

# Mutual Fund Shareholder Letter Tone - Do Investors Listen?

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## Abstract

Fund companies send shareholder letters to their investors on a semi-annual basis to discuss fund performance and general market conditions. This paper uses textual analysis to investigate the impact of shareholder letters on mutual fund flows. We find that the tone of these letters predicts future fund flows; a more negative tone leads to lower net flows. We do not find any predictive power of shareholder letter tone for future fund performance, but a more negative tone of a letter predicts less subsequent idiosyncratic risk taking.

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*Keywords:* Mutual Funds, Flows, Textual Analysis, Shareholder Letters, Form N-CSR

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## Abstract

Fund companies send shareholder letters to their investors on a semi-annual basis to discuss fund performance and general market conditions. This paper uses textual analysis to investigate the impact of shareholder letters on mutual fund flows. We find that the tone of these letters predicts future fund flows; a more negative tone leads to lower net flows. We do not find any predictive power of shareholder letter tone for future fund performance, but a more negative tone of a letter predicts less subsequent idiosyncratic risk taking.

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# 1 Introduction

Shareholder letters are part of the semi-annual shareholder reports (Form N-CSR and N-CSRS filings) that registered management investment companies file with the SEC and send to their investors. In these letters, fund managers discuss the general economic environment and outlook, as well as individual stocks that they hold and how these stocks performed. They also offer explanations for why certain stocks have been bought, sold or not been considered at all and comment on various other issues they consider relevant. The writing style of these letters varies greatly from very technical to almost literary.<sup>1</sup>

In spite of the recent trend in the finance literature to investigate the impact of soft information on financial markets based on textual analysis (see, e.g., Tetlock (2007), Tetlock, Saar-Tsechansky, and Macskassy (2008), Loughran and McDonald (2011)), the writing style of mutual funds' shareholder letters has not caught any attention in academic studies so far. This is surprising, given that in 2013 more than 40% of all households in the US own mutual funds, according to the Investment Company Institute, and receive shareholder letters.<sup>2</sup> They are sent out regularly to investors and are frequently quoted in the business press.<sup>3</sup> It thus seems plausible that the writing style of these letters has an impact on investment decisions and capital flows.

The mutual fund industry offers an ideal setting to analyze whether and how investors react to soft information such as narratives in financial disclosures. Unlike other settings where the impact of soft information on investment decision-making has been analyzed, here we can directly observe the reaction of investors, because money flows in mutual funds are

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<sup>1</sup>For example, Wintergreen Advisers' shareholder letters are written by a co-founder with a college minor in English and produces a letter full of "inspirational quotes". See <http://online.barrons.com/article/SB50001424053111904009804579248280874966654.html>

<sup>2</sup>For a detailed view on the Investment Company Institute's annual statistics on households' mutual fund holdings, see <http://www.ici.org/research/stats>

<sup>3</sup>For example, Morningstar offered a list of great shareholder letters to its readers: [http://news.morningstar.com/articlenet/article.aspx?id=4793&\\_QSBPA=Y](http://news.morningstar.com/articlenet/article.aspx?id=4793&_QSBPA=Y)

explicitly observable. In contrast, existing studies typically only indirectly observe investors' reaction to soft information by investigating price changes on capital markets.

In this paper we use a dictionary-based computer linguistic program to measure the tone of shareholder letters, and investigate its impact on mutual fund flows. We use standard dictionaries from the previous literature and design our own dictionary based on the words typically used in mutual fund shareholder letters. Our sample comprises all US open end equity funds between 2006 and 2012 that publish a shareholder letter. We find that mutual fund investors react strongly to the tone of shareholder letters. We document robust evidence that flows are significantly lower the more negatively a shareholder letter is written. Specifically, a one standard deviation increase in negativity leads to a \$2.35 million reduction of subsequent fund flows. This result is obtained after controlling for variables that might influence letter tone and at the same time investor flows such as past fund performance. The flow reaction is observed immediately following the publication of a shareholder letter and lasts for about 10 days. It is persistent and does not reverse over the long run.

The impact of negative tone on net-flows is mainly observed after periods of negative market returns, when the industry usually experiences outflows. This finding suggests that an article with a more optimistic tone can prevent existing investors from redeeming their fund shares. Furthermore, we find some evidence that a personal writing style can reduce the adverse impact of negatively written letters on flows. This result is consistent with investors' being more willing to accept negative news if somebody takes responsibility.

We also examine whether it is rational for investors to react to the tone of shareholder letters, by analyzing the impact of letter tone on subsequent performance. We find that more negative shareholder letters do not predict worse future fund performance. If anything, some specifications suggest a slight improvement in fund performance after a negative shareholder letter. This finding shows that shareholder letters influence investment behavior of fund investors despite the fact that they do not contain information about the actual future financial development of the fund.

Finally, we analyze whether tone has predictive power for fund managers' risk-taking behavior. Arguing that negative tone is associated with a generally more negative attitude of a fund manager with respect to the future development of the stock market, one might expect that negative tone is a proxy for stronger risk aversion and eventually lower risk-taking of fund managers. We indeed find that a negative tone strongly predicts less idiosyncratic risk-taking of a fund manager, indicating that they make fewer benchmark-deviating bets after a negative shareholder letter.

Our results have important implications for mutual fund companies. They underline the importance of verbal information that fund companies provide to their investors. A significant number of investors seems to react strongly to the way a shareholder letter is written. Given that these letters are legally regulated to portray a fair and truthful picture of the current economic situation of a fund, fund companies are restricted in the wording used in these letters. This explains why not all shareholder letters are written in an extremely optimistic and positive tone. However, it might pay fund companies to devote time to a careful creation of these letters, particularly in times of lower fund returns, to prevent fund investors from withdrawing their money. A recent Barron's article on shareholder letters supports this view, arguing that "How managers explain their duds may be more telling than how they boast about their wins."<sup>4</sup>

Our paper contributes to the large literature on the determinants of mutual fund flows. Many papers examine the impact of past performance on fund flows (e.g., Sirri and Tufano (1998), among many others). Ivkovic and Weisbenner (2009) find that investors (irrationally) chase funds that outperformed in the past although there is barely any skill-induced performance persistence of funds in the long-term (Carhart (1997)). Other determinants of mutual fund flows that have been investigated in the literature comprise fund expenses (Barber, Odean, and Zheng (2005)), advertising of a fund (Jain and Wu (2000) and Gallaher, Kaniel, and Starks (2008)), a fund's media coverage (Kaniel, Starks, and Vasudevan (2007)), and fund manager characteristics (e.g., Wermers (2003), Niessen-Ruenzi and Ruenzi (2013),

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<sup>4</sup>see <http://online.barrons.com/articles/SB50001424053111904009804579248280874966654>.

and Kumar, Niessen-Ruenzi, and Spalt (2014)). Daughdrill (2014) analyzes descriptions in the “Investment Objective” and “Investment Strategy” sections of fund prospectuses and finds that they have no significant impact on flows. We contribute to this literature by showing for the first time that writing styles of mutual funds’ shareholder letters have a significant impact on mutual fund flows.

We also contribute to the literature trying to predict managerial behavior based on textual disclosures. Looking at managers of publicly traded firms, Loughran and McDonald (2014) find that readability of 10-K files is significantly related to earnings forecast errors. The authors argue that managers who try to obscure earnings-relevant information will use a different writing style than managers who have nothing to hide. Regarding mutual fund managers, we are not aware of any study that examines the predictive power of narrative statements on fund managers’ risk-taking behavior.<sup>5</sup> We extend the literature by showing that the tone of shareholder letters is informative about the future risk-taking behavior of fund managers and should thus be taken into consideration by potential investors.

Finally, our paper contributes to the recently burgeoning literature on textual analysis in finance. There are several papers showing that investors react to soft information in financial texts. For example, Loughran and McDonald (2011) develop a text-based measure of financial constraints based on 10-K filings and find that it predicts subsequent liquidity events, while Loughran and McDonald (2013) analyze the language in form S-1 disclosures and their impact on IPO first-day returns, offer-price revisions, and volatility. Furthermore, Loughran and McDonald (2014) suggest a new measure for the complexity of 10-K filings.

Interestingly, the interpretation of investors’ reaction to financial texts differs greatly across papers. For example, Tetlock, Saar-Tsechansky, and Macskassy (2008) find that investors react to the fraction of negative words in firm-specific news reports and interpret this reaction as rational given that linguistic content in these news stories predicts the

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<sup>5</sup>There are a few studies that try to predict behavior based on personal characteristics of fund managers. For example, the impact of age on investment behavior is examined in Greenwood and Nagel (2009), while Niessen-Ruenzi and Ruenzi (2013) focus on the impact of gender.

firm’s earnings. Tetlock (2007) and Garcia (2013) find that investors react to high media pessimism which eventually leads to downward pressure on market prices. However, Tetlock (2007) observes a reversion to fundamentals later on and thus interprets investors’ reaction as being driven by (irrational) sentiment. A similar result is observed by Tetlock (2011) who shows that individual investors in particular trade on stale news which leads to price pressure and subsequent return reversals. Our paper contributes to this discussion by showing that textual information is also taken into account by mutual fund investors. Since we do not find any predictive power of this information for future fund performance, our results rather support the view that shareholder letter tone can influence sentiment among mutual fund investors rather than triggering a rational reaction.

## **2 Data and summary statistics**

### **2.1 Shareholder letters**

We obtain mutual funds’ shareholder letters from N-CSR annual and semi-annual filings that are available from the SEC’s Edgar database. According to section 30(e) of the Investment Company Act of 1940, every registered investment company has to transmit financial reports to its stockholders at least semiannually. These reports include information on the portfolio composition, a statement of income, and a balance sheet. Most importantly in our context, they usually include a letter directly addressing the fund’s shareholders. These letters vary largely in terms of their content. For example, they can discuss the fund’s performance relative to a benchmark, give reasons the fund outperformed or underperformed, describe economic and market conditions, highlight some securities of the portfolio (e.g. winners, losers, exposure to industries), or advertise the fund. Sometimes they even talk about global developments such as wars and other international conflicts. Inclusion of such a letter, classified as “narrative disclosure” by the SEC, is voluntary but must not contain any untrue statements and has to be certified by the mutual fund’s principal executive and financial

officers.<sup>6</sup> We find that 90% of mutual funds regularly send out a shareholder letter. Only 0.8% of funds never send out a shareholder letter. These funds are mostly index funds. The remaining 9.92% of funds send out shareholder letters on an irregular basis.<sup>7</sup>

Since shareholder letters are not mandatory, there is no clear-cut section or item of the N-CSR filing which we can extract for our empirical analysis. Therefore, we identify common phrases for the beginning and the ending of the letter to isolate it from the fund's financial report.<sup>8</sup> If no phrase for the end (beginning) of the letter is found, we use the beginning (end) of the subsequent (previous) section as the cut-off. We extract the text of these letters automatically with a computer program and verify the precision of the letter extraction procedure by conducting manual checks.

We also collect information on who signs the shareholder letter. In most of the cases (37.0%), the president of the fund company signs the shareholder letter, while fund managers sign in 9.7% of the cases. Other people in charge of signing shareholder letters are Chief Executive Officers (14.8%), and Chairmen (16.7%). It is also possible that two or more individuals sign a letter, or that one individual signs a letter in multiple roles (for example, "CEO and Chairman"). More details on who signs the shareholder letter are provided in Appendix A. Although the president or some other senior executive often signs the letter for legal reasons, it is plausible to assume that the letters are typically prepared by the manager in charge of the respective fund.<sup>9</sup>

There are two separate dates included in the N-CSR filings that are relevant for our empirical analysis: the "report date" refers to the fiscal year or fiscal half-year end (i.e., reporting period end date), respectively, to which the filing refers, while the "filing date"

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<sup>6</sup>Certification requirements are described in detail by the SEC; see <https://www.sec.gov/rules/final/34-47262.htm>.

<sup>7</sup>In unreported tests, we examine whether there are differences in net-flows or absolute flows following the filing of reports that do or do not contain a letter. We find no evidence for this to be the case. However, given that there are only very few observations without letters, this test lacks statistical power.

<sup>8</sup>Common phrases include, for example, "Dear Shareholders", "Dear Investors", "Sincerely", or "Yours Truly".

<sup>9</sup>In unreported results, we investigate whether our main effect is driven by who signs the shareholder letter. We do not find any impact of the individual signing the letter on any of our results.



marks the day on which the report is filed with the SEC. We extract both dates from the N-CSR filings. We also investigate the distribution of financial reports over calendar months (see Appendix B). While most reports are filed in December (13.8%) and June (13.8%), we find that the report dates are fairly evenly distributed across the year otherwise. The fewest reports are filed in October (4.1%).

According to SEC regulations, the maximum time span between the day on which the fund company sends off a fund’s financial report to investors and the day on which the letter is filed with the SEC is 10 days. As fund companies have no incentives to postpone the filing of their reports with the SEC after they sent them out to shareholders, it is likely that this typically happens on the same day. Thus, the filing date can be assumed to be equivalent (or very close) to the day on which the fund shareholders also receive the respective reports. Our later daily flow analysis in Section 4.2.1 supports this assumption.

After extracting the shareholder letters from the N-CSR filings, we use the Pennebaker, Both, and Francis (2007) linguistic inquiry and word count (LIWC) computer program to classify the tone of each shareholder letter. The program automatically processes text files and analyzes their content. We rely on the “bag of words” technique following the approach of prior papers on textual analysis in finance (Tetlock (2007), Tetlock, Saar-Tsechansky, and Macskassy (2008), Loughran and McDonald (2011)). These papers collect words that are used to express negativity and combine these words in a dictionary which is then used to systematically measure the tone of a text. We use two alternative dictionaries to measure the tone of shareholder letters. Specifically, we use the Loughran and McDonald (2011) negativiy dictionary, and our own dictionary of negative words that we construct based on reading a randomly drawn subsample of shareholder letters.<sup>10</sup> We focus on dictionaries capturing negative tone as previous work has shown that negations are quite frequent around positive statements, which makes it much harder to precisely capture positive tone with textual analysis (see, e.g., Loughran and McDonald (2011)).

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<sup>10</sup>In our stability tests, we show that our results also obtain based on the Harvard IV-4 Psychosociological Dictionary, a word list that was developed to measure negative emotions in a general context (see Table 5).

The Loughran and McDonald (2011) dictionary, LMD, is designed to specifically capture negative tone in financial text. However, it is constructed based on textual analysis of 10-K filings. Therefore, we also construct our own dictionary, HNR, based on the shareholder letters in our sample as these letters might have different writing styles than 10-K filings. Specifically, we randomly draw 200 letters from the sample of shareholder letters and have two individuals read them independent of each other. While reading the letters, they mark all words that sound negative to them. If both readers have marked a word as negative, we include it in our dictionary. This results in a dictionary of 653 words out of which 328 are also included in the LMD dictionary.<sup>11</sup> Appendix C provides the top 25 negative words of the two dictionaries that appear most frequently in shareholder letters. In column (1) the most frequent words according to the LMD dictionary are displayed. They include “volatility”, “decline”, and “losses”. In column (2), we display the most frequent words according to our HNR dictionary, that do not also appear in the LMD dictionary. Examples of words that are included in our dictionary, but are not part of the LMD dictionary are “inflation”, “uncertainty”, and “fluctuate”. These words are used frequently to describe unfavorable market conditions and underperformance of mutual funds, while they are less common in 10-K text files.

We use both dictionaries in our textual analysis, thereby trading off the concern that our own dictionary is too subjective against the concern that a more general, but externally validated, dictionary does not capture the tone of shareholder letters. Based on the two dictionaries, we calculate two tone measures for each shareholder letter based on the fraction of negative words a letter contains. Negativity according to the Loughran and McDonald (2011) dictionary is labeled as  $LMD^-$ , while negativity according to our own dictionary is labeled as  $HNR^-$ . These measures are described in more detail in Appendix D. For each letter, we also compute two language complexity measures. First, we compute the logarithm of the average number of words per sentence,  $LN(WPS)$ , arguing that longer sentences are

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<sup>11</sup>The HNR dictionary of negative words in shareholder letters is available from the authors upon request.

more difficult to read. Second, we compute the logarithm of a letter’s total number of words,  $LN(Words)$ , to measure the overall length of a letter.<sup>12</sup>

## 2.2 Mutual fund data

We use mutual fund data from the Center for Research on Security Prices (CRSP) survivorship bias free mutual fund database. This database comprises mutual fund characteristics and returns. We aggregate all share classes at the fund level.

To merge shareholder letters with the CRSP database, we establish a unique link between the Series ID obtained from the SEC filing and the WFICN (Wharton Financial Institution Code Number) of fund portfolios as provided in MFLinks. The matching procedure is based on the fund’s ticker symbol.<sup>13</sup> Over the period from 2006 to 2012 we identify 5,825 fund portfolios in CRSP/MF Links. Excluding funds with missing ticker symbol reduces the number of funds to 5,338 portfolios. After matching CRSP and SEC data via the ticker symbol, we conduct several plausibility checks to make sure that SEC Series ID and CRSP WFICN indeed correspond to the same fund portfolio.<sup>14</sup> Overall, 79.43% of the funds in the CRSP/MFLinks universe can be matched to SEC N-CSR filings. Balanced funds, money market funds, fixed income funds, and exchange traded funds are dropped from the sample. We focus on equity funds to allow for easy comparability of performance across funds. In addition, we drop observations where a fund’s total net assets in a given month are below one million USD. Our final sample comprises 3,567 matched open-end equity funds from 2006 to 2012.

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<sup>12</sup>We do not focus on other text complexity measures suggested in the previous literature like the Fog index (see, e.g., Miller (2010)), as Loughran and McDonald (2014) show that these measures do a poor job in capturing complexity in a financial disclosure context. They suggest using simple metrics based on document length instead.

<sup>13</sup>More details on the matching process are provided in Appendix E.

<sup>14</sup>For example, we test whether one single Series ID is assigned to multiple WFICNs at the same time. Since both identifiers are on the portfolio level, this should not be the case. Thus, all cases where one single Series ID is assigned to multiple WFICNs at the same time are dropped from the sample.

The main variable of interest is the percentage net inflow (“Fund Flow”) for fund  $i$  in month  $t$ . As explicit flow information is not provided in CRSP, we follow Sirri and Tufano (1998) and define a synthetic flow proxy as

$$\text{Fund Flow}_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}}{TNA_{i,t-1}} - r_{i,t},$$

where  $TNA_{i,t}$  denotes fund  $i$ ’s total net assets at the end of month  $t$  and  $r_t$  denotes fund  $i$ ’s return (net of fees) in month  $t$  as reported in CRSP. Flows are adjusted for fund mergers as in Lou (2012). To eliminate the impact of outliers we winsorize fund flows at the smallest and largest 1% of flow observations. In some of our later analysis we also look at daily flows. Fund flows are defined accordingly, but we use Morningstar data in these cases, as CRSP does not provide daily TNAs of funds.

### 2.3 Summary statistics

Summary statistics on all major variables are presented in Table 1.

— Please insert TABLE 1 approximately here —

In Panel A, we present summary statistics on the shareholder letters extracted from the N-CSR filings. The mean percentage of negative words in a given shareholder letter according to the  $LMD^-$  dictionary amounts to 1.87%. This is similar to the mean percentage of negative words in a given shareholder letter according to our own dictionary ( $HNR^-$ ) which amounts to 1.91%.<sup>15</sup> The fraction of negative words varies substantially between virtually zero and nearly 6% according to our dictionaries.

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<sup>15</sup>These numbers are comparable to Loughran and McDonald (2011) who find an average negativity of 1.57% for 10K filings.

To get a better impression on how negativity varies over our sample period, Figure 1 plots average negativity across our two tone measures as well as lagged 6-month S&P 500 returns.

— Please insert FIGURE 1 approximately here —

Visual inspection shows that negativity and lagged stock market returns are negatively related: After periods of low stock market returns, negativity increases substantially, while the opposite holds for periods after high stock market returns. These patterns show that our tone measures perform well in capturing the general tendency of market conditions, i.e., when S&P 500 returns turn sharply negative, the tone of the subsequent letters is more negative as well. At the same time, the correlation between letter tone and market returns mandates controlling for the general market environment and we do so in our later analysis by including various time-fixed effects.

The average shareholder letter includes about 891 words and an average of 27.4 words per sentence. With respect to the two dates that are included in the N-CSR filings, we find that there are on average 64 days time difference between reporting period end date (report date) and the filing date for a given shareholder letter.

In Panel B, we present summary statistics on the fund characteristics obtained from the CRSP mutual fund database. The sample includes all funds for which we are able to link a shareholder letter. We find that average monthly flows amount to 0.2% with a variation from -21% to 34% at the lower and upper 1% of observations. The average monthly flow of 0.2% seems small as compared to average flows from earlier studies focusing on samples from the 1980s and 1990s, like Sirri and Tufano (1998). However, this is consistent with the much lower aggregate growth rates of the mutual fund industry during recent years that comprise our sample period. Furthermore, the average fund in our sample has total net assets of 1,447.70 million USD, is 13.36 years old and has an annual expense ratio of about 1.2%. Average fund returns over the reporting periods of six months amount to 3.2%.

In the next step, we investigate correlations between our variables of interest. Results are presented in Table 2.

— Please insert TABLE 2 approximately here —

The two variables that measure the negativity of a shareholder letter,  $LMD^-$  and  $HNR^-$ , are highly correlated, suggesting that they measure similar dimensions of negativity in a letter.

The correlation between the tone measures and flows in the subsequent month is negative. This indicates that flows are lower when the letter had a more negative tone. However, this can of course be driven by lagged returns being negatively correlated with our tone measures (i.e., good returns lead to lower numbers of negative words) and at the same time being positively correlated with future flows. We also observe a positive correlation between fund age, fund risk and both negativity measures, respectively, meaning that shareholder letters tend to be more negative the older and the more risky a fund is. This mandates controlling for fund characteristics when estimating the impact of negativity on mutual fund flows in our later analysis.

### 3 Determinants of shareholder letters' tone

We start our empirical investigation by looking at the determinants of shareholder letters' tone. After reading some randomly selected shareholder letters we find that they largely differ in their writing styles. While some of them are written in a very technical manner with a formal discussion of the fund's financial outcome, others are written in a very literary style with quotes and humorous comments. Appendix F presents reports from two funds as examples. Words that are included in one of our negativity dictionaries are printed in bold font. Both funds had significant negative returns over the six months before the letter is sent. The first fund, offered by American Century Quantitative Equity Funds, delivered

a return of  $-34\%$ , while the second fund, offered by Virtus Insight Trust, delivered a very similar return of  $-33\%$ . In the six months after the filing of the shareholder letters, the American Century fund faced only relatively moderate outflows of  $0.8\%$ , which is in sharp contrast to the Virtus fund, which experienced large outflows of  $6.73\%$  over the same period. Interestingly, the fund managers of these funds offer different views on how to interpret the financial outcome of the respective fund. The first shareholder letter (American Century) is still relatively positive. It states that “we are financially strong” and that the fund is expected to “identify attractive investment opportunities regardless of market conditions”. In contrast, the second letter (Virtus) expresses much less optimism. For example, it talks about a “constant flow of negative news” and says that “the near-term outlook continues to be filled with uncertainties”. This difference is also reflected by the two negativity measures which have on average a value of  $3.35\%$  for the first letter, and a higher average value of  $4.22\%$  for the second letter, respectively.

To investigate the determinants of a shareholder letter’s tone formally, we conduct a multivariate analysis where we use one of the two tone measures,  $LMD^-$  or  $HNR^-$ , respectively, as dependent variable and then relate the tone to past performance as well as several fund and fund company characteristics. To take into account that some fund managers might have a generally more positive and optimistic writing style, we include fund fixed effects in all regressions. Thus, any effect we find is purely driven by within-fund variation of letter tone. In addition, we also include time fixed effects to control for the general performance of equity markets. Specifically, because the time lag between the “report month” and the “filing month” differs between funds, we include both, report month and filing month fixed effects. Report month fixed effects capture the impact that average performance and market conditions might have on letter tone of all funds whose reporting period ends in the same month as the fund under consideration. Filing month fixed effects capture any potential impact of general conditions at the moment the report is actually filed. This distinction is important, as for example a very negative market return after the reporting period end but before the filing date, i.e., in the period during which the letter

is actually written, might well have an impact on the tone of the letter, too. Furthermore, we also include the individual fund return in the first month after the reporting period end date,  $\text{Return}_{m+1}$ , as well as in the second month up to the filing date,  $\text{Return}_{m+2, fm}$ . Results on the determinants of shareholder letter tone are presented in Table 3.

— Please insert TABLE 3 approximately here —

We find that fund returns over the reporting period are significantly negatively related to our tone measure, i.e., a higher return leads to significantly fewer negative words. This result holds based on both tone measures. While expected, this finding shows that the tone measures actually do seem to do a good job of capturing performance-induced differences in letter writing style.

There also is a negative impact of flows during the reporting period on the tone of shareholder letters, suggesting that if a fund receives relatively high flows the tone of the letter becomes less negative - even after controlling for past performance. This result is consistent with letter writers feeling more confident and eventually writing more positive prose about a fund if the fund experienced large inflows. Fund volatility and size of the fund do not have a significant impact on letter tone. However, larger fund companies tend to write more negative shareholder letters on average as indicated by the positive impact of fund company size on the negativity measures. A possible explanation for this finding is that larger corporations generally face higher litigation risk (Holzer (1998)) and thus might write more conservatively. We also include a fund's age, its expense ratio, and the growth rate of its segment to analyze whether more established funds, more expensive funds, or funds in a growing market segment tend to be written about more positively; we generally do not find any significant impact. We also do not find a significant impact of fund returns between a fund's reporting date and the date it is filed with the SEC on the tone of a shareholder letter.



Taken together, the main impact on tone comes from individual fund returns over the reporting period and from family size, highlighting the importance of carefully controlling for these variables in our following analysis of the impact of tone on fund flows.

## 4 The impact of shareholder letter tone on fund flows

In the following, we investigate whether mutual fund investors are sensitive to variations in letter tone and eventually base their investment decisions on the way in which fund companies communicate with them. In Section 4.1 we look at the reaction of monthly flows to tone. In Section 4.2, we examine the temporal dynamics of this relationship in more detail. In Section 4.3 we investigate the impact of a personal writing style on mutual fund flows.

### 4.1 Evidence based on monthly flows

Shareholder letters are published semi-annually. They have to be filed with the SEC not later than 10 days after they have been sent out to investors. To investigate the impact of shareholder letters on mutual fund flows, correctly specifying the time structure in our empirical model is important. In our main specification, we relate fund flows in month  $t$  to the tone of a shareholder letter filed with the SEC in month  $t$  only if the fund files the letter with the SEC before and including day 15 of a given month. If a fund files the letter with the SEC after day 15 of a given month, we relate its flows in the subsequent month  $t + 1$  to the tone of a shareholder letter filed in month  $t$ .<sup>16</sup> This specification helps us to capture the flow effects better if they occur in a relatively short time period after the letters

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<sup>16</sup>In unreported results, we alternatively relate fund flows in month  $t$  (irrespective of when in month  $t$  a letter is filed) to the tone of a shareholder letter filed with the SEC in the same month and our results obtain. The drawback of this approach is that funds filing their shareholder letters with the SEC at the very end of month  $t$  are unlikely to experience any flow effects within the same month.

are sent out. We think that this is likely to be the case since investors probably react to a shareholder letter immediately after they receive and read it, or not at all.<sup>17</sup>

The dependent variable in our main regressions is monthly fund flows winsorized at the top and bottom 1%. We relate fund flows to one of our negativity measures,  $LMD^-$  or  $HNR^-$ , respectively, and a set of controls: various papers show that past performance ranks have a positive and convex impact on inflows (e.g., Sirri and Tufano (1998)). Thus, we include the fund’s return rank and squared return rank within its investment objective.<sup>18</sup> Return ranks are based on fund returns over the shareholder letter’s reporting period, i.e., the previous 6 months before the reporting date. We also include lagged fund size, lagged company size, fund age, and the fund’s expense ratio. Furthermore, we add the logarithm of the number of words and of the number of words per sentence as language complexity measures and control for the number of days between the shareholder letter’s reporting and filing date. Finally, we include flows of new money into the whole segment of the fund. Standard errors are clustered at the fund level.

The regressions are estimated with fund, reporting month, and filing month fixed effects. Note that the inclusion of fund fixed effects takes care of the possibility that letters about some funds are always written in a certain style. Our identification comes from within fund time-series variation in the tone of the shareholder letter. Thus, our results should provide a lower bound for the potential impact of tone on flows as any potential cross-sectional variation in tone between funds is neglected. Results are reported in Table 4.

— Please insert TABLE 4 approximately here —

In the first two columns, we relate fund flows to our raw tone measures, i.e., the fraction of negative words that are included in a shareholder letter according to one of our linguistic

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<sup>17</sup>In our later analysis in Section 4.2.1, we investigate daily fund flows that circumvent the problem of properly defining a time structure as described above. However, daily flows are only available for a subsample of funds and a shorter time period.

<sup>18</sup>For detailed definitions of these and all other control variables, see Appendix D.

dictionaries,  $LMD^-$  or  $HNR^-$ , respectively. We find that fund flows are significantly negatively related to the negativity of a shareholder letter, i.e., the more negative the tone of a letter, the lower its subsequent flows. This result is statistically significant at the 1% (5%) level for the  $LMD^-$  ( $HNR^-$ ) negativity measure. The impact of letter tone on flows is also economically meaningful: for example, a one standard deviation increase in the fraction of negative words according to the  $LMD^-$  ( $HNR^-$ ) word list leads to flows which are 2.35 (1.78) million USD lower for a fund of average size.

With respect to our control variables, we can confirm the positive and convex performance flow relation found in earlier studies (e.g., Sirri and Tufano (1998)).<sup>19</sup> We also observe a negative impact of fund size and fund age on fund flows, while company size, segment flows, and the expense ratio have a significantly positive impact on fund flows. Overall, results on control variables are broadly in line with the previous literature.

Our previous results in Table 3 show that shareholder letters tend to be more positive after good fund performance. In addition, fund flows and fund company size are also predictive for the tone of a shareholder letter. Thus, one concern regarding our result could be that shareholder letters merely reflect new information on the fund’s economic situation and that fund investors react to this new information by adjusting their investments accordingly. However, note that our flow regressions from Table 4 do control for the variables that have already had an impact on tone in Table 3. Nevertheless, to further rule out this explanation, we re-run our main regression based on adjusted measures of a shareholder letter’s negativity. That is, we first run multivariate regressions similar to the specification presented in Table 3 where one of our negativity measures is the dependent variable.<sup>20</sup>

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<sup>19</sup>Alternatively, we estimate the performance flow relationship with a piecewise linear regression approach using three performance intervals based on the return rank of a fund in its segment over the reporting period. The cutoffs for defining the three intervals are 0.2 and 0.8. Our main result (not reported) is not affected.

<sup>20</sup>We follow the specification in Table 3 but for reasons of consistency with the models in Panel A from Table 4 we include the fund’s return rank and squared return rank instead of just the fund return. In addition, we include the fund company’s value-weighted return. However, none of these modifications affects our results.

From these regressions, we obtain the residuals as our orthogonalized measures of a letter’s negativity, which we label as  $LMD_{adj}^-$  and  $HNR_{adj}^-$ , respectively.

We then use these adjusted tone measures as independent variables in our main flow regressions. Results are presented in columns (3) and (4) of Table 4. They portray a picture consistent with our earlier results. We still observe a significantly negative coefficient of shareholder letter tone on mutual fund flows for both negativity measures. Results are only slightly weaker, but still meaningful in economic and statistical terms.

If investors read shareholder letters on a regular basis, they might be particularly sensitive to changes in tone. Therefore, as an alternative specification, we use the change in negativity as an explanatory variable for fund flows in columns (5) and (6) of Table 4. Results are based on the same regression specification as in the first two columns but do not include fund fixed effects. Instead, they include the lagged dependent variable. We still observe a significantly negative impact of letter tone on mutual fund flows for both negativity measures.

Taken together, results in Table 4 provide strong evidence that the tone of a shareholder letter has an impact on mutual fund flows. The more negative the tone, the lower are subsequent net flows.

In the next step, we conduct several robustness checks. They are all based on the adjusted tone measure specification from columns (3) and (4) of Table 4, which is the stricter specification and yields more conservative results.<sup>21</sup> For brevity, we only report the coefficients on negativity and on those control variables that are newly added to the baseline specification. Results are presented in Table 5.

— Please insert TABLE 5 approximately here —

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<sup>21</sup>Our following flow results all also obtain (and are generally even stronger) if we use the unadjusted versions of our tone measures.

In the first three columns of Panel A in Table 5 we repeat the regressions from Table 4 for an alternative tone measure based on the Harvard IV-4 Psychosociological Dictionary as used by Tetlock (2007). Unlike the dictionaries we use in our main analysis, this dictionary was not designed to capture negative tone in financial texts, but in a general context. The results we obtain are similar but somewhat weaker than in Table 4 (with the exception of the tone change analysis, where the result gets slightly stronger in statistical terms). This finding supports the argument of Loughran and McDonald (2011) that dictionaries specifically designed to capture tone in financial contexts are more appropriate than general negativity dictionaries.

In columns (4) and (5) of Panel A, we include two additional control variables to take into account that a shareholder letter can be written on one fund only or on several funds at the same time. We define a dummy variable that is equal to one for all shareholder letters that are on one individual fund only, and zero otherwise. We also include the logarithm of the number of funds covered by a shareholder letter. The results still show a significant impact of our adjusted negativity measures. Furthermore, the number of funds covered in a letter has a negative impact on flows, suggesting that fund investors dislike getting relatively unspecific reports for a larger number of funds rather than a report more focused on the specific fund they invested in.

In the last two columns of Panel A, we exclude shareholder letters where a manager change took place during the reporting period or up to three months after the reporting period. If a manager change occurred before the shareholder letter was filed, the letter could have been written by the new fund manager and differences in writing style or the manager change per se might induce subsequent changes in fund flows. Results show that coefficients on negativity get slightly larger if manager changes are excluded from the sample. This finding might be due to the fact that investors have more difficulties in interpreting the writing style of a new manager, or because manager changes per se cause noise in estimating the letter tone-flow relationship.

In Panel B of Table 5, we examine the robustness of our main result for two subperiods (columns (1) to (4)) as well as for flows after negative and positive market returns separately (columns (5) to (8)). The first (second) subperiod is from January 2006 to June 2009 (July 2009 to December 2012). It is possible that investors reacted more sensitively to shareholder letter tone during the financial crisis, when market uncertainty was high. However, comparing the coefficients on negativity, we do not observe large differences in the impact of negativity on fund flows. Although the subperiods are rather short, we still obtain significant coefficients for both subperiods that are similar in magnitude.

According to Garcia (2013), investors sensitivity to news is most pronounced during difficult times. Therefore, in the remaining columns of Panel B, we split the sample according to past stock market returns. This allows us to examine whether fund investors react more strongly to shareholder letters after bad market performance. We find that the negative impact of shareholder letter tone on fund flows is indeed much more pronounced after market downturns than when the stock market yielded positive returns.<sup>22</sup> This finding has two implications: first, as the mutual fund industry typically faces outflows after bad market performance, this result suggests that a less negative tone in bad times can stop investors from withdrawing money (while there is no evidence that a more positive tone leads to higher new investments by investors). Second, as only existing fund shareholders can sell shares, it is plausible that our result is driven by this group of investors (rather than by new investors that might have searched for and read the respective shareholder letter).<sup>23</sup>

## 4.2 Temporal dynamics: How long does the effect last?

In this section, we analyze the short- and long-term temporal dynamics of the relation between shareholder letter tone and investor flows. To further refine our main result of a

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<sup>22</sup>This result (not reported) is similar if we condition on the performance of a fund instead of the stock market return to classify good and bad times.

<sup>23</sup>As there are no data on separate in- and outflows on a high frequency, we cannot test these implications explicitly.

negative relation between fund flows and the tone of shareholder letters, we first turn to a short-term analysis of how daily fund flows react to shareholder letters after the filing date (Section 4.2.1). We then turn to a long-term analysis of flows over several months after the filing of a shareholder letter (Section 4.2.2). The short-term analysis allows us to better capture an immediate reaction of fund flows to shareholder letters and to investigate the time pattern of the flow reaction in more detail. Thereby, we can directly test the conjecture from Section 4.1, that flows react very rapidly to tone. This setting also helps us to identify the impact of letter tone more clearly in an event-study-like setting. The long-term analysis addresses the question of whether the tone-driven flow effects reverse over time or whether the lower flows to funds with more negative letters lead to a persistent difference of assets under management.

#### 4.2.1 Short-term reaction based on daily flow data

Unfortunately, CRSP only contains monthly TNA data and thus does not allow us to investigate daily flows. However, a proxy for daily flows can be calculated based on daily TNA and return data provided in the Morningstar database. Daily flow data for most funds (4,375 funds or 61.84% of funds in Morningstar with information on daily flows) become available in Morningstar in July 2008.<sup>24</sup> For those funds for which daily flow information is available, we merge daily flow data from Morningstar with CRSP/MFLinks using the fund's 9-digit CUSIP.

— Please insert FIGURE 2 approximately here —

Figure 2 shows the subsequent cumulative flows for up to 15 days after the filing date of a shareholder letter. We plot the cumulative flows separately for funds with above- and below-median realizations of their orthogonalized negativity measures based on the LMD dictionary.<sup>25</sup> Visual inspection shows a strong divergence of flows during the first 10 days.

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<sup>24</sup>Only a few funds (486 funds or 6.87%) provide information on daily flows before July 2008.

<sup>25</sup>Results based on the HNR dictionary look very similar.

Funds with an above-median negativity score face outflows, while funds with a below-median negativity score experience inflows. This pattern confirms our previous regression results which were based on monthly data. After day 10, the difference in cumulative flows does not increase anymore, which suggests a relatively rapid flow reaction to letter tone.

To investigate the exact time pattern of the flow reaction more formally, we compute fund flows for different time windows following the filing date of a shareholder letter. Specifically, we compute non-overlapping flows over the first 5 days, days 6 to 10, and days 11 to 15 after a shareholder letter is filed and re-run our main regression specification. Results are reported in Table 6.

— Please insert TABLE 6 approximately here —

We again use the adjusted tone measures as our main independent variable. Results show that there is an immediate reaction of daily fund flows after a shareholder letter is sent out and filed with the SEC. The reaction is strongest within the first five days. The coefficient is statistically significant at the 1% level for both, the  $LMD_{adj}^-$  and  $HNR_{adj}^-$  negativity measure. We still observe a significant flow reaction for the subsequent five days, i.e., days 6 to 10 after the filing date, but significance drops to the 5% and 10% level, respectively. We do not observe any significant flow reaction between days 11 and 15 after the shareholder letter is filed. This result confirms the findings from Figure 2 that most of the flow reaction occurs within a period of 10 days after the filing date.

#### **4.2.2 Long-term reaction of fund flows to shareholder letters**

In the next step, we investigate the reaction of flows to letter tone over non-overlapping long-term horizons from one month after the filing to five months after the filing (i.e., before the next semi-annual N-CSR report is published) and from months 6 to 11 after the filing (including the next N-CSR report), respectively.



— Please insert TABLE 7 approximately here —

Results in columns (1) and (3) show a weak additional negative impact of negativity on flows in the five subsequent months. However, the effect is only significant at the 10% level for the  $LMD_{adj}^-$  measure and insignificant for the  $HNR_{adj}^-$  measure. Looking at months 6 to 11 after the filing (in columns (2) and (4)), we find no significant and very small negative coefficient estimates, confirming that there is no subsequent offsetting long-term flow effect in the opposite direction.

Taken together, results in Tables 6 and 7 suggest that there is an immediate flow reaction to the tone of a shareholder letter. We observe a significant reduction of fund flows in response to a negative shareholder letter mainly within the first 10 days after a letter is filed. The initial reaction is not reversed in the following months. We observe neither a strong additional flow reaction in periods further away from the filing date, nor a reversal of the initial flow effect over longer time periods.

### 4.3 Do writing styles matter?

In this section, we investigate whether mutual fund investors also react to other dimensions of a shareholder letter’s writing style in addition to its negativity. While some shareholder letters are written in a rather bureaucratic style and use a lot of passive constructions, others are written in very personal language. Some researchers argue that readers might have a preference for either a personal or a bureaucratic writing style (e.g., Chartprasert (1993)). Thus, it is possible that mutual fund investors judge the content of a shareholder letter differently if it is written in a personal style that conveys the impression that the letter writer is directly talking to the investor. To investigate whether personal writing styles mitigate the impact of our negativity tone measure on mutual fund flows, we define a dummy variable that is equal to one if a shareholder letter is written in first-person singular or plural, i.e., if it contains “I” or “we”, and zero otherwise. Then, we re-run our

main flow regression from columns (3) and (4) in Table 4 and include the personal writing style dummy variable, as well as an interaction of this dummy with one of the negativity measures. To make sure that we are not just capturing differences in flows that arise due to the management structure of a fund, we also include a dummy variable indicating whether a fund is managed by a team. Results are presented in Table 8.

— Please insert TABLE 8 approximately here —

Results still show a significantly negative impact of letter tone on mutual fund flows. Furthermore, we find a marginally significant impact of the writing style dummy variable, which suggests that investors appreciate personal writing styles. This result is also consistent with the findings of Massa, Reuter, and Zitzewitz (2010) who point out that investors prefer a named individual to be associated with a financial product and that the media, and investors prefer investments that come with plausible stories about their performance.

The interaction term of the personal writing style dummy and the tone measure is positive. This suggests that the negative relation between letter tone and subsequent fund flows is mitigated if the letter is written in a personal writing style, i.e., investors react less negatively to a letter with a negative tone if it is written in a personal style. Possibly, investors interpret a personal writing style in a negative letter as evidence that somebody takes responsibility and show appreciation of this by not withdrawing money. However, the impact of the interaction is only significant for the  $HNR_{adj}^-$  negativity measure. Overall, a personal writing styles seems to have only a moderate influence on the negativity-flow relationship.

## 5 Are shareholder letters predictive for fund performance or fund manager behavior?

The results in the previous section clearly show that mutual fund investors do indeed react to the tone of shareholder letters. However, at this point it is still an open question whether the tone of shareholder letters reduces information asymmetries and is an informative signal that mutual fund investors should take into account when making their investment decisions. Thus, we now investigate the predictive power of shareholder letters for future fund performance (Section 5.1). We also investigate whether shareholder letters are informative with respect to other dimensions of managerial behavior besides future performance, namely the manager’s risk-taking behavior (Section 5.2).

### 5.1 Shareholder letter tone and future performance

To examine the predictive power of letter tone for future fund performance we relate various performance measures of a fund as dependent variable to the lagged tone of the fund’s shareholder letter and several control variables. As our main independent variable of interest we use the orthogonalized LMD and HNR negativity measures of the previous shareholder letter.<sup>26</sup> As performance measures we use the 6-month performance over the period starting with the month after the filing month, i.e., from  $t+1$  to  $t+6$ , based on (1) raw returns, (2) the CAPM 1-factor alpha, and (3) the Carhart (1997) 4-factor alpha.<sup>27</sup> For example, if a fund files a shareholder letter in January 2010, we define performance over the period February 2010 to July 2010 (that is, until the next shareholder letter is sent out). As control variables we include fund size, family size, a fund’s expense ratio and fund age. We further include language complexity measures as well as the time difference between a letter’s reporting date and filing date and control for the impact of flows during the

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<sup>26</sup>Using raw tone measures instead does not affect our main result.

<sup>27</sup>Note that examining excess returns over the market return would be equivalent to including month fixed effects in our regression. Since all of our regressions include month fixed effects, we do not investigate excess returns over the market return separately.

reporting period to which the letter refers. To capture any impact that tone-induced flows might have on performance, we also include contemporaneous flows over the performance measurement period. Finally, we include reporting month and filing month fixed effects as well as individual fund fixed effects. The latter control for the impact of all non-time-varying individual fund characteristics on performance. Standard errors are clustered on the fund level. Results are presented in Table 9.

— Please insert TABLE 9 approximately here —

The first three columns present results based on the adjusted LMD negativity measure. Coefficient estimates for the impact of negativity on future performance are all positive. The same pattern holds for the adjusted HNR negativity measure in the last three columns. A positive coefficient estimate for the negativity measure suggests that funds about which a manager writes more negatively tend to perform better in the future, rather than worse. However, none of the coefficients is statistically significant at conventional levels.

With respect to the control variables, we find that fund size has a detrimental effect on performance, which confirms earlier evidence (e.g., Chen, Hong, Huang, and Kubik (2004)). Fund age positively influences fund performance, while past flows over the reporting period have a negative impact. The latter finding can be explained by flow-induced liquidity trading leading to inferior stock picks (Alexander, Cici, and Gibson (2007)). The coefficient estimate for the impact of contemporaneous flows is significantly positive. This effect can be explained by flows reacting to short-term performance within the same six month period. The other control variables show no significant impact on performance.<sup>28</sup>

To assess the stability of our performance results, we also investigate the impact of letter tone on future performance for alternative investment horizons. Specifically, instead of looking at the performance over the subsequent six months, we compute performance

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<sup>28</sup>Expense ratios usually have a significantly negative impact on net of fee performance measures. However, in our setting we include fund fixed effects, and expense ratios are very persistent over time. This explains why we find no significant impact of expense ratios on performance in Table 9.

over shorter horizons of one month and one quarter, respectively. Results are presented in Table 10.

— Please insert TABLE 10 approximately here —

In Panel A, we present results for the impact of negativity on one month performance. Regressions include the same control variables and fixed effects as in Table 9. We observe that performance significantly improves one month after a negative shareholder letter, if we use four factor alphas as the dependent variable, irrespective of whether tone is measured by  $LMD_{adj}^-$  or  $HNR_{adj}^-$ . However, there is no statistically significant impact of letter tone on future raw returns or future one factor alphas.

In Panel B, we present results for the impact of negativity on performance during the following quarter. Across specifications, we always find a positive coefficient estimate for the impact of negativity on performance but coefficients are always insignificant.

Overall, we conclude that there is only weak evidence that the tone of shareholder letters predicts future fund performance over a short horizon. If anything, a more negative tone of a shareholder letter is associated with slightly better subsequent performance. We can only speculate about what might explain this effect. One possible reason could be that fund managers increase their efforts to improve performance after they had to send out a negative shareholder letter and explain to investors why they underperformed. In line with this view, Puetz and Ruenzi (2011) and Eshraghi and Taffler (2012) find that fund manager overconfidence is negatively related to future fund performance. Thus, less optimistic fund managers might write more negative letters and be better able to improve their performance in the future.

Irrespective of the reason for this finding, our earlier finding that shareholders invest less in a fund if the tone of the fund's shareholder letter is more negative can not be rationalized based on the performance results in this section. Rather, if fund investors would use the

tone of a shareholder letter as an informative signal, they should invest more in funds with a negative letter in anticipation of improved future fund performance.

## 5.2 Shareholder letter tone and managerial behavior

In the remainder of this section, we analyze whether the tone of a shareholder letter predicts mutual fund managers' risk-taking behavior. Specifically, we analyze the conjecture that a negative tone of a shareholder letter is a sign of a pessimistic attitude of the fund manager and eventually leads to less risk-taking.<sup>29</sup> Thus, we relate managerial risk-taking to the tone of the last preceding shareholder letter. As dependent variables we use the fund's total risk, defined as the standard deviation of daily fund returns, its systematic risk, computed as the market beta in the Carhart (1997) 4-factor model estimated based on daily fund returns, and its idiosyncratic risk, calculated as the standard deviation of the residuals from the same model. The main independent variable of interest is one of our two negativity measures. We include various fund and fund company characteristics. Furthermore, we also include flows and past performance during the reporting period as control variables. It is important to control for past performance, as the realized performance in the last period might lead to a change in managerial behavior because of strategic risk-taking incentives (see, e.g., Brown, Harlow, and Starks (1996)).

All regressions include the same time fixed and fund fixed effects as our previous regressions and standard errors are again clustered at the fund level. Results are presented in Table 11.

— Please insert TABLE 11 approximately here —

The first three columns present results using the  $LMD_{adj}^-$  negativity measure. We find a negative (positive) coefficient estimate for the impact of negativity on total fund risk in

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<sup>29</sup>In line with this view, Puri and Robinson (2007) show that optimism leads to higher stock market participation.

column (1) (on systematic risk in column (2)). However, the estimates are not significant at conventional levels. If we look at idiosyncratic risk (column (3)), we find a significantly negative coefficient, i.e., a high negativity score of a shareholder letter predicts significantly less idiosyncratic risk in the subsequent six months. The effect is statistically significant at the 1% level. This finding suggests that fund managers deviate from the market less and take fewer active bets if the tone of their last shareholder letter was more negative, which is consistent with risk-averse managers herding more towards the market. This result is also confirmed based on our own negativity measure  $HNR_{adj}^-$  (column (6)).

With respect to the control variables, we find that larger funds take slightly more overall risk and that older funds tend to take less risk for all risk measures. The six month return of the fund over the last reporting period has a strong positive impact on risk taking, suggesting that fund managers become more daring after good past performance.<sup>30</sup>

## 6 Conclusion

This paper uses textual analysis to investigate the tone of shareholder letters. These letters are regularly sent out by fund companies to inform investors about the fund’s performance, strategy and business environment. They reach a large number of investors and vary greatly in their content and style.

Our results, based on a large and representative sample of US equity funds, show that the tone of these letters can be measured reliably by dictionary-based negativity measures suggested in the finance literature as well as by a self-constructed dictionary designed to capture negativity in mutual fund shareholder letters.

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<sup>30</sup>Results in Table 11 are based on risk-taking behavior over the six months after a shareholder letter is filed with the SEC. If we assume that the tone of the letter reflects the current mood of a fund manager, the effect might be rather short-term. Thus, as a stability check, we also look at risk taking over shorter periods after the filing of the report. The general pattern from Table 11 is confirmed and the results (not reported) are even slightly more pronounced.

Our main finding is that fund flows strongly react to the content of these letters. This result holds after carefully controlling for past performance and other fund characteristics. Specifically, the tone of a shareholder letter, measured as the fraction of negative words it comprises, is negatively related to future fund flows. This suggests that many mutual fund investors pay close attention to the content of shareholder letters, i.e., they take the tone of these letters into account when making their investment decisions, shying away from funds that use a negative language in their discussion.

Overall, our results show that there is a surprisingly strong reaction of investors to verbal information provided by fund companies in their shareholder letters. Thus, fund companies should pay close attention to how shareholder letters are written and try to avoid an overly pessimistic tone in these letters. At the same time, our analysis suggests that investors should take the wording of these letters with a grain of salt, as we can also show that these letters are not a predictor of subsequent fund performance.



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**Table 1: Summary statistics**

This table shows summary statistics (mean, standard deviation (sd), median (p50), 1st percentile (p1), 99th percentile (p99), and number of observations (N)) of shareholder letters in Panel A, and of the fund characteristics in Panel B. Tone is measured by the fraction of negative words according to the Loughran and McDonald (2011) ( $LMD^-$ ) or our own ( $HNR^-$ ) negativity dictionary in a given letter. Complexity is measured by the number of words and the number of words per sentence (WPS). Time Difference is the number of days between the fiscal (half-) year end date (Report Date) and the date when the document is filed with the SEC (Filing Date). All fund characteristics are defined in detail in Appendix D.

Variable	mean	sd	p50	p1	p99	N
Panel A: Shareholder letters						
$LMD^-$	1.869	1.284	1.750	0.000	5.340	33,893
$HNR^-$	1.911	1.405	1.786	0.000	5.800	33,893
Number of Words	891.348	809.214	603	43	4,172	33,893
Words per Sentence (WPS)	27.43	10.52	25.30	16.10	96.00	33,893
Time Difference	64.23	5.15	65.00	49.00	72.00	33,893
Panel B: Fund characteristics						
Fund Flow	0.002	0.066	-0.005	-0.211	0.342	33,403
Fund Size	1,447.70	6,231.10	241.10	2.900	20,881.10	33,893
Fund Size (ln)	5.454	1.918	5.485	1.065	9.947	33,893
Fund Age	13.364	11.563	10.958	0.583	67.167	33,656
Fund Age (ln)	4.770	0.859	4.887	2.079	6.693	33,656
Expense Ratio	0.012	0.005	0.012	0.001	0.026	32,554
Fund Risk	0.052	0.026	0.049	0.012	0.136	33,760
Return Reporting Period	0.032	0.176	0.048	-0.452	0.467	33,002

**Table 2: Cross correlations of main variables**

This table shows correlations of shareholder letter tone, measures of complexity, and fund characteristics. Tone is measured by the fraction of negative words according to the Loughran and McDonald (2011) (LMD<sup>-</sup>) or our own (HNR<sup>-</sup>) negativity dictionary in a given letter. Complexity is measured by the number of words and the number of words per sentence (WPS). Time Difference is the number of days between the fiscal (half-) year end date (Report Date) and the date when the document is filed with the SEC (Filing Date). All fund characteristics are defined in detail in Appendix D. *p*-values are provided in parentheses.

Variables	LMD <sup>-</sup>	HNR <sup>-</sup>	Words	WPS	Time Diff.	Fund Flow	Fund Size	Fund Age	Exp. Ratio	Fund Risk	Return RP
LMD <sup>-</sup>	1.000										
HNR <sup>-</sup>	0.932 (0.000)	1.000									
Words	0.046 (0.000)	0.042 (0.000)	1.000								
WPS	-0.183 (0.000)	-0.187 (0.000)	-0.104 (0.000)	1.000							
Time Diff.	0.008 (0.166)	0.003 (0.536)	-0.083 (0.000)	0.069 (0.000)	1.000						
Fund Flow	-0.029 (0.000)	-0.030 (0.000)	-0.008 (0.164)	-0.004 (0.470)	0.004 (0.490)	1.000					
Fund Size	-0.015 (0.006)	0.001 (0.895)	-0.002 (0.763)	-0.048 (0.000)	-0.157 (0.000)	-0.100 (0.000)	1.000				
Fund Age	0.052 (0.000)	0.052 (0.000)	-0.002 (0.755)	-0.028 (0.000)	-0.105 (0.000)	-0.190 (0.000)	0.436 (0.000)	1.000			
Expense Ratio	-0.006 (0.286)	-0.017 (0.003)	0.018 (0.001)	-0.028 (0.000)	0.085 (0.000)	0.010 (0.064)	-0.400 (0.000)	-0.086 (0.000)	1.000		
Fund Risk	0.139 (0.000)	0.109 (0.000)	0.015 (0.006)	0.013 (0.015)	-0.018 (0.001)	-0.014 (0.006)	-0.059 (0.000)	0.113 (0.000)	0.078 (0.000)	1.000	
Return RP	-0.183 (0.000)	-0.180 (0.000)	0.005 (0.319)	0.018 (0.001)	0.010 (0.066)	0.054 (0.000)	0.068 (0.000)	0.024 (0.000)	0.016 (0.002)	0.071 (0.000)	1.000

**Table 3: Determinants of shareholder letter tone**

This table shows regressions of shareholder letter tone on various fund characteristics. Tone is measured by the Loughran and McDonald (2011) dictionary of negative words (column (1)) or our own dictionary of negative words (column (2)). The control variables are defined in detail in Appendix D. All regressions include fund-fixed effects and time-fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month when a letter is filed with the SEC (Filing Month). Standard errors are clustered at the fund level.  $t$ -statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	LMD <sup>-</sup> (1)	HNR <sup>-</sup> (2)
Return Reporting Period	-0.003*** (-3.06)	-0.003*** (-3.31)
Flow Reporting Period	-0.001** (-2.47)	-0.001** (-2.24)
Fund Risk	-0.007 (-1.07)	-0.006 (-0.87)
Fund Size	-0.000 (-0.04)	0.000 (0.21)
Company Size	0.001*** (5.09)	0.002*** (5.97)
Fund Age	-0.001 (-1.27)	-0.001 (-1.19)
Expense Ratio	-0.057 (-1.11)	-0.018 (-0.31)
Segment Growth	0.000 (0.04)	-0.002 (-1.26)
Return <sub><math>m+1</math></sub>	-0.002 (-1.15)	-0.001 (-0.63)
Return <sub><math>m+2, fm</math></sub>	0.002 (1.15)	0.001 (0.42)
Constant	-0.041*** (-2.92)	-0.050*** (-3.25)
Fund FE	Y	Y
Reporting Month FE	Y	Y
Filing Month FE	Y	Y
Adj. $R^2$	0.208	0.192
Observations	32,010	32,010

**Table 4: Shareholder letter tone and monthly fund flows**

This table shows regressions of monthly fund flows on shareholder letter tone and various fund characteristics. The dependent variable is net fund flow in the month of the SEC filing. We replace flows of the filing month by flows in the subsequent month whenever the filing of the shareholder letter takes place after the 15<sup>th</sup> calendar day. Negativity is the fraction of negative words in a shareholder letter based on one of our dictionaries. It is based on the LMD<sup>-</sup> dictionary in columns (1), (3), and (5), and by the HNR<sup>-</sup> dictionary in columns (2), (4), and (6). In columns (1) and (2), we use the raw tone measures. In columns (3) and (4), we first orthogonalize the tone measures in a regression and then use the residual from that regression as adjusted tone measure. The adjusted tone regression includes the controls and fixed effects from Table 3 and in addition the return rank (instead of the raw return), the squared return rank, and the value-weighted return of the fund family. In columns (5) and (6), we compute changes in tone from the previous letter to the current letter. All control variables are defined in detail in Appendix D. Regressions in columns (1) to (4) include fund fixed effects. All regressions include time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month). Standard errors are clustered at the fund level. *t*-statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 4: Shareholder letter tone and monthly fund flows (cont'd)**

	Raw tone		Adj. tone		Changes in tone	
	LMD <sup>-</sup> (1)	HNR <sup>-</sup> (2)	LMD <sub>adj.</sub> <sup>-</sup> (3)	HNR <sub>adj.</sub> <sup>-</sup> (4)	$\Delta$ LMD <sup>-</sup> (5)	$\Delta$ HNR <sup>-</sup> (6)
Negativity	-0.126*** (-3.11)	-0.087** (-2.25)	-0.106** (-2.52)	-0.069* (-1.72)	-0.068** (-2.28)	-0.063** (-2.13)
Return Rank	0.009 (1.64)	0.009* (1.66)	0.008 (1.37)	0.008 (1.37)	0.014** (2.53)	0.014** (2.53)
Return Rank <sup>2</sup>	0.010* (1.85)	0.010* (1.83)	0.011* (1.95)	0.011* (1.95)	0.008 (1.59)	0.009 (1.59)
Fund Size	-0.012*** (-9.23)	-0.012*** (-9.22)	-0.012*** (-8.98)	-0.012*** (-8.97)	-0.001*** (-4.48)	-0.001*** (-4.48)
Company Size	0.003*** (2.64)	0.003*** (2.62)	0.003** (2.31)	0.003** (2.31)	0.000* (1.66)	0.000* (1.66)
Fund Age	-0.023*** (-7.14)	-0.023*** (-7.12)	-0.023*** (-6.75)	-0.023*** (-6.74)	-0.006*** (-9.02)	-0.006*** (-9.02)
Expense Ratio	0.566* (1.77)	0.572* (1.78)	0.669* (1.79)	0.668* (1.79)	-0.188** (-2.12)	-0.189** (-2.13)
LN(Words)	-0.000 (-0.63)	-0.000 (-0.80)	-0.000 (-0.65)	-0.000 (-0.81)	-0.001 (-1.57)	-0.001 (-1.58)
LN(WPS)	0.001 (0.75)	0.001 (0.86)	0.001 (0.95)	0.002 (1.08)	-0.002 (-1.20)	-0.002 (-1.21)
Time Difference	0.000 (0.88)	0.000 (0.89)	0.000 (0.82)	0.000 (0.82)	-0.000 (-1.47)	-0.000 (-1.45)
Flow Segment	0.833*** (7.85)	0.833*** (7.84)	0.923*** (8.11)	0.922*** (8.10)	0.758*** (7.71)	0.759*** (7.71)
Flow (lagged)					0.114*** (7.11)	0.114*** (7.11)
Constant	0.059 (0.84)	0.060 (0.85)	0.179*** (4.64)	0.179*** (4.62)	-0.143** (-2.13)	-0.143** (-2.14)
Fund FE	Y	Y	Y	Y	N	N
Report Month FE	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y
Adj. R <sup>2</sup>	0.050	0.050	0.051	0.051	0.058	0.058
Observations	31,726	31,726	29,612	29,612	26,967	26,967



**Table 5: Letter tone and monthly fund flows - Robustness**

This table shows regressions of monthly fund flows on shareholder letter tone and various fund characteristics. The dependent variable is net fund flow in the month of the SEC filing. We replace flows of the filing month by flows in the subsequent month whenever the filing of the shareholder letter takes place after the 15<sup>th</sup> calendar day. In columns (1) to (3) of Panel A, negativity is defined according to the Harvard IV-4 Psychosociological Dictionary, HVD.  $LMD_{adj}^-$  or  $HNR_{adj}^-$  is the adjusted fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) or our own dictionary, respectively. In columns (4) and (5), we include a dummy variable “One Fund Letter” that takes on the value one, if a letter is only about one specific fund, and zero otherwise, and the natural logarithm of the number of funds covered in the letter. In columns (6) and (7) we exclude observations with a manager change during the reporting period or up to three months after the reporting period. In Panel B, we examine the temporal stability of our results. In columns (1) and (2) (columns (3) and (4)) we focus on the period January 2006 to June 2009 (July 2009 to December 2012). In columns (5) and (6) (columns (7) and (8)) we focus on observations where the market return during the reporting period was positive (negative). All control variables are defined in detail in Appendix D. All regressions include fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month). Standard errors are clustered at the fund level.  $t$ -statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 5: Letter tone and monthly fund flows - Robustness cont'd**

Panel A: Alternative specifications								
	Alternative tone measure			Single funds		Manager changes		
	HVD <sup>-</sup> (1)	HVD <sup>-</sup> <sub>adj.</sub> (2)	Δ HVD <sup>-</sup> (3)	LMD <sup>-</sup> <sub>adj.</sub> (4)	HNR <sup>-</sup> <sub>adj.</sub> (5)	LMD <sup>-</sup> <sub>adj.</sub> (6)	HNR <sup>-</sup> <sub>adj.</sub> (7)	
Negativity	-0.064** (-2.24)	-0.053* (-1.78)	-0.071*** (-3.23)	-0.106** (-2.53)	-0.069* (-1.73)	-0.144*** (-2.71)	-0.099* (-1.93)	
One Fund Letter				-0.008 (-1.51)	-0.008 (-1.50)			
LN(No. Funds covered)				-0.004** (-2.10)	-0.004** (-2.10)			
Controls	Y	Y	Y	Y	Y	Y	Y	
Fund FE	Y	Y	Y	Y	Y	Y	Y	
Report Month FE	Y	Y	Y	Y	Y	Y	Y	
Filing Month FE	Y	Y	Y	Y	Y	Y	Y	
Adj. R <sup>2</sup>	0.050	0.051	0.058	0.051	0.051	0.055	0.055	
Observations	31,726	29,612	26,967	29,612	29,612	20,926	20,926	
Panel B: Temporal stability								
	01/2006-06/2009		07/2009-12/2012		MRet ≥ 0		MRet < 0	
	LMD <sup>-</sup> <sub>adj.</sub> (1)	HNR <sup>-</sup> <sub>adj.</sub> (2)	LMD <sup>-</sup> <sub>adj.</sub> (3)	HNR <sup>-</sup> <sub>adj.</sub> (4)	LMD <sup>-</sup> <sub>adj.</sub> (5)	HNR <sup>-</sup> <sub>adj.</sub> (6)	LMD <sup>-</sup> <sub>adj.</sub> (7)	HNR <sup>-</sup> <sub>adj.</sub> (8)
Negativity	-0.149** (-2.51)	-0.116** (-1.99)	-0.132** (-1.98)	-0.135** (-2.11)	-0.084 (-1.23)	-0.055 (-0.85)	-0.184*** (-2.96)	-0.141** (-2.34)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y	Y	Y
Adj. R <sup>2</sup>	0.078	0.078	0.047	0.047	0.060	0.036	0.060	0.035
Observations	15,194	15,194	14,418	14,418	17,353	12,259	17,353	12,259

**Table 6: Shareholder letter tone and daily fund flows**

This table shows regressions of fund flows on shareholder letter tone and various fund characteristics. The dependent variables are daily net fund flows from day  $t+1$  to  $t+5$  (columns (1) and (4)), from day  $t+6$  to  $t+10$  (columns (2) and (5)), and from day  $t+11$  to  $t+15$  (columns (3) and (6)), where  $t$  is the SEC filing date.  $LMD_{adj}^-$  or  $HNR_{adj}^-$  are the adjusted fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) or our own dictionary, respectively. The adjusted tone regression includes the controls and fixed effects from Table 3 and in addition the return rank (instead of the raw return), the squared return rank, and the value-weighted return of the fund family. Control variables from columns (3) and (4) in Table 4 are always included in the regressions and defined in detail in Appendix D. All regressions include fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month). Standard errors are clustered at the fund level.  $t$ -statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Daily flow from	$LMD_{adj}^-$			$HNR_{adj}^-$		
	t1-t5 (1)	t6-t10 (2)	t11-t15 (3)	t1-t5 (4)	t6-t10 (5)	t11-t15 (6)
Negativity	- 0.029*** (-2.93)	-0.016* (-1.65)	-0.003 (-0.34)	- 0.029*** (-3.04)	-0.021** (-2.15)	0.002 (0.24)
Controls	Y	Y	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y
Adj. R <sup>2</sup>	0.062	0.041	0.041	0.062	0.041	0.041
Observations	13,837	13,905	13,906	13,837	13,905	13,906

**Table 7: Shareholder letter tone and long term fund flows**

This table shows regressions of fund flows on shareholder letter tone and various fund characteristics. In columns (1) and (3), the dependent variable is the monthly net fund flow from one month after the filing month to five months after the SEC filing. In columns (2) and (4), the dependent variable is the monthly net fund flow from six to eleven months after the SEC filing.  $LMD_{adj}^-$  or  $HNR_{adj}^-$  are the adjusted fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) or our own dictionary, respectively. The adjusted tone regression includes the controls and fixed effects from Table 3 and in addition the return rank (instead of the raw return), the squared return rank, and the value-weighted return of the fund family. Control variables from columns (3) and (4) in Table 4 are always included in the regressions and defined in detail in Appendix D. All regressions include fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month). Standard errors are clustered at the fund level.  $t$ -statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	$LMD_{adj}^-$		$HNR_{adj}^-$	
	Flows $_{t+1;t+5}$ (1)	Flows $_{t+6;t+11}$ (2)	Flows $_{t+1;t+5}$ (3)	Flows $_{t+6;t+11}$ (4)
Negativity	-0.239* (-1.81)	-0.060 (-0.36)	-0.120 (-0.93)	-0.084 (-0.52)
Controls	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y
Adj. R <sup>2</sup>	0.101	0.110	0.101	0.110
Observations	28,749	26,429	28,749	26,429

**Table 8: Investors' reaction to a personal writing style**

This table shows regressions of monthly fund flows on shareholder letter tone and various fund characteristics. The regressions correspond to those reported in columns (3) and (4) in Table 4. In addition, we include a dummy variable to capture a fund letter's personal writing style. This dummy variable is equal to one if a letter is written in first-person singular or plural, and zero otherwise. We also include an interaction term of the fund's writing style dummy and its tone. "Team managed" is a dummy variable equal to one if a fund is managed by a team, and zero if it has a single manager. Standard errors are clustered at the fund level.  $t$ -statistics are provided in parentheses. \* \* \*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	LMD $^-_{adj}$		HNR $^-_{adj}$	
	(1)	(2)	(3)	(4)
Negativity	-0.105** (-2.52)	-0.173*** (-2.85)	-0.067* (-1.69)	-0.186*** (-2.94)
Personal Writing Style x Negativity		0.133 (1.52)		0.225** (2.46)
Personal Writing Style	0.002* (1.72)	0.002* (1.67)	0.002* (1.72)	0.002 (1.61)
Team managed	0.002 (1.39)	0.002 (1.40)	0.002 (1.36)	0.002 (1.39)
Controls	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y
Adj. $R^2$	0.051	0.051	0.051	0.051
Observations	29,610	29,610	29,610	29,610

**Table 9: Shareholder letter tone and future fund performance**

This table shows regressions of fund performance on shareholder letter tone and various fund characteristics. The dependent variable is the fund's return (columns (1) and (4)), the fund's CAPM 1-factor alpha (columns (2) and (5)), and the fund's Carhart 4-Factor-Model alpha (columns (3) and (6)). Performance is measured from one month after a letter's SEC filing (t+1) to six months after the SEC filing (t+6). Alphas are computed using beta coefficients obtained from a regression using daily fund returns over the previous twelve months (t-12 to t-1).  $LMD_{adj}^-$  ( $HNR_{adj}^-$ ) is the adjusted fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) (our own) dictionary. All control variables are defined in detail in Appendix D. All regressions include fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month when the filing takes place (Filing Month). Standard errors are clustered at the fund level. *t*-statistics are provided in parentheses. \* \* \*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	$LMD_{adj}^-$			$HNR_{adj}^-$		
	Raw Return (1)	1-Factor Alpha (2)	4-Factor Alpha (3)	Raw Return (4)	1-Factor Alpha (5)	4-Factor Alpha (6)
Negativity	0.003 (0.06)	0.039 (0.83)	0.042 (0.77)	0.002 (0.04)	0.047 (1.07)	0.079 (1.58)
Fund Size	-0.020*** (-15.77)	-0.015*** (-12.72)	-0.012*** (-9.90)	-0.020*** (-15.77)	-0.015** (-12.72)	-0.012*** (-9.90)
Company Size	-0.000 (-0.14)	-0.001 (-0.67)	-0.001 (-0.92)	-0.000 (-0.14)	-0.001 (-0.67)	-0.001 (-0.91)
Fund Age	0.017*** (5.04)	0.020*** (5.29)	0.009** (2.39)	0.017*** (5.04)	0.020*** (5.29)	0.009** (2.39)
Expense Ratio	-0.174 (-0.37)	0.247 (0.55)	0.159 (0.40)	-0.174 (-0.37)	0.246 (0.55)	0.156 (0.39)
LN(Words)	-0.001 (-1.59)	-0.001 (-1.13)	-0.001 (-1.24)	-0.001 (-1.59)	-0.001 (-1.16)	-0.001 (-1.36)
LN(WPS)	-0.001 (-0.70)	-0.001 (-0.73)	-0.000 (-0.22)	-0.001 (-0.69)	-0.001 (-0.66)	-0.000 (-0.03)
Time Difference	-0.000** (-2.13)	-0.000* (-1.88)	-0.000 (-1.44)	-0.000** (-2.13)	-0.000* (-1.90)	-0.000 (-1.46)
Flow Rep. Per.	-0.009*** (-3.48)	-0.008*** (-3.38)	-0.010*** (-4.07)	-0.009*** (-3.48)	-0.008*** (-3.38)	-0.010*** (-4.07)
Flow <sub>t+1,t+6</sub>	0.035*** (10.19)	0.044*** (14.07)	0.034*** (10.35)	0.035*** (10.18)	0.044*** (14.05)	0.034*** (10.34)
Constant	0.040 (0.88)	-0.039 (-0.85)	0.011 (0.25)	0.040 (0.88)	-0.039 (-0.86)	0.010 (0.22)
Fund FE	Y	Y	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y
Adj. $R^2$	0.861	0.214	0.194	0.861	0.214	0.194
Observations	28,653	28,653	28,653	28,653	28,653	28,653

**Table 10: Letter tone and performance - Variations of investment horizon**

This table shows regressions of fund performance on shareholder letter tone and various fund characteristics. The dependent variable is the fund’s return (columns (1) and (4)), the fund’s CAPM 1-factor alpha (columns (2) and (5)), and the fund’s Carhart 4-Factor-Model alpha (columns (3) and (6)). In Panel A, performance is measured over one month after a letter is sent (t+1). In Panel B, performance is measured from one month after a letter is sent (t+1) to three months after the letter is sent (t+3). Alphas are computed using beta coefficients obtained from a regression using daily fund returns over the previous twelve months (t-12 to t-1).  $LMD_{adj}^-$  and  $HNR_{adj}^-$  are the adjusted fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) or our own dictionary, respectively. All control variables from Table 9 are included in the regressions and are defined in detail in Appendix D. Instead of  $Flow_{t+1,t+6}$  we use  $Flow_{t+1}$  in Panel A and  $Flow_{t+1,t+3}$  in Panel B. All regressions include fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month). Standard errors are clustered at the fund level. *t*-statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Performance in t+1						
	$LMD_{adj}^-$			$HNR_{adj}^-$		
	Raw Return (1)	1-Factor Alpha (2)	4-Factor Alpha (3)	Raw Return (4)	1-Factor Alpha (5)	4-Factor Alpha (6)
Negativity	0.000 (0.01)	0.012 (0.66)	0.045*** (2.69)	-0.006 (-0.36)	0.006 (0.35)	0.030* (1.95)
Controls	Y	Y	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y
Adj. $R^2$	0.827	0.163	0.152	0.827	0.163	0.152
Observations	28,653	28,653	28,653	28,653	28,653	28,653
Panel B: Performance from t+1 to t+3						
	$LMD_{adj}^-$			$HNR_{adj}^-$		
	Raw Return (1)	1-Factor Alpha (2)	4-Factor Alpha (3)	Raw Return (4)	1-Factor Alpha (5)	4-Factor Alpha (6)
Negativity	0.014 (0.41)	0.020 (0.59)	0.015 (0.45)	0.018 (0.57)	0.030 (1.02)	0.034 (1.15)
Controls	Y	Y	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y
Adj. $R^2$	0.854	0.202	0.185	0.854	0.202	0.185
Observations	28,653	28,653	28,653	28,653	28,653	28,653

**Table 11: Letter tone and managerial risk-taking**

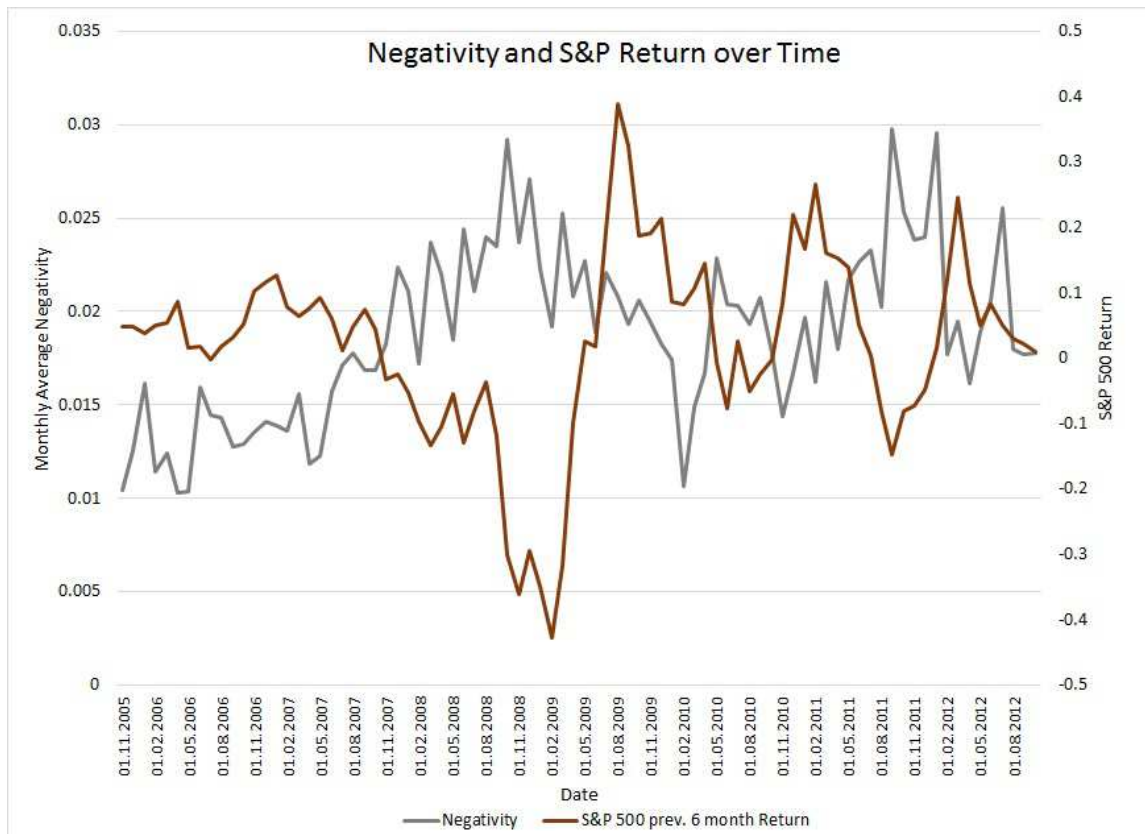
This table shows regressions of fund risk on shareholder letter tone and various fund characteristics. The dependent variable is the fund's total risk (columns (1) and (4)), the systematic risk (columns (2) and (5)), and the idiosyncratic risk (columns (3) and (6)). Fund risk is the standard deviation of daily returns from one month after a letter is sent (t+1) to six months after the letter is sent (t+6). Systematic (idiosyncratic) risk is the market beta (standard deviation of residuals) obtained from estimating a Carhart 4-Factor-Model using daily data from month t+1 to t+6 where  $t$  is the filing month.  $LMD_{adj.}^-$  ( $HNR_{adj.}^-$ ) are the adjusted fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) (our own) dictionary. All control variables are defined in detail in Appendix D. All regressions include fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month). Standard errors are clustered at the fund level.  $t$ -statistics are provided in parentheses. \*\*\*, \*\*, and \* represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	$LMD_{adj.}^-$			$HNR_{adj.}^-$		
	Fund Risk (1)	Syst. Risk (2)	Idiosyncr. Risk (3)	Total Risk (4)	Syst. Risk (5)	Idiosyncr. Risk (6)
Negativity	-0.300 (-1.40)	0.034 (0.40)	-0.450*** (-3.46)	-0.277 (-1.32)	-0.042 (-0.52)	-0.410*** (-3.36)
Fund Size	0.010* (1.75)	0.008*** (3.08)	0.008*** (2.60)	0.010* (1.75)	0.008*** (3.08)	0.008*** (2.59)
Company Size	0.007 (1.22)	0.002 (0.58)	-0.003 (-0.85)	0.007 (1.22)	0.002 (0.57)	-0.003 (-0.84)
Fund Age	-0.038** (-2.03)	-0.028*** (-3.31)	-0.022** (-1.99)	-0.038** (-2.03)	-0.028*** (-3.31)	-0.022** (-1.99)
Expense Ratio	0.935 (0.52)	1.624* (1.71)	-1.253 (-0.86)	0.938 (0.52)	1.625* (1.71)	-1.248 (-0.86)
LN(Words)	0.009*** (3.06)	-0.000 (-0.32)	0.005*** (2.71)	0.009*** (3.03)	-0.000 (-0.19)	0.005*** (2.65)
LN(WPS)	0.025*** (3.02)	0.003 (0.68)	0.009* (1.88)	0.024*** (2.99)	0.002 (0.53)	0.009* (1.84)
Time Difference	0.001* (1.90)	0.000 (1.17)	0.001*** (2.87)	0.001* (1.91)	0.000 (1.19)	0.001*** (2.90)
Flow Rep. Per.	0.005 (0.48)	-0.000 (-0.04)	-0.000 (-0.07)	0.005 (0.48)	-0.000 (-0.04)	-0.000 (-0.07)
Return Rep. Per.	0.136*** (3.87)	0.060*** (3.96)	0.047** (2.53)	0.135*** (3.86)	0.060*** (3.96)	0.047** (2.51)
Constant	1.101*** (6.15)	1.219*** (13.02)	0.378*** (3.49)	1.102*** (6.16)	1.221*** (13.05)	0.379*** (3.50)
Fund FE	Y	Y	Y	Y	Y	Y
Report Month FE	Y	Y	Y	Y	Y	Y
Filing Month FE	Y	Y	Y	Y	Y	Y
Adj. $R^2$	0.892	0.073	0.466	0.892	0.073	0.466
Observations	29,092	29,092	29,092	29,092	29,092	29,092



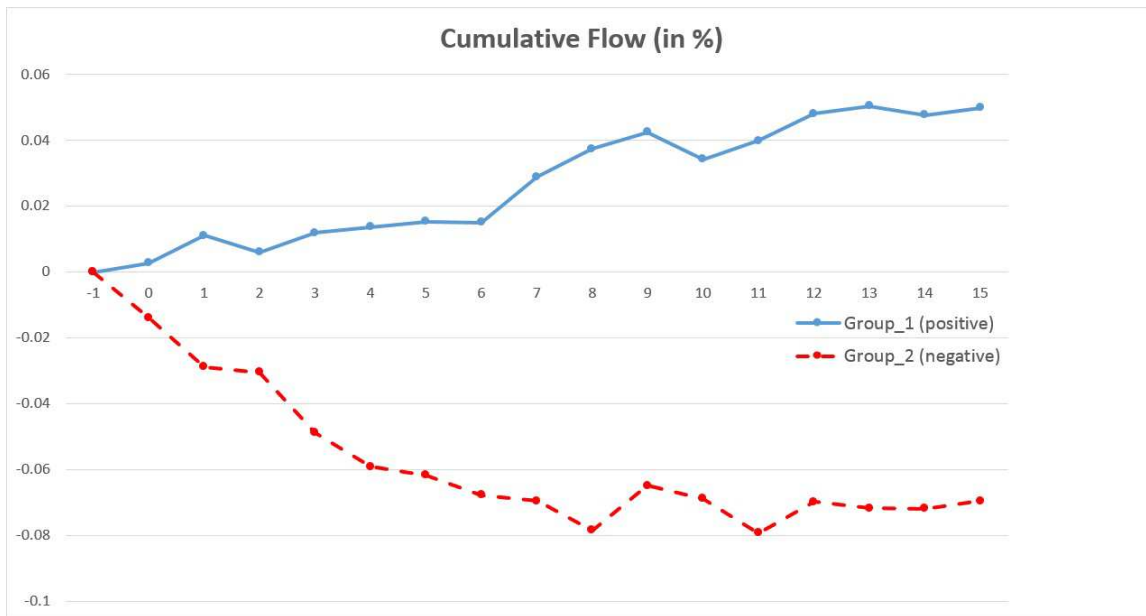
**Figure 1: Average negativity over time**

The grey line in this figure shows the average shareholder letter negativity obtained from the Loughran and McDonald (2011) dictionary, and our own dictionary. The sample period is from November 2005 to October 2012. The brown line in this figure shows S&P 500 returns over the previous six months of a given date.



**Figure 2: Cumulative daily flows after shareholder letter filing date**

This figure shows the subsequent cumulative flows for up to 15 days after the filing date (day 0) of a shareholder letter separately for letters with positive (blue solid line) and negative (red dashed line) adjusted tone. Tone is measured by  $LMD^-$  which is the fraction of negative words in the shareholder letter based on the Loughran and McDonald (2011) dictionary. We orthogonalize  $LMD^-$  in a regression and then use the residual from that regression as adjusted tone measure. The adjusted tone regression includes the controls and fixed effects from Table 3 and in addition the return rank (instead of the raw return), the squared return rank, and the value-weighted return of the fund family. The two groups are obtained by a median split of the letters based on adjusted  $LMD^-$  tone.



## Appendices

### A Who signs the shareholder letter?

	Abs. Frequency	Rel. Frequency
Chief Investment Officer	1369	4.0%
Chief Executive Officer	5016	14.8%
Chief Operating Officer	61	0.2%
Chief Financial Officer	69	0.2%
Fund Manager	3300	9.7%
President	12544	37.0%
Chairman	5666	16.7%
Managing Director	394	1.2%
Unknown	13068	38.6%

## B Timing of N-CSR and N-CSR filings

	Report Date		Filing Date	
	Number (1)	Percentage (2)	Number (3)	Percentage (4)
January	1,748	3.5%	4,412	8.9%
February	2,678	5.4%	2,342	4.7%
March	5,685	11.5%	5,876	11.9%
April	6,504	13.2%	2,127	4.3%
May	1,855	3.8%	2,902	5.9%
June	6,496	13.2%	6,824	13.8%
July	1,770	3.6%	4,943	10.0%
August	2,671	5.4%	3,514	7.1%
September	5,724	11.6%	4,732	9.6%
October	5,984	12.1%	2,011	4.1%
November	1,718	3.5%	2,899	5.9%
December	6,555	13.3%	6,806	13.8%

## C Most frequent negative words

Column (1) of this table shows the 25 most frequently mentioned words according to the Loughran and McDonald (2011) dictionary (LMD<sup>-</sup>) in our sample of shareholder letters. Column (2) shows the 25 most frequent words from our own dictionary (HNR<sup>-</sup>) that are not also included in the LMD<sup>-</sup> dictionary.

Rank	LMD <sup>-</sup> (1)	HNR <sup>-</sup> (2)
1	volatility	inflation
2	decline	uncertainty
3	losses	fluctuate
4	crisis	pressure
5	concerns	bear
6	weakness	detractors
7	recession	struggled
8	negative	sharp
9	challenges	hard
10	slowing	mixed
11	unemployment	headwinds
12	against	drop
13	difficult	downs
14	late	downside
15	underperformed	bubble
16	questions	sell-off
17	problems	crunch
18	detracted	forces
19	slowdown	depression
20	worst	woes
21	fears	subdued
22	sharply	anxiety
23	downturn	expensive
24	lagged	contagion
25	hurt	tough

## D Variable description

This table briefly defines the main variables used in the empirical analysis. The data sources are:

- (i) CRSP: CRSP Survivorship Bias Free Mutual Fund Database
- (ii) SEC: Securities and Exchange Commission EDGAR Database
- (iii) EST: Estimated by the authors
- (iv) KF: Kenneth French Data Library
- (v) MS: Morningstar Direct Database

Panel A: Main dependent variables

Variable name	Description	Source
Fund Flow	Computed as $(TNA_{i,t} - TNA_{i,t-1})/TNA_{i,t-1} - r_{i,t}$ where $TNA_{i,t}$ denotes fund $i$ 's total net assets ( $TNA$ ) in month $t$ and $r_{i,t}$ denotes fund $i$ 's return in month $t$ as reported in CRSP. The merger correction proposed in Lou (2012) is applied.	CRSP, EST
Daily Fund Flow	Computed as the Dollar Flow on day $t$ (MS variable "Estimated Fund-Level Net Flow aggregated from share classes (daily)") divided by the total net assets on day $t-1$ (MS variable "Fund Size aggregated from share classes (daily)").	MS, EST
1-Factor Alpha	Performance alpha from a market model. The alphas are estimated out of sample, i.e., coefficients to compute alphas for the 6-month period following the filing month are obtained using daily fund returns over the previous twelve months ( $t-12$ to $t-1$ ). Market returns are from the Kenneth French data library.	CRSP, KF, EST
4-Factor Alpha	Performance alpha from a model including factor returns for the market, HML and SMB factors from the Kenneth French data library, as well as the Carhart momentum factor. The alphas are estimated out of sample, i.e., coefficients to compute alphas for the 6-month period following the filing month are obtained using daily fund returns over the previous twelve months ( $t-12$ to $t-1$ ).	CRSP, KF, EST
Fund Risk	Standard deviation of daily returns. Depending on the regression, the variable is calculated in the month after the filing ( $t+1$ ), one month after the filing ( $t+1$ ) to three months after the filing ( $t+3$ ), and one month after the filing ( $t+1$ ) to six months after the filing ( $t+6$ ).	CRSP, EST
Systematic Risk	Loading on the excess return of the market in the Carhart Four-Factor-Model. The estimation is based on daily returns. Depending on the specification, the estimation windows are the month after the filing ( $t+1$ ), one month after the filing ( $t+1$ ) to three months after the filing ( $t+3$ ), and one month after the filing ( $t+1$ ) to six months after the filing ( $t+6$ ).	CRSP, KF, EST
Idiosyncratic Risk	Estimated as the standard deviation of the residual in the Carhart Four-Factor-Model. The estimation is based on daily returns. Depending on the specification, the estimation windows are the month after the filing ( $t+1$ ), one month after the filing ( $t+1$ ) to three months after the filing ( $t+3$ ), and one month after the filing ( $t+1$ ) to six months after the filing ( $t+6$ ).	CRSP, KF, EST

Panel B: Main independent variables

Variable name	Description	Source
$LMD^-$	Fraction of negative words in a letter according to the Loughran and McDonald (2011) dictionary.	SEC, EST
$HVD^-$	Fraction of negative words in a letter according to the Harvard IV-4 Psychosociological dictionary.	SEC, EST
$HNR^-$	Fraction of negative words in a letter according to our own dictionary.	SEC, EST
$LMD_{adj}^-$ ( $HVD_{adj}^-$ , $HNR_{adj}^-$ )	Residual of a regression of $LMD^-$ ( $HVD^-$ , $HNR^-$ ) on Flow Reporting Period, Fund Size, Company Size, Fund Age, Expense Ratio, Fund Risk, Segment Growth, Return Rank, Return Rank Squared, the value-weighted return of the fund family, and the fund returns between the fiscal (half-) year end and the filing date. The regression also includes fund fixed effects and time fixed effects for the month of the fiscal (half-) year end (Report Month) and for the month of the SEC filing (Filing Month).	SEC, EST

Panel C: Other control variables

Variable name	Description	Source
Return Reporting Period	Return over the six months before the fiscal (half-) year end.	CRSP
Return Rank	Performance rank of a fund based on its return over the six months before the fiscal (half-) year end in its market segment. This variable is normalized between zero and one.	CRSP, EST
Return Rank <sup>2</sup>	Squared performance rank of a fund based on its return over the six months before the fiscal (half-) year end in its market segment. This variable is normalized between zero and one.	CRSP, EST
$Return_{m+1}$	Return over the month after a reporting month.	CRSP, EST
$Return_{m+2, fm}$	Return from two month after the reporting month to the filing month.	CRSP, EST
Flow Reporting Period	Flow over the six months before the fiscal (half-) year end.	CRSP, EST
Fund Size	Logarithm of a fund's total net assets.	CRSP
Company Size	Logarithm of a fund company's total net assets.	CRSP
Expense Ratio	A fund's annual expense ratio in percent	CRSP
Fund Age	Logarithm of a fund's age computed from the date a fund was first offered (CRSP variable "first_offer_dt").	CRSP, EST
Flow Segment	Growth rate of the fund's segment due to inflows in percent. Calculated based on aggregation of individual fund growth rates due to inflows.	CRSP, EST
Segment Growth	Change in the number of funds per market segment in a given month.	CRSP, EST
LN(Words)	Natural logarithm of a letter's total number of words.	SEC, EST
LN(WPS)	Natural logarithm of a letter's average number of words per sentence.	SEC, EST
Time Difference	Number of days between the reporting period end date (report date) and the filing date for a given shareholder letter.	SEC, EST

## E Details on extracting shareholder letters from N-CSR filings

The N-CSR filings are available since 2003 but investment companies did not have to use unique portfolio identifiers until 2006. Before 2006, there is only the Central Index Key (CIK) that can be linked to one or multiple portfolios and thus cannot be used as a unique portfolio identifier. Beginning February 6, 2006, all open-end mutual fund companies have been required to use electronic IDs that allow identification of fund portfolios and share classes when making their filings with the SEC.<sup>31</sup> There are two types of identifiers used by the SEC. The Series ID is used as an identifier on the fund portfolio level, while the Class ID is used as an identifier on the share class level. We find that after 2006, 96.40% of all N-CSR filings of open-end investment companies include a Series ID. Since we will use these portfolio identifiers as well as the ticker symbols to merge shareholder letters to CRSP mutual fund data, our sample starts in 2006. The sample ends in December 2012. Filings without information on the Series ID are dropped from our sample.

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<sup>31</sup>See adopting release <http://www.sec.gov/rules/final/33-8590.pdf>



## F Two excerpts from letters to shareholders

“Dear Investor: Thank you for taking time to review the following discussions, from our experienced portfolio management team, of the fund reporting period ended December 31, 2008. It was a time of enormous upheaval and change. We understand and appreciate the **challenges** you have faced during this historic period, and share your **concerns** about the economy, the markets, and fund holdings. To help address these issues, I’d like to provide my perspective on how we have managed—and continue to manage—your investments in these **uncertain** times. As a company, American Century Investments is well positioned to deal with market **turmoil**. We are financially strong and privately held, which allows us to align our resources with your long-term investment interests. In addition, our actively managed, team-based approach allows our portfolio teams to identify attractive investment opportunities regardless of market conditions. Our seasoned investment professionals have substantial experience and have successfully navigated previous market **crises**. These portfolio managers and analysts continue to use a team approach and follow disciplined investment processes designed to produce the best possible long-term results for you. For example, our equity investment teams are working closely with our fixed income group to monitor and assess credit **crisis** developments. The fixed income team anticipated **dislocation** in the credit markets and—through its disciplined processes and teamwork—helped reduce our exposure to investments that suffered substantial **losses**. How soon a sustainable recovery will occur is **uncertain**. But I am certain of this: Since 1958, we’ve demonstrated a consistent ability to execute solid, long-term investment strategies and the discipline to remain focused during times of **volatility** or shifts in the markets. We’ve stayed true to our principles, especially our belief that your success is the ultimate measure of our success. Thank you for your continued confidence in us.” (AMERICAN CENTURY QUANTITATIVE EQUITY FUNDS, INC. Small Company Fund, December 2008, previous 6-month return: —33.84%)

“DEAR FELLOW SHAREHOLDERS OF VIRTUS MUTUAL FUNDS: The past year was unprecedented in the financial markets and a sobering period for most investors. And that may be the most flattering description we can give 2008. Economies across the globe were buffeted by the **severe** credit **contraction** that **destabilized** financial markets and led to bank **closures**, **failures** of financial services companies, and massive government **bailouts**. Corporations suffered from tightened commercial lending and a **sharp drop** in consumer demand, and responded with predictable **cutbacks** in employment and capital spending. The financial markets reflected the scope of these global economic **challenges**. The Dow Jones Industrial Average was down 31.9 percent in 2008, its **worst** year since 1931. The Standard & Poor’s 500 index **dropped** 22 percent in the fourth quarter alone, and 37 percent for the full year - its **worst** performance since 1937. The NASDAQ market had its **worst** year ever. Investor confidence has been a major casualty of this financial **turmoil**. Many investors, **paralyzed** by the constant flow of **negative** news, have reacted to this extraordinary market **volatility** by **deviating** from their long-term financial plans. But just as it is **unrealistic** to base investment expectations on the market’s supercharged returns from much of the 1980s and 1990s, it may be equally **misleading** to assume that future long-term results will track the market’s recent **dismal** performance. While no one can predict the future, it is important to remember that the market has generally rewarded investors over the long term. Since 1927, stocks have returned 9.6 percent on average annually, and that includes the steep **decline** experienced through the end of last year. Although the near-term outlook continues to be filled with **uncertainties**, we believe that investors with long-term goals - such as saving for a child’s college education or preparing for one’s own comfortable retirement - are best served by structuring and modifying their investment program with an eye to the long-term, rather than giving **disproportionate** weight to the short-term fluctuations in the marketplace. We strongly recommend that you review your portfolio with your financial planner or representative to ensure that it matches your current long-term objectives and your tolerance for risk. (...) On behalf of the entire team at Virtus Investment Partners, and the investment professionals at our affiliated managers and subadvisers, I thank you for entrusting your assets to us.” (VIRTUS INSIGHT TRUST DISCIPLINED SMALL-CAP OPPORTUNITY FUND, December 2008, previous 6-month return: -33.22%)