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**The Exclamation Mark of Cain:  
Risk Saliency and Mutual Fund Flows\***

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# The Exclamation Mark of Cain: Risk Salience and Mutual Fund Flows

Yevgeny Mugerman, Nadav Steinberg and Zvi Wiener

## Abstract

We study a regulation that increased mutual funds' risk salience through name change. Using daily fund flow data and several identification strategies, we find that requiring certain mutual funds to affix an exclamation mark ("!") to their names caused a statistically and economically significant decline in their net flows, with a larger effect on fund inflows than outflows. The exclamation mark's impact stems from retail investors, both those that seek financial advice and those that invest independently. Mutual funds "defamed" by the exclamation mark designation actually increased their exposure to the particular risk highlighted by the regulator.

*JEL classification:* G18, G28, G23, G41

*Keywords:* Mutual Funds, Regulation, Investor Attention, Investor Protection

**אות הקין של סימן הקריאה: בולטות הסיכון וזרמי ההשקעה בקרנות נאמנות**

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## תקציר

אנחנו חוקרים רגולציה שהגדילה את הבולטות של קרנות נאמנות באמצעות שינוי בשמן. באמצעות נתונים על זרמי ההשקעה היומיים בקרנות ומספר אסטרטגיות לזיהוי קשרים סיבתיים אנחנו מוצאים שהדרישה להוסיף סימן קריאה לשמן של קרנות מסוימות הובילה לירידה משמעותית מבחינה סטטיסטית וכלכלית בזרמי ההשקעה נטו בקרנות אלה, עם השפעה גדולה יותר על הצבירות בקרנות מאשר על הפדיונות מהן. ההשפעה של סימן הקריאה נובעת מהמשקיעים הקמעונאיים, הן אלה שנעזרו בייעוץ פיננסי והן אלה שהשקיעו באופן עצמאי. קרנות נאמנות ש- 'הוכתמו' באות הקין של סימן הקריאה דווקא הגדילו את החשיפה שלהן לסיכון שהובלט על-ידי הרגולטור.

## 1. Introduction

According to conventional theories on decision-making, investment decisions are affected only by rational calculations, such as risk, return, fees, and so forth. One of the most significant contributions of behavioral finance literature in this realm is the finding that changes in the presentation of information, and particularly an increase in the salience of that information, play a significant role in affecting investor behavior. While this issue has been examined in various experiments, the evidence on actual investor behavior is still scarce.

This paper examines the effect of information presentation, designed to highlight risk, in a real-world environment. Specifically, we analyze the impact of an Israeli regulatory reform focused on increasing the salience of risk disclosure on mutual fund flows. The regulation required fund managers to make a minor visual change by adding an exclamation mark (“!”) to the names of mutual funds whose investment policy enabled them to hold high-yield corporate bonds in excess of their maximum exposure to equity investments. Our research takes advantage of the relatively clean setting created by the specific characteristics of this quasi-natural experiment. First, modifications to the presentation of information usually accompany actual economic or investment policy changes, or at least changes in the information set available to investors. In our setting, however, the modification of mutual fund names was not accompanied by changes in either fund activities or the obtainable information relative to the pre-reform period. Second, whereas regulatory reforms typically affect an entire universe of comparable investment vehicles, in the examined reform an exclamation mark was affixed only to the names of certain mutual funds, to the exclusion of comparable funds. Hence, our setting provides a natural control group.

In recent years, regulators around the world have made great efforts to simplify the disclosure of financial information, improve its accessibility, and facilitate the ability of investors to compare financial products. As policy makers become aware of the impact of information presentation on investors, there are growing concerns regarding the exact structure information disclosure should take. Specifically, regulators tend to prefer visual representation of the main characteristics of the investments, especially their risk levels. Some of the visual representations make use of an exclamation mark to signal specific risks related to the investment product. The use of an exclamation mark as a risk indicator for retail investment products has been adopted by various regulatory regimes worldwide, including in the EU, Canada, and Israel.

A noteworthy case, and one which demonstrates this paper’s potential contribution to contemporary regulatory discussions, is the European Key Investor Information Disclosure (KIID). KIID is designed to improve the way the essential characteristics of PRIIPS (Packaged Retail and Insurance-based Investment Products) and UCITS (Undertakings for Collective Investments in Transferable Securities) are disclosed, so that investors are reasonably able to understand the risks involved in investing in these retail investment products. The KIID regulation uses a numeric risk indicator, and it was proposed to add an exclamation

mark after the risk category number to signal the presence of particular characteristics which render the fund unsuitable for the methodology used in traditional risk measurement.<sup>1</sup> The proposed KIID modification was examined in a survey-based study (IFF Research and YouGov, 2009)<sup>2</sup> and provoked a public debate over its merits and limitations.<sup>3</sup> Our research directly relates to this debate on the impact of information presentation formats, and specifically the use of exclamation marks. As such, it may provide useful insights for regulators and financial product vendors into the implications of regulation-induced or voluntary use of such signals.

We utilize proprietary daily flow data on all the fixed-income mutual funds in Israel, and use two different identification strategies to establish a causal link between the addition of the exclamation mark and the change in fund flows. Our main identification strategy takes advantage of the staggered implementation of the reform across different fund management firms. Due to procedural limitations<sup>4</sup>, different management firms affixed the mark to their treated funds on different dates between March 1<sup>st</sup> 2010 and March 18<sup>th</sup> 2010. We exploit this staggered implementation of the reform and compare the change in flows into fixed income mutual funds that added the exclamation mark to their names with the change in flows into their (treated) counterparts that have not yet added the mark to their names. The second identification strategy uses the fact that the treated funds in our sample added the exclamation mark to their names according to a rather technical criteria—their actual holdings in high-yield corporate bonds relative to their maximum equity exposure. We compare the change in flows into fixed income mutual funds that added the exclamation mark to their names with the change in flows into their (untreated) counterparts that did not add the mark. To account for potential differences between the exclamation mark funds and other funds in this analysis, we use propensity score matching to focus on the most closely related control funds.<sup>5</sup> As this identification strategy rests on a distinction between treated and untreated funds, we also address possible selection out of the treatment group. Using either identification strategy we find that the addition

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<sup>1</sup> For instance, the fund has not existed long enough to generate the required length of time series, or the volatility of its historical return series is not expected to represent the future risk and reward profile.

<sup>2</sup> The survey tested investors' understanding and interpretation of the exclamation mark. While most of those surveyed claimed that the purpose of the mark was to attract attention, or to warn that the fund was risky, some intermediaries argued that it was unnecessary or too complicated and could deter some clients from investing.

<sup>3</sup> For example, the Securities Industry and Financial Markets Association (SIFMA) and the Center for Financial Market Integrity opposed the use of an exclamation mark on the grounds that it could cause investors to perceive the fund negatively, while the European Savings and Retail Banking Group (ESBG) was in favor of such use for its ability to "capture the attention of the investor, motivating him to look for further information on the product."

<sup>4</sup> Discussions with fund managers reveal that the specific implementation date varied between fund families due to technical reasons, such as: legal transactions, board meetings on specific dates, etc. If the mark addition schedule would have been driven by optimization motives, it would most probably have resulted in a different implementation date for each specific mutual fund of the management firm. We elaborate more on this issue in the setting section.

<sup>5</sup> In yet another specification, we also compare the treated funds to all the other (non-matched) funds, to ensure the previous results are not driven by the matching procedure.

of an exclamation mark to a fund's name is associated with a drop in daily scaled net inflows to that fund. This decline is statistically significant, and its absolute value is twice as large as the average daily scaled mutual fund net inflows during our sample period.

The reform was first introduced to the public in September 2009.<sup>6</sup> We examine whether mutual fund managers used the period between the first draft of the new regulation and its implementation in March 2010 to actively elude the impending exclamation mark modifier. Using mandatory disclosure of high-yield bond holdings in excess of maximum equity exposure, we identify a group of 'suspect funds' that were exclamation mark candidates, but ultimately 'escaped the designation'. We find 198 mutual funds that adjusted either their investment policy or their high-yield bond position prior to the rule's implementation, possibly to avoid the need to add the exclamation mark modifier. We repeat all our estimations, excluding these funds from the control group, with similar results. Furthermore, these 'suspect funds' resemble the funds that received the exclamation mark in the relevant characteristics—their high-yield bond holdings and equity exposure—and thus they arguably form the best control group. Therefore, we repeat the main estimation for the restricted subsample of treated funds and 'suspect funds'. The results, again, demonstrate that the addition of an exclamation mark significantly affected the mutual funds' net inflows. This suggests that even with respect to funds that were *ex-ante* similar in the relevant risk dimension, the mutual funds for which risk disclosure became more salient suffered in daily flows.

After establishing our identification of the effect of the exclamation mark reform on fund flows, we turn to investigate the channels through which it worked. Looking into the two components of the net inflows, we find that both the inflows into treated funds are lower than expected absent the reform, and the outflows from treated funds tend to be higher than expected. The relative economic magnitude and the statistical significance, however, are stronger for the inflows and more consistent across specifications. The weaker impact of the reform on fund outflows is probably due to the high yields enjoyed by investors in the treated funds in the months preceding the reform, which rendered them less sensitive to the increased risk salience than their potential counterparts who did not experience the aforementioned yields. The weaker impact on the outflows can also be attributed to the well-documented status quo bias (Samuelson and Zeckhauser, 1988).

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<sup>6</sup> Thus, any new information that may have been embedded in the regulation was already accounted for in September 2009, and should not have affected investor behavior six months later. Furthermore, an analysis of the effect of the initial draft publication suggests that it did not lead to a significant decline of inflows to mutual funds that were expected to be affected by the reform relative to other funds.

At the clientele level, we explore which investor type was affected by the reform—retail investors or professional investors. We use detailed proprietary data on holdings of foreign investors in Israeli mutual funds to examine whether these, arguably more sophisticated, investors were also affected by the increased risk salience. Using the differences-in-differences (DID) technique, we find only scarce evidence that the reform affected foreign investor flows into treated mutual funds. Hence, it seems that the effect we find is driven mostly by retail investors, who are more prone to behavioral biases than their professional counterparts.

Different retail investors may also differ from one another in their investment behavior. Specifically, some retail investors seek professional financial advice prior to investing, while others ostensibly act independently. In Israel there are two major financial advisors that control the retail market. These financial advisors rely on internal rating systems to produce mutual fund rankings that guide their advisory staff in interactions with clients seeking investment consulting. We managed to obtain a proprietary database of mutual fund ratings from one of these major financial consultants and match it with our data. We then divided all funds into two major groups—high ranked and low/no ranked funds, as it is reasonable to assume that advised clients invest mostly, if not exclusively, in the mutual funds with high ranking according to the internal rating systems. We find that flows into both groups—high ranked funds and low ranked funds—shrank following the exclamation mark “award”, suggesting that both retail investors that seek financial advice and those that invest on their own were influenced by the exclamation mark.

Our research relates directly to the literature exploring the effect of visual presentation and risk salience on investor behavior. The focus on salient information stems from limited attention spans and information overload, which lead investors to refrain from incorporating all available information in the decision-making process. Shorter, more vivid, and simplified information can enhance the effectiveness of disclosure (Walther, 2015). The effectiveness of simplified information in addressing cognitive overload and limited attention spans has been confirmed in various laboratory experiments. In a seminal experiment on consent to drug treatments (Epstein and Lasagna, 1969), subjects were given various consent forms for the use of a specific drug (*acetylhdroxybenzoate*), which included information on the drug’s risks. The experiment showed that the length of the form was negatively correlated with patient comprehension. Notably, some subjects receiving the longer form were unaware of potential risk of death.

In the financial field, scholars have shown that investors, analysts and managers are inclined to focus on salient information (Hirshleifer and Teoh, 2003; Jarvenpaa, 1989; Dessaint and Matray, 2017; Frydman and Wang, 2017; Shaton, 2017; Cronqvist, Ladika, and Sautner, 2018). However, other papers suggest that these findings could be driven by factors unrelated to the information salience (e.g. Michaeli, Rubin, and Vedrashko, 2016). In particular, studies have been conducted on the impact of salience on risk perception.

Bordalo, Gennaioli, and Shleifer (2012) developed a model that illustrates the effects of salience on investor decision-making under uncertainty. According to their research, investors overweigh the upside or the downside of a risky alternative depending on the salience of information. Similarly, Kaufman and Weber (2013) show that the format used to communicate risk impacts portfolio selection differentially and the aggregation of information combining several formats encourages investor confidence and risk-taking.

Focusing on mutual funds, this paper contributes to the literature on investor decision-making regarding mutual fund investments. Empirical studies examining mutual fund flows show that investors tend to make their decisions based on past performance (Hendricks, Patel, and Zeckhauser, 1993).<sup>7</sup> Hendricks *et al.* relate this behavior to the hot-hands effect, while Sapp and Tiwari (2004) oppose the idea of “smart money” or that investors have selection ability, and show that investors simply opt for recent winners, regardless of specific future expectations. Further, Goetzmann and Peles (1997) provide evidence that the tendency of investors to adjust their beliefs to justify past actions stifles outflows from poorly performing mutual funds. Other common and well-researched behavioral biases include the disregard of costs and observed preferences for more salient options. Pontari, Stanaland, and Smythe (2009) show that investors often focus on past performance and tend to ignore fees and costs, despite their direct impact on wealth. Similar findings are obtained by Barber, Odean and Zheng (2005), who analyze mutual fund flows and fee schedule revisions over several decades. They conclude that investors learn quickly about front-end loads and commissions as they are more obvious and salient, but do not exhibit any preference for funds with lower operating and marketing expenses. Marketing and advertising also play a significant role in mutual fund inflows (Jain and Wu, 2000; Cronqvist, 2006; Lee, Yun and Haley, 2012). Sirri and Tufano (1998) find that due to search costs, mutual funds with greater media attention or those that belong to larger fund families enjoy greater inflows. Moreover, investors tend to ignore selection bias in advertised data by mutual fund families, which emphasizes high-performing funds (Koehler and Mercer, 2009).

In addition, several recent papers suggest excessive reliance on mutual fund rankings. Kaniel and Parham (2017) show significant inflows into funds mentioned in a prominent *Wall Street Journal* ranking, compared to funds which just missed making the list. They further show that fund managers react strategically to this media-driven attention by increasing marketing efforts. In a concurrent paper, Ben-David et al. (2018) generalize this finding and show that investors rely on Morningstar ratings rather than on exposure to risk factors when allocating capital across mutual funds. Hartzmark and Sussman

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<sup>7</sup> Furthermore, inflows to equity funds tend to be very sensitive to good performance, while outflows are not that sensitive to bad performance (see e.g. Huang et al., 2007). A recent study by Goldstein et al. (2017) shows that, in contrast, inflows in corporate bond funds have greater sensitivity to bad performance.

(forthcoming) show that investors care even about non-performance rankings. The authors document that a shock to the salience of mutual funds' sustainability ranking significantly affect their flows.

Finally, the paper most closely related to ours is Cooper, Gulen, and Rau (2005). Cooper et al. find that mutual funds which changed their names to reflect popular investment trends enjoyed positive abnormal inflows, regardless of the actual changes in their portfolio holdings. It is noteworthy that while they examined strategic name changes allegedly aimed at exploiting irrational investor behavior, we study a minor, regulation-mandated change to some fund names aimed at increasing risk salience.

From the broad regulatory perspective, our research also contributes to a growing body of work on consumer financial protection. Campbell, Jackson, Madrian, and Tufano (2011) investigate three case studies: of mortgage markets, payday lending, and financing retirement consumption. The researchers show the need for, and limits of, regulation in different realms of household finance. Campbell (2016) examines the challenges of consumer financial regulation from a broad and cross-country perspective. In our case, we show how a minor regulatory intervention could significantly move financial markets.

The remainder of the paper proceeds as follows: Section 2 presents the unique attributes of the setting and elaborates on the characteristics of the Israeli mutual fund industry and the regulatory reform under examination. Section 3 discusses the data and the methods used to measure changes in the net inflows in the wake of the regulatory reform. Section 4 provides our main results. Section 5 investigates the impact of the reform's initial announcement on investors and fund managers, and analyzes the run-up period from the announcement to the implementation. Section 6 studies which investors were affected by the addition of the exclamation mark. Section 7 tests the robustness of the results, and, finally, Section 8 concludes.

## **2. Setting**

### **2.1. The Israeli mutual funds industry**

Like their global counterparts, mutual funds in Israel are an important investment vehicle. Local mutual fund investors are primarily retail clients who invest directly in the funds. In Israel, this investment does not provide investors with any tax benefits, and, given the tax advantages attached to other investment vehicles, it is generally not used for retirement savings. As of the end of 2018, the mutual fund industry accounted for 8.1 percent of the public's portfolio of financial assets. There were 2,093 mutual funds<sup>8</sup> with

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<sup>8</sup> 1,156 of which were actively managed mutual funds.



about NIS 300 billion under management.<sup>9</sup> Mutual funds in Israel are regulated by the Israel Securities Authority (ISA).

## **2.2. The Israeli corporate bond market**

Israeli mutual funds hold approximately 31% of the domestic corporate bond market. In contrast to the situation in most countries, including the US, corporate bonds in Israel are primarily publicly traded on the Tel Aviv Stock Exchange. Off-floor trading and OTC platforms for institutional investors also exist, but most trading is continuous and transparent. Though corporate bonds have been officially traded on the TASE from its inception in 1953, the corporate debt market in Israel began to develop in the 1990s and to mature and grow in 2005, following a series of reforms that liberalized the Israeli capital market. Abudy and Wohl (2018) find that despite its relatively small size, the Israeli market is quite liquid, characterized by high trading volumes and low spreads relative to the US corporate bond market.

## **2.3. The exclamation mark reform**

On March 1, 2010,<sup>10</sup> the ISA issued new rules for implementation by the end of that month. The new regulation required mutual funds to add an exclamation mark to their names if their investment policy allowed them to hold high-yield corporate bonds (unrated bonds, or bonds rated below BBB<sup>11</sup>) in excess of their maximum exposure to equity investments.<sup>12</sup> Under this scheme, the addition of an exclamation mark is reserved for a special class of funds, for which investment in high-yield corporate bonds and cash deposits in low-rated banking institutions is expected to exceed the upper limit of the fund's disclosed maximum exposure to equities. Although the exclamation mark suggests high risk, it is not used to designate a fund's total risk nor does it necessarily distinguish high-risk funds from lower-risk funds. It is an indicator of exposure to potential credit risk through the fund's investment in so-called "junk bonds". The ceiling set on high-yield instruments is not a fixed percentage of the fund's holdings, but is relative to its exposure to equities. Funds which do not exceed the equity ceiling are not required to add the exclamation mark modifier, even if they have the same relative holdings in high-yield bonds. Appendix A provides a few examples of the change.

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<sup>9</sup> The figures in dollar terms are about 1/3.75 of the shekel sums (December 2018).

<sup>10</sup> The final draft was passed to mutual fund management companies several weeks before the announcement.

<sup>11</sup> According to the rating scale of the local S&P subsidiary, or an equivalent rating by other rating agencies.

<sup>12</sup> The mandatory addition of an exclamation mark in the name of certain funds was introduced as an addition to rules governing fund classification and exposure profiling. Under these rules, the names of all funds must include a 2-character (numeric—on a scale of 0 to 6—and alphanumeric—on a scale of 0 to F) code signaling the fund's exposure to equity and foreign currency investments, thus indicating in a nutshell the investment policy undertaken by the fund.

The new rule replaced a previous rule, which required a monthly (ex-post) disclosure of high-yield corporate bond holdings that exceeded a fund's maximum possible equity exposure on at least one day of the month. Hence, the level of disclosure remained unchanged, as the new rule replaced a similar rule. The mutual funds that initially received the exclamation mark (110 in total) were almost exclusively fixed-income funds (107 funds), and of these, approximately 71 percent specialized in corporate bond investments.

The exclamation mark reform was first introduced by the ISA to fund management companies and to the public on September 9, 2009 by way of a regulatory 'statement of intent'.<sup>13</sup> It was initiated in response to the numerous corporate bond defaults precipitated by the 2008 financial crisis.<sup>14</sup> The reform's objective was to alert investors to the possible credit risk inherent in "junk bond" investments by requiring certain mutual funds to add an exclamation mark to their names, thus enhancing the risk salience of these funds.<sup>15</sup>

A unique feature of this reform is that it was truly "in name only." There was no change in either the amount or quality of information available to the public relative to the pre-reform period,<sup>16</sup> since:

- (1) The mutual funds' investment policies had already been available to the public;
- (2) The mutual funds' names had already included a number indicating the funds' maximum exposure to equities;
- (3) The mutual funds' actual end-of-month holdings had already been reported by all fund managers;
- (4) More importantly, the mutual funds' holdings of high-yield corporate bonds in excess of the maximum equity exposure had also, been specifically disclosed by the relevant funds' managers.

Thus, the reform changed only one modest characteristic: an exclamation mark was added to the middle of the relevant mutual funds' names.

Our empirical analysis makes use of the staggered implementation of the exclamation mark reform across funds. One concern may be that the timing of the reform application to the different mutual funds over the course of March 2010 is not random. Specifically, it could be driven by fund managers' attempts to maximize their earnings. Our data suggests this to be unlikely, since one would expect value-

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<sup>13</sup> Such drafts do not necessarily result in actual regulations, and the final version of the regulation can differ from the initial draft. In our case the reform was implemented as suggested, but its implementation was postponed from December 2009 to March 2010.

<sup>14</sup> In 2009 alone, 6.7 percent of corporate bonds (measured in book debt value) entered restructuring proceedings (Bank of Israel Annual Report, 2010).

<sup>15</sup> We emphasize that prior to the reform, the coded 'exposure profiling' included in fund names did not address maximum exposure to debt instruments, such as high-yield bonds.

<sup>16</sup> Moreover, the addition of the exclamation mark didn't affect funds' order/placement in different fund lists.

maximization to differ even across the different funds of the same fund management firm. However, the data show that the great majority of management firms added the exclamation mark to all the relevant funds under their management on the same date, which seems sub-optimal under the value-maximization assumption. Moreover, discussions with market participants revealed that the date of the name change was driven by technical reasons, as the change required board decision, modifications to funds' legal documentation and appropriate disclosure. This process was time-consuming and its realization was affected by board meeting schedules and other management-firm specific time constraints. Notwithstanding, if, however unlikely, fund managers did implement the reform gradually to maximize fund values, then our results constitute a lower bound for the effect of the exclamation mark reform. In other words, if fund managers would not have chosen the optimal implementation date to minimize the expected outflows, then the negative effect of the exclamation mark addition on fund flows would have been even larger in absolute terms.

### 3. Data and methodology

We use proprietary daily fund flow data<sup>17</sup> for February 14<sup>th</sup>–April 6<sup>th</sup>, 2010 (the period around the reform implementation). This data consists of 23,247 fund-day observations pertaining to 761 actively managed fixed-income mutual funds<sup>18</sup> managed by 30 different management firms. We exclude observations of mutual funds with less than \$1 million in assets under management. We exploit data on the mutual funds' daily inflows and outflows to calculate the daily net inflows for each fund. We then scale these net inflows by the funds' assets under management (AUM) to construct our dependent variable.<sup>19</sup> To address potential outliers we truncate 1% of each side of the distribution of the flows. In addition, we collected data on fund names, which enable us to identify the specific day on which the fund received an exclamation mark. We use these data to construct a dummy variable, which equals 1 for funds receiving an exclamation mark in March 2010, effective from the day they actually received the mark, and 0 otherwise. Table 1 describes the components of our main variables of interest.

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<sup>17</sup> Israeli mutual fund daily flow data have previously been employed by Ben-Rephael, Kandel, and Wohl (2011).

<sup>18</sup> Our universe comprises fixed-income mutual funds only. During the sample period, there were no ETFs in Israel, as ETNs were the index-tracking instrument of choice at the time.

<sup>19</sup> Scaled flows are the common practice in the mutual fund literature (DelGuercio and Tkac, 2002). However, following Kronmal's (1993) critique of the use of ratios, and specifically their usage as dependent variables, some papers also examine unscaled fund flows (e.g. DelGuercio and Tkac, 2002; Benson and Humphrey, 2008). In light of this discussion, we note that our inferences are robust to forgoing the scaling and using the dollar net flows instead.

**Table 1 – Descriptive Statistics**

The table describes the main variables of interest based on the daily data for the whole sample period—February 14<sup>th</sup>–April 6<sup>th</sup>, 2010. *Creations* are daily creations in thousands of shekels, *redemptions* are daily redemptions in thousands of shekels, *net inflows* are daily *creations* minus daily *redemptions* in thousands of shekels, *Lag AUM* is assets under management as of the beginning of the relevant month in thousands of shekels, *scaled net inflows* are *net inflows* divided by *AUM* in percentage terms, *scaled inflows* are *creations* divided by *AUM* in percentage terms, and *scaled outflows* are outflows divided by *AUM* in percentage terms.

All funds	mean	sd	p10	p25	p50	p75	p90
Inflows (thousands of NIS)	608.79	1,794.49	0	15.21	131.03	498.96	1,410.39
Outflows (thousands of NIS)	488.96	1,449.12	0	22.66	132.72	454.26	1,157.23
Net Flows (thousands of NIS)	119.82	1,818.71	-624.10	-146.06	0	207.36	872.09
Lag AUM (thousands of NIS)	148,861.69	304,580.95	9,780.10	23,175.90	59,941.00	165,613.00	332,809.00
Scaled Net Flows	0.22%	1.14%	-0.61%	-0.22%	0.00%	0.33%	1.15%
Management Firms	30						
Fixed Income Mutual Funds	761						
Fund-Date Observations	23,247						

We complement the flow data with hand-collected data on the funds' high-yield bonds in excess of maximum equity exposure from September 2009 until February 2010. This data is based on the monthly filings that fund managers were required to provide to the public prior to the reform. We will use this data to identify funds that were expected to receive an exclamation mark based on their attributes in the period preceding the reform.

In order to investigate the behavior of sophisticated investors, we supplement the fund data with proprietary data on foreign investor holdings in Israeli fixed-income mutual funds (for the end of February 2010 and for the end of March 2010) that was collected by the Bank of Israel, based on detailed reports filed by domestic commercial banks. This data enables us to isolate the change in foreign holdings stemming from foreign investor flows into and out of local fixed-income mutual funds from the changes stemming from fluctuations in mutual fund prices and currency exchange rates. As of February 2010, foreign investors' holdings of Israeli fixed income mutual funds totaled \$192 million, representing about 0.63 percent of the total local fixed-income mutual funds' AUM. Foreign investors had holdings in 651 Israeli fixed-income mutual funds (81 percent of the available funds). The dispersal of foreign investors' holdings in local fixed-income mutual funds is also reflected in a particularly low Herfindahl–Hirschman Index of 0.007. We also use data on institutional investor holdings from “*Praedicta*,” a local data vendor that works with the Israeli Ministry of Finance, which collects data from institutional investor filings.

Moreover, we have contacted a large commercial bank and obtained proprietary mutual fund ratings data for the end of February 2010 and for the end of March 2010. In Israel, the largest commercial banks are also the major financial advisors controlling the majority of the retail banking market and offering financial advisory services to their clients free of charge. These banks rely on internal rating systems to produce mutual fund rankings that guide their advisory staff in interactions with clients seeking investment advice. Thus, it is reasonable to assume that advised clients invest primarily, if not exclusively, in mutual funds that are highly ranked by the banks' systems. The proprietary database of mutual fund ratings rendered to us consists of 519 ranked fixed-income mutual funds, which were assigned in March<sup>20</sup> 2010 into one of four ranking categories. In our empirical analysis we regroup the funds into high-ranked funds (the two highest rankings) and low-ranked funds (the two lowest rankings and funds that lack ranking data).

Finally, we use hand-collected data on mutual fund advertisements during February 14th–April 6th, 2010 to investigate whether our results could be explained by changes in the marketing of various mutual funds following the exclamation mark reform. We use either  $Num\_Ads$  or  $Val\_Ads$  interchangeably, where  $Num\_Ads_{n,t}$  is the number of advertisements for fund  $n$  on day  $t$ , and  $Val\_Ads_{n,t}$  is the value of advertisements for fund  $n$  on day  $t$ .  $Val\_Ads_{n,t}$  is calculated as the product of the number of ads multiplied by their size (where a full-page newspaper ad equals 1), multiplied by the value of the page in the specific newspaper in which the ad appeared in thousands of shekels,<sup>21</sup> and divided by the number of mutual funds mentioned in the ad.

Our main identification strategy (the first strategy) concentrates on the treated funds only. Treated funds that have not yet received the exclamation mark on the examined day serve as a control group. Using this control, we estimate the difference between the pre- and post-reform periods for the treated funds (using the relevant reform dates for each fund). This strategy arguably avoids estimation “noise,” which could be generated by less relevant funds in the control group. We also deploy an additional strategy (the second strategy) that uses: 1) matched<sup>22</sup> or 2) other fixed-income mutual funds<sup>23</sup> as alternative control groups. Hence, we use three *excluding* control groups – treated funds, matched funds, other funds.

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<sup>20</sup> We also use the ranking in February 2010 to ensure that the exclamation mark reform did not cause an across-the-board decrease in the ranking of affected funds.

<sup>21</sup> Based on data from *Yifat* Media Research, a private firm that estimates the value of a newspaper's page based on its exposure.

<sup>22</sup> Matched untreated fixed-income mutual funds. We use propensity score matching (PSM) to match the treated mutual funds to similar mutual funds that did not add an exclamation mark to their names throughout March 2010. The details of the matching procedure are in Appendix B.

<sup>23</sup> All untreated and non-matched fixed-income mutual funds. This is the largest control group and the one that is possibly the least similar to the treated group. However, we use it to ensure that the results are not driven by the specific matching procedure.

We employ the DID methodology to estimate the impact of adding an exclamation mark to mutual fund names on their daily flows, *vis-à-vis* the flows of the treated mutual funds that did not add the mark to their names by that day,<sup>24</sup> or the flows of matched/other fixed-income mutual funds that were not subject to the reform. The first difference is between funds that received the exclamation mark and those that did not receive the mark (yet or at all), and the second is between the days prior to and following the adoption of the exclamation mark. In each estimation strategy we concentrate on three different time windows as follows:

- i.  $\pm 10$  trading days relative to the mark addition (different days for different funds between February 14<sup>th</sup> and April 6<sup>th</sup>). For the treated funds, this period is based on the actual date of the name modification. For the matched funds, we take the modification date of the paired treated fund. For other funds, the relevant date was determined according to the date of the name changes in the same management firm. In this specification, each fund has observations in the specific time period relevant to that fund.
- ii. All days within the sample period (February 14<sup>th</sup>-April 6<sup>th</sup>). In this specification all funds have the same (fixed) period around the staggered reform implementation. The period begins 10 trading days before the first fund mark addition and ends 10 trading days after the last fund mark addition. The identification of the days before/after the mark addition is, again, based on the actual mark addition to each treated fund, the mark addition to the paired fund or the mark addition to the treated funds of the management firm, for the treated funds, matched control funds and other control funds respectively;
- iii. Before and after the reform window (February 14<sup>th</sup>-February 26<sup>th</sup> and March 18<sup>th</sup>-April 6<sup>th</sup>). This specification excludes the implementation period (forgoing the staggered implementation), and thus it is more suitable for the second identification strategy. In the specifications using this time window, we do not make use of the specific date of the exclamation mark addition for each fund. This also means that in the first identification strategy that focuses on the treated funds this window only reflects the second difference (after the reform vs. before the reform) and not any difference between treated mutual funds.

Following the first strategy, we regress the scaled net inflows of the fund on the exclamation mark dummy variable as well as on “fund” and “day” fixed effects:

$$(1) \text{Flow}_{n,t} = \alpha + \beta^* \text{excl\_mark}_{n,t} + \lambda_t + \varphi_n + \varepsilon_{n,t},$$

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<sup>24</sup> We stress again that the implementation of the reform was staggered, and the treated mutual funds received the mark on different days between March 1<sup>st</sup> 2010 and March 18<sup>th</sup> 2010. The unique setting combined with the daily data allows us to use treated funds during pre-change days as a control group.

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 February 2010;  $excl\_mark_{n,t}$  is a dummy variable that equals 1 for mutual fund  $n$  on day  $t$  if the fund's name on this day included an exclamation mark and equals zero otherwise;  $\lambda_t$  is the day fixed effect; and  $\varphi_n$  is the mutual fund fixed effect. We cluster standard errors at the management firm (the fund's family) level.<sup>25</sup> Our main interest is in the estimation of  $\beta$ , which captures the difference-in-difference effect of the exclamation mark on fund flows.

Equation (1) estimates the effect of receiving the exclamation mark, while controlling for all the fund's attributes and for possible day-of-the-month effects. It facilitates the measurement of the reform's effect on fund flows *above and beyond* fund heterogeneity and time effects. Since the fixed-income mutual funds that received the exclamation mark in March 2010 were primarily corporate bond funds, we also repeat the estimation focusing solely on funds specializing in corporate bond investments. This is designed to reduce possible noise generated by other types of fixed-income mutual funds that may be sensitive to factors other than those affecting the treated funds.

Our second identification strategy focuses on different control groups. By definition, this estimation strategy, as opposed to the main identification strategy (Equation 1), excludes the treated funds in the pre-treatment period from the control group. Formally, here, we estimate regression of the form:

$$(2) \Delta Flow_n = \alpha + \beta * treated_n + \varepsilon_n,$$

where  $\Delta Flow_n$  is the difference in the scaled net inflows of mutual fund  $n$  between the post-reform period and the pre-reform period, and  $treated_n$  is a dummy variable that equals 1 for treated mutual funds, and zero otherwise. Again, we cluster standard errors at the management firm level. Our primary coefficient of interest is  $\beta$ , which measures the difference-in-difference effect of the exclamation mark on fund flows.

#### 4. The effect of the reform's implementation on mutual fund flows

Table 2 presents our main results from a multivariate estimation of the reform effect that focuses on the treated mutual funds (Equation 1). Columns (1)–(3) present the results of estimating Equation (1) using the three above-mentioned time windows (i)–(iii) respectively. Columns (4)–(6) replicate the estimation for the restricted sample of corporate bond mutual funds. Across all these specifications, the addition of an exclamation mark to the mutual fund name is associated with a highly statistically significant decline in

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<sup>25</sup> In the robustness tests that follow, we examine clustering on other dimensions, including double-clustering at the fund / management firm and time levels.

daily net inflows into this fund. The table demonstrates that investor selection of mutual funds is strongly affected by the addition of the exclamation mark, above and beyond any general affinity towards certain funds, or preference for certain days in March 2010.<sup>26</sup>

**Table 2 –The effect of the exclamation mark on daily fund flows—the first identification strategy**

The table reports the results of OLS panel regressions of net mutual fund inflows (in percentages, creations minus redemptions scaled by fund size at the beginning of the relevant month) on *excl\_mark* (a dummy variable which equals 1 for funds that received an exclamation mark from the day they received the mark and onward, and 0 otherwise), as well as on a fund fixed effect and on a day fixed effect. Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. Columns (1)–(3) present the results of estimating Equation (1) using the three time windows, as follows. Column 1 presents the results for  $\pm 10$  trading days relative to the mark addition (different days for different funds during the February 14th–April 6<sup>th</sup> period). This period is based on the actual date of the name modification. In this specification, each fund has observations in the specific time period, which is relevant to that fund. Column 2 presents the results for all days within the sample period (February 14th–April 6<sup>th</sup>). In this specification all funds have the same (fixed) period around the staggered reform implementation. Column 3 presents the results for the pre-reform and the post-reform windows (February 14th–February 26<sup>th</sup>, and March 18<sup>th</sup>–April 6<sup>th</sup>). This specification excludes the implementation period. Columns 4–6 repeat the estimations of Columns 1–3 respectively, restricting the mutual fund universe solely to funds specializing in corporate bond investments.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>excl_mark</i>	-0.82*** (0.1)	-0.57*** (0.1)	-0.98*** (0.2)	-0.72*** (0.1)	-0.60*** (0.1)	-1.26*** (0.2)
Trading day fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Mutual fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,860	3,340	1,973	1,360	2,462	1,467
Adjusted R <sup>2</sup>	46.0%	35.7%	34.5%	48.3%	41.5%	40.3%

This decline is also economically important, as it is 2.5 times larger (Column 2 of Table 2) in absolute terms than the unconditional mean of daily net inflows (0.5 standard deviations). The cumulative effect over March 2010 of the exclamation mark addition on the treated funds vis-a-vis the treated funds that have not yet received the mark totals -8.70 percent. We emphasize that this is not the actual flow, but rather the change versus the counterfactual expected flow. As a comparison, Cooper et al. (2005) document cumulative abnormal flows of 8.44 percent in the three months following mutual fund investment-style related name-change.

<sup>26</sup> The results are robust across different subsamples constructed by different maximum equity exposure thresholds according to the funds' investment policy statements (IPS). We elaborate on this issue in the robustness tests section.



Our main results remain qualitatively similar when we employ the second identification strategy. In Table 3, Columns (1)–(3) present the results of estimating Equation (2) using the three above-mentioned time windows (i)–(iii) respectively. Columns (4)–(6) replicate the estimation for the restricted sample of corporate bond mutual funds. Panel A of Table 3 uses PSM matched funds as a control group, and Panel B of Table 3, in turn, makes use of other fixed-income mutual funds (excluding matched funds) as controls. The table plausibly shows that our results are not driven by the choice of the specific control group.

**Table 3 –The effect of the exclamation mark on daily fund flows—the second identification strategy**

The table reports the results of OLS cross-sectional regressions of the difference in the scaled net inflows (in percentages, creations minus redemptions scaled by fund size at the beginning of the relevant month) between the post-reform period and the pre-reform period on *the indicator variable of the fund being treated* (a dummy variable that equals 1 for funds that received an exclamation mark, and 0 otherwise). Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. Panel A reports estimations for the treated and PSM matched funds (matched untreated fixed-income mutual funds), while Panel B reports estimations for the treated and other fixed-income mutual funds (all untreated and not matched fixed-income mutual funds). Columns (1)–(3) present the results of estimating Equation (2) using the three time windows, as follows. Column 1 presents the results for  $\pm 10$  trading days relative to the mark addition (different days for different funds during the February 14th–April 6<sup>th</sup> period). For the treated funds, this period is based on the actual date of the name modification. For the matched funds, we take the actual date of the paired treated fund. For other funds, the relevant date was determined according to the date of the name changes in the same management firm. Column 2 presents the results for all days within the sample period (February 14th–April 6th). In this specification all funds have the same (fixed) period around the staggered reform implementation. Column 3 presents the results for the pre-reform and the post-reform windows (February 14th–February 26th, and March 18th–April 6th). This specification excludes the implementation period. Columns 4–6 repeat the estimations of Columns 1–3 respectively, restricting the mutual fund universe solely to funds specializing in corporate bond investments.

Panel A: PSM matched funds

	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated</i>	-0.67*** (0.1)	-0.84*** (0.1)	-0.92*** (0.2)	-0.70*** (0.2)	-0.89*** (0.2)	-0.98*** (0.2)
Number of observations	199	199	199	103	103	103
<i>Adjusted R</i> <sup>2</sup>	12.4%	12.8%	9.7%	8.6%	9.2%	7.4%

Panel B: Other fixed-income mutual funds

	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated</i>	-0.65*** (0.1)	-0.80*** (0.1)	-0.93*** (0.2)	-0.75*** (0.1)	-0.91*** (0.1)	-1.02*** (0.2)
Number of observations	636	620	621	283	278	286
<i>Adjusted R</i> <sup>2</sup>	7.7%	10.9%	10.4%	14.1%	15.4%	12.7%

In light of the large impact of the reform and in line with previous papers (e.g. Kaniel and Parham, 2017) we suspect mutual fund managers may react strategically to the exclamation mark addition. Indeed, looking at mutual fund holdings we find a ‘mark of Cain effect’: funds that were “stained” by the exclamation mark designation increased their “junk bond” holdings (as percent of their AUM) in March 2010 significantly more than other fixed-income mutual funds (t-stat=1.8). While this finding is only suggestive, it may indicate that the policy designed to emphasize the risk embedded in high-yield bond holdings has actually encouraged affected funds to increase this risk.

Recall that the reform emphasized a specific risk segment. It is thus interesting to examine if its effect differs across total fund risk. To address this issue we repeat Estimation (1), this time distinguishing between high-risk funds and low-risk funds according to the historical standard deviation of fund returns.<sup>27</sup> We find that both types are hurt by the exclamation mark addition, as there is a significant drop in net flows into affected funds, regardless of their total risk. The impact, though, is stronger for the riskier funds—that is, the funds with higher past standard deviation of returns experienced a more severe reduction in flows following the mark addition as manifested by a significantly negative interaction term of the exclamation mark variable and the past high-volatility indicator variable.

## 5. The impact of the reform announcement

In this section we examine mutual funds’ reaction to the forthcoming regulation in the period leading up to its implementation.<sup>28</sup>

Examining the reform, it is important in the first place to emphasize that if it embedded any new information then we would expect investors to react to the information upon the reform announcement. Specifically, looking at the strong reaction of investors to the addition of the exclamation mark, one may wonder whether increased risk salience was the sole factor in investor decision-making or whether an altered perception of fund risk also came into play. Investors could have interpreted the new regulation as a signal of the regulator’s risk assessment. We find this to be unlikely, since previous regulation that required specific disclosure of high-yield bond holdings in excess of maximum stock exposure was already in place and should have demonstrated regulatory concerns regarding this risk. Moreover, if investors did interpret the new regulation as a regulatory signal about mutual fund risks, they could have reacted upon its

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<sup>27</sup> Specifically, we consider a mutual fund to be high-risk if the standard deviation of its monthly returns in the three years preceding the reform is above the median standard deviation of the treated mutual funds in this period.

<sup>28</sup> It should be stressed that there were no other regulatory interventions in the mutual fund industry during this period.

announcement in September 2009, and diverted flows from the mutual funds that were expected to receive the exclamation mark and towards other funds. We examine investor reaction to the first draft of the new rule, which, unlike the final rule, was not accompanied by an actual change in fund names, and do not find convincing evidence to support this conjecture.<sup>29</sup> Importantly, any informational effect of the new regulation should have affected investors upon its announcement and not upon the implementation that is the focus of this study.

More concerning for our study than investors' reaction to the reform announcement, may be funds' reaction, and specifically mutual fund managers' behavior in the run-up period between the reform announcement and its implementation. To address the possibility of selection out of 'the exclamation mark group' we trace fixed-income mutual fund behavior during the interim period between the announcement and implementation of the reform—September 2009 to February 2010. Fund managers had two alternative, though not mutually exclusive, ways to avoid having to incorporate the exclamation mark into their names. The first was to adjust the investment policy statement (IPS) to increase maximum equity holdings, and the second was to sell high-yield bonds until such holdings were beneath the threshold of the fund's maximum equity exposure. They could also adopt both tactics in tandem. The resetting of maximum exposure thresholds necessitates a special decision by the fund's board and notification to the public, and it is thus clearly the more burdensome and salient option. To be sure, we screened all mutual fund reports to the public during the interim period, and found 29 reports disclosing IPS changes in the relevant direction. In 27 cases, it appears that the change was 'genuine',<sup>30</sup> and excluding the other two funds<sup>31</sup> from our sample does not alter the results. The second adjustment alternative requires neither a board decision nor a specific disclosure. We note, however, that high-yield bond holdings may fluctuate for various reasons unrelated to the reform.

In order to more systematically pinpoint funds that might have avoided the exclamation mark using either one of these methods, we make use of the filings on holdings of high-yield bonds in excess of

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<sup>29</sup> Particularly, we use a difference-in-difference estimation to examine the impact of the new regulatory draft on net inflows into fixed-income mutual funds that were expected to receive an exclamation mark (according to their September 2009 disclosure of holdings in high-yield bonds in excess of their maximum equity exposure) versus fixed-income mutual funds that were not expected to be affected by the new requirement. Most of the specifications we checked indicate that the release of the draft rule did not lead to a statistically significant decline in flows to the funds that were expected to be affected by the reform. The results are available upon request.

<sup>30</sup> Because: (a) the fund also changed its foreign currency exposure, or (b) the fund changed its equity exposure beyond what was required to avoid the exclamation mark, or (c) the fund did not possess borderline holdings in high-yield bonds to begin with.

<sup>31</sup> Both these funds pertain to one fund management firm, both changed the maximum equity exposure from 0% to 10%, where actual high-yield bond holdings were below 10 percent (around 8% in one fund, and around 4% in the other), and after changing the IPS in December 2009 neither of these funds invested in equities.

maximum stock exposure that fund managers were required to provide prior to the reform. Based upon these reports, we identify a group of 'suspect funds', i.e., fixed-income mutual funds that reported high-yield bond holdings in excess of their maximum equity exposure at least once between September 2009 and February 2010,<sup>32</sup> but did not ultimately add an exclamation mark to their names in March 2010. We found 198 'suspect funds'—mutual funds that possibly avoided the forthcoming regulation by increasing their maximum equity exposure and/or reducing high-yield bond holdings in the run-up to the reform.

First, we rerun the estimation based on Equation (2), excluding the 'suspect funds' from the control group. We present the results of this estimation for the treated funds and the PSM control group excluding the 'suspect funds' in Panel A of Table 4, again, using the three different time windows (i)–(iii) in Columns (1)–(3) respectively. Columns (4)–(6) replicate the estimation for the treated funds and other fixed-income mutual funds (excluding matched funds), utilizing the periods (i)–(iii) correspondingly. As the table shows, the results are robust to the exclusion of the 'suspect funds' from the control group. Even without these funds in the control group, the addition of the exclamation mark was detrimental to mutual funds' net inflows relative to those of the non-treated funds.<sup>33</sup>

The 'suspect funds' are not merely potential noise in the data, but are interesting in their own right as they are arguably very similar to the funds that adopted the exclamation mark. Despite their similarity, ultimately these 'suspect funds' were not affected by the reform. Hence, they constitute a natural control group to the treated funds. Indeed, we find relatively similar trends in the daily net flows of the treated funds and the 'suspect funds' in the days preceding the reform (Figure 1, Panel A), though the trends seem to be actually parallel only for the suspect funds pertaining to our matched control group (Figure 1, Panel B).

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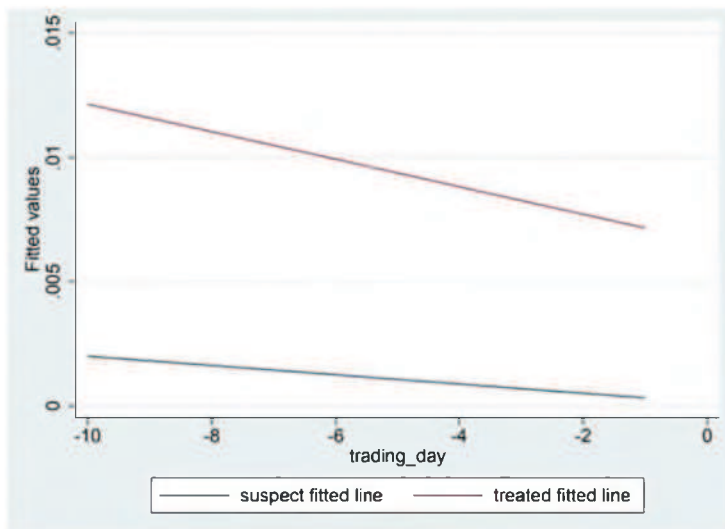
<sup>32</sup> Fixed-income mutual funds, which reported holdings of high-yield corporate bonds in excess of the maximum stock exposure at least once during the run-up period, were included in the 'suspect fund' group. The results of the empirical analysis are similar if we only focus either on funds that reported holdings of high-yield corporate bonds in excess of their maximum equity exposure when the new regulation was first announced in September 2009, or those that issued such reports just prior to its implementation in February 2010. These results are available from the authors upon request.

<sup>33</sup> To alleviate concerns that the results can be explained by some management firms' systematic avoidance of the exclamation mark reform, we also repeated the estimations excluding the quartile of managers with the highest proportion of 'suspect funds'. The results, available from the authors upon request, are again similar to the results from the estimation presented in Table 3.

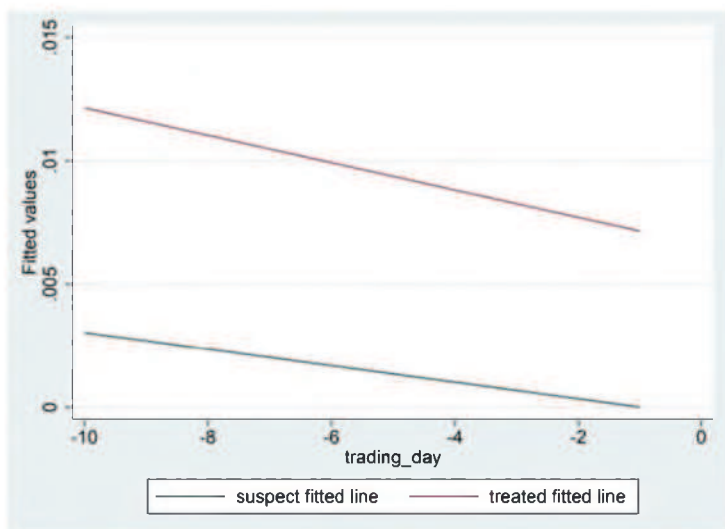
**Figure 1 – Treated funds versus ‘suspect funds’**

The figure presents a simple linear approximation of the daily scaled net inflows (fraction) in ten trading days preceding the reform implementation period separately for treated funds (fixed-income mutual funds that added an exclamation mark to their names) and ‘suspect funds’ (fixed-income mutual funds that reported high-yield bond holdings in excess of their maximum equity exposure at least once between September 2009 and February 2010, but did not ultimately add an exclamation mark to their names in March 2010). The first panel presents these trends for the treated funds and all ‘suspect funds’, and the second panel focuses on ‘suspect funds’ pertaining to the propensity score matched control group.

**Panel A – Treated funds and ‘suspect funds’**



**Panel B – Treated funds and matched ‘suspect funds’**



Therefore, in Panel B of Table 4, we repeat the estimation based on Equation (2), but this time only for the restricted subsample of treated funds and suspect funds. Columns (1)–(3) present the time windows (i)–(iii) in the respective order. The results again demonstrate that the addition of an exclamation mark significantly affected mutual fund net inflows. This suggests that even with respect to funds that were ex-ante similar in the relevant risk dimension, the fixed-income mutual funds for which risk became more salient suffered relative net daily outflows.

**Table 4 – The effect of the exclamation mark on daily fund flows either excluding ‘suspect funds’ or using them as a control group**

The table reports the results of OLS cross-sectional regressions of the difference in the scaled net inflows (in percentages, creations minus redemptions scaled by fund size at the beginning of the relevant month) between the post-reform period and the pre-reform period on *the indicator variable of the fund being treated* (a dummy variable that equals 1 for funds that received an exclamation mark, and 0 otherwise). Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. Panel A presents the results for the treated funds and the PSM control group (Columns 1–3) or other funds control group (Columns 4–6) excluding the suspect funds (fixed-income mutual funds that reported high-yield bond holdings in excess of their maximum equity exposure at least once between September 2009 and February 2010, but did not ultimately add an exclamation mark to their names in March 2010). Panel B reports estimations for the restricted subsample of treated funds and the suspect funds as a control group. Columns (1)–(3) of both Panels present the results of estimating Equation (2) using the three time windows, as follows. Column 1 presents the results for  $\pm 10$  trading days relative to the mark addition (different days for different funds during the February 14th–April 6<sup>th</sup> period). For the treated funds, this period is based on the actual date of the name modification. For the matched funds, we take the actual date of the paired treated fund. For other funds, the relevant date was determined according to the date of the name changes in the same management firm. Column 2 presents the results for all days within the sample period (February 14th–April 6th). In this specification all funds have the same (fixed) period around the staggered reform implementation. Column 3 presents the results for the pre-reform and the post-reform windows (February 14th–February 26th, and March 18th–April 6th). This specification excludes the implementation period. Columns 4–6 repeat the time windows of Columns 1–3 respectively.

Panel A: excluding ‘suspect funds’

	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated</i>	-0.60*** (0.1)	-0.77*** (0.1)	-0.83*** (0.2)	-0.65*** (0.1)	-0.79*** (0.1)	-0.92*** (0.2)
Number of observations	146	146	146	497	482	479
<i>Adjusted R</i> <sup>2</sup>	6.5%	6.9%	5.0%	8.9%	12.4%	12.2%

Panel B: using ‘suspect funds’ as a control group

	(1)	(2)	(3)
<i>treated</i>	-0.60*** (0.1)	-0.81*** (0.1)	-0.96*** (0.2)
Number of observations	298	297	301
<i>Adjusted R</i> <sup>2</sup>	9.7%	12.3%	10.9%

## 6. Which investors were affected by the reform

We have shown that the reform had a strong impact on net inflows to fixed-income mutual funds. The question now is whether and to what degree these results stem from the inflows, the outflows, or both. A seminal paper by Barber and Odean (2008) shows that investors tend to purchase attention-grabbing stocks. Their research does not document a similar phenomenon in investors' selling behavior, since retail investors tend to sell the subset of securities they already own, and seldom take short positions. These results suggest that in our setting, existing investors (prior to the reform) will take note of the added exclamation mark and may tend to sell. The effect on potential buyers is less clear, as while the exclamation mark signals enhanced risk, thus deterring potential investors, the increased attention may drive purchases.<sup>34</sup>

A series of experiments conducted by Barron, Leider, and Stack (2008) offers a different angle: The researchers find that people may make riskier decisions if they have already experienced a series of safe outcomes. This suggests that in our context, current investors in treated mutual funds may be less affected by the reform than potential new investors who have not yet gained positive experience from this investment. Moreover, current investors feel especially competent about the source of risk, hence in this situation, it is reasonable to assume that the status quo bias (Samuelson and Zeckhauser, 1988) will emerge more strongly in selling behavior. This is particularly relevant when potential buyers' risk aversion over a bet is strengthened by highlighting (!) their feelings of incompetence (Fox and Tverski, 1995).

To address this question empirically, we repeat the Equation (1) estimations, this time distinguishing between outflows and inflows. The results in Table 5 show that both inflows into and outflows from the treated mutual funds were affected by the addition of the exclamation mark. Inflows into treated funds were lower than expected absent the reform, and outflows from treated funds were higher than the expected outflows. Though both the inflows and the outflows were affected by the reform, the relative economic magnitude of the effect differs. The daily increase in outflows accounts for less than one-third of the average daily fund redemptions, while the daily reduction in inflows represents about one-and-a-third times the average daily new fund investments. This difference may be attributable to the high yields that investors in treated mutual funds gained by holding these funds in the period prior to the reform.<sup>35</sup> This positive experience could have made current investors in the treated mutual funds less sensitive to the increased risk salience than their potential future counterparts who did not enjoy the aforementioned yields.

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<sup>34</sup> Hirshleifer, Myers, Myers, and Theo (2002) and Lee (1992) find that investors are net buyers following earnings surprises—both positive and negative.

<sup>35</sup> Fixed-income mutual funds that added an exclamation mark to their names yielded an average return of 36% in the 12 months that preceded March 2010. This extraordinary rate of return was the result of a strong recovery of the markets, and Israel's corporate bond market in particular, following the 2008 global financial crisis.

**Table 5 –The effect of the exclamation mark on daily fund flows by direction**

The table reports the results of OLS panel regressions (Equation 1) of mutual fund inflows (creations scaled by fund size, in percentages) in Columns 1–3, and outflows (redemptions scaled by fund size, in percentages) in Columns 4–6 on *excl\_mark* (a dummy variable that equals 1 for funds that received an exclamation mark from the day they received the mark and onward, and 0 otherwise). Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. Columns 1 and 4 present the results for  $\pm 10$  trading days relative to the mark addition (different days for different funds during the February 14th–April 6<sup>th</sup> period). This period is based on the actual date of the name modification. In this specification, each fund has observations in the specific time period, which is relevant to that fund. Columns 2 and 5 present the results for all days within the sample period (February 14th–April 6th). In this specification all funds have the same (fixed) period around the staggered reform implementation. And finally, Columns 3 and 6 present the results for the pre-reform and the post-reform windows (February 14th–February 26th, and March 18th–April 6th). The latter specification excludes the implementation period.

	INFLOWS			OUTFLOWS		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>excl_mark</i>	-0.68*** (0.1)	-0.46*** (0.1)	-0.85*** (0.2)	0.13** (0.1)	0.11* (0.1)	0.13*** (0.1)
Trading day fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Mutual fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,860	3,340	1,973	1,860	3,340	1,973
Adjusted $R^2$	54.5%	45.6%	46.0%	32.0%	33.4%	34.3%

Mutual funds allow retail clients access to professional asset management, and facilitate their exposure to financial markets. These funds, however, are not designed exclusively for the retail market, and they also attract more sophisticated investors. A separate analysis on whether increased salience affects professional investors is particularly important in light of the impact these investors may have on financial market functioning. Several studies have focused on the question of whether sophisticated investors are susceptible to the same behavioral biases exhibited by retail investors. Some of these studies evaluate the effect of specific behavioral biases on professional investors. Fund managers, for example, were found to be prone to loss aversion (Olsen, 1997) and to overconfidence (Puetz and Ruenzi, 2011). Other papers suggest that experience and professionalism can significantly mitigate the impact of behavioral biases on investment decision-making. The disposition effect, for example, seems to be substantially weaker among sophisticated investors than among retail investors (Shapira and Venezia, 2001; Feng and Seasholes, 2005). Similar conclusions were reached with respect to other biases, such as the endowment effect (List, 2003) and familiarity bias (Grinblatt and Keloharju, 2000b). In the case of mutual funds, Chen, Goldstein and Jiang (2010) show that it is the retail investors rather than the institutional (sophisticated) investors that cause stronger outflows from illiquid funds following bad performance.



Many papers consider local institutional investors synonymous with sophisticated investors. In Israel, however, institutional investors barely invest in local mutual funds, preferring to invest directly in traded securities, including index-tracking ETNs, instead. In contrast, foreign investors do maintain holdings in Israeli mutual funds, investing at that time in 638 fixed-income funds (86 percent of fixed-income funds with available foreign holdings data).<sup>36</sup> At the end of February 2010 they had positive holdings in 96 percent of the treated funds and in 85 percent of the control funds. The literature considers foreign investors more sophisticated than the public at large (Grinblatt and Keloharju, 2000a).<sup>37</sup> Thus, to investigate whether sophisticated investors in mutual funds were affected by the increased risk salience stemming from the addition of the exclamation mark, we use detailed proprietary data on foreign investor holdings of Israeli mutual funds.

**Table 6 – The effect of the exclamation mark on monthly foreign investor flows to mutual funds before and after the reform**

The table reports the results of OLS panel regressions of net mutual fund inflows by foreign investors (change in foreign holdings adjusted for changes in price and the NIS/USD exchange rate, and scaled by foreign investors holdings in the fund at the end of the previous month) and on *march\_treated* (a dummy variable that equals 1 for funds that received an exclamation mark from March 2010 and onwards, and 0 otherwise). Standard errors, robust to heteroscedasticity, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. Columns 1 reports estimations for treated and matched mutual funds; Column 2 reports the estimation results for foreign holdings of all other fixed-income mutual funds (excluding the matched funds). Columns 3 and 4 replicate the estimations of Column 1 and 2, respectively, restricting the mutual fund universe solely to funds specializing in corporate bond investments.

	(1)	(2)	(3)	(4)
march	1.249 (0.950)	0.012 (0.075)	2.096 (1.775)	0.052 (0.118)
treated	0.272** (0.107)	0.155 (0.118)	0.209 (0.148)	0.134 (0.163)
march_treated	-1.337 (0.972)	-0.108 (0.173)	-2.282 (1.760)	-0.238 (0.197)
Number of observations	363	1,104	195	512
Adjusted R <sup>2</sup>	0.7%	0.1%	1.5%	0.1%

<sup>36</sup> We lack foreign holdings data on 13 of the fixed-income mutual funds in our sample.

<sup>37</sup> However, recent research by Swan and Westerholm (2016) suggests that foreign investors in Finland no longer achieve superior performance. The authors ascribe this surprising finding, *inter-alia*, to the relative informational disadvantage.

Table 6 presents the results of a differences-in-differences OLS estimation of the effect of the reform on foreign investor net inflows into Israeli fixed-income mutual funds.<sup>38</sup> Comparing foreign investor net flows in March 2010—after the reform initiation—to those in February 2010—prior to the reform, most specifications seem to indicate that the reform did not precipitate a reduction in foreign investor inflows into the treated mutual funds. This suggests that, in distinction to retail investors,<sup>39</sup> foreign investors were not affected by the increased risk salience, and incorporated available (pre-reform) information more carefully. This conforms to the notion that financially sophisticated investors are less prone to suffer from a limited attention bias. Anecdotal evidence from local institutional investors' holdings of Israeli fixed-income mutual funds supports the notion that sophisticated investors were not swayed by the addition of the exclamation mark.<sup>40</sup>

We make an additional step to identify the exact underlying channel of the reform distinguishing between different retail investors. Households may differ from one another in their investment behavior. Specifically, some households seek professional financial advice prior to investing, while others act on their own advice. We use proprietary mutual fund ratings that form the basis for mutual fund investment consultations offered to retail clients by one of the two largest financial advisors in the country.<sup>41</sup> It is worthwhile to mention that these rankings don't seem to be influenced by the reform in the first place: We do not detect evidence of a systemic reduction in the ratings of treated funds following the exclamation mark reform. Next, we group the fixed-income funds into high-ranked funds and low-ranked funds.<sup>42</sup> Our premise is that advised clients invest in the mutual funds with high ranking according to the banks' systems, while other clients also invest in low-ranked mutual funds. Thus, in Table 7 we repeat the Equation (1) estimations, including the interaction variable between the exclamation mark and the high-ranked fund indicator.<sup>43</sup>

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<sup>38</sup> Due to data limitations, this specification is based on monthly data rather than daily data, comparing March flows to February flows. The results are qualitatively similar if we take a more conservative approach that foregoes the actual month of the reform, i.e. if we compare the foreign flows calculated for February 2010 with those calculated for April 2010 rather than March 2010.

<sup>39</sup> We emphasize that this difference is not driven by the use of monthly data. Our main inferences are unchanged if we conduct the estimation at the monthly level (i.e. combining the daily data into monthly observations and comparing March/April flows to February flows).

<sup>40</sup> Local institutional investors (pension funds, provident funds, and insurance firms) are financially sophisticated investors that are also extremely familiar with the local capital market and well aware of regulatory developments. However, Israeli institutional investors rarely invest in local mutual funds, preferring instead to invest directly in the underlying traded securities. Upon the examination of data, based on the institutional investors' filings, it turns out that institutional investors collectively had holdings in only 10 fixed-income mutual funds in December 2009 and March 2010. A back-of-the-envelope calculation based on these very sparse holdings suggests that local institutional investors were also not affected by the reform.

<sup>41</sup> For more in-depth details, see Mugerma, Hecht and Wiener (2019).

<sup>42</sup> Including funds that lack ranking data. The results are robust to the exclusion of these funds.

<sup>43</sup> The results are qualitatively similar for the separate regressions for high-ranked and low-ranked fixed income funds.

**Table 7 – The effect of the exclamation mark on daily fund flows, distinguishing between high- and low-ranked funds**

The table reports the results of OLS panel regressions of net mutual fund flows (Columns 1–3), inflows (Columns 4–6), and outflows (Columns 7–9) on *excl\_mark* (a dummy variable that equals 1 for funds that received an exclamation mark from the day they received the mark and onward, and 0 otherwise) and on the interaction variable of high-ranked mutual fund and the exclamation mark, as well as on a fund fixed effect and on a day fixed effect. Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. The sample universes are as follows: Columns 1, 4, and 7 present the results for  $\pm 10$  trading days relative to the mark addition (different days for different funds during the February 14th–April 6<sup>th</sup> period). This period is based on the actual date of the name modification. In this specification, each fund has observations in the specific time period, which is relevant to that fund. Columns 2, 5, and 8 present the results for all days within the sample period (February 14th–April 6th). In this specification all funds have the same (fixed) period around the staggered reform implementation. And finally, Columns 3, 6, and 9 present the results for the pre-reform and the post-reform windows (February 14th–February 26th, and March 18th–April 6th). The latter specification excludes the implementation period.

	NET FLOWS			INFLOWS			OUTFLOWS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>excl_mark</i>	-0.57*** (0.2)	-0.35*** (0.1)	-0.80*** (0.2)	-0.43** (0.2)	-0.27** (0.1)	-0.70*** (0.2)	0.14** (0.1)	0.08 (0.1)	0.10*** (0.0)
<i>high-ranked*excl_mark</i>	-0.52* (0.3)	-0.49* (0.3)	-0.50* (0.3)	-0.53* (0.3)	-0.43 (0.3)	-0.40 (0.3)	-0.00 (0.0)	0.06 (0.0)	0.09* (0.0)
Trading day fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mutual fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,860	3,340	1,973	1,860	3,340	1,973	1,860	3,340	1,973
<i>Adjusted R</i> <sup>2</sup>	47.0%	36.5%	35.4%	55.5%	46.2%	46.7%	32.0%	33.4%	34.4%

Columns 1–3 of Table 7 show that the reform effect is statistically significant for both types of funds, suggesting that both households seeking financial advice and those that act on their own were affected by the exclamation mark reform. The mildly significant result for the interaction term of the exclamation mark and the high ranking may suggest an even stronger effect on the advised clients, perhaps driven by financial advisors' aversion to the increased risk salience. In addition, we estimate the effect of the exclamation mark on high-ranked and low-ranked funds, this time distinguishing the inflows from the outflows. The results, presented in Columns 4–9 of Table 7, reinforce the conclusion from Table 5 that the reform had a larger and more significant effect on fund inflows than on fund outflows. This result is especially pronounced for the high-ranked funds, whose inflows had been most affected by the addition of the exclamation mark. The lower impact on the outflows from high-ranked funds seems to rule out the possibility of financial advisors actively reaching out to existing exclamation mark fund holders to caution them about the change.

## 7. Robustness tests

### 7.1. Marketing efforts

In previous sections, we documented a causal relationship between the addition of the exclamation mark to mutual fund names and the flows into these funds. This relationship, however, may stem from a self-fulfilling prophecy. It is possible that the fund management firms anticipated the adverse effect of the exclamation mark on fund flows<sup>44</sup> and reacted simultaneously by adjusting marketing efforts. Specifically, if fund managers reacted to the reform by reducing advertising for treated funds, and if investors were indeed positively affected by fund advertising, then our results may be driven by a self-fulfilling prophecy, rather than by the increased risk salience engendered by the reform.

In order to examine this alternative hypothesis, we search all three national business newspapers in Israel for ads for specific fixed-income mutual funds throughout the sample period. For each advertisement we also record its size and the number of mutual funds mentioned in it.<sup>45</sup> We begin our analysis of the effect of the marketing efforts by directly testing whether mutual fund management firms did indeed adjust their marketing efforts to the reform. Specifically, we repeat our main estimation (Equation (1)) but replace the dependent variable with either  $Num\_Ads$  or  $Val\_Ads$ , where  $Num\_Ads_{n,t}$  is the number of advertisements for fund  $n$  on day  $t$  and  $Val\_Ads_{n,t}$  is the shekel value of this advertising for fund  $n$  on day  $t$ . The results, available from the authors upon request, show that advertising for the treated funds was somewhat scaled down both in the number and in the value of advertisements following the exclamation mark reform, but that this effect is not statistically significant.

Since we detect some marketing reaction to the reform, we examine whether this adequately accounts for the main findings. To this end, we:

- (a) Repeat the main estimation (Equation (1)), excluding all fixed-income mutual funds that ever advertised in the aforementioned business newspapers throughout the sample period, i.e., all funds for which  $Num\_Ads_{n,t} > 0$  for at least one day in the sample.
- (b) Add  $Num\_Ads_{n,t}$  as another explanatory variable to Equation (1).

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<sup>44</sup> We note that the 'lost' flows of the treated funds did not end up in the untreated funds of the same management firm. Using our daily data and the DID methodology, we estimate the effect of the exclamation mark addition on the untreated funds. Specifically, we compare the flows into untreated family funds before and after their family members received the exclamation mark to the flows into untreated funds of families whose treated members have not yet received the exclamation mark. We do not find any significant effect of the exclamation mark addition on the other funds within the fund family.

<sup>45</sup> We also count other types of mutual funds, as this figure is intended as a proxy for the place each mutual fund receives in the add, and non-fixed-income mutual funds are also consuming space, thereby arguably reducing the reader's attention towards the examined fixed-income mutual fund.

(c) Add  $Val\_Ads_{n,t}$  as another explanatory variable to Equation (1).

The outcomes of all these tests<sup>46</sup> are in keeping with the main results, presented in Table 2. Accordingly, we infer that although the reform may have affected mutual funds' marketing efforts to some extent, this cannot explain our results. Rather the increased salience of potential credit risk is the apparent cause of the documented decline in flows.

## 7.2. Placebo tests for the (!) day

To further ascertain that the results that use the first identification strategy (that is, based on the staggered implementation of the reform across treated funds) are not explained by contemporaneous trends that are specific to the treated funds but are nonetheless not driven by the mark itself<sup>47</sup>, we conduct a placebo test.<sup>48</sup> We run 10,000 Monte Carlo simulations, randomly choosing the treatment trading day for each manager (i.e., for all the fixed-income funds of each manager) within the implementation period. In each simulation we estimate Equation (1), regressing the funds' scaled net inflows on the "placebo exclamation mark" (as well as on fund and day fixed effects) in two periods: i)  $\pm 10$  trading days relative to the specific placebo mark addition in each iteration (Panel A of Figure 2); and ii) all days within the sample period (Panel B of Figure 2). Then we compare the resulting t-statistic with the t-statistic based on the actual exclamation mark indicator. Both in the simulation and in the regression based on the actual indicator, we use all the fixed-income mutual funds except those pertaining to four fund managers that did not add the exclamation mark to all the funds under their management on the same day. If the effect of the reform is not driven by pure chance, we expect to find that the estimated t-statistic based on the real data will be found in the extreme left tail of the simulated t-statistic distribution. Indeed, as Panel A and Panel B of Figure 2 clearly demonstrate, the actual estimation t-statistic lies in the extreme left tail of the simulation distribution, with only 23 of the 20,000 Monte Carlo iterations (in both specifications) to its left. These outcomes enhance our confidence that our results on the effect of the reform are not fortuitous.

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<sup>46</sup> These results are not reported here. The tables are available from the authors upon request. We note that the correlation between  $Num\_Ads$  and  $Val\_Ads$  is high (82 percent), and so we do not use them together on the right side of the regression equation. The correlations between these variables and  $excl\_mark$  are low (1.38 percent and 0.22 percent, respectively), thus alleviating concerns of multicollinearity in the estimated regressions.

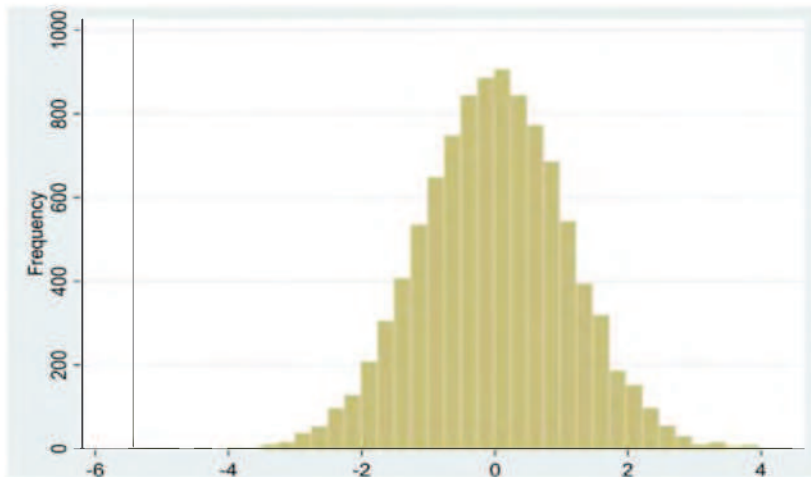
<sup>47</sup> This would be the case, for example, if funds specializing in high-yield bonds suffered from negative sentiment in the second half of March 2010 for some reason unrelated to the fact that many such funds received an exclamation mark in the preceding days.

<sup>48</sup> We also repeat our estimations separately excluding either the first or the last five trading days of the implementation period. The results are in line with the main results. In addition, we extend our estimation period to also include all the trading days in February 2010 and April 2010. The results, available from the authors upon request, are qualitatively and quantitatively similar to the main results.

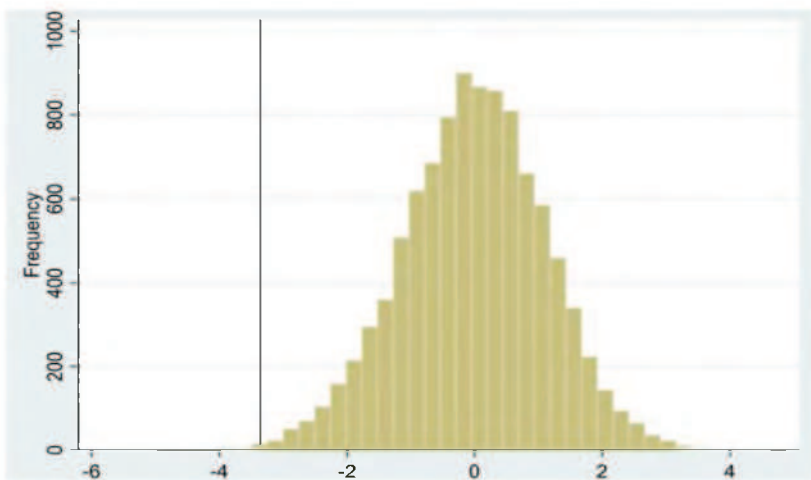
## Figure 2 – Placebo test for the day-of-period effect

The figure presents a distribution of t-statistics from 10,000 Monte Carlo simulations. In each iteration we randomly chose the treatment day for each manager (i.e., for all the fixed-income mutual funds of each manager) within the implementation period, and regress the funds' scaled net inflows (creations minus redemptions scaled by fund size) on a "placebo exclamation mark" (a randomly chosen "treatment" day for all the funds of each manager within the month), as well as on a fund fixed effect and on a day fixed effect. Panel A reports results for  $\pm 10$  trading days relative to the placebo mark addition (different period for different funds during February 14th–April 6th). Panel B, in turn, presents estimations for all days within the sample period (February 14th–April 6th). The figure also includes a vertical line indicating the t-statistics of -5.43 and of -3.36 for Panel A and Panel B respectively, which were estimated from a version of our base specification that uses all fixed-income funds excluding those pertaining to four management firms that did not add the exclamation mark to all the relevant funds they manage on the same day.

Panel A:  $\pm 10$  trading days relative to the placebo mark addition



Panel B: All days within the sample period



### 7.3. Different equity exposure thresholds

The addition of the exclamation mark does not reflect a fixed percentage of high-yield corporate bond holdings, but is relative to the fund’s exposure to equities. As this exposure is measured by discrete threshold one may wonder if the effect this paper shows stems from a specific exposure threshold. While theoretically there are 6 possible thresholds, spanning all the possible maximum equity exposures of a mutual fund—from 0 to 200 percent exposure to equities—about 85 percent of the treated funds are characterized by maximum equity exposure of either 0 or 10 percent. Therefore, to examine this issue further, we repeat our main estimation based on Equation (1)<sup>49</sup> separately for funds with up to 0/10 percent equity exposure. Table 8 demonstrates that the effect is prominent across equity exposure thresholds, as the reform significantly reduced flows into treated funds with both levels of maximum stock exposure.

**Table 8 –The effect of the exclamation mark on daily fund flows by equity exposure**

The table reports the results of OLS panel regressions of net mutual fund inflows (in percentages, creations minus redemptions scaled by fund size at the beginning of the relevant month) on *excl\_mark* (a dummy variable that equals 1 for funds that received an exclamation mark from the day they received the mark and onward, and 0 otherwise), as well as on a fund fixed effect and on a day fixed effect. Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. In Columns 1–3 we focus only on fixed-income mutual funds with no equity exposure according to the fund’s investment policy statement (IPS), while in Columns 4–6 we focus on fixed-income mutual funds with equity exposure of up to 10% according to their IPS. Standard errors, clustered at the management firm level, appear in parentheses below the coefficients. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively. The sample periods are as follows: Columns 1 Column 4 present the results for  $\pm 10$  trading days relative to the mark addition (different days for different funds during the February 14th–April 6<sup>th</sup> period). This period is based on the actual date of the name modification. In this specification, each fund has observations in the specific time period, which is relevant to that fund. Columns 2 and 5 present the results for all days within the sample period (February 14th–April 6th). In this specification all funds have the same (fixed) period around the staggered reform implementation. Columns 3 and 6 present the results for the pre-reform and the post-reform windows (February 14th–February 26th, and March 18th–April 6th). The latter specification excludes the implementation period.

	NO EQUITY EXPOSURE			UP TO 10% EQUITY EXPOSURE		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>excl_mark</i>	-0.83*** (0.1)	-0.54*** (0.1)	-0.81*** (0.2)	-1.03*** (0.3)	-0.72*** (0.1)	-1.11*** (0.3)
Trading day fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Mutual fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,320	2,162	1,272	360	611	365
Adjusted R <sup>2</sup>	45.8%	32.5%	30.7%	52.2%	44.4%	46.6%

<sup>49</sup> As the estimations based on Equation (2) use only the cross-section of fixed income mutual funds, we have enough observations for the treated funds to repeat these estimations only for the 0% threshold. The results of these estimations resemble the main results in Table 3, and they are available from the authors upon request.

#### 7.4. Estimation of standard errors

In our main specification we cluster the standard errors at the management firm level in order to tackle the possibility that investors' investment decisions in different mutual funds of the same fund family are correlated. To ensure that this clustering choice does not drive our results, we repeat the estimations of Equation (1), this time clustering standard errors at the single mutual fund level or on the time dimension, in our case treating each day in our sample as a cluster. Furthermore, we recognize that while our estimation accounts for fixed fund and day effects, the standard errors may still be sensitive to non-fixed effects of both the fund/fund family and the day. Thus, following Petersen (2009), we repeat the estimation using double clustering,<sup>50</sup> combining clustering by day with either clustering by fund or clustering by fund family. The results for all specifications, available from the authors upon request, show that the statistical significance of our results is robust to all these different clustering choices.

The methodological discussion thus far, in regard to the estimation of Equation (1), has suggested the standard DID methodology to estimate the reform's impact on mutual fund flows. However, Bertrand, Duflo, and Mullainathan (2004) demonstrate that such a standard methodology can lead to upwardly biased t-statistics in the presence of serial correlation. While we believe that this is not a major concern in our daily flow data,<sup>51</sup> we directly address this concern by ignoring the time series information in the daily data using the two-stage modification suggested by Bertrand, Duflo, and Mullainathan (2004) for staggered reforms, thus collapsing the daily data into a two-period panel estimation. The results, available from the authors upon request, greatly resemble the main results: the exclamation mark reform reduced daily flows into treated funds relative to their still unmarked counterparts.

## 8. Conclusions

Using the proprietary mutual fund daily flow data and two distinct identification strategies, we demonstrate a causal effect from a minor change to the names of certain mutual funds to the subsequent net inflows into these funds. We find that mutual funds that were required to add an exclamation mark (!) to their name suffered a significant drop in flows in subsequent days. This impact is very significant statistically and economically, even though the regulatory reform precipitating the name change only affected the mutual funds' risk salience, while neither their fundamentals nor the quality or quantity of information available to

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<sup>50</sup> We use the cluster2 Stata ado from Petersen's website:

[https://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se\\_programming.htm](https://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm).

<sup>51</sup> The average fund's daily autocorrelation during the entire period was only 6.5 percent.



the investors changed. Further analysis suggests that the effect of the reform does not stem from selection in its application.

We show that both inflows into treated funds and outflows from them were affected, but the economic magnitude is larger for the decrease in inflows. Looking into the mutual funds' clientele, we find that the reform's effect is driven by retail investor behavior rather than by more financially sophisticated investors. We use data from a major financial advisor to distinguish advised retail clients from households who invest on their own, and find that both segments of retail investors were affected. Finally, we made a first step in trying to investigate mutual fund managers' strategic behavior following the mark designation. In this dimension, we document a 'Mark of Cain effect': Funds that were labeled with the exclamation mark increased (!) their "junk bond" holdings significantly more than other fixed-income mutual funds. We leave the further investigation of this behavior to future research.

This paper adds to the behavioral literature on the effect of limited attention, salience, and the presentation of information on investment activity. Importantly, only a few papers show a relationship between well-known behavioral biases and human behavior in the real world, let alone in the financial investment arena. This paper takes advantage of a unique regulatory experiment that changes the salience of risk but neither the risk itself nor its fundamental disclosure. Our unique setting not only provides the opportunity to isolate information salience, it also provides us with a highly comparable control group; the staggered implementation of mutual fund name changes by different management firms enables us to include the treated funds in the control group up until they actually add the exclamation mark to their name.

We believe that this paper can also inform policy decision-making, as a case study on how regulatory requirements regarding the presentation of information can affect investor perceptions and behavior. Our results demonstrate that minor changes to the presentation of information can have a major impact on investor activities, at least in the short term and particularly in the case of retail investors. At the same time, the findings suggest that the affected financial entities are not necessarily passive with respect to the regulatory intervention and their reactions could mitigate the reform's effects or even lead to unintended consequences. As regulators around the world strive to simplify financial information and facilitate the ability of retail investors to select suitable financial products, we believe that the insights gleaned from this study can be instrumental in the deliberation of similar measures in other jurisdictions.

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## Appendix A – Examples of the regulatory reform implementation

### (1) Several clarifying examples of the reform requirement

Mutual fund number	Mutual fund name	Maximum exposure to equity holdings according to the fund's investment policy statement	(Actual) investment in high-yield corporate bonds	Regulatory requirement to add an exclamation mark?
5120852	ANALYST NIS BONDS (00)	0%	0%	NO
5102827	PSAGOT BETA (0A) SHEKEL WITHOUT STOCKS	0%	0.25%	YES
5110234	HAREL (1B) CPI-IINKED PREMIUM	10%	8.58%	NO
5108162	CRAMIM (1A) CORPORATE BONDS	10%	16.51%	YES
5102157	EDMOND DE ROTHSCHILD (2A) BOND ALLOCATION +30%	30%	25.34%	NO
5110432	HAREL (2C) CORPORATE AND CONVERTIBLE BONDS	30%	38.84%	YES

### (2) Announcement of fund's name change (Hebrew)

שם הקרן לפני השינוי:  
 מגדל (0A) אג"ח חברות קרן נאמנות (מספר קרן: 5104849)

שם הקרן לאחר השינוי:  
 מגדל (0A)(!) אג"ח חברות קרן נאמנות

שם הקרן באנגלית לאחר השינוי:  
 Migdal (0A)(!) Agach Havarot Mutual Fund

מובהר בזה, כי הכללת הסימן (!) בשם של קרן משמעותו, כי על פי מדיניות ההשקעות של הקרן, שיעור החשיפה האפשרי שלה לאג"ח שאינן בדידוג השקעה (כהגדרתן להלן) עשוי לעלות על שיעור החשיפה המרבי של הקרן למניות כעולה מדרגת החשיפה שלה למניות.

### (3) Several examples of the revised mutual fund names

- ANALYST (0A)(!) DIVERSIFIED PORTFOLIO WITHOUT EQUITY
- EPSILON (1B)(!) 10/90
- HAREL (2B)(!) CORPORATE AND CONVERTIBLE BONDS

## Appendix B – Matching procedure

Our matching procedure expands the control group relative to the first control group (which consisted solely of treated funds) to include untreated funds as well, but only those that are relatively similar to the treated funds. We conduct the matching based on management firm, and the relevant attributes in light of the reform: the share of high-yield bonds in the fund’s portfolio and its maximum exposure to equity based on the stated investment policy.<sup>52</sup> Specifically, in the first stage, we use propensity score matching, estimating the effect of management firm, high-yield bond holdings, and maximum equity exposure on the probability of the fund being a ‘treated fund’, i.e. a fund receiving an exclamation mark at some point during March 2010. To this end we use a probit estimation model based on fund characteristics as of eleven days before the implementation period—February 11<sup>th</sup>, 2010. The estimation equation is:

$$(2) \text{Treated}_n = \alpha + \lambda * \text{Manager}_n + \beta_2 * \text{HY\_BONDS}_n + \beta_3 * \text{Equity\_exp}_n + \varepsilon_n,$$

where  $\text{Treated}_n$  is a dummy variable, which equals 1 only for treated funds;  $\text{Manager}_n$  denotes the manager fixed effects;  $\text{HY\_BONDS}_n$  denotes the high-yield bond holdings of fund  $n$  relative to its assets under management;  $\text{Equity\_exp}_n$  denotes the maximum equity exposure relative to assets under management of fund  $n$  according to its investment policy. The table demonstrates that indeed both the high-yield bond holdings and a fund’s maximum equity exposure are relevant variables for predicting its chances of getting the exclamation mark.

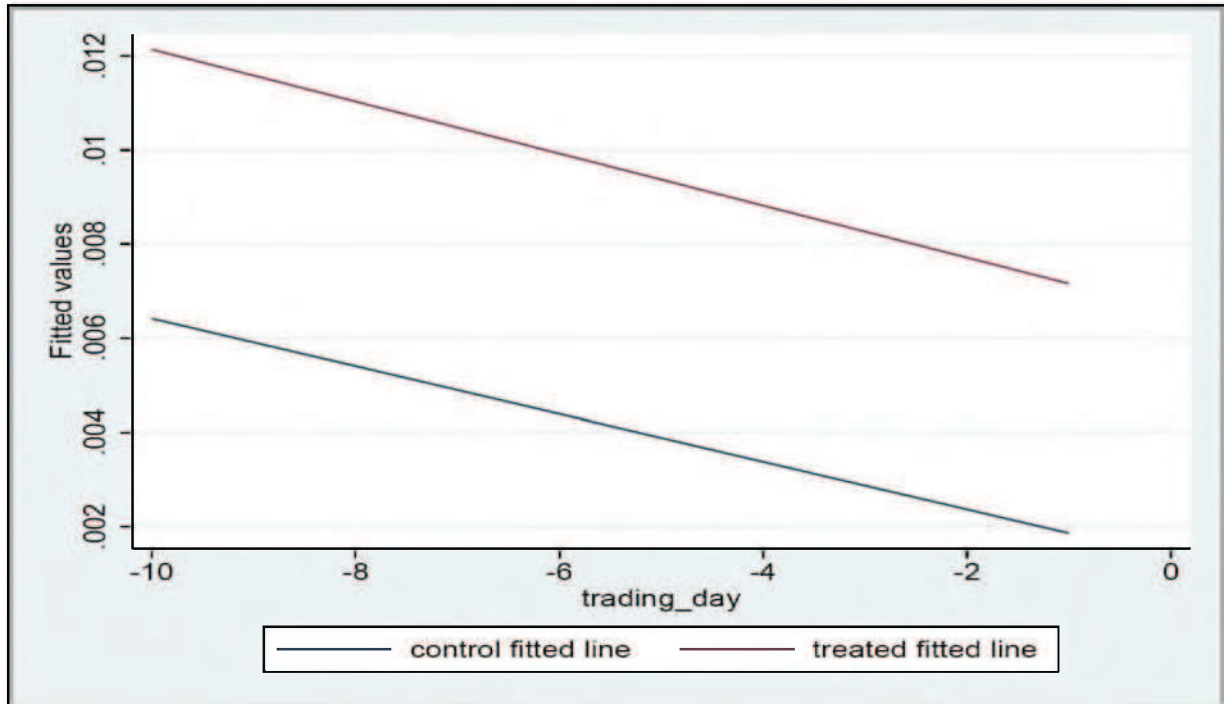
**Table B1**

	(1)
HY_BONDS	27.04*** (3.64)
Equity_exp	-2.62*** (0.43)
Mutual fund type fixed effects	Yes
Number of observations	583
<i>Pseudo R</i> <sup>2</sup>	68.13%

<sup>52</sup> As a robustness test to our matching procedure we also match treated funds to similar control funds, this time based only on the most relevant dimension: high-yield bond holdings. This simpler procedure yields qualitatively similar results, i.e. the addition of the exclamation mark leads to a very significant drop in flows into treated funds *vis-a-vis* ex-ante comparable control funds.

Figure B1 shows that the matched control funds exhibit a pre-event trend that is parallel to that of the treated funds.

**Figure B1**





**Appendix Table 1 - Variable Definitions**

<b>Variable</b>	<b>Definition</b>	<b>Units</b>
Creations	Daily creations	NIS thousands
Redemptions	Daily redemptions	NIS thousands
Net Inflows	Daily <i>creations</i> minus daily <i>redemptions</i>	NIS thousands
AUM	Assets under management as of the end of February 2010	NIS thousands
Scaled Net Inflows	<i>net</i> inflows divided by <i>AUM</i>	Percentages
Scaled Inflows	<i>Creations</i> divided by <i>AUM</i>	Percentages
Scaled Outflows	<i>Redemptions</i> divided by <i>AUM</i>	Percentages
Num Ads	Daily number of advertisements in the three national business newspapers	Integers
Val Ads	Daily value of advertisements in the three national business newspapers	NIS thousands
Excl_mark	1 for funds that received an exclamation mark from the day they received the mark and onward, and 0 otherwise	Binary
Foreign Scaled Net Inflows	Change in foreign holdings adjusted for changes in price and the NIS/USD exchange rate, and scaled by foreign investors holdings of the fund at the end of the previous month	Percentages
HY_bonds	Investments in corporate bonds rated below BBB as a share of total fund assets	Percentages
Equity_exposure	The maximum equity exposure of the fund according to its investment policy	Discrete

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