to-noise ratio in fund returns.”

tend to have a positive alpha, while funds with low active share tend to strongly underperform. Cremers and Pareek (2016) show that this outperformance is stronger among funds with high active share that can be identified as ‘patient’, while Cremers, Fulkerson, and Riley (2018) show greater outperformance among funds with high active share that provide a benchmark in the fund prospectus that accurately reflects fund riskiness. Doshi, Elkamhi, and Simutin (2015) compare a fund’s actual portfolio to a value-weighted portfolio of a fund’s investments and find that fund performance increases as the difference between the two increases. Sherrill, Shirley, and Stark (2017) show that large ETF holdings signal poor future performance.

With respect to active share in particular, there is a substantial debate about whether it has and will continue to predict outperformance. Schlanger, Philips, and Peterson LaBarge (2012) and Cohen, Leite, Nielson, and Browder (2014) both question the predictive power of active share, and Frazzini, Friedman, and Pomorski (2016) claim that “empirical support for the measure is not very robust.” Conversely, Petajisto (2016) and Cremers (2017) argue that the latter analysis in particular contains significant shortcomings (e.g., in the model used to measure fund performance and the interpretation of the results). Regardless of active share’s power in previous time periods, Brown and Davies (2017) suggest that funds may have an incentive to manipulate active share if investors use it to make decisions, which could constrain its future utility.

The concentration of a fund’s portfolio also has predictive power. Kacperczyk, Sialm, and Zheng (2005) find that funds whose portfolios are more concentrated within certain industry groups tend to have better performance, and Goldman, Sun, and Zhou (2016) find better performance among funds that concentrate their portfolio on “the top one or two stocks within each industry sector.” More generally, portfolios that are relatively concentrated have been found to predict better performance (Huij and Derwall, 2011; Hiraki, Liu, and Wang, 2015; Choi, Fedenia, Skiba, and Sokolyk, 2017; and Fulkerson and Riley, 2019), although that finding is not universal (Sapp and Yan, 2008).

Other studies look at both past returns and holdings. For example, Kacperczyk, Sialm, and Zheng (2008) show that the returns generated by the fund’s trading activity over a past period—as measured by the difference between a fund’s actual returns over the period and the hypothetical returns generated by keeping the fund’s portfolio holdings constant—predicts performance. Groenborg, Lunde, Timmermann, and Wermers (2018) likewise use holdings and returns in combination to predict subsequent performance.

Looking beyond holdings and returns, a manager’s personal history has been found to predict performance. Chuprinin and Sosyura (2018) find that managers born into poorer families tend to outperform managers born into richer families. In early work, Shukla and Singh (1994), Golec (1996), and Chevalier and Ellison (1999) find many aspects of fund manager education to be predictive. However, Gottesman and Morey (2006) show that, among educational measures, only the quality of the manager’s MBA program is related to future performance.

Ownership stakes have also been found to be predictive of fund performance. Khorana, Servaes, and Wedge (2007) show that fund performance improves “by about 3 basis points for each basis point of managerial ownership.” Likewise, Evans (2008) finds a positive relation between manager ownership and performance, and Cremers, Driessen, Maenhout, and Weinbaum (2009) show that funds with low ownership by fund directors tend to underperform.

### 3.4. Distinguishing the various skills of active managers

While the literature often refers to ‘skill’ as the generic ability to generate alpha, it also examines the variety of different skills managers actually use to create value for investors.

The skill that has received the most attention is the ability to select stocks. Daniel, Grinblatt, Titman, and Wermers (1997) and Wermers (2000) isolate the performance resulting from stock selection by studying the performance individual fund holdings. Each stock in a fund’s portfolio is compared to a benchmark consisting of stocks with matching characteristics (i.e., similar market capitalization, book-to-market ratio, and prior return). They find that, on average, funds select stocks that outperform the market; however, Fulkerson (2013) shows the outperformance resulting from this skill has declined somewhat through time. Jones and Shanken (2005) find that, on average, funds “possess some skill in selecting stocks,” although the benefits from that skill are not enough to offset expenses. Relatedly, Chen, Jegadeesh, and Wermers (2000) show that the stocks purchased by funds tend to have significantly higher returns than the stocks sold by those funds, and Chen, Desai, and Krishnamurthy (2013) find significant stock selection ability with respect to short selling.

Subsequent research explores various nuances with regard to stock-picking. Duan, Hu, and Mclean (2009) find that managers demonstrate greater stock selection ability among stocks with high idiosyncratic volatility, and Fulkerson (2013) finds that the majority of stock selection skill tends to come from selecting stocks within industries. Cohen, Polk, and Silli (2010) find that stock-picking skills are particularly pronounced in the largest positions in a fund’s portfolio.

Other studies aim to identify the specific sources of stock selection ability. For example, Baker, Litov, Wachter, and Wurgler (2010) and Cai and Lau (2015) show that managers can predict earnings; Nain and Yao (2013) show evidence that managers can predict post-merger performance; and Koch (2017) shows that some managers add value by transacting before other mutual funds. Further, Chen, Gao, Zhang, and Zhu (2018) show the stock selection skill is amplified by prior work experience as an industry analyst, while Cohen, Frazzini, and Malloy (2008) show evidence that managers leverage their education networks to identify profitable opportunities.

Geographical location appears to play an important role in managers’ stock selection. Coval and Moskowitz (1999) show that managers have a preference for investing in local firms for which they may have an information advantage. In times of high aggregate market volatility, Giannetti and Laeven (2016) find that managers are also more likely to liquidate their positions in geographically-remote locations. Social interactions with local managers may play a role as well. Hong, Kubik, and Stein (2005) find that managers are more likely to buy a stock if other managers in the same city are also buying that stock. This behavior appears rational given that Pool, Stoffman, and Yonker (2015) show that “a long-short strategy composed of stocks purchased minus sold by neighboring managers delivers positive risk-adjusted returns.”

Studies may underestimate stock selection skill if they do not account for the ‘type’ of trade or the reason for a trade. Alexander, Cici, and Gibson (2007) show that purchases motivated by valuation considerations outperform the market by a significant margin, but that purchases motivated by the need to invest excess cash from fund inflows do not. Similarly, Rohleder, Schulte, Stryca, and Wilkens (2018) show that valuation-motivated buys significantly outperform and that valuation-

motivated sells significantly underperform. Da, Gao, and Jagannathan (2011) find that “impatient informed trading positions” generate most of the alpha in the portfolios of funds with positive expected alpha.

While stock selection skill is typically examined on a fund-by-fund basis, the aggregate skill of the fund industry has also been studied. Wermers, Yao, and Zhao (2012) develop a method to efficiently aggregate holdings across funds and show that when the combined position in a stock increases, the stock subsequently outperforms. Gupta-Mukherjee (2013) shows that “a portfolio based on representative beliefs of a group of managers investing in similar assets outperforms passive benchmarks, indicating that they reflect informed beliefs.” Jiang, Verbeek, and Wang (2014) find that the stocks overweighted by active managers as a whole tend to outperform the stocks underweighted by 7% per year after adjusting for risk. As a group, fund managers appear to accurately anticipate future individual stock returns.

Despite these substantial research efforts, precisely estimating a manager’s stock selection skill is difficult. On the one hand, Puckett and Yan (2011) find that many estimates of stock selection skill are downward biased, because the quarterly fund holdings data used in most studies does not account for interim trading. On the other hand, Nicolosi (2009) argues that such estimates are upward biased because of the assumptions about trading made when using that same quarterly data, while Chakrabarty, Moulton, and Trzcinka (2017) find that the short-term trades that are often missed when using quarterly data tend to perform poorly.

Another skill that a manager can use to add value is market timing, which academics usually define as the ability to correctly predict the future direction of the overall market or of sub-markets. Jiang, Yao, and Yu (2007) find that active funds tend to have positive timing ability, and Kaplan and Sensoy (2005) find that active funds tend to increase their benchmark exposure prior to positive benchmark returns. Mamaysky, Spiegel, and Zhang (2008) show that “a subset of [funds] (perhaps as high as 20%)” are able to time the market. Along similar lines, Busse (1999) shows that funds can time changes in market volatility.

Unfortunately, because of data limitations, testing for market timing ability is particularly difficult. The use of quarterly holdings is common, but Elton, Gruber, and Blake (2012) find more evidence of timing ability using monthly holdings, which are not widely available to researchers. The use of monthly fund returns is likewise common, but Bollen and Busse (2001) find that “mutual funds exhibit significant timing ability more often in daily tests than in monthly tests.” Similarly, Goetzmann, Ingersoll, and Ivkovic (2000) document the difficulty of accurately measuring timing ability using monthly returns if the fund manager is making daily timing decisions.

Apart from selection and timing, the literature has found that active managers have other ways to add value. Some managers handle information effectively. Kacperczyk and Seru (2007) show that skilled managers tend to be less reliant on new public information, such as the information released in earnings announcements, when making investment decisions. Similarly, Cullen, Gasbarro, and Monroe (2010) find that funds that trade counter to public information tend to exhibit superior average performance, because they have relevant private information. The type of publicly-released information also seems to matter. Chuprinin, Gaspar, and Massa (2018) show that funds that trade in response to changes in quantitative information, rather than qualitative information, tend to perform better.

Other managers add value through corporate oversight. Iliev and Lowry (2015) show that managers who directly engage on governance issues, rather than relying on the recommendations of Institutional Shareholder Services (ISS), perform better. However, Duan and Jiao (2016) find that many funds ‘vote with their feet’ by selling positions rather than try to influence governance through voting.

More practically, some managers add value through tax management. Sialm and Starks (2012) show that funds held primarily by taxable investors tend to select investment strategies that result in lower taxes, and Gibson, Safieddine, and Titman (2000) show evidence of funds engaging in tax-motivated trades. This tax management is valued by investors. Bergstresser and Poterba (2002) find that “after-tax returns have more explanatory power than pretax returns in explaining inflows” to mutual funds.

Finally, managers can add value by maintaining a disciplined investment approach. Singal and Xu (2011) “find that about 30% of all funds exhibit some degree of disposition behavior and that such funds underperform compared to funds that are not disposition-prone by 4-6% per year.”<sup>8</sup> Managers unable to avoid this bias “have significantly higher rates of failure than other funds,” as investors tend to avoid such funds. Cici (2012) shows that “learning effects have reduced the manifestation of the disposition effect over time, implying that academic research has influenced industry practices.” More generally, Del Guercio and Reuter (2014) show that investor monitoring of fund behavior is important, as funds with low monitoring tend to significantly underperform.

### **3.5. When are managers’ skills most useful?**

As described in the previous sections, managers create value through active management using a number of skills. However, the value to investors of these skills is affected by many factors, including market conditions, the competitive environment, and fund structure. In this section we consider the factors that may increase or decrease the value of active management.

One important factor in determining the value of skill is the variation in the number of opportunities for profitable investments. Pastor, Stambaugh, and Taylor (2017) show that funds perform better in periods after they have increased trading and that overall trading within the industry predicts performance. They hypothesize that funds vary their trading depending on the number of profitable opportunities available in the market. Along a similar line, von Reibnitz (2018) finds that funds perform better in periods when there is greater variation in returns among stocks, and Dong, Feng, and Sadka (2018) find that “the ability of fund managers to create value depends on market liquidity conditions.”<sup>9</sup>

The value of both stock selection and market timing ability varies with market and economic conditions. Kacperczyk, Van Nieuwerburgh, and Veldkamp (2014) show that skilled funds time the market well during bear markets and pick stocks well during bull market. Studies that ignore

---

<sup>8</sup>The disposition effect refers to investors treating unrealized losses and unrealized gains differently. Investors tend to avoid selling assets with unrealized losses because they want to ‘get even’ before selling.

<sup>9</sup> de Silva, Sapra, and Thorley (2001) caution that performance evaluation requires adjustments for changes in “return dispersion over time” as “an excess return of  $\pm 10$  [percentage points] in a narrow-dispersion year like 1996 is a much more material indicator of performance than the same excess return in a wide-dispersion year like 1999.”

the impact of market conditions make managers as a whole appear less skilled. Kosowski (2011) finds that funds have negative risk-adjusted returns in expansion periods, but positive risk-adjusted returns in recession periods. Consequently, he states that many traditional models “understate the value added by active mutual fund managers in recessions.”

The level of competition also affects the value of a fund manager’s skill. Dyck, Lins, and Pomorski (2013) find that the value of active management is greater in less competitive asset markets, and Hoberg, Kumar, and Prabhala (2018) find that active funds investing in the United States perform better when they have a style that faces less competition from other active funds. However, lower competition across all dimensions does not lead to better performance for active funds. Cremers, Ferreira, Matos, and Starks (2016) examine a variety of international markets and show that active funds are more active, are lower cost, and perform better when competition from low-cost index funds is higher.

The structure of the fund’s managerial team appears to influence how value is created through active management. Dass, Nanda, and Wang (2013) find that solo managers tend to time the market well, while teams of managers tend to select stocks well. Goldman, Sun, and Zhou (2016) find that solo managers “have much more concentrated portfolios, tend to perform better, and have higher expense ratios than funds managed by multiple managers.” However, using more accurate data on team structure, Patel and Sarkissian (2017) show that “team-managed funds outperform single-managed funds across various performance metrics.” Overall, it is unclear whether a team or solo manager adds more value.

Finally, the structure of manager incentives may matter. Elton, Gruber, and Blake (2003) show that management incentive fees are related to better stock-picking, although it may also lead to increased risk. Massa and Patgiri (2009) find that high-incentive contracts are associated with both increased risk-taking and higher risk-adjusted returns. Conversely, Golec and Starks (2004) identify no evidence of increased risk-taking, and Drago, Lazzari, and Navone (2010) find no statistically significant effect on risk or return. Ma, Tang, and Gomez (2018) demonstrate that there is substantial variation in managers’ total compensation contracts, but “find little evidence of differences in future performance associated with any particular compensation arrangement.” Outside of risk and return measures, Dass, Massa, and Patgiri (2008) find that the “incentives contained in the mutual funds’ advisory contracts induce managers to overcome their tendency [to make similar trades as other managers].”<sup>10</sup>

### **3.6. On the zero-sum game**

Finally, the theory that active management is a ‘zero-sum game’ may miss important nuances. Pedersen (2018) argues that this mathematical argument “is based on the implicit assumption that the market portfolio never changes, which does not hold in the real world because new shares are issued, others are repurchased, and indices are reconstituted so even passive investors must

---

<sup>10</sup> Jiang and Verardo (2018) measure “the tendency of fund managers to follow the trades of the institutional crowd” and find that the funds who do not follow the crowd outperform those that do “by over 2% per year.” Wei, Wermers, and Yao (2015) show that the contrarian funds “generate superior performance both when they trade against and with the [non-contrarian funds].”

regularly trade.” He claims that “active managers can be worth positive fees in aggregate” once this assumption is relaxed.

Index reconstitutions provide evidence of an opportunity for all active managers to benefit from the predictable trades of passive managers. Chen, Noronha, and Singal (2006) show that arbitrage activity around the reconstitution of the S&P 500 and the Russell 2000 costs investors in passively managed funds linked to those indexes about \$1 billion to \$2 billion per year, a significant transfer of wealth from passive funds to active funds.

### **3.7. An alternative measure of skill**

Berk and van Binsbergen (2015) propose that an active manager’s skill should be measured as the fund’s “gross excess return over its benchmark multiplied by [assets under management].” In other words, their measure estimates the value extracted by the manager from the capital markets in dollar terms. Using this ‘value added’ measure, they find that the average actively managed fund (across all fund styles, including non-equity) generates about \$3.2 million per year in value for investors. Further, they find that, on average, active funds have a net alpha of 36 basis points per year when compared to index mutual funds with similar styles. The comparison to the index mutual funds is particularly relevant, because those funds reflect the net cost of passive investing, as opposed to theoretical benchmarks that cannot easily be held by investors.

Berk and Van Binsbergen (2015) prefer their measure of gross skill because “the net alpha is determined in equilibrium by competition between investors, and not by the skill of managers.” They build on the theoretical model of the mutual fund industry developed by Berk and Green (2004). In that model, investors competitively allocate capital between funds, which are subject to diseconomies of scale—meaning that as a fund’s assets under management increases, its performance tends to decrease. In equilibrium in this model, skilled managers cannot have persistently positive net alpha because they will continue to receive new capital until they are no longer able to generate that positive alpha. In the end, all managers, regardless of their skill level, will have the same expected net alpha. Using this model, Berk (2005) labels as “myths” the ideas that (1) “the return investors earn in an actively managed fund measures the skill level of the manager managing that fund” and (2) “because the average return of all actively managed funds does not beat the market, the average manager is not skilled and therefore does not add value.”

However, for the Berk and Green (2004) model to be an accurate representation of the mutual fund industry, capital must be competitively allocated and significant diseconomies of scale must exist. Regarding the first requirement, there is a substantial body of research—starting with Chevalier and Ellison (1997) and Siri and Tufano (1998)—showing that capital is competitively allocated. While fund flows may not be fully efficient, the literature shows that funds that perform well generally receive inflows, and that funds that perform poorly tend to experience outflows. Wahal and Wang (2011) conclude that “the mutual fund market has evolved into one that displays the hallmark features of a competitive market.”

However, not all distribution channels are equally competitive. Funds can be sold either directly to investors or through a broker. Del Guercio and Reuter (2014) show allocations are less efficient for broker-sold funds, and Christoffersen, Evans, and Musto (2013) find that brokers’ incentives

(i.e., the size of fund loads) play a significant role in how brokers direct capital. These broker-sold funds, which Bergstresser, Chalmers, and Tufano (2009) find underperform “even before subtracting distribution costs,” suggest that the assumption of competitive capital allocation does not have complete empirical support. Instead of allocating capital purely on a comparison of fund assets to managerial skill, investors may give significant weight to factors such as trust (Gennaioli, Shleifer, and Vishny, 2015) or make different choices depending on their sophistication (e.g., Chalmers, Kaul, and Phillips, 2013, and Garleanu and Pedersen, 2018).<sup>11</sup> In short, market segmentation may undermine the first requirement of the Berk and Green (2004) model.

Regarding the second requirement, the academic literature has found mixed evidence for diseconomies of scale. Chen, Hong, Huang, and Kubik (2004); Yan (2008); Pastor, Stambaugh, and Taylor (2015); Harvey and Liu (2017); Zhu (2018); and McLemore (2019) find evidence of diseconomies of scale in the mutual fund industry, but Reuter and Zitzewitz (2015); Phillips, Pukthuanthong, and Rau (2018); and Adams, Hayunga, and Mansi (2018) find no relation between fund size and performance. Ferreira, Keswani, Miguel, and Ramos (2013) only find diseconomies of scale for certain types of funds. In particular, they find that “funds that invest overseas [are] not negatively affected by scale.” Therefore, given that the evidence with respect to diseconomies of scale is mixed and that the support for competitive capital allocation is incomplete, results based on the Berk and Green (2004) model must be interpreted carefully.

#### **4. Recent Research on Other Actively Managed Mutual Fund Styles**

The prior section considers the expansive literature on active management in U.S. equity funds that has been published since approximately 1997. A natural extension of that review is an examination of the literature on other fund types. Unfortunately, there has been far less research on the degree to which the conventional wisdom applies to other asset classes and investment approaches. Furthermore, the advances in the U.S. equity literature over the past 20 years have rarely been applied to other fund types. Here, we briefly consider what has been published in the areas of bond funds, hybrid funds, socially responsible funds, target date funds, real estate investment trust (REIT) funds, sector funds, and international funds.

##### **4.1. Bond funds**

Several studies provide evidence that active bond fund managers are skilled. By examining bond fund buying and selling, Moneta (2015) finds that bond funds generate alpha before costs. Gutierrez, Maxwell, and Xu (2009) find evidence of persistence in performance. As with U.S. equity funds, Amihud and Goyenko (2013) find that if common pricing factors explain a relatively low percentage of a bond fund’s past returns, then the future performance of that fund is likely to be relatively strong. Chen, Ferson, and Peters (2010) and Cici and Gibson (2012) find evidence of market timing ability, while Boney, Comer, and Kelly (2009) show that managers are generally

---

<sup>11</sup>Among other papers, Goetzmann and Peles (1997); Wilcox (2003); Elton, Gruber, and Busse (2004); Barber, Odean, and Zheng (2005); Cooper, Gulen, and Rau (2005); Frazzini and Lamont (2008); Sensoy (2009); Bailey, Kumar, and Ng (2011); Solomon, Soltes, and Sosyura (2014); Barber, Huang, and Odean (2016); and Phillips, Pukthuanthong, and Rau (2016) show more empirical results that appear inconsistent with investors acting rationally with respect to capital allocations.

unsuccessful at timing the yield curve. In general, bond fund managers appear to make informed decisions on behalf of their investors, consistent with the findings for U.S. equity funds.

However, bond funds appear to underperform, on average, when considering net returns. Moneta (2015) finds that, despite outperformance before fees, most categories of bond funds underperform after fees. Similar underperformance after fees is seen in U.S. government bond funds (Ferson, Henry, and Kisgen, 2006), U.S. corporate bond funds (Cici and Gibson, 2012), Canadian bond funds (Ayadi and Kryzanowski, 2011), and global bond funds (Detzler, 1999). Jones and Wermers (2011) find that the majority of bond funds failed to beat their benchmark during the 2008-2009 recession, and Choi and Kronlund (2018) find that corporate bond funds that “reach for yield” in low interest rate environments tend to have negative risk-adjusted returns.

An important caveat regarding the apparent negative average performance in actively managed bond funds is that, despite significant research in monetary economics and finance on interest rates and the returns on fixed income investments, there is no generally-accepted model for controlling for bond portfolio risks. As a result, a wide variety of models have been employed. Table 1 summarizes the models employed in past studies. Bai, Bali, and Wen (2019) develop a novel model focusing on downside risk, credit risk, and liquidity risk in corporate bonds, and this could potentially lead to new insights if applied to bond funds. Nevertheless, a gap currently exists in the literature regarding the best model for understanding the performance of bond funds.

**Table 1 – The variety of performance models in bond fund research**

<b>Performance model</b>	<b>Studies using model</b>
Small number of bond-specific pricing factors	Blake, Elton, and Gruber (1993)
Large number of bond-specific pricing factors	Bessembinder, Kahle, Maxwell, and Xu (2009)
Equity models augmented with bond-specific factors	Comer, Larrymore, and Rodriguez (2007) Chen, Hong, Jiang, and Kubik (2013) Goldstein, Jiang, and Ng (2017)
Conditional factor model	Ayadi and Kryzanowski (2011)
Stochastic discount factor	Ferson, Henry, and Kisgen (2006)
Active peer benchmarks	Hunter, Kandel, Kandel, and Wermers (2014)
Holdings	Cici and Gibson (2012) Moneta (2015)

## **4.2. Hybrid funds**

Hybrid funds are a mix of equity and fixed income assets. Most of the limited research on these funds focuses on the unique issues that arise when measuring their performance. For example, traditional equity factor models show a positive alpha, but Comer, Larrymore, and Rodriguez (2007) find that the inclusion of pricing factors related to bonds lead to a negative alpha in at least

one subsample. Herrmann and Scholz (2013) focus on style benchmarks to control for risk, and while they find no average outperformance, there is some short-term persistence in returns.

Since hybrid funds have the freedom to change their mix of stocks and bonds, managers of these funds may create value through superior market timing. Specifically, they may adjust the relative percentage of stocks and fixed income assets in their portfolio depending on which asset class they expect to earn the highest returns. Comer (2006) finds some timing ability in a few subsamples of hybrid funds, and Comer, Larrimore, and Rodriguez (2008) show outperformance by hybrid funds during bear markets.

### **4.3. Socially responsible, or ESG, funds**

Socially responsible funds—also known as environmental, social, and governance, or ESG, funds—have grown rapidly in recent years. Assets in these funds, including assets in new ESG ETFs, doubled between 2013 and 2015 (Davidson, 2015). Some investors prefer these funds because they either want to encourage pro-social corporate behavior or to avoid associating with firms that engage in certain behaviors. Riedl and Smeets (2017) find investors “are willing to forgo financial performance in order to invest in accordance with their social preferences.” There is an extensive body of research on ESG investing, but only a few of these studies specifically evaluate mutual funds.<sup>12</sup>

The research on socially responsible funds that does exist focuses on the potential negative impact of restricting a portfolio to a socially responsible strategy. In the context of Modern Portfolio Theory, a constrained portfolio would be dominated by an unconstrained portfolio, so excluding stocks based on ESG criteria should lead to a suboptimal portfolio. However, the empirical research on the actual impact of ESG filters on funds is split.

On the one hand, Grinold (1989); Adler and Kritzman (2008); and El Ghouli and Karoui (2017) find that the constraints create costs for investors. On the other hand, Hamilton, Jo, and Statman (1993); Statman (2000); Bauer, Koedijk, and Otten (2005); Renneboog, Ter Horst, and Zhang (2008a); Meziani (2014); and Dolvin, Fulkerson, and Krukover (2018) suggest that ESG funds are generally neither better nor worse than conventional funds on a risk-adjusted basis. Renneboog, Ter Horst, and Zhang (2008b) performed a thorough review of the ESG literature at that time and concluded that “there is little evidence that the risk-adjusted returns of [ESG funds in the US and UK] are different from those of conventional funds,” but that “[ESG] funds in Continental Europe and Asia-Pacific underperform benchmark portfolios.”

Despite the constraints of socially responsible investing, some research has found positive effects on performance. Henke (2016) considers bond mutual funds and finds that those following a socially responsible strategy outperform those following a conventional strategy by about 0.5%

---

<sup>12</sup>Several studies consider the value of investing in individual securities based on socially responsible criteria. For example, Hong and Kacperczyk (2009); Deng, Kang, and Sin Low (2013); Eccles, Ioannou, and Serafeim (2014); Kim, Li, and Li (2014); Flammer (2015); and Nagy, Kassam, and Lee (2016).

per year, and Nofsinger and Varma (2014) show that ESG funds outperform during market crises compared to comparable conventional funds.

#### **4.4. Target date funds**

Target date funds represent a growing percentage of assets under management, but it is unclear if active management in target date funds creates value for investors. Bodie and Treussard (2007) and Gomes, Kotlikoff and Viceira (2008) show that target date funds represent a significant improvement over the decisions being made by plan participants and that these funds create some value by holding lower expense share classes. However, Elton, Gruber, de Souza, and Blake (2015) demonstrate that target date fund managers have neither positive alpha nor timing ability, and Elton, Gruber, and de Souza (2018) find that target date funds may do worse than the general public when selecting managers.

One complication in evaluating the performance of target date funds arises from the shifting asset mix of the fund. Managers design a ‘glide path’ that changes the mix of investments as the target date becomes closer, but it isn’t clear what the most appropriate glide path should be. Balduzzi and Reuter (2019) find that target date funds with similar target dates often have distinctly different risk profiles and historical returns. Spitzer and Singh (2008) show that target date funds have begun to skew towards fixed income and that, around 2007, target date funds began to underperform relative to a portfolio equally split between stocks and bonds. Tang and Lin (2015) suggest that this trend is the result of some managers taking on too little risk, while Trammell (2009) suggest it comes from focusing the fund on the needs of employers with a particular type of workforce.

The shifting asset mix of target date funds makes them difficult to benchmark. Because their asset allocations change over time, Surz and Israelsen (2008) find that it is difficult to identify a single benchmark that can be consistently applied. The funds’ changing allocations are intended to create value for shareholders, but Branch and Qui (2011) show that glide paths and changing allocations have not clearly been better than a fixed allocation strategy.

#### **4.5. REIT funds**

Real estate investment trust, or REIT, mutual funds invest primarily in the equity issuances of exchange listed REITs. While REIT funds represent a relatively small part of the total mutual fund industry, many investors include these funds in their portfolios because of their high dividend yields and low correlations with the overall market. Fund managers can potentially add value by choosing REITs that outperform or by timing the relative performance of different types of REITs. However, the research on performance is mixed. A number of studies suggest no outperformance, while other studies suggest superior performance.<sup>13</sup>

---

<sup>13</sup>O’Neal and Page (2000); Lin and Yung (2004); Chiang, Kozhevnikov, Lee, and Wisen (2008); Derwall, Huij, Brounen, and Marquering (2009); and Hartzell, Muhlhofer, and Titman (2010) find no evidence of outperformance, while Gallo, Lockwood, and Rutherford (2000); Kallberg, Liu, and Trzcinka (2000); Fuerst and Marcato (2009); and Kaushik and Pennathur (2012) do find some evidence of outperformance.

#### 4.6. Sector funds

Research on active management often excludes sector funds, which means that there is limited current knowledge about them. Sector funds have restrictive mandates that provide a smaller scope through which a manager can add value, and the low diversification of sector funds necessarily leads to higher idiosyncratic risk. Dellva, DeMaskey, and Smith (2001) find evidence of stock-picking ability in sector funds, consistent with manager expertise in the sector, but neither they nor Kaushik, Pennathur, and Barnhart (2010) find any evidence that sector funds can time the market. One concern in evaluating these funds is that their performance is sensitive to the choice of benchmark, but Khorana and Nelling (1997) show that the return on the overall market still explains most of the returns for sector funds.

#### 4.7. International funds

International mutual funds have a larger set of opportunities than domestic funds. However, security markets in different countries have significant heterogeneity, with varying levels of transparency, liquidity, regulation, and investor protection. Forester and Karolyi (1999), among others, show that these differences help lead to higher correlations in local stock returns than in global stock returns. Even though Fama and French (2012, 2017) show that common return patterns exist in most markets and Eun, Huang, and Lai (2008) show an increasing correlation between markets over time, international mutual funds domiciled in the United States could add value by navigating the significant complexities that still exist when investing internationally.

Karolyi (2016) finds that only 16% of top academic studies examine non-U.S. markets, so it is not surprising that limited research exists on U.S.-domiciled international mutual funds. Kao, Cheng, and Chan (1998) find that international funds had a positive average alpha during the 1980s and 1990s, and Turtle and Zhang (2012) show positive alphas for emerging market funds during global bull markets. Hiraki, Liu, and Wang (2015) find that international funds that concentrate in specific countries and industries outperform more diversified funds. Fan and Addams (2012) and Breloer, Scholz, and Wilkens (2014) do not find evidence that top-performing international funds in the past continue to outperform in the future, but Droms and Walker (2001) do find some evidence of persistence. Eun, Huang, and Lai (2008) highlight the diversification value of small-cap international funds, although Didier, Rigobon, and Schmukler (2013) find that the funds themselves could be more diversified than they are.

Many unique factors make the process of assessing the value created by active management in international funds difficult. The approach used to calculate the daily net asset values of international funds in the past may cause distortions in the evaluation of the returns.<sup>14</sup> Comer and Rodriguez (2012) highlight issues with the benchmarking of international funds, particularly the

---

<sup>14</sup>Funds that invest in domestic assets can calculate their daily net asset value using that day's closing market prices. However, because of time zone differences, the prices used for international assets can be either stale or still fluctuating. Bhargava and Dubofsky (2001); Goetzmann, Ivokovic, and Rouwenhorst (2001); Bhargava, Bose, and Dubofsky (2003); Zitzewitz (2006); and Chua, Lai, and Wu (2008) show how this issue can make the net asset value inaccurate for international funds and demonstrate that short-term traders can exploit that inaccuracy. Since that research was conducted, however, changes in regulation and fund practices may have altered the viability of these 'time-zone arbitrage' strategies.

biases that result from the common use of the MSCI World Index. Dyck, Lins, and Pomorski (2013) show that the value of active management depends on the efficiency of the particular markets in which the fund invests, and Cremers, Ferreira, Matos, and Starks (2016) highlight that the level of competition between active managers—including competition from index funds and ETFs—varies significantly across international mutual fund markets. Finally, the complexities of international investing may generate additional constraints for managers, with Dubofsky (2010) finding that international funds have portfolios biased towards greater liquidity.

## **5. Important Questions**

We conclude our literature review by considering the current challenges researchers face in addressing the value of active management. Because of these challenges, several open questions remain, with many opportunities for future research. We discuss six topics in this section that, with further exploration, may refute or confirm the conventional wisdom on active management.

### **5.1. The appropriate model for evaluating fund performance**

Any measure of the value of active management must use a method of accounting for fund risk or factor exposure. Active managers typically create value when they deliver a higher return than a passive benchmark of equivalent risk. Therefore, conclusions about the value of active management only have merit if the benchmark used in the analysis is correct. The literature uses factor models, market index models, and holdings-based models, but they all have important limitations, as we outline in this section.

For mutual funds, the multi-factor model of Carhart (1997) is commonly used. That model attempts to account for returns that can be attributed to market, size, value, and momentum factors rather than fund manager skill. However, important critiques of this model have arisen. Huij and Verbeek (2009); Moreno and Rodriguez (2009); and Kadan and Liu (2014) highlight the shortcomings of this type of factor specification. Cremers, Petajisto, and Zitzewitz (2012) show that the construction of the size and value factors in the Carhart model implies that mutual funds should be compared to benchmarks with large weights (both positive and negative) on small-cap value stocks, despite those stocks being only a very minor part of the investment universe. This questionable comparison can “lead to biased alphas (in either direction).”

Furthermore, the factors used in Carhart (1997) may not be the appropriate set. Harvey, Liu, and Zhu (2016) and Hou, Xue, and Zhang (2017) identify hundreds of potential pricing factors that could be used, and the choice of factors has a significant effect on conclusions about fund performance. For example, Jordan and Riley (2015) show that including the new Fama and French (2015) factors explains the apparent outperformance of U.S. equity mutual funds with low volatility. However, despite the shortcomings of Carhart’s model, the literature has not settled on a broadly-accepted factor model to replace it.

Instead of a factor model, researchers can compare an active fund’s returns to a passive market index. If an active fund’s risk or factor exposures are the same as the index, then the manager of a fund adds value whenever the fund’s returns exceed the index’s returns. This type of benchmark is ubiquitous in practice. In the United States, the Securities and Exchange Commission (SEC)

requires that mutual funds disclose a benchmark index in their prospectuses to help investors evaluate fund performance. Several studies use benchmark-adjusted returns, and benchmark-adjusted returns are prevalent in industry reports, such as the SPIVA U.S. Scorecard from S&P Dow Jones Indices (Soe and Poirier, 2016), Morningstar's Active/Passive Barometer (Bryan, Boccellari, Johnson, and Rawson, 2015), and Vanguard's research white papers (Harbron, Roberts, and Rowley, 2017).

Unfortunately, self-declared benchmarks often do not represent the actual investment style of the fund. Sensoy (2009) and Cremers, Fulkerson, and Riley (2018) find that 25% to 30% of funds have self-declared benchmarks that are a poor match for the fund. The later paper shows that the self-declared benchmarks of those funds typically have less risk than the funds themselves, which leads to fund performance being overstated, on average. Further, self-declared benchmarks rarely change, even though fund managers frequently change their style over time.<sup>15</sup> Alternative methods of determining the benchmark, such as the 'minimum active share' benchmark proposed by Cremers and Petajisto (2009), can be used to improve this method of evaluating performance.

A final alternative for risk adjustment is to focus on fund holdings and evaluate performance on a position-by-position basis. Daniel, Grinblatt, Titman, and Wermers (1997) and Wermers (2000) provide some of the first holdings-based analyses of fund performance and find that, before costs, mutual funds tend to select stocks that outperform. Busse, Jiang, and Tang (2018) combine holdings-based returns with factor models to 'double-adjust' fund performance. While these methods are useful for calculating the value of active managers' decisions, evaluating funds based on the performance of their holdings has significant drawbacks. The holdings-implied performance may not accurately represent the actual returns realized by a fund's investors, due to trading costs and fees, and these methods cannot include the substantial trading activity that occurs between the dates when holdings reports are available.

## **5.2 Investor behavior with respect to fund performance**

While the prior subsection focused on the issue of measuring fund performance from an academic standpoint, identifying the performance measures that are considered by mutual fund investors when making their buy and sell decisions is a separate challenge. A long literature, starting with Chevalier and Ellison (1997) and Sirri and Tufano (1998), shows that investors pay significant attention to the historical performance of a fund and invest more in the highest performing funds. However, the precise measure of performance that investors use to make decisions is still being determined, as are the implications of that choice of performance measure.

Barber, Huang, and Odean (2016) and Berk and van Binsbergen (2016) show that the Sharpe (1964) and Lintner (1965) capital asset pricing model (CAPM) best explains the actual behavior of mutual fund investors. That is, the buying and selling decisions of mutual fund investors are best predicted by assuming that they estimate a fund's performance by adjusting just for risk relative to the overall market. This approach stands in contrast to the more complex factor models

---

<sup>15</sup>See, for example, diBartolomeo and Witkowski (1997); Kim, Shukla, and Tomas (2000); Elton, Gruber, and Blake (2003); Hirt, Tolani, and Philips (2015); Bams, Otten, and Ramezanifar (2017); and Mateus, Mateus, and Todorovic (2017).

often used in the academic literature, such as the Carhart (1997) model, which includes multiple factors in addition to risk relative to the overall market.

Berk and van Binsbergen (2016) claim that their results imply that the CAPM is the best model currently available to capture fund riskiness and estimate fund performance, but Barber, Huang, and Odean (2016) disagree. They argue that, when measuring fund manager skill, accounting for “all factor-related returns” is important. More generally, they claim that they “do not believe the results in either paper provide much evidence regarding the true asset pricing model.”

Outside of factor models, Sensoy (2009) and Cremers, Fulkerson, and Riley (2018) show that investors also consider performance relative to passive benchmark indices when making decisions. The benchmark that funds are required to provide by the SEC is particularly important because investors appear to use that benchmark to make buying and selling choices even when it is a poor match for the fund’s investment style. While this observation may be consistent with other evidence that mutual fund investors are not perfectly rational (e.g., Cooper, Gulen, and Rau, 2005), it may also be a result of the barriers investors face. Sirri and Tufano (1998) and Hortacsu and Syverson (2004) describe these barriers as ‘search costs’—meaning the money and time required to research investments—and conclude that these costs may encourage investors to use simpler criteria and discourage them from using data that is difficult to acquire or interpret.

### **5.3 Limitations of the holdings data**

The lack of transparency regarding the process of managing fund portfolios creates a further limitation on the assessment of the value of active management. Most research uses data on fund holdings from Thomson Reuters, but that database has three important limitations. First, the database only contains quarterly holdings reports. Second, it contains only equity positions. Third, as Schwarz and Potter (2016) show, it misses many reported holdings from mandated SEC filings, while including many voluntary filings that are not publicly available from the SEC. Together, those constraints limit the conclusions that researchers can draw about active management from available holdings data. The quarterly nature of the data appears to be its most limiting aspect. Elton, Gruber, Blake, Krasny, and Ozelge (2010) show that quarterly holdings miss many trades that occur during the quarter.

Apart from these data concerns, the holdings themselves may not actually represent the fund’s portfolio. Because fund managers know their positions will be publicly available, they may ‘window dress’ their portfolios by changing allocations near the end of a quarter. Danthine and Moresi (1998) and Wermers (2001) explain these changes as an effort to prevent front-running or free-riding on a manager’s investments ideas. Morey and O’Neal (2006) and Agarwal, Gay, and Ling (2014) suggest that managers change holdings to make the fund appear better informed to mutual fund investors.

Even if a fund’s holdings reflect its true strategy, Nicolosi (2009) and Fulkerson (2013) show that typical academic assumptions about when trading occurs can bias the measured performance of fund managers.

## **5.4 Limitations of manager data**

Despite the fact mutual funds are relatively easy to invest in and are heavily regulated, academic researchers do not have access to detailed data on fund managers and fund operations. With regard to fund managers, Massa, Reuter, and Zitzewitz (2010) discuss how the CRSP database, which is the most widely-used source of information in academic research, has very limited data on fund managers. Patel and Sarkissian (2017) show that Morningstar Direct has better data, but neither database makes it easy to track managers between funds, nor do they provide readily usable information on manager backgrounds and non-mutual fund activities (see, e.g., Gottesmann and Morey, 2006; Evans and Fahlenbrach, 2012; Kempf, Manconi, and Spalt, 2017; and Chen, Chen, Johnson, and Sardarli, 2017).

Even less information is available about the investment processes used by active managers to identify new opportunities and monitor their current positions. We are aware of no research that even summarizes those processes. Research in this area would require data on the key inputs into the processes—such as the number of analysts employed, the use of outside research, and the data sources—all of which is currently unavailable. Because of these data limitations, the literature has given almost no consideration to the role of process in value creation through active management. As a result, many questions related to active management remain unexplored.

## **5.5 Active management in multi-asset portfolios**

The bulk of this literature review considers the active management of mutual funds, but active management also occurs in multi-asset portfolios. In addition to maximizing performance within an asset class, a multi-asset portfolio manager also makes decisions about the amount of investment in each asset class. Current knowledge about the value of active management in multi-asset portfolios is limited to a relatively small amount of research on pension funds.

Brinson, Hood, and Beebower (1986) find that the decisions of pension fund managers explain only a small part of their funds' total returns. Dyck, Lins, and Pomorski (2013) show that pension funds underperform by 0.35% per year in U.S. markets, but outperform by 1.80% per year in emerging markets. Andonov, Bauer, and Cremers (2013) find that U.S. pension fund managers improve performance by 0.89% per year through their allocation, timing, and security selection activities. However, that improvement is largely explained by momentum and has significant diseconomies of scale.

While these studies provide some evidence that the active management of pension funds creates value, pension fund managers face unique constraints. Novy-Marx and Rauh (2011) show that public pension funds are biased towards riskier assets, because regulations allow funds holding riskier assets to have a higher liability discount rate. Higher discount rates enable public pension funds to report a better funding ratio to officials. Andonov, Bauer, and Cremers (2017) consider this regulatory incentive and find that underfunded pension funds increase their risk at the cost of decreased risk-adjusted performance. Because of these distinctive circumstances, applying results from pension funds to all multi-asset portfolios is difficult.

## 5.6 Impact of constraints on the value of active management

A final challenge in measuring the value of active management regards the impact of constraints on active managers. Theoretical models often assume that active managers are unconstrained and are able to allocate assets optimally to maximize risk-adjusted returns. In practice, active managers of mutual funds operate under many regulatory and institutional constraints that may affect their decisions and their ability to create value for investors—Clarke, de Silva, and Thorley (2002) note that any constraint will “limit a manager’s ability to transfer valuable information into portfolio positions.” Among other constraints, Almazan, Brown, Carlson, and Chapman (2004) find that mutual funds often have institutional restrictions on “borrowing, purchasing securities on margin, short-selling, holding individual equity options, trading in equity index futures, or purchasing restricted securities” beyond those imposed by the SEC. Likewise, Evans, Ferreira, and Porras Prado (2017) show that fund families often tightly restrict their individual funds’ investment opportunity sets. If these constraints are important, studies of active management in mutual funds may not be applicable to other actively managed investment vehicles, the value of active management in mutual funds may vary as the constraints change, and conclusions about active management using mutual fund data today may not be applicable in the future.

There has been some research on the impact of constraints on mutual fund managers. In particular, the literature focuses on two primary constraints: the requirement to provide daily liquidity and the need for regulatory compliance. Mutual funds provide daily liquidity to investors by buying and selling shares of the fund at net asset value at the end of each day. Offering this level of liquidity forces managers to maintain portfolios that will allow them to quickly raise cash for investors who want to exit the fund on any given day. The need to maintain liquidity has been shown to generate real costs for individual funds and can negatively impact both mutual funds as a whole and the overall market.<sup>16</sup> Managers can hold more cash or invest more in assets that are easily sold to better manage investor buying and selling, but that comes at the cost of deviating from their otherwise optimal asset allocation.<sup>17</sup>

Beyond the requirement to provide liquidity, mutual funds face many other regulatory requirements that could affect the value of active management. Funds must make a variety of disclosures, such as the previously discussed requirement to disclose holdings to the public, and funds are subject to investment restrictions, like limitations on leverage. In addition to the direct costs of compliance, these regulatory requirements can generate substantial indirect costs. For example, Parida and Teo (2018) show that more frequent portfolio disclosure lowers mutual fund performance by making it easier for other investors to ‘front run’ trades, and Dyakov and Verbeek (2013) show that “publicly available information of fund flows and holdings exposes mutual funds in distress to predatory trading.”

Estimating the total impact of these constraints on the value of active management is a daunting task. One approach is to look at the value of active management in less-constrained portfolios,

---

<sup>16</sup>Edelen (1999); Johnson (2004); Greene, Hodges, and Rakowski (2007); Dubofsky (2010); Rakowski (2010); and Fulkerson and Riley (2017) focus on the cost of providing liquidity at the individual fund level. Chen, Goldstein, and Jiang (2010); Coval and Stafford (2007); Dyakov and Verbeek (2013); Shive and Yun (2013); Goldstein, Jiang, and Ng (2017); and Parida and Teo (2018) have implications at the fund level but also discuss more general market impact.

<sup>17</sup>See Wermers (2000); Yan (2006); Nascimento and Powell (2010); Simutin (2014); and Chernenko and Sunderam (2016) for a discussion of the trade-offs associated with mutual fund cash holdings.

such as hedge funds and separate accounts. Though not completely unregulated, these investment vehicles are subject to fewer constraints than mutual funds. Kosowski, Naik, and Teo (2007) and Ibbotson, Chen, and Zhu (2011) suggest hedge funds have an alpha of 3% to 5% per year, indicating substantial value from active management in that industry; however, Aragon (2007); Fung, Hsieh, Naik, and Ramadorai (2008); Dichev and Yu (2011); and Joenväära, Kauppila, Kosowski, and Tolonen (2019) estimate that hedge funds have alphas of roughly zero. Separate accounts have received much less attention than hedge funds, but Busse, Goyal, and Wahal (2010) and Elton, Gruber, and Blake (2013) find that, on average, separate accounts outperform equivalent mutual funds.

Unfortunately, using this type of comparison to estimate the cost of constraints, or to determine the general applicability of mutual fund results, is perilous. The comparison with hedge funds is particularly difficult because there are many problems with the available data.<sup>18</sup> Granting those concerns, it is worth observing that Agarwal, Boyson, and Naik (2009); Clifford, Jordan, and Riley (2013); Huang and Wang (2013); Klement (2015); and Hartley (2017) each find that mutual funds that attempt to replicate ‘hedge fund style’ investment strategies (e.g., absolute return funds, alternative strategy funds, and market neutral funds) are unable to replicate the performance of actual hedge funds. These results support the idea that mutual fund managers have a more limited ability to create value for investors through active management because of constraints.

---

<sup>18</sup>See, for example, Getmansky, Lo, and Makarov (2004); Bollen and Pool (2009); Agarwal, Fos, and Jiang (2013); Aiken, Clifford, and Ellis (2013); Hodder, Jackwerth, and Kolokolova (2014); Jorion and Schwarz (2014a); Jorion and Schwarz (2014b); Patton, Ramadorai, and Streatfield (2015); and Dimmock and Gerken (2016).

## References

- Adams, John, Darren Hayunga, and Sattar Mansi. 2018. Diseconomies of scale in the actively-managed mutual fund industry: What do the outliers in the data tell us?. *Critical Finance Review* 7, 273-329.
- Adler, Timothy, and Mark Kritzman. 2008. The cost of socially responsible investing. *Journal of Portfolio Management* 35, 52-56.
- Agarwal, Vikas, Gerald Gay, and Leng Ling. 2014. Window dressing in mutual funds. *Review of Financial Studies* 27, 3133-3170.
- Agarwal, Vikas, Nicole Boyson, and Narayan Naik. 2009. Hedge funds for retail investors? An examination of hedged mutual funds. *Journal of Financial and Quantitative Analysis* 44, 273-305.
- Agarwal, Vikas, Vyacheslav Fos, and Wei Jiang. 2013. Inferring reporting-related biases in hedge fund databases from hedge fund equity holdings. *Management Science* 59, 1271-1289.
- Aiken, Adam, Christopher Clifford, and Jesse Ellis. 2013. Out of the dark: Hedge fund reporting biases and commercial databases. *Review of Financial Studies* 26, 208-243.
- Alexander, Gordon, Gjergji Cici, and Scott Gibson. 2007. Does motivation matter when assessing trade performance? An analysis of mutual funds. *Review of Financial Studies* 20, 125-150.
- Almazan, Andres, Keith Brown, Murray Carlson, and David Chapman. 2004. Why constrain your mutual fund manager?. *Journal of Financial Economics* 73, 289-321.
- Amihud, Yakov, and Ruslan Goyenko. 2013. Mutual fund's  $R^2$  as predictor of performance. *Review of Financial Studies* 26, 667-694.
- Andonov, Aleksandar, Rob Bauer, and Martijn Cremers. 2013. Can large pension funds beat the market? Asset allocation, market timing, security selection, and the limits of liquidity. Working paper.
- Andonov, Aleksandar, Rob Bauer, and Martijn Cremers. 2017. Pension fund allocation and liability discount rates. *Review of Financial Studies* 30, 2555-2595.
- Andrikogiannopoulou, Angie, and Filippos Papakonstantinou. 2019. Reassessing false discoveries in mutual fund performance: Skill, luck, or lack of power?. *Journal of Finance*, forthcoming.
- Aragon, George. 2007. Share restrictions and asset pricing: Evidence from the hedge fund industry. *Journal of Financial Economics* 83, 33-58.
- Ayadi, Mohamed, and Lawrence Kryzanowski. 2011. Fixed-income fund performance: Role of luck and ability in tail membership. *Journal of Empirical Finance* 18, 379-392.
- Avramov, Doron, and Russ Wermers. 2006. Investing in mutual funds when returns are predictable. *Journal of Financial Economics* 81, 339-377.

- Bai, Jennie, Turan Balie, and Quan Wan. 2019. Common risk factors in the cross-section of corporate bond returns. *Journal of Financial Economics* 131, 619-642.
- Bailey, Warren, Alok Kumar, and David Ng. 2011. Behavioral biases of mutual fund investors. *Journal of Financial Economics* 102, 1-27.
- Baker, Malcolm, Lubomir Litov, Jessica Wachter, and Jeffrey Wurgler. 2010. Can mutual fund managers pick stocks? Evidence from their trades prior to earnings announcements. *Journal of Financial and Quantitative Analysis* 45, 1111-1131.
- Baks, Klaas, Andrew Metrick, and Jessica Wachter. 2001. Should investors avoid all actively managed mutual funds? A study in bayesian performance evaluation. *Journal of Finance* 56, 45-85.
- Balduzzi, Pierluigi, and Jonathan Reuter. 2019. Heterogeneity in target date funds: Strategic risk-taking or risk matching?. *Review of Financial Studies* 32, 300-337.
- Bams, Dennis, Roger Otten, and Ehsan Ramezanifar. 2017. Investment style misclassification and mutual fund performance. Working paper.
- Barber, Brad, Terrance Odean, and Lu Zheng. 2005. Out of sight, out of mind: The effect of expenses on mutual fund flows. *Journal of Business* 78, 2095-2119.
- Barber, Brad, Xing Huang, and Terrance Odean. 2016. Which factors matter to investors? Evidence from mutual fund flows. *Review of Financial Studies* 29, 2600-2642.
- Barras, Laurent, Olivier Scaillet, and Russ Wermers. 2010. False discoveries in mutual fund performance: Measuring luck in estimated alphas. *Journal of Finance* 65, 179-216.
- Bauer, Rob, Kees Koedijk, and Roger Otten. 2005. International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance* 29, 1751-1767.
- Bergstresser, Daniel, and James Poterba. 2002. Do after-tax returns affect mutual fund inflows? *Journal of Financial Economics* 63, 381-414.
- Bergstresser, Daniel, John Chalmers, and Peter Tufano. 2009. Assessing the costs and benefits of brokers in the mutual fund industry. *Review of Financial Studies* 22, 4129-4156.
- Berk, Jonathan, and Jules van Binsbergen. 2015. Measuring skill in the mutual fund industry. *Journal of Financial Economics* 118, 1-20.
- Berk, Jonathan, and Jules van Binsbergen. 2016. Assessing asset pricing models using revealed preference. *Journal of Financial Economics* 119, 1-23.
- Berk, Jonathan, and Richard Green. 2004. Mutual fund flows and performance in rational markets. *Journal of Political Economy* 112, 1269-1295.

- Berk, Jonathan, Jules van Binsbergen, and Binying Liu. 2017. Matching capital and labor. *Journal of Finance* 72, 2467-2504.
- Berk, Jonathan. 2005. Five myths of active portfolio management. *Journal of Portfolio Management* 31, 27-31.
- Bernstein, Peter. 1998. Where, oh where are the .400 hitters of yesteryear? *Financial Analysts Journal* 54, 6-14.
- Bessembinder, Hendrik, Kathleen Kahle, William Maxwell, and Danielle Xu. 2009. Measuring abnormal bond performance. *Review of Financial Studies* 22, 4219-4258.
- Bessembinder, Hendrik, William Maxwell, and Kumar Venkataraman. 2006. Market transparency, liquidity externalities, and institutional trading costs in corporate bonds. *Journal of Financial Economics* 82, 251-288.
- Bhargava, Rahul, and David Dubofsky. 2001. A note on fair value pricing of mutual funds. *Journal of Banking & Finance* 25, 339-354.
- Bhargava, Rahul, Ann Bose, and David Dubofsky. 2003. Exploiting international stock market correlations with open-end international mutual funds. *Journal of Business Finance & Accounting* 25, 765-773.
- Blake, Christopher, Edwin Elton, and Martin Gruber. 1993. The performance of bond mutual funds. *Journal of Business* 66, 371-403.
- Bodie, Zvi, and Jonathan Treussard. 2007. Making investment choices as simple as possible, but not simpler. *Financial Analysts Journal* 63, 42-47.
- Bogle, John. 2005. The relentless rules of humble arithmetic. *Financial Analysts Journal* 61, 22-35.
- Bollen, Nicolas, and Jeffrey Busse. 2001. On the timing ability of mutual fund managers. *Journal of Finance* 56, 1075-1094.
- Bollen, Nicolas, and Jeffrey Busse. 2005. Short-term persistence in mutual fund performance. *Review of Financial Studies* 18, 569-597.
- Bollen, Nicolas, and Veronika Pool. 2009. Do hedge fund managers misreport returns? Evidence from the pooled distribution. *Journal of Finance* 64, 2257-2288.
- Boney, Vaneesha, George Comer, and Lynne Kelly. 2009. Timing the investment grade securities market: Evidence from high quality bond funds. *Journal of Empirical Finance* 16, 55-69.
- Branch, Ben, and Liping Qiu. 2011. Exploring the pros and cons of target date funds. *Financial Services Review* 20, 95-111.

- Breloer, Bernhard, Hendrik Scholz, and Marco Wilkens. 2014. Performance of international and global equity mutual funds: Do country momentum and sector momentum matter? *Journal of Banking & Finance* 43, 58-77.
- Brinson, Gary, Randolph Hood, and Gilbert Beebower. 1986. Determinants of portfolio performance. *Financial Analysts Journal* 42, 39-44.
- Brown, David, and Shaun William Davies. 2017. Moral hazard in active asset management. *Journal of Financial Economics* 125, 311-325.
- Brown, Stephen, and William Goetzmann. 1995. Performance persistence. *Journal of Finance* 50, 679-698.
- Brown, Stephen, William Goetzmann, Roger Ibbotson, and Stephen Ross. 1992. Survivorship bias in performance studies. *Review of Financial Studies* 5, 553-580.
- Bryan, Alex, Thomas Boccellari, Ben Johnson, and Michael Rawson. 2015. Morningstar's active/passive barometer: A new yardstick for an old debate. Morningstar white paper.
- Buffett, Warren. 2006. 2005 Chairman's Letter.
- Busse, Jeffrey, Amit Goyal, and Sunil Wahal. 2010. Performance and persistence in institutional investment management. *Journal of Finance* 65, 765-790.
- Busse, Jeffrey, and Paul Irvine. 2006. Bayesian alphas and mutual fund persistence. *Journal of Finance* 61, 2251-2288.
- Busse, Jeffrey, Lei Jiang, and Yuehua Tang. 2018. Double-adjusted mutual fund performance. Working paper.
- Busse, Jeffrey. 1999. Volatility timing in mutual funds: Evidence from daily returns. *Review of Financial Studies* 12, 1009-1041.
- Cai, Yu, and Sie Ting Lau. 2015. Informed trading around earnings and mutual fund alphas. *Journal of Banking & Finance* 60, 168-180.
- Carhart, Mark. 1997. On persistence in mutual fund performance. *Journal of Finance* 52, 57-82.
- Chakrabarty, Bidisha, Pamela Moulton, and Charles Trzcinka. 2017. The performance of short-term institutional trades. *Journal of Financial and Quantitative Analysis* 52, 1403-1428.
- Chalmers, John, Aditya Kaul, and Blake Phillips. 2013. The wisdom of crowds: Mutual fund investors' aggregate asset allocation decisions. *Journal of Banking & Finance* 37, 3318-3333.
- Chen, Fan, Li-Wen Chen, Hardy Johnson, and Sabuhi Sardarli. 2017. Tailored versus mass produced: Portfolio managers concurrently managing separately managed accounts and mutual funds. *Financial Review* 52, 531-561.

- Chen, Honghui, Gregory Noronha, and Vijay Singal. 2006. Index changes and losses to index funds investors. *Financial Analysts Journal* 62, 31-47.
- Chen, Honghui, Hemang Desai, and Srinivasan Krishnamurthy. 2013. A first look at mutual funds that use short sales. *Journal of Financial and Quantitative Analysis* 48, 761-787.
- Chen, Hsiu-Lang, Narasimhan Jegadeesh, and Russ Wermers. 2000. The value of active mutual fund management: An examination of the stockholdings and trades of fund managers. *Journal of Financial and Quantitative Analysis* 35, 343-368.
- Chen, Joseph, Harrison Hong, Ming Huang, and Jeffrey Kubik. 2004. Does fund size erode mutual fund performance? The role of liquidity and organization. *American Economic Review* 94, 1276-1302.
- Chen, Joseph, Harrison Hong, Wenxi Jiang, and Jeffrey Kubik. 2013. Outsourcing mutual fund management: Firm boundaries, incentives, and performance. *Journal of Finance* 68, 523-558.
- Chen, Li-Win, and Fan Chen. 2009. Does concurrent management of mutual and hedge funds create conflicts of interest? *Journal of Banking & Finance* 33, 1423-1433.
- Chen, Qi, Itay Goldstein, and Wei Jiang. 2010. Payoff complementarities and financial fragility: Evidence from mutual fund outflows. *Journal of Financial Economics* 97, 239-262.
- Chen, Rui, Zhennan Gao, Xueyong Zhang, and Min Zhu. 2018. Mutual fund managers' prior work experience and their investment skill. *Financial Management* 47, 3-24.
- Chen, Yong, Wayne Ferson, and Helen Peters. 2010. Measuring the timing ability and performance of bond mutual funds. *Journal of Financial Economics* 98, 72-89.
- Chernenko, Sergey, and Adi Sunderam. 2016. Liquidity transformation in asset management: Evidence from the cash holdings of mutual funds. Working paper.
- Chevalier, Judith, and Glenn Ellison. 1997. Risk taking by mutual funds as a response to incentives. *Journal of Political Economy* 105, 1167-1200.
- Chevalier, Judith, and Glenn Ellison. 1999. Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance* 54, 875-899.
- Chiang, Kevin, Kirill Kozhevnikov, Ming-Long Lee, and Craig Wisen. 2008. Further evidence on the performance of funds of funds: The case of real estate mutual funds. *Real Estate Economics* 36, 47-61.
- Choi, Nicole, Mark Fedenia, Hilla Skiba, and Tatyana Sokolyk. 2017. Portfolio concentration and performance of institutional investors worldwide. *Journal of Financial Economics* 123, 189-208.
- Chordia, Tarun, Richard Roll, and Avanidhar Subrahmanyam. 2008. Liquidity and market efficiency. *Journal of Financial Economics* 87, 249-268.

- Chordia, Tarun, Richard Roll, and Avanidhar Subrahmanyam. 2011. Recent trends in trading activity and market quality. *Journal of Financial Economics* 101, 243-263.
- Christoffersen, Susan, Richard Evans, and David Musto. 2013. What do consumers' fund flows maximize? Evidence from their brokers' incentives. *Journal of Finance* 68, 201-235.
- Chua, Choong Tze, Sandy Lai, and Yangru Wu. 2008. Effective fair pricing of international mutual funds. *Journal of Banking & Finance* 32, 2307-2324.
- Chuprinin, Oleg, and Denis Sosyura. 2018. Family descent as a signal of managerial quality: Evidence from mutual funds. *Review of Financial Studies*, forthcoming.
- Chuprinin, Oleg, Sergio Gaspar, and Massimo Massa. 2018. Adjusting to the information environment: News tangibility and mutual fund performance. *Management Science*, forthcoming.
- Cici, Gjergji. 2012. The prevalence of the disposition effect in mutual funds' trades. *Journal of Financial and Quantitative Analysis* 47, 795-820.
- Cici, Gjergji, and Scott Gibson. 2012. The performance of corporate bond mutual funds: Evidence based on security-level holdings. *Journal of Financial and Quantitative Analysis* 47, 159-178.
- Cici, Gjergji, Scott Gibson, and Rabih Moussawi. 2010. Mutual fund performance when parent firms simultaneously manage hedge funds. *Journal of Financial Intermediation* 19, 169-187.
- Clarke, Roger, Harindra de Silva, and Steven Thorley. 2002. Portfolio constraints and the fundamental law of active management. *Financial Analysts Journal* 58, 48-66.
- Clifford, Christopher, Bradford Jordan, and Timothy Riley. 2013. Do absolute return mutual funds have absolute returns? *Journal of Investing* 22, 23-40.
- Cohen, Lauren, Andrea Frazzini, and Christopher Malloy. 2008. The small world of investing: Board connections and mutual fund returns. *Journal of Political Economy* 116, 951-979.
- Cohen, Randolph, Christopher Polk, and Bernhard Silli. 2010. Best idea. Working paper.
- Cohen, Tim, Brian Leite, Darby Nielson, and Andy Browder. 2014. Active share: A misunderstood measure in manager selection. Fidelity research.
- Comer, George, and Javier Rodriguez. 2012. International mutual funds: MSCI benchmarks and portfolio evaluation. Working paper.
- Comer, George, Norris Larrimore, and Javier Rodriguez. 2007. Controlling for fixed-income exposure in portfolio evaluation: Evidence from hybrid funds. *Review of Financial Studies* 22, 481-507.
- Comer, George, Norris Larrimore, and Javier Rodriguez. 2008. Measuring the value of active fund management: The case of hybrid mutual funds. *Managerial Finance* 35, 63-77.

- Comer, George. 2006. Hybrid mutual funds and market timing performance. *Journal of Business* 79, 771-797.
- Conrad, Jennifer, Sunil Wahal, and Jin Xiang. 2015. High-frequency quoting, trading, and the efficiency of prices. *Journal of Financial Economics* 116, 271-291.
- Cooper, Michael, Huseyin Gulen, and Raghavendra Rau. 2005. Changing names with style: Mutual fund name changes and their effects on fund flows. *Journal of Finance* 60, 2825-2858.
- Coval, Joshua, and Erik Stafford. 2007. Asset fire sales (and purchases) in equity markets. *Journal of Financial Economics* 86, 479-512.
- Coval, Joshua, and Tobias Moskowitz. 1999. Home bias at home: Local equity preference in domestic portfolios. *Journal of Finance* 54, 2045-2073.
- Cremers, Martijn, and Ankur Pareek. 2016. Patient capital outperformance: The investment skill of high active share managers who trade infrequently. *Journal of Financial Economics* 122, 288-306.
- Cremers, Martijn, and Antti Petajisto. 2009. How active is your fund manager? A new measure that predicts performance. *Review of Financial Studies* 22, 3329-3365.
- Cremers, Martijn, Antti Petajisto, and Eric Zitzewitz. 2012. Should benchmark indices have alpha? Revisiting performance evaluation. *Critical Finance Review* 2, 1-48.
- Cremers, Martijn, Jon Fulkerson, and Timothy Riley. 2018. Benchmark Discrepancies and Mutual Fund Performance Evaluation. Working paper.
- Cremers, Martijn, Joost Driessen, Pascal Maenhout, and David Weinbaum. 2009. Does skin in the game matter? Director incentives and governance in the mutual fund industry. *Journal of Financial and Quantitative Analysis* 44, 1345-1373.
- Cremers, Martijn, Miguel Ferreira, Pedro Matos, and Laura Starks. 2016. Indexing and active fund management: International evidence. *Journal of Financial Economics* 120, 539-560.
- Cremers, Martijn. 2017. Active share and the three pillars of active management: Skill, conviction, and opportunity. *Financial Analysts Journal* 73, 61-79.
- Cullen, Grant, Dominic Gasbarro, and Gary Monroe. 2010. Mutual fund trades and the value of contradictory private information. *Journal of Banking & Finance* 34, 378-387.
- Da, Zhi, Pengjie Gao, and Ravi Jagannathan. 2011. Impatient trading, liquidity provision, and stock selection by mutual funds. *Review of Financial Studies* 24, 675-720.
- Daniel, Kent, Mark Grinblatt, Sheridan Titman, and Russ Wermers. 1997. Measuring mutual fund performance with characteristic-based benchmarks. *Journal of Finance* 52, 1035-1058.

- Danthine, Jean-Pierre, and Serge Moresi. 1998. Front-running by mutual fund managers: A mixed bag. *Review of Finance* 2, 29-56.
- Dass, Nishant, Massimo Massa, and Rajdeep Patgiri. 2008. Mutual funds and bubbles: The surprising role of contractual incentives. *Review of Financial Studies* 21, 51-99.
- Dass, Nishant, Vikram Nanda, and Qinghai Wang. 2013. Allocation of decision rights and the investment strategy of mutual funds. *Journal of Financial Economics* 110, 254-277.
- Davidson, Alex. 2015. A guide to sustainable investing. *Wall Street Journal*. (November 8). Accessed online 4/17/18.
- Davis, James. 2001. Mutual fund performance and manager style. *Financial Analysts Journal* 57, 19-27.
- de Silva, Harindra, Steven Sapra, and Steven Thorley. 2001. Return dispersion and active management. *Financial Analysts Journal* 57, 29-42.
- Del Guercio, Diane, and Jonathan Reuter. 2014. Mutual fund performance and the incentive to generate alpha. *Journal of Finance* 69, 1673-1704.
- Del Guercio, Diane, Egemen Genc, and Hai Tran. 2018. Playing favorites: Conflicts of interest in mutual fund management. *Journal of Financial Economics*, forthcoming.
- Dellva, Wilfred, Andrew DeMaskey, and Colleen Smith. 2005. Selectivity and market timing performance of Fidelity sector mutual funds. *Financial Review* 36, 39-54.
- Deng, Xin, Jun-koo Kang, Buen Sin Low. 2013. Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics* 110, 87-109.
- Derwall, Jeroen, Joop Huij, Dirk Brounen, and Wessel Marquering. 2009. REIT momentum and the performance of real estate mutual funds. *Financial Analysts Journal* 65, 24-34.
- Detzler, Miranda. 1999. The performance of global bond mutual funds. *Journal of Banking & Finance* 23, 1195-1217.
- Deuskar, Prachi, Joshua Pollet, Jay Wang, and Lu Zheng. 2011. The good or the bad? Which mutual fund managers join hedge funds? *Review of Financial Studies* 24, 3008-2024.
- diBartolomeo, Dan, and Erik Witkowski. 1997. Mutual fund misclassification: Evidence based on style analysis. *Financial Analysts Journal* 53, 32-43.
- Dichev, Ilia, and Gwen Yu. 2011. Higher risk, lower returns: What hedge fund investors really earn. *Journal of Financial Economics* 100, 248-263.
- Didier, Tatiana, Roberto Rigobon, and Sergio Schmukler. 2013. Unexploited gains from international diversification: Patterns of portfolio holdings around the world. *Review of Economics and Statistics* 95, 1562-1583.

- Dimmock, Stephen, and William Gerken. 2016. Regulatory oversight and return misreporting by hedge funds. *Review of Finance* 20, 795-821.
- Dolvin, Steven, Jon Fulkerson, and Anna Krukover. 2018. Do “good guys” finish last? The relationship between Morningstar sustainability ratings and mutual fund performance. *Journal of Investing*, forthcoming.
- Dong, Xi, Shu Feng, and Ronnie Sadka. 2018. Liquidity risk and mutual fund performance. *Management Science*, forthcoming.
- Doshi, Hitesh, Redouane Elkamhi, and Mikhail Simutin. 2015. Managerial activeness and mutual fund performance. *Review of Asset Pricing Studies* 5, 156-184.
- Drago, Danilo, Valter Lazzari, and Marco Navone. 2010. Mutual fund incentive fees: Determinants and effects. *Financial Management* 39, 365-392.
- Droms, William, and David Walker. 2001. Performance persistence of international mutual funds. *Global Finance Journal* 12, 237-248.
- Duan, Ying, and Yawen Jiao. 2016. The role of mutual funds in corporate governance: Evidence from mutual funds’ proxy voting and trading behavior. *Journal of Financial and Quantitative Analysis* 51, 489-513.
- Duan, Ying, Gang Hu, and David McLean. 2009. When is stock picking likely to be successful? Evidence from mutual funds. *Financial Analysts Journal* 65, 55-66.
- Dubofsky, David. 2010. Mutual fund portfolio trading and investor flow. *Journal of Banking and Finance* 34, 802-812.
- Dyakov, Teodor, and Marno Verbeek. 2013. Front-running of mutual fund fire-sales. *Journal of Banking & Finance* 37, 4931-4942.
- Dyck, Alexander, Karl Lins, and Lukasz Pomorski. 2013. Does active management pay? New international evidence. *Review of Asset Pricing Studies* 3, 200-228.
- Eccles, Robert, Ioannis Ioannou, and George Serafeim. 2014. The impact of corporate sustainability on organizational processes and performance. *Management Science* 60, 2835-2857.
- Edelen, Roger. 1999. Investor flows and the assessed performance of open-end mutual funds. *Journal of Financial Economics* 53, 439-466.
- El Ghoul, Sadok, and Aymen Karoui. 2017. Does corporate social responsibility affect mutual fund performance and flows?. *Journal of Banking & Finance* 77, 53-63.
- Elton, Edwin, Martin Gruber, and Andre de Souza. 2018. Fund of funds selection of mutual funds. *Critical Finance Review*, forthcoming.

- Elton, Edwin, Martin Gruber, and Christopher Blake. 1996a. Survivor bias and mutual fund performance. *Review of Financial Studies* 9, 1097-1120.
- Elton, Edwin, Martin Gruber, and Christopher Blake. 1996b. The persistence of risk-adjusted mutual fund performance. *Journal of Business* 69, 133-157.
- Elton, Edwin, Martin Gruber, and Christopher Blake. 2003. Incentive fees and mutual funds. *Journal of Finance* 58, 779-804.
- Elton, Edwin, Martin Gruber, and Christopher Blake. 2012. An examination of mutual fund timing ability using monthly holdings data. *Review of Finance* 16, 619-645.
- Elton, Edwin, Martin Gruber, and Christopher Blake. 2013. The performance of separate accounts and collective investment trusts. *Review of Finance* 18, 1717-1742.
- Elton, Edwin, Martin Gruber, and Jeffrey Busse. 2004. Are investors rational? Choices among index funds. *Journal of Finance* 59, 261-288.
- Elton, Edwin, Martin Gruber, Andre de Souza, and Christopher Blake. 2015. Target date funds: Characteristics and performance. *Review of Asset Pricing Studies* 5, 254-272.
- Elton, Edwin, Martin Gruber, Christopher Blake, Yoel Krasny, and Sadi Ozelge. 2010. The effect of holdings data frequency on conclusions about mutual fund behavior. *Journal of Banking & Finance* 34, 912-922.
- Elton, Edwin, Martin Gruber, Sanjiv Das, and Matthew Hlavka. 1993. Efficiency with costly information: A reinterpretation of evidence from managed portfolios. *Review of Financial Studies* 6, 1-22.
- Eun, Cheol, Wei Huang, and Sandy Lai. 2008. International diversification with large- and small-cap stocks. *Journal of Financial and Quantitative Analysis* 43, 489-524.
- Evans, Allison. 2008. Portfolio manager ownership and mutual fund performance. *Financial Management* 37, 513-534.
- Evans, Richard, and Rudiger Fahlenbrach. 2012. Institutional investors and mutual fund governance: Evidence from retail-institutional fund twins. *Review of Financial Studies* 25, 3530-3571.
- Evans, Richard, Miguel Ferreira, and Melissa Porras Prado. 2017. Fund performance and equity lending: Why lend what you can sell?. *Review of Finance* 21, 1093-1121.
- Fama, Eugene, and Kenneth French. 2010. Luck versus skill in the cross-section of mutual fund performance. *Journal of Finance* 65, 1915-1947.
- Fama, Eugene, and Kenneth French. 2012. Size, value, and momentum in international stock returns. *Journal of Financial Economics* 105, 457-472.

- Fama, Eugene, and Kenneth French. 2015. A five-factor asset pricing model. *Journal of Financial Economics* 116, 1-22.
- Fama, Eugene, and Kenneth French. 2017. International tests of a five-factor asset pricing model. *Journal of Financial Economics* 123, 441-463.
- Fan, Yuhong, and Lon Addams. 2012. United States-based international mutual funds: Performance and persistence. *Financial Services Review* 21, 51-61.
- Fang, Jieyan, Alexander Kempf, and Monika Trapp. 2014. Fund manager allocation. *Journal of Financial Economics* 111, 661-674.
- Ferreira, Miguel, Aneel Keswani, António Miguel, and Sofia B. Ramos. 2013. The determinants of mutual fund performance: A cross-country study. *Review of Finance* 17, 483-525.
- Ferson, Wayne, Tyler Henry, and Darren Kisgen. 2006. Evaluating government bond fund performance with stochastic discount factors. *Review of Financial Studies* 19, 423-455.
- Flammer, Caroline. 2015. Does corporate social responsibility lead to superior financial performance? A regression discontinuity approach. *Management Science* 61, 2549-2568.
- Forester, Stephen, and Andrew Karolyi. 1999. The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States. *Journal of Finance* 54, 981-1013.
- Frazzini, Andrea, and Owen Lamont. 2008. Dumb money: Mutual fund flows and the cross-section of stock returns. *Journal of Financial Economics* 88, 299-322.
- Frazzini, Andrea, Jacques Friedman, and Lukasz Pomorski. 2016. Deactivating active share. *Financial Analysts Journal* 72, 14-21.
- French, Kenneth. 2008. Presidential address: The cost of active investing. *Journal of Finance* 63, 1537-1573.
- Fuerst, Franz, and Gianluca Marcato. 2009. Style analysis in real estate markets: Beyond the sector and region dichotomy. *Journal of Portfolio Management* 35, 104-117.
- Fulkerson, Jon, and Timothy Riley. 2017. Mutual fund liquidity costs. *Financial Management* 46, 359-375.
- Fulkerson, Jon, and Timothy Riley. 2019. Portfolio concentration and mutual fund performance. *Journal of Empirical Finance* 51, 1-16.
- Fulkerson, Jon. 2013. Is timing everything? The value of mutual fund manager trades. *Financial Management* 42, 243-261.
- Fung, William, David Hsieh, Narayan Naik, and Tarun Ramadorai. 2008. Hedge funds: Performance, risk, and capital formation. *Journal of Finance* 63, 1777-1803.

- Galiani, Sebastian, Paul Gertler, and Mauricio Romero. 2017. Incentives for replication in economics. Working paper.
- Gallo, John, and Larry Lockwood. 1999. Fund management changes and equity style shifts. *Financial Analysts Journal* 55, 44-52.
- Gallo, John, Larry Lockwood, and Ronald Rutherford. 2000. Asset allocation and the performance of real estate mutual funds. *Real Estate Economics* 28, 165-185.
- Garleanu, Nicolae, and Lasse Pedersen. 2018. Efficiently inefficient markets for assets and asset management. *Journal of Finance* 73, 1663-1712.
- Gennaioli, Nicola, Andrei Shleifer, and Robert Vishny. 2015. Money doctors. *Journal of Finance* 70, 91-114.
- Getmansky, Mila, Andrew Lo, and Igor Makarov. 2004. An econometric model of serial correlation and illiquidity in hedge fund returns. *Journal of Financial Economics* 74, 529-609.
- Giannetti, Mariassunta, and Luc Laeven. 2016. Local ownership, crises, and asset prices: Evidence from US mutual funds. *Review of Finance* 20, 947-978.
- Gibson, Scott, Assem Safieddine, and Sheridan Titman. 2000. Tax-motivated trading and price pressure: An analysis of mutual fund holdings. *Journal of Financial and Quantitative Analysis* 35, 369-386.
- Glode, Vincent. 2011. Why mutual funds “underperform”. *Journal of Financial Economics* 99, 546-559.
- Goetzmann, William, and Nadav Peles. 1997. Cognitive dissonance and mutual fund investors. *Journal of Financial Research* 20, 145-158.
- Goetzmann, William, and Roger Ibbotson. 1994. Do winners repeat? *Journal of Portfolio Management* 20, 9-18.
- Goetzmann, William, Jonathan Ingersoll, and Zoran Ivkovic. 2000. Monthly measurement of daily timers. *Journal of Financial and Quantitative Analysis* 35, 257-290.
- Goetzmann, William, Zoran Ivkovic, and K. Geert Rouwenhorst. 2001. Day trading international mutual funds: Evidence and policy solutions. *Journal of Financial and Quantitative Analysis* 36, 287-309.
- Goldman, Eitan, Zhenzhen Sun, and Thomas Zhou. 2016. The effect of management design on the portfolio concentration and performance of mutual funds. *Financial Analysts Journal* 72, 49-61.
- Goldstein, Itay, Hao Jiang, and David Ng. 2017. Investor flows and fragility in corporate bond funds. *Journal of Financial Economics* 126, 592-613.

Golec, Joseph, and Laura Starks. 2004. Performance fee contract change and mutual fund risk. *Journal of Financial Economics* 73, 93-118.

Golec, Joseph. 1996. The effects of mutual fund managers' characteristics on their portfolio performance, risk and fees. *Financial Services Review* 5, 133-147.

Gomes, Francisco, Laurence Kotlikoff, and Luis Viceira. 2008. Optimal life-cycle investing with flexible labor supply: A welfare analysis of life-cycle funds. *American Economic Review* 98, 297-303.

Gottesman, Aron, and Matthew Morey. 2006. Manager education and mutual fund performance. *Journal of Empirical Finance* 13, 145-182.

Goyal, Amit, and Sunil Wahal. 2008. The selection and termination of investment management firms by plan sponsors. *Journal of Finance* 63, 1805-1847.

Greene, Jason, Charles Hodges, and David Rakowski. 2007. Daily mutual fund flows and redemption policies. *Journal of Banking & Finance* 31, 3822-3842.

Grinblatt, Mark, and Sheridan Titman. 1992. The persistence of mutual fund performance. *Journal of Finance* 47, 1977-1984.

Grinold, Richard. 1989. The fundamental law of active management. *Journal of Portfolio Management* 15, 30-37.

Groenborg, Niels, Asger Lunde, Allan Timmermann, and Russ Wermers. 2018. Picking funds with confidence. Working paper.

Grossman, Sanford, and Joseph Stiglitz. 1980. On the impossibility of informationally efficient markets. *American Economic Review* 70, 393-408.

Gruber, Martin. 1996. Another puzzle: The growth of actively managed mutual funds. *Journal of Finance* 51, 783-801.

Gupta-Mukherjee, Swasti. 2013. When active fund managers deviate from their peers: Implications for fund performance. *Journal of Banking & Finance* 37, 1286-1305.

Gutierrez, Roberto, William Maxwell, and Danielle Xu. 2009. On economies of scale and persistent performance in corporate-bond mutual funds. Working paper.

Hamilton, Sally, Hoje Jo, and Meir Statman. 1993. Doing well while doing good? The investment performance of socially responsible mutual funds. *Financial Analysts Journal* 49, 62-66.

Harbron, Garrett, Daren Roberts, and James Rowley. 2017. The case for low-cost index-fund investing. Vanguard white paper.

Hartley, Jonathan. 2017. Liquid alternative mutual funds versus hedge funds. Working paper.

- Hartzell, Jay, Tobias Muhlhofer, and Sheridan Titman. 2010. Alternative benchmarks for evaluating mutual fund performance. *Real Estate Economics* 38, 121-154.
- Harvey, Campbell, and Yan Liu. 2017. Decreasing returns to scale, fund flows, and performance. Working paper.
- Harvey, Campbell, Yan Liu, and Heqing Zhu. 2016. ...and the cross-section of expected returns. *Review of Financial Studies* 29, 5-68.
- Hasbrouck, Joel. 2009. Trading costs and returns for U.S. equities: Estimating effective costs from daily data. *Journal of Finance* 64, 1445-1477.
- Hendricks, Darryll, Jayendu Patel, and Richard Zeckhauser. 1993. Hot hands in mutual funds: Short-run persistence of relative performance, 1974 – 1988. *Journal of Finance* 48, 93-130.
- Henke, Hans-Martin. 2016. The effect of social screening on bond mutual fund performance. *Journal of Banking & Finance* 67, 69-84.
- Herrmann, Ulf, and Hendrik Scholz. 2013. Short-term persistence in hybrid mutual fund performance: The role of style-shifting abilities. *Journal of Banking & Finance* 37, 2314-2328.
- Hiraki, Takato, Ming Liu, and Xue Wang. 2015. Country and industry concentration and the performance of international mutual funds. *Journal of Banking & Finance* 59, 297-310.
- Hirt, Joshua, Ravi Tolani, and Christopher Philips. 2015. Global equity benchmarks: Are prospectus benchmarks the correct barometer? Vanguard white paper.
- Hoberg, Gerard, Nitin Kumar, and Nagpurnanand Prabhala. 2018. Mutual fund competition, managerial skill, and alpha persistence. *Review of Financial Studies* 5, 1896-1929.
- Hodder, James, Jens Carsten Jackwerth, and Olga Kolokolova. 2014. Recovering delisting returns of hedge funds. *Journal of Financial and Quantitative Analysis* 49, 797-815.
- Hong, Harrison, and Marcin Kacperczyk. 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics* 93, 15-36.
- Hong, Harrison, Jeffrey Kubik, and Jeremy Stein. 2005. Thy neighbor's portfolio: Word-of-mouth effects in the holdings and trades of money managers. *Journal of Finance* 60, 2801-2824.
- Hortacsu, Ali, and Chad Syverson. 2004. Product differentiation, search costs, and competition in the mutual fund industry: A case study of S&P 500 index funds. *Quarterly Journal of Economics* 119, 403-456.
- Hou, Kewei, Chen Xue, and Lu Zhang. 2017. A comparison of new factor models. Working paper.
- Huang, Jing-Zhi, and Ying Wang. 2013. Should investors invest in hedge fund-like mutual funds? Evidence from the 2007 financial crisis. *Journal of Financial Intermediation* 22, 482-512.

- Huij, Joop, and Jeroen Derwall. 2011. Global equity fund performance, portfolio concentration, and the fundamental law of active management. *Journal of Banking & Finance* 35, 155-165.
- Huij, Joop, and Marno Verbeek. 2007. Cross-sectional learning and short-run persistence in mutual fund performance. *Journal of Banking & Finance* 31, 973-997.
- Huij, Joop, and Marno Verbeek. 2009. On the use of multifactor models to evaluate mutual fund performance. *Financial Management* 38, 75-102.
- Hunter, David, Eugene Kandel, Shmuel Kandel, and Russ Wermers. 2014. Mutual fund performance evaluation with active peer benchmarks. *Journal of Financial Economics* 112, 1-29.
- Ibbotson, Roger, Peng Chen, and Kevin Zhu. 2011. The ABCs of hedge funds: Alphas, betas, and costs. *Financial Analysts Journal* 67, 15-25.
- Iliev, Peter, and Michelle Lowry. 2015. Are mutual funds active voters? *Review of Financial Studies* 28, 446-485.
- Ioannidis, John. 2005. Why most published research findings are false. *PLoS Medicine* 2, 696-701.
- Ippolito, Richard. 1989. Efficiency with costly information: A study of mutual fund performance, 1965 – 1984. *Quarterly Journal of Economics* 104, 1-23.
- Jegadeesh, Narasimhan, and Sheridan Titman. 1993. Returns to buying winners and selling losers: Implications for stock market efficiency. *Journal of Finance* 48, 65-91.
- Jensen, Michael. 1968. The performance of mutual funds in the period 1945-1964. *Journal of Finance* 23, 389-416.
- Jiang, George, Tong Yao, and Tong Yu. 2007. Do mutual funds time the market? Evidence from portfolio holdings. *Journal of Financial Economics* 86, 724-758.
- Jiang, Hao, and Michela Verardo. 2018. Does herding behavior reveal skill? An analysis of mutual fund performance. *Journal of Finance* 73, 2229-2269.
- Jiang, Hao, Marno Verbeek, and Yu Wang. 2014. Information content when mutual funds deviate from benchmarks. *Management Science* 60, 2038-2053.
- Joenväärä, Juha, Mikko Kauppila, Robert Kosowski, and Pekka Tolonen. 2019. Hedge fund performance: Are stylized facts sensitive to which database one uses?. *Critical Finance Review*, forthcoming.
- Johnson, Woodrow. 2004. Predictable investment horizons and wealth transfers among mutual fund shareholders. *Journal of Finance* 59, 1979-2012.
- Jones, Christopher, and Jay Shanken. 2005. Mutual fund performance with learning across funds. *Journal of Financial Economics* 78, 507-552.

- Jones, Robert, and Russ Wermers. 2011. Active management in mostly efficient markets. *Financial Analysts Journal* 67, 29-45.
- Jordan, Bradford, and Timothy Riley. 2015. Volatility and mutual fund manager skill. *Journal of Financial Economics* 118, 289-298.
- Jorion, Phillippe, and Christopher Schwarz. 2014a. Are hedge fund managers systematically misreporting? Or not? *Journal of Financial Economics* 111, 311-327.
- Jorion, Phillippe, and Christopher Schwarz. 2014b. The strategic listing decisions of hedge funds. *Journal of Financial and Quantitative Analysis* 49, 773-796.
- Kacperczyk, Marcin, and Amit Seru. 2007. Fund manager use of public information: New evidence on managerial skills. *Journal of Finance* 62, 485-528.
- Kacperczyk, Marcin, Clemens Sialm, and Lu Zheng. 2005. On the industry concentration of actively managed equity mutual funds. *Journal of Finance* 60, 1983-2011.
- Kacperczyk, Marcin, Clemens Sialm, and Lu Zheng. 2008. Unobserved actions of mutual funds. *Review of Financial Studies* 21, 2379-2416.
- Kacperczyk, Marcin, Stijn van Nieuwerburgh, and Laura Veldkamp. 2014. Time-varying fund manager skill. *Journal of Finance* 69, 1455-1484.
- Kadan, Ohad, and Fang Liu. 2014. Performance evaluation with high moments and disaster risk. *Journal of Financial Economics* 113, 131-155.
- Kallberg, Jarl, Crocker Liu, and Charles Trzcinka. 2000. The value added from investment managers: An examination of funds of REITs. *Journal of Financial and Quantitative Analysis* 35, 387-408.
- Kao, Wenchi, Louis Cheng, and Kam Chan. 1998. International mutual fund selectivity and market timing during up and down market conditions. *Financial Review* 33, 127-144.
- Kaplan, Steve, and Berk Sensoy. 2005. Do mutual funds time their benchmarks? Working paper.
- Karolyi, Andrew. 2016. Home bias, an academic puzzle. *Review of Finance* 20, 2049-2079.
- Kaushik, Abhay, and Anita Pennathur. 2012. An empirical examination of the performance of real estate mutual funds 1990-2008. *Financial Services Review* 21, 343-358.
- Kaushik, Abhay, Anita Pennathur, and Scott Barnhart. 2010. Market timing and the determinants of performance of sector funds over the business cycle. *Managerial Finance* 36, 583-602.
- Kempf, Elisabeth, Alberto Manconi, and Oliver Spalt. 2017. Learning by doing: The value of experience and the origins of skill for mutual fund managers. Working paper.
- Khorana, Ajay, and Edward Nelling. 1997. The performance, risk, and diversification of sector funds. *Financial Analysts Journal* 53, 62-74.

- Khorana, Ajay, Henri Servaes, and Lei Wedge. 2007. Portfolio manager ownership and fund performance. *Journal of Financial Economics* 85, 179-204.
- Khorana, Ajay. 2001. Performance changes following top management turnover: Evidence from open-end mutual funds. *Journal of Financial and Quantitative Analysis* 36, 371-393.
- Kim, Moon, Ravi Shukla, and Michael Tomas. 2000. Mutual fund objective misclassification. *Journal of Economics and Business* 52, 309-323.
- Kim, Yongtae, Haidan Li, and Siqi Li. 2014. Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance* 43, 1-13.
- Klement, Joachim. 2015. The cross-section of liquid absolute return funds. *Journal of Index Investing* 6, 21-32.
- Koch, Andrew. 2017. Herd behavior and mutual fund performance. *Management Science* 63, 3849-3873.
- Kosowski, Robert, Allan Timmermann, Russ Wermers, and Hal White. 2006. Can mutual fund “stars” really pick stocks? New evidence from a bootstrap analysis. *Journal of Finance* 61, 2551-2595.
- Kosowski, Robert, Narayan Naik, and Melvyn Teo. 2007. Do hedge funds deliver alpha? A Bayesian and bootstrap analysis. *Journal of Financial Economics* 84, 229-264.
- Kosowski, Robert. 2011. Do mutual funds perform when it matters most to investors? US mutual fund performance and risk in recessions and expansions. *Quarterly Journal of Finance* 1, 607-664.
- Kostovetsky, Leonard, and Jerold Warner. 2015. You’re fired! New evidence on portfolio manager turnover and performance. *Journal of Financial and Quantitative Analysis* 50, 729-755.
- Kothari, S.P., and Jerold Warner. 2001. Evaluating mutual fund performance. *Journal of Finance* 56, 1985-2010.
- Lin, Crystal, and Kenneth Yung. 2004. Real estate mutual funds: Performance and persistence. *Journal of Real Estate Research* 26, 69-94.
- Linnainmaa, Juhani. 2013. Reverse survivorship bias. *Journal of Finance* 68, 789-813.
- Lintner, John. 1965. Security prices, risk, and maximal gains from diversification. *Journal of Finance* 20, 587-615.
- Ma, Linlin, Yuehua Tang, and Juan-Pedro Gomez. 2019. Portfolio manager compensation in the U.S. mutual fund industry. *Journal of Finance* 74, 587-638.
- Malkiel, Burton. 1995. Returns from investing in equity mutual funds 1971 to 1991. *Journal of Finance* 50, 549-572.

- Mamaysky, Harry, Matthew Spiegel, and Hong Zhang. 2007. Improved forecasting of mutual fund alphas and betas. *Review of Finance* 11, 359-400.
- Mamaysky, Harry, Matthew Spiegel, and Hong Zhang. 2008. Estimating the dynamics of mutual fund alphas and betas. *Review of Financial Studies* 21, 233-264.
- Massa, Massimo, and Rajdeep Patgiri. 2009. Incentives and mutual fund performance: Higher performance or just higher risk taking? *Review of Financial Studies* 22, 1777-1815.
- Massa, Massimo, and Vijay Yadav. 2015. Investor sentiment and mutual fund strategies. *Journal of Financial and Quantitative Analysis* 50, 699-727.
- Massa, Massimo, Jonathan Reuter, and Eric Zitzewitz. 2010. When should firms share credit with employees? Evidence from anonymously managed mutual funds. *Journal of Financial Economics* 95, 400-424.
- Mateus, Irina, Cesario Mateus, and Natasa Todorovic. 2017. Mutual fund performance: An approach to identifying the top performing funds. Working paper.
- McLemore, Ping. 2019. Do mutual funds have decreasing returns to scale? Evidence from fund mergers. *Journal of Financial and Quantitative Analysis*, forthcoming.
- Meziani, A. Seddik. 2014. Investing with environmental, social, and governance issues in mind: From the back to the fore of style investing. *Journal of Investing* 23, 115-124.
- Moneta, Fabio. 2015. Measuring bond mutual fund performance with portfolio characteristics. *Journal of Empirical Finance* 33, 223-242.
- Moreno, David, and Rosa Rodriguez. 2009. The value of coskewness in mutual fund performance evaluation. *Journal of Banking & Finance* 33, 1664-1676.
- Morey, Matthew, and Edward O'Neal. 2006. Window dressing in bond mutual funds. *Journal of Financial Research* 29, 325-347.
- Nagy, Zoltan, Altaf Kassam, and Linda-Eling Lee. 2016. Can ESG add alpha? An analysis of ESG tilt and momentum strategies. *Journal of Investing* 25, 113-124.
- Nain, Amrita, and Tong Yao. 2013. Mutual fund skill and the performance of corporate acquirers. *Journal of Financial Economics* 110, 437-456.
- Nascimento, Juliana, and Warren Powell. 2010. Dynamic programming models and algorithms for the mutual fund cash balance problem. *Management Science* 56, 801-815.
- Nicolosi, Gina. 2009. The telling trades of mutual funds. *Financial Management* 38, 915-936.
- Nofsinger, John, and Abhishek Varma. 2014. Socially responsible funds and market crises. *Journal of Banking & Finance* 48, 180-193.

- Nohel, Tom, Jay Wang, and Lu Zheng. 2010. Side-by-side management of hedge funds and mutual funds. *Review of Financial Studies* 23, 2342-2373.
- Novy-Marx, Robert, and Joshua Rauh. 2011. Public pension promises: How big are they and what are they worth? *Journal of Finance* 66, 1211-1249.
- O'Neal, Edward, and Daniel Page. 2000. Real estate mutual funds: Abnormal performance and fund characteristics. *Journal of Real Estate Portfolio Management* 6, 239-247.
- Parida, Sitikantha, and Terence Teo. 2018. The impact of more frequent portfolio disclosure on mutual fund performance. *Journal of Banking & Finance* 87, 427-445.
- Pastor, Lubos, and Robert Stambaugh. 2002. Investing in equity mutual funds. *Journal of Financial Economics* 63, 351-380.
- Pastor, Lubos, Robert Stambaugh, and Lucian Taylor. 2015. Scale and skill in active management. *Journal of Financial Economics* 116, 23-45.
- Pastor, Lubos, Robert Stambaugh, and Lucian Taylor. 2017. Do funds make more when they trade more? *Journal of Finance* 72, 1483-1528.
- Patel, Saurin, and Sergei Sarkissian. 2017. To group or not to group? Evidence from mutual fund databases? *Journal of Financial and Quantitative Analysis* 52, 1989-2021.
- Patton, Andrew, Tarun Ramadorai, and Michael Streatfield. 2015. Change you can believe in? Hedge fund data revisions. *Journal of Finance* 70, 963-999.
- Pedersen, Lasse. 2018. Sharpening the arithmetic of active management. *Financial Analysts Journal* 74, 21-36.
- Petajisto, Antti. 2016. Author response to "deactivating active share". *Financial Analysts Journal* 72, 11-12.
- Phelps, Shawn, and Larry Detzel. 1997. The nonpersistence of mutual fund performance. *Quarterly Journal of Business and Economics* 36, 55-69.
- Phillips, Blake, Kuntara Pukthuanthong, and Raghavendra Rau. 2014. Detecting superior mutual fund managers: Evidence from copycats. *Review of Asset Pricing Studies* 4, 286-321.
- Phillips, Blake, Kuntara Pukthuanthong, and Raghavendra Rau. 2016. Past performance may be an illusion: Performance, flows, and fees in mutual funds. *Critical Finance Review* 5, 351-398.
- Phillips, Blake, Kuntara Pukthuanthong, and Raghavendra Rau. 2018. Size does not matter: Diseconomies of scale in the mutual fund industry revisited. *Journal of Banking & Finance* 88, 357-365.
- Pool, Veronika, Noah Stoffman, and Scott Yonker. 2015. The people in your neighborhood: Social interactions and mutual fund portfolios. *Journal of Finance* 70, 2679-2732.

- Porter, Gary, and Jack Trifts. 2014. The career paths of mutual fund managers. *Financial Analysts Journal* 70, 55-71.
- Puckett, Andy, and Sterling Yan. 2011. The interim trading skills of institutional investors. *Journal of Finance* 66, 601-633.
- Rakowski, David. 2010. Fund flow volatility and performance. *Journal of Financial and Quantitative Analysis* 45, 223-237.
- Renneboog, Luc, Jenke Ter Horst, and Chendi Zhang. 2008a. Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Corporate Finance* 14, 302-322.
- Renneboog, Luc, Jenke Ter Horst, and Chendi Zhang. 2008b. The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of Banking & Finance* 32, 1723-1742.
- Reuter, Jonathan, and Eric Zitzewitz. 2015. How much does size erode mutual fund performance? A regression discontinuity approach. Working paper.
- Riedl, Arno, and Paul Smeets. 2017. Why do investors hold socially responsible mutual funds?. *Journal of Finance* 72, 2505-2550.
- Riley, Timothy. 2019. Can mutual fund stars still pick stocks?: A replication and extension of Kosowski, Timmermann, Wermers, and White (2006). *Critical Finance Review*, forthcoming.
- Rohleder, Martin, Dominik Schulte, Janik Stryca, and Marco Wilkens. 2018. Mutual fund stock-picking skill: New evidence from valuation- versus liquidity-motivated trading. *Financial Management*, forthcoming.
- Rosenthal, Robert. 1979. The “file drawer problem” and tolerance for null results. *Psychological Bulletin* 86, 638-641.
- Sapp, Travis, and Sterling Yan. 2008. Security concentration and active fund management: Do focused funds offer superior performance? *Financial Review* 43, 27-49.
- Schlanger, Todd, Christopher Phillips, and Karin Peterson LaBarge. 2012. The search for outperformance: Evaluating ‘active share’. Vanguard white paper.
- Schwarz, Christopher, and Mark Potter. 2016. Revisiting mutual fund portfolio disclosure. *Review of Financial Studies* 29, 3519-3544.
- Sensoy, Berk. 2009. Performance evaluation and self-designated benchmark indexes in the mutual fund industry. *Journal of Financial Economics* 92, 25-39.
- Sharpe, William. 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance* 19, 425-442.

- Sharpe, William. 1966. Mutual fund performance. *Journal of Business* 39, 119-138.
- Sharpe, William. 1991. The arithmetic of active management. *Financial Analysts Journal* 47, 7-9.
- Sharpe, William. 2013. The arithmetic of investment expenses. *Financial Analysts Journal* 69, 34-41.
- Sherrill, Eli, Sara Shirley, and Jeffrey Stark. 2017. Actively managed mutual funds holding passive investments: What do ETF positions tell us about mutual fund ability? *Journal of Banking & Finance* 76, 48-64.
- Shive, Sophie, and Hayong Yun. 2013. Are mutual funds sitting ducks? *Journal of Financial Economics* 107, 220-237.
- Shukla, Ravi, and Sandeep Singh. 1994. Are CFA charterholders better equity fund managers? *Financial Analysts Journal* 50, 68-74.
- Sialm, Clemens, and Laura Stark. 2012. Mutual fund tax clienteles. *Journal of Finance* 67, 1397-1422.
- Simutin, Mikhail. 2014. Cash holdings and mutual fund performance. *Review of Finance* 18, 1425-1464.
- Singal, Vijay, and Zhaojin Xu. 2011. Selling winners, holding losers: Effect on fund flows and survival of disposition-prone mutual funds. *Journal of Banking & Finance* 35, 2704-2718.
- Sirri, Erik, and Peter Tufano. 1998. Costly search and mutual fund flows. *Journal of Finance* 53, 1589-1622.
- Soe, Aye, and Ryan Poirier. 2016. SPIVA U.S. Scorecard. *S&P Global*. Web: <https://www.spglobal.com/our-insights/SPIVA-US-Scorecard.html>, accessed 4/17/18.
- Solomon, David, Eugene Soltes, and Denis Sosyura. 2014. Winners in the spotlight: Media coverage of fund holdings as a driver of flows. *Journal of Financial Economics* 113, 53-72.
- Spitzer, John, and Sandeep Singh. 2008. Shortfall risk of target-date funds during retirement. *Financial Services Review* 17, 143-153.
- Statman, Meir. 2000. Socially responsible mutual funds. *Financial Analysts Journal* 56, 30-39.
- Surz, Ronald, and Craig Israelsen. 2008. Evaluating target date lifecycle funds. *Journal of Performance Measurement* 12, 62-70.
- Tang, Ning, and Yen-Ting Lin. 2015. The efficiency of target-date funds. *Journal of Asset Management* 16, 131-148.
- Trammell, Susan. 2009. Glide path. *CFA Magazine*, January-February issue.

Turtle, H.J., and Chengping Zhang. 2012. Time-varying performance of international mutual funds. *Journal of Empirical Finance* 19, 334-348.

von Reibnitz, Anna. 2018. When opportunity knocks: Cross-sectional return dispersion and active fund performance. *Critical Finance Review*, forthcoming.

Wahal, Sunil, and Albert Wang. 2011. Competition among mutual funds. *Journal of Financial Economics* 99, 40-59.

Wei, Kelsey, Russ Wermers, and Tong Yao. 2015. Uncommon value: The characteristics and investment performance of contrarian funds. *Management Science* 61, 2394-2414.

Wermers, Russ, Tong Yao, and Jane Zhao. 2012. Forecasting stock returns through an efficient aggregation of mutual fund holdings. *Review of Financial Studies* 25, 3490-3529.

Wermers, Russ. 1997. Momentum investment strategies of mutual funds, performance persistence, and survivorship bias. Working paper.

Wermers, Russ. 2000. Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *Journal of Finance* 55, 1655-1695.

Wermers, Russ. 2001. The potential effects of more frequent portfolio disclosure on mutual fund performance. *Investment Company Institute: Perspective* 7, 1-11.

Wilcox, Ronald. 2003. Bargain hunting or star gazing? Investors' preferences for stock mutual funds. *Journal of Business* 76, 645-663.

Yan, Xuemin. 2006. The determinants and implications of mutual fund cash holdings: Theory and evidence. *Financial Management* 35, 67-91.

Yan, Xuemin. 2008. Liquidity, investment style, and the relation between fund size and fund performance. *Journal of Financial and Quantitative Analysis* 43, 741-768.

Zhu, Min. 2018. Informative fund size, managerial skill, and investor rationality. *Journal of Financial Economics* 130, 114-134.

Zitzewitz, Eric. 2006. How widespread was late trading in mutual funds? *American Economic Review* 96, 284-289.