Bank of Israel **Research Department**

How Do Mutual Fund Management Fee Changes Impact Mutual Fund Flows?

Yevgeny Mugerman* and Nadav Steinberg**

Discussion Paper 2024.12
October 2024

Bank of Israel - http://www.boi.org.il

[1] We acknowledge helpful comments and suggestions by Zhenyang (Leo) Bao, Nittai Bergman, Kym Brown, Silvio Contessi, Dan Galai, Alon Eizenberg, Neal Galpin, Ron Kaniel (discussant), Evgeny Lyandres, Olga Obizhaeva, Joshua Shemesh, Stanislav Sokolinski, Roy Stein, Zvi Wiener, Avi Wohl, Jin Yu, as well as participants at the 2024 International Conference in Finance, Accounting, and Banking (ICFAB), the 2024 Ackerman Family Center Conference, and seminars at the Bank of Israel and Monash University.

* Yevgeny Mugerman – Graduate School of Business Administration, Bar-Ilan University, 5290002 Ramat Gan, Israel, and Federmann Center for the Study of Rationality, Hebrew University of Jerusalem mugi@huji.ac.il;

** Nadav Steinberg – International Monetary Fund, Washington, DC 20431, United States, nsteinberg@imf.org, and Bank of Israel.

חטיבת המחקר, בנק ישראל ת"ד 780 ירושלים 91007

Research Department, Bank of Israel. POB 780, 91007 Jerusalem, Israel

How Do Mutual Fund Management Fee Changes Impact Mutual Fund Flows?

Yevgeny Mugerman, and Nadav Steinberg

Abstract

This paper investigates the causal relationship between changes in mutual fund management fees and fund flows using a comprehensive dataset of daily fund flows. Our analysis provides evidence of investor responsiveness to fee adjustments: an increase in fees leads to a decrease in net inflows, and a decrease in fees leads to an increase in net inflows. We address endogeneity concerns through various methods, including distinguishing between anticipated and surprising fee changes, using instrumental variables, and leveraging two regulatory reforms that affected management fees based on fund type or fee structure. By distinguishing inflows from outflows, we find that new investments are more sensitive to fee changes than existing investments. Using a proprietary database of all mutual fund holdings, we find that new investments by current fund investors drive this sensitivity. While on average our findings challenge the prevailing notion that retail investors are passive and inattentive to investment costs, we do find that investors in high management fee funds are much less sensitive to further fee increases.

JEL classification: G18, G28, G23, G41
Keywords: Mutual Funds, Management Fee Changes, Retail Investors

כיצד משפיעים שינויים בדמי הניהול בקרנות הנאמנות על תזרימי הכספים של הקרנות?

יבגני מוגרמן ונדב שטיינברג

תקציר

מאמר זה בוחן את הקשר הסיבתי בין שינויים בדמי הניהול בקרנות נאמנות לבין תזרימי הכספים שלהן, תוך שימוש במאגר נתונים שמקיף את כל תזרימי הכספים היומיים הנכנסים והיוצאים בקרנות הנאמנות. הניתוח שלנו מספק ראיות לתגובות המשקיעים לשינויים בדמי הניהול: העלאה בדמי הניהול מובילה לירידה בתזרימי הנטו של הקרן והפחתתם מובילה לעלייה בתזרימים אלה.

אנו מתמודדים עם בעיות אנדוגניות באמצעים שונים, כולל הבחנה בין שינויים צפויים ובלתי צפויים בדמי הניהול, שימוש במשתני עזר וניצול של שתי רפורמות מסדירות, שהשפיעו על דמי הניהול לפי סוג הקרן או המבנה של דמי הניהול. באמצעות הבחנה בין תזרימי כספים נכנסים ויוצאים, מצאנו כי השקעות חדשות רגישות יותר לשינויים בדמי הניהול מאשר השקעות קיימות. השימוש במאגר נתונים שמקיף את כל האחזקות בקרנות נאמנות הראה כי השקעות חדשות מצד משקיעים קיימים הן הגורם שמניע את הרגישות הזו. ממצאינו מאתגרים את התפיסה המקובלת שמשקיעים קמעונים אינם מגיבים או שאינם מייחסים חשיבות יתירה לעלויות הניהול של השקעותיהם, אך מצאנו עם זאת שמשקיעים בקרנות נאמנות עם דמי ניהול גבוהים, רגישים הרבה פחות להעלאות נוספות בדמי הניהול.

סיווג על פי כתב העת לספרות כלכלית (JEL): G18, G28, G23, G41.

מילות מפתח: קרנות נאמנות, שינויים בדמי ניהול, משקיעים קמעונים.

1. Introduction

Mutual funds are a popular investment vehicle for retail investors seeking diversified and straightforward market exposure. The cost of investing in these funds, known as the management fee, is paid to fund managers for their services and directly impacts the net returns realized by investors.[2] As with other prices, higher management fees may lead to lower demand for the fund, and vice-versa, assuming all other factors remain constant. However, this assumption may not hold due to differences in fund quality and the challenges investors face in measuring this quality and understanding fund costs.

First, the law of one price applies to identical products, but mutual funds vary in their portfolios, expected risk and return[3], and the skill of their managers. The seminal paper by Berk and Green (2004) suggests that skilled fund managers can command higher fees through greater assets under management and/or higher fees than their less talented counterparts. Thus, the fee level may signal quality, which may not be fully captured by observable variables.[4] The common practice in mutual fund literature is to control for mutual fund fees by including the fee level in estimations. However, this may fail to reflect the causal relationship between management fees and future fund flows, as the association between fund flows and fee levels can be contaminated by other factors, including fund quality.

Turning to the second issue, ample evidence suggests that households lack financial literacy in general, and even more so with respect to mutual funds (Lusardi and Mitchell, 2007).[5] Evidence suggests that households rely on fund rankings, even when these rankings do not provide new information (Kaniel and Parham, 2017).[6] Ben-David et al. (2022) summarize that household investment behavior in mutual funds reflects limited financial literacy and naiveté, suggesting that households are simple decision-makers. Investors often do not fully comprehend the importance of fund fees for future returns.[7] For example, Elton et al. (2004) show that index

---

[2] Most empirical evidence supports this conjecture. Elton et al. (1993), Carhart (1997), French (2008), and Fama and French (2010), among others, find that higher management fees reduce the net return to investors. In contrast, Berk and Van Binsbergen (2015) find that higher aggregate fees are associated with better future gross performance.

[3] See, for example, Sheng, Simutin, and Zhang (2023).

[4] For example, while researchers may aim to control for past fund performance, depending on the data and an adequate pricing model, they may not be able to control for recent changes in fund management, the quality of current analysts, the application of a new valuable data source, and so forth.

[5] The situation in Israel, which serves as the setting for our study, aligns with previous research (see e.g., Meir et al., 2016).

[6] Furthermore, Kaniel and Parham's study also sheds light on the strategic behavior of fund managers in response to this media-driven attention.

[7] There is abundant literature on the relationship between mutual fund performance and their flows. For example, see Ippolito (1992), Chevalier and Ellison (1997), Lynch and Musto (2003), and Goldstein, Jiang, and Ng

fund investors often fail to choose low-expense funds, while Choi et al. (2010) corroborate these findings in a lab experiment. Barber, Odean, and Zheng (2005) find that investors react negatively to salient fees but tend to ignore operating expenses. Carlin (2009) rationalizes the widespread failure of retail investors to respond to prices in financial markets by suggesting that financial firms add complexity to their price structures to prevent price discovery. deHaan et al. (2021) find empirical support for this model in the mutual fund market, claiming that funds strategically complicate their disclosure and fee structure to take in higher management fees.[8]

Given the concerns about fund differentiation and investors' bounded rationality and inattention, it is unclear whether investors should or would react rationally to the current fee level if it has not changed.[9] This study departs from most prior research by focusing on mutual fund fee changes rather than their level. We examine the impact of fee changes on fund flows using a comprehensive dataset encompassing all mutual fund fee change announcements in Israel over nine years. Unlike previous studies that relied on low-frequency data, we leverage daily mutual fund data, allowing us to investigate the effects of fee changes on flows at a higher frequency. This approach addresses concerns regarding the timing of flows relative to fee changes, provides a more nuanced understanding of investor behavior, and mitigates some endogeneity concerns present in prior research.

Our analysis demonstrates that management fee decreases lead to increased fund flows, while management fee increases result in reduced fund flows. These findings hold even after accounting for various factors that may confound the relationship. We control for fund size, age, past performance, and fee level to ensure the robustness of our results. We address potential concerns related to fund-specific characteristics and time-specific events by including fund fixed effects and date fixed effects in our analysis. This approach accounts for unobservable factors affecting fund flows and mitigates the influence of time-varying macro events. Our analysis reveals that the impact of management fee changes on fund net inflows is consistent across all fund types, with a particularly pronounced effect for bond mutual funds.

(2017). In contrast to retail investors, institutional investors show greater sensitivity to high fees (Evans and Fahlenbrach, 2012).

[8] Another recent paper by Hitzemann et al. (2022) finds that mutual funds with a higher beta charge higher fees, attributing this to leverage-constrained investors willing to pay for leveraged investments.

[9] While Berk and Green (2004) suggest that rational investors need not react to fee levels, Gil-Bazo and Ruiz-Verdu (2009) reveal the puzzling empirical fact that funds with worse before-fee adjusted returns charge higher management fees, attributing it to investors with low performance sensitivity failing to move away from those funds.

This finding suggests that investors in bond funds are more sensitive to fee adjustments and exhibit more significant changes in their investment behavior in response to fee changes.

Christoffersen and Musto (2002) and Gil-Bazo and Ruiz-Verdu (2009) show evidence to suggest that fund managers take advantage of the relatively low performance sensitivity of some retail investors by charging them with high management fees. Our findings show that on average management fee increases tend to drive net outflows from mutual funds. However, we find that investors in funds with especially high fees are significantly less sensitive to fee increase. That is, investors who are willing to pay especially high fees, relative to their peers, also show lower tendency to take out their money once these funds increase their fees even further. This result complements the findings of Christoffersen and Musto (2002) and Gil-Bazo and Ruiz-Verdu (2009) and can serve to support regulatory focused efforts to protect these less-attentive retail investors.

Focusing on flow dynamics around management fee increases, we find that funds experience abnormally high flows prior to fee increases, indicating investor demand. However, following the fee change, these funds face a reduction in flows. This observation highlights the daily heterogeneity masked in the low-frequency data used in prior studies. Our daily data, combined with actual announcements of management fee changes, mitigate most endogeneity concerns, allowing us to estimate the impact of fee changes on fund flows in the days following the change relative to the period before the change. Using daily data at the fund level enables us to control for all daily events affecting all mutual funds and for all time-invariant attributes of each fund. Nevertheless, time-varying fund characteristics may still impact both fund demand and fees, potentially affecting our estimations.

To obtain a clean estimate of the causal effect of a management fee change, we use three different methods:

First, we replicate Warner and Wu's (2011) estimation of mutual fund fee changes to predict the probability of a fee increase or decrease for each fund-day observation in our sample. We define each actual fee change as anticipated or unanticipated based on its ex-ante estimated probability relative to the median probability of fee changes. This definition allows us to separately estimate the impact of relatively expected and surprising fee changes on fund flows. We find that investors react strongly to both anticipated and surprising fee changes, mitigating concerns of endogeneity.

Second, we note that major fund decisions may be taken at the fund-family level, as suggested by several papers. We find a positive correlation between fee increases and decreases of different funds within the same family. We suspect that family-driven fee changes are more likely to result from structural or supply-side factors at the family level rather than from demand-side factors at the specific fund level. Using a fee change in another fund within the same family as an instrumental variable for a fee change in the examined fund, we apply a 2SLS estimation and obtain results almost identical to our main results, supporting the causal relationship between fee changes and subsequent fund flows.

Third, we take advantage of two quasi-natural experiments, where regulatory actions caused some mutual funds to adjust their management fees for reasons unrelated to changes in specific fund characteristics. Both reforms affected management fees of certain mutual funds more than others, and neither is likely to be associated with demand for specific funds beyond management fees. The first reform allows us to study the causal impact of an increase in management fees, while the second reform allows us to study the impact of fee reductions. Our primary quasi-natural experiment uses a 2016 reform that allowed mutual funds to increase management fees only once a year at the beginning of the year. This restriction disproportionately affected zero-fee funds, which were more likely to increase fees. Focusing on the first 100 trading days of each year, we find that affected zero-fee funds experienced more net outflows following the reform relative to other mutual funds and the period preceding the reform. Our second quasi-natural experiment uses a 2013 legislation that reduced distribution fees for specific mutual funds, notably active equity mutual funds, causing a regulation-induced reduction in management fees. Following the legislation, affected active equity mutual funds experienced more net inflows relative to other funds and the period before the legislation.

Having established causality from fee changes to flows, we further analyze which investors drive this reaction. Our flow data allow us to decompose net fund inflows into inflows and outflows. Previous research, such as Barber and Odean (2008), demonstrated that investors tend to lean toward attention-grabbing stocks, while their sales are less influenced by stock salience. Similarly, Mugerman, Steinberg, and Wiener (2022) observed analogous results for Israeli mutual funds. It is reasonable to assume that current and prospective investors may respond differently to mutual fund fee changes. Sirri and Tufano (1998) hypothesized that increasing management fees might lead to the loss of some existing investors, but the proceeds could be used to intensify marketing efforts, thereby reducing search costs for prospective

investors. Our analysis reveals that fee increases negatively affect both current and potential investments, but the impact is greater regarding prospective investors and/or additional investments by existing investors. Fee decreases attract more inflows, but do not seem to deter outflows. The strong effect of fee adjustments on potential investments aligns with Barber and Odean's (2008) insights regarding the allure of attention-grabbing changes.

We supplement our daily data at the fund level with proprietary monthly data at the investor-security level. This unique holding data, though anonymized, enables us to examine the investment decisions of specific investors in response to mutual fund fee changes. We find that wealthy investors have low sensitivity to fee changes. In addition, current investors are more attentive to fee changes than potential ones.

This paper makes several contributions to the literature on mutual fund fees and their impact on fund flows. First, it is the only study since Sirri and Tufano (1998) to comprehensively examine the effects of mutual fund fee changes on future fund flows. Unlike prior research that primarily relied on low-frequency data, our study leverages daily mutual fund data, allowing for a more detailed and accurate analysis of investor behavior and the timing of fund flows relative to fee changes.

Second, we employ a robust methodological framework that addresses endogeneity concerns through multiple approaches, including the replication of Warner and Wu's (2011) fee change probability estimation, the use of instrumental variables based on fund-family level fee changes, and two quasi-natural experiments induced by regulatory reforms. These methods strengthen the causal inference between fee changes and fund flows.

Third, our analysis distinguishes between the impacts of fee changes on different types of mutual funds, revealing that investors' sensitivity to fee adjustments varies across fund types, with a particularly pronounced effect observed in bond mutual funds. This observation highlights the heterogeneity in investor responses to fee changes.

Additionally, by decomposing net fund inflows into inflows and outflows, we provide insights into the differential reactions of current versus prospective investors to fee changes. This differentiation is crucial for understanding the dynamics of investor behavior in response to management fee adjustments.

Furthermore, the use of proprietary monthly data at the investor-security level enables us to analyze individual investor attributes and their responses to fee changes. This granular

approach reveals that wealthier investors show lower sensitivity to fee changes, and that current investors are more attentive to these adjustments than prospective investors.

Overall, our findings underscore the importance of fee transparency and effective communication in the mutual fund industry. They also suggest that investors are sophisticated in their reactions to fee changes, considering management fees as relevant indicators of future fund performance. By responding to fee changes, investors demonstrate engagement with the underlying factors influencing fund returns, emphasizing the need for fund managers to carefully consider their fee structures and the rationale behind any changes.

2. Background - The Israeli Mutual Funds Industry and Mutual Fund Management Fees

The Israeli mutual funds industry holds a crucial position in the realm of investment, much like its global counterparts. It serves as a pivotal player in facilitating investor participation, professional asset management, market liquidity, price discovery, and capital formation within the country. By providing individuals with a regulated platform to invest their savings and engage in the financial markets, mutual funds offer a convenient avenue for wealth accumulation. One of the key strengths of the industry lies in its emphasis on professional management, ensuring that investors can benefit from the expertise of skilled asset managers. It is worth noting that local mutual fund investors in Israel primarily consist of retail clients[10] who directly invest in the funds. Unlike the United States, mutual funds in Israel typically have only one class of shares. Additionally, unlike other investment vehicles such as retirement savings accounts, mutual fund investments in Israel do not offer tax advantages. As a result, mutual funds are typically not utilized as retirement savings instruments.[11]

With 1595 mutual funds and around NIS 240 billion in assets under management at the end of 2020[12], the mutual fund industry plays a substantial role in Israel's financial landscape. To ensure investor protection and market integrity, mutual funds in Israel are regulated by the Israel Securities Authority (ISA). The ISA establishes and enforces regulations and guidelines that govern the operation of mutual funds as well as their disclosure requirements, safeguarding the interests of both investors and the broader financial system.

[10] Israeli institutional investors prefer direct investment in the underlying traded securities rather than investing in local mutual funds.
[11] For more in-depth details, see Hamdani, Kandel, Mugerman, and Yafeh (2017).
[12] The average exchange rate during the sample period, 2012–2020, was NIS 3.66 to the US dollar.

Similar to mutual funds in the US and worldwide, mutual funds in Israel collect various types of fees:

- **Front-end loads:** These fees are paid to the fund management firm upon the purchase of shares in a mutual fund. In the US, front-end loads were prevalent in the past, but the popularity of no-load funds has increased over time as investors have become more aware of, and avoided, these significant fees (Barber, Odean, & Zheng, 2005). In Israel, front-end loads are relatively uncommon and low compared to both the US and other expenses associated with mutual funds.[13]
- **Expenses:** These fees are paid annually to the fund management firm as a percentage of the fund's assets under management. In the US, expenses are sometimes classified as 12b-1 fees, investment management fees, or advisory fees. While 12b-1 fees, which are typically additional compensation for brokers distributing the fund, do not exist in Israel, advisory fees are significant both in the US (Warner & Wu, 2011) and in Israel. In Israel, expenses are typically fixed as a percentage of the fund's assets, similar to the majority of US mutual funds (although some US funds may have expense ratios that vary with the fund's assets under management).[14]
- **Back-end loads:** These fees are paid to the fund management firm upon the sale of shares in a mutual fund. Back-end loads are not very common in either the US (Barber, Odean, & Zheng, 2005) or Israel.

Hence, expenses play a substantial role as costs for mutual fund investors, reflecting fundamental changes in the attributes of funds and fund families (Warner & Wu, 2011). The significance of expenses for US fund investors has increased over time as more funds have abandoned prominent and disliked loads (Barber, Odean, & Zheng, 2005). In Israel, expenses are essentially synonymous with management fees. Hence, in this paper, we focus specifically on expenses and will use the terms expenses and management fees interchangeably.

Under ISA regulations, mutual funds are required to disclose any changes in their management fees through current reports made available to the public on the ISA's MAGNA system and

[13] In Israel, fund managers themselves pay a distribution fee to the fund distributor, typically commercial banks that provide their clients with investment consulting services, at a rate of 0.25% of the sale amount for each actively managed mutual fund sold. (The distribution fee was higher before a reform in 2013, which we will discuss further below.) It is worth noting that this distribution fee indirectly influences the fees that the funds charge their clients.

[14] In Israel, unlike the United States, fund investors are additionally responsible for covering an annual trustee fee. This trustee fee is calculated as a fixed percentage of the fund's assets under management, but it should be noted that the fee is negligible, at approximately 0.05% on an annual basis.

the Tel Aviv Stock Exchange's MAYA system. The fund's management firm is obligated to provide all relevant information regarding the fee change through ISA Form 72, titled "Change in fund manager payment." This information includes details about the fund, the date of the report, the implementation date of the fee change, the previous fee level, and the new fee level. Similar to other current reports, the management firm must report a fee change on the same date it becomes known to the firm or on the next trading day, depending on the timing of the firm's awareness.

3. Sample and Data Description

3.1. Sample Construction

As opposed to most of the research on mutual fund flows, we base our analysis on daily, rather than monthly (or lower frequency) data, and on actual fund flows, rather than on the change in fund assets. Specifically, we take advantage of a comprehensive daily dataset of mutual funds in Israel from 2012 to 2020, sourced from the ISA database. To calculate the daily net inflows for each fund, we utilize the data on daily inflows and outflows. We augment the flow data with manually collected data on all the announcements of management fee changes at the day and fund level, based on ISA Form 72. That is, for each mutual fund and for each change in management fees we collect the relevant details on the fee change including the former and new fee levels, as well as the announcement date and implementation date. We complement the flow and fee data with additional data on the fund's characteristics, such as AUM, return, standard deviation of daily returns, management firm, and management fund type (equity fund, fixed-income, government bonds), as well as the indication for an active fund.

The net inflows are then scaled by the fund's AUM, allowing us to construct our dependent variable. Additionally, to address potential outliers in the flow data, we truncate 1% of each tail of the flow distribution. To ensure the robustness of our analysis, we exclude observations of funds that have assets under management (AUM) of less than $1 million and those that are within two months of their establishment. By excluding these observations, which represent funds with relatively small sizes and those with short operational periods, we mitigate the potential for anomalous daily flows that could distort our analysis.

After applying these exclusion criteria, our final sample consists of 2,576,456 fund-day observations related to 2,295 mutual funds managed by 34 different management firms. Within this sample, there are 613 equity funds, 1,106 fixed-income corporate mutual funds, and 576

funds specializing in government bond investments. Among the total sample, 1,695 funds are actively managed mutual funds, and the rest are index funds.[15]

3.2. Descriptive Statistics

Table 1 describes the components of our main variables of interest.

[Insert Table 1 about here]

Utilizing the availability of daily flows data, our analysis allows us to closely monitor the experience of individual funds when they announce changes to their management fees. This enables us to precisely identify the impact of fee changes on fund flows and track the patterns before and after the announcement. Figure 1 provides an insightful illustration of mutual fund flows surrounding fee changes. Panel A focuses on fee increases, while Panel B examines fee decreases. The figure captures the net inflows of management funds (scaled by AUM) over a 200-day period, spanning 100 days before the fee change announcement and 100 days from (and including) the announcement.

[Insert Figure 1 about here]

The figure shows a discernible shock to fund flows following a fee change. The visual depiction is striking, showcasing a cumulative scaled net inflow of approximately -13.5%/+38.6% for fee raises/decreases during the 99-day period following the fee change announcement.

These findings seem to suggest a significant investor reaction to fee changes, in contrast to the literature that depicts retail investors as inattentive to fund management fees. The sharp movements in net inflows demonstrate investors' sensitivity to fee modifications, and highlight the potential influence of fee changes on investor behavior.

4. The Effect of Fee Change on Daily Fund Flows

Table 2 examines the fee change effects on the daily fund flows. Our main regression specification (1) is:

[15] Unlike index mutual funds, the sample used in this study does not include ETFs (Exchange-Traded Funds). ETFs have distinct characteristics compared to both active and passive mutual funds, as they are traded continuously on the exchange. As a result, we do not have access to the necessary data on inflows and outflows specific to ETFs for inclusion in our analysis.

$$\text{Flow}_{n,t} = \alpha + \beta\ \text{post\_fee\_increase}_{n,t}(\text{post\_fee\_decrease}) + \lambda_t + \varphi_n + \text{F}_n + \varepsilon_{n,t}$$

where $Flow_{n,t}$ denotes the net inflows (inflows minus outflows) of mutual fund *n* on day *t* scaled by the fund's AUM as of the end of previous trading day; $post\_fee\_increase_{n,t}$ (post_fee_decrease)[16] is a dummy variable that equals 1 if $day_{n,t}$ is within the 100-day window following the fee increase (fee_decrease) announcement by $fund_n$ and zero otherwise[17]; $?_t$ is the trading day fixed effect; and $?_n$ is the mutual fund fixed effect. $F_{n,t}$ is a vector of fund *n*'s characteristics as of trading day t. We control for several time-variable fund characteristics, such as fee level, fund age, fund size, past returns, and the standard deviation of the fund's past returns. $\varepsilon_{n,t}$ is an error term clustered at the management firm (the fund's family) level.[18] Equation (1) estimates the effect of a fee change while controlling for all the fund's attributes and for possible trading-day effects. It facilitates the measurement of the fee change effect on fund flows *above and beyond* fund heterogeneity and time effects.

Our main interest is in the estimation of ?, which captures the effect of the fee change on fund flows.

The first column of Table 2 examines the effect of a fee increase. The main explanatory variable here is a dummy variable. Hence, its effect is rather intuitive—a fee increase is associated with an average daily decline of 0.1 percentage points in the fund's scaled net inflows over the 100-day period. This decline is also economically important, as it is 12.5 times larger in absolute terms than the unconditional mean of daily net inflows (0.16 standard deviations). The cumulative effect over the 100-day period is a decline of about 10.5 percentage points in the scaled net inflows.

Column 2 reviews the effect of a fee increase on fund flows, this time using a percentage points measure for fee increase (Post_Inc_Pp). The Post_Inc_Pp variable is calculated like *fee_increase*, however instead of 1s during the 100-day window following the fee increase, the

[16] Our primary analysis omits the 2013 reform, as detailed in section 5.4.2. This reform introduced numerous 'technical' fee reductions. Our findings demonstrate even greater robustness when we incorporate the effects of this reform.

[17] The 100-day window period spans days A through A+99, where day A is the day of the fee change announcement. As shown in Figure 1, this window is in line with investors' reaction. For robustness, we attempted various windows. While the precise estimates may vary, in all specifications the fee increase significantly affect fund flows.

[18] In the robustness tests, we examine clustering on other dimensions, two-way clustered by management firm and day to account for potential correlation of error terms both across observations for a particular management firm and for observations in each day. The outcomes are qualitatively similar, indicating that clustering is not a prime concern within our context.

Post_Inc_Pp gets the value of the actual increase in percentage points. Column 2 shows that a fee increase of one percentage point is associated with a decline of 0.25 percentage points in daily flow.

In Columns 3–4 we repeat the estimations of Columns 1–2, but this time testing for fee decreases. The results are even more definite. An average fee decrease is associated with an average daily improvement of 0.35 percentage points in the fund's scaled net inflows over the 100-day period, scaling up to the cumulative effect of 30 percentage points, while a fee decrease of one percentage point is associated with a daily flow increase of 0.64 percentage points.

[Insert Table 2 about here]

What is the scale of this reaction? We can gain some intuition from the perspective of mutual fund managers. First, let's consider the impact of a fee increase on their profits. The mutual fund's profits would increase due to the fee change multiplied by the assets under management (AUM_{A+100}).[19] However, during these 100 days, the mutual fund may experience a decline in assets, resulting in a loss. We can approximate this loss by calculating the difference in asset values ($AUM_{A+100} - AUM_A$) multiplied by the fee level before the adjustment. By taking these factors into account, we can calculate the net profit or loss for each fee increase. Panel A of Figure 2 displays the distribution of the funds' profits or losses resulting from the fee increase, as a percentage of the assets under management on the day of the fee change. Second, in the case of a fee decrease, the mutual fund's profits would increase due to the expanded management fee base, represented by ($AUM_{A+100} - AUM_A$) multiplied by the new fee level (after the reduction). However, there would be a corresponding loss due to the fee decrease multiplied by the initial AUM_A. Similar calculations allow us to assess the net profit or loss for each fee decrease, which is presented in Panel B of Figure 2.

Overall, Figure 2 offers meaningful insights, indicating that fee adjustments had a limited impact on mutual fund revenues in both scenarios. Specifically, when fees were increased, the average profit generated from this decision over the entire period amounted to 1.786% (with a median profit of 0.099%). Conversely, when fees were decreased, the average loss incurred was a mere 0.023% (with a median loss of 0.098%). These results further support the notion of

[19] The analysis is based on a window of 100 trading days, with day A representing the day of the fee increase announcement. This choice of window aligns with the observed reaction of investors, as depicted in Figure 1.

an appropriate reaction from mutual fund investors, as their response appears to absorb any potential surplus resulting from the fee adjustment.

[Insert Figure 2 about here]

While most of the existing literature primarily focuses on equity mutual fund flows, our setting encompasses a broader range of funds, including fixed-income mutual funds and government bond mutual funds.[20] It is noticeable that relatively few papers are devoted to bond mutual funds, let alone to the investors' fee-flow decision-making in these funds. Nevertheless, factors that impact fixed-income fund flows may have decisive implications for the stability of the financial system as a whole given the potential for downward price spiral (Haddad, Moreira and Muir 2021), and investor shifts from one fund type to the other can impact the aggregate market (Ben-Rephael, Kandel and Wohl, 2012). Prior evidence suggests differences between different mutual fund types with respect to the flow-return association (Goldstein, Jiang and Ng, 2017).

In Table 3, we present the same specifications as Table 2, but this time we analyze the effects in different subsamples. To maintain brevity, we report the results for specifications that include a dummy variable for fee changes. To examine the impact of fee changes across these different fund types, we divide the analysis into columns representing specific subsamples. Columns 1 and 4 pertain to equity specialized mutual funds, Columns 2 and 5 represent fixed-income corporate bond funds, and Columns 3 and 6 are associated with government bond mutual funds. Columns 1–3 present the results for fee increase specifications, while columns 4–6 focus on fee decrease specifications. Remarkably, the results across all subsamples exhibit a notable degree of similarity. Despite the diversity of mutual fund types in our sample, the impact of fee changes on fund flows appears consistent across these categories. This consistency suggests that the relationship between fee changes and fund flows is robust and not heavily influenced by the specific fund type under consideration. The economic magnitude of the effect of management fee changes on fund flows varies across different types of mutual funds. Notably, the impact is more pronounced in bond mutual funds, including both corporate and government bond funds. This finding suggests that investors in these funds are particularly sensitive to changes in management fees and are more likely to adjust their investment

[20] We note that the corporate bond market in Israel is relatively liquid (Abudy and Wohl, 2018).

decisions based on fee adjustments.

One might speculate that fee adjustments could have a disproportionate impact on flows in passive funds. However, our results, available upon request, reveal no discernible differences in investor response to fee changes between active and passive mutual funds. These findings complement those of Ben-David, Lee, Rossi, and Song (2022), who document that investors both in active and passive funds are chasing returns.

[Insert Table 3 about here]

Our findings show that mutual fund investors are generally sensitive to fee changes. Specifically, these mostly retail investors tend to take their money from a fund following an increase in its management fees. While these findings make intuitive economic sense, they are at odds with some of the studies that we reviewed in the introduction, which suggest naïve behaviour of at least some retail investors when it comes to financial products and mutual fund prices.

Christoffersen and Musto (2002) and Gil-Bazo and Ruiz-Verdu (2009) show evidence to suggest that fund managers take advantage of the relatively low performance sensitivity of some retail investors by charging them with high management fees. To check if this is also the case in our sample, we look to identify these investors. Specifically, in accordance with the findings of these papers, we suspect that holdings of mutual funds with especially high management fees can signal low sensitivity to performance.[21] This case is even stronger for money market funds as their before-fee performance tends to be similar, thus creating a strong negative correlation between their fees and net-of-fee returns (Christoffersen and Musto, 2002).

In Table 4 we repeat our main estimation (Table 2) but add a dummy variable for high-fee funds and the interaction of this dummy variable with the dummy variable for recent fee increase. We find that funds with very high fees relative to their investment category peers tend to attract more flows (controlling for investors' general tendency to prefer low-fee funds, as reflected by the negative coefficient of the fee-level variables) on average, suggesting that investors may perceive these funds as of high quality with respect to their performance or services. This result, however, does not hold for the more homogeneous group of money market funds. More interestingly, we find that the interaction between high-fee funds and recent fee

[21] The premise here is that fees are not highly positively correlated with before-fee performance, consistent with most of the empirical findings in the literature. Gil-Bazo and Ruiz-Verdu (2009) find that funds with worse before-fee performance actually charge higher fees.

increase is positive, suggesting that investors who are willing to pay especially high fees, relative to their peers, also show lower tendency to take out their money once these funds increase their fees even further. Importantly, these results hold both for the full sample and for the subsample of money market funds.

Therefore, while our main results show that mutual fund investors tend to react strongly to fee increases, there also seems to be a group of much less price-sensitive investors who are willing to pay high and increasing fees. This result complements the findings of Christoffersen and Musto (2002) and Gil-Bazo and Ruiz-Verdu (2009), and can serve to support regulatory focused efforts to protect these less-attentive retail investors.

[Insert Table 4 about here]

5. Are Fee Changes Exogenous?

It is important to acknowledge that, at this stage, we cannot definitively claim that the results presented in Tables 2 and 3 demonstrate a pure causal relationship between fee increases (decreases) and the subsequent decrease (increase) in fund flows. That is as it is reasonable to assume that there are (unobservable?) specific fund characteristics that drive fee changes. Specifically, funds that have experienced a change (that is, something that is not absorbed by fund fixed effects) that should make them more or less attractive may find it desirable to adjust their management fees in response. Such a change may be observable (e.g., improved returns), but it may also be unobservable or outside our dataset. These potentially unobservable factors could influence fund flows in a corresponding manner. This suggests that the observed correlation between fee changes and fund flows may overestimate or underestimate the true causal effect.

It is worth noting that such endogeneity can either attenuate or amplify our results. On the one hand, an omitted fund attribute that unexpectedly increases (decreases) demand for the fund may also incentivize an increase (decrease) in management fees to capitalize on (counter) the heightened (reduced) demand. If such an increase (decrease) in fees does not suffice to completely eliminate the original impact, it will be shown in our data as a positive association between management fee increases (decreases) and future net inflows.[22] On the other hand, an

[22] This intuition aligns with the model proposed by Berk and Green (2004). According to their model, skilled fund managers attract flows from rational investors who learn about the managers' abilities through their past performance. In response, managers act rationally by either increasing the size of the fund and investing the

increase (decrease) in demand for the fund can serve to increase (decrease) its size, thus producing (eliminating) economies of scale (Warner and Wu, 2011). Either way, a relation between fund demand and fund management fee change can obscure the estimation of the impact of management fee changes on fund flows. In the next section we will examine the potential for endogeneity in mutual fund fee changes by looking at fund demand prior to fee changes. In the following sections we will address endogeneity concerns using several empirical methods: distinguishing more and less predicted fee changes; instrumenting for fee changes; and utilizing quasinatural experiments in fee changes.

5.1. Preannouncement Trends

To examine the relation between past demand and fee changes in the data, we investigate trends prior to fee announcements (pretreatment dynamics). We refer here to the patterns in the scaled net inflows before the change is administered. Formally, we estimate the following linear equation (2):

$$\text{Flow}_{n,t} = \alpha + \beta_1\ \text{post\_fee\_increase}_{n,t}(\text{post\_fee\_decrease}) + \lambda_t + \varphi_n + \text{F}_n + \beta_2\ \text{pre\_fee\_increase}_{n,t}(\text{pre\_fee\_decrease}) + \varepsilon_{n,t}$$

This equation is similar to Equation 1 above, but Equation (2) adds a new explanatory variable pre_fee_increase (pre_fee_decrease), controlling for the patterns before the fee change announcement. $pre\_fee\_increase_{n,t}$ (pre_fee_decrease) is a dummy variable that equals 1 if $day_{n,t}$ is within the 100-day window prior the fee increase (fee decrease) announcement by $fund_n$, and equals zero otherwise.[23] In addition to the estimation of ?1, our main interest here is the estimation of ?2, capturing possible pre-fee-change trends.

The first two columns of Table 5 examine the effect of a fee increase, while the Columns 3 and 4 examine the effect of a decrease. The results show that the trend prior to a fee increase tends to be positive, though only marginally statistically significant in Column 1, and statistically insignificant in Column 2. This may suggest that mutual funds tend to increase their management fees following an increase in demand. Columns 3 and 4 of Table 5 show positive fund flows before fee decreases. This may suggest that, in line with Warner and Wu (2011),

additional funds in low-cost index investments (referred to as 'closet indexing') or by raising their management fees. Both alternatives, as depicted in the model, ultimately lead to a reduction in the fund's excess return to zero.

[23] The 100-day window period spans days A-1 through A-100, where day A is the fee increase announcement day.

funds tend to reduce their fees following an increase in their assets under management due to economy of scale. It is also possible that other factors, such as competitive pressures or changes in market conditions, encourage funds to reduce their management fees.

[Insert Table 5 about here]

The positive flow prior to fee increases may serve to explain the findings in Sirri and Tufano (1998) that while fee decreases are followed by an increase in fund flows, fee increases do not seem to impact fund flows. The authors attribute fee increases' lack of impact on flows to the fund's use of the proceeds to attract new clients, thus mitigating the impact of the fee change on fund outflows. However, the increase we see in mutual fund flows prior to management fee increases may suggest that Sirri and Tufano's (1998) results are affected by the time heterogeneity of fund flows around fee increases. That is, their annual flow data masks an increase in flows prior to (endogenous?) fee increases, combined with a decrease in flows following the fee increase.[24]

5.2. Anticipated and Unanticipated Fee Changes

To address the potential endogeneity associated with fee changes in relation to fund flows, we investigate the effects of fee changes that are more or less anticipated based on observable factors. In a related context, Warner and Wu (2011) examined the determinants that account for changes in mutual fund advisory contracts. These advisory contract fees compose a large share of the total management fees paid by investors to mutual funds in the US, and they are the focus of our study.[25] Warner and Wu (2011) observe that fees generally experience an upward trajectory in response to outstanding performance, not only within the particular fund but also across other funds within the same family. Conversely, fees exhibit a downward

[24] To examine whether the disparity between our findings and those of Sirri and Tufano (1998) is indeed a result of the different data frequencies, we replicate their estimation regarding the impact of fee changes on fund flows (Sirri and Tufano, 1998, Table IV) using our annual frequency data. Interestingly, our results closely align with theirs, demonstrating that fee reductions have a significant positive effect on subsequent fund flows, while the effect of fee increases is not statistically significant. We obtain these results using Fama-MacBeth regressions, as employed in the original Sirri and Tufano (1998) paper, as well as through pooled regression with fund and year fixed effects. These results, which can be obtained upon request, offer further evidence supporting the importance of data frequency in the analysis of mutual fund flows.

[25] We use the term "management fees" to refer to expenses, which in Israel include only advisory fees a.k.a. investment management fees (see discussion in Section 2 above).

tendency for larger funds and those that have expanded in size, highlighting the presence of economies of scale, which are also discernible at the fund-family level.

Warner and Wu's (2011) findings reveal that fee adjustments are not "random" but are influenced by factors such as fund performance and growth, which may be correlated with fund flows. While these findings underscore the potential endogeneity within the relationship between mutual fund fee changes and fund flows, they also offer a viable path forward. However, the direction of this path hinges on the specific narrative that concerns us: If one's primary concern revolves around pre-established observable factors, such as past performance and historical fund flows, influencing bias in the estimation, then the unpredicted fee changes (i.e., fee adjustments that were deemed less likely according to Warner and Wu, 2011) are less susceptible to this issue. Conversely, if the concern revolves around unexpected, unobserved events that might impact a fund's fee and its anticipated future performance (e.g., a mutual fund recruiting a top manager to manage its investments and covering her salary through a fee increase), thereby introducing bias into the estimation, then it is the predicted fee changes (i.e., fee alterations that were considered more probable according to Warner and Wu, 2011) that are less susceptible to this concern. Consequently, our study aims to present empirical evidence on the effects of both more- and less-predicted fee changes on fund flows.

To accomplish this, we replicate the main estimation from Warner and Wu (2011), as presented in Equation (1) and detailed in Columns (1) and (2) of their Table 4.[26] Using the results of this estimation, we generate predictions for the probability of a fee increase and a fee decrease for each mutual fund on each trading day. These predictions allow us to classify fee increases and decreases as either anticipated or surprising based on fund attributes such as size, fee level, and past performance. Subsequently, we conduct our main estimation (Equation 1), distinguishing between anticipated and unanticipated fee changes. Anticipated fee increases (decreases) are defined as fee changes that had a higher probability of occurring than the median probability among all fee increases (decreases), while unanticipated fee increases (decreases) are defined as fee changes that had a lower probability of occurring than the median probability among all fee increases (decreases). Table 6 suggests that the main results hold for both the more expected and the more surprising fee changes. Thus, it seems that our results cannot be completely driven by endogeneity, whether observable or not.

[26] Due to data limitations, we are unable to include several ancillary variables in our estimation. These variables include changes in the number of services provided by the investment advisor, changes in portfolio turnover, changes in the number of subadvisors, and merger-related dummy variables.

[Insert Table 6 about here]

5.3. Instrumenting Fee Changes

Another empirical measure to address the potential endogeneity of a fund fee change with respect to demand for the fund is to instrument for the fee change with a variable that is correlated with the fee change and is plausibly exogenous with respect to fund demand. To this end we turn our attention to the fund family. In line with past research that shows major family impact on fund decision making (e.g., Khorana and Servaes, 1999; Massa, 2003; Gaspar et al., 2006), we suspect that fee changes are determined at the fund family level. More specifically, we observe a noteworthy trend that funds within the same family tend to adjust their fees in a coordinated manner.[27]

Although we cannot definitively discount the possibility that demand-related factors at the individual fund level may contribute to this correlation, it appears highly plausible that these familial decisions are influenced by external factors unrelated to demand. These external factors are more likely to be supply-driven, rather than demand-driven, and could encompass aspects such as the cost structure of the fund family or the financial requirements of its owner. In light of the correlation between fee changes of funds belonging to the same family, we use a fee increase in at least one *other* fund of the same family as an instrumental variable for fee increase, and a fee decrease in at least one other fund of the same family as an instrumental variable for fee decrease. These IVs are valid instruments as long as the exclusion restriction is maintained, i.e., as long as the demand for the examined fund does not impact the probability of a fee change in another fund belonging to the same family.

The first column of Table 7 illustrates that an upswing in mutual fund fees corresponds, on average, to a daily decrease of 0.114 percentage points in the fund's scaled net inflows during the ensuing 100-day period. Conversely, the second column in the table reveals that a reduction in mutual fund fees is associated, on average, with a daily uptick of 0.243 percentage points in the fund's scaled net inflows over the same 100-day period. These findings align closely with our primary estimations, as presented in Table 2, underscoring the likelihood that our primary results signify a causal relationship rather than a spurious correlation influenced by

[27] In our analysis, we identify a noteworthy correlation of 12.7% between fee increases in one fund and concurrent fee increases in at least one other fund within the same family. Similarly, for fee reductions, this correlation is notable at 10.1%. These findings are substantiated by robust t-statistics, with a value of 6.55 for fee increases and 5.28 for fee decreases in the respective first stage-wise regressions.

endogeneity.

[Insert Table 7 about here]

5.4. Quasi-natural Experiments in Fee Changes

As another way to obtain a reliable estimation of the causal effect resulting from a management fee change, we capitalize on the presence of two quasinatural experiments. These experiments leverage regulatory actions that prompted certain mutual funds to adjust their management fees for reasons *unrelated* to any specific changes in the fund characteristics. Importantly, both reforms had a greater impact on the management fees of some funds than on their (close) counterpart funds. Furthermore, it is unlikely that either reform is associated with the demand for specific funds through any other channel besides the management fees. Therefore, these quasinatural experiments provide valuable opportunities to isolate the impact of management fee changes from other confounding factors. Since the fee adjustments are driven by external regulatory actions and not influenced by specific fund characteristics, we can attribute any observed effects to the fee changes themselves. Thus, this approach helps us establish a stronger causal link between fee changes and investor behavior.

5.4.1. Regulatory Intervention affecting Management Fee Increases

As our first quasinatural experiment, we examine the impact of an ISA-led reform implemented in 2016, which restricted mutual funds from increasing management fees at any time other than the beginning of the year. The purpose of this reform was to enable investors to effectively compare mutual funds based on various factors, including management fees. The ISA proposed a voluntary unified framework for mutual fund management firms to commit to potential fee increases, and it continually published information about whether funds had adopted this commitment.

Under the framework, mutual funds were required to refrain from raising management fees on any date other than January 1st (or the first trading day) of each calendar year. Additionally, newly established funds were not permitted to increase fees earlier than six months after their initial public offering. While the commitment was technically nonbinding, all active mutual fund managers voluntarily adopted the unified commitment framework by April 1st, 2016. Consequently, management fee increases, which were previously distributed throughout the

year (with a preference for January and February), became concentrated almost exclusively in January starting from 2017.[28]

Figure 3 depicts the distribution of fee increases across different months of the year before and after the regulatory reform. The drastic shift in the distribution pattern suggests that the reform had a direct influence on the timing of fee adjustments. The regulatory intervention effectively resulted in a higher concentration of fee increases occurring in January, indicative of the reform's effectiveness in altering the industry's fee-increase-setting practices.[29]

[Insert Figure 3 about here]

Although this commitment technically applied to all mutual funds, its actual impact on management fees varied based on the likelihood of future fee increases. Therefore, our study focuses on a specific category of mutual funds that were more likely to increase management fees and were consequently significantly affected by the new regulatory limitation: zero-fee funds. During our sample period, a noticeable proportion of mutual funds charged zero management fees. Taking distribution fees and trading fees—both paid by fund managers—into account, such funds seem bound to lose money even before one takes into account expenses such as salaries, marketing, etc. It seems that some funds boast zero-fees as a promotional technique, and indeed these funds are much more likely to increase management fees throughout our sample. However, following the 2016 regulation, all management fee increases were restricted to the beginning of the year, disproportionately affecting zero-fee funds due to their higher tendency to raise fees.

To analyze the effects of the reform, we employ a difference-in-difference approach around the implementation of the reform in 2016. Specifically, we compare the net inflows of funds with zero management fees in the previous year to funds with a positive level of management fees. Our analysis focuses on the first 100 trading days of each year, comparing net inflows during the years 2017–2020 to the net inflows during the years 2012–2016.

[28] The exceptions are due to fund mergers and the completions of temporary management fee reductions (i.e., promotions). During mergers, the management fee structure may undergo adjustments to align with the new fund's objectives and investor base. These changes can result in alterations to the fees charged to investors. The second exception relates to temporary management fee reductions, which are occasionally implemented by mutual funds as promotional strategies to attract new investors or incentivize existing investors. These reductions typically have a predetermined time frame during which the fees are lowered. Once this period concludes, the management fees revert to their original or adjusted levels.

[29] Our main results are valid both for the 2012–2106 and the 2017–2020 subperiods.

Figure 4 shows that the zero-fee mutual funds exhibit a pre-event trend that is parallel to that of all other mutual funds as well as to that of other mutual funds of the same investment group and similar size of each of the zero-fee funds. These preregulation trends provide a benchmark for comparing the zero-fee funds and other/matched mutual funds before the 2016 intervention takes place.

[Insert Figure 4 about here]

We employ a difference-in-differences estimation to quantify the impact on fund flows (3):

$$\mathrm{Flow}_{n,t} = \alpha + \beta_1 \mathrm{prev\_dec\_zero}_{n,t} + \beta_2 \mathrm{prev\_dec\_zero}_{n,t} * \mathrm{post} + \lambda_t + \varphi_n + \mathrm{F}_n + \varepsilon_{n,t}$$

In our analysis, the variable $Flow_{n,t}$ represents the scaled net inflows (inflows minus outflows) of mutual fund n on day t, relative to the fund's assets under management (AUM) as of the previous trading day. The dummy variable prev_dec_zero takes a value of 1 if the management fee level was zero in the previous year's December, and 0 otherwise. The interaction term prev_dec_zero*post captures the interaction between the previous December zero indicator and the post period (2017–2020).[30] The trading day fixed effect λ_t and mutual fund fixed effect φ_n are included to account for time-specific and fund-specific factors. Additionally, we control for other characteristics of the fund represented by the vector Fn, including fee levels. $\varepsilon_{n,t}$ is an error term clustered at the management firm (the fund's family) level. Our primary focus is to estimate the coefficient β_2, which captures the difference-in-difference effect, specifically examining the impact of fee changes on fund flows. This allows us to assess the differential effect of fee changes before and after the reform period, and for zero-fee mutual funds relative to other mutual funds.

[Insert Table 8 about here]

Examining the net inflows in the first 100 trading days, we observe that zero-fee funds, which were particularly impacted by the reform, experienced significant net outflows compared to other mutual funds, as well as compared to a matched group of funds and to the prereform period. Our analysis suggests that the regulatory framework implemented by the ISA, which limited fee increases to the beginning of each year, led to a higher likelihood of zero-fee funds raising their management fees at the start of each year compared to other funds. This fee

[30] We highlight that the standalone variable 'post' is captured by the trading day fixed effects (λ_t).

increase, in turn, resulted in a reduction in flows to zero-fee funds during the first 100 days of the years 2017–2020, exceeding expectations in the absence of fee increases. The magnitude of this exogenous effect, as demonstrated by this quasi-natural experiment and presented in Table 8, is comparable (Column 1 of Table 8) to, or even larger (Column 2 of Table 8) than, the potentially endogenous effect estimated in our main specification (column 1 of Table 2).

To validate that the influence of the 2016 reform on the flow of zero-fee funds is primarily attributed to the reform's effect on the funds' management fees, we employ a placebo test. In this test, we replicate the difference-in-differences estimation but shift our focus away from the initial 100 days of each year. We anticipate that these initial days are susceptible to the influence of fee increases that occurred in preceding Decembers. Instead, we center our analysis on the months spanning from July to November, covering approximately 100 trading days that are less susceptible to fluctuations driven by fee adjustments in December. Remarkably, during this alternative timeframe, we discover that the 2016 reform had no discernible impact on the net inflows of zero-fee funds when compared to the prereform years and to other mutual funds. This falsification test lends strong support to our conclusion that the effects of the 2016 reform accurately mirror the impact of an exogenous fee increase on fund flows.[31]

5.4.2. Regulatory Intervention affecting Management Fee Decreases

In our second quasinatural experiment we take advantage of a regulatory change that occurred in 2013 and caused a reduction in mutual fund fees. This regulatory change targeted specific types of mutual funds, particularly active equity mutual funds, while other funds were either excluded or minimally affected by the change. Sokolinski (2023) focuses his analysis on the impact of this reform and shows that indeed the reform caused a decline in the management fees of active equity mutual funds, and this decline drove an increase in net flows into these funds (relative to other funds and relative to the months preceding the reform).

In Israel,[32] the distribution of mutual funds is primarily controlled by banks, which act as the main distributors. These banks receive a distribution commission from mutual fund

[31] Further examination suggests that the impact of the 2016 reform is not exclusively due to increased public attention to fee increases directly after December. The average impact of the reform on zero-fee funds' net outflows over the months February to May of each year resembles its impact on their outflows in January. In contrast, we do observe that the reform's impact on the net outflows of these funds was most pronounced in 2017 and gradually diminished in the subsequent years. This suggests that while the inception of the reform did enhance the visibility of fee increases in December 2016, public attention waned in the years that followed.

[32] The following discussion is based on Koffman (2013) and Sokolinski (2023).

management firms upon the sale of a mutual fund, based on the fund's risk profile as determined by its type. It is important to note that this distribution commission is uniform for all mutual funds of the same risk profile and cannot be negotiated between the bank and the fund or fund family. Additionally, the advisors who distribute these funds are employees of the banks, and the law prohibits the banks from tying their compensation to the sales they generate.

In November 2012, the ISA initiated a reduction in bank distribution fees as a measure to decrease mutual fund management fees. To ensure that the reduction in distribution fees paid by the funds to the banks would translate into lower management fees for investors, the ISA secured a commitment from 20 leading management firms. These firms agreed to pass on the reduction to investors by lowering their management fees. In March 2013, the Israeli parliament legislated the change in the distribution fee schedule. As a result, the distribution fee for actively managed equity funds decreased significantly from 0.8% to 0.35%. In comparison, the distribution fees decreased more mildly for the other types of funds. For actively managed bond funds they decreased from 0.4% to 0.35%, for actively managed money market funds from 0.125% to 0.1%, and for actively managed "solid" funds from 0.25% to 0.2%. Passively managed (index) mutual funds of all categories were exempted from distribution fees prior to the reform and maintained this exemption following the reform.

In the same vein as Sokolinski (2023), our study leverages the heterogeneous nature of this exogenous change in mutual fund management fees to investigate the impact of management fee reduction on fund net inflows. We employ a difference-in-difference specification centered around the implementation of the reform in May 2013, comparing the change in net inflows to actively managed equity funds, which experienced a significant reduction in their management fees following a substantial decrease in distribution fees, with the change in net inflows to other mutual funds (other active mutual funds that experienced a much more minor reduction in distribution fees and passive mutual funds, for which the distribution fee remained zero). Figure 5 indicates that the actively managed equity mutual funds impacted by the distribution fee reform exhibit a pre-event trend that is parallel to that of other mutual funds, including those within the same investment group and similar size as each of the actively managed equity funds.[33] To wit, in the 100 trading days leading up to the implementation of the reform in May

[33] While the trends displayed in Figure 5 show parallel patterns, we note that the flow level for the matched group of funds is higher than both the actively managed equity mutual funds and the group of all other funds. It is worth mentioning that the matched sample in Figure 3 consists of passive equity mutual funds. These funds experienced a substantial inflow of investor capital during the initial months of 2013, driven by various factors, including the strong demand for passive equity funds during that period. This increased demand can be

2013, the flow to equity mutual funds did not significantly deviate from the flows to other mutual funds that were less sensitive to the approaching reform.

[Insert Figure 5 about here]

Having shown a parallel trend, we turn to estimate a diff-in-diff specification based on the linear equation (4) as follows:

$$\mathrm{Flow}_{n,t} = \alpha + \beta_1 \ \mathrm{active} * \mathrm{post} + \lambda_t + \varphi_n + \mathrm{F}_n \ + \varepsilon_{n,t}$$

In our analysis, the variable $Flow_{n,t}$ represents the scaled net inflows (inflows minus outflows) of mutual fund n on day t, relative to the fund's assets under management (AUM) as of the previous trading day. The interaction term active*post captures the interaction between the active equity fund indicator and the post period (100 trading days following the implementation of the distribution fee reduction reform on May 1st, 2013).[34] The trading day fixed effect λ_t and mutual fund fixed effect φ_n are included to account for time-specific and fund-specific factors. Additionally, we control for other characteristics of the fund represented by the vector Fn, including fee levels. $\mathcal{E}_{n,t}$ is an error term clustered at the management firm (the fund's family) level. Our primary focus is on the coefficient β_1, which captures the difference-in-difference effect, specifically examining the impact of fee changes on fund flows. This allows us to assess the differential effect of fee changes before and after the reform period, and for actively managed equity mutual funds relative to other mutual funds.

[Insert Table 9 about here]

The results presented in Table 9 provide evidence that actively managed equity mutual funds, which experienced a larger reduction in distribution fees and subsequently lowered their management fees to a greater extent (in accordance with their commitment), observed significantly higher net inflows than other mutual funds. These findings hold true when

attributed, in part, to the lower prices of passive funds than those of their actively managed counterparts. This pricing discrepancy was largely influenced by the difference in distribution fees, which happened to be the exact aspect targeted by the May 2013 regulatory changes.

[34] We note that the stand-alone variables 'active' and 'post' are absorbed by the mutual fund fixed effects (φ_n) and the trading day fixed effects (λ_t) respectively.

comparing them to a group of other mutual funds as well as to a group of matched mutual funds and to the period preceding the reform.[35]

Our interpretation of these results is that the distribution fee reform, which specifically targeted active equity funds and resulted in more substantial fee reductions for this group, triggered a surge in flows to these funds in the trading days following the implementation of the reform. This surge in flows is above and beyond the flows experienced prior to the fee decrease, as well as in comparison to flows to other types of mutual funds. These daily data insights align with and strengthen the findings of Sokolinski (2023) regarding the impact of the 2013 reform. From a broader perspective they support our main findings regarding mutual fund investors' reaction to management fee changes. Hence, the two reforms we study provide support for the argument that our main inferences about the impact of mutual fund fee changes do not seem to result from potential endogeneity driven by hidden demand or other relevant unobservable factors.

6. Investor Characteristics and Investment Decisions: Who Responds to Fee Adjustments

6.1. Inflows versus Outflows

Unveiling the robust response of investors to mutual fund fee adjustments gives rise to an additional line of inquiry regarding the specific investors behind this observed impact. To begin with, we delve deeper into the analysis to understand the contribution of inflows, outflows, or both to the impact of fee changes on net fund flows.

Barber and Odean (2008) show a tendency among investors to purchase attention-grabbing stocks. However, they do not observe a similar phenomenon in investors' selling behavior, as retail investors typically sell securities they already own and rarely engage in short selling. In line with this logic, Mugerman, Wiener, and Steinberg (2022) find that potential investors in Israeli mutual funds are more responsive than existing investors to changes in fund risk saliency. In the current setting, fee increases or decreases can potentially elicit two contrasting

[35] The matching approach utilized in our analysis resembles a comparison between actively managed equity funds and passive equity funds. However, our matching methodology offers the additional benefit of controlling for fund size, which enhances the robustness of the findings. In fact, when we directly compare actively managed equity funds to passive equity funds without employing matching, we observe qualitatively and quantitatively similar results to those obtained from the matched-sample estimation. Sokolinski (2023) also employs the active versus passive equity funds comparison as a secondary estimation method and arrives at similar conclusions.

responses from existing investors. While some existing investors may take note of the fee adjustment and react by either selling or not selling their holdings, others may not actively seek out information regarding the funds they currently own during the period following the fee change. Meanwhile, the fee change itself may attract the attention of potential investors, leading some of them to consider (or reconsider in the case of fee increases) purchasing the affected funds.

To empirically address this issue, we extend our analysis by examining the Equation (1) estimations while distinguishing between outflows and inflows. This allows us to explore the differential effects of fee changes on these two components of fund flows, and to examine whether fee changes primarily drive existing investors to withdraw or avoid withdrawing their investments (outflows) or whether they mainly serve to attract or deter potential or existing investors from making new investments (inflows).

[Insert Table 10 about here]

The findings presented in Columns 1 and 2 of Table 10 reveal that both inflows into and outflows from mutual funds were influenced by the fee increase. However, it is worth noting that there are notable differences in the relative economic magnitude of these effects. Specifically, we observe that the impact of fee increases on fund inflows is more than twice as large as the impact on fund outflows. These contrasting magnitudes suggest that fee increases have a larger impact on reducing inflows than on increasing outflows. This indicates that fee increases deter potential investments (that is, potential investors and new investments from current investors) more than they motivate existing investors to withdraw their funds.

Sirri and Tufano (1998) propose that what fee-increasing funds lose in existing clients, they gain back by attracting new clients through marketing, so that the total impact of mutual fund fee increases on their flows is not significantly different than zero. However, the results in Columns 1 and 2 of Table 10 may suggest that potential clients are actually even more negatively influenced by fee increases than the fund's current clients. Hence, we suspect that the lack of impact of fund fee increases in Sirri and Tufano (1998) is due to the endogeneity in their annual flow data, as we explained above, rather than from the mitigating effect of marketing as they suggest.

Turning our attention to fee decreases, the results, as presented in Columns 3 and 4 of Table 10, present an interesting observation. While the fee decrease proves highly effective in

attracting new investments (as evident in Column 3), existing investors do not appear to be significantly motivated by the fee decrease, and show a tendency to leave the fund (as seen in the outflow figures). This result may seem counterintuitive, and warrants further investigation to understand the underlying reasons behind this behavior.

6.2. Investor-Specific Attributes

To further examine the impact of investors' attributes on their response, we leverage an exclusive dataset compiled by the Bank of Israel, encompassing comprehensive monthly security holdings of investors at both the holder and security level within the Tel Aviv Stock Exchange.

Several studies have utilized similar datasets to examine the influence of various investor characteristics on their investment decisions. For instance, Betermier et al. (2017) investigate the ownership of value and growth stocks among different investors, while a recent study by Balasubramaniam et al. (2023) explores the relationship between investor attributes and the characteristics of the stocks they choose to hold. Grinblatt et al. (2011) employ unique IQ data from Finland to demonstrate a monotonic relationship between IQ and stock market participation, and in a related study, Grinblatt et al. (2012) explore the impact of investors' IQ on their investment choices. Specifically relevant to our paper, Grinblatt et al. (2016) discover that investors with higher IQ tend to avoid mutual funds that impose high management fees and Meyer and Pagel (2022) find that investors who realized a gain following the liquidation of a mutual fund are much more likely to reinvest the money than investors who realized a loss following such liquidation. These studies collectively contribute to our understanding of how different investor characteristics shape their investment behavior and choices.

In contrast to these studies, our research focuses on investor reactions not to constant security characteristics, but rather to *changes* in a specific characteristic, namely mutual fund management fees. The dataset we utilize provides comprehensive information on monthly security holdings within the Tel Aviv Stock Exchange. However, the data is anonymized and lacks investor-specific details beyond their security investments. Consequently, our conclusions regarding the investors will be derived solely from these holdings. The available data cover the period starting from January 2020, so that our analysis concentrates on the year 2020 and the initial months of 2021. We focus our analysis on retail local investors, as they represent the vast majority of investors in local mutual funds (approximately 99% of Israeli mutual fund investors are individual residents of Israel). Our final data set includes about 50

million observations of over 650 thousand investors, holding more than 1,500 different mutual funds, over 17 months.[36]

We investigate the relationship between investor reaction to a recent announcement regarding a mutual fund fee change (in the preceding 5 months) and the investors' attributes as reflected in their security holdings. While our data do not facilitate an identification of fund investors, we are able to use the comprehensive data on their security holdings to characterize them. We use this information to establish several investor attributes, such as wealth, attention, and sophistication through the following six variables:

(1) We use the size of the investor's portfolio as a proxy for wealth;

(2) We use the number of securities (mutual fund or others) in the investor's portfolio as a proxy for attention, since investors who hold more securities are expected to be less attentive to new information about the terms of any specific security[37];

(3) We use the buy-and-hold investment style as an antonym for a frequent trader, identifying investors that never actively trade through our sample period as buy-and-hold investors[38];

(4) We use an index investment style as a synonym for passive investments, identifying investors that invest in passively-managed mutual funds and do not invest at all in either active mutual funds or in specific securities as passive investors. The term passive does not reflect negatively on these investors, but may rather suggest that these are financially sophisticated investors who seek to maximize their diversification at a minimal cost;

(5) We use home-biased investors as a proxy for (lack of) diversification, identifying investors that invest exclusively in Israeli securities and mutual funds that focus on the Israeli market (according to their investment category) as home-biased. While home-bias demonstrates lack of diversification on a specific dimension, we suspect it is prominent in the case of a small economy with unique idiosyncratic risks such as Israel;

[36] January 2020 is excluded from the estimation, as the BOI data do not contain the opening positions for this month, thus rendering any transaction analysis impractical.

[37] We acknowledge that in many settings the number of securities can serve as a measure of diversification, and diversification is related not only to attention, but also to other factors such as financial literacy (Gaudecker, 2015). However, our focus is on mutual funds and in this realm the number of securities is a poor proxy for diversification, as even a single mutual fund may suffice to gain exposure to numerous securities and even to a myriad of sectors and countries.

[38] Benos (1998) and Odean (1998) suggest that overconfidence drives investors' excess trading. Odean (1999) shows empirically that indeed investors trading through a discount brokerage trade too much. Barber et al. (2022) suggest that fintech brokerage can serve to reduce trading frictions, which, alongside its merits, may incentivize over-trading.

(6) Finally, we use investor holdings in a fund at the beginning of the examined month as another proxy for attention. Our premise is that investors who already hold a position in a specific fund will be more alert to changes in its price than their counterparts who do not currently have any holdings in this particular fund. If this is the case, then current investors' purchasing decisions will be more affected than the decisions of other, potential, investors.[39]

We estimate the probability of a purchase or a sale of a specific mutual fund over a specific month by a specific investor, based on the change in the investor's holdings net of any price change. We estimate this probability using a linear probability model with the aforementioned variables interacted with a dummy variable for either fund fee increase or fund fee decrease over the previous 5 months. Our detailed dataset enables us to control for fund*month fixed effects, such that the estimation effectively compares investors with different attributes within the same fund and month. We also cluster standard errors at the investor level, to account for potential correlation between the standard errors of an individual investor in his or her different transaction decisions.

[Insert Table 11 about here]

Table 11 does not reveal a robust and reliable relation between the majority of the examined investor attributes and their reaction to management fee changes. The two most consistent patterns that do emerge suggest that wealthier investors seem to be less sensitive to fee changes, and that current investors are the least likely to buy following a fee increase and the most likely to buy following a fee decrease. The latter result sheds further light on our findings regarding the impact of fee changes on fund inflows and outflows. It suggests that not only the outflows but also the inflows following fee changes originate mostly from existing fund investors. That is, even the large impact of fee changes on inflows is driven less by new potential investors and more by the willingness, or lack thereof, of existing investors to increase their holdings.

[39] In contrast to the prior attributes, this investor-fund characteristic is only applicable to purchase decisions, as investors cannot sell funds in which they do not have any holdings. (Short selling is irrelevant in our data set of retail open-end mutual fund holdings.)

7. Conclusions

In this study, we have examined the relationship between mutual fund management fee changes and mutual fund flows, aiming to shed light on the impact of price (fee) changes on investor behavior in the mutual fund industry. Our findings provide compelling evidence that, surprisingly enough, supports the basic law of economics: the price and its changes do affect demand. Contrary to the perception that retail investors are relatively inactive and insensitive to fee adjustments, we have demonstrated that they are indeed influenced by mutual fund fee changes.

Using daily fund flow data, we found that an increase in management fees led to lower net inflows, while a decrease in fees resulted in higher net inflows. This effect was particularly pronounced among new (potential) investments, suggesting an enhanced sensitivity to fee changes compared to existing investors. Furthermore, fee decreases had a more substantial impact on fund flows than fee increases, indicating that investors are more responsive to reductions in fees.

We use three different methods to address concerns of endogeneity and establish a causal relationship:

First, we rely on Warner and Wu's (2011) analysis of the factors that affect management fee changes in order to produce predictions for fee increases and fee decreases, and use these predictions as a counterfactual, against which we can identify more- and less- expected fee change. We find that investors react strongly to both predicted and surprising fee changes, suggesting that our results cannot be completely driven by endogeneity, whether observable or not.

Second, we take advantage of the literature's finding that major mutual fund policy decisions are made at the fund family level, and of a positive correlation that we establish between fee changes of different funds within the family. Specifically, we use a fee increase in at least one other fund of the same fund family as an instrumental variable for fee increase, and a fee decrease in at least one other fund of the same fund family as an instrumental variable for fee decrease. These IVs are valid instruments as long as the demand for the examined fund does not impact the probability of a fee change in another fund pertaining to the same fund family. The results of our 2SLS regressions support our main results. Hence, this second method also implies that our findings reflect causal relation, rather than spurious correlation driven by endogeneity.

Third, we leverage two regulatory reforms that affected management fees in specific mutual funds based on their type or fee structure. Our analysis of these quasi-natural experiments also yields results that align with our main findings, providing further support for investors' sensitivity to exogenously induced fee changes.

Finally, we took advantage of a unique proprietary and comprehensive data set of all the security holdings of investors in the Tel Aviv Stock Exchange to examine which investor attributes affect their reaction to mutual fund fee alterations. We find that less affluent investors react more to fee changes than their wealthier counterparts, and that current investors' purchase decisions are more affected by fee changes than the purchase decisions of potential investors in the fund.

Our research challenges the notion that retail investors in the mutual fund industry are passive and inattentive. Instead, we have demonstrated that they do react to fee changes. This insight has important implications for both fund managers and investors. Fund managers can strategically leverage fee adjustments as a tool to attract new investors, while investors can make informed decisions to minimize their investment costs.

References

Abudy, M. and A. Wohl (2018). "Corporate Bond Trading on a Limit Order Book Exchange", *Review of Finance*, 22(4):1413–1440.

Balasubramaniam, V., J.Y. Campbell, T. Ramadorai, and B. Ranish (2023). "Who Owns What? A Factor Model for Direct Stock Holding", *The Journal of Finance*, 78(3): 1545–1591.

Barber, B.M., X. Huang, T. Odean, and C. Schwarz (2022). "Attention-Induced Trading and Returns: Evidence from Robinhood Users", *The Journal of Finance*, 77(6): 3141–3190.

Barber, B.M. and T. Odean (2008). "All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors", *The Review of Financial Studies*, 21(2): 785–818.

Barber, B.M., T. Odean, and L. Zheng (2005). "Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows", *The Journal of Business*, 78(6): 2095–2120.

Ben-David, I., J. Li, A. Rossi, and Y. Song (2022). "What do Mutual Fund Investors Really Care About?" *The Review of Financial Studies*, 35(4): 1723–1774.

Ben-Rephael, A., S. Kandel, and A. Wohl (2012). "Measuring Investor Sentiment with Mutual Fund Flows", *Journal of Financial Economics*, 104(2): 363–382.

Benos, A.V. (1998). "Aggressiveness and Survival of Overconfident Traders", *Journal of Financial Markets*, 1(3–4): 353–383.

Betermier, S., L.E. Calvet, and P. Sodini (2017). "Who are the Value and Growth Investors?" *The Journal of Finance*, 72(1): 5–46.

Berk, J.B. and R.C. Green (2004). "Mutual Fund Flows and Performance in Rational Markets", *Journal of Political Economy*, 112(6): 1269–1295.

Berk, J.B. and J.H. Van Binsbergen (2015). "Measuring Skill in the Mutual Fund Industry", *Journal of Financial Economics*, 118(1): 1–20.

Carhart, M.M. (1997). "On Persistence in Mutual Fund Performance", *The Journal of Finance*, 52(1): 57–82.

Carlin, B.I. (2009). "Strategic Price Complexity in Retail Financial Markets", *Journal of Financial Economics*, 91(3): 278–287.

Chevalier, J. and G. Ellison (1997). "Risk Taking by Mutual Funds as a Response to Incentives", *Journal of Political Economy*, 105(6): 1167–1200.

Choi, J.J., D. Laibson, and B.C. Madrian (2010). "Why Does the Law of One Price Fail? An Experiment on Index Mutual Funds", *The Review of Financial Studies*, 23(4): 1405–1432.

Christoffersen, S. and D. Musto (2002). "Demand Curves and the Pricing of Money Management", *The Review of Financial Studies*, 15(5): 1499–1524.

DeHaan, E., Y. Song, C. Xie, and C. Zhu (2021). "Obfuscation in Mutual Funds", *Journal of Accounting and Economics*, 72(2–3): 101429.

Elton, E.J., M.J. Gruber, S. Das, and M. Hlavka (1993). "Efficiency with Costly Information: A Reinterpretation of Evidence from Managed Portfolios", *The Review of Financial Studies*, 6(1): 1–22.

Elton, E.J., M.J. Gruber, J.A. and Busse (2004). "Are Investors Rational? Choices Among Index Funds", *The Journal of Finance*, 59(1): 261–288.

Evans, R.B. and R. Fahlenbrach (2012). "Institutional Investors and Mutual Fund Governance: Evidence from Retail-Institutional Fund Twins", *The Review of Financial Studies*, 25(12): 3530–3571.

Fama, E.F. and K.R. French (2010). "Luck Versus Skill in the Cross-Section of Mutual Fund Returns", *The Journal of Finance*, 65(5): 1915–1947.

French, K.R. (2008). "Presidential Address: The Cost of Active Investing", *The Journal of Finance*, 63(4): 1537–1573.

Gaspar, J. M., M. Massa, and P. Matos (2006). "Favoritism in Mutual Fund Families? Evidence on Strategic Cross-Fund Subsidization", *The Journal of Finance*, 61(1): 73–104.

Gaudecker, H.M.V. (2015). "How Does Household Portfolio Diversification Vary with Financial Literacy and Financial Advice?" *The Journal of Finance*, 70(2): 489–507.

Gil-Bazo, J. and P. Ruiz-Verdú (2009). "The Relation Between Price and Performance in the Mutual Fund Industry", *The Journal of Finance*, 64(5): 2153–2183.

Goldstein, I., H. Jiang, and D.T. Ng (2017). "Investor Flows and Fragility in Corporate Bond Funds", *Journal of Financial Economics*, 126(3): 592–613.

Grinblatt, M., S. Ikäheimo, M. Keloharju, and S. Knüpfer (2016). "IQ and Mutual Fund Choice", *Management Science*, 62(4): 924–944.

Grinblatt, M., M. Keloharju, and J. Linnainmaa (2011). "IQ and Stock Market Participation", *The Journal of Finance*, 66(6): 2121–2164.

Grinblatt, M., M. Keloharju, and J. Linnainmaa (2012). "IQ, Trading Behavior, and Performance", *Journal of Financial Economics*, 104(2): 339–362.

Haddad, V., A. Moreira, and T. Muir (2021). "When Selling Becomes Viral: Disruptions in Debt Markets in the COVID-19 Crisis and the Fed's Response", *The Review of Financial Studies*, 34(11): 5309–5351.

Hamdani, A., E. Kandel, Y. Mugerman, and Y. Yafeh (2017). "Incentive Fees and Competition in Pension Funds: Evidence from a Regulatory Experiment", *Journal of Law, Finance and Accounting*, 2: 49–86. https://doi.org/10.1561/108.00000015

Hitzemann, S., S. Sokolinski, and M. Tai (2022). "Paying for Beta: Leverage Demand and Asset Management Fees", *Journal of Financial Economics*, 145(1): 105–128.

Kaniel, R., and R. Parham (2017). "WSJ Category Kings: The Impact of Media Attention on Consumer and Mutual Fund Investment Decisions", *Journal of Financial Economics*, 123(2): 337–356.

Kaufman, E. (2013). "Reduction in Commissions that Mutual Funds Pay to Banks", Israeli Knesset (Hebrew).

Khorana, A. and H. Servaes (1999). "The Determinants of Mutual Fund Starts", *The Review of Financial Studies*, 12(5): 1043–1074.

Ippolito, R. A. (1992). "Consumer Reaction to Measures of Poor Quality: Evidence from the Mutual Fund Industry", *The Journal of Law and Economics*, 35(1): 45–70.

I.S.A. (2016). "Framework for Making Commitments Regarding Fund Management Fee Increases", (Hebrew).

Lusardi, A. and O.S. Mitchelli (2007). "Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education: The Problems are Serious, and Remedies are not Simple", *Business Economics*, 42: 35–44.

Lynch, A. W. and D.K. Musto (2003). "How Investors Interpret Past Fund Returns", *The Journal of Finance*, 58(5): 2033–2058.

Massa, M. (2003). "How do Family Strategies Affect Fund Performance? When Performance Maximization is Not the Only Game in Town", *Journal of Financial Economics*, 67(2): 249–304.

Meir, A., Y. Mugerman, and O. Sade (2016). "Financial Literacy and Retirement Planning", *Israel Economic Review*, 14(1): 75–95.

Meyer, S. and M. Pagel (2022). "Fully Closed: Individual Responses to Realized Gains and Losses", *The Journal of Finance*, 77(3): 1529–1585.

Mugerman, Y., N. Steinberg, and Z. Wiener (2022). "The Exclamation Mark of Cain: Risk Salience and Mutual Fund Flows", *Journal of Banking & Finance*, 134: 106332.

Odean, T. (1998). "Volume, Volatility, Price, and Profit when all Traders are Above Average". *The Journal of Finance*, 53(6): 1887–1934.

Odean, T. (1999). "Do Investors Trade Too Much?", *American Economic Review*, 89(5): 1279–1298.

Sheng, J., M. Simutin, and T. Zhang (2023). "Cheaper is not Better: On the 'Superior' Performance of High-Fee Mutual Funds", *The Review of Asset Pricing Studies*, 13(2): 375–404.

Sirri, E.R. and P. Tufano (1998). "Costly Search and Mutual Fund Flows", *The Journal of Finance*, 53(5): 1589–1622.

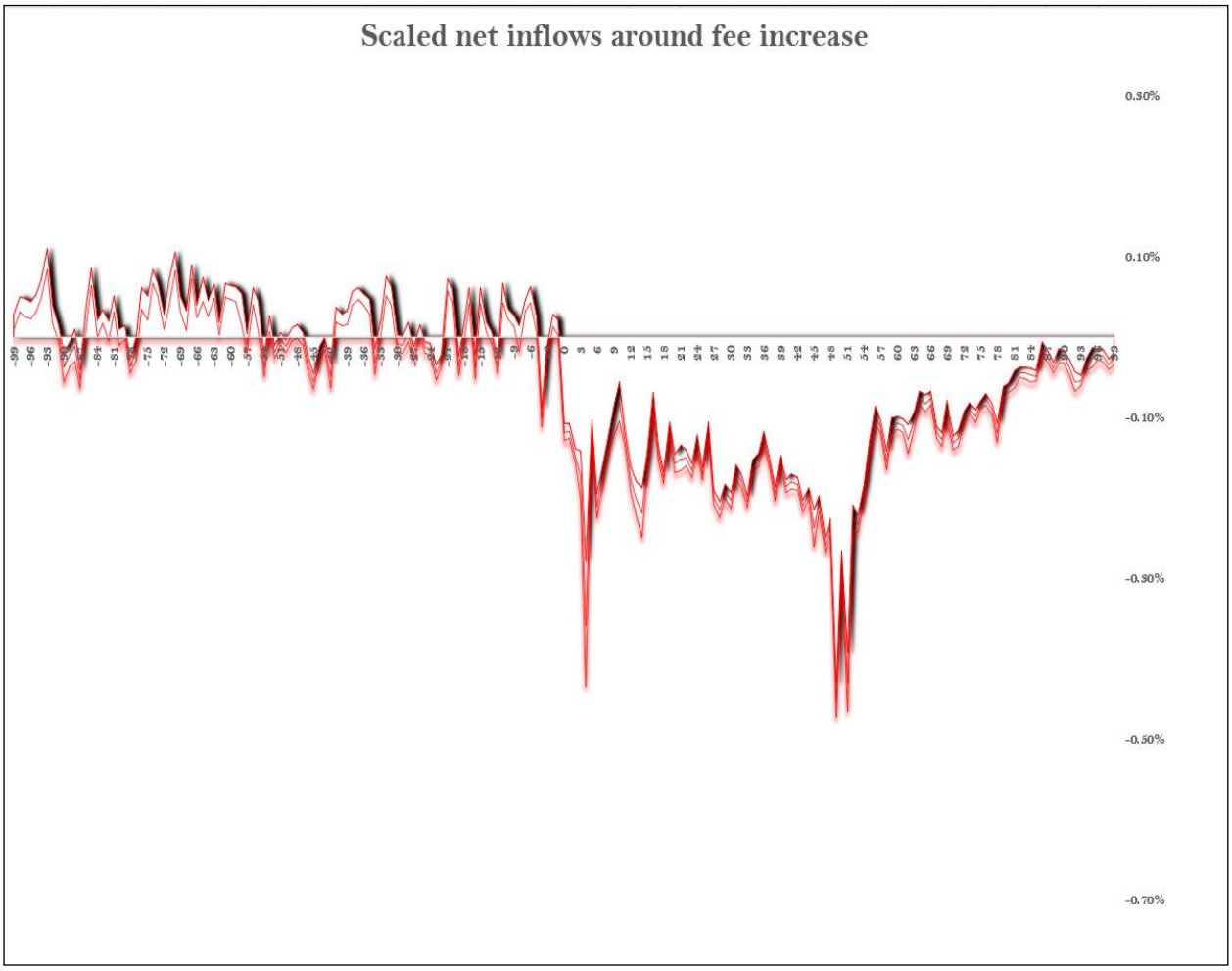
Sokolinski, S. (2023). "Regulating Commission-Based Financial Advice: Evidence from a Natural Experiment", *Journal of Financial and Quantitative Analysis*, 58(3): 1359–1389.

Warner, J.B. and J.S. Wu (2011). "Why do Mutual Fund Advisory Contracts Change? Performance, Growth, and Spillover Effects", *The Journal of Finance*, 66(1): 271–306.

Figure 1 – The Impact of Fee Change Announcement on Daily Scaled Net Inflows

Notes: The figure illustrates the average scaled net inflows in relation to fee increase (Panel A) and fee decrease (Panel B) announcements. The vertical axis represents the averaged (across relevant fund-day observations) scaled net daily inflows as a percentage of AUM, while the horizontal axis represents the period surrounding the fee change announcement, ranging from day -100 to day 99. The error bands depicted in the figure correspond to 95% confidence intervals.

Panel A



Panel B

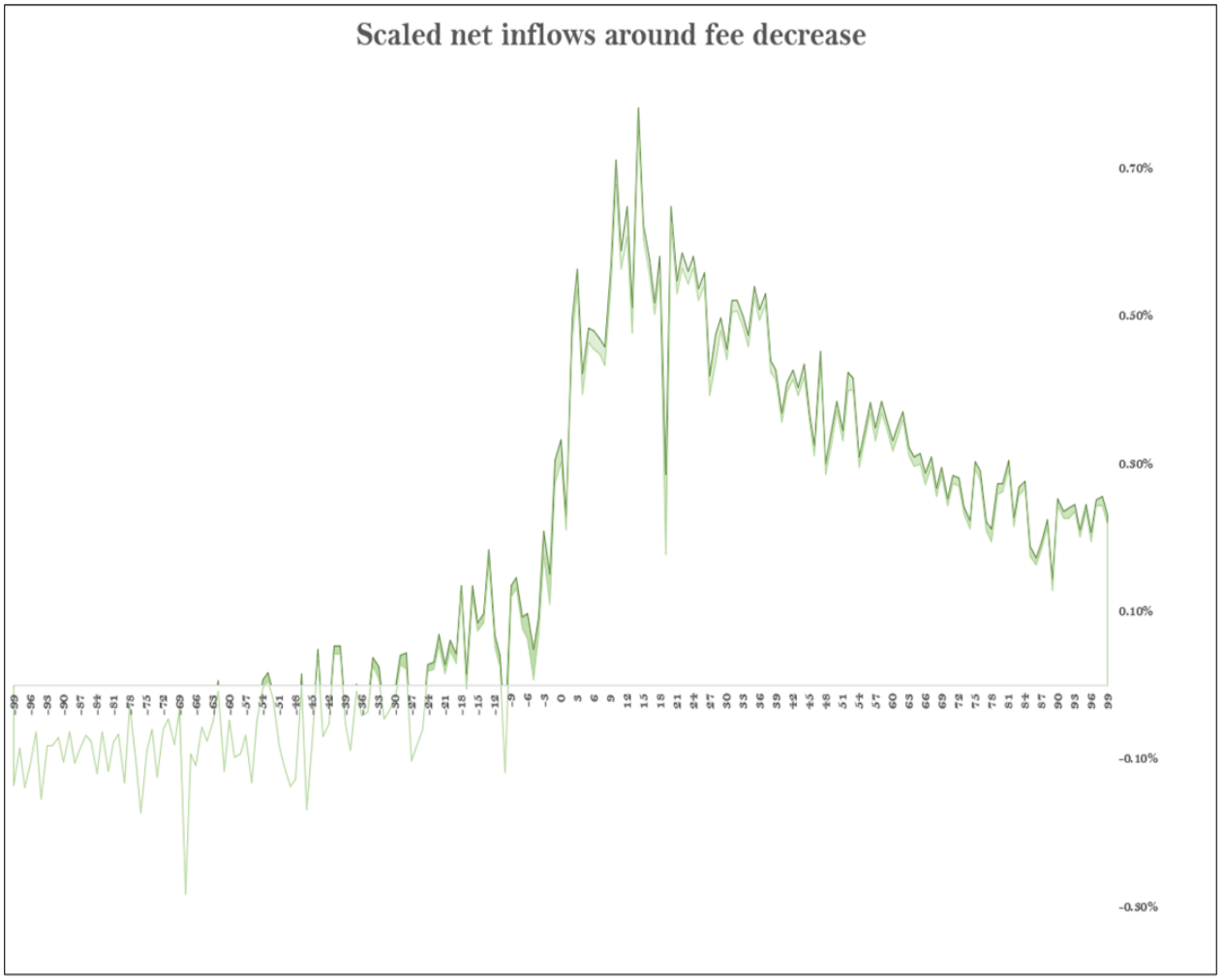
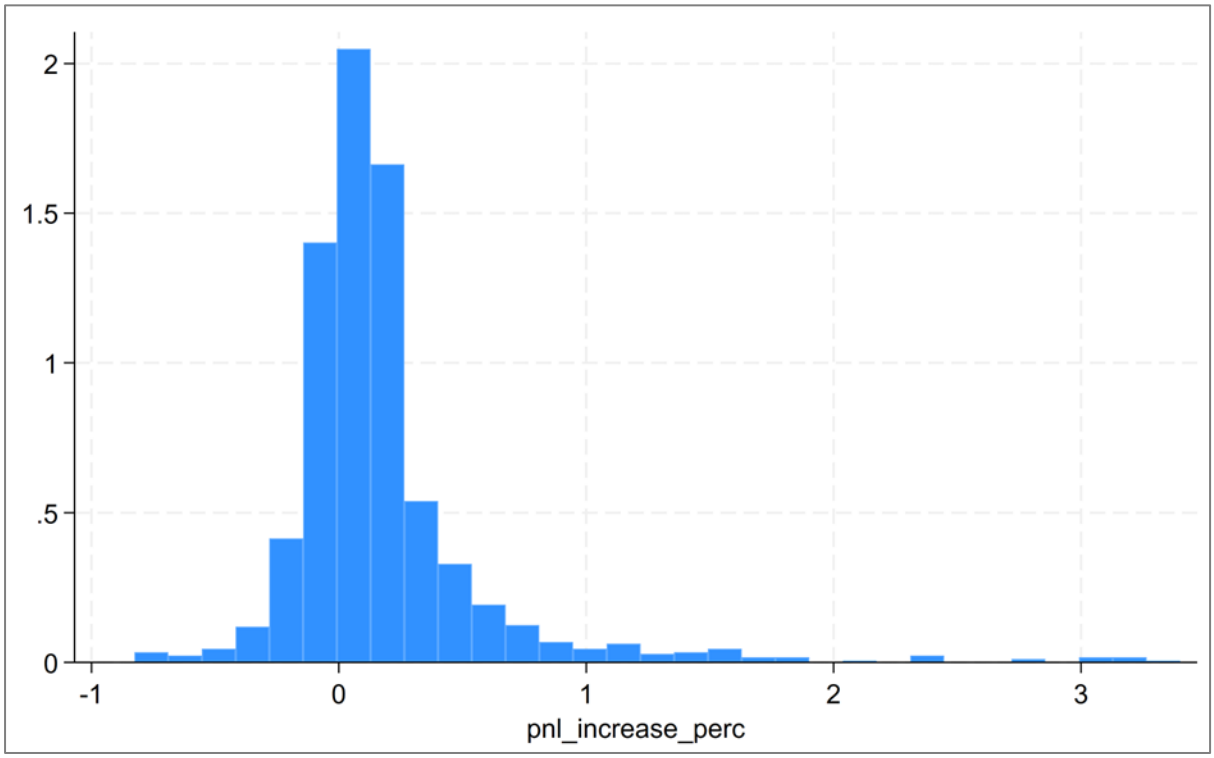

Scaled net inflows around fee decrease
0.70%
0.50%
0.30%
0.10%
-0.10%
-0.30%

Figure 2 – Mutual Funds' Profits or Losses After Fee Adjustments

Notes: The figure presents the distribution of funds' profits or losses as a percentage of their assets under management resulting from fee adjustments. Panel A depicts the distribution for fee increases, while Panel B represents fee decreases. The horizontal axis indicates the profit or loss as a percentage of the assets under management, while the vertical axis represents the density of occurrences. The fitted line in both panels represents the normal distribution.

Panel A – Profits (losses) after fee increase



Panel B – Profits (losses) after fee decrease

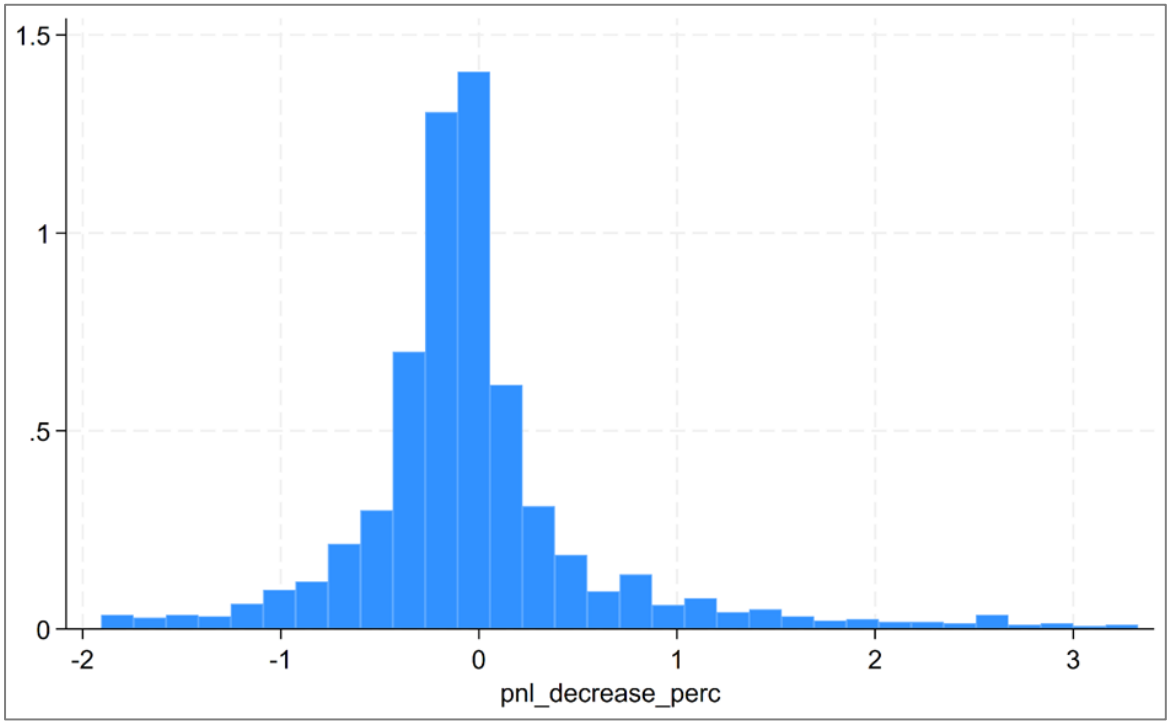


Figure 3 – The Monthly Distribution of Management Fee Increases: Before (2012–2016) vs. After (2017–2020) the Reform

Notes: The figure illustrates the distribution of fee increases across different months of the year during the pre-reform period (2012–2016) and the post-reform period (2017–2020). The vertical axis represents the percentage of fee increases, while the horizontal axis represents the calendar months. The orange bars depict the distribution of fee increases before the reform, while the grey bars represent the distribution after the reform.

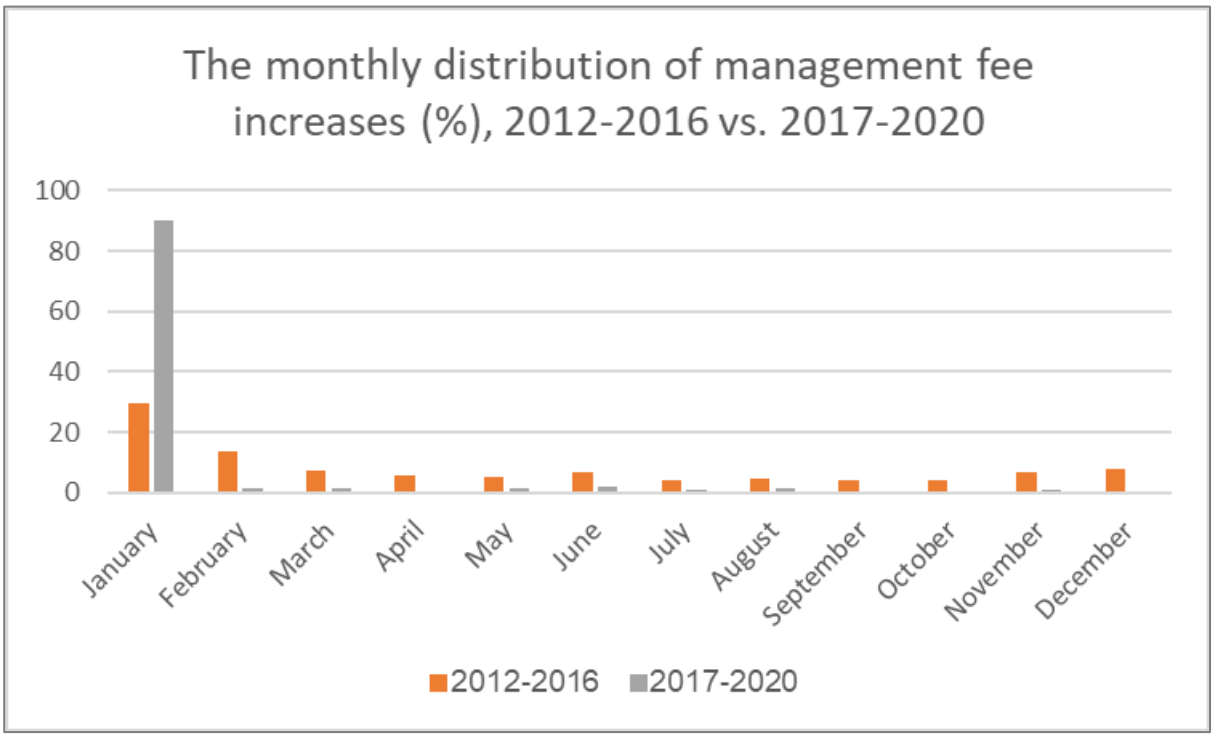


Figure 4 – Pre-Reform Trends for Zero Fee Mutual Funds, All Other Mutual Funds, and Matched Funds

Notes: The figure presents the pre-regulation (i.e., pre-2017) trends for zero-fee funds, for all other mutual funds, and for other matched funds. The matching is based on exact matching by fund type and nearest neighbor matching by fund size. The average daily scaled net inflows (expressed as a percentage) are depicted on the vertical axis, while the years leading up to the reform are represented on the horizontal axis.

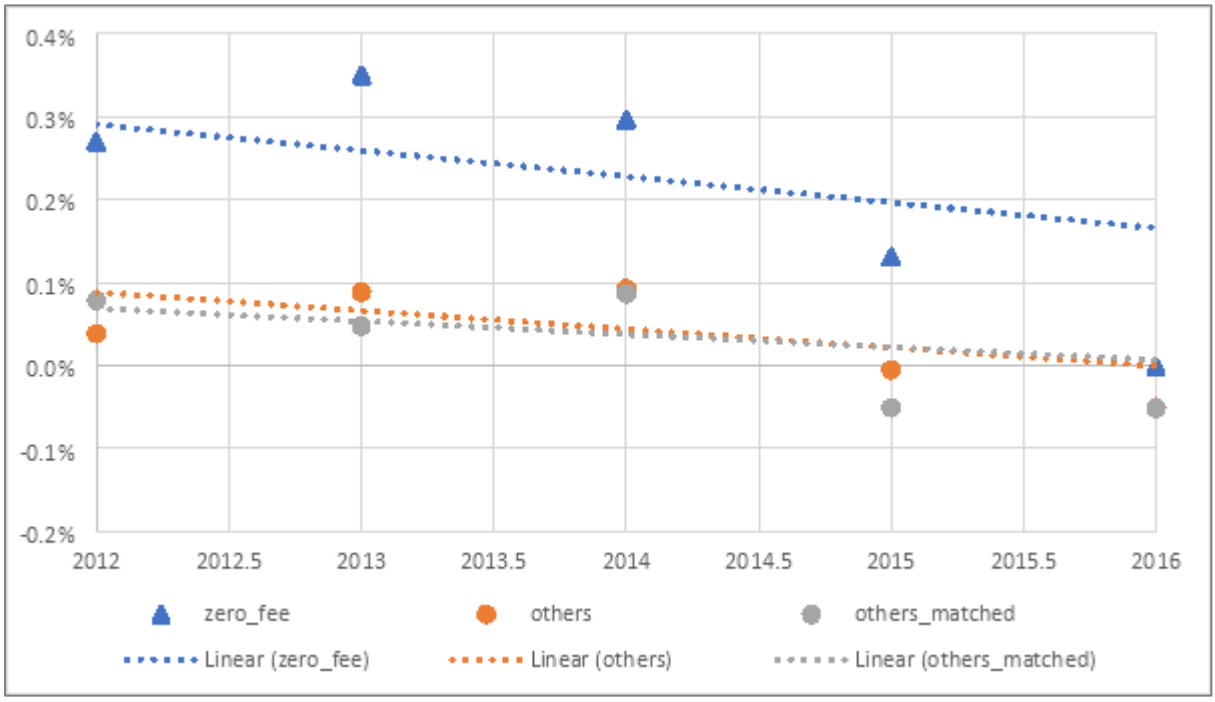


Figure 5 – Pre-Regulation Trends for Actively Managed Equity Mutual Funds, All Other Mutual Funds, and Matched Funds

Notes: The figure presents the pre-regulation (i.e., 100 trading days prior to May 1st, 2013) trends for actively managed equity mutual funds, for all other mutual funds, and for other matched funds. The matching is based on exact matching by fund type and nearest neighbor matching by fund size. The average daily scaled net inflows (expressed as a percentage) are depicted on the vertical axis, while the trading days leading up to the reform are represented on the horizontal axis.

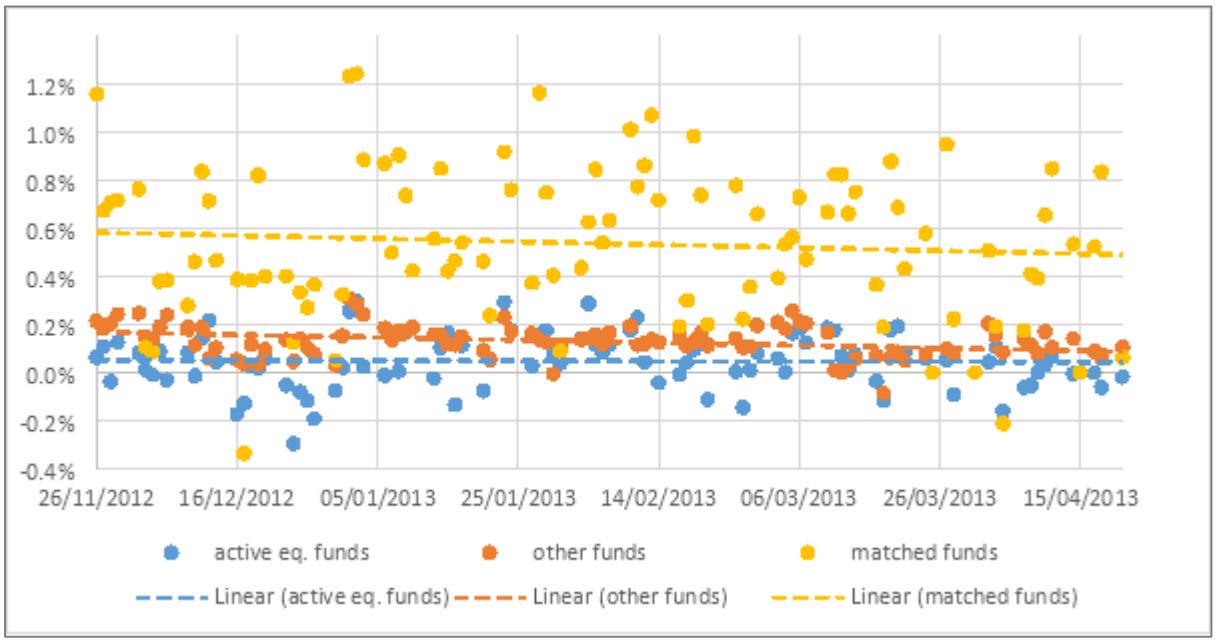


Table 1 – Descriptive Statistics

The table describes the main variables of interest based on the daily data for the whole sample period—January 2012–December 2020. Scaled net inflows are net inflows divided by AUM in percentage terms. Annual fees are mutual fund annual management fees, while load fees are front-end load fees. Fees are presented in percentage terms. Age is mutual fund's age (in months). Return is fund's return for the previous year. Std_Return is a standard deviation of daily returns over the previous 250 trading days, which provides a measure of the fund's return volatility or riskiness based on historical return fluctuations.

FUNDS	**mean**	**sd**	**p10**	**p25**	**p50**	**p75**	**p90**
Scaled Net Inflows	-0.0084%	0.649%	-0.49%	-0.15%	0.00%	0.02%	0.47%
Return	0.024805	0.081212	-0.035844	-0.0034084	0.0188484	0.048985	0.0973139
Std_Return	0.0036747	0.0056804	0.0006412	0.0009913	0.0018396	0.0051616	0.0087577
Annual Fees	1.02%	0.738%	0.23%	0.53%	0.82%	1.34%	2.14%
Load Fees	0.03%	0.255%	0.00%	0.00%	0.00%	0.00%	0.00%
Number of Fee Increases by Fund (Total Fee Increases–1,339)	2.02	1.11	1	1	2	3	3
FEE INCREASE (Basis Points)	18	15	05	10	15	23	32
Number of Fee Decreases by Fund (Total Fee Decreases–1,009)	1.83	1.08	1	1	2	2	3
FEE DECREASE (Basis Points)	-32	33	-04	-10	-21	-40	-73
All funds (2,295) – AUM (NIS million)	161.315	272.398	11.779	26.375	69.385	172.734	397.568
Equity Mutual Funds (613) – AUM (NIS million)	90.24188	167.5857	8.1628	15.6254	35.63	93.4111	209.3564
Fixed Income Mutual Funds (1,106) – AUM (NIS million)	186.839	312.5744	13.2003	30.2098	80.8096	200.5445	463.1053
Government Bond Mutual Funds (576) – AUM (NIS million)	179.6425	259.7713	17.6399	38.9473	91.2453	206.7287	436.7433
Management Firms	34						
Fund-Date Observations	2,576,456						

Table 2 – The Impact of Fee Changes on Daily Fund Flows

*The table presents the results of Ordinary Least Squares (OLS) regressions aimed at examining the impact of fee changes on scaled daily net inflows. The scaled daily net inflows are defined as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Post_Inc is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by fund n, and equal to 0 otherwise; Post_Inc_Bp represents the fee increase in percentage points (Fee after - Fee before) if the observation for fund n on day t falls within the 100-day window following a fee increase announcement by fund n, otherwise, it is 0; Post_Dec is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee decrease announcement by fund n, and equal to 0 otherwise; Post_Dec_Bp represents the fee decrease in percentage points (Fee after - Fee before) if the observation for fund n on day t falls within the 100-day window following a fee decrease announcement by fund n, otherwise, it is 0. The regressions include additional control variables at the fund level that vary over time, namely – Age: The age of the fund in months; Size: The natural logarithm of the fund's Assets Under Management; Return: The fund's return over the previous 250 trading days; and Std_Daily_Returns: The standard deviation of daily returns over the previous 250 trading days. The scaled net inflow variable is winsorized at the 1% and 99% levels. All specifications include a comprehensive set of fixed effects for both day and fund. Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)	(4)
Post_Inc	-0.105***			
	(0.00877)			
Post_Inc_Pp		-0.254***		
		(0.0428)		
Post_Dec			0.347***	
			(0.0427)	
Post_Dec_Pp				-0.632***
				(0.0566)
Annual_Fee	-0.0581***	-0.0568***	-0.0818***	-0.103***
	(0.0156)	(0.0157)	(0.0150)	(0.0168)
Load_Fee	-0.0275*	-0.0268*	-0.0238	-0.0217
	(0.0138)	(0.0138)	(0.0141)	(0.0150)
Age	-0.213***	-0.214***	-0.201***	-0.204***
	(0.0240)	(0.0240)	(0.0258)	(0.0255)
Size	-0.00213	-0.00458	-0.00217	-0.00349
	(0.00397)	(0.00383)	(0.00398)	(0.00398)
Return	1.170***	1.173***	1.135***	1.122***
	(0.151)	(0.151)	(0.152)	(0.151)
Std_Daily_Returns	-5.750	-5.800	-5.837	-5.823
	(3.580)	(3.599)	(3.604)	(3.589)
Day and Fund FE	YES	YES	YES	YES
Observations	2,576,456	2,576,456	2,576,456	2,576,456
Adjusted R^2	9.4%	9.3%	10.2%	10.0%

Table 3 – The Impact of Fee Changes on Daily Fund Flows: Analysis by Mutual Fund Investment Types

The table presents the results of Ordinary Least Squares (OLS) regressions aimed at examining the impact of fee changes on scaled daily net inflows, by different investment types of mutual funds (equity mutual funds, fixed income mutual funds, and government bond mutual funds). The scaled daily net inflows are defined as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Post_Inc is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by fund n, and equal to 0 otherwise; Post_Dec is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee decrease announcement by fund n, and equal to 0 otherwise. The regressions include additional control variables at the fund level that vary over time, namely – Age: The age of the fund in months; Size: The natural logarithm of the fund's Assets Under Management; Return: The fund's return over the previous 250 trading days; and Std_Daily_Returns: The standard deviation of daily returns over the previous 250 trading days. The scaled net inflow variable is winsorized at the 1% and 99% levels. All specifications include a comprehensive set of fixed effects for both day and fund. Columns 1–3 provide results for fee increases, while Columns 4–6 show estimations for fee decreases. The different types of mutual funds, differentiated across different investment strategies are in columns. The subsample of Equity mutual funds is presented in Columns 1 and 4, the subsample of fixed-income mutual funds is presented in Columns 2 and 5, and the subsample of government bond mutual funds is presented in Columns 3 and 6.

*Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Equity	Fixed-Income	Government	Equity	Fixed-Income	Government
Post_Inc	-0.0992***	-0.0992***	-0.125***			
	(0.0239)	(0.0113)	(0.0133)			
Post_Dec				0.190***	0.380***	0.359***
				(0.0304)	(0.0510)	(0.0591)
Annual_Fee	-0.0438**	-0.0775**	-0.00244	-0.0496***	-0.129***	-0.0424
	(0.0185)	(0.0283)	(0.0521)	(0.0168)	(0.0278)	(0.0524)
Load_Fee	-0.00676	-0.0241	-0.0477*	0.000163	-0.0208	-0.0555*
	(0.0109)	(0.0183)	(0.0265)	(0.0121)	(0.0167)	(0.0298)
Age	-0.174***	-0.213***	-0.270***	-0.164***	-0.204***	-0.251***
	(0.0177)	(0.0296)	(0.0361)	(0.0187)	(0.0311)	(0.0370)
Size	-0.00354	-0.0109*	-0.0145**	-0.00404	-0.00901	-0.0178**
	(0.00436)	(0.00550)	(0.00657)	(0.00404)	(0.00572)	(0.00656)
Return	1.082***	1.918***	5.543***	1.061***	1.855***	5.422***
	(0.135)	(0.555)	(0.450)	(0.137)	(0.545)	(0.449)
Std_Daily_Returns	-3.840	-17.27	-84.45***	-3.904	-17.03	-82.56***
	(3.911)	(11.19)	(8.329)	(3.973)	(11.01)	(8.363)
Day and Fund FE	YES	YES	YES	YES	YES	YES
Observations	629,049	1,252,988	694,419	629,049	1,252,988	694,419
Adjusted R^2	10.2%	11.5%	11.8%	10.4%	12.6%	12.7%

Table 4 – The Impact of Fee Changes on Daily Fund Flows: Controlling for Funds with High Fee Levels Relative to their Peers

*The table presents the results of Ordinary Least Squares (OLS) regressions aimed at examining the impact of fee changes on scaled daily net inflows, controlling for funds with high fee levels relative to their peers. The scaled daily net inflows are defined as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Post_Inc is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by fund n, and equal to 0 otherwise; High_Fee is a dummy variable equal to 1 if the fund's management fee is within the top 10% of its investment category on day t, and equal to 0 otherwise; High_Fee_Post_Inc is an interaction variable capturing the combined effect of High_Fee and Post_Inc (High_Fee *Post_Inc). The regressions include additional control variables at the fund level that vary over time, namely – Age: the age of the fund in months; Size: the natural logarithm of the fund's Assets Under Management; Return: the fund's return over the previous 250 trading days;* and *Std_Daily_Returns: the standard deviation of daily returns over the previous 250 trading days. The scaled net inflow variable is winsorized at the 1% and 99% levels. Columns 1 and 3 present results for the full sample, while Columns 2 and 4 focus on money market funds only. All specifications include a comprehensive set of fixed effects for both day and fund. Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and, 1% levels, respectively.*

	(1)	**(2)**	**(3)**	**(4)**
Post_Inc	-0.105***	-0.0998***	-0.108***	-0.102***
	(0.00877)	(0.0178)	(0.00887)	(0.0172)
High_Fee			0.0671***	0.000358
			(0.0118)	(0.0521)
High_Fee_Post_Inc			0.0670***	0.0947***
			(0.0182)	(0.0317)
Annual_Fee	-0.0581***	0.0861	-0.0769***	0.0855
	(0.0156)	(0.0692)	(0.0158)	(0.0889)
Load_Fee	-0.0275*	0.864**	-0.0303**	0.864**
	(0.0138)	(0.392)	(0.0138)	(0.392)
Age	-0.213***	-0.193***	-0.206***	-0.192***
	(0.0240)	(0.0626)	(0.0243)	(0.0629)
Size	-0.00213	-0.00449	-0.000565	-0.00439
	(0.00397)	(0.0136)	(0.00404)	(0.0135)
Return	1.170***	4.089***	1.168***	4.089***
	(0.151)	(0.328)	(0.151)	(0.328)
Std_Daily_Returns	-5.750	-64.28***	-5.693	-64.28***
	(3.580)	(4.605)	(3.550)	(4.608)
Day and Fund FE	YES	YES	YES	YES
Observations	2,576,456	313,713	2,576,456	313,713
Adjusted R^2	9.4%	8.7%	9.4%	8.7%

Table 5 – The Impact of Fee Changes on Daily Fund Flows: Controlling for Preannouncement Trends

The table presents the results of Ordinary Least Squares (OLS) regressions aimed at examining the impact of fee changes on scaled daily net inflows, controlling for preannouncement trends. The scaled daily net inflows are defined as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Post_Inc is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by fund n, and equal to 0 otherwise; Post_Inc_Bp represents the fee increase in percentage points (Fee after - Fee before) if the observation for fund n on day t falls within the 100-day window following a fee increase announcement by fund n, otherwise, it is 0; Post_Dec is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee decrease announcement by fund n, and equal to 0 otherwise; Post_Dec_Bp represents the fee decrease in percentage points (Fee after - Fee before) if the observation for fund n on day t falls within the 100-day window following a fee decrease announcement by fund n, and is 0 otherwise. The explanatory variables related to trends before fee changes are as follows: Pre_Inc is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window before a fee increase announcement by fund n, and equal to 0 otherwise; Pre_Inc_Bp represents the fee increase in percentage points (Fee after - Fee before) if the observation for fund n on day t falls within a 100-day window before a fee decrease announcement by fund n, and is 0 otherwise; Pre_Dec is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window before a fee decrease announcement by fund n, and equal to 0 otherwise; Pre_Dec_Bp represents the fee decrease in percentage points (Fee after - Fee before) if the observation for fund n on day t falls within a 100-day window before a fee decrease announcement by fund n, and is 0 otherwise.

The regressions include additional control variables at the fund level that vary over time, namely – Annual_Fee: The management fee level (in percent) 100 trading days ago (it provides the fee level before any fee adjustments took place); Load_Fee: Front-end load fees (in percent), capturing any fees charged to investors at the time of purchase or sale of the mutual fund shares; Age: The age of the fund in months; Size: The natural logarithm of the fund's Assets Under Management; Return: The fund's return over the previous 250 trading days; and Std_Daily_Returns: The standard deviation of daily returns over the previous 250 trading days. The scaled net inflow variable is winsorized at the 1% and 99% levels. All specifications include a comprehensive set of fixed effects for both day and fund. Columns 1–3 provide results for fee increases, while Columns 4–6 show estimations for fee decreases. The different types of mutual funds, differentiated across investment strategies, are in columns. The subsample of Equity mutual funds is presented in Columns 1 and 4, the subsample of fixed-income mutual funds is presented in Columns 2 and 5, and the subsample of government bond mutual funds is presented in Columns 3 and 6.

*Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and, 1% levels, respectively.*

	(1)	(2)	(3)	(4)
Post_Inc	-0.0971***			
	(0.0102)			
Pre_Inc	0.0469**			
	(0.0189)			
Post_Inc_Pp		-0.233***		
		(0.0458)		
Pre_Inc_Pp		0.159		
		(0.0971)		
Post_Dec			0.350***	
			(0.0434)	
Pre_Dec			0.0241**	
			(0.0116)	
Post_Dec_Pp				-0.635***
				(0.0569)
Pre_Dec_Pp				-0.0315*
				(0.0166)
Annual_Fee	-0.0520***	-0.0499***	-0.0842***	-0.105***
	(0.0162)	(0.0166)	(0.0153)	(0.0169)
Load_Fee	-0.0264*	-0.0259*	-0.0237	-0.0215
	(0.0136)	(0.0138)	(0.0141)	(0.0151)
Age	-0.213***	-0.214***	-0.200***	-0.204***
	(0.0240)	(0.0240)	(0.0260)	(0.0256)
Size	-0.00382	-0.00525	-0.00133	-0.00312
	(0.00406)	(0.00393)	(0.00400)	(0.00398)
Return	1.170***	1.172***	1.133***	1.121***
	(0.151)	(0.152)	(0.152)	(0.151)
Std_Daily_Returns	-5.761	-5.783	-5.844	-5.831
	(3.586)	(3.599)	(3.610)	(3.594)
Day and Fund FE	YES	YES	YES	YES
Observations	2,576,456	2,576,456	2,576,456	2,576,456
Adjusted R^2	9.4%	9.3%	10.2%	10.0%

Table 6 – Impact of "Anticipated" and "Unanticipated" Fee Adjustments on Daily Fund Flows

*The table presents the results of Ordinary Least Squares (OLS) regressions that analyze the impact of anticipated and unanticipated fee changes, following Warner and Wu's (WW, 2011) methodology, on scaled daily net inflows. Scaled daily net inflows are calculated as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. Columns 1 and 2 focus on fee increases. In Column 1, the main explanatory variable is "Post_Inc_WW_Ex," a dummy variable with a value of 1 if the observation for fund n on day t falls within a 100-day window following an anticipated fee increase announcement (above or equal to the median probability of fee increase according to WW2011 methodology) by fund n, and 0 otherwise. In Column 2, the main explanatory variable is "Post_Inc_WW_UnEx," a dummy variable with a value of 1 if the observation for fund n on day t falls within a 100-day window following an unanticipated fee increase announcement (below the median probability of fee increase according to WW2011 methodology) by fund n, and 0 otherwise. Columns 3 and 4 focus on fee decreases. In Column 3, the main explanatory variable is "Post_Dec_WW_Ex," a dummy variable with a value of 1 if the observation for fund n on day t falls within a 100-day window following an anticipated fee decrease announcement (above or equal to the median probability of fee decrease according to WW2011 methodology) by fund n, and 0 otherwise. In Column 4, the main explanatory variable is "Post_Dec_WW_UnEx," a dummy variable with a value of 1 if the observation for fund n on day t falls within a 100-day window following an unanticipated fee decrease announcement (below the median probability of fee decrease according to WW2011 methodology) by fund n, and 0 otherwise. All specifications include additional control variables at the fund level that vary over time: Age (the age of the fund in months), Size (the natural logarithm of the fund's Assets Under Management), Return (the fund's return over the previous 250 trading days), and Std_Daily_Returns (the standard deviation of daily returns over the previous 250 trading days). The scaled net inflow variable is winsorized at the 1% and 99% levels. Furthermore, the regressions control for fixed effects for both day and fund. Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)	(4)
Post_Inc_WW_An	-0.134***			
	(0.00981)			
Post_Inc_WW_UnAn		-0.0721***		
		(0.00899)		
Post_Dec_WW_An			0.376***	
			(0.0484)	
Post_Dec_WW_UnAn				0.305***
				(0.0514)
Annual_Fee	-0.0514***	-0.0499***	-0.0719***	-0.0507***
	(0.0155)	(0.0150)	(0.0154)	(0.0147)
Load_Fee	-0.0273*	-0.0254*	-0.0220	-0.0271*
	(0.0137)	(0.0140)	(0.0145)	(0.0136)
Age	-0.213***	-0.212***	-0.214***	-0.213***
	(0.0240)	(0.0241)	(0.0244)	(0.0242)
Size	-0.00177	-0.00540	-0.00305	-0.00533
	(0.00396)	(0.00386)	(0.00392)	(0.00389)
Return	1.169***	1.173***	1.144***	1.168***
	(0.152)	(0.152)	(0.151)	(0.152)
Std_Daily_Returns	-5.776	-5.813	-5.825	-5.800
	(3.597)	(3.604)	(3.610)	(3.587)
Day and Fund FE	YES	YES	YES	YES
Observations	2,576,456	2,576,456	2,576,456	2,576,456
Adjusted R^2	9.4%	9.3%	9.8%	9.6%

Table 7 – The Impact of Fee Changes on Scaled Daily Net Inflows: Instrumental Variable Regression Results

*The table presents the results of Instrumental Variable regressions aimed at examining the impact of fee changes on scaled daily net inflows. Scaled daily net inflows represent the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: 1) The variable "Post_Inc_Hat" is an instrumented version of "Post_Inc," which is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by fund n, and 0 otherwise. "Post_Inc" is instrumented by the variable "Post_Inc_Others," which is a binary indicator that equals 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by another fund from the same management firm as fund n, and 0 otherwise. 2) The variable "Post_Dec_Hat" is an instrumented version of "Post_Dec," which is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee decrease announcement by fund n, and 0 otherwise. "Post_Dec" is instrumented by the variable "Post_Dec_Others," which is a binary indicator that equals 1 if the observation for fund n on day t falls within a 100-day window following a fee decrease announcement by another fund from the same management firm as fund n, and 0 otherwise. The regressions include additional control variables at the fund level that vary over time, namely: Age: The age of the fund in months; Size: The natural logarithm of the fund's Assets Under Management; Return: The fund's return over the previous 250 trading days; and Std_Daily_Returns: The standard deviation of daily returns over the previous 250 trading days. The scaled net inflow variable is winsorized at the 1% and 99% levels. All specifications incorporate a comprehensive set of fixed effects for both day and fund. Column 1 presents the results for fee increases, while Column 2 shows the estimations for fee decreases. In both columns we utilize the STATA package ivreghdfe.ado; obtained from http://fmwww.bc.edu/RePEc/bocode/i. Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	**(2)**
Post_Inc_Hat	-0.114***	
	(0.00979)	
Post_Dec_Hat		0.243***
		(0.0435)
Annual_Fee	-0.0591***	-0.0709***
	(0.0159)	(0.0159)
Load_Fee	-0.0277*	-0.0241*
	(0.0137)	(0.0141)
Age	-0.213***	-0.205***
	(0.0240)	(0.0252)
Size	-0.00185	-0.00321
	(0.00395)	(0.00386)
Return	1.170***	1.147***
	(0.151)	(0.151)
Std_Daily_Returns	-5.744	-5.832
	(3.578)	(3.606)
Day and Fund FE	YES	YES
Observations	2,576,456	2,576,456
Adjusted R^2	2.1%	2.9%

Table 8 – The Impact of Fee Increase Limitation on Daily Fund Flows

The table presents the results of a difference-in-difference (DID) regression aimed at using an exogenous shock to examine the impact of fee changes on scaled daily net inflows. The regression focuses on the first 100 trading days of each calendar year, comparing the years prior to the management fee increase limitation reform enacted in 2016 (2012–2016) with the years following the reform (2017–2020). Column 1 compares funds with zero management fees (as of the previous December) to all other mutual funds, while Column 2 compares the funds with zero management fees only to similar funds—mutual funds of the same type and similar size (nearest neighbour) to the zero fee funds.

The scaled daily net inflows are defined as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Previous_Dec_Zero is a dummy variable equal to 1 if the management fees of fund n in December of the previous year equalled zero, and equal to 0 otherwise; Post_Zero is an interaction variable equal to 1 if Previous_Dec_Zero=1 and the year is between 2017 and 2020, and 0 otherwise. (The post variable does not appear explicitly in the regression, as it is absorbed by the day fixed effects.) All other control variables are as described in Table 2. All specifications include a comprehensive set of fixed effects for both day and fund.

*Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and, 1% levels, respectively.*

	(1)	**(2)**
Previous_Dec_Zero	0.124***	0.123
	(0.022)	(0.081)
Post_Zero	-0.098**	-0.156*
	(0.035)	(0.08)
Other controls	YES	YES
Day and Fund FE	YES	YES
Observations	965,496	125,449
Adjusted R^2	7.1%	23.3%

Table 9 – The Impact of Distribution Fee Reduction on Daily Fund Flows

The table presents the results of a difference-in-difference (DID) regression aimed at using an exogenous shock to examine the impact of fee changes on scaled daily net inflows. The regression focuses on the 200 trading days around the implementation of the distribution fee reduction reform enacted in 2013. The estimation compares the 100 trading days prior to the reform implementation (May 1st 2013) with the 100 days following the implementation. Column 1 compares actively managed equity mutual funds to all other mutual funds, while Column 2 compares the actively managed equity mutual funds to similar funds—mutual funds of the same type and similar size (nearest neighbour) to the active equity funds.

The scaled daily net inflows are defined as the daily difference between inflows and outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Post_Active is an interaction variable equal to 1 if the fund is an actively managed equity mutual fund and the date is later than April 30th 2013, and equal to 0 otherwise. (The active equity fund variable does not appear explicitly in the regression as it is absorbed by the fund fixed-effects, while the post variable does not appear explicitly in the regression as it is absorbed by the day fixed-effects). All other control variables are as described in Table 2. All specifications include a comprehensive set of fixed effects for both day and fund.

*Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and, 1% levels, respectively.*

	(1)	**(2)**
Post_Active	0.031*	0.225***
	(0.016)	(0.074)
Other controls	YES	YES
Day and Fund FE	YES	YES
Observations	211,997	40,879
Adjusted R^2	20.9%	14.96%

Table 10 – The Impact of Fee Changes on Daily Fund Flows: A Comparison between Existing and New Investments

The table presents the results of Ordinary Least Squares (OLS) regressions aimed at examining the impact of fee changes on scaled daily net inflows, specifically by taking into account the difference between inflows and outflows. The scaled daily inflows are defined as the daily inflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The scaled daily outflows are defined as the daily outflows, divided by the Assets Under Management (AUM) at the end of the previous trading day. The explanatory variables related to fee changes are as follows: Post_Inc is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee increase announcement by fund n, and equal to 0 otherwise; Post_Dec is a dummy variable equal to 1 if the observation for fund n on day t falls within a 100-day window following a fee decrease announcement by fund n, and equal to 0 otherwise.

The regressions include additional control variables at the fund level that vary over time, namely – Annual_Fee: The management fee level (in percent) 100 trading days ago (this provides the fee level before any fee adjustments took place); Load_Fee: Front-end load fees (in percent), capturing any fees charged to investors at the time of purchase or sale of the mutual fund shares; Age: The age of the fund in months; Size: The natural logarithm of the fund's Assets Under Management; Return: The fund's return over the previous 250 trading days; and Std_Daily_Returns: The standard deviation of daily returns over the previous 250 trading days. The scaled net inflow variable is winsorized at the 1% and 99% levels. All specifications include a comprehensive set of fixed effects for both day and fund. Columns 1 and 2 provide results for fee increases, while Columns 3 and 4 show estimations for fee decreases.

The dependent variable in Columns 1 and 3 represents the scaled daily inflows, which measures the daily net inflows of funds after accounting for their assets under management. This variable captures the flow of new investments into the funds on a daily basis. In Columns 2 and 4, the dependent variable is the scaled daily outflows, which captures the daily net outflows from the funds after adjusting for their assets under management. This variable reflects the withdrawal or redemption of funds by investors on a daily basis.

*Robust standard errors, clustered at the management firm level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and, 1% levels, respectively.*

	(1)	(2)	(3)	(4)
	Inflows	Outflows	Inflows	Outflows
Post_Inc	-0.0721***	0.0340***		
	(0.0117)	(0.00700)		
Post_Dec			0.389***	0.0420***
			(0.0496)	(0.0113)
Annual_Fee	-0.131***	-0.0747***	-0.163***	-0.0832***
	(0.0259)	(0.0159)	(0.0270)	(0.0165)
Load_Fee	-0.0828***	-0.0473***	-0.0797***	-0.0479***
	(0.00944)	(0.0123)	(0.00899)	(0.0122)
Age	-0.256***	-0.0426**	-0.241***	-0.0406**
	(0.0263)	(0.0188)	(0.0274)	(0.0184)
Size	-0.0160***	-0.0130***	-0.0145***	-0.0115***
	(0.00543)	(0.00428)	(0.00508)	(0.00412)
Return	1.169***	0.0540	1.128***	0.0479
	(0.142)	(0.0387)	(0.142)	(0.0382)
Std_Daily_Returns	-5.457	0.159	-5.523	0.180
	(3.339)	(0.556)	(3.349)	(0.560)
Day and Fund FE	YES	YES	YES	YES
Observations	2,576,456	2,576,456	2,576,456	2,576,456
Adjusted R^2	18.0%	20.2%	18.8%	20.2%

Table 11 – Analyzing the Influence of Investor Attributes on Their Response to Fee Adjustments

*The table presents the results of a linear probability regression aimed at examining the impact of investor attributes on the investor's decision to sell (Columns 1 and 2) or buy (Columns 3 and 4) a specific mutual fund in a specific month. Sell (buy) is a dummy variable that equals 1 if investor i sold (purchased) fund n in month t, based on the change in the investor's holdings between month t-1 and month t, net of any price change, and 0 otherwise. The explanatory variables related to the sell (purchase) are as follows (all these variables are calculated as of the end of month t-1): Size is the total market value of investor i's portfolio; Num_sec is the total number of different securities (mutual funds or others) in investor i's portfolio; B&H_investor is a dummy variable that equals 1 if investor i never actively traded (i.e. all changes to the investor's position were solely due to price changes) through the sample period, and 0 otherwise; Index_investor is a dummy variable that equals 1 if investor i holds only passively-managed mutual funds (i.e. does not hold any actively-managed mutual funds or specific securities), and 0 otherwise; Home-bias is a dummy variable that equals 1 if investor i invests only in Israeli securities or in mutual funds that focus on the Israeli market (according to their investment category), and 0 otherwise; Inc is a dummy variable that equals 1 if fund n announced a management fee increase at least once between month t-5 and month t-1, and 0 otherwise (this variable is absorbed by the fund*month FEs as a stand-alone variable, and thus only shows as an interaction variable with the other explanatory variables); Dec is a dummy variable that equals 1 if fund n announced a management fee decrease at least once between month t-5 and month t-1, and 0 otherwise (this variable is absorbed by the fund*month FEs as a stand-alone variable, and thus only shows as an interaction variable with the other explanatory variables); Prior_holdings is a dummy variable that equals 1 if investor i had holdings in fund n in month t-1, and 0 otherwise (this variable is only applicable to purchase decisions since mutual fund investors cannot sell funds in which they do not have any holdings).*

*All specifications include month*fund fixed effects. Robust standard errors, clustered at the investor level, are reported in parentheses below the coefficients. The significance levels are denoted by *, **, and ***, indicating significance at the 10%, 5%, and, 1% levels, respectively.*

	(1)	(2)	(3)	(4)
	SELL	SELL	BUY	BUY
Size	-0.00424***	-0.00424***	-0.0347***	-0.0346***
	(0.0000792)	(0.0000792)	(0.000227)	(0.000228)
Num_sec	0.000144***	0.000144***	0.000495***	0.000500***
	(0.00000899)	(0.00000903)	(0.0000203)	(0.0000205)
B&H_investor	-0.0239***	-0.0238***	-0.160***	-0.158***
	(0.000119)	(0.000118)	(0.000685)	(0.000681)
Index_investor	-0.000691	-0.000554	0.0271***	0.0268***
	(0.000683)	(0.000694)	(0.00176)	(0.00177)
Home_bias	0.000531***	0.000500***	0.0680***	0.0672***
	(0.000161)	(0.000160)	(0.000774)	(0.000769)
Size_inc	0.000284***		0.00536***	
	(0.0000315)		(0.000445)	
Num_sec_ inc	-0.00000537		0.0000865***	
	(0.00000968)		(0.0000243)	
B&H_investor_inc	0.00725***		0.0841***	
	(0.000437)		(0.00171)	
Index_investor_inc	0.00133		-0.00552	
	(0.00137)		(0.00337)	
Home_bias_inc	-0.00242***		-0.0344***	
	(0.000482)		(0.00177)	
Size_dec		0.000749***		-0.00205***
		(0.0000569)		(0.000745)
Num_sec_dec		0.0000151		0.0000840*
		(0.0000214)		(0.0000461)
B&H_investor_dec		0.00545***		0.0523***
		(0.000789)		(0.00366)
Index_investor_dec		-0.0101**		-0.000991
		(0.00488)		(0.0115)
Home_bias_ dec		-0.00547***		-0.00493
		(0.000952)		(0.00374)
Prior_holdings			-0.907***	-0.908***
			(0.000306)	(0.000306)
Prior_holdings_inc			-0.0787***	
			(0.00576)	
Prior_holdings_dec				0.0237**
				(0.00955)
Fund*Month FE	YES	YES	YES	YES
Observations	49,196,087	49,196,087	49,196,087	49,196,087
Adjusted R^2	11.9%	11.9%	39.1%	39.1%