Chasing Ghosts:

What Determines Flows Into Funds Without Performance Histories?

Abstract

Newly initiated mutual funds have short or non-existent performance histories. We find that in the absence of realized returns – the strongest predictor of flows into mature funds – flows are driven by the hypothetical fund return inferred from the portfolio's backfilled holdings. Consistent with fund managers responding to window-dressing incentives, this hypothetical return is excessively high for young funds but decreases as the fund matures. Funds with high hypothetical pre-initiation return have high turnover shortly after the initiation, indicating active rebalancing away from a window-dressed portfolio. Such funds have lower long-term risk-adjusted performance, highlighting the irrational nature of using backfilled returns as a signal in capital allocation.

Key words: mutual funds, window-dressing, flows

Introduction

What determines the allocation of capital flows in the cross-section of mutual funds is a question of central importance in asset management. For funds with established return histories, past fund performance dominates other effects and is the most robust and economically strong predictor of flows (Chevalier and Ellison (1997); Sirri and Tufano (1998)). However, it is unclear which signals drive capital allocation in newly initiated funds, for which the return series are short or unavailable. In such situations the investors are deprived of the most objective statistic – fund returns – and are likely to be more susceptible to other salient information that appears to signal fund quality. The content of these signals falls largely under the discretion of fund managers.

From the perspective of a fund manager looking to maximize flows, the most effective hypothetical ploy would be to rewrite the history of fund past returns to make the fund appear more successful. Naturally, the realized returns cannot be altered ex post, while strategies to boost returns ex ante are predicated on increased risk, something that investors appear to recognize (Barber, Huang, and Odean (2016); Berk and van Binsbergen (2016)). Yet, before a young fund accumulates a return history of reasonable length, the fund manager can attempt to signal strong *hypothetical* past performance by structuring a portfolio in a way that investors would associate with high managerial ability.

Such techniques are broadly termed 'window-dressing'. The evidence on the relationship between fund flows and window-dressing is scarce and is based on the analysis of mature funds where objective fund performance dominates all other effects. For example, Solomon, Soltes, and Sosyura (2014) show that disclosed fund holdings weigh too heavily on stocks with high past returns but only if such stocks are covered by the media. This tilt towards past outperformers has an incremental effect on flows over and above that of the fund's realized return which remains the primary driver. However, this setting restricts both the manager's ability to window-dress and the investors' reaction to window-dressing. First, a manager of a mature fund cannot be too aggressive in his/her selection of past winners, since even naïve investors would notice the large discrepancy between the fund's actual return and the backward-looking return implied by the holdings. Second, to the extent that investors are at least somewhat rational, the economic effect of window-dressing will remain marginal, since the availability of actual fund returns reduces the importance of other, less objective, signals.

These constraints are considerably weaker for funds with short performance records and do not apply if these records are not yet available. Motivated by this insight, we investigate the prevalence of window-dressing in young funds, its effect on flows, and its relationship to future fund performance. These focal issues are both practically and theoretically important. First, it is common for assets under management to grow rapidly in the first two years of a fund's life even though the fund has yet to demonstrate consistently strong performance. It is important to understand what drives this growth and, in particular, whether manager-determined portfolio structures play a significant part. Second, our agenda helps shed light on the scientific debate on the rationality of mutual fund investors. Generally, it is difficult to separate the flow-performance relationship into the rational and irrational component, since both equilibrium and behavioral theories predict this relationship (Berk and Green (2004); Frazzini and Lamont (2008)). However, if the investors' response to non-return signals is strong and these signals are not positively associated with future fund performance, this would indicate irrationality and highlight governance issues in the asset management industry. Finally, even though the term 'window-dressing' carries an obvious negative connotation, it is unclear whether window-dressing techniques are employed by managers opportunistically or are simply useful tools to channel capital to high-quality funds when the objective evidence of this quality is not yet available. The former mechanism is detrimental to governance, while the latter improves the efficiency of capital allocation.

In the absence of returns, a fund's choice of the benchmark index and the portfolio composition are salient signals of the fund's "strategy". In other words, while existing funds cannot alter their past performance statistics, new funds can market themselves as having a strategy that would have worked well in the past, without any actual returns to indicate the contrary.[1] Both the benchmark and the portfolio are observable to investors early on in the fund's life: the benchmark index is declared in the prospectus, while the first schedule of holdings is typically available in the next quarter after fund registration. Data aggregators, such as Morningstar and CNN Money, present this information in a structured way and make it is easy for prospective investors to check the historical performance of the index and the stocks in the fund's portfolio. Furthermore, fund management firms often post fund "factsheets" on their websites even before the regulatory disclosures are submitted and processed by the aggregators and update these files as the fund matures.

This paper investigates the properties of the prospectus index and the portfolio structures of newly initiated open-end equity-focused U.S. mutual funds during the period from 1994 to 2015. First, we document a significant abnormality in the holdings-implied return – the return on a hypothetical portfolio in which stock positions are fixed at the levels reported in the first schedule of holdings – computed in the 12 months before and after fund initiation. Figure 1 shows the results graphically for Broad U.S. Equity

[1] Anecdotal evidence points to some instances of direct advertisement of backtested performance of financial products but does not account for any implicit techniques that are not regulated by the product transparency requirements:
"Only five of the 163 U.S. notes sold in 2010 tracked proprietary indexes that had historical growth rates that were negative, according to performance charts in offering documents. Meanwhile, more than two-fifths of notes followed indexes that looked like clear winners, jumping more than 10 percent a year, based on compound annual growth rates. The results were largely the product of backtesting."
How Wall Street Finds New Ways to Sell Old, Opaque Products to Retail Investors, Bloomberg report, 01/22/2016.

and Sector Equity funds. In the Broad U.S. Equity universe, the cumulative 12-month holdings-based return in the run-up to the initiation is 16.8% compared to 12.3% in the 12-month period after the initiation. The run-up return is, of course, entirely hypothetical; we sometimes refer to it as the "ghost return" for ease of exposition. The difference between this ghost return and the forward-looking return, i.e. the kink in the cumulative return curve, is significant at the 1% level. Importantly, this kink is *unique to new funds*. We do not observe any significant difference between past and future holdings-based returns around other dates, such as fund inception anniversaries or share class additions. Furthermore, the effect is stronger for sector funds: the cumulative holdings-based return before and after the initiation is 30.6% and 8.1%, respectively. This result is consistent with the fact that sector funds have a more active mandate for portfolio formation and higher holdings concentration.

The regression analysis provides additional evidence. For every fund anniversary we consider a measure of backward-looking holdings-implied return, computed as the return on a hypothetical portfolio whose composition in the twelve months prior to the anniversary date mirrors that of the portfolio reported immediately after that date. We regress the backward-looking return on the "ghost dummy" – an indicator variable equal to 1 in the initiation year, when the backward-looking return is computed over the period when the actual fund returns do not exist. This variable is designed to capture the magnitude of the kink effect – the difference between the fund's backward-looking return at initiation (i.e. the return that cannot be attributed to actual fund performance) and the backward-looking return of a mature fund (which is composed of the actual fund return plus some window-dressing). The "ghost dummy" is significant at 1% and is robust to investment category and fund family fixed effects. This result suggests that funds' initial portfolios are constructed to demonstrate a high hypothetical past return, significantly more so than all the subsequent portfolios. This evidence supports the hypothesis that funds view the backward-looking return as a particularly useful marketing tool at times when few realized returns are observable to investors. As funds mature and report more returns, the backward-looking return becomes less effective and can even endanger actual fund performance.

The kink effect can be decomposed into several components. First, it can be driven by the timing of fund initiations – if more funds start at the top of the market cycle, after a period of growth but before a slow-down, the return measure would show inflection at initiation. Indeed, some of our results can be attributed to the timing of fund entry. When we include the control for the past market return (similar to adding time fixed effects), the coefficient on the "ghost dummy" drops from 0.042 to 0.022 (or by 48%) but remains strongly significant. The fact that high market returns are followed by more fund initiations is not too surprising. However, it is noteworthy that these initiations precede market slow-downs. These findings are consistent with the view that marketing considerations – i.e. ease of obtaining flows –

dominate the investment opportunities argument – i.e. that new funds are established when managers believe they can create value for investors. 52% of the overall effect cannot be attributed to the timing of fund entry but is split between the choice of the benchmark index and the residual stock selection approximately in the proportion of 2:3. All three channels are consistent with the view that newly initiated funds seek to capitalize on investors' backward-looking bias, which is especially strong in the absence of an informative fund performance history.

Next, we investigate fund flows and their relationship to different return measures. The ghost return, computed as the average monthly return of the holdings from the first schedule over the 12-month period before the fund initiation, strongly predicts flows in the first four quarters of flow observations since fund inception (significant at the 1% level in the first three quarters). However, the effect of the ghost return on flows declines monotonically with each passing quarter and is gradually replaced by the monotonically increasing effect of the actual fund return. To illustrate, the sensitivity of flows to the ghost return in quarter 4 is only 10.4% that of quarter 1, while the sensitivity of flows to the actual (average monthly) past fund return in quarter 4 is 629.4% that of quarter 1. In the first two quarters, the ghost return dominates the actual fund return as a predictor of flows.

Finally, we relate ghost returns to portfolio activity measures and fund long-term performance, as measured by the four-factor alpha. We find that funds with high ghost returns have unusually high portfolio turnover in the first year since inception, indicating active rebalancing away from the initially chosen portfolio composition. Furthermore, these funds have lower future alphas, suggesting that hypothetical performance inferred from the backfilled holdings does not signify valuable investment opportunities or signal superior managerial quality.

Overall, our results confirm that holdings-imputed returns have a strong impact on investor behavior at precisely the time when they are the least informative of the fund's actual strategy and when funds have the most discretion in choosing their target benchmark and portfolio structure. This paper extends several strands of the asset management literature.

We contribute to the literature on window-dressing in fund management (Lakonishok, Shleifer, Thaler, and Vishny (1991); Carhart, Kaniel, Musto, and Reed (2002)). Whereas the previous work has focused on mature funds, where window-dressing is both limited in scope and less effective due to the dominant role of the fund's realized return, we focus on fund initiations when portfolio composition becomes the first-order driver of flows. To compare, the two recent studies relating window-dressing to flows document second-order effects. Agarwal, Gay, and Ling (2014) show how signals from portfolio holdings augment those from fund performance, while Solomon, Soltes, and Sosyura (2014) find that media coverage of holdings enhances the attraction of a window-dressed portfolio.

We add to the literature on the flow-performance sensitivity (Chevalier and Ellison (1997); Sirri and Tufano (1998)). It remains an open question whether investors' chasing of past returns is a behavioral phenomenon (Frazzini and Lamont (2008)) or a rational response to an observable signal of managerial quality (Berk and Green (2004)). Our results support the behavioral explanation. In our setting, ghost returns are not physically earned and do not signal better future performance. Yet they are strongly positively related to flows thus creating perverse incentives for window-dressing.

We contribute to the governance literature on firms' capital market activities (Roll (1986); Shleifer and Vishny (2003); Rhodes-Kropf and Viswanathan (2004)). So far, this literature has mostly focused on corporations and investigated corporate managers' incentives to issue overvalued equity. Corporations can entice investors into buying overvalued stock either by taking advantage of the market conditions (Shleifer and Vishny (2003)) or by boosting valuations proactively (Ahern and Sosyura (2014)). In this paper, we find evidence of analogous activities in the mutual fund industry. In addition, we decompose the overall effect into the passive and the active channel – i.e. the timing of fund entry following periods of strong market performance (akin to IPOs and SEOs undertaken at market peaks) and portfolio selection conditional on entry.

Finally, we contribute to the literature on mutual fund initiations. Even though we do not examine all possible determinants of fund initiations, our results highlight how window-dressing incentives contribute to the fund entry decision. In particular, we find that fund entries are a function of past market data and are not reflective of new investment opportunities. The effect is stronger among sector funds which seek to take advantage of temporarily "hot" market segments and indices with strong past performance. Simply put, investment advisors appear to act when and where flows are easier to obtain rather than when and where they can create the most value for the fund investors. Despite the proliferation of new funds and proprietary indices in recent years, the academic literature on mutual fund initiations remains scarce. Khorana and Servaes (1999) investigate fund initiations before 1992 and find that they are positively related to assets invested in other funds of the same objective and to the fund family's past performance. Evans (2010) documents that about 23% of new mutual funds started between 1996 and 2005 were incubated and only opened to the public after realizing performance success. This result can explain why young funds tend to have higher returns than mature funds in the sample. Our analysis reveals that incubated funds have lower return kinks, indicating that incubation and index/portfolio selection are substitute marketing strategies.

2. Sample and data

We begin our sample construction with an exhaustive historical list of all U.S.-domiciled equity mutual funds from Morningstar (as of November 2015). We exclude, by name or through available classification flags, funds that are short or leveraged or invest in asset classes other than equity. We further exclude funds with an exclusively international equity focus (i.e. country funds or emerging market funds). For each fund share class, we obtain monthly returns, total net assets (TNA), dividend distributions, annual management fees, loadings and marketing fees, current prospectus benchmark, and other relevant fund characteristics (e.g., whether a share class is open to institutional or retail investors) from Morningstar.

Next, we focus on fund portfolio holdings. We merge our list of funds sequentially with the CRSP mutual fund database, Thomson S12, and FactSet Lionshares. The matching to CRSP and FactSet is undertaken at the share class level by either the fund ticker or CUSIP, while matching to S12 requires an existing match with CRSP and a non-missing link in the MFLinks table (maintained by Russ Wermers and WRDS). We require that all fund share classes available in one of these three databases map exclusively into fund share classes of the same fund under Morningstar and exclude funds where this is not the case. For the vast majority of funds in our universe, we are able to find a suitable match in the CRSP mutual fund database. While CRSP does not have holdings for all the funds, it is a reliable source of monthly time-series data, such as returns and net assets. Thus, where necessary, we supplement the Morningstar data with that from the CRSP mutual funds database.

Our main unit of observation is the fund (identified by Morningstar key 'fundid'). Thus, we aggregate all relevant class-level quantities such as returns, fees etc. to the fund level using class-level net assets as weights. We discard links to CRSP entirely if a fund's history of TNA differs significantly between Morningstar and CRSP. It is generally the case that more than one of the databases report a portfolio disclosure for a given fund at a given time. In some cases, reported holdings are slightly different. For example, FactSet provides more complete holdings records for non-U.S. positions than the other two databases. For this reason, we do not combine holdings from different sources. Rather, for a given fund, we check which source provides the longest and the most complete history of holdings reports and use only that source.

We restrict our sample to the period from 1994 to 2015, because monthly time series data from Morningstar prior to 1994 is not consistently available. We use Morningstar variable 'Branding Name' to define fund families and compute family characteristics, such as family size (aggregate TNA across all funds) and the number of live funds in the family in a given period. We use Morningstar variable

‘Morningstar Category’ to classify funds into investment categories. For U.S. broad domestic equity funds these categories essentially concur with the common 3-by-3 style matrix by size and value (e.g. large-cap growth or small-cap value). For sector funds, Morningstar provides classification of 11 pre-defined sectors. For funds that are not classified by Morningstar, we parse the fund name for key words and map them into the existing categories. Funds that cannot be mapped into either style or sector are discarded from the analysis.

Table 1 provides an overview of the funds in our sample. For expositional purposes, we split the sample by investment focus, i.e. diversified U.S. equity vs. sector funds. We further separate funds into 9 specific styles and 11 sectors within their broad investment focus. Diversified funds represent the majority of mutual fund assets with \$4.4T at the end of the sample period, whereas sector funds only manage one tenth of that. Comparing the number of funds yields a similar insight.

Next, we compute several variables important for our future analysis. The percentage flow for fund j in any three-month period T is defined as

$$\frac{TNA_{jT} - (1 + r_{jT})TNA_{jT-1}}{TNA_{jT-1}}$$

where TNA_{jT} is the dollar total net assets of fund j at the end of period T and r_{jT} is fund j's gross return over period T. The portfolio concentration measure is the Herfindahl concentration index based on the portfolio weights. The holding horizon is the "FIFO Horizon Measure" of Lan, Moneta, and Wermers (2015) which is based on the assumption that shares bought first are also sold first. The diversification benefit is computed as one minus the ratio of the portfolio current holdings’ volatility over the past 36 months and the weighted average of the past 36-month individual stock volatilities. The active weight measure is the sum of absolute deviations of the weights in the actual portfolio from a hypothetical portfolio that contains all positions in proportion to their market capitalization (see Doshi, Elkamhi, and Simutin (2015)). The description of the turnover measures ('Discretionary trading', 'Rebalancing', and 'Turnover (SEC)') is provided in Section 5.

Table 2 reports summary statistics for a number of fund characteristics at the fund-year level, separated, as before, by investment focus, and style/sector. The average (median) fund in the broad equity subset controls \$906 million (\$168 million) of assets, charges an expense ratio of 1.20% (1.18%), and holds 158 (78) equity positions. Except for the expense ratio, these statistics are lower for sector funds. Broad spectrum funds are better diversified than sector funds (mean diversification of 0.486 vs. 0.373), have lower active weight (37% vs. 41%), and lower portfolio concentration (0.021 vs. 0.039).

3. Hypothetical returns around fund initiations

We begin our analysis by comparing measures of a fund's hypothetical return before and after the initiation. We use the word 'hypothetical' to emphasize the fact that the return measure does not reflect the actual fund return but is constructed from other observable data. Specifically, we consider the first schedule of portfolio holdings reported by the fund and compute the fund's holdings-implied return as the weighted-average of the constituent stock returns over a specific period. To begin, we focus on the 24-month period around fund inception. In projecting the holdings backward and forward we impose the condition that the number of shares of respective stocks held remain constant in the 24-month period, except for adjustments for stock splits and dividends. The left pane of Figure 1 shows the cumulative holdings-implied return in that period normalized to 0 in the month of inception. The right pane of Figure 1 shows the (actual) cumulate return on the benchmark index chosen by the newly created fund. For comparison, Figure 2 displays these returns around dates of additional share class inceptions, excluding those that occurred within 6 months of the original fund inception, and Figure 3 repeats the same process for the anniversaries of the original fund inception. The patterns in the figures indicate a significant discontinuity of the hypothetical return (or a "kink" in the cumulative return) at fund inception, but much less so when the fund branches out to new share classes. During the life of the fund, represented in Figure 3 by regular snapshots every 12 months after fund inception, the kink is entirely absent. We also notice that the original kink is much more pronounced for sector funds than for broad U.S. equity funds. An almost identical pattern would obtain if we replaced future 12 month holdings returns with actual fund returns.

In Table 3 we compare the magnitudes of the hypothetical cumulative return computed in the 12 months before and after select events. As before, we compute the holdings-implied fund return and the return on the benchmark index as proxies for a hypothetical return. We consider three types of events: fund inceptions, additional share class inceptions, and fund anniversaries (months that are removed from the fund inception month by multiples of 12). We show the results separately for broad U.S. equity funds (Panel A) and sector equity funds (Panel B). All return data are winsorized at 1 and 99 percent to exclude potential outlier effects. The column labelled 'Prior' contains the average of cumulative returns over the 12 months preceding the event, while column 'Post' contains the average of cumulative returns over the 12 months following the event. Column 'Diff.' displays the difference in these averages and the associated *t*-statistic.

This analysis reveals that post-initiation holdings-implied returns and benchmark returns are significantly higher than their pre-initiation counterparts. For example, in the broad U.S. equity category, the average run-up holdings-implied return (benchmark return) is 16.8% (12.5%) but the follow-up holding-implied return (benchmark return) is only 12.3% (9.6%). In addition, the holdings-implied return is consistently higher than the benchmark return, suggesting that funds tend to load on successful stocks ex post, something we investigate in greater detail later. The drop in a hypothetical return is significantly higher for sector funds: e.g., the holdings-implied return drops by 19.8% in this fund group, compared to 4.2% in the broad equity group. Importantly, for both broad spectrum and sector funds, the large prior-post return difference is specific to the initiation event and is not observed during share class additions or fund anniversaries. These results provide initial evidence of the following fact: if an investor attempted to backfill fund returns in the period before fund inception, either using the ex post composition of the fund's portfolio or relying on the benchmark index, he/she would find those returns to be exceptionally high. As of now, it is unclear whether such a mental exercise has any practical consequences, but it is at least unusual to observe these high hypothetical returns at exactly the time when no history of actual fund returns is available. For the remainder of the paper, we will refer to the backward-looking holdings-implied return of the fund in the 12 months prior to the initiation as the "ghost return".

In our first set of tests, we investigate the ghost return effect in regression specifications and also decompose it into several components. We adopt the annual regression setup in which observations are 12 months apart and the first observation for each fund is taken at the inception date, or, more precisely, at the end of the inception month. We refer to the first observation of each fund as 'inception' and all the subsequent observations as 'anniversaries'. Central to all parts of our analysis is the distinction between the early periods in a fund's life, when a meaningful record of actual fund returns is not available, and later periods. Accordingly, we define an indicator variable DGhost as equal to 1 for the first observation of each fund, and 0 otherwise. The name of the variable reflects the idea that in the early period any proxy for the fund return history is hypothetical and does not represent realized returns.

To understand the dynamics of a hypothetical return that can be inferred from a fund's holdings, we define the dependent variable BHR (backward-projected holdings return) as the value-weighted average return of the fund's portfolio holdings over the 12-month period before the inception/anniversary based on the composition (numbers of shares of stocks held) of the first reported portfolio after the inception/anniversary. RetVar represents the return of either the CRSP value-weighted index (MRet) or the fund's benchmark (IndexRet) over the same 12-month period. We regress BHR on DGhost, RetVar, and the interaction of the two as follows:

$$\mathrm{BHR}_{i,(\tau-12,\tau]} = \beta\ \mathrm{RetVar}_{(\tau-12,\tau]} + \gamma\ \mathrm{DGhost}_{i,\tau} + \delta\ \mathrm{DGhost}_{i,\tau} \times \mathrm{RetVar}_{(\tau-12,\tau]} + \epsilon_{i,\tau}$$

Here, i indexes funds and τ indexes months since fund inception. We also include various fixed effects (not shown explicitly in the equation above) based on investment category (i.e. style or sector), fund family, and, in some specifications, year. *T*-statistics are based on standard errors clustered at the fund level. The sample is a pooled sample of all U.S. equity and sector funds with non-missing return data.[2]

Table 4 presents the results of this analysis. In column 1, we include DGhost by itself to capture the overall effect of the kink – i.e. the difference between the backward-projected holdings return of young and mature funds. The coefficient on DGhost is 0.042 (significant at 1%), confirming that the pre-initiation holdings-based return is excessively high, consistent with the effects documented in the univariate tests. In column 2, we add the market return as a control to measure BHR over and above the equity market growth. In this specification, the coefficient on DGhost drops to 0.022 but remains significant at 1%. This result indicates that almost half of the ghost return magnitude (48%) can be explained by the fact that fund initiations are concentrated at times that follow periods of market rallies. In column 3, we consider the interaction between DGhost and the market to test whether the first post-inception portfolio loads significantly on market risk, something that can explain abnormal performance at times of rising markets. We find that this is not the case: the coefficient on the interaction term is economically small and statistically weak. This non-result makes intuitive sense, since the portfolio composition is chosen after the market growth has occurred. If the goal is to create an impression of good hypothetical performance via portfolio holdings, it is not necessary to load up on high-beta stocks; rather, choosing winner stocks ex post regardless of their systematic risk is more flexible and less prone to be discounted in the risk-adjustment analysis. Columns 5 and 6 show similar specifications but feature the fund's benchmark index return instead of the market return. After the timing of fund entry, the choice of the index (signalling the investment focus) is the second important decision that a young fund must make. Once we control for the index, the coefficient on DGhost drops to 0.013 (still significant at 1%); however the interaction effect remains insignificant, suggesting that high ghost return is not caused by a portfolio structured as the leveraged index. The difference in DGhost coefficients between columns 2 and 5 can be explained by a particular choice of the benchmark index. Specifically, young funds choose benchmarks, which, on average, experienced an even better performance than the rest of the market in the 12 months prior to fund inception. The residual effect of 0.013 (31%) cannot be explained by either the timing of fund entry or the choice of the benchmark index, and thus should be attributed to stock selection (of a type that does not simply leverage the market or the index). We note again that in all specifications the coefficient on DGhost measures BHR of a young fund over that of a mature fund. Accordingly, the coefficient of (0.042) 0.013 implies that the overall BHR of young funds (BHR of young funds due to

[2] We opt to analyse sector funds jointly with U.S. equity funds due to the small sample size of sector funds as evident in Table 3. We examine the relationship between the ghost return and the fund/index specialty in a separate analysis.

stock selection alone) is (4.2%) 1.3% per year higher than that of older funds. In column 7, we include time fixed effects to illustrate the robustness of our results to alternative specifications. However, the R-sq of the regression is only marginally higher in the presence of time fixed effects than with the market or the index control alone.

In reality, the distinction between the selection of the investment focus and the selection of specific stocks is rather fuzzy. First, by picking a particular benchmark and the associated sector, the fund manager already completes a large part of the stock selection process by narrowing down the universe of equities to choose from. Second, the composition of many indices is not as mechanical or static as one would expect. In fact, many indices are determined through meetings of a committee that is relatively free to pick new index components from a loosely defined universe of stocks with minor restrictions on market capitalization, free float, and liquidity. It is not out of the question that index committees themselves may have an incentive to pick recent winners in order to make their index more attractive to clients.

These issues apply to varying degrees to different investment categories, giving rise to a cross-sectional variation in index types. In contrast to a sector fund, a large-cap U.S. equity fund will have effectively a smaller menu of benchmarks to choose from, not necessarily because there are fewer distinct benchmarks in that space (although this is the case), but more importantly because the time-series correlation between any two broad large-cap U.S. equity indices is in the vicinity of 99 percent. For such broad-spectrum funds, there is little to be gained in terms of ghost returns from choosing one index over another, whereas for more specialized funds, this choice is more consequential. On the other hand, a fund with a broader focus is less limited in its selection of specific stocks than a more specialized fund. To summarize, the choice of the index and the initial holdings are not independent and overlap to some degree.

For that reason, in our future analysis we do not attempt to split the effects of the index choice and the portfolio composition in excess of the index. Instead, in our next test, we investigate the ghost return magnitudes for funds with different types of indices, acknowledging that the choice of the index as well as the choice of individual stocks contribute to these magnitudes. We define several variables that classify funds in our sample based on the proximity of their benchmarks is to other funds' benchmarks. We run the following regression:

$$\mathrm{BHR}_{i,(\tau-12,\tau]} = \beta\ \mathrm{MRet}_{(\tau-12,\tau]} + \gamma\ \mathrm{DGhost}_{i,\tau} + \nu\ \mathrm{DSubset}_{i,\tau} + \delta\ \mathrm{DGhost}_{i,\tau} \times \mathrm{DSubset}_{i,\tau} + \epsilon_{i,\tau}$$

Dummy DSubset represents one of four benchmark characteristics: DSpecial is set to 1 when the fund's benchmark is followed by fewer than 5 other funds at the time of the fund's inception; DLowCorr is equal to 1 when the weighted average correlation of the fund's benchmark with the benchmarks of the closest 100 peer funds is less than 0.95 (approximately the 10^{th} percentile), where closeness is defined by the time-series correlation of monthly returns; DLargeDist is equal to 1 when the average Euklidian distance in the monthly return space between the fund's benchmark and those of the closest 100 peer funds is larger than 0.01 (approximately the 10^{th} percentile). Lastly, we define dummy DSector to differentiate between sector funds and broad equity funds.

Table 5 reports the results. For each of the aforementioned characteristics/subsets we present three regression specifications. All of them contain DSubset and the interaction of DSubset and DGhost but the timing controls differ. In the first specification we do not include any such controls to capture the timing effect of the fund entry, while in the second and third specifications we control for the market and the time fixed effects, respectively. The results indicate that the ghost return is particularly high for the specialty subsets relative to the rest of the sample with the coefficient on the interaction term ranging between 5 pp and 10 pp (significant at 5% or better). In each specialty subset the ghost return effect is more than double that in the complementary subset.

Next, we consider fund-specific characteristics, especially those at the discretion of fund managers or the fund family. We are mostly interested in their relationship to the ghost effect phenomenon, e.g. whether they are substitutes or complements of the ghost return. Our questions are as follows: do funds with front loads or redemption fees rely more or less on the ghost return? do high distribution fees reduce or increase the magnitude of the ghost return? do we observe different results depending on whether the fund is aimed at retail or institutional investors? For example, funds with redemption constraints can engage in more aggressive flow-chasing, since the invested capital will not be easy to withdraw even if future fund performance falls short of investors' expectations (anchored in the ghost return). Similarly, distribution fees measure direct marketing efforts and might work in combination with the ghost return but also substitute for it. Finally, institutional investors are plausibly less susceptible to hypothetical performance measures, and funds targeting institutional clients might find window-dressing less effective.

For each fund we define several dummy variables: DInst, DFront, DDeferred, Fee12b1, and DIncubator. We retrieve the data from the CRSP mutual fund database and supplement it with the annual data from Morningstar, where missing. For the fee-related variables (DFront and DDeferred), we classify a fund as charging a particular fee if at least one of its share classes (with the inception date within the first 6 months of the original fund inception) does.[3] Similarly, we classify a fund as institutional (DInst) if

[3] We notice that it is common for a fund to start offering multiple share classes soon after the inception of the first share class. We consider such clustering of inceptions as a deliberate strategy that was likely decided upon by the time the first share class started trading.

none of the share classes started within the first 6 months are offered to retail investors. Fee12b1 is the weighted average of the 12b-1 fees of the fund's share classes as of the latest annual report. Finally, we define DIncubator as a dummy equal to 1 for incubated funds as classified in Evans (2010). Incubated funds are provided seed capital by their parent fund families but remain closed to public investment initially. Evans (2010) suggests that a well-performing incubated fund is more likely to be opened, while less successful funds are generally shut down. This selection induces a bias into the sample and contributes to high observable returns of young funds. Our measure of ghost return is not driven by this bias since it is constructed over the period preceding the original (private) fund inception. However, to the extent that investors are more likely to consider actual fund returns (where possible) rather than ghost returns, incubated funds are unlikely to create high ghost returns intentionally.

Table 6 reports the results of the following estimation:

$$\text{BHR}_{i,(\tau-12,\tau]} = \beta\ \text{MRet}_{(\tau-12,\tau]} + \gamma\ \text{DGhost}_{i,\tau} + \nu\ \text{FundChar}_{i,\tau} + \delta\ \text{DGhost}_{i,\tau} \times \text{FundChar}_{i,\tau} + \epsilon_{i,\tau}$$

FundChar represents one of the five fund characteristics described above. Each regression contains the interaction term of DGhost and one of these characteristics. The coefficient on this interaction shows how the kink, i.e. the difference between the first-year BHR and later BHRs, varies between different types of funds.

The results in column 1 of Table 6 suggest that institutional funds display no propensity for ghost returns (in excess of the market) as the interaction coefficient cancels out the baseline effect. This evidence is consistent with the view that funds targeting institutional clients are less likely to apply window-dressing to boost their ghost returns, plausibly because such techniques are ineffective in attracting institutional flows. In contrast, the results in columns 2 and 3 show that the ghost return is higher for funds that charge a load, consistent with stronger marketing incentives at these funds. Further, as indicated by the positive and significant coefficient on the interaction term in column 4, the distribution fees increase the ghost return effect, suggesting that funds pursuing aggressive marketing strategies are using direct and indirect marketing techniques as complements. Finally, the results in column 5 confirm that incubated funds have significantly lower ghost returns, supporting the hypothesis that incubation and window-dressing are substitutes and that a high ghost return is not as effective when a fund is incubated. In other words, there is little incentive for a manager of an incubated fund to window-dress the fund's portfolio at initiation since it is the fund's subsequent performance that will determine the fund's future status and flows.

4. Analysis of flows

The findings in the previous section show that, on average, funds display abnormally high ghost returns: both the backward-projected holdings return and the actual index return are abnormally high in the 12 months prior to the official fund inception, as compared to later periods of fund life. A natural interpretation of these findings is that funds create these ghost returns strategically using one or all of the following three channels: timing the fund inception relative to market cycles, choosing a "hot" benchmark index, and populating the fund portfolio with momentum stocks. However, these techniques are only effective to the extent that fund investors condition their flows on the ghost return, a conjecture that requires careful investigation. One problem with this hypothesis is that flows are known to be highly sensitive to actual fund returns, which need not be correlated with (and might even be inversely related to) the ghost return. Yet actual fund returns are not available for the pre-initiation period and might not be informative for some time after the initiation either. In this section, we examine the relationship between flows, realized fund returns, and BHR in different periods of fund life to address the following question: do investors substitute realized returns for BHR at times when there are no records of realized returns or when such records are scarce?

Our main dependent variable is FFlow defined in Section 2. Each FFlow is computed over a three-month period and is expressed in decimals (i.e. 0.05 indicates the flow of 5%). The three-month periods are chosen as follows. For a given fund, we determine its regular schedule of holdings reports and consider all three-month periods $(\tau+2,\tau+5]$ such that τ is the month of the holdings report. For example, if a fund reports its portfolio snapshots as of the second month of each calendar quarter – February, May, August, and November – the flow periods are May-July, August-October, November-January, and February-April. We allow for this two-month delay to account for the discrepancy between the portfolio report date and its public disclosure (e.g., see Aggarwal et al. (2015)).

Next, we investigate how backward-projected holdings returns affect fund flows in the following three cases: in a simple univariate setting, after controlling for the fund's actual return, and in the first year of fund life. Since this analysis is conducted at quarterly frequency, we replace the ghost dummy from the previous tests with the fund age indicator $D_{\tau<12}$ which is equal to 1 if a holdings report date falls within the first year of fund life. This variable is designed to flag portfolio reports that are preceded by fewer than 12 months of actual fund returns. Table 7 reports the results of the following estimation:

$$\mathrm{FFlow}_{i,(\tau+2,\tau+5]} = \beta_1\,\mathrm{BHR}_{i,(\tau-12,\tau]} + \beta_2\,\mathrm{FundRet}_{i,(\tau-12,\tau]} + \gamma\,\mathrm{D}_{\tau<12} + \delta_1\,\mathrm{D}_{\tau<12} \times \mathrm{BHR}_{i,(\tau-12,\tau]} + \delta_2\,\mathrm{D}_{\tau<12} \times \mathrm{FundRet}_{i,(\tau-12,\tau]} + \Gamma^{\mathrm{T}}\,\mathrm{Controls} + \epsilon_{i,\tau}$$

The vector of control variables includes the log of the total net assets of all funds in the same fund family (LogFamilySize), the number of funds in the family currently in existence (LogNAlive), fund size (equal to the natural log of the fund's TNA, LogTNA), the weighted average expense ratio of the fund's share classes (ExpRatio), and the fund's marketing/distribution fees (Fee12b1, defined as in Section 3). In column 1 (column 2), the main independent variable of interest is monthly BHR (monthly past fund return), computed over the 12-month period preceding the portfolio disclosure date.[4] In column 3, BHR and past fund return are included jointly. On its own, BHR is a strong predictor of flows but its effect is subsumed by the actual fund return: we find that (on average throughout the fund life) the incremental effect of BHR on flows is slightly negative.

However, the effects are significantly different in the first year of fund life. In column 5, we interact BHR and FundRet with $D_{\tau<12}$ and document the following results. First, the effect of the actual fund return is significantly weaker (by 66%) in young funds, as indicated by the large and significant coefficient on the interaction of FundRet with $D_{\tau<12}$. Second, the effect of BHR (a part of which is now computed over the pre-initiation period) on flows is strongly positive in the first year and is only marginally weaker in economic magnitude than the effect of past fund return (-0.671+1.479=0.808 vs 2.666–1.757=0.909).

These results indicate that investors consider the holdings-implied return as a replacement for actual fund returns when a sufficiently long series of actual returns is not available. However, the analysis in Table 7 does not paint a complete picture. First, it features rolling BHR on the left-hand side but not the pure ghost return – the holdings-based return computed from stock returns in the 12 months prior to fund initiation. Second, it does not show how quickly investors lose interest in the hypothetical return and switch their attention to the actual fund return. We address these questions by estimating the following regression specification:

$$\text{FFlow}_{i,(\tau+2,\tau+5]} = \beta_1 \text{ GhostBHR}_{i,(-12,0]} + \beta_2 \text{ FundRet}_{i,(\tau-12,\tau]} + \sum_{l=1}^{4} \gamma^l \text{ DQ}_l$$
$$+ \sum_{l=1}^{4} \delta_1^l \text{ DQ}_l \times \text{ GhostBHR}_{i,(-12,0]} + \sum_{l=1}^{4} \delta_2^l \text{ DQ}_l \times \text{ FundRet}_{i,(\tau-12,\tau]} + \Gamma^{\text{T}} \text{ Controls} + \epsilon_{i,\tau}$$

To trace out the potential decay in the effect of the ghost return on fund flows over time, we define four dummy variables – DQ_1 to DQ_4 – to indicate quarters since fund inception. Specifically, DQ_l takes the value of 1 if τ falls into the l^{th} quarter of the fund's life. These dummies are interacted with GhostBHR

[4] In this specification, we consider average monthly returns over a given period to avoid the sample composition effect in cumulative return: e.g., that the cumulative fund return is calculated over 12 observations when the fund is mature but over fewer than 12 observations when the fund was recently started.

(the ghost return expressed on the monthly basis) and FundRet (the trailing fund return expressed on the monthly basis, as in Table 7).

Table 8 shows the results of this analysis. First, we note that the ghost return has a small negative effect on fund flows when we do not condition on time (column 1). This result persists after the inclusion of fund past return among the explanatory variables (column 3). This negative relationship implies that funds that engage in excessive window-dressing at initiation are less popular among investors long-term (possibly due to inferior performance not captured by FundRet; we investigate the relationship between the ghost return and funds' long-term risk-adjusted performance later). The interaction effects in columns 4 and 5 reveal that GhostBHR has a positive effect on flows in the first four quarters of fund life and that the strength of this effect decreases monotonically with each passing quarter. By quarter 4, the effect decreases by 88% (=(0.317–0.187)/(1.274–0.187)) relative to quarter 1. In contrast, actual fund return monotonically gains in significance: its effect increases by more than sixfold from quarter 1 to quarter 4. In the first two quarters, the ghost return dominates the (short history of the) actual fund return as a predictor of flows.

On the whole, the evidence in this section supports the conjecture that, in the absence of a reliable fund performance history, ghost returns drive investors' capital allocation decisions. Ghost returns dominate the actual fund returns (usually the strongest predictor of flows) for at least the first six months of the fund's life and continue to be marginally important in the next six months.

5. Portfolio tilt, turnover, and long-term performance

In this section we examine the structure and the dynamics of portfolios of young funds in greater detail. Our earlier results suggest that a part of the ghost return can be attributed to overweighting stocks with good past performance, over and above the effects of the market and the index. We test this conjecture further by looking at the extent to which funds tilt their portfolios towards winner stocks and away from loser stocks over time and as a function of the initial ghost return. In this setup, stocks are classified as winners or losers on a relative basis, regardless of their average performance. This allows us to eliminate the market growth effect by construction and focus entirely on the stock selection. This aspect is particularly interesting because, unlike the timing of entry and (to a lesser degree) the choice of the benchmark, the portfolio composition can be changed over time. For example, as the effect of the backward-looking return on flows diminishes, funds might relax their preference for momentum stocks and concentrate more on forward-looking analysis.

We construct our main dependent variable PTilt (portfolio tilt) as follows. First, at the end of each month, we rank all stocks in the CRSP universe by their trailing 12-month return and assign each stock its percentile rank from 1 to 100. Then we center and normalize this rank by subtracting 50.5 and dividing the result by 100. The value-weighted (equal-weighted) average of these normalized ranks computed across all the stocks in the portfolio forms the value-weighted (equal-weighted) portfolio tilt in a given quarter.

Since PTilt is independent of the market performance, we pair it with the market-adjusted version of the ghost return (ExGhostBHR), computed as the difference between the original ghost return and the return on the CRSP value-weighted index in the 12-month period preceding the fund inception. We estimate the following regression:

$$\mathrm{PTilt}_{i,\tau} = \beta\ \mathrm{ExGhostBHR}_{i,(-12,0]} + \gamma\ \mathrm{D}_{\tau<12} + \delta\ \mathrm{D}_{\tau<12} \times\ \mathrm{ExGhostBHR}_{i,(-12,0]} + \Gamma^{\mathrm{T}}\ \mathrm{Controls} + \epsilon_{i,\tau}$$

Just as in the previous tests, the observations are separated by three-month periods aligned with the fund's quarterly disclosure schedule. Table 9 shows the results of this analysis for both the value-weighted (left pane) and the equal-weighted (right pane) momentum tilt. The evidence suggests that funds with high ghost returns have higher tilts on average. More importantly, most of the tilt effect is concentrated in early portfolios, as indicated by the significant (at 1%) positive coefficient on the interaction term in column 3. This early tilt is about three times as big as the tilt in later years. To illustrate, a one standard deviation higher excess ghost return at inception (about 1.7 pp) is associated with an increase in tilt towards winners in the first year of fund life of 5.73 pp (=1.7*(1.141+2.232)), or about half the unconditional standard deviation of the tilt measure. The fact that funds with high ghost returns have high tilts is not surprising given the evidence from Tables 3 and 4. However, it is noteworthy that this high tilt does not endure and loses two-thirds of its magnitude by the end of the first year.

Next, we examine how a fund manager's decision to create an abnormal ghost return around inception affects the dynamics of portfolio activity. The result in Table 9 suggests that a fund that attempts to create a large ghost return by selecting stocks or industries with large recent returns will eventually rebalance its portfolio, probably to minimize tracking error and reduce the adverse effect of the window-dressed portfolio on performance. We define three trading activity measures to identify the portion of portfolio turnover that is due to active and deliberate management decisions rather than due to flow-induced additions to existing positions. All of these measures compare adjacent fund portfolio disclosures that are 3 months apart.

We compute 'Discretionary trading' by explicitly scaling all existing positions in the previous portfolio by percentage flows observed during the intermittent 3 months and then calculating the turnover between this flow-imputed portfolio and the actual portfolio reported at the end of the 3-month period. In computing 'Rebalancing' we make no direct assumptions about the allocation of flows but directly compare consecutive portfolio weights stock by stock. For both measures, any position that is absent either at the beginning or the end of the period is assigned zero weight, as we consider adding a new position or liquidating an existing position as discretionary managerial choices. Lastly, 'Turnover (SEC)' follows the SEC definition of portfolio turnover, i.e. the minimum of total sales and purchases over a specified period. A young fund that only adds to existing positions as it grows could potentially have zero turnover as per the SEC's definition. Any positive contribution to the SEC measure for a young fund likely stems from the active decision by the fund manager to sell/reduce an existing position.

We regress the turnover measures on the fund's ghost return (in excess of the market) and its interaction with the age dummy as follows:

$$\text{Activity}_{i,(\tau,\tau+3]} = \beta\ \text{ExGhostBHR}_{i,(-12,0]} + \gamma\ \text{D}_{\tau<12} + \delta\ \text{D}_{\tau<12} \times \text{ExGhostBHR}_{i,(-12,0]} + \Gamma^{\text{T}}\ \text{Controls} + \epsilon_{i,\tau}$$

Table 10 reports the results of this analysis. First, we note the significant positive coefficient on the age dummy in column 2, which reflects the difference in portfolio activity between young and mature funds regardless of the ghost return magnitude. Second, the interaction term in column 3 is also strongly positive and significant (at 1%) for all measures of turnover. These results suggest that funds with particularly high ghost returns experience an abnormal turnover soon after the initiation in excess of that expected of all young funds. Overall, the combined evidence from Tables 9 and 10 is consistent with the view that high ghost returns are created intentionally and that portfolios constructed to convey the impression of strong hypothetical fund performance are short-lived.

Finally, we examine the relationship between the ghost return and the subsequent long-term risk-adjusted fund performance. We consider two performance measures: the four factor alpha and the benchmark-adjusted return. Both these measures are computed from fund gross returns but are later used in the regression that includes expense ratio as a control. The alphas are constructed as follows. For every month τ that the fund is in operation we form an estimation window that stretches 18 months back and forward. In this window, we estimate the factor loadings in the Fama-French four-factor model (these loadings are set to missing if fewer than 30 valid fund returns are available in the estimation period). We compute the fund alpha in month τ as the difference between the actual fund return and the return predicted by the four-factor model based on the estimated loadings. Because of the constraint on the number of non-missing observations, the alphas are not available for approximately the first 12 months of fund life. However, since we focus on long-term performance in this analysis, this issue is not of central importance.

We regress the performance measures on the excess ghost return using the following specification:

$$\text{Performance}_{i,\tau} = \beta \ \text{ExGhostBHR}_{i,(-12,0]} + \delta \ \text{GhostMRet}_{(-12,0]} + \Gamma^{\text{T}} \ \text{Controls} + \epsilon_{i,\tau}$$

Table 11 displays the results of this analysis. In column 1, the coefficient on ExGhostBHR is negative and significant (at 1%), indicating that funds with high excess ghost returns tend to post weaker long-term performance. At the same time, future fund performance is unrelated to the market return in the pre-initiation period: the coefficient on GhostMRet is insignificant in columns 2 and 3. To summarize, when we decompose the ghost return into the market-driven part and the index/stock selection part, it is the latter that predicts weaker future fund performance.

Conclusion

We study mutual fund window-dressing incentives and flow response to these incentives at times when funds have few actual returns to report. First, we find that portfolio compositions of young funds are structured to convey the impression of strong hypothetical past performance, significantly more so than those of mature funds. The average difference between the holdings-implied fund return computed in the 12 months before the initiation (the "ghost return") and that computed in the 12 months after the initiation is over 4% for broad U.S. equity funds and over 19% for sector funds. We do not observe any significant differences between pre- and post- event holdings-implied returns around other events, such as additional share class inceptions and fund anniversaries. Second, the following three choices contribute to the high ghost return: the timing of fund initiation relative to market performance (48% of the effect), the choice of the fund investment focus as reflected in the benchmark index (21%), and the overweighting of well-performing stocks in excess of the market and the benchmark performance (31%). Third, we document that flows respond strongly to the "ghost return" initially but that this response fades monotonically with time as more actual fund returns become available. In contrast, the flow response to the realized fund return, while weak in the first few quarters of flow observations, increases monotonically from quarter to quarter. Finally, we find that funds with particularly high ghost returns actively rebalance their portfolios during the first year of existence and significantly reduce their exposure to momentum stocks over time. Overall, our results suggest that fund managers make extensive use of marketing devices rooted in investors' backward-looking bias, significantly more so at times when realized fund returns are too scarce to provide a reliable alternative signal of managerial quality. This evidence further suggests that the widely documented return-chasing behavior of mutual fund investors has irrational basis, since investors appear to react to hypothetical return measures that not only are not representative of the actual past fund returns but are also negatively related to future fund performance.

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Figure 1: Cumulative Holdings-Implied Return and Benchmark Return around Initial Fund Inceptions

This set of graphs shows the average cumulative holdings-implied return (left) and benchmark index return (right) for mutual funds in the 24-month window around the initial fund inception. The returns are normalized to zero in the month of inception. In each of the two panes, the returns are plotted separately for broad domestic U.S. equity funds and sector funds. The holdings-implied return is computed as the value-weighted average return of the fund's portfolio holdings based on the composition of the first reported portfolio after the inception. The respective numbers of shares of stocks held are assumed constant for 12 months before and after the event (except for adjustments for corporate actions, such as splits or stock dividends). The benchmark return is the total or gross return (TR/GR) reported by Morningstar for the prospectus benchmark of the fund.

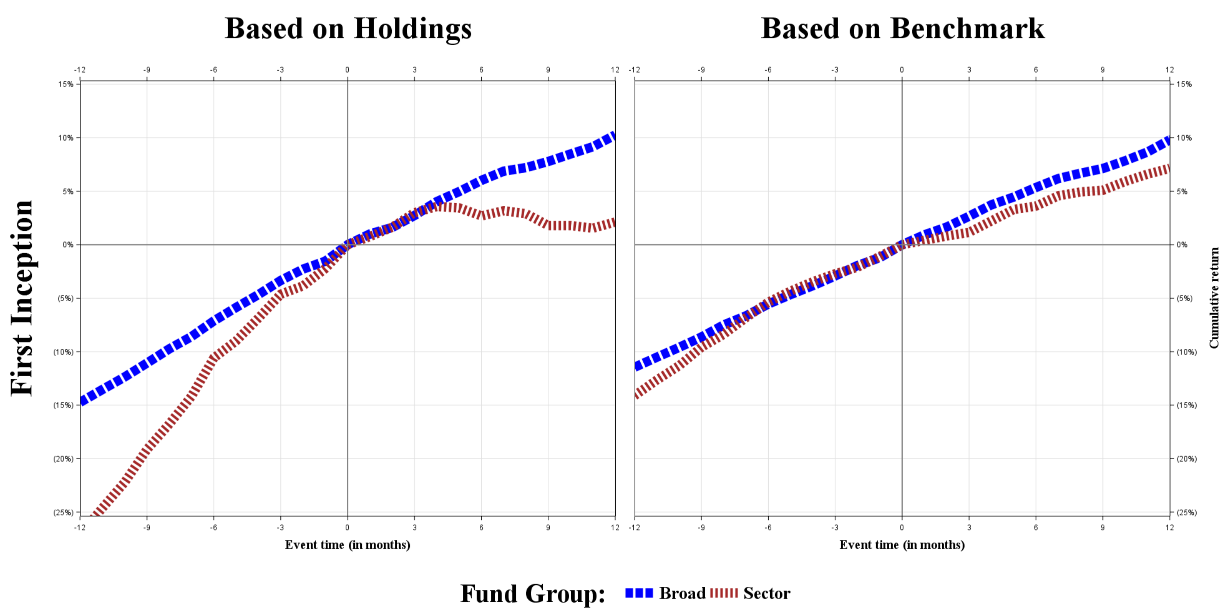

Figure 2: Cumulative Holdings-Implied and Benchmark Returns around Additional Share Class Inceptions

This pair of graphs shows the average cumulative holdings-implied return (left) and benchmark index return (right) for mutual funds in the 24-month window around the inception of additional fund share classes. Share class inceptions within 6 months of the original fund inception are excluded. The construction methodology is the same as in Figure 1.

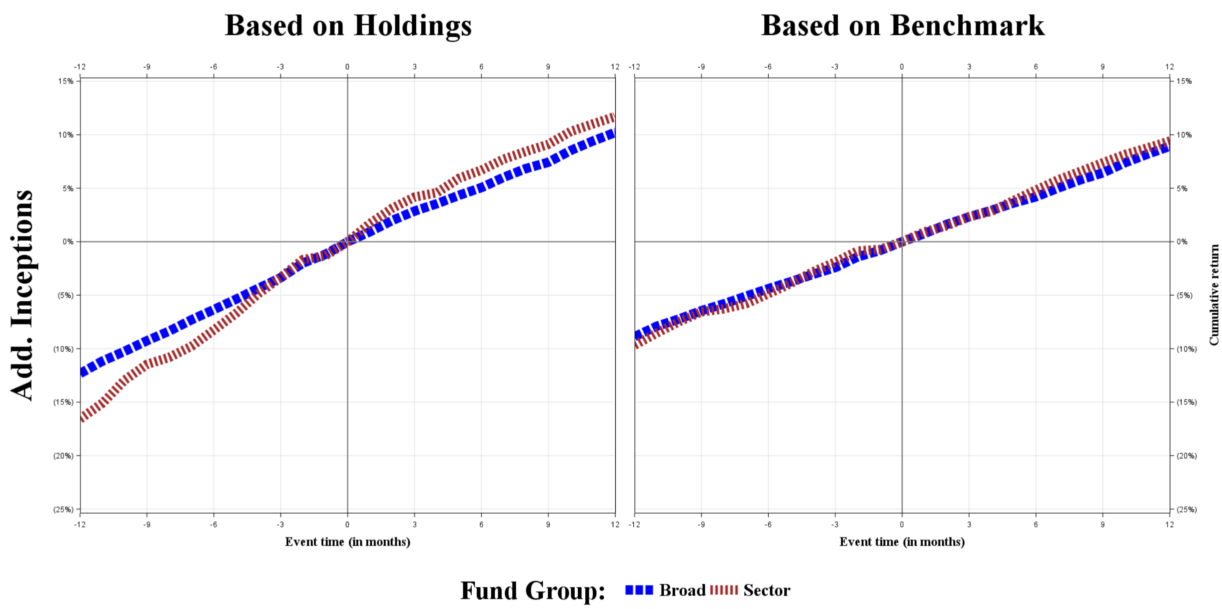

Figure 3: Cumulative Holdings-Implied and Benchmark Returns around Anniversaries of the Initial Fund Inception

This pair of graphs shows the average cumulative holdings-implied return (left) and benchmark index return (right) for mutual funds in the 24-month window around the anniversaries (every 12 months) of the initial fund inception. The construction methodology is the same as in Figure 1.

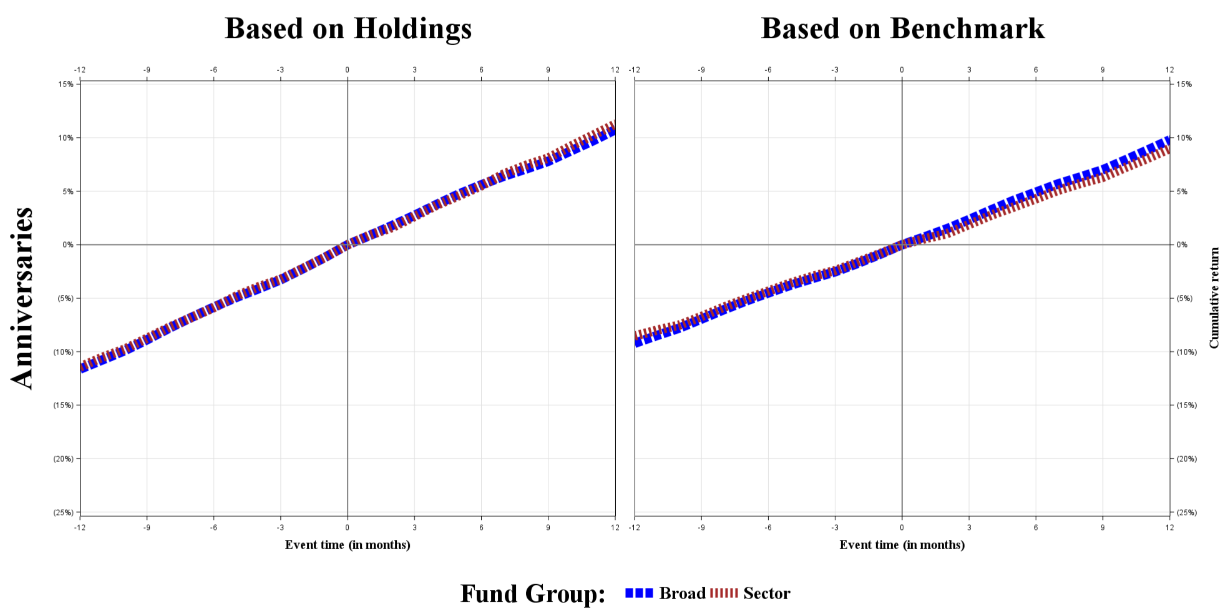

Table 1: Sample Overview

This table lists the number of funds, aggregate fund net assets (as of the end of the sample period), and the average number of holdings for the funds in the sample. Funds are divided into two specialty groups (broad diversified U.S. equity and sector funds) and further into style or sector categories. In addition, for each category, we separate mutual funds and exchange-traded funds. The final column shows the proportion of total net assets per category managed by exchange-traded funds.

Style/Sector	**# Funds**	**Agg. AUM (in $m)**	**Avg. ExpRatio**	**Avg. # Equities**
Panel A: Broad Equity				
Large Blend	1,177	1,273,559	0.48%	214
Large Growth	1,063	1,229,508	0.77%	92
Large Value	797	856,638	0.71%	98
Mid-Cap Blend	325	160,277	0.70%	252
Mid-Cap Growth	514	262,512	1.00%	99
Mid-Cap Value	248	191,500	0.87%	139
Small Blend	421	171,628	0.87%	347
Small Growth	526	180,732	0.97%	130
Small Value	264	96,097	0.94%	225
ALL	**5,335**	**4,422,450**	**0.71%**	**151**
Panel B: Sector Equity				
Communications	33	4,795	0.85%	45
Consumer Goods & Svcs.	18	9,727	0.89%	67
Energy	76	45,006	2.91%	48
Financials	70	9,955	1.13%	65
Healthcare	87	133,474	0.69%	61
Industrials	12	3,982	0.87%	47
Natural Resources	53	17,575	0.98%	53
Precious Metals	52	7,369	1.05%	25
Real Estate	229	113,248	0.90%	47
Technology	209	46,742	1.10%	64
Utilities	53	19,738	1.01%	52
ALL	**892**	**411,613**	**1.09%**	**55**

Table 2: Fund Characteristics

This table shows the distribution of various characteristics of the mutual funds in the sample divided into two specialty groups (broad diversified U.S. equity and sector funds). The unit of observation is fund-year. The characteristics include fund total net assets, fund expense ratio, annual gross fund return, 12-month volatility of monthly fund returns, number of holdings, portfolio concentration (Herfindahl Index of portfolio weights), holding horizon (see Lan, Moneta, and Wermers (2015)), fraction of diversified risk, and active weight (see Doshi, Elkamhi and Simutin (2015)). In addition, the table presents three measures of portfolio activity: 'Discretionary Trading' captures the portion of turnover attributable to active portfolio allocation; 'Rebalancing' measures the sum of changes in weights of consecutive portfolios; 'Turnover (SEC)' follows the SEC definition of portfolio turnover, i.e. the minimum of total sales and purchases over a period. All three measures compare holdings that are 3 months apart.

Variable	**Fund-Years**	**MEAN**	**P10**	**P25**	**MEDIAN**	**P75**	**P90**
Panel A: U.S. Equity							
Fund TNA (in $m)	49,689	906	10	40	168	676	2,101
Expense Ratio	56,374	1.20%	0.66%	0.94%	1.18%	1.44%	1.77%
Gross Fund Return (12m)	49,001	0.084	-0.195	0.009	0.121	0.207	0.290
Return Volatility (ann.)	49,001	0.161	0.081	0.102	0.143	0.201	0.264
# of Holdings	39,711	158	35	50	78	132	341
Portfolio Conc.	39,650	0.021	0.008	0.012	0.018	0.026	0.036
Hldg Horizon (in years)	39,575	2.6	1.02	1.45	2.13	3.16	4.77
Diversification	39,575	0.486	0.352	0.413	0.497	0.562	0.602
Active Weight	39,711	37%	23%	30%	37%	45%	53%
Disc. Trading	29,554	48%	19%	31%	45%	62%	80%
Rebalancing	29,554	48%	22%	33%	46%	62%	75%
Turnover (SEC)	29,554	35%	10%	20%	33%	48%	62%
Panel B: Sector Equity							
Fund TNA (in $m)	7,950	514	9	32	132	478	1,281
Expense Ratio	8,930	1.46%	0.88%	1.11%	1.42%	1.73%	2.07%
Gross Fund Return (12m)	7,778	0.072	-0.292	-0.033	0.117	0.235	0.336
Return Volatility (ann.)	7,778	0.202	0.094	0.122	0.169	0.248	0.380
# of Holdings	6,049	61	29	38	51	72	100
Portfolio Conc.	6,031	0.039	0.02	0.026	0.035	0.046	0.06
Hldg Horizon (in years)	6,014	2.4	1.08	1.5	2.12	2.94	4.11
Diversification	6,008	0.373	0.213	0.287	0.364	0.460	0.541
Active Weight	6,049	41%	21%	30%	41%	51%	60%
Disc. Trading	4,414	43%	18%	27%	39%	54%	71%
Rebalancing	4,414	42%	21%	29%	40%	54%	67%
Turnover (SEC)	4,414	29%	8%	16%	27%	40%	53%

Table 3: Holdings-Implied Fund Returns and Benchmark Returns

This table compares holdings-implied returns and benchmark returns in the 12 months prior to the fund's inception/anniversary to the corresponding return in the 12 months after. The holdings-implied return is computed as the value-weighted average return of the fund's portfolio holdings based on the composition of the first reported portfolio after the inception/anniversary. The respective numbers of shares of stocks held are assumed constant for 12 months before and after the event (except for adjustments for corporate actions, such as splits or stock dividends). The benchmark return is the total or gross return (TR/GR) reported by Morningstar for the prospectus benchmark of the fund. The funds are grouped by specialty (broad diversified U.S. equity funds and sector funds). The table reports the average 12-month pre- and post- event returns and the difference between the two for a) the first share class inception of each fund, b) additional share class inceptions, and c) (12-month) anniversaries of the first inception.

	Holdings-implied Returns				**Benchmark Returns**			
	# obs	**Prior**	**Post**	**Diff.**	**# obs**	**Prior**	**Post**	**Diff.**
Panel A: U.S. Equity								
MF: First Shareclass Inception	1,595	0.168	0.123	0.042***	3,134	0.125	0.096	0.027***
				(4.85)				(6.07)
MF: Other Shareclass Inceptions	3,100	0.139	0.137	0.002	4,212	0.100	0.095	0.004
				(0.29)				(1.02)
MF: Anniversaries of First Inception	30,062	0.132	0.134	-0.002	41,107	0.101	0.099	0.002
				(-1.16)				(1.31)
Panel B: Sector Equity								
MF: First Shareclass Inception	274	0.306	0.081	0.198***	450	0.159	0.065	0.088***
				(6.35)				(6.16)
MF: Other Shareclass Inceptions	406	0.183	0.148	0.025	537	0.103	0.097	0.006
				(1.16)				(0.55)
MF: Anniversaries of First Inception	4,595	0.134	0.132	0.001	6,096	0.094	0.093	0.002
				(0.19)				(0.59)

Table 4: Backward-Projected Holdings Returns (BHR)

This table shows the results from the following pooled regression of backward-projected holdings returns (BHR):

$$\text{BHR}_{i,(\tau-12,\tau]} = \beta\,\text{RetVar}_{(\tau-12,\tau]} + \gamma\,\text{DGhost}_{i,\tau} + \delta\,\text{DGhost}_{i,\tau} \times \text{RetVar}_{(\tau-12,\tau]} + \epsilon_{i,\tau}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-year. For each fund, the observations are separated by 12-month intervals and are taken at the end of the calendar month (e.g., February) in which the fund inception occurred. BHR is computed as the value-weighted average return of the fund's portfolio holdings over the 12-month period before the inception/anniversary based on the composition (numbers of shares of stocks held) of the first reported portfolio after the inception/anniversary. RetVar represents concurrent returns of either the CRSP value-weighted index (MRet) or the fund's benchmark (IndexRet). DGhost is a dummy equal to 1 in the inception year (and zero otherwise). The sample consists of all anniversaries that fall into the sample years 1994-2015 for broad diversified U.S. and sector equity mutual funds. Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

Indep. variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
DGhost	0.042***	0.022***	0.023***	0.017***	0.013***	0.012***	0.008**
	(7.59)	(5.77)	(5.20)	(3.91)	(3.79)	(2.90)	(2.04)
$\text{MRet}_{(\tau-12,\tau]}$		1.021***	1.021***	1.075***			
		(206.67)	(206.44)	(186.19)			
$\text{DGhost} \times \text{MRet}_{(\tau-12,\tau]}$			-0.006	0.037*			
			(-0.28)	(1.70)			
$\text{IndexRet}_{(\tau-12,\tau]}$					0.995***	0.994***	1.000***
					(239.45)	(237.59)	(195.28)
$\text{DGhost} \times \text{IndexRet}_{(\tau-12,\tau]}$						0.014	0.021
						(0.68)	(1.08)
Time F.E.	NO	NO	NO	YES	NO	NO	YES
Family F.E.	YES	YES	YES	YES	YES	YES	YES
Category F.E.	YES	YES	YES	YES	YES	YES	YES
R-Square	0.0487	0.6716	0.6716	0.6820	0.7268	0.7268	0.7306
# Obs.	43,412	43,412	43,412	43,412	41,268	41,268	41,268

Table 5: Backward-Projected Holdings Returns (BHR) and Benchmark Characteristics

This table shows the results from the following pooled regression of backward-projected holdings returns (BHR):

$$\text{BHR}_{i,(\tau-12,\tau]} = \beta\,\text{MRet}_{(\tau-12,\tau]} + \gamma\,\text{DGhost}_{i,\tau} + \nu\,\text{DSubset}_{i,\tau} + \delta\,\text{DGhost}_{i,\tau} \times \text{DSubset}_{i,\tau} + \epsilon_{i,\tau}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-year. For each fund, the observations are separated by 12-month intervals and are taken at the end of the calendar month (e.g., February) in which the fund inception occurred. BHR is computed as the value-weighted average return of the fund's portfolio holdings over the 12-month period before the inception/anniversary based on the composition (numbers of shares of stocks held) of the first reported portfolio after the inception/anniversary. MRet represents the concurrent return on the CRSP value-weighted index. DGhost is a dummy equal to 1 in the inception year (and zero otherwise). DSubset captures one of four benchmark characteristics: DSpecial equals 1 if the fund's benchmark is currently followed by fewer than 5 other funds; DLowCorr equals 1 if the average correlation between the fund's benchmark and the benchmarks of the closest 100 peer funds is less than 0.95; DLargeDist equals 1 if the average Euklidian distance in the monthly return space between the fund's benchmark and the benchmarks of the closest 100 peer funds is larger than 0.01; DSector equals 1 if the fund is a sector fund. The sample consists of all anniversaries that fall into the sample years 1994-2015 for broad diversified U.S. and sector equity mutual funds. Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

Indep. variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
DGhost	0.030***	0.015***	0.012***	0.033***	0.015***	0.012***	0.036***	0.016***	0.014***	0.026***	0.010***	0.008**
	(5.13)	(3.56)	(2.80)	(5.54)	(3.76)	(2.81)	(6.21)	(4.02)	(3.37)	(4.53)	(2.71)	(2.03)
$\text{MRet}_{(\tau-12,\tau]}$		1.017***	1.072***		1.021***	1.076***		1.021***	1.076***		1.021***	1.076***
		(200.77)	(182.28)		(203.85)	(184.84)		(203.93)	(184.91)		(204.27)	(184.71)
DSpecial	-0.003	-0.005	-0.006									
	(-0.61)	(-1.13)	(-1.39)									
DGhost × DSpecial	0.056**	0.036**	0.038**									
	(2.58)	(2.08)	(2.30)									
DLowCorr				0.003	-0.002	-0.005						
				(0.70)	(-0.53)	(-1.31)						
DGhost × DLowCorr				0.052***	0.036***	0.043***						
				(2.96)	(2.72)	(3.38)						
DLargeDist							0.010***	-0.000	-0.002			
							(2.63)	(-0.13)	(-0.46)			
DGhost × DLargeDist							0.050**	0.044***	0.043***			
							(2.42)	(2.73)	(2.81)			
DSector										-0.012***	-0.001	-0.003
										(-3.05)	(-0.33)	(-0.82)
DGhost × DSector										0.104***	0.072***	0.073***
										(5.21)	(4.67)	(4.88)
Time F.E.	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Family F.E.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Category F.E.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
R-Square	0.0207	0.6496	0.6614	0.0216	0.6450	0.6559	0.0218	0.6450	0.6559	0.0224	0.6454	0.6563
# Obs.	41,331	41,331	41,331	43,412	43,412	43,412	43,412	43,412	43,412	43,412	43,412	43,412

Table 6: Backward-Projected Holdings Returns (BHR) and Fund Characteristics

This table shows the results from the following pooled regression of backward-projected holdings returns (BHR):

$$\text{BHR}_{i,(\tau-12,\tau]} = \beta\,\text{MRet}_{(\tau-12,\tau]} + \gamma\,\text{DGhost}_{i,\tau} + \nu\,\text{FundChar}_{i,\tau} + \delta\,\text{DGhost}_{i,\tau} \times \text{FundChar}_{i,\tau} + \epsilon_{i,\tau}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-year. For each fund, the observations are separated by 12-month intervals and are taken at the end of the calendar month (e.g., February) in which the fund inception occurred. BHR is computed as the value-weighted average return of the fund's portfolio holdings over the 12-month period before the inception/anniversary based on the composition (numbers of shares of stocks held) of the first reported portfolio after the inception/anniversary. MRet represents the concurrent return on the CRSP value-weighted index. DGhost is a dummy equal to 1 in the inception year (and zero otherwise). FundChar is a placeholder for one of several fund characteristics: DInst equals 1 if the fund only offered institutional share classes at inception; DFront and DDeferred indicate the presence of a front-end load and a deferred sales charge, respectively, in at least one of the fund's share classes; Fee12b1 is the marketing and distribution fee (in %); DIncubator equals 1 if the fund was incubated (the methodology is by Evans (2010)). The sample consists of all anniversaries that fall into the sample years 1994-2015 for broad diversified U.S. and sector equity mutual funds. Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

Indep. variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
DGhost	0.025***	0.015***	0.013***	0.024***	0.007
	(6.00)	(3.07)	(2.63)	(6.06)	(1.52)
$\text{MRet}_{(\tau-12,\tau]}$	1.021***	1.021***	1.021***	1.021***	1.020***
	(206.69)	(206.82)	(206.92)	(206.72)	(205.91)
DInst	-0.004				
	(-1.23)				
DGhost × DInst	-0.026**				
	(-2.35)				
DFront		0.003			
		(1.09)			
DGhost × DFront		0.017**			
		(2.10)			
DDeferred			0.000		
			(0.09)		
DGhost × DDeferred			0.017**		
			(2.23)		
Fee12b1				-0.760	
				(-1.37)	
DGhost × Fee12b1				6.486**	
				(2.47)	
DIncubator					-0.002
					(-0.48)
DGhost × DIncubator					-0.029**
					(-2.08)
Time F.E.	NO	NO	NO	NO	NO
Family F.E.	YES	YES	YES	YES	YES
Category F.E.	YES	YES	YES	YES	YES
R-Square	0.6717	0.6717	0.6716	0.6716	0.6749
# Obs.	43,412	43,412	43,412	43,412	42,225

Table 7: Quarterly Fund Flows and Backward-Projected Holdings Returns

This table shows the results of pooled fund-quarter regressions of quarterly fund flows:

$$\begin{aligned}\text{FFlow}_{i,(\tau+2,\tau+5]} &= \beta_1 \,\text{BHR}_{i,(\tau-12,\tau]} + \beta_2 \,\text{FundRet}_{i,(\tau-12,\tau]} + \gamma \, D_{\tau<12} \\ &+ \delta_1 \, D_{\tau<12} \times \text{BHR}_{i,(\tau-12,\tau]} + \delta_2 \, D_{\tau<12} \times \text{FundRet}_{i,(\tau-12,\tau]} \\ &+ \mathbf{\Gamma}^\intercal \,\text{Controls}_{i,\tau} + \epsilon_{i,\tau}\end{aligned}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-quarter. Each FFlow is computed over the 3-month period which is 2 months removed from the closest prior portfolio report date to allow for the disclosure delay (as in Aggarwal, Gay, and Ling (2015)). FFlow is equal to the net dollar flow into the fund divided by the beginning-of-period fund TNA. BHR is the holdings-implied return computed over the 12-month period preceding the portfolio disclosure date and FundRet is the average monthly fund gross return over that period. $D_{\tau<12}$ equals 1 if the portfolio disclosure date lies within 12 months of the fund inception date. Control variables include the log of the total net assets of all funds in the same fund family (LogFamilySize), the number of funds in the family (LogNAlive), fund size (LogTNA), the expense ratio (ExpRatio), and the marketing and distribution fees (Fee12b1). Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

Indep. variable	**(1)**	**(2)**	**(3)**	**(4)**
$\text{BHR}_{(\tau-12,\tau]}$	0.764***		-0.437***	-0.671***
	(15.10)		(-6.60)	(-9.82)
$\text{FundRet}_{(\tau-12,\tau]}$		1.992***	2.302***	2.666***
		(35.65)	(30.16)	(33.54)
$D_{\tau<12}$				0.103***
				(27.69)
$D_{\tau<12} \times \text{BHR}_{(\tau-12,\tau]}$				1.479***
				(7.68)
$D_{\tau<12} \times \text{FundRet}_{(\tau-12,\tau]}$				-1.757***
				(-10.71)
LogFamilySize	0.004***	0.004***	0.004***	0.002***
	(5.88)	(5.34)	(5.06)	(3.80)
LogNAlive	-0.006***	-0.005***	-0.004***	-0.003**
	(-4.45)	(-3.53)	(-3.02)	(-2.37)
LogTNA	-0.011***	-0.011***	-0.011***	-0.009***
	(-24.63)	(-25.61)	(-25.64)	(-20.44)
ExpRatio	-1.876***	-1.909***	-1.896***	-1.708***
	(-8.89)	(-9.42)	(-9.36)	(-8.92)
Fee12b1	0.966**	1.067***	1.059***	1.063***
	(2.37)	(2.76)	(2.75)	(2.90)
Time F.E.	YES	YES	YES	YES
Family F.E.	NO	NO	NO	NO
Category F.E.	YES	YES	YES	YES
R-Square	0.0590	0.0846	0.0860	0.1182
# Obs.	110,680	110,217	110,217	110,217

Table 8: Quarterly Fund Flows and Ghost Returns

This table shows the results of pooled fund-quarter regressions of quarterly fund flows:

$$\begin{aligned}\text{FFlow}_{i,(\tau+2,\tau+5]} = {} & \beta_1\,\text{GhostBHR}_{i,(-12,0]} + \beta_2\,\text{FundRet}_{i,(\tau-12,\tau]} + \sum_{l=1}^{4}\gamma^{l}\,\text{DQ}_l \\ & + \sum_{l=1}^{4}\delta_1^{l}\,\text{DQ}_l \times \text{GhostBHR}_{i,(-12,0]} + \sum_{l=1}^{4}\delta_2^{l}\,\text{DQ}_l \times \text{FundRet}_{i,(\tau-12,\tau]} \\ & + \boldsymbol{\Gamma}^{\intercal}\,\text{Controls}_{i,\tau} + \epsilon_{i,\tau}\end{aligned}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-quarter. Each FFlow is computed over the 3-month period which is 2 months removed from the closest prior portfolio report date to allow for the disclosure delay (as in Aggarwal, Gay, and Ling (2015)). FFlow is equal to the net dollar flow into the fund divided by the beginning-of-period fund TNA. GhostBHR is the holdings-implied return computed over the 12-month period preceding the inception date (using the first available portfolio disclosure) and FundRet is the (rolling 12-month) average monthly fund gross return preceding each disclosure date. DQ_l equals 1 if the portfolio disclosure date lies within the l^{th} quarter of the fund's life ($1 \leq l \leq 4$). Control variables include the log of the total net assets of all funds in the same fund family (LogFamilySize), the number of funds in the family (LogNAlive), fund size (LogTNA), the expense ratio (ExpRatio), and the marketing and distribution fees (Fee12b1). Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

Table 8: Continued

Indep. variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
$\text{GhostBHR}_{(-12,0]}$	-0.232***		-0.174***	-0.187***	-0.179***
	(-5.93)		(-4.62)	(-5.16)	(-4.98)
$\text{FundRet}_{(\tau-12,\tau]}$		1.870***	1.852***	1.871***	2.144***
		(29.31)	(28.95)	(30.85)	(31.90)
DQ_1				0.119***	0.128***
				(12.30)	(13.50)
DQ_2				0.104***	0.113***
				(20.56)	(22.34)
DQ_3				0.084***	0.088***
				(19.75)	(19.95)
DQ_4				0.070***	0.071***
				(18.18)	(18.07)
$\text{DQ}_1 \times \text{GhostBHR}_{(-12,0]}$				1.274***	1.642***
				(3.23)	(4.17)
$\text{DQ}_2 \times \text{GhostBHR}_{(-12,0]}$				1.029***	1.135***
				(5.33)	(6.06)
$\text{DQ}_3 \times \text{GhostBHR}_{(-12,0]}$				0.354**	0.385***
				(2.37)	(2.59)
$\text{DQ}_4 \times \text{GhostBHR}_{(-12,0]}$				0.317**	0.331**
				(2.31)	(2.39)
$\text{DQ}_1 \times \text{FundRet}_{(\tau-12,\tau]}$					-1.824***
					(-6.93)
$\text{DQ}_2 \times \text{FundRet}_{(\tau-12,\tau]}$					-1.260***
					(-8.47)
$\text{DQ}_3 \times \text{FundRet}_{(\tau-12,\tau]}$					-0.517***
					(-3.32)
$\text{DQ}_4 \times \text{FundRet}_{(\tau-12,\tau]}$					-0.130
					(-0.91)
LogFamilySize	0.004***	0.004***	0.004***	0.003***	0.003***
	(4.77)	(4.29)	(4.25)	(3.26)	(3.24)
LogNAlive	-0.005***	-0.004**	-0.004**	-0.004**	-0.004**
	(-2.65)	(-2.49)	(-2.38)	(-2.23)	(-2.21)
LogTNA	-0.012***	-0.012***	-0.012***	-0.008***	-0.008***
	(-22.80)	(-23.10)	(-22.84)	(-16.42)	(-16.56)
ExpRatio	-1.982***	-2.295***	-2.213***	-2.021***	-2.030***
	(-7.78)	(-9.28)	(-8.93)	(-8.80)	(-8.88)
Fee12b1	0.815	1.304***	1.246***	1.466***	1.472***
	(1.64)	(2.71)	(2.60)	(3.24)	(3.28)
Time F.E.	YES	YES	YES	YES	YES
Family F.E.	NO	NO	NO	NO	NO
Category F.E.	YES	YES	YES	YES	YES
R-Square	0.0684	0.0885	0.0893	0.1273	0.1300
# Obs.	102,610	101,265	101,265	101,265	101,265

Table 9: Portfolio Momentum Tilts

This table shows the results of pooled fund-quarter regressions of fund portfolio momentum tilts:

$$\text{Tilt}_{i,\tau} = \beta \, \text{ExGhostBHR}_{i,(-12,0]} + \gamma \, D_{\tau<12} + \delta \, D_{\tau<12} \times \text{ExGhostBHR}_{i,(-12,0]} + \mathbf{\Gamma}^{\intercal} \, \text{Controls}_{i,\tau} + \epsilon_{i,\tau}$$

The unit of observation is fund-quarter. At the end of each month, we calculate the momentum tilt of the portfolio as follows. First, we sort all stocks in the CRSP universe by their trailing 12-month return and assign each stock its centered percentile rank, i.e. the actual percentile rank (from 1 to 100) normalized to $[-0.495, 0.495]$. The momentum tilt of the portfolio is the value-weighted (equal-weighted) average of these ranks across the portfolio positions. ExGhostBHR is the average monthly holdings-implied return minus the corresponding return on the CRSP value-weighted index computed over the 12-month period prior to fund inception based on the composition of the first reported portfolio after the inception. $D_{\tau<12}$ equals 1 if the portfolio disclosure date lies within 12 months of the fund inception date. FundRet is the average monthly fund gross return in the previous period. Other control variables include the log of the total net assets of all funds in the same fund family (LogFamilySize), the number of funds in the family (LogNAlive), fund size (LogTNA), the expense ratio (ExpRatio), and the marketing and distribution fees (Fee12b1). Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

	Momentum Tilt (VW)			**Momentum Tilt (EW)**		
Indep. variable	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
$\text{ExGhostBHR}_{(-12,0]}$	1.262***	1.262***	1.141***	1.252***	1.252***	1.135***
	(11.07)	(11.07)	(9.93)	(10.76)	(10.76)	(9.67)
$D_{\tau<12}$		-0.003	-0.015***		-0.000	-0.012***
		(-1.23)	(-5.69)		(-0.13)	(-4.48)
$D_{\tau<12} \times \text{ExGhostBHR}_{(-12,0]}$			2.232***			2.163***
			(11.28)			(11.12)
$\text{FundRet}_{(\tau-3,\tau]}$	0.589***	0.589***	0.596***	0.569***	0.569***	0.575***
	(19.52)	(19.51)	(19.90)	(19.43)	(19.43)	(19.84)
LogFamilySize	-0.007***	-0.007***	-0.007***	-0.005***	-0.005***	-0.006***
	(-4.85)	(-4.83)	(-4.96)	(-3.95)	(-3.94)	(-4.06)
LogNAlive	0.016***	0.016***	0.016***	0.014***	0.014***	0.014***
	(5.53)	(5.52)	(5.68)	(4.89)	(4.89)	(5.04)
LogTNA	0.002***	0.002***	0.002**	0.001	0.001	0.001
	(2.84)	(2.63)	(2.46)	(1.53)	(1.48)	(1.31)
ExpRatio	-0.113	-0.121	-0.155	0.668*	0.668*	0.634
	(-0.29)	(-0.31)	(-0.40)	(1.68)	(1.68)	(1.60)
Fee12b1	-1.405	-1.409	-1.406	-1.907**	-1.907**	-1.904**
	(-1.61)	(-1.62)	(-1.61)	(-2.22)	(-2.22)	(-2.22)
Time F.E.	YES	YES	YES	YES	YES	YES
Family F.E.	NO	NO	NO	NO	NO	NO
Category F.E.	YES	YES	YES	YES	YES	YES
R-Square	0.2785	0.2785	0.2842	0.2445	0.2445	0.2504
# Obs.	53,373	53,373	53,373	53,373	53,373	53,373

Table 10: Measures of Portfolio Activity

This table shows the results of pooled fund-quarter regressions of measures of portfolio activity:

$$\text{Activity}_{i,(\tau,\tau+3]} = \beta\,\text{ExGhostRet}_{i,(-12,0]} + \gamma\,D_{\tau<12} + \delta\,D_{\tau<12} \times \text{ExGhostRet}_{i,(\tau-12,\tau]} + \mathbf{\Gamma}^{\intercal}\,\text{Controls}_{i,\tau} + \epsilon_{i,\tau}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-quarter. In each quarter, we consider the following activity measures: 'Discretionary Trading' captures the portion of turnover attributable to active portfolio allocation; 'Rebalancing' measures the sum of changes in weights of consecutive portfolios; 'Turnover (SEC)' follows the SEC definition of portfolio turnover, i.e. the minimum of total sales and purchases over a period. ExGhostRet is the average monthly holdings-implied return minus the corresponding return on the CRSP value-weighted index computed over the 12-month period prior to fund inception based on the composition of the first reported portfolio after the inception. $D_{\tau<12}$ equals 1 if the portfolio disclosure date lies within 12 months of the fund inception date. FundRet is the average monthly fund gross return in the previous period. Other control variables include the log of the total net assets of all funds in the same fund family (LogFamilySize), the number of funds in the family (LogNAlive), fund size (LogTNA), the expense ratio (ExpRatio), and the marketing and distribution fees (Fee12b1). Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

	Disc. Trading			**Rebalancing**			**Turnover (SEC)**		
Indep. variable	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
$\text{ExGhostBHR}_{(-12,0]}$	3.801***	3.797***	3.635***	3.981***	3.981***	3.842***	3.755***	3.757***	3.625***
	(7.17)	(7.18)	(6.87)	(8.06)	(8.06)	(7.75)	(7.87)	(7.87)	(7.51)
$D_{\tau<12}$		0.124***	0.106***		0.026*	0.011		-0.051***	-0.066***
		(7.28)	(6.15)		(1.85)	(0.75)		(-3.80)	(-4.89)
$D_{\tau<12} \times \text{ExGhostBHR}_{(-12,0]}$			3.422***			2.939***			2.781***
			(3.15)			(3.46)			(3.51)
$\text{FundRet}_{(\tau-3,\tau]}$	0.677***	0.664***	0.672***	-0.179	-0.182	-0.175	-0.406***	-0.401***	-0.394***
	(4.73)	(4.65)	(4.71)	(-1.44)	(-1.47)	(-1.41)	(-3.44)	(-3.40)	(-3.34)
LogFamilySize	0.022***	0.021***	0.021***	0.013*	0.012*	0.012*	0.014**	0.014**	0.014**
	(2.90)	(2.74)	(2.72)	(1.80)	(1.76)	(1.74)	(2.00)	(2.06)	(2.05)
LogNAlive	0.015	0.015	0.016	0.028**	0.028**	0.028**	0.026*	0.026*	0.026*
	(1.00)	(1.04)	(1.07)	(2.06)	(2.06)	(2.09)	(1.94)	(1.92)	(1.95)
LogTNA	-0.042***	-0.038***	-0.038***	-0.029***	-0.028***	-0.028***	-0.017***	-0.018***	-0.019***
	(-8.72)	(-7.63)	(-7.69)	(-6.48)	(-6.11)	(-6.16)	(-3.78)	(-4.09)	(-4.14)
ExpRatio	27.308***	27.626***	27.587***	25.242***	25.310***	25.276***	23.408***	23.277***	23.245***
	(10.76)	(10.94)	(10.92)	(10.94)	(10.98)	(10.97)	(10.39)	(10.33)	(10.32)
Fee12b1	-29.466***	-29.343***	-29.366***	-28.276***	-28.250***	-28.270***	-25.488***	-25.538***	-25.557***
	(-5.92)	(-5.91)	(-5.91)	(-6.13)	(-6.12)	(-6.12)	(-5.72)	(-5.72)	(-5.73)
Time F.E.	YES	YES	YES	YES	YES	YES	YES	YES	YES
Family F.E.	NO	NO	NO	NO	NO	NO	NO	NO	NO
Category F.E.	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-Square	0.1840	0.1863	0.1869	0.2121	0.2122	0.2127	0.1529	0.1534	0.1539
# Obs.	51,447	51,447	51,447	51,447	51,447	51,447	51,447	51,447	51,447

Table 11: Future Fund Performance and Ghost Returns

This table shows the results of pooled fund-month regressions of fund performance:

$$\text{Performance}_{i,\tau} = \beta\,\text{ExGhostBHR}_{i,(-12,0]} + \delta\,\text{GhostMRet}_{(-12,0]} + \mathbf{\Gamma}^{\intercal}\,\text{Controls}_{i,\tau-1} + \epsilon_{i,\tau}$$

where i indexes funds and τ indexes months since fund inception. The unit of observation is fund-month. Performance measures are a) monthly fund alphas, computed as the difference between gross fund return and the fitted value from the Fama-French 4-factor model and b) the simple difference between gross fund return and the benchmark return in the same month. Fama-French factor loadings are computed over a consecutive 36-month period centered around the current month, $[\tau - 17, \tau + 18]$. GhostMRet is the average monthly return on the CRSP value-weighted index computed over the 12-month period prior to fund inception. ExGhostBHR is the average monthly holdings-implied return computed over the 12-month period prior to fund inception based on the composition of the first reported portfolio after the inception, minus GhostMRet. Control variables include the log of the total net assets of all funds in the same fund family (LogFamilySize), the number of funds in the family (LogNAlive), fund size (LogTNA), the expense ratio (ExpRatio), and the marketing and distribution fees (Fee12b1). Fixed effects are present as indicated by column. T-statistics are based on standard errors clustered at the fund level and are reported in parentheses. * (**, ***) indicates the significance of the coefficient at the 10% (5%, 1%) level.

	Alpha (Gross, FF4)			**Index Adj. Return**		
Indep. variable	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
$\text{ExGhostBHR}_{(-12,0]}$	-0.016***		-0.016***	-0.050***		-0.050***
	(-4.72)		(-4.69)	(-3.79)		(-3.80)
$\text{GhostMRet}_{(-12,0]}$		-0.000	-0.001		-0.008	-0.011
		(-0.01)	(-0.39)		(-0.67)	(-0.98)
LogFamilySize	0.000**	0.000**	0.000**	0.000*	0.000*	0.000
	(2.22)	(2.25)	(2.21)	(1.69)	(1.71)	(1.54)
LogNAlive	-0.001***	-0.001***	-0.001***	0.000	0.000	0.000
	(-3.49)	(-3.83)	(-3.48)	(0.89)	(0.45)	(0.95)
logTNA	-0.000***	-0.000***	-0.000***	-0.001***	-0.001***	-0.001***
	(-9.98)	(-9.90)	(-9.96)	(-5.53)	(-5.42)	(-5.38)
Expense Ratio	-0.086***	-0.092***	-0.086***	-0.108**	-0.125**	-0.105**
	(-4.00)	(-4.32)	(-4.00)	(-2.17)	(-2.41)	(-2.14)
Fee12b1	0.083**	0.086**	0.083**	0.048	0.050	0.041
	(2.31)	(2.39)	(2.31)	(0.52)	(0.53)	(0.45)
Time F.E.	YES	YES	YES	YES	YES	YES
Family F.E.	YES	YES	YES	YES	YES	YES
Category F.E.	YES	YES	YES	YES	YES	YES
R-Square	0.0296	0.0294	0.0296	0.0328	0.0320	0.0328
# Obs.	269,692	269,692	269,692	77,662	77,662	77,662