Asset Reclassification and Mutual Fund Flows*

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Preliminary Draft

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June 20, 2026

ABSTRACT

This paper documents substantial asset 'reclassification' in the U.S. mutual fund industry: fund assets are moved into twin separate accounts and collective trusts sharing the same strategy and portfolio team. In 2021, transfers between mutual funds and their twin vehicles exceeded $550 billion. These reclassifications involve no investor flows, yet they distort measured fund flows, creating a non-classical measurement error that biases coefficient estimates in flow-based regressions. Adjusting for reclassification changes the estimates of central relationships in the mutual fund literature, such as flow-performance sensitivity and smart- and dumb-money tests.

JEL Classification: G23

Keywords: mutual funds, twin investment vehicles, asset reclassification, fund flows

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1 Introduction

Asset management studies rely heavily on mutual fund flows as a workhorse measure of investor demand. An extensive literature draws on flows and flow-based measures to identify which factors drive investor demand (e.g., Ippolito, 1992; Sirri and Tufano, 1998), how investor demand shapes the incentives of fund managers (e.g., Chevalier and Ellison, 1997; Lynch and Musto, 2003), and whether investors have fund selection ability (e.g., Gruber, 1996; Zheng, 1999; Frazzini and Lamont, 2008).[1] However, an emerging phenomenon in the asset management industry creates large errors in the standard approach to inferring flows from changes in fund assets under management. Mutual fund assets are often moved into twin vehicles—separate accounts and collective trusts—that follow the same investment strategy and are managed by the same portfolio team.[2] These transfers, which we call asset 'reclassification,' often involve large pools of capital, but they reflect no change in actual investor demand. They are simply changes in legal structure, motivated, for example, by the goal of retirement plan sponsors to lower fees. Mutual fund flows can therefore be systematically distorted as a measure of investor demand. As reclassification is a relatively new phenomenon, the conclusions of prior literature that studies flows may not be affected, but the results of current and future research may be sensitive to these asset transfers.

This paper studies asset reclassification and finds that this phenomenon is substantial enough to affect inference. In 2021, for example, total transfers between U.S. mutual funds and their twins exceeded $550 billion. These reclassification events are not random: they correlate with mutual fund characteristics and represent a form of non-classical measurement

[1] Other seminal papers using fund flows and flow-based measures include but are not limited to Warther (1995),Wermers (1999),Edelen (1999), Guercio and Tkac (2002), Hortaçsu and Syverson (2004), Berk and Green (2004), Barber et al. (2005), Reuter and Zitzewitz (2006), Huang et al. (2007), Coval and Stafford (2007), Sialm et al. (2015), and Barber et al. (2016). Brown et al. (1996) also use evidence on the flow-performance sensitivity to justify shifts in risk-taking within the calendar year.

[2] Table 3 documents selected cases of asset reclassification events from mutual funds to twin vehicles reported in the financial press.

error, one that biases coefficient estimates in flow-based regression analyses. We develop an empirical framework that reduces this bias and assesses the robustness of flow-based regression analyses to it. We then apply the framework to central concepts in the mutual fund literature, such as flow-performance sensitivity and smart- and dumb-money tests, and show that the estimates significantly change due to asset reclassification.

News reports point to substantial asset reclassification events, increasingly common in the retirement setting, yet mutual funds face no requirement to disclose them. We can nonetheless observe a part of this activity directly by identifying cases where mutual funds are replaced by twins in the investment menus of defined contribution plans. We use the BrightScope database to study more than 5.2 million menu options, spanning mutual funds, collective investment trusts, and pooled separate accounts, in over 110,000 401(k) and 403(b) plans from 2011 to 2022. We document substantial reclassification of assets between mutual funds and their twin vehicles, intensifying in more recent years. From 2017 to 2022, such reclassification from mutual funds to twin vehicles in DC plans averaged more than 2.5% of the assets held in mutual fund options each year. And it is not random. The mutual fund options that convert to collective investment trusts are substantially larger, more cost-efficient, overwhelmingly concentrated in target-date strategies, and better-performing. Asset reclassification can therefore distort flow-based inference twice over: once through its sheer magnitude, and again because it correlates with fund characteristics, a non-classical measurement error in flow-based regressions.

Although retirement data let us identify asset shifts between mutual funds and twin vehicles directly, they capture only a subset of the asset reclassification events in the mutual fund industry. We therefore build an empirical framework that yields indirect proxies for the magnitude of reclassification, drawing on data for mutual funds and their twin vehicles from Morningstar Direct. For mutual funds, Morningstar reports fund and share-class characteristics, along with the share-class series we aggregate to the fund level: monthly total net assets and returns, annual fees, and the overall Morningstar star rating. For separate accounts and collective trusts, Morningstar similarly reports monthly vehicle-level total net assets and returns, along with their linkages to twin mutual funds.[3] An additional feature of these data makes the framework possible: for many funds, Morningstar provides information on the assets held in opened and closed twin vehicle accounts. To estimate the total amount of reclassified assets, the framework rests on two facts. First, reclassification should leave assets under management at the investment product level, the combined assets of a mutual fund and its twin vehicles, unchanged, since it moves no money into or out of the product. Second, reclassification is reflected in the assets of opened and closed accounts in the twin vehicles; we can think about those figures as reclassification plus a 'remainder,' where only the remainder shifts total assets at the product level. Across a sample of more than 16,000 mutual funds and nearly 6,000 twin vehicles from Q1:2000 to Q2:2022, we estimate the portion of assets in opened and closed accounts that leaves total assets under management at the product level untouched, and take that portion as our indirect proxy for reclassification.

Our analysis reveals that asset reclassification distorts the measurement of fund flows unevenly across fund characteristics: allocation strategies such as target-date funds carry the largest strategy-based effects, and smaller funds bear the most pronounced size-based impact. Our proxy for asset reclassification, however, exists only for mutual funds with data on twin vehicle accounts, and by itself it cannot capture the magnitude of industry-level reclassification volume. To quantify the annual amount of reclassification at the industry level, we first sum reclassification amounts across the subsample of twin vehicles with available information on opened and closed accounts, which yields an annual aggregate within that subsample. Next, we combine twin-vehicle data from Morningstar and Nasdaq eVestment into comprehensive,

[3] Morningstar links a mutual fund to its twin vehicle through a Strategy ID. That identifier is often missing, and in many cases a fund and its twin carry different Strategy IDs, so the recorded number of mutual fund-twin links falls well short of the true number. To close the gap, we supplement Morningstar's Strategy ID links with additional links from the Nasdaq eVestment database and with links inferred from text analysis of asset management company and vehicle names.

industry-wide statistics on twin vehicles. Finally, we scale the subsample aggregate up to the universe of all twin vehicles, multiplying it by the ratio of total assets across all twin investment vehicles to total assets in the subsample for that year. As mentioned above, the results indicate that reclassification is an important mechanism in the asset management industry, and is now far larger than assets involved in fund mergers. In 2021, for example, total transfers between U.S. mutual funds and their twin vehicles exceeded $550 billion, surpassing the roughly $56 billion in fund mergers that same year.

After quantifying annual asset reclassification at the industry level, we turn to its methodological implications for flow-based inference. Reclassification correlates with actual (unobserved) fund flows and fund characteristics, and so resembles a non-classical measurement error, but its consequences depend on which side of the regression the flows enter. Where flows are the dependent variable, as in regressions of flow-performance sensitivity, reclassification attenuates the estimated relationship; where past flows are an explanatory variable, as in smart- and dumb-money tests, it mechanically inflates that relationship. We first show, in theory, that adjusting flows for reclassification events within our framework reduces the bias in both cases; we then take the framework to the data. Adjusting for reclassification significantly raises the flow-performance sensitivity of funds with twin vehicles by one third to one half across performance measures, a gap that is wider among funds holding more than 50% of their assets in institutional share classes. In smart- and dumb-money tests, by contrast, once flows are adjusted for reclassification, most coefficient estimates fall by more than half.

Overall, our results show that asset reclassification can bias coefficient estimates in flow-based inference, so it is important to test whether a flow-based result is robust to it. Such a check, however, can be burdensome and time-consuming, given the data work it requires. To make it easier, we plan to release a package, available in Stata, R, and Python. It loads our fund-quarter reclassification estimates for samples of mutual funds from CRSP and

Morningstar, and lets researchers rerun their analyses with reclassification-adjusted flows or flow-based measures.

Our study contributes to several strands of the literature. First, it adds to the extensive literature that employs mutual fund flows or flow-based measures to investigate which factors drive investor demand (e.g., Ippolito, 1992; Sirri and Tufano, 1998; Guercio and Tkac, 2002; Berk and Green, 2004; Barber et al., 2005; Reuter and Zitzewitz, 2006; Barber et al., 2016), how flow-performance sensitivity varies across funds/investor groups (e.g., Guercio and Tkac, 2002; Huang et al., 2007; Evans and Fahlenbrach, 2012; Sialm et al., 2015), how investor demand shapes the incentives of fund managers (e.g., Chevalier and Ellison, 1997, 1999; Lynch and Musto, 2003), whether investors have fund selection ability (e.g., Gruber, 1996; Zheng, 1999; Wermers, 2003; Sapp and Tiwari, 2004; Keswani and Stolin, 2008; Frazzini and Lamont, 2008), whether flows drive contemporaneous fund performance (e.g., Edelen, 1999; Greene and Hodges, 2002; Alexander et al., 2007), and the market implications of fund flows (e.g., Warther, 1995; Wermers, 1999; Edelen and Warner, 2001; Lou, 2012; Parker et al., 2023), among other questions.[4] Christoffersen et al. (2014) provide a review of this literature. These studies use fund flows or flow-based measures as proxies for investor demand, which, as we show, can be systematically distorted by asset reclassification, biasing the estimates in flow-based regressions. We also develop an empirical framework that reduces this bias. Adjusting for reclassification significantly changes the estimates of central relationships in the mutual fund literature, such as flow-performance sensitivity and smart- and dumb-money tests.

Second, it relates to the literature on institutional investment products. Numerous studies investigate performance (e.g., Busse et al., 2010; Peterson et al., 2011; Elton et al.,

[4] Asset reclassification happens at funds with higher performance and flows, so it may matter less for the fire-sale price-pressure (e.g., Coval and Stafford, 2007; Edmans et al., 2012; Wardlaw, 2020) and financial-fragility (e.g., Chen et al., 2010; Schmidt et al., 2016; Goldstein et al., 2017) literatures. Brown et al. (1996) also use evidence on the flow-performance sensitivity to justify shifts in risk-taking within the calendar year.

2013; Gerakos et al., 2021), flow determinants (Fedyk, 2024), and investment consultants' recommendations within the realm of institutional investment products (Jenkinson et al., 2016). Evans and Fahlenbrach (2012) pioneer the retail–institutional twin design and show that investors in institutional twins respond more strongly to high fees and weak risk-adjusted performance than retail investors, and that retail funds with an institutional twin outperform those without one by about 1.5% per year. Evans and Sun (2021) rely on separate accounts that are twins of retail mutual funds as a control group to study the role of factor models and simple performance heuristics in investor decision making around Morningstar's 2002 rating methodology change. Tian and Shi (2024) documents a shift from mutual funds to collective investment trusts in 401(k) plans. Additionally, several studies in this literature examine twin investment vehicles. Huang et al. (2026) show that including twin vehicle assets raises the measured scale of active equity management by at least 65%. Jones et al. (2023) find structural differences explain outperformance of separately managed accounts over corresponding mutual funds. Rohleder et al. (2023) demonstrate joint underperformance of 'fraternal twin' vehicles and their corresponding mutual funds (have the same fund family, manager, and investment objective, but different portfolios) compared to 'identical twin vehicles and their corresponding mutual funds (have identical portfolios in addition to the fund family, manager, and investment objective). Most of this work, Huang et al. (2026) aside, considers the flows of institutional products as though each vehicle's growth reflected investor demand of its own. We show that it does not always hold: twin flows are in part explained by asset reclassification events. The framework we develop can likewise be brought to studies of institutional investment products, to reduce the reclassification bias and to assess how robust their flow-based regressions are to it.

Third, our paper contributes to the literature investigating the determinants of menu design in DC retirement plans.[5] Several studies demonstrate that plan providers' incentives

[5]Reuter (2024) reviews the broad literature on DC retirement plan design and participant behavior.

affect plan menus (e.g., Cohen and Schmidt, 2009; Pool et al., 2016, 2022). Bhattacharya and Illanes (2022) demonstrate that imperfect market competition for recordkeeping can result in low plan quality. A few papers also examine the role of employer-related factors in the plan menu design, such as transaction costs when selecting and switching plan providers (Yang, 2023), employers' willingness to pay for plan quality (Bhattacharya and Illanes, 2022), and litigation risk (Gropper, 2023). This paper investigates how asset reclassification shapes DC retirement plan menus and demonstrates that mutual fund options are frequently replaced with their twin investment vehicles.

Finally, our paper adds to the literature highlighting problems in mutual fund databases. Multiple studies demonstrate survivorship bias in commonly employed mutual fund datasets (e.g., Grinblatt and Titman, 1989; Brown et al., 1992; Elton et al., 1996). Elton et al. (2001) identify omission return bias and inaccurate merger months in the CRSP Survivor Bias Free U.S. Mutual Fund Database. Evans (2010) documents incubation bias in reported mutual fund returns using CRSP data. Schwarz and Potter (2016) reveal discrepancies between CRSP and Thomson databases and SEC filings. Specifically, they find that CRSP and Thomson databases include many voluntarily reported portfolios absent from SEC filings while missing numerous SEC-filed portfolios. Our study extends this literature by demonstrating that reported mutual fund sales, redemptions, and asset changes may not always accurately reflect actual asset movements, emphasizing the importance of improving mutual fund data reporting standards.

The rest of the paper is structured as follows. Section 2 discusses the institutional background of twin investment vehicles and describes our data. Section 3 presents motivating evidence on asset reclassification and the flow distortions it creates. Section 4 explains our methodology for inferring asset reclassification. Section 5 quantifies the distortions that reclassification creates in measured mutual fund flows and its aggregate magnitude at the industry level. Section 6 demonstrates the implications of adjusting for asset reclassification in flow-based inference. Section 7 offers concluding remarks.

2 Institutional Background and Data

This section describes the institutional background on twin investment vehicles and the data used in our empirical analysis. We first summarize the structural, operational, and regulatory features of twin vehicles relevant to asset reclassification. We then describe our mutual fund, twin-vehicle, and DC-plan datasets, followed by sample construction and summary statistics.

2.1 Institutional Background on Twin Vehicles

The labels "collective trusts" and "separate accounts" are umbrella labels: each covers more than one distinct institutional vehicle that can serve as mutual fund twins. Collective investment trusts (CITs) are tax-exempt vehicles sponsored by banks or trust companies and available only to qualified retirement plans. The Office of the Comptroller of the Currency regulates CITs established by national banks and trust companies, while state regulators oversee those established by state-chartered institutions. The Department of Labor adds a further layer of oversight for any CIT that holds assets of retirement plans covered by the Employee Retirement Income Security Act of 1974. Common trust funds resemble CITs but draw from a wider investor base, including foundations, corporations, and endowments. Separately managed accounts (SMAs) are single-investor portfolios run by investment advisers, in which the client directly owns the underlying securities. Their clients include retirement plans, other institutional investors, and large retail investors. Like CITs and common trust funds, SMAs are not registered with the SEC, though the investment advisers who manage them operate under SEC oversight. Pooled separate accounts (PSAs) are insurance-company vehicles that aggregate assets from multiple plans, with regulatory oversight shared between state insurance commissioners and ERISA. Despite substantial differences across these vehicles, two features are common to all of them: none is registered with the SEC, and none must provide standardized public performance disclosure. Appendix C provides further institutional detail on each vehicle.

2.2 Mutual Fund Data

Mutual fund data is sourced from the Morningstar Direct database, encompassing active and inactive U.S. mutual funds from Q1:2000 through Q2:2022. The dataset provides share-class level historical data on quarterly gross and net returns, quarterly total net assets, and annual expense ratios, along with share-class characteristics such as inception dates. At the fund level, the Morningstar database supplies historical data tracking quarterly total net assets, sales, redemptions, alongside fund characteristics including detailed investment strategy classifications.

We calculate fund-level gross and net returns by averaging share class-level returns weighted by share class TNA. Fund age is calculated as the time elapsed since the inception date of the fund's oldest share class. We employ the Global Broad Category Group classification to define the primary asset class for each fund and the more detailed Morningstar Category classification to identify and group funds pursuing comparable investment strategies.

For our analysis, we calculate quarterly mutual fund flows using the standard formula:

$$F_{i,t} = \frac{TNA_{i,t} - (1 + r_{i,t})TNA_{i,t-1} - MGN_{i,t}}{(1 + r_{i,t})TNA_{i,t-1}} \quad (1)$$

where $TNA_{i,t}$ represents the total net assets of fund i at time t. $r_{i,t}$ denotes the net return of fund i at time t. $MGN_{i,t}$ is the inflow from fund mergers of fund i at time t.

2.3 Twin-Vehicle Data

In addition to mutual fund data, the Morningstar Direct database provides data on institutional-focused investment vehicles. The Morningstar universe covers CITs and SMAs, but not PSAs.

At the vehicle level, the Morningstar database supplies historical data including quarterly gross and net returns, quarterly total net assets, and vehicle characteristics such as investment strategy classifications. The database also provides inception dates at the share class level, which we use to calculate vehicle age as the time elapsed since the inception date of the vehicle's oldest share class.

At the strategy level, the Morningstar database supplies the following quarterly historical information on the non-mutual fund part of an investment strategy: total number of strategy accounts, taxable and tax-exempt accounts, newly opened and closed accounts, and assets categorized by account type, including assets in opened and closed accounts.

For our analysis, we calculate quarterly investment product-level flows as follows:

$$F_{s,t} = \frac{\sum\limits_{j \in \{mf,cit,sma\}} TNA_{j,s,t} - \sum\limits_{j \in \{mf,cit,sma\}} (1 + r_{j,s,t}) TNA_{j,s,t-1} - \sum\limits_{j \in \{mf,cit,sma\}} MGN_{j,s,t}}{\sum\limits_{j \in \{mf,cit,sma\}} (1 + r_{j,s,t}) TNA_{j,s,t-1}} \quad (2)$$

where $TNA_{j,s,t}$ represents the total net assets of strategy s in quarter t for investment vehicle type j, which can be mutual fund ($j = mf$), CIT ($j = cit$), or SMA ($j = sma$). $r_{j,s,t}$ denotes the net return of strategy s in quarter t for investment vehicle type j. $MGN_{j,s,t}$ is the inflow from vehicle mergers of strategy s in quarter t for investment vehicle type j. Unlike individual vehicle and mutual fund flows, strategy-level flow is not affected by reclassifications.

We also calculate flows due to opened and closed twin vehicle accounts as follows:

$$F_{\text{Opened},s,t} = \frac{\text{Assets in Opened Accounts}_{s,t}}{\sum\limits_{j \in \{mf,cit,sma\}} (1 + r_{j,s,t}) TNA_{j,s,t-1}} \tag{3}$$

$$F_{\text{Closed},s,t} = \frac{\text{Assets in Closed Accounts}_{s,t}}{\sum\limits_{j \in \{mf,cit,sma\}} (1 + r_{j,s,t}) TNA_{j,s,t-1}} \tag{4}$$

where $\text{Assets in Opened Accounts}_{s,t}$ and $\text{Assets in Closed Accounts}_{s,t}$ represent assets in opened and closed twin vehicle accounts, respectively, of strategy s in quarter t.

Morningstar does not track every institutional twin, so we supplement its data with institutional-product data from Nasdaq eVestment. eVestment collects information from asset managers on their institutional investment products, including separately managed accounts and commingled vehicles such as collective investment trusts, and reports quarterly assets under management at the vehicle and product levels.

2.4 DC-Plan Data

Form 5500 Filings

Form 5500 is a mandatory filing requirement for private-sector employee benefit plans regulated under the Employee Retirement Income Security Act of 1974 (ERISA). Access to these filings is available through the DOL's website, which also compiles information from these filings in its 'Form 5500 Datasets.' The datasets separate the Form 5500 information into the main form and the individual schedules. Each filing is identified by an 'ack_id.' This is the main ID that connects the main form and the schedules.

The filing requirement is not universal. For example, public 403(b) plans and governmental defined benefit plans do not file Form 5500. Additionally, 401(k) plans with fewer than 100 participants are only required to provide basic plan information and therefore do not disclose details on their investment menus or file Schedule H. Since menu and Schedule H information are essential for our analyses, we focus on reporting plans with at least 100 participants.

Despite these limitations, Form 5500 filings that contain a Schedule H attachment capture \$11.8 trillion in pension assets in 2021. This is roughly 30% of the total pension assets in the US, as reported by the Investment Company Institute (ICI) Factbook. The most comprehensive coverage comes from 401(k) plans. The corresponding figure is \$6.1 trillion for this group, which represents 76% of the 401(k) assets reported by ICI.

Schedule H provides detailed financial information across plan assets, liabilities, income, and expenses. It reports asset values by type (including U.S. Government securities, corporate debt instruments, and various equity holdings) and aggregate asset values for investments in common/collective trusts, pooled separate accounts, and registered investment companies such as mutual funds. Notably, assets held in separately managed accounts are typically reported as direct plan assets rather than being classified as investment vehicles.[6] Therefore, the label 'separately managed account' does not appear as a vehicle type in Form 5500 data.

Additionally, if a retirement plan invests in institutional investment vehicles, it must disclose these holdings in Schedule D of Form 5500.[7] This Schedule reports the plan's end-of-year dollar value invested in each institutional vehicle along with the detailed information about the vehicle, including the vehicle's code (PN), name, sponsor company code (EIN), and sponsor company name.

Panel A of Figure A.1 reports total retirement assets invested in CITs and (Pooled) Separate Accounts for the 2009-2022 period, based on the universe of Schedule D filings by retirement plans. Using Schedule H filings reveals a similar picture. The panel also shows plan assets invested in 'master trusts,' which are investment vehicles that pool assets from multiple plans by the same employer or multiple employers, for example. These are often investment

[6] According to Form 5500 filing instructions, SMAs may be reported either as individual Master Trust Investment Accounts or as direct plan assets. We perform a textual analysis of Master Trust Investment Account names and determine that the majority of these accounts are not SMAs.

[7] Institutional-focused vehicles are classified as "Direct Filing Entities" (DFEs) in Form 5500 filings.

‘bundles’ resembling funds of funds that may contain mutual funds, CITs, Separate Accounts, and other investment options, such as Guaranteed Investment Contracts or individual assets. However, this information cannot be unpacked from the retirement plans’ filings.

In Panel A, we use Schedule D information submitted by *retirement plans*. However, institutional-focused vehicles can also file *their own* Form 5500 forms to reduce reporting burdens for participating plans. These institutional-focused vehicles are collectively referred to as direct filing entities (DFE’s) in the DOL filings. Their Form 5500 filings contain three forms: the main form, Schedule D, and Schedule H. An alternative way to learn about retirement asset allocations by vehicle type is therefore to use the information filed by the DFE’s themselves.

There are over 125 thousand DFE filings in the DOL datasets in the 2009 to 2022 period. The main form in these filings identifies the DFE type. We then obtain the total assets for each filing DFE from their Schedule H. Panel B of Figure A.1 shows the total assets reported by each investment vehicle type by year. Compared to Panel A, it is clear that relying on DFE filings paints a more comprehensive picture, though not all DFE’s file. This is because the total assets of the DFE’s also include retirement assets from plans that are not reporting to the DOL or only file basic plan information. DFE’s, however, are often funds of funds, so some assets are double counted in Panel B.

To mitigate this problem, we use information from Schedule D of the DFE filings. Generally, Schedule D contains two parts. Part I is only filled out by DFE’s that are funds of funds that invest in institutional vehicles such as CITs and Separate Accounts (this is analogous to the use of Part I by retirement plans, described above). When the DFE’s Schedule D filing contains Part I information, we use this information to identify its underlying funds. We then check whether these underlying funds also file Form 5500 with the DOL. If they do, we subtract the total assets they report on Schedule H of their filing from the total assets reported by the DFE. Although we stop at this first step, an iterative correction may be required to completely eliminate double counting. This is because, in some cases, there are many 'layers' in these institutional arrangements. That is, a DFE may be a fund of fund that holds other underlying funds, where the underlying funds may also be funds of funds that hold underlying funds, some of which are funds of funds.

The adjusted asset values are tabulated in Panel C of Figure A.1. Panel C shows that double-counting is potentially an important concern when aggregating DFE assets. For example, the total assets invested in CITs decline significantly after the adjustment, but remain significantly higher than the asset values reported in Panel A, which are based on disclosures by retirement plans.

Retirement Menu Data

Up to this point, our industry snapshots are obtained from the DOL's Form 5500 datasets. As mentioned above, these datasets collect information from the main form and the individual schedules, but do not contain information from the supplementary materials that often accompany the Form 5500 filings. For example, for plans filing Schedule H, the detailed list of investment options offered on the menu is typically attached as an appendix to Form 5500. However, extracting this information presents significant technical challenges.

To address this limitation, we supplement our Form 5500 data with detailed investment menu information from the BrightScope Beacon database, which collects retirement plan menu data from audited Form 5500 filings. We obtain data from the Brightscope database for the 2009-2022 period. Brightscope provides a good coverage of Form 5500 filers and, by the post-2015 period, it captures the near universe of retirement plans with at least 100 participants. In Panel D of Figure A.1 we calculate the total assets invested by investment type using detailed menu information from Brightscope. Brightscope also reports allocations to common stock. We include this in the figure as common stock holdings may occur through investments in separately managed accounts, as mentioned above. The figure reveals that common stock holdings are relatively small, indicating that separately managed accounts are not likely to be a popular investment vehicle in retirement plans.

More generally, the four panels of the figure show large differences in the total assets that researchers can capture using different data sources related to retirement plans. Having documented these differences, we now turn to reclassification. To identify asset reclassifications, we follow two approaches. Our first approach focuses on options that maintain identical names but change vehicle types. Qualifying cases must demonstrate two consecutive periods in the original vehicle type, whether mutual fund, collective investment trust, or pooled separate account, followed by two consecutive periods in the new vehicle type while retaining the same investment name throughout the transition.

Our second approach addresses options with slight name modifications due to reclassification by matching closed options with newly opened options. This process requires confirming that the same asset management company manages both options and verifying that one option's name components form a subset of the other's components. For example, when "Vanguard Extended Market Index" as a mutual fund transitions to "Vanguard Institutional Extended Market Index" as a collective investment trust, the original name components ('Vanguard', 'Extended', 'Market', and 'Index') are fully contained within the new name ('Vanguard', 'Institutional', 'Extended', 'Market', and 'Index'), satisfying our subset criteria. This approach favors precision over coverage: it identifies reclassification events with high confidence but misses the rare cases whose name changes are large enough to break the subset rule.

2.5 Sample Construction and Summary Statistics

We begin by populating our sample with every active and inactive U.S. mutual fund in Morningstar from Q1:2000 through Q2:2022. For each fund, we determine in three steps whether it has CIT or SMA twins. First, we use the Morningstar StrategyID, which links a mutual fund to its twins. Because this identifier does not always pair a fund with its twins, in a second step we supplement Morningstar's twin data with eVestment. We first link funds across the two databases by CUSIP, by Ticker, and by a joint match on asset management company and fund name; we then recover from the eVestment universe those twins that Morningstar assigns to a separate StrategyID or does not track. Finally, within the Morningstar universe, we additionally fuzzy-match on asset management company names and on mutual fund and institutional vehicle names and retain only matched pairs whose return correlation is at least 99%. Table 1 summarizes the resulting sample of mutual funds and their twins.

Panel A in Table 1 reports summary statistics for the Morningstar mutual fund data. Continuous variables are winsorized at the 1st and 99th percentiles to remove outliers. The sample comprises 16,464 distinct mutual funds. The average quarterly gross and net returns are 1.68% and 1.41%, respectively. The average mutual fund has total net assets (TNA) of $1,171.82 million, though the median of $196.86 million suggests a right-skewed distribution. Quarterly sales and redemptions average $91.64 million and $85.51 million, respectively. The sample is predominantly comprised of equity funds (54%), followed by fixed income (27%), allocation (15%), and other strategies (4%). The average fund age is 12.53 years.

Panel B in Table 1 reports summary statistics for the Morningstar institutional-focused vehicle data. Continuous variables are winsorized at the 1st and 99th percentiles to remove outliers. The sample comprises 1,518 twin CITs and 4,291 twin SMAs. CITs' average size ($2,432.10 million) exceeds that of mutual funds (in Panel A), with a different strategic composition: 47% equity, 39% allocation, 13% fixed income, and 1% other strategies. CITs are generally younger, with an average age of 7.63 years. SMAs are larger still, with an average size of $2,866.78 million, exceeding both mutual funds and CITs. Their strategic distribution tilts more heavily toward equity than mutual funds, with 74% equity, 21% fixed income, 3% allocation, and 1% other strategies. SMAs' average age is 12.82 years. On average, each investment product serves 163.82 institutional-focused vehicle accounts, with 79.60 taxable and 55.97 tax-exempt accounts. Quarterly account turnover averages 6.70 accounts lost and 5.70 gained. Average assets in institutional-focused vehicle accounts total $4,101.04 million, with taxable accounts ($2,621.82 million) larger on average than tax-exempt accounts ($1,945.67 million). The average asset outflow from institutional-focused vehicle lost accounts is $26.16 million, while assets gained average $34.19 million.

INSERT TABLE 1 HERE

Table 2 reports summary statistics for the data on menu options in DC retirement plans obtained from the BrightScope Beacon database. Continuous variables are winsorized at the 1st and 99th percentiles. The analysis is restricted to plans for which asset reclassification data can be identified. Since asset reclassification identification requires information for at least two preceding periods and one following period, this requirement reduces the initial sample period from 2009-2023 to 2011-2022. We further restrict the sample to investment options that are mutual funds, collective investment trusts, or pooled separate accounts, as only these investment vehicles can be subject to asset reclassification. The final sample comprises 5,211,871 plan-menu option pairs (including mutual funds, collective investment trusts, and pooled separate accounts) across 110,087 401(k) and 403(b) plans over the period from 2011 to 2022.

The average option balance is $2.87 million and the median is $0.26 million: most options hold small amounts and a few hold large ones. The average expense ratio is 0.62% (median 0.64%). The typical plan has total assets of $54.45 million, with a median of $14.13 million. Plans offer 27.2 investment options on average (median 26, standard deviation 11.47), ranging from 1 to 77.

INSERT TABLE 2 HERE

3 Motivating Evidence

This section presents motivating evidence on asset reclassification and the flow distortions it creates. We first document reclassification events using DC retirement plan data and characterize the investment options that undergo such transitions. We then provide motivating evidence on how asset reclassification distorts mutual fund flow measurement at the fund level.

3.1 Documenting Asset Reclassification

Table 3 collects cases of asset reclassification reported in the financial press. The cases span large fund families and a range of strategies, and the reclassified amounts run from tens of millions to several billion dollars. For example, in 2014, the Delta Air Lines 401(k) plan moved about $1 billion from the Fidelity Contrafund into a CIT run by the same team; in 2022, the Oklahoma Public Employees plans converted their Vanguard target-date funds to CITs. In each case, assets move from a mutual fund to an institutional twin without leaving the asset manager or changing the underlying portfolio, so the mutual fund records an outflow without an actual outflow of assets.

INSERT TABLE 3 HERE

Figure 2 depicts the evolution of asset reclassification magnitude in DC retirement plans from 2011 to 2022. The black bars show reclassification from mutual funds to twin vehicles (collective investment trusts and pooled separate accounts). This reclassification grows over the observation period, from about 0.45% of mutual fund assets in 2011 to 4.11% in 2022. Reclassification first spiked to 3.61% in 2017, primarily driven by Vanguard's establishment of a series of collective investment trusts for its mutual funds at the end of 2016, which led to widespread adoption of these lower-cost alternatives across DC retirement plans. After 2017, reclassification activity moderates before rising again to its peak of 4.11% in 2022. Asset reclassification from mutual funds to twin vehicles averaged 2.66% of total mutual fund assets during the 2017-2022 period.

Reclassification from twin vehicles back to mutual funds, shown by gray bars, is considerably smaller. This reverse reclassification ranges between 0.12% and 0.35% of mutual fund assets, with no clear trend.

INSERT FIGURE 2 HERE

Having established the magnitude of asset reclassification in DC retirement plans, we next examine the characteristics of investment options that undergo such transitions. Table 4 compares characteristics of mutual fund options that undergo asset reclassification and those that remain unchanged in DC plan menus. The analysis distinguishes between two types of reclassification destinations: collective investment trusts (column 1) and pooled separate accounts (column 2).

Mutual fund options that transition to CITs differ markedly from non-reclassified options. They are larger, with average assets of $33.28 million against $3.46 million for non-reclassified options. They are also cheaper, with expense ratios of 0.40% versus 0.58%, and they have higher prior three-year performance percentiles (61.29 versus 56.34) and lower return volatility (3.57% versus 3.70%).

Allocation strategies account for 82.11% of CIT reclassifications, against 34.85% of non-reclassified options. These options also have lower portfolio turnover (26.05% versus 47.65%) and come from younger funds (14.53 versus 17.73 years). The underlying mutual funds are smaller ($28.47 billion versus $44.88 billion in assets under management) but are offered within much larger retirement plans ($465.86 million versus $91.07 million in plan assets).

Mutual fund options that transition to PSAs have a different profile. They are smaller than both CIT reclassifications and non-reclassified options, averaging only $1.09 million in assets. They have higher expense ratios (0.65% versus 0.58%) and come from larger underlying mutual funds ($42.01 billion in assets under management). They are more concentrated in equity strategies (54.02% versus 51.24%) and sit in smaller retirement plans than their CIT counterparts.

INSERT TABLE 4 HERE

3.2 Motivating Evidence for Mutual Fund Flow Distortions

To illustrate the potential magnitude and importance of asset reclassification for mutual fund flow measurement, we present a detailed case study of the Vanguard Extended Market Index Fund in Figure 3. Vanguard established a twin collective investment trust (CIT) for this fund at the end of 2016.

Figure 3 presents three distinct flow measurement approaches over the period 2013-2018. We compare standard annual flows with two alternative measures that adjust for asset reclassification: flows adjusted using observable asset reclassification cases from the BrightScope database, and flows adjusted under the assumption that all assets in the established twin CIT originated from reclassification. These approaches provide bounds on the true magnitude of asset reclassification. The BrightScope-adjusted flows likely underestimate total reclassification effects, as the database does not capture all asset reclassification cases. Conversely, the CIT assets-adjusted flows likely overestimate total reclassification effects, as not all assets in the twin CIT necessarily originate from reclassification of existing mutual fund assets.

The three measures diverge sharply once the twin CIT is established. Unadjusted flows are modest, at 3.71% in 2017 and 2.16% in 2018. Flows adjusted for observable reclassification using BrightScope data are larger, at 10.78% and 4.76%. Flows adjusted using total CIT assets are larger still, at 20.04% in 2017 and 8.16% in 2018. The unadjusted series declines over time; the adjusted series does not.

INSERT FIGURE 3 HERE

The case study shows that asset reclassification can severely distort measured mutual fund flows for funds with twin vehicles.

Figure 4 generalizes the case study to the full sample. It compares the distribution of standard mutual fund flows in quarters we flag as likely reclassification periods with the distribution in all other quarters. Panel A flags quarters in which a fund's redemptions spike while its twin vehicles report assets in newly opened accounts, the signature of a transfer from the mutual fund to a twin. In these quarters the flow distribution shifts toward large outflows, even though the matching twin-vehicle inflows mean that no money leaves the investment product. Panel B flags the reverse case, in which a fund's sales spike while its twin vehicles report assets in closed accounts; here the distribution shifts toward large inflows. Reclassification thus leaves a clear footprint in measured mutual fund flows that has no counterpart in investor demand.

INSERT FIGURE 4 HERE

4 Methodology

Asset reclassification cases in DC retirement plans represent only a fraction of the total. To quantify the unobserved remainder, this section develops a framework to construct a fund-level proxy for asset reclassification.

To infer the unobservable total reclassified assets at the mutual fund level, we develop a procedure based on two facts. First, asset reclassification should not affect total investment product assets (the combined assets of mutual funds and their twin vehicles), as asset reclassification does not represent actual asset flows. Second, asset reclassification is reflected in twin vehicle accounts: a portion of assets in opened and closed accounts represents asset reclassification and does not change investment product assets, whereas the remainder does. Assets in newly opened twin vehicle accounts (excluding those related to asset reclassification) increase investment product assets, while assets in closed accounts (excluding those related to asset reclassification) decrease investment product assets.

To account for heterogeneity in asset reclassification across fund characteristics, we estimate share parameters that vary across cells defined by global broad category, within category size tercile, exposure to institutional assets, and calendar subperiod. Let $c(s)$ denote the global broad category of investment product s (Equity, Fixed, Allocation, Other), $q(s,t)$ the size tercile of s within its category-year computed from lagged investment product TNAs, $h(s,t)$ an indicator equal to one if investment product s holds any institutional share-class assets on the mutual-fund side in quarter t – institutional share classes are those tagged *Institutional* by Morningstar's share-class classification or, when the tag is missing or ambiguous, by a name-based rule that flags institutional share-class codes (I, Ins); and $p(t)$ the calendar subperiod (one of five windows: 2000–2004, 2005–2009, 2010–2013, 2014–2017, or 2018–2022) in which quarter t falls. We estimate:

$$\begin{aligned} F_{s,t} \quad = \quad & \sum_{(c,q,h,p)} \beta_{1,c,q,h,p} F_{\text{Opened},s,t} \mathbb{1}_{s,t}(c,q,h,p) + \sum_{(c,q,h,p)} \beta_{2,c,q,h,p} F_{\text{Closed},s,t} \mathbb{1}_{s,t}(c,q,h,p) \\ & + \gamma X_{s,t} + \alpha_s + \alpha_{g,t} + \alpha_{f,t} + \epsilon_{s,t} \end{aligned} \tag{5}$$

where $F_{s,t}$ represents the flow of investment product s in quarter t calculated according to equation (2). $F_{\text{Opened},s,t}$ and $F_{\text{Closed},s,t}$ denote investment product flows attributable to opened and closed accounts, calculated according to equations (3) and (4), respectively. $\mathbb{1}_{s,t}(c,q,h,p)$ equals one if investment product s in quarter t has category c, lies in size tercile q, has exposure to institutional assets h, and falls in subperiod p. $\beta_{1,c,q,h,p}$ and $\beta_{2,c,q,h,p}$ are the cell-specific parameters of interest, quantifying the shares of assets in opened and closed twin vehicle accounts, respectively, that contribute to investment product flows. $\gamma X_{s,t}$ represents the vector of the following control variables: the log of lagged investment product size and the log of lagged investment product age in years. α_s denotes investment product fixed effects that control for time-invariant heterogeneity at the investment product level. $\alpha_{g,t}$ denotes Morningstar Global Category $\times$ time fixed effects that absorb category-specific time shocks; here g indexes the granular Morningstar Global Category, which is finer than the broad category c that defines the cells. $\alpha_{f,t}$ denotes fund family $\times$ time fixed effects that absorb time-varying firm-level shocks (e.g., a fund family experiencing common inflows or outflows across all of its strategies in a given quarter). We construct cells as the cross of the four global broad categories (Equity, Fixed Income, Allocation, Other), size terciles computed within each category-year from lagged investment product TNAs, an institutional share-class dummy (the indicator h above for funds holding any institutional share-class assets on the mutual-fund side), and five calendar subperiods (2000–2004, 2005–2009, 2010–2013, 2014–2017, and 2018–2022), yielding one hundred and twenty cells. The specification is estimated as a single pooled regression with full interactions on $F_{\text{Opened},s,t}$ and $F_{\text{Closed},s,t}$. Standard errors are double-clustered at the global category and time levels and are reported in parentheses.

The complementary shares $1 - \beta_{1,c,q,h,p}$ and $1 + \beta_{2,c,q,h,p}$ measure the portion of opened and closed twin-vehicle account assets attributable to asset reclassification within each cell. Cell shares are not constrained to $[0, 1]$ during estimation; a small number of cells with sparse twin-account activity may yield estimates outside the unit interval. We clip these shares to the unit interval at the application stage (negative estimates set to zero, estimates above one set to one) so that each cell's implied share has the economically meaningful interpretation of a fraction of opened or closed twin-vehicle account dollars. We additionally impose economic-feasibility caps at the dollar level: reclassification from mutual funds to twin vehicles is capped at lagged mutual fund assets, and reclassification from twin vehicles to mutual funds is capped at lagged twin-vehicle assets.

Applying the estimated cell-specific shares to opened and closed twin-vehicle account assets at the fund level yields fund-quarter measures of reclassified assets:

$$\textit{Reclassified Assets Out}_{i,t} = (1 - \beta_{1,c(i),q(i,t),h(i,t),p(t)})\,\textit{Assets in Opened Accounts}_{i,t} \tag{6}$$

$$\textit{Reclassified Assets In}_{i,t} = (1 + \beta_{2,c(i),q(i,t),h(i,t),p(t)})\,\textit{Assets in Closed Accounts}_{i,t} \tag{7}$$

where *Reclassified Assets Out*$_{i,t}$ quantifies the estimated assets transferred from mutual fund i to its twin vehicles in quarter t, and *Reclassified Assets In*$_{i,t}$ measures the estimated assets transferred from twin vehicles to mutual fund i in quarter t.

We calculate the flow attributable to asset reclassification $F_{\text{Reclassification},i,t}$ of mutual fund i at time t as follows:

$$F_{\text{Reclassification},i,t} = \frac{\textit{Reclassified Assets Out}_{i,t} - \textit{Reclassified Assets In}_{i,t}}{(1 + r_{i,t})TNA_{i,t-1}} \tag{8}$$

where $TNA_{i,t}$ represents the total net assets of fund i at time t, while $r_{i,t}$ denotes the fund's net return for the same period.

We calculate mutual fund flows adjusted for asset reclassification as follows:

$$\overline{F_{i,t}} = F_{i,t} + F_{\text{Reclassification},i,t} \tag{9}$$

where $F_{i,t}$ represents the standard flow of fund i at time t and $F_{\text{Reclassification},i,t}$ represents the asset reclassification flow for the same fund-time, calculated according to equation (8).

5 Mutual Fund Flow Distortions and the Magnitude of Asset Reclassification

5.1 Asset Reclassification and Mutual Fund Flow Distortions

Having derived reclassification-adjusted flows, we examine how they differ from standard flows at the fund-quarter level. Table 6 compares standard and adjusted flows across fund characteristics. The gap between the two varies across both investment strategy (Panel A) and fund size (Panel B). By strategy, allocation and fixed income funds show the largest gaps; by size, the smallest funds (T1) do.

INSERT TABLE 6 HERE

5.2 Quantifying Annual Asset Reclassification at the Industry Level

Data regarding twin vehicle accounts is not available for all twin vehicles, complicating the estimation of aggregate asset reclassification. To address this data limitation, we employ a two-step procedure. First, we sum the fund-quarter reclassification amounts from equations (6) and (7) within the subsample of twin vehicles with available account information to obtain an annual aggregate within the subsample. Second, we scale this aggregate to the universe by multiplying it by the ratio of total assets across all twin investment vehicles to total assets within the subsample for the corresponding year.

Figure 5 presents the annual aggregate value of asset reclassification between mutual funds and their twin investment vehicles from 2010 to 2021, compared with the annual total value of mutual fund mergers. Combined asset transfers between mutual funds and their twin vehicles, summed across both directions, reached \$580 billion in 2021, comprising \$320 billion from mutual funds to twin vehicles and \$260 billion in the opposite direction; over

2010–2021, this combined volume averaged $430 billion annually. The corresponding mutual fund mergers totaled $56 billion in 2021 and averaged $54 billion annually over the same period.

INSERT FIGURE 5 HERE

Figure 5 demonstrates substantial asset reclassification in both directions: from mutual funds and into them. Figure 6 examines which vehicles drive each direction by splitting the strategies that report twin-account data into two non-overlapping groups: those whose only twins are collective investment trusts (Panel A) and those whose only twins are separately managed accounts (Panel B). Within each group, we apply the inference procedure of Section 4 to the 2020–2021 strategy-quarters and decompose the total reclassified dollars into the portion moving from mutual funds to twin vehicles and the portion moving in the opposite direction, with the two portions summing to one hundred percent within each panel. The results indicate that both vehicle types are frequently present in the reclassification from mutual funds to twin vehicles, while the opposite asset reclassification is dominated by SMAs.

INSERT FIGURE 6 HERE

We also analyze how accounting for asset reclassification affects the measurement of total net inflows to U.S. mutual funds. We adjust the total net inflows to U.S. mutual funds for asset reclassification by adding annual aggregate asset reclassification from mutual funds to their twin investment vehicles and subtracting annual aggregate asset reclassification from twin vehicles to mutual funds. Figure A.7 compares total net inflows to U.S. mutual funds from 2010 to 2021 with and without adjusting for asset reclassification.

INSERT FIGURE A.7 HERE

6 Empirical Results for Flow-Based Inference

After quantifying asset reclassification at both fund and aggregate levels, we examine its methodological implications for regression analyses involving fund flows. Asset reclassification introduces non-classical measurement error in standard flow measures, potentially biasing empirical results. We investigate this bias first theoretically and then empirically, comparing coefficient estimates from OLS regressions that use standard fund flows versus reclassification-adjusted flows.

6.1 Flows-on-LHS Relationships

6.1.1 Measurement Error When Flows Are a Dependent Variable

Let $F_{i,t}^{\text{true}}$ denote the unobservable true investor flow and $F_{\text{Reclassification},i,t}^{\text{true}}$ the true reclassification flow. The standard observed flow satisfies

$$F_{i,t} \;=\; F_{i,t}^{\text{true}} + u_{i,t}, \qquad u_{i,t} \;\equiv\; -F_{\text{Reclassification},i,t}^{\text{true}}, \tag{10}$$

where $u_{i,t}$ is the measurement error.

Let $Y_{i,t}$ denote an arbitrary determinant of flows (using the lag $Y_{i,t-1}$ in place of $Y_{i,t}$ leaves the derivations below unchanged), and write the data-generating process for the true flow as:

$$F_{i,t}^{\text{true}} \;=\; \beta\, Y_{i,t} + \gamma' X_{i,t} + \epsilon_{i,t}, \qquad E[\epsilon_{i,t} \mid Y_{i,t}, X_{i,t}] = 0, \tag{11}$$

where β is the parameter of interest, $X_{i,t}$ a vector of controls and fixed effects, and $\epsilon_{i,t}$ the unobserved shock. Reclassification may correlate with the current and past variables $Y_{i,t}$,

$X_{i,t}$, and $\epsilon_{i,t}$. The OLS coefficient on $Y_{i,t}$, conditional on $X_{i,t}$, is

$$\hat{\beta}_{\text{OLS}} \;=\; \beta + \frac{\text{Cov}(u_{i,t},\, Y_{i,t} \mid X_{i,t})}{\text{Var}(Y_{i,t} \mid X_{i,t})} \;=\; \beta - \frac{\text{Cov}(F^{\text{true}}_{\text{Reclassification},i,t},\, Y_{i,t} \mid X_{i,t})}{\text{Var}(Y_{i,t} \mid X_{i,t})}, \tag{12}$$

Based on our results from Section 3, the sign of the numerator typically matches the sign of β. For example, if $Y_{i,t}$ is performance, it will positively predict both fund flows and asset reclassification. Therefore:

$$\text{sign}\Big(\text{Cov}(u_{i,t},\, Y_{i,t} \mid X_{i,t})\Big) = \text{sign}(\beta). \tag{13}$$

Thus, $\hat{\beta}_{\text{OLS}} < \beta$ if $\beta > 0$ and vice versa.

The reclassification-adjusted flow $\overline{F_{i,t}}$ of equation (9) replaces $F^{\text{true}}_{\text{Reclassification},i,t}$ with the cell-based estimator $F_{\text{Reclassification},i,t}$,

$$F^{\text{true}}_{\text{Reclassification},i,t} \;=\; F_{\text{Reclassification},i,t} + \eta_{i,t}, \tag{14}$$

where $\eta_{i,t}$ is the residual orthogonal to the cell-share projection, so that $\overline{F_{i,t}} = F^{\text{true}}_{i,t} - \eta_{i,t}$ and

$$\hat{\beta}_{\overline{F}} \;=\; \beta - \frac{\text{Cov}(\eta_{i,t},\, Y_{i,t} \mid X_{i,t})}{\text{Var}(Y_{i,t} \mid X_{i,t})}, \tag{15}$$

with $|\text{Cov}(\eta_{i,t}, Y_{i,t} \mid X_{i,t})| < |\text{Cov}(F^{\text{true}}_{\text{Reclassification},i,t}, Y_{i,t} \mid X_{i,t})|$, since the cell-share estimator absorbs the between-cell variation in $\text{Cov}(F^{\text{true}}_{\text{Reclassification},i,t}, Y_{i,t} \mid X_{i,t})$, leaving only the within-cell variation. As a result, $\hat{\beta}_{\overline{F}}$ is closer to β than $\hat{\beta}_{\text{OLS}}$.

6.1.2 Flow–Performance Sensitivity

We analyze scenarios in which mutual fund flows, $F_{i,t}$, serve as a dependent variable, focusing on the flow-performance sensitivity regressions.

$$F_{i,t} = \beta Y_{i,t-1} + \gamma X_{s,t} + \alpha_i + \alpha_t + \epsilon_{s,t} \tag{16}$$

where $Y_{i,t-1}$ represents the past performance of mutual fund i, measured as the net return compounded over the four quarters preceding the flow quarter, the five-year rolling CAPM alpha, or the five-year rolling four-factor (Carhart) alpha. β is the parameter of interest quantifying the flow-performance sensitivity. $X_{s,t}$ denotes the vector of the following control variables: the log of fund size (lagged one period) and the log of fund age in years (lagged one period). α_i are the fund fixed effects that control for time-invariant heterogeneity at the mutual fund level. α_t indicate time fixed effects that control for common time-varying factors. Standard errors are double-clustered at the strategy and time levels.

Table 7 reports coefficient estimates from the OLS regression (16) for the sample of mutual funds with twin vehicles and available data on twin accounts, across all investment categories, with the net return compounded over the four quarters preceding the flow quarter as the performance measure. Adjusting flows for reclassification raises the estimated flow-performance sensitivity from 0.174 to 0.239 (a 38% increase) in the full sample, and from 0.184 to 0.276 (50%) among funds holding more than 50% of assets in institutional share classes. A stacked specification that estimates the standard and adjusted slopes jointly confirms that these increases are statistically significant at the 1% level (differences of 0.066 and 0.092, respectively). Appendix Table B.2 extends the regression to the full universe of U.S. mutual funds. Mutual funds without twins enter unadjusted, while mutual funds with twins and available data on twin accounts are reweighted to represent all twins. The asset reclassification adjustment still raises the sensitivity significantly, by roughly 8% across all mutual funds and 14% in the institutional segment.

INSERT TABLE 7 HERE

Table 8 restricts the sample to actively managed equity mutual funds with twin vehicles and available data on twin accounts, for which performance can also be measured on a risk-adjusted basis: the trailing 12-month compounded net return in Panel A, the five-year rolling CAPM alpha in Panel B, and the five-year rolling four-factor alpha in Panel C. The reclassification adjustment raises the estimated sensitivity to the trailing net return from 0.214 to 0.281 (a 31% increase), and the understatement is even larger for risk-adjusted performance, with the CAPM- and four-factor-alpha sensitivities rising by 52% and 54%, respectively. The gap is widest among funds holding more than 50% of assets in institutional share classes, at 35% for the trailing net return and 64–66% for the alphas, suggesting that asset reclassifications between mutual funds and twin vehicles are especially prevalent among institutional investors. A stacked specification confirms that all of these increases are statistically significant at the 1% level. Appendix Table B.3 repeats the exercise across all active equity mutual funds and finds the same pattern, with the adjustment raising the sensitivity by roughly 7% to 16% across the three performance measures, and more in the institutional segment, all significant at the 1% level.

INSERT TABLE 8 HERE

6.2 Flows-on-RHS Relationships

6.2.1 Measurement Error When Flows Are an Explanatory Variable

Retain the decomposition $F_{i,t-1} = F^{\text{true}}_{i,t-1} + u_{i,t-1}$ of equation (10). The standard flow co-moves positively with reclassification, $\text{Cov}(F_{i,t}, F^{\text{true}}_{\text{Reclassification},i,t}) > 0$ (Table 5), which, using $\text{Cov}(F_{i,t}, F^{\text{true}}_{\text{Reclassification},i,t}) = \text{Cov}(F^{\text{true}}_{i,t} - F^{\text{true}}_{\text{Reclassification},i,t}, F^{\text{true}}_{\text{Reclassification},i,t}) = \text{Cov}(F^{\text{true}}_{i,t}, F^{\text{true}}_{\text{Reclassification},i,t}) -$

σ_u^2, implies

$$\sigma_{F^{\text{true}},u} \;\equiv\; \text{Cov}(F_{i,t}^{\text{true}}, u_{i,t}) \;=\; -\text{Cov}(F_{i,t}^{\text{true}}, F_{\text{Reclassification},i,t}^{\text{true}}) \;<\; -\sigma_u^2 \;<\; 0, \tag{17}$$

where

$$\sigma_u^2 \;\equiv\; \text{Var}(F_{\text{Reclassification},i,t}^{\text{true}}). \tag{18}$$

Let $Y_{i,t}$ be any outcome predicted by lagged flows and write

$$Y_{i,t} \;=\; \beta\, F_{i,t-1}^{\text{true}} + \gamma' X_{i,t} + \epsilon_{i,t}, \qquad E[\epsilon_{i,t} \mid F_{i,t-1}^{\text{true}}, X_{i,t}] = 0, \tag{19}$$

where β is the parameter of interest, $X_{i,t}$ a vector of controls and fixed effects, and $\epsilon_{i,t}$ the unobserved shock. Because reclassification correlates only with current and past variables, it is uncorrelated with the future innovation $\epsilon_{i,t}$, while its correlation with the contemporaneous controls is unrestricted,

$$\text{Cov}(F_{\text{Reclassification},i,t-1}^{\text{true}}, \epsilon_{i,t}) = 0, \qquad \text{Cov}(F_{\text{Reclassification},i,t-1}^{\text{true}}, X_{i,t}) \text{ unrestricted.} \tag{20}$$

The OLS coefficient on $F_{i,t-1}$, conditional on $X_{i,t}$, is

$$\hat{\beta}_{\text{OLS}} \;=\; \beta \cdot \frac{\tilde{\sigma}_{F^{\text{true}}}^2 + \tilde{\sigma}_{F^{\text{true}},u}}{\tilde{\sigma}_{F^{\text{true}}}^2 + 2\tilde{\sigma}_{F^{\text{true}},u} + \tilde{\sigma}_u^2}, \tag{21}$$

where $\tilde{\sigma}_{F^{\text{true}}}^2$, $\tilde{\sigma}_{F^{\text{true}},u}$, and $\tilde{\sigma}_u^2$ denote the variance of $F_{i,t-1}^{\text{true}}$, its covariance with $u_{i,t-1}$, and the variance of $u_{i,t-1}$, each net of $X_{i,t}$. Due to inequality (17), $|\hat{\beta}_{\text{OLS}}| > |\beta|$.

Using the decomposition (14), the adjusted flow satisfies $\overline{F_{i,t-1}} = F_{i,t-1}^{\text{true}} - \eta_{i,t-1}$ with measurement error $-\eta_{i,t-1}$, where $\tilde{\sigma}^2_\eta \leq \tilde{\sigma}^2_u$ and $|\tilde{\sigma}_{F^{\text{true}},\eta}| \leq |\tilde{\sigma}_{F^{\text{true}},u}|$, so that

$$\hat{\beta}_{\overline{F}} \;=\; \beta \cdot \frac{\tilde{\sigma}^2_{F^{\text{true}}} - \tilde{\sigma}_{F^{\text{true}},\eta}}{\tilde{\sigma}^2_{F^{\text{true}}} - 2\tilde{\sigma}_{F^{\text{true}},\eta} + \tilde{\sigma}^2_\eta}, \tag{22}$$

whose multiplier lies closer to one than that of equation (21). The contemporaneous-flow case is presented in Appendix D.

6.2.2 Smart- and Dumb-Money Tests

We empirically test the predictions of subsection 6.2.1 regarding the relationship between flows and future performance (Gruber, 1996; Zheng, 1999; Keswani and Stolin, 2008; Frazzini and Lamont, 2008) and estimate the following regression specification:

$$Y_{i,t} = \beta F_{i,t-1} + \gamma X_{s,t} + \alpha_c + \alpha_t + \epsilon_{s,t} \tag{23}$$

where $Y_{i,t}$ represents the performance measure of mutual fund i in quarter t. We employ three performance measures: the net return in the following quarter, the forward CAPM alpha, and the forward Carhart four-factor alpha, where each alpha is the intercept from a per-fund regression of quarterly net excess returns on factor returns over the twelve quarters following the flow quarter, requiring at least eleven nonmissing quarters. The forward alpha windows draw on return data through Q3:2024, beyond the end of the flow sample. Performance is measured net of fees, following the convention of the smart-money literature, because the net return is what fund investors actually earn. β is the parameter of interest capturing the relation between flows and future performance. $X_{s,t}$ denotes the vector of the following control variables: the log of fund size (lagged one period) and the log of fund age in years (lagged one period). α_c are Global category fixed effects that control for time-invariant heterogeneity across investment categories. α_t indicates time fixed effects that control for common time-varying factors. Standard errors are double-clustered at the strategy and time levels.

Table 9 reports coefficient estimates from the OLS regression (23) examining the relationship between fund flows and subsequent performance for active equity mutual funds. The sample comprises active equity mutual funds with twin investment vehicles, for which data on opened and closed twin vehicle accounts is available; the forward alpha windows cap the last flow quarter at Q4:2021. The dependent variable is the one-quarter-forward net return in Panel A, the forward CAPM alpha in Panel B, and the forward Carhart four-factor alpha in Panel C, each alpha estimated over the three years following the flow quarter. Columns 1–3 report a fund fixed-effects specification and Columns 4–6 a Global-category fixed-effects specification; within each, we compare standard quarterly fund flows as the explanatory variable (the first column) with reclassification-adjusted flows (the second, calculated according to equation (9)), and a stacked specification (the third) that tests whether the two coefficients differ.

Adjusting flows for reclassification shrinks the coefficient magnitudes toward zero, consistent with the upward bias that reclassification-induced measurement error imparts to the absolute magnitude of estimates with flows on the right-hand side. The effect is most pronounced under fund fixed effects: across all three panels the adjusted coefficient is roughly one-half to two-thirds smaller in absolute value, and the stacked specification confirms the difference is statistically significant in every panel. Under Global-category fixed effects the coefficients are smaller and the adjustment moves them by less, with the difference not statistically significant in any panel. Appendix Table B.4 re-estimates the test across all active equity mutual funds; under fund fixed effects the adjustment continues to shrink the coefficients significantly toward zero, while under Global-category fixed effects they remain near zero. Our results are consistent with the dumb-money phenomenon (Frazzini and Lamont, 2008).

INSERT TABLE 9 HERE

7 Conclusion

This paper documents substantial asset 'reclassification' in the mutual fund industry: combined asset transfers between mutual funds and their twin vehicles exceeded \$550 billion in 2021. These transfers do not involve investor flows; instead, mutual fund assets are converted into twin investment vehicles, such as separate accounts or collective investment trusts.

Using data on DC retirement plans, we find that reclassification from mutual funds to twin vehicles averaged more than 2.5% of total mutual fund option assets during 2017–2022. The options that undergo reclassification differ systematically by destination vehicle. Options that become collective investment trusts are larger, cheaper, higher-performing, and concentrated in target-date strategies, and they come from large retirement plans. Options that become pooled separate accounts are smaller, more expensive, more equity-focused, and come from smaller plans.

We also show that adjusting for asset reclassification matters for regression analyses that use fund flows. Reclassification correlates with actual fund flows and represents a non-classical measurement error whose effect depends on which side of the regression the flows enter. When past flows serve as an explanatory variable, as in a smart- and dumb-money test, this error inflates the estimate; adjusting for reclassification shrinks the coefficients toward zero, with most falling by more than half. When flows serve as a dependent variable, the error attenuates the estimate; adjusting significantly raises the flow-performance sensitivity of funds with twin vehicles, by one third to one half across performance measures and by more among funds with a higher share of institutional assets.

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Figures

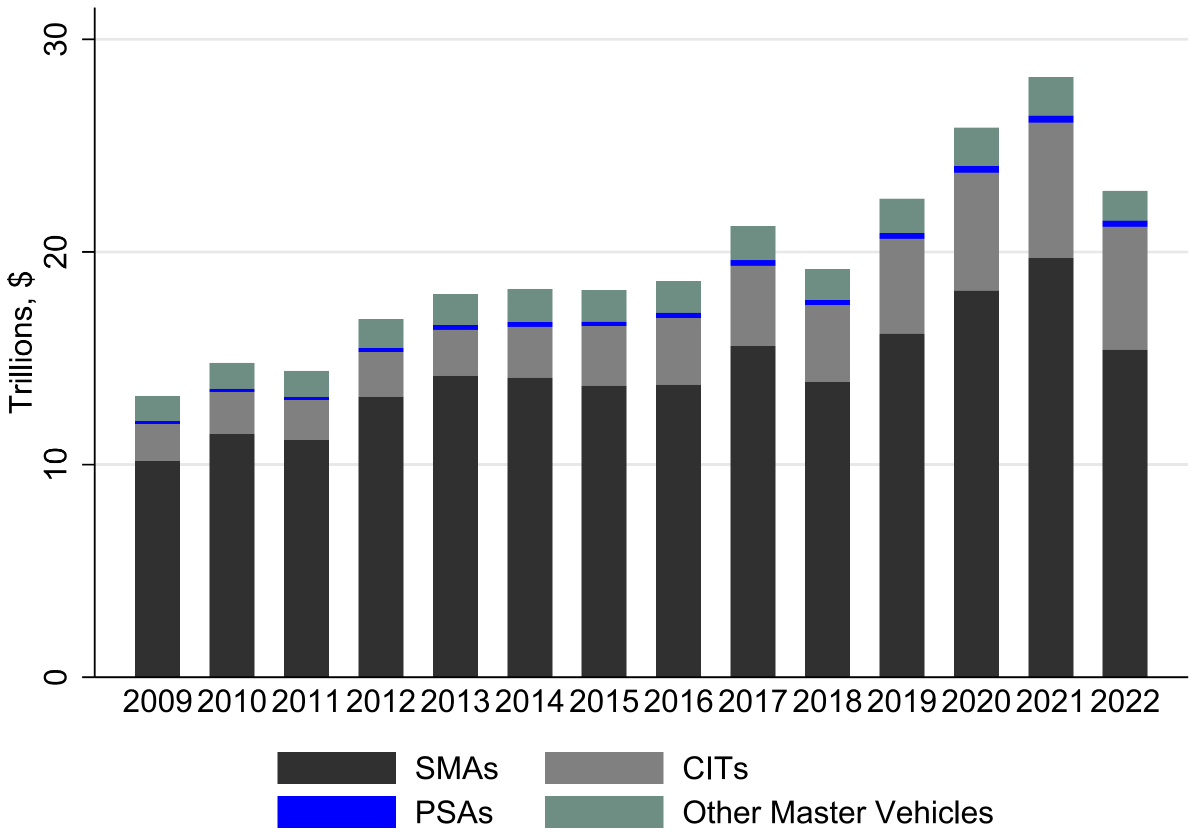


Figure 1: Growth of Assets in Institutional Investment Vehicles

This figure illustrates the growth of total net assets across four institutional investment vehicle categories from 2009 to 2022: separately managed accounts (SMAs), common and collective investment trusts (CITs), pooled separate accounts (PSAs), and other master vehicles. Information regarding the total net assets of SMAs is sourced from the Morningstar Direct. Total net assets for all remaining investment vehicle categories are derived from Form 5500 filings submitted by employee benefit plans and Direct Filing Entities.

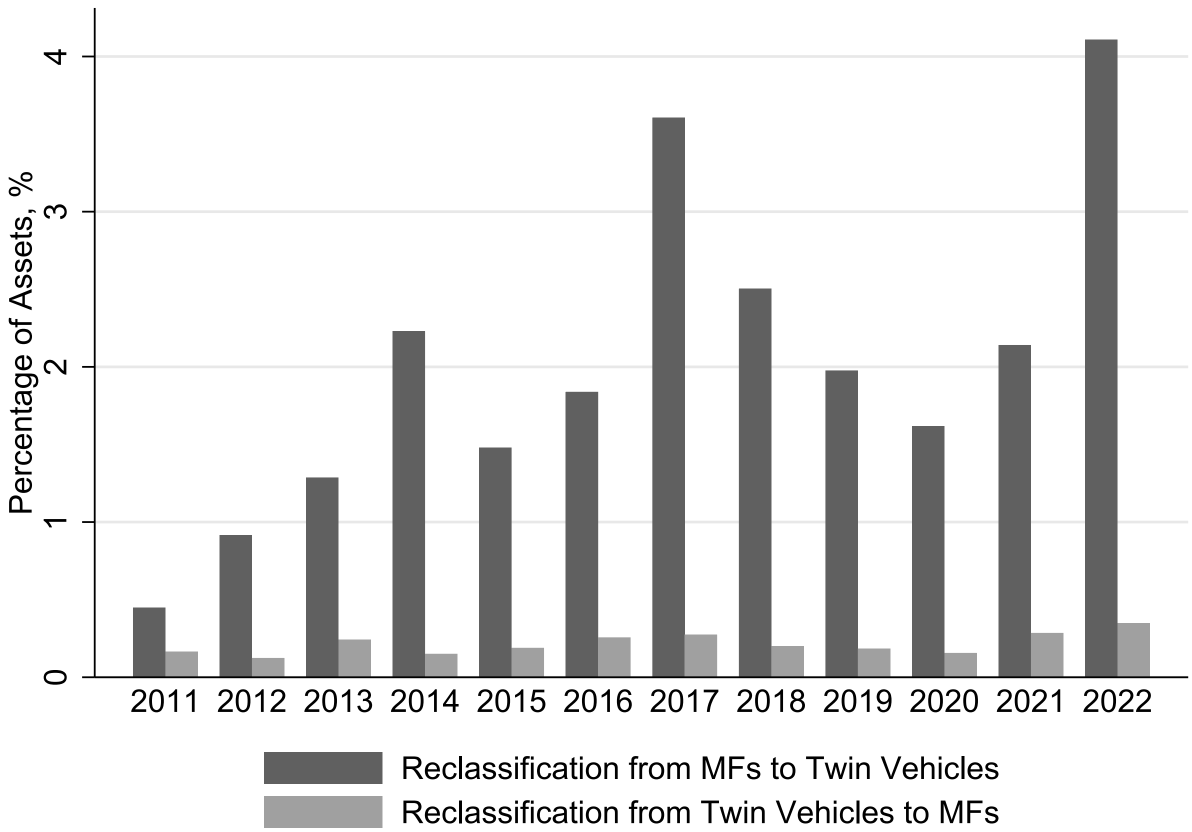


Figure 2: Asset Reclassification Magnitude in DC Retirement Plans

This figure illustrates the magnitude of asset reclassification in defined contribution (DC) retirement plans with at least 100 participants from 2011 to 2022. The sample includes plans with complete investment option information available in the BrightScope Beacon dataset. We measure asset reclassification magnitude as follows: (1) Mutual fund to twin vehicle reclassification is the ratio of total balances at the end of the previous year in mutual fund options replaced by their twin vehicles to total balances at the end of the previous year of all mutual fund investment options; (2) Twin vehicle to mutual fund reclassification is the ratio of total balances at the end of the previous year in twin vehicle options replaced by their corresponding mutual funds to total balances at the end of the previous year of all mutual fund investment options.

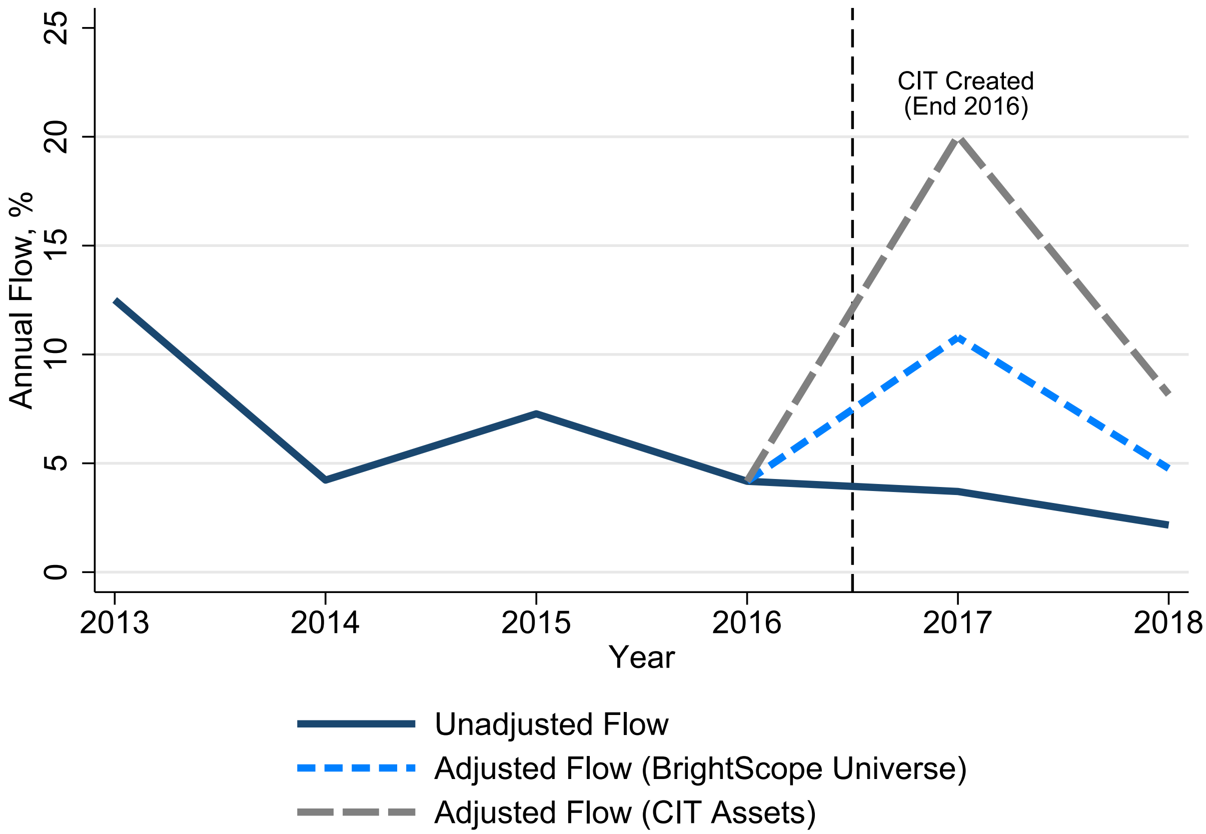
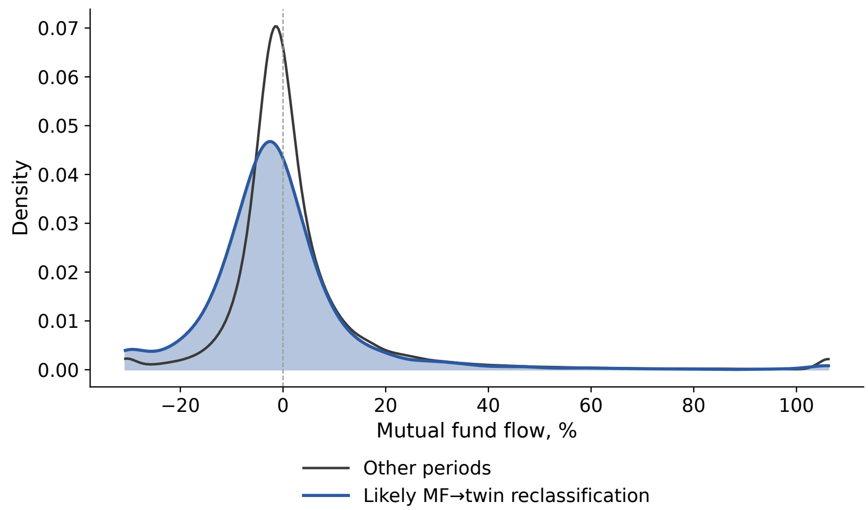


Figure 3: The Impact of Asset Reclassification on Mutual Fund Flow Measurement: Evidence from the Vanguard Extended Market Index Fund

This figure demonstrates the impact of asset reclassification on mutual fund flow measurement, using the Vanguard Extended Market Index Fund as a case study. The vertical dashed line marks the establishment of a twin collective investment trust (CIT) for this mutual fund in late 2016. Three measures of mutual fund flows are compared: (1) Unadjusted Flow represents standard annual flow without accounting for asset reclassification; (2) Adjusted Flow (BrightScope Universe) incorporates corrections for observable asset reclassification within defined contribution retirement plans, using data from the BrightScope database; and (3) Adjusted Flow (CIT Assets) indicates flow adjustments based on asset reclassification inferred from total assets held in the corresponding twin CIT.

Panel A: Likely MF→twin reclassification periods vs. other periods



Panel B: Likely twin→MF reclassification periods vs. other periods

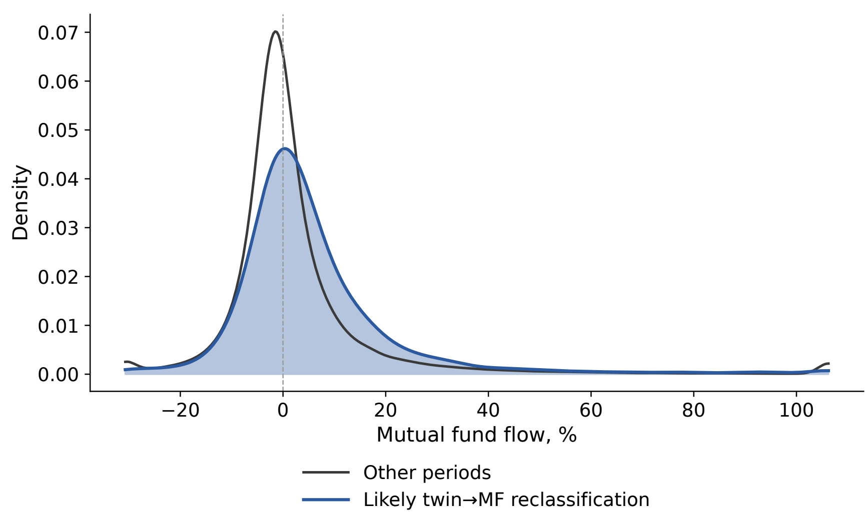


Figure 4: Distribution of Mutual Fund Flows During Likely Asset-Reclassification Periods vs. Other Periods

This figure plots kernel density estimates of mutual fund flows during fund-quarters flagged as likely asset-reclassification periods (blue line) and during all other fund-quarters in the same sample (black line). The sample spans the period from 2010:Q1 to 2022:Q2 and includes mutual funds with twin vehicles, which have information on mutual fund redemptions, sales, and assets in twin-vehicle opened- and closed-account. A fund-quarter is flagged as a *likely MF→twin period* asset reclassification (Panel A) when (i) the seasonally-adjusted redemption rate exceeds its trailing 12-quarter rolling mean by at least 0.5 standard deviations, and (ii) the matched twin vehicles report positive assets in newly opened accounts in the same quarter. A fund-quarter is flagged as a *likely twin→MF period* asset reclassification (Panel B) under the analogous criterion applied to mutual fund sales and assets in twin-vehicle closed accounts.

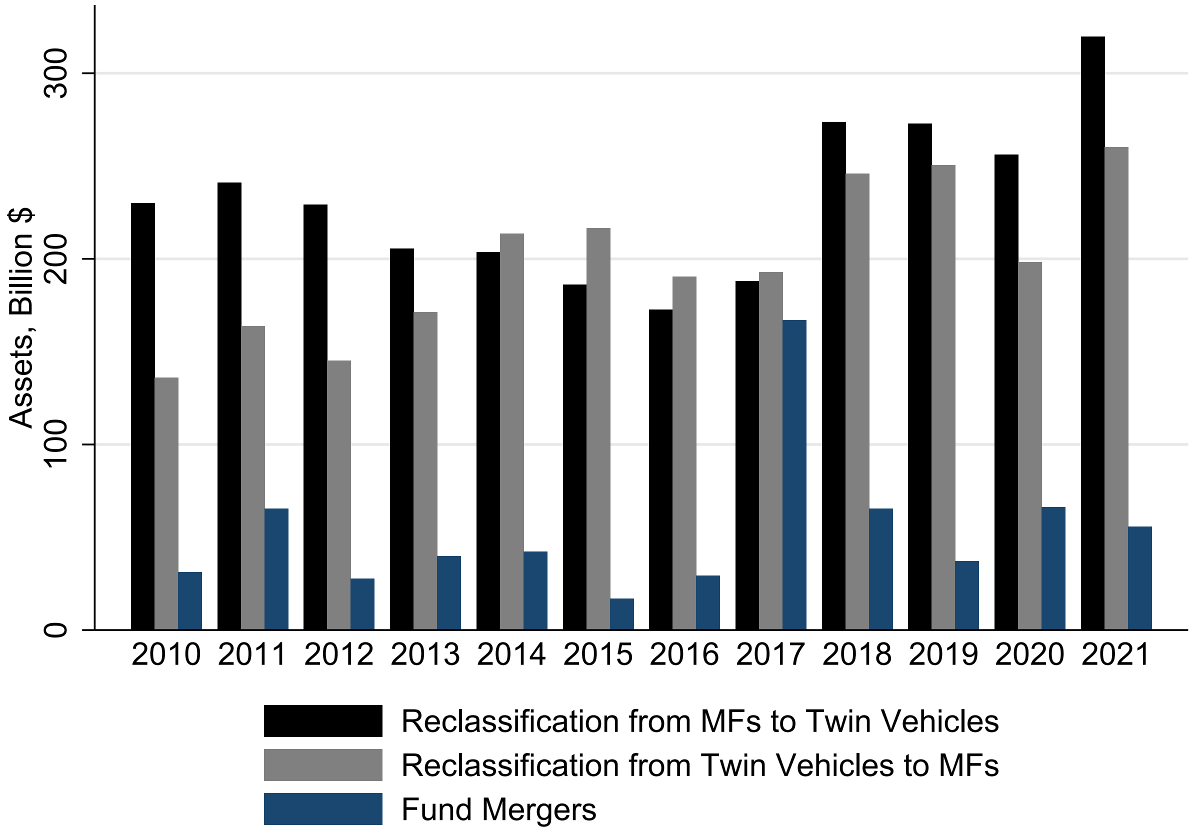


Figure 5: Annual Aggregate Asset Reclassification and Mutual Fund Mergers

This figure presents the annual aggregate value of asset reclassification between mutual funds and their twin investment vehicles from 2010 to 2021, compared with the annual total value of mutual fund mergers. Asset reclassification is inferred from the cell-based shares estimated in equation (5) multiplied by assets in opened and closed twin vehicle accounts and subject to economic-feasibility constraints (reclassification from mutual funds to twin vehicles cannot exceed previous-quarter mutual fund assets; reclassification in the opposite direction cannot exceed previous-quarter twin vehicle assets). The subsample annual aggregate is scaled to the universe by multiplying by the ratio of total twin-vehicle assets across all twin investment vehicles to total twin-vehicle assets within the subsample for the corresponding year. The data on fund mergers comes from the Morningstar Direct database.

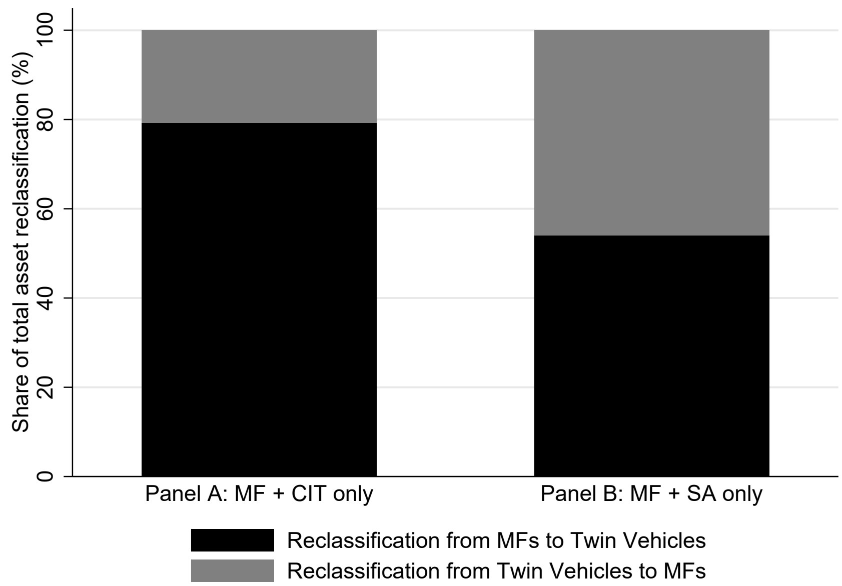


Figure 6: Direction of Asset Reclassification by Twin-Vehicle Type: CITs vs. Separately Managed Accounts, 2020–2021

This figure decomposes total asset reclassification activity over 2020–2021 into the share moving from mutual funds to twin vehicles and the share moving in the opposite direction, separately for two non-overlapping subsamples. Panel A is the subsample of investment strategies with at least one mutual fund and at least one collective investment trust (CIT) twin, but no separately managed account (SMA) twin. Panel B is the subsample of strategies with at least one mutual fund and at least one SMA twin, but no CIT twin. The dollar reclassification components in each panel are constructed by applying the procedure of Section 4 to the relevant strategy-quarters and aggregating over the 2020–2021 window. The two stacked components in each bar sum to 100%.

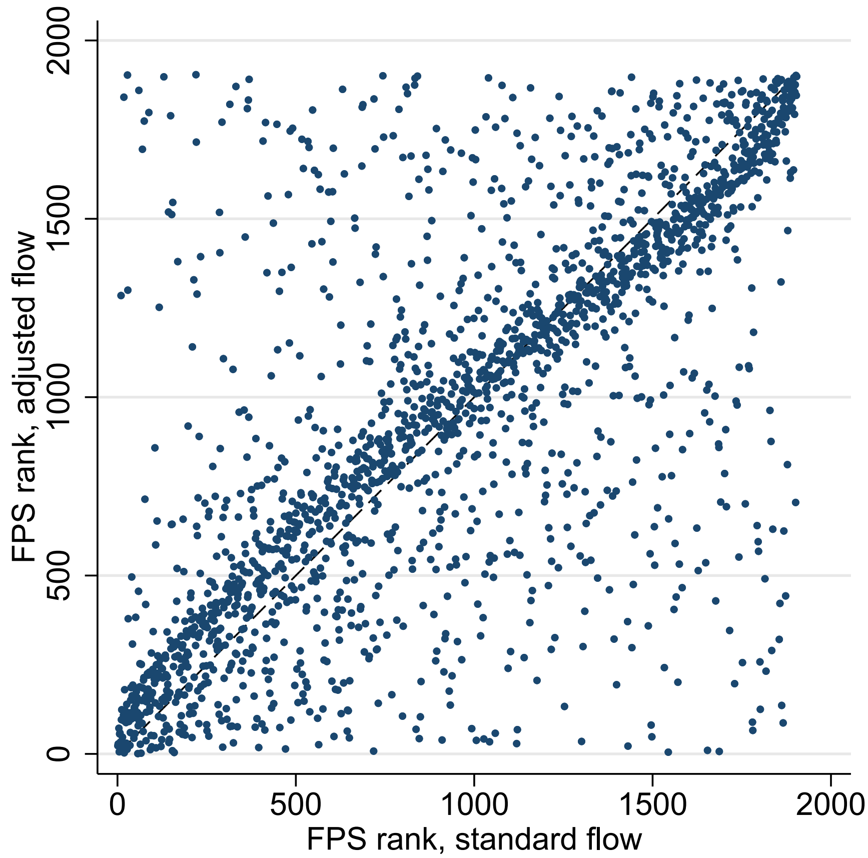


Figure 7: Fund-Level Flow–Performance Sensitivity: Standard vs. Reclassification-Adjusted Fund Flows

This figure compares the fund ranking of flow-performance sensitivity (FPS) under two flow definitions: the standard quarterly mutual fund flow and the reclassification-adjusted quarterly fund flow. For each mutual fund with at least 20 quarters over 2010–2022, we estimate equation (16) using standard and reclassification adjusted fund flows and then rank funds under each flow definition (rank 1 corresponds to the highest FPS). Each marker represents one fund; the dashed line is the 45-degree line.

Tables

Table 1: Summary Statistics on Mutual Funds, Common/Collective Investment Trusts, and Separately Managed Accounts

This table presents summary statistics for mutual funds, common/collective investment trusts (CITs), and separately managed accounts (SMAs) using data from Morningstar Direct and eVestment. The CIT and SMA samples are restricted to twin vehicles only. The combined sample comprises 16,464 mutual funds, 1,518 twin CITs, and 4,291 twin SMAs over the period Q1:2000 to Q2:2022. All variables are reported quarterly and continuous variables are winsorized at the 1st and 99th percentiles.

	Mean	Median	SD	Min	Max	# Obs.
Panel A - Mutual Fund Data						
Gross Return, %	1.68	1.82	7.94	-24	23	619,267
Net Return, %	1.41	1.59	7.95	-25	23	626,276
Fund TNA, Million	1,171.82	196.86	3,109.44	1	22,469	654,865
Sales, Million	91.64	13.10	244.58	0	1,728	513,577
Redemptions, Million	85.51	14.16	220.98	0	1,553	513,577
Equity Strategy	0.54	1.00	0.50	0	1	655,168
Allocation Strategy	0.15	0.00	0.36	0	1	655,168
Fixed Income Strategy	0.27	0.00	0.44	0	1	655,168
Other Strategy	0.04	0.00	0.19	0	1	655,168
Age, Years	12.53	9.83	11.18	0	98	654,231
Panel B - Institutional-Focused Vehicle Data						
Common/Collective Investment Trusts						
Gross Return, %	1.86	2.30	7.98	-23	22	21,569
Net Return, %	1.82	2.38	7.89	-22	22	37,506
Fund TNA, Million	2,432.10	315.45	7,002.18	0	51,835	46,775
Equity Strategy	0.47	0.00	0.50	0	1	39,033
Allocation Strategy	0.39	0.00	0.49	0	1	39,033
Fixed Income Strategy	0.13	0.00	0.34	0	1	39,033
Other Strategy	0.01	0.00	0.09	0	1	39,033
Age, Years	7.63	5.75	7.01	0	49	38,911
Separately Managed Accounts						
Gross Return, %	2.25	2.40	8.54	-24	25	204,810
Net Return, %	2.07	2.23	8.54	-25	25	202,850
Fund TNA, Million	2,866.78	553.60	7,043.39	0	50,472	230,462
Equity Strategy	0.74	1.00	0.44	0	1	208,651
Allocation Strategy	0.03	0.00	0.18	0	1	208,651
Fixed Income Strategy	0.21	0.00	0.41	0	1	208,651
Other Strategy	0.01	0.00	0.12	0	1	208,651
Age, Years	12.82	11.25	9.06	0	89	207,107
Investment Product-Level Data for CITs and SMAs						
Total Inst. Vehicle Accounts	163.82	11.00	1,317.11	0	71,614	156,187
Inst. Vehicle Taxed Accounts	79.60	4.00	710.90	0	34,218	117,810
Inst. Vehicle Tax-Exempt Accounts	55.97	5.00	531.46	0	38,014	114,780
Inst. Vehicle Accounts Lost	6.70	0.00	372.42	0	103,751	112,559
Inst. Vehicle Accounts Gained	5.70	0.00	131.08	0	35,044	115,745
Assets in Inst. Vehicle Accounts, Million	4,101.04	940.15	9,688.45	0	76,552	170,272
Assets in Inst. Vehicle Taxed Accounts, Million	2,621.82	456.04	6,557.76	0	49,491	131,274
Assets in Inst. Vehicle Tax-Exempt Accounts, Million	1,945.67	315.21	5,204.55	0	43,608	128,787
Assets in Inst. Vehicle Accounts Gained, Million	34.19	0.00	131.63	0	1,071	107,969
Assets in Inst. Vehicle Accounts Lost, Million	26.16	0.00	100.39	0	762	107,187

Table 2: Summary Statistics for Investment Menu Options in DC Retirement Plans

This table presents summary statistics for investment menu options in defined contribution (DC) retirement plans from BrightScope Beacon covering 2011 to 2022, which we use to analyze asset reclassification in DC plans. The unit of observation is plan-menu option-year. The sample includes only investment options that are mutual funds, collective investment trusts (CITs), and pooled separate accounts (PSAs), comprising 5,211,871 plan-menu option pairs across 110,087 401(k) and 403(b) plans. Plan-level variables are computed within this sample. Continuous variables are winsorized at the 1st and 99th percentiles.

	Mean	**Median**	**SD**	**Min**	**Max**	**# Obs.**
Investment Option-Year Level						
Option Balance (in M)	2.87	0.26	11.87	0	178	17,837,955
Expense Ratio	0.62	0.64	0.38	0	2	17,101,552
Mutual Fund Option	0.70	1.00	0.46	0	1	17,837,955
Common/Collective Investment Trust Option	0.05	0.00	0.21	0	1	17,837,955
Pooled Separate Account Option	0.26	0.00	0.44	0	1	17,837,955
Plan Level						
Plan Balance (in M)	54.45	14.13	135.87	0	932	110,087
Number of Plan Menu Options	27.18	26.00	11.47	1	77	110,087

Table 3: Selected Asset Reclassification Cases in the News

This table documents selected cases of asset reclassification events from mutual funds to twin vehicles reported in the financial press. Columns report the plan or plan sponsor, the asset manager, the dollar value of assets reclassified (or, when the plan-specific dollar amount is not disclosed, the dollar size of the affected plan), the year of the transition, the investment strategy involved, and the news sources. Cases are sorted by reclassified-dollar magnitude.

Plan / Sponsor	Manager	$ Reclassified	Year	Strategy Name	Source
Wells Fargo 401(k)	Wells Fargo	$5B	2016	Wells Fargo/State Street Target Date	PlanAdviser
SCL Health 401(k) and 403(b)	JPMorgan	TDFs of $3.5B Plans	2020	JPMorgan SmartRetirement	ASPPA-Net; Court Order
Delta Air Lines 401(k)	Fidelity	$1B	2014	Fidelity Contrafund	Reuters
Oklahoma PERS (SoonerSave & Pathfinder)	Vanguard	TDFs of $1.5B Plans	2022	Vanguard Target Retirement	Pensions & Investments
Lithia Motors 401(k)	JPMorgan	$570.6M	2023–2024	JPMorgan SmartRetirement	NAPA Net
Humana Retirement Savings Plan	PIMCO	$529M	2021	PIMCO Total Return	Pensions & Investments
CentroMotion 401(k)	T. Rowe Price	$55M	2022	T. Rowe Price Retirement TDF	Pensions & Investments
Regal Ware Profit-Sharing Plans	T. Rowe Price	$18–21M	2021	T. Rowe Price Retirement TDF	Pensions & Investments

Table 4: Characteristics of Mutual Fund Options Undergoing Asset Reclassification in DC Plan Menus

This table compares descriptive statistics for mutual fund options in defined contribution (DC) plan menus that experience asset reclassification versus those that do not. Option Size is the option's dollar value of assets (in millions). Relative Option Size is the ratio of assets invested in an option to plan assets. Mutual fund-level variables include fund age, fund size (in billions) as measured by total assets under management, the volatility of monthly fund returns, turnover, the expense ratio, indicator variables for an investment strategy class (Equity, Fixed Income, Allocation, or Other), and mean performance percentiles. Performance percentiles are calculated over the previous three years based on mutual funds of the same Morningstar category in the Morningstar fund universe. The remaining variables are plan-level variables: the number of menu options and the dollar value of plan assets (in millions). Significance levels for tests of the difference in means are denoted by *, **, and ***, which correspond to the 10%, 5%, and 1% levels, respectively.

Variable	(1) Reclassified Options to CITs	(2) Reclassified Options to PSAs	(3) Non-Reclassified Options	(4) Diff. (1)-(3)	(5) Diff. (2)-(3)
Option Size (in M)	33.28	1.09	3.46	29.83***	-2.45***
	(130.82)	(11.86)	(27.69)	(0.19)	(0.18)
Relative Option Size (in %)	5.03	3.37	3.67	1.36***	-0.30***
	(5.52)	(4.60)	(4.56)	(0.03)	(0.03)
Expense Ratio (in %)	0.40	0.65	0.58	-0.17***	0.07***
	(0.32)	(0.39)	(0.40)	(0.00)	(0.00)
Turnover (in %)	26.05	46.99	47.65	-21.61***	-0.61
	(53.91)	(79.57)	(89.62)	(0.67)	(0.59)
Age (in years)	14.53	18.53	17.73	-3.20***	0.81***
	(7.71)	(11.94)	(11.32)	(0.08)	(0.07)
Fund Size (in B)	28.47	42.01	44.88	-16.40***	-2.82***
	(56.48)	(109.66)	(107.05)	(0.85)	(0.82)
Return Std.Dev. (in %)	3.57	3.62	3.70	-0.13***	-0.08***
	(1.48)	(1.66)	(1.80)	(0.01)	(0.01)
Prior 3-Yr. Perf. (Percentile)	61.29	56.32	56.34	4.95***	-0.03
	(24.48)	(23.59)	(25.42)	(0.19)	(0.17)
Equity Strategy (in %)	14.70	54.02	51.24	-36.54***	2.87***
	(35.42)	(49.84)	(49.98)	(0.37)	(0.33)
Fixed Income Strategy (in %)	3.17	12.20	13.58	-10.40***	-1.35***
	(17.52)	(32.73)	(34.26)	(0.26)	(0.22)
Allocation Strategy (in %)	82.11	33.55	34.85	47.27***	-1.41***
	(38.33)	(47.22)	(47.65)	(0.36)	(0.31)
Other Strategy (in %)	0.02	0.23	0.34	-0.32***	-0.11***
	(1.29)	(4.74)	(5.80)	(0.04)	(0.04)
Number of Plan Menu Options	27.52	40.18	35.19	-7.69***	5.01***
	(15.24)	(27.79)	(32.72)	(0.22)	(0.20)
Plan Balance (in M)	465.86	49.28	91.07	374.93***	-42.80***
	(574.92)	(205.90)	(272.90)	(1.89)	(1.72)
Observations	21,379	26,310	8,170,643	8,218,332	8,218,332

Table 5: Standard Flow and Reclassification Flow

This table documents the empirical relationship between the standard mutual fund flow $F_{i,t}$ and the reclassification flow $F_{\text{Reclassification},i,t}$ (equation 8) that underlies the measurement error framework of Section 6.1.1. The dependent variable is the standard quarterly flow and the regressor is the reclassification flow. The sample is mutual funds with twin vehicles for which opened- and closed-account data are available, over Q1:2000–Q2:2022; both variables are winsorized at the 2nd and 98th percentiles. Column 1 includes no fixed effects; Column 2 adds investment-product and time fixed effects. Standard errors clustered at the fund level are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	$\text{Flow}_{i,t}$	$\text{Flow}_{i,t}$
Reclassification $\text{Flow}_{i,t}$	0.089***	0.059***
	(0.006)	(0.005)
Fund FE	No	Yes
Time FE	No	Yes
Observations	100,010	99,947
R^2	0.02	0.21

Table 6: Average Quarterly Standard and Adjusted Flows

This table compares average quarterly standard and reclassification-adjusted mutual fund flows. The sample includes mutual funds with twin vehicles and spans the period from Q2:2000 to Q2:2022. Panel A reports flows by global broad category group; Panel B reports flows by fund size tercile (T1=smallest, T3=largest). Both standard and adjusted flows are reported, with all measures winsorized at the 2nd and 98th percentiles. Values are in percentage points.

	Flows	Adj. Flows
Panel A: Global Broad Category Group		
Allocation	4.91	8.10
Equity	1.22	1.69
Fixed Income	1.95	3.42
Other	1.63	2.51
Total	1.53	2.34
Panel B: Fund Size Tercile		
T1	3.57	4.62
T2	0.58	1.32
T3	-0.28	0.04
Total	1.53	2.34

Table 7: Flow–Performance Sensitivity: All Mutual Funds with Twin Vehicles

This table examines how asset reclassification adjustments alter the estimated sensitivity of fund flows to past performance across mutual funds with twin vehicles. We estimate the regression specification (16) using the sample of mutual funds with twin vehicles, across all investment categories, for which data on opened and closed twin vehicle accounts is available. The sample spans Q2:2000 through Q2:2022. Columns 1–3 present results for the full sample of mutual funds with twin vehicles, and Columns 4–6 restrict the sample to funds with more than 50% of assets in institutional share classes. Within each group, the first column uses standard quarterly flows as the dependent variable, the second employs quarterly flows adjusted for reclassification according to equation (9), and the third ("Stacked") reports a pooled regression that stacks the standard and adjusted flows as the dependent variable and fully interacts an adjusted-flow indicator with the performance measure, the controls, and the fixed effects, providing a test of the equality of the two estimates. The performance measure is the net return compounded over the four quarters preceding the flow quarter. All specifications include fund and time fixed effects, as well as the log of lagged fund size and the log of fund age (in years). Standard errors double-clustered at the strategy and time levels are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Mutual Funds with Twin Vehicles			**MFs with Institutional Share Classes** $> 50\%$		
	$\text{Flow}_{i,t}$	Adj. $\text{Flow}_{i,t}$	Stacked	$\text{Flow}_{i,t}$	Adj. $\text{Flow}_{i,t}$	Stacked
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Net Return}_{i,[t-4,t-1]}$	0.174***	0.239***	0.174***	0.184***	0.276***	0.184***
	(0.016)	(0.022)	(0.016)	(0.021)	(0.029)	(0.021)
$\text{Net Return}_{i,[t-4,t-1]} \times$ Adj.			0.066***			0.092***
			(0.010)			(0.013)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	79,188	79,188	158,376	36,507	36,507	73,014
R^2	0.246	0.199	0.208	0.264	0.210	0.220

Table 8: Flow–Performance Sensitivity: Active Equity Mutual Funds with Twin Vehicles

This table examines how asset reclassification adjustments alter the estimated sensitivity of fund flows to past performance across actively managed equity mutual funds with twin vehicles. We estimate the regression specification (16) using the sample of mutual funds with twin vehicles for which data on opened and closed twin vehicle accounts is available. The sample spans Q2:2000 through Q2:2022. Columns 1–3 present results for the full sample of actively managed equity mutual funds with twin vehicles, and Columns 4–6 restrict the sample to funds with more than 50% of assets in institutional share classes. Within each group, the first column uses standard quarterly flows as the dependent variable, the second employs quarterly flows adjusted for reclassification according to equation (9), and the third ("Stacked") reports a pooled regression that stacks the standard and adjusted flows as the dependent variable and fully interacts an adjusted-flow indicator with the performance measure, the controls, and the fixed effects, providing a test of the equality of the two estimates. The performance measure is the net return compounded over the four quarters preceding the flow quarter in Panel A, the five-year rolling CAPM alpha in Panel B, and the five-year rolling four-factor (Carhart) alpha in Panel C. All specifications include fund and time fixed effects, as well as the log of lagged fund size and the log of fund age (in years). Standard errors double-clustered at the strategy and time levels are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	All Active Equity Mutual Funds			**Active Equity MFs with Institutional Share Classes $> 50\%$**		
	$\text{Flow}_{i,t}$ (1)	Adj. $\text{Flow}_{i,t}$ (2)	Stacked (3)	$\text{Flow}_{i,t}$ (4)	Adj. $\text{Flow}_{i,t}$ (5)	Stacked (6)
Panel A: Trailing 12-Month Net Return						
$\text{Net Return}_{i,[t-4,t-1]}$	0.214***	0.281***	0.214***	0.233***	0.315***	0.233***
	(0.018)	(0.024)	(0.018)	(0.023)	(0.034)	(0.023)
$\text{Net Return}_{i,[t-4,t-1]} \times$ Adj.			0.068***			0.082***
			(0.010)			(0.017)
Panel B: Five-Year Rolling CAPM Alpha						
$\alpha^{CAPM}_{i,[t-20,t-1]}$	2.091***	3.186***	2.091***	2.612***	4.341***	2.612***
	(0.155)	(0.271)	(0.155)	(0.200)	(0.386)	(0.200)
$\alpha^{CAPM}_{i,[t-20,t-1]} \times$ Adj.			1.095***			1.729***
			(0.158)			(0.271)
Panel C: Five-Year Rolling Four-Factor Alpha						
$\alpha^{4F}_{i,[t-20,t-1]}$	2.508***	3.856***	2.508***	3.100***	5.089***	3.100***
	(0.193)	(0.330)	(0.193)	(0.270)	(0.513)	(0.270)
$\alpha^{4F}_{i,[t-20,t-1]} \times$ Adj.			1.348***			1.989***
			(0.180)			(0.322)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	49,635	49,635	99,270	21,065	21,065	42,130

Table 9: Smart- and Dumb-Money Tests

This table reports coefficient estimates from the OLS regression (23) examining the relation between performance and past flows for active equity mutual funds. The sample comprises active equity mutual funds with twin investment vehicles, for which data on opened and closed twin vehicle accounts are available; the forward alpha windows cap the last flow quarter at Q4:2021. The dependent variable is the one-quarter-forward net return in Panel A, the one-quarter-forward CAPM alpha calculated over a three-year window in Panel B, and the one-quarter-forward Carhart four-factor alpha calculated over a three-year window in Panel C. Forward alphas are computed using return data through Q3:2024, beyond the end of the flow sample, and require at least eleven of the twelve forward quarters. All columns use the full sample of active equity mutual funds with twin vehicles; Columns 1–3 report a fund fixed-effects specification and Columns 4–6 a Global-category fixed-effects specification. Within each specification, the explanatory variable is the standard quarterly fund flow in the first column and the quarterly flow adjusted for asset reclassification (calculated according to equation (9)) in the second, and the third ("Stacked") reports a pooled regression that stacks the standard and adjusted flows as the explanatory variable and fully interacts an adjusted-flow indicator with the flow, the controls, and the fixed effects, providing a test of the equality of the two estimates. All specifications include time fixed effects and the following control variables: the log of lagged fund size and the log of fund age in years. Standard errors, reported in parentheses, are double-clustered at the strategy and time levels. Significance levels are denoted by *, **, and ***, which correspond to the 10%, 5%, and 1% levels, respectively.

	Within Fund Variation			**Within Global Category Variation**		
	$\text{Flow}_{i,t}$ (1)	Adj. $\text{Flow}_{i,t}$ (2)	Stacked (3)	$\text{Flow}_{i,t}$ (4)	Adj. $\text{Flow}_{i,t}$ (5)	Stacked (6)
Panel A: Forward Net Return						
Fund $\text{Flow}_{i,t}$	-0.0122***	-0.0053***	-0.0122***	-0.0008	-0.0006	-0.0008
	(0.0046)	(0.0018)	(0.0046)	(0.0043)	(0.0018)	(0.0043)
Fund $\text{Flow}_{i,t}$ × Adj.			0.0069**			0.0002
			(0.0031)			(0.0027)
Panel B: Forward CAPM Alpha						
Fund $\text{Flow}_{i,t}$	-0.0107***	-0.0044***	-0.0107***	-0.0023	-0.0012*	-0.0023
	(0.0014)	(0.0005)	(0.0014)	(0.0016)	(0.0007)	(0.0016)
Fund $\text{Flow}_{i,t}$ × Adj.			0.0062***			0.0011
			(0.0010)			(0.0010)
Panel C: Forward Four-Factor Alpha						
Fund $\text{Flow}_{i,t}$	-0.0081***	-0.0032***	-0.0081***	-0.0016*	-0.0008*	-0.0016*
	(0.0009)	(0.0004)	(0.0009)	(0.0009)	(0.0004)	(0.0009)
Fund $\text{Flow}_{i,t}$ × Adj.			0.0048***			0.0008
			(0.0006)			(0.0006)
Fund FE	Yes	Yes	Yes	—	—	—
Category FE	—	—	—	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	58,861	58,861	117,722	58,810	58,810	117,620

Appendix

A Appendix Figures

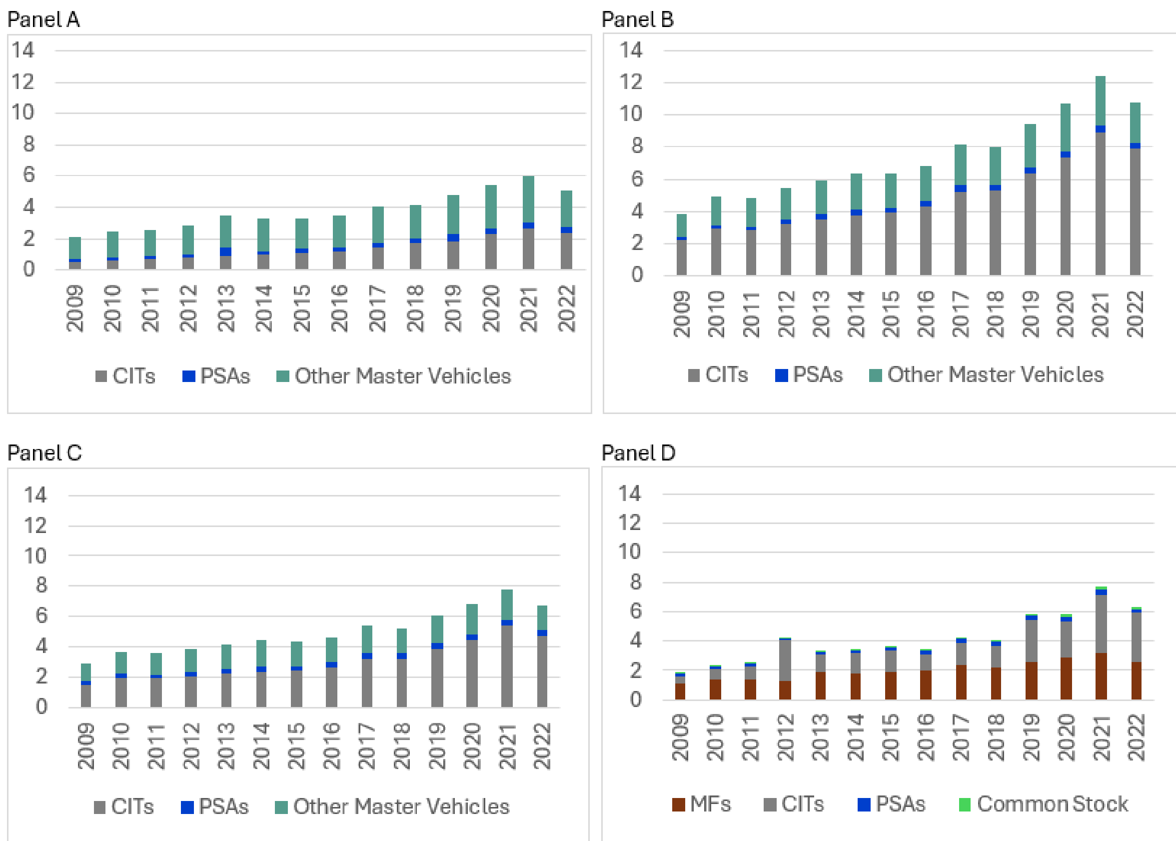


Figure A.1: Retirement Asset Allocations to Institutional-Focused Investment Vehicles

The figure provides information on aggregate asset allocations to vehicle categories from 2009 to 2022: common and collective investment trusts (CITs), pooled separate accounts (PSAs), and other master vehicles, using different sources of data. Panel A aggregates retirement assets by institutional-focused vehicle type based on the universe of Schedule D filings by retirement plans. In Panel B, the aggregate numbers are from the universe of Schedule D filings by direct filing entities (DFE's). In Panel C, we adjust the aggregate figures in Panel B for possible double-counting. Panel D shows aggregate plan investments in institutional-focused vehicles based on the Brightscope database. Additionally, it also shows allocation to common stocks (which potentially captures allocations to separately managed accounts (SMAs))

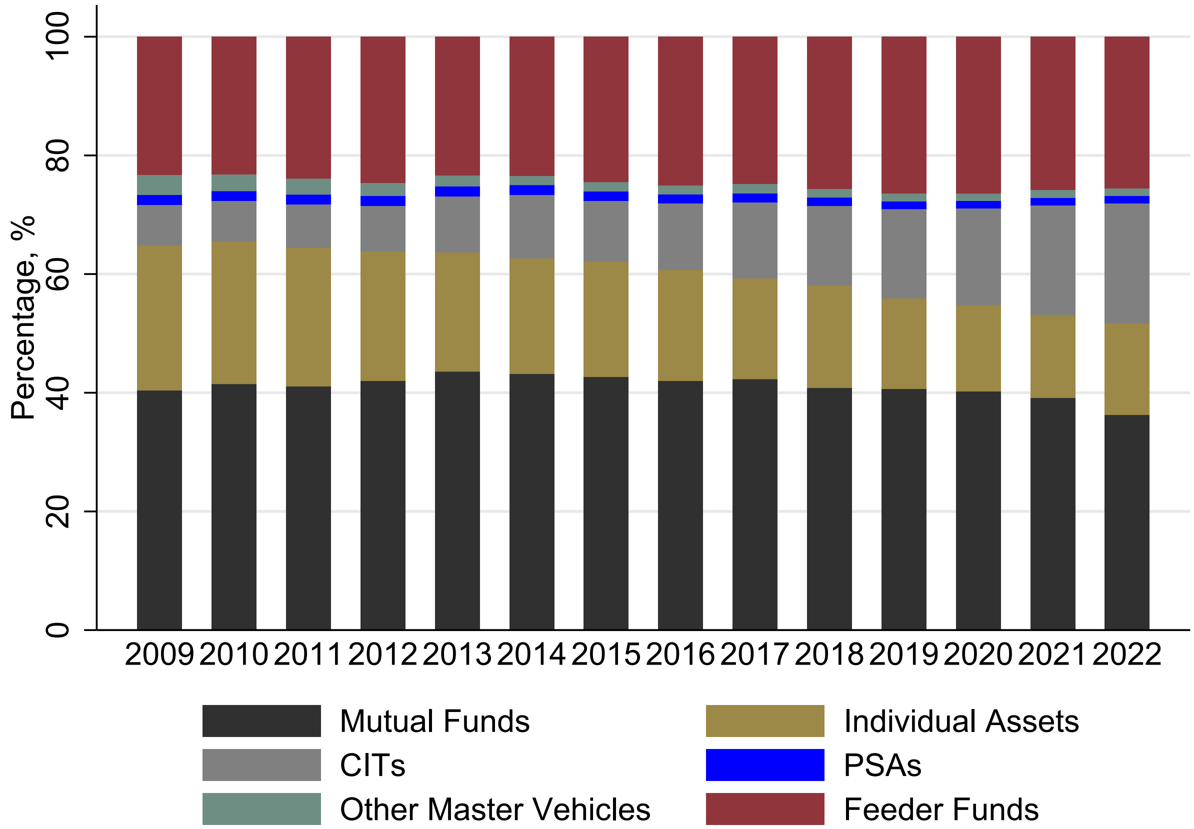
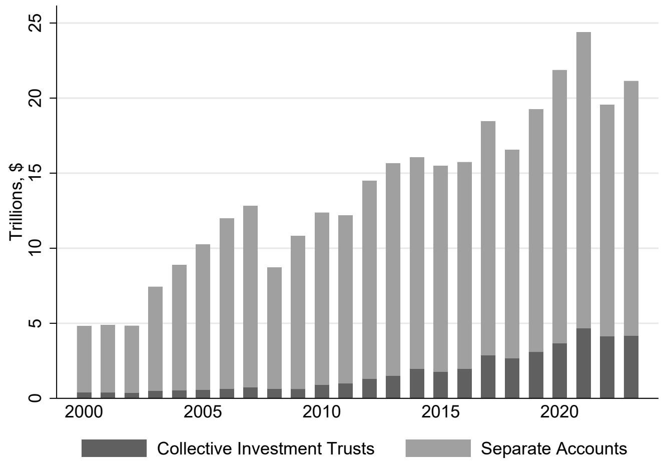


Figure A.2: Asset Allocation across Investment Vehicles in DC Retirement Plans

This figure illustrates the changing distribution of assets in defined contribution (DC) retirement plans allocated across individual assets and five investment vehicle categories from 2009 to 2022: mutual funds, common and collective investment trusts (CITs), pooled separate accounts (PSAs), other master vehicles, and feeder funds. The data are sourced from Schedule H Form 5500 filings submitted by defined contribution (DC) retirement plans with at least 100 participants. To identify feeder fund structures, we utilize Schedule H Form 5500 filings submitted by Direct Filing Entities in conjunction with information from Schedule D Form 5500 filings submitted by DC retirement plans. This figure does not include separately managed accounts (SMAs), which do not appear in Form 5500 filings because their assets are typically reported as direct plan assets rather than being classified as an investment vehicle.

(a) Panel A. Total Net Assets



(b) Panel B. Number of Investment Vehicles

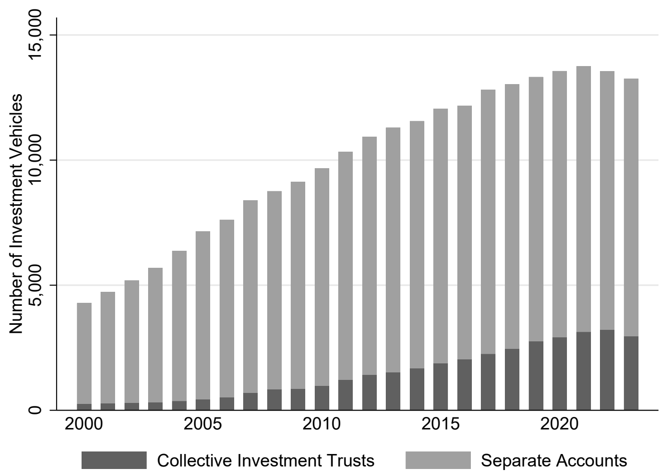


Figure A.3: Collective Investment Trusts and Separately Managed Accounts: Morningstar Coverage

This figure illustrates Morningstar's coverage of collective investment trusts and separately managed accounts from 2000 to 2023. Panel A presents the total net assets, while Panel B displays the total number of investment vehicles. The total number of investment vehicles is defined as the number of unique Fund IDs.

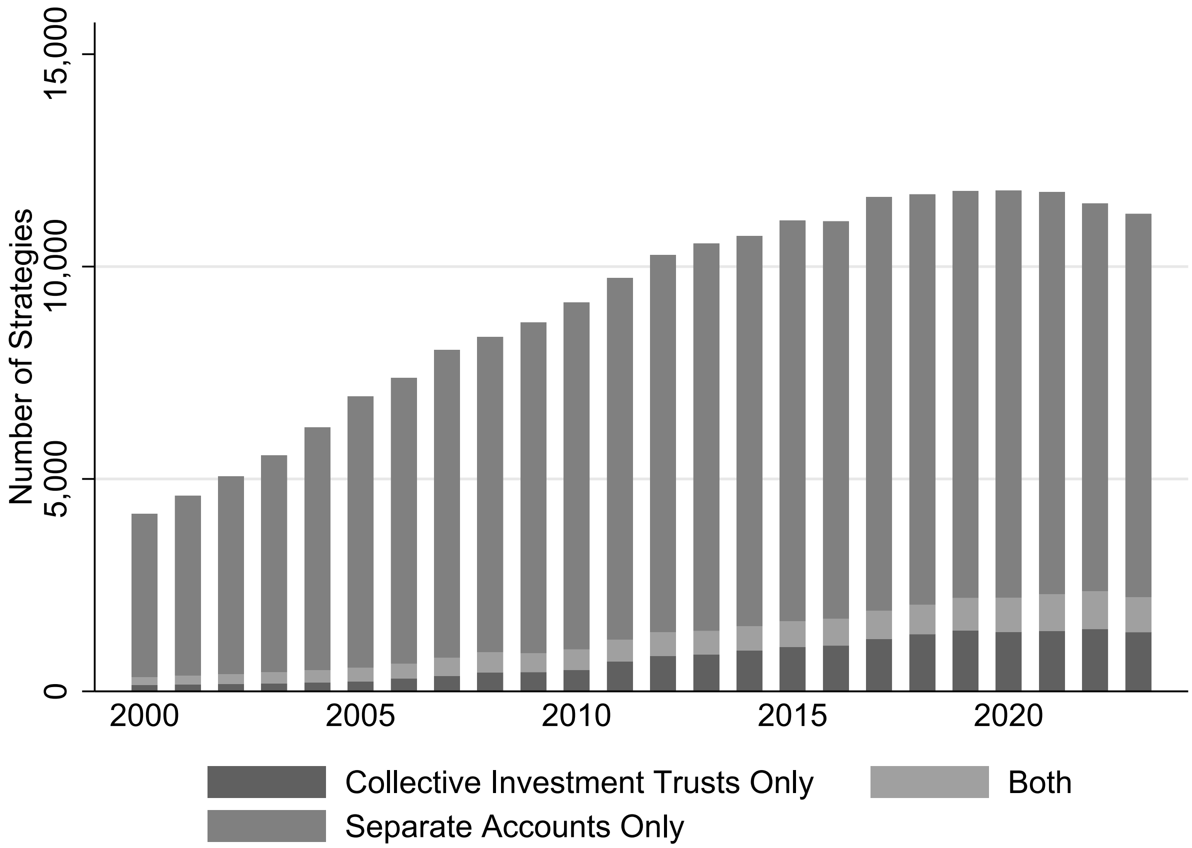


Figure A.4: Investment Products in Collective Investment Trusts and Separately Managed Accounts: Morningstar Coverage

This figure illustrates Morningstar's coverage of investment products in collective investment trusts and separately managed accounts from 2000 to 2023. The number of investment products is defined as the number of unique Strategy IDs.

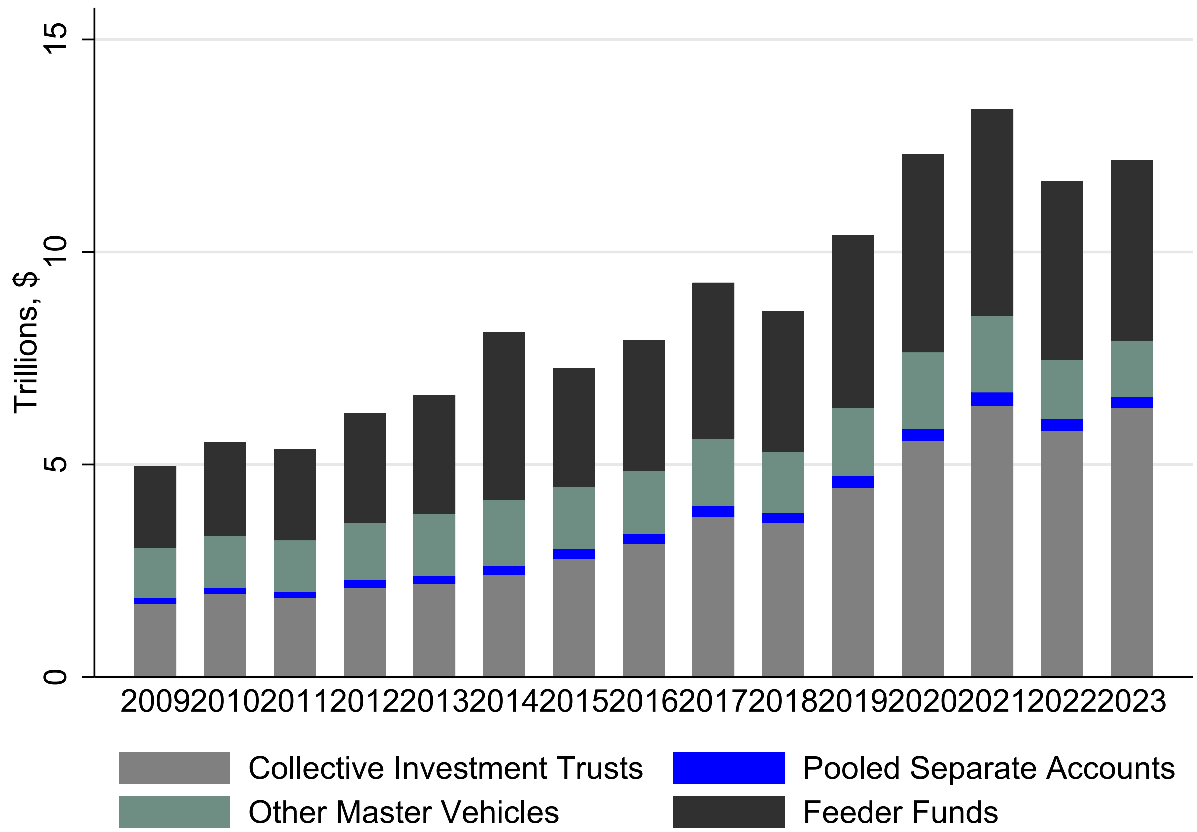


Figure A.5: Assets in Institutional-Focused Investment Vehicles Observed Through Form 5500 Filings

This figure illustrates the growth of assets in employee benefit plans and Direct Filing Entities reporting Form 5500 filings across four investment vehicle categories from 2009 to 2022: common and collective investment trusts (CITs), pooled separate accounts (PSAs), other direct vehicles, and fiduciary vehicles.

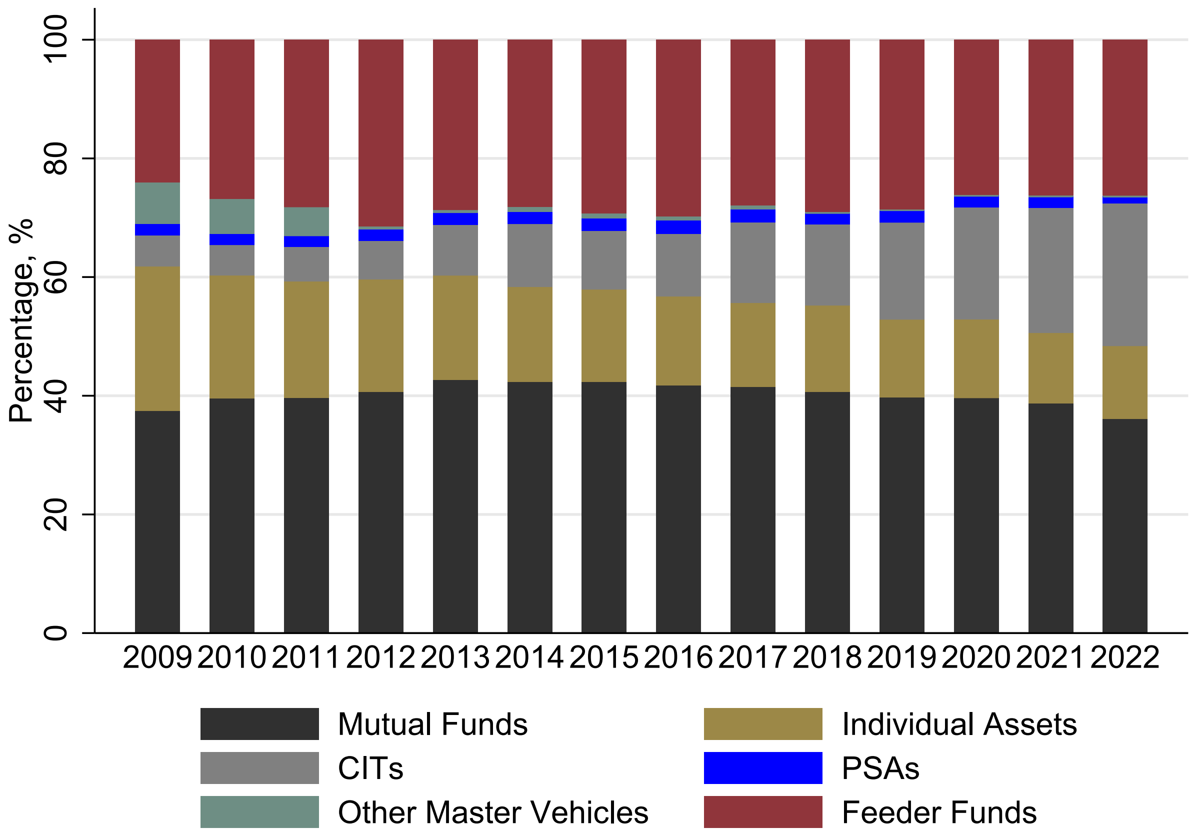


Figure A.6: Assets in Institutional-Focused Investment Vehicle within Large DC Retirement Plans: the Constant Sample of Plans

This figure illustrates the changing distribution of assets in DC retirement plans allocated across individual assets and five investment vehicle categories from 2009 to 2022: mutual funds, common and collective investment trusts (CITs), pooled separate accounts (PSAs), other master vehicles, and feeder funds. The data are sourced from Schedule H Form 5500 filings submitted by large DC retirement plans. The sample is limited to DC retirement plans with continuous annual filings throughout the 2009-2022 period. This figure does not include separately managed accounts (SMAs), which do not appear in Form 5500 filings because their assets are typically reported as direct plan assets rather than being classified as an investment vehicle.

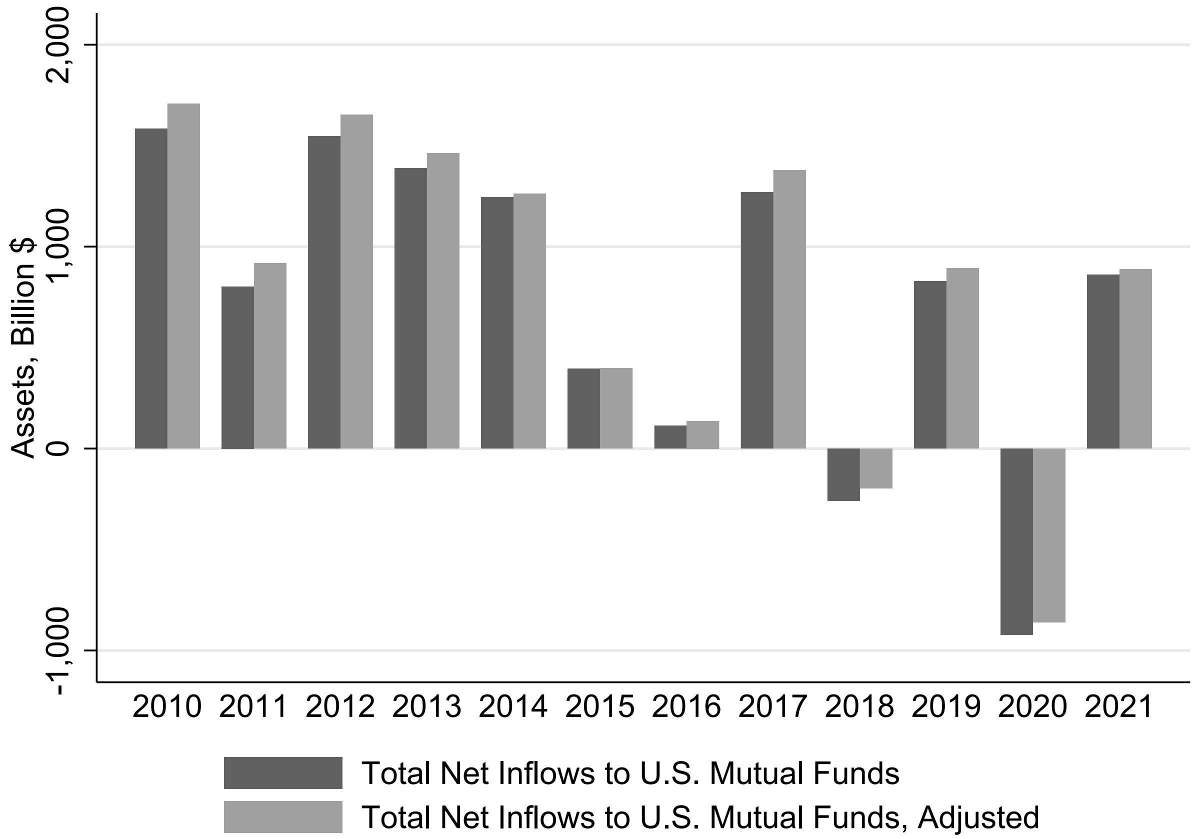


Figure A.7: Total Net Inflows to U.S. Mutual Funds: Adjusted vs. Unadjusted for Asset Reclassification

This figure compares total net inflows to U.S. mutual funds from 2010 to 2021 with and without adjusting for asset reclassification. Total net inflows to U.S. mutual funds represent the annual sum of quarterly values from the Federal Reserve's "Total Financial Assets, Transactions" time series [BOGZ1FA654090000Q], sourced from the Financial Accounts of the United States, Board of Governors of the Federal Reserve System (US), and retrieved via the Federal Reserve Bank of St. Louis FRED system. The total net inflows to U.S. mutual funds are adjusted for asset reclassification by adding annual aggregate asset reclassification from mutual funds to their twin investment vehicles and subtracting annual aggregate asset reclassification from twin vehicles to mutual funds.

B Appendix Tables

Table B.1: Median Cell-Level Slope Coefficients by Dimension

This table summarizes the cell-specific slope coefficients from the reclassification regression in equation (5), which interacts opened- and closed-account flows with indicators for the 120 cells defined by global broad category, within-category size tercile, institutional-asset exposure, and calendar subperiod. For each level of each cell dimension, we report the median across the non-empty cells at that level of the opened-account slope β_1 and the closed-account slope β_2.

Dimension	Level	Median β_1 (Opened)	Median β_2 (Closed)	# Cells
Global broad category				
	Equity	0.370	-0.533	30
	Fixed Income	0.092	-0.184	30
	Allocation	0.245	-0.033	30
	Other	0.131	0.000	22
Size tercile				
	T1 (smallest)	0.211	-0.161	39
	T2	0.217	-0.521	37
	T3 (largest)	0.178	-0.397	36
Institutional assets				
	None	0.185	-0.275	53
	Some	0.235	-0.383	59
Subperiod				
	2000–2004	0.000	0.000	23
	2005–2009	0.090	-0.186	24
	2010–2013	0.528	-0.506	22
	2014–2017	0.272	-0.366	22
	2018–2022	0.235	-0.498	21

Table B.2: Flow–Performance Sensitivity: All Mutual Funds

This table examines how asset reclassification adjustments alter the estimated sensitivity of fund flows to past performance across all mutual funds. We estimate the regression specification (16) using the full sample of mutual funds, across all investment categories. Mutual funds without twin vehicles enter with adjusted flow equal to standard flow; mutual funds with twin vehicles for which account data are available carry the reclassification adjustment and are reweighted to represent all mutual funds with twins, while mutual funds with twin vehicles for which such account data are unavailable are excluded from the sample. The sample spans Q2:2000 through Q2:2022. Columns 1–3 present results for the full sample of mutual funds, and Columns 4–6 restrict the sample to funds with more than 50% of assets in institutional share classes. Within each group, the first column uses standard quarterly flows as the dependent variable, the second employs quarterly flows adjusted for reclassification according to equation (9), and the third ("Stacked") reports a pooled regression that stacks the standard and adjusted flows as the dependent variable and fully interacts an adjusted-flow indicator with the performance measure, the controls, and the fixed effects, providing a test of the equality of the two estimates. The performance measure is the net return compounded over the four quarters preceding the flow quarter. All specifications include fund and time fixed effects, as well as the log of lagged fund size and the log of fund age (in years). Standard errors double-clustered at the strategy and time levels are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	All Mutual Funds			**MFs with Institutional Share Classes $> 50\%$**		
	$\text{Flow}_{i,t}$	Adj. $\text{Flow}_{i,t}$	Stacked	$\text{Flow}_{i,t}$	Adj. $\text{Flow}_{i,t}$	Stacked
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Net Return}_{i,[t-4,t-1]}$	0.145***	0.156***	0.145***	0.161***	0.183***	0.161***
	(0.012)	(0.013)	(0.012)	(0.016)	(0.017)	(0.016)
$\text{Net Return}_{i,[t-4,t-1]} \times$ Adj.			0.011***			0.022***
			(0.002)			(0.004)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	482,597	482,597	965,194	147,969	147,969	295,938
R^2	0.202	0.198	0.200	0.224	0.216	0.220

Table B.3: Flow–Performance Sensitivity: All Active Equity Mutual Funds

This table examines how asset reclassification adjustments alter the estimated sensitivity of fund flows to past performance across all actively managed equity mutual funds. We estimate the regression specification (16) using the full sample of actively managed equity mutual funds. Active equity mutual funds without twin vehicles enter with adjusted flow equal to standard flow; those with twin vehicles for which account data are available carry the reclassification adjustment and are reweighted to represent all active equity mutual funds with twins, while those with twin vehicles for which such account data are unavailable are excluded from the sample. The sample spans Q2:2000 through Q2:2022. Columns 1–3 present results for the full sample of actively managed equity mutual funds, and Columns 4–6 restrict the sample to funds with more than 50% of assets in institutional share classes. Within each group, the first column uses standard quarterly flows as the dependent variable, the second employs quarterly flows adjusted for reclassification according to equation (9), and the third ("Stacked") reports a pooled regression that stacks the standard and adjusted flows as the dependent variable and fully interacts an adjusted-flow indicator with the performance measure, the controls, and the fixed effects, providing a test of the equality of the two estimates. The performance measure is the net return compounded over the four quarters preceding the flow quarter in Panel A, the five-year rolling CAPM alpha in Panel B, and the five-year rolling four-factor (Carhart) alpha in Panel C. All specifications include fund and time fixed effects, as well as the log of lagged fund size and the log of fund age (in years). Standard errors double-clustered at the strategy and time levels are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	All Active Equity Mutual Funds			**Active Equity MFs with Institutional Share Classes > 50%**		
	$Flow_{i,t}$	Adj. $Flow_{i,t}$	Stacked	$Flow_{i,t}$	Adj. $Flow_{i,t}$	Stacked
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Trailing 12-Month Net Return						
$\text{Net Return}_{i,[t-4,t-1]}$	0.211***	0.225***	0.211***	0.220***	0.243***	0.220***
	(0.013)	(0.013)	(0.013)	(0.015)	(0.017)	(0.015)
$\text{Net Return}_{i,[t-4,t-1]} \times \text{Adj.}$			0.014***			0.024***
			(0.003)			(0.006)
Panel B: Five-Year Rolling CAPM Alpha						
$\alpha^{CAPM}_{i,[t-20,t-1]}$	1.454***	1.648***	1.454***	1.783***	2.183***	1.783***
	(0.095)	(0.107)	(0.095)	(0.146)	(0.184)	(0.146)
$\alpha^{CAPM}_{i,[t-20,t-1]} \times \text{Adj.}$			0.194***			0.400***
			(0.030)			(0.074)
Panel C: Five-Year Rolling Four-Factor Alpha						
$\alpha^{4F}_{i,[t-20,t-1]}$	1.571***	1.824***	1.571***	2.127***	2.651***	2.127***
	(0.113)	(0.130)	(0.113)	(0.184)	(0.229)	(0.184)
$\alpha^{4F}_{i,[t-20,t-1]} \times \text{Adj.}$			0.252***			0.524***
			(0.032)			(0.083)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	177,179	177,179	354,358	56,465	56,465	112,930

Table B.4: Smart- and Dumb-Money Tests: All Active Equity Mutual Funds

This table reports coefficient estimates from the OLS regression (23) examining the relation between performance and past flows for all active equity mutual funds. The sample comprises all active equity mutual funds; the forward alpha windows cap the last flow quarter at Q4:2021. Active equity mutual funds without twin vehicles enter with adjusted flow equal to standard flow, while those with twin vehicles for which account data are available carry the reclassification adjustment and are reweighted to represent all active equity mutual funds with twins; those with twin vehicles for which such account data are unavailable are excluded from the sample. The dependent variable is the one-quarter-forward net return in Panel A, the one-quarter-forward CAPM alpha calculated over a three-year window in Panel B, and the one-quarter-forward Carhart four-factor alpha calculated over a three-year window in Panel C. Forward alphas are computed using return data through Q3:2024, beyond the end of the flow sample, and require at least eleven of the twelve forward quarters. All columns use the full sample of active equity mutual funds; Columns 1–3 report a fund fixed-effects specification and Columns 4–6 a Global-category fixed-effects specification. Within each specification, the explanatory variable is the standard quarterly fund flow in the first column and the quarterly flow adjusted for asset reclassification (calculated according to equation (9)) in the second, and the third ("Stacked") reports a pooled regression that stacks the standard and adjusted flows as the explanatory variable and fully interacts an adjusted-flow indicator with the flow, the controls, and the fixed effects, providing a test of the equality of the two estimates. All specifications include time fixed effects and the following control variables: the log of lagged fund size and the log of fund age in years. Standard errors, reported in parentheses, are double-clustered at the strategy and time levels. Significance levels are denoted by *, **, and ***, which correspond to the 10%, 5%, and 1% levels, respectively.

	Within Fund Variation			**Within Global Category Variation**		
	$\text{Flow}_{i,t}$ (1)	Adj. $\text{Flow}_{i,t}$ (2)	Stacked (3)	$\text{Flow}_{i,t}$ (4)	Adj. $\text{Flow}_{i,t}$ (5)	Stacked (6)
Panel A: Forward Net Return						
Fund $\text{Flow}_{i,t}$	-0.0116***	-0.0091***	-0.0116***	0.0001	-0.0002	0.0001
	(0.0034)	(0.0025)	(0.0034)	(0.0028)	(0.0021)	(0.0028)
Fund $\text{Flow}_{i,t}$ × Adj.			0.0025**			-0.0003
			(0.0011)			(0.0009)
Panel B: Forward CAPM Alpha						
Fund $\text{Flow}_{i,t}$	-0.0074***	-0.0059***	-0.0074***	-0.0001	-0.0002	-0.0001
	(0.0009)	(0.0006)	(0.0009)	(0.0011)	(0.0008)	(0.0011)
Fund $\text{Flow}_{i,t}$ × Adj.			0.0015***			-0.0001
			(0.0003)			(0.0003)
Panel C: Forward Four-Factor Alpha						
Fund $\text{Flow}_{i,t}$	-0.0054***	-0.0042***	-0.0054***	0.0003	0.0002	0.0003
	(0.0006)	(0.0004)	(0.0006)	(0.0006)	(0.0005)	(0.0006)
Fund $\text{Flow}_{i,t}$ × Adj.			0.0012***			-0.0000
			(0.0002)			(0.0002)
Fund FE	Yes	Yes	Yes	—	—	—
Category FE	—	—	—	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	216,094	216,094	432,188	214,318	214,318	428,636

C Detailed Institutional Background on Twin Vehicles

The terms “collective trusts” and “separate accounts” are umbrella designations encompassing several distinct institutional-focused investment vehicles. “Collective trusts” may refer to collective investment trusts or common trust funds, while “separate accounts” can denote separately managed accounts or pooled separate accounts. We provide institutional background for each vehicle and clarify their structural, operational, and regulatory differences.

C.1 Collective Investment Trusts (CITs)

“Collective investment trusts” (CITs) are tax-exempt, pooled investment vehicles established by banks or trust companies. Often managed by the same asset managers as mutual funds, CITs are available only to qualified retirement plans, including defined benefit, 401(k), and 457(b) plans, with potential expansion to 403(b) plans pending legislation.

CITs originated in the 1920s when regulators allowed banks to manage deceased customers' assets.[8] Their use for pension savings expanded post-WWII with the rise of employer-sponsored retirement plans. In 2000, the National Securities Clearing Corporation's inclusion of CITs in its trading platform improved tracking for qualified investors.

CITs offer lower fees than mutual funds, making them an appealing option for retirement plans aiming to minimize expenses and reduce litigation risks related to these expenses. Consequently, CITs have grown significantly in the retirement space, reaching $9 trillion in 2021.[9] The fee difference primarily stems from reduced operational expenses due to lighter regulation and reporting standards.

Unlike mutual funds, CITs operate outside SEC regulation and are subject to fragmented oversight by various regulatory authorities. The Office of the Comptroller of the Currency regulates CITs established by national banks or trust companies, while state regulators oversee CITs created by state-chartered institutions. Additionally, the Department of Labor regulates CITs holding assets of retirement plans covered by the Employee Retirement Income Security Act of 1974. This regulatory framework results in significantly lower oversight and reporting requirements, including no public performance disclosure.

Overall, CITs offer lower fees and less transparency than mutual funds, with lighter regulation, while remaining similar to institutional share classes of mutual funds.

[8] Shnitser (2023) provides a comprehensive overview of CIT history and regulation.

[9] Based on data from Form 5500.

C.2 Common Trust Funds

Common trust funds function similarly to collective investment trusts in operational and regulatory aspects, but with one key distinction: they accept investments from a broader range of investors, including foundations, corporations, endowments, asset aggregators, and high net worth individuals.[10]

C.3 Separately Managed Accounts (SMAs)

"Separately managed accounts" (SMAs) are investment portfolios managed by professional asset managers in accounts designated solely for a single investor. SA investors directly own underlying securities, contrasting with mutual funds' pooled ownership structure. SMAs originated in the 1970s for high-net-worth individuals, and, like CITs, they are not registered with the SEC and lack public performance disclosures. Nonetheless, the SEC recently modified Form ADV Part 1 to collect information on SMAs. Since 2017, an investment adviser is required to report the value of assets in SMAs held at a single custodian if this value represents at least 10% of total assets in SMAs managed by the investment adviser. In addition, the Department of Labor also regulates SMAs holding ERISA-covered retirement plan assets.

An important distinction between CITs and SMAs is the investor base that these vehicles cater to. While CITs serve specific qualified retirement plans, SMAs cater to a broader range of investors, including CIT-qualified retirement plans, 403(b) plans, other institutional investors, and large retail clients.

C.4 Pooled Separate Accounts (PSAs)

"Pooled separate accounts" (PSAs) are investment vehicles created by life insurance companies where assets from multiple clients are combined in accounts segregated from the insurer's general assets.[11]

PSAs originated in the mid-20th century through state statutes initially designed for variable annuities. The modern PSA evolved in the late 1950s/early 1960s when insurance companies created these vehicles to offer pension clients higher-return portfolios with greater equity exposure than state insurance regulations typically permitted in general accounts. By

[10] Source: white paper of the Coalition of Collective Investment Trusts https://www.seic.com/sites/default/files/2022-05/SEI-STC-CCIT-WhitePaper.pdf

[11] An overview of the history and regulation of pooled separate accounts can be found in Wiedenbeck et al. (2013).

segregating plan assets, insurers circumvented conservative state investment limitations while providing market-based returns without guaranteeing principal or fixed rates.

PSAs function at the nexus of insurance regulation and ERISA law. State insurance commissioners exercise oversight of these vehicles to protect consumers from potential fraud and other risks. When retirement plan assets are placed within a PSA, ERISA regulations classify these investments as “plan assets,” thereby subjecting them to ERISA’s fiduciary obligations.

PSAs are only available to qualified pension, profit-sharing, annuity, and certain government plans. These vehicles, like other institutional investment vehicles, typically have lighter regulatory oversight and less demanding reporting requirements. Information regarding their performance is also inaccessible to the general public.

D Measurement Error When Contemporaneous Flows Are an Explanatory Variable

Let $Y_{i,t}$ be any outcome related to contemporaneous flows and write

$$Y_{i,t} \;=\; \beta\, F^{\text{true}}_{i,t} + \gamma' X_{i,t} + \epsilon_{i,t}, \qquad E[\epsilon_{i,t} \mid F^{\text{true}}_{i,t}, X_{i,t}] = 0, \tag{24}$$

where $F^{\text{true}}_{i,t}$ is the true flow, β the parameter of interest, $X_{i,t}$ a vector of controls and fixed effects, and $\epsilon_{i,t}$ the disturbance. The observed flow satisfies $F_{i,t} = F^{\text{true}}_{i,t} + u_{i,t}$ with $u_{i,t} = -F^{\text{true}}_{\text{Reclassification},i,t}$, as in equation (10). Because the disturbance $\epsilon_{i,t}$ is contemporaneous with reclassification, the orthogonality of equation (20) need not hold,

$$\tilde{\sigma}_{\epsilon,u} \;\equiv\; \text{Cov}(\epsilon_{i,t}, u_{i,t} \mid X_{i,t}) \;=\; -\text{Cov}(\epsilon_{i,t}, F^{\text{true}}_{\text{Reclassification},i,t} \mid X_{i,t}), \tag{25}$$

The OLS coefficient on $F_{i,t}$, conditional on $X_{i,t}$, is

$$\hat{\beta}_{\text{OLS}} \;=\; \beta \cdot \frac{\tilde{\sigma}^2_{F^{\text{true}}} + \tilde{\sigma}_{F^{\text{true}},u}}{\tilde{\sigma}^2_{F^{\text{true}}} + 2\tilde{\sigma}_{F^{\text{true}},u} + \tilde{\sigma}^2_u} \;+\; \frac{\tilde{\sigma}_{\epsilon,u}}{\tilde{\sigma}^2_{F^{\text{true}}} + 2\tilde{\sigma}_{F^{\text{true}},u} + \tilde{\sigma}^2_u}, \tag{26}$$

where $\tilde{\sigma}^2_{F^{\text{true}}}$, $\tilde{\sigma}_{F^{\text{true}},u}$, and $\tilde{\sigma}^2_u$ denote the variance of $F^{\text{true}}_{i,t}$, its covariance with $u_{i,t}$, and the variance of $u_{i,t}$, each net of $X_{i,t}$.From equation (26), it is not clear whether $\hat{\beta}_{\text{OLS}}$ is larger or smaller than β, since the numerator of the second ratio is typically negative.