

# Reaching for Yield by Corporate Bond Mutual Funds\*

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## Abstract

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## Abstract

We study reaching for yield among corporate bond mutual funds. In a low-interest-rate environment, funds may seek to invest in bonds with relatively higher yields than their benchmarks in order to attract flows. We show that funds engage in more reaching for yield when the level and slope of the yield curve are low and when the default spread is narrow. The funds that engage in reaching for yield are also exposed to greater illiquidity, exacerbating redemption risks. Funds with poor year-to-date performance relative to their peers engage in more active reaching for yield. When funds shift their portfolios towards higher yields, they experience higher inflows, indicating that investors respond positively to this behavior. Funds that engage in reaching for yield generate relatively higher returns, but their performance is explained by common risk factors and thus driven primarily by risk-taking rather than skill.

# 1 Introduction

Since the Great Recession, investors have directed unprecedented amounts of money into corporate bond mutual funds. These funds' holdings of corporate bonds more than doubled between 2007 and 2013, to over 1.7 trillion dollars.<sup>1</sup> Some commentators and academics have nevertheless expressed a growing concern that the recent sustained run of easy monetary policies may lead asset managers to “reach for yield.”<sup>2</sup> Practitioners have also suggested that corporate bond mutual funds in particular increasingly buy bonds with higher yields than their benchmarks in order to “beat” the benchmark.<sup>3</sup>

In this paper, we examine reaching for yield by U.S. corporate bond mutual funds and its implications for fund investors. Despite the important role these funds play in securities markets, relatively little research has examined the holdings of bond funds compared with the vast literature on equity funds. One reason behind this paucity of research is that comprehensive data on mutual funds' corporate bond holdings and pricing are not readily available. We seek to fill a gap in this literature by investigating the risk-taking and holdings of these funds with a focus on reaching for yield.<sup>4</sup> To do so, we employ unique data on the corporate bond holdings of U.S. open-ended bond mutual funds from Morningstar and pricing data from Thomson Reuters. Our analysis also speaks to the current debate on the effect of the unconventional monetary policies and the incentives of delegated asset managers on risk-taking in securities markets (see, e.g., Feroli, Kashyap, Schoenholtz, and Shin (2014), Becker and Ivashina (2015), Hanson and Stein (2015), and Di Maggio and Kacperczyk 2016). Corporate bond mutual funds offer a compelling setting in which to study these effects, given the fierce competition in this industry and strong incentives to showcase superior returns. In addition, corporate bonds display a wide variety in yields

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<sup>1</sup>See Investment Company Institute: 2014 Investment Company Factbook.

<sup>2</sup>Reaching for yield, while not often defined in a precise way, refers broadly to an investor's preference for higher-yielding, and thus potentially riskier, securities. We measure reaching for yield as a portfolio consisting of bonds with higher yields relative to the benchmark index in the same rating and maturity categories. These fund-level measures of reaching for yield are formally described in Section 2.3.

<sup>3</sup>See, e.g., “Bond Funds Get Aggressive,” *The Wall Street Journal*, Sep 28 2012 and “A Disappearing Act”, Blackrock, May 2014.

<sup>4</sup>Reaching for yield by insurance companies, commercial banks, and money market funds has recently been studied in A few other papers also study bond funds, including Blake, Elton, and Gruber (1993), Chen, Ferson, and Peters (2010b), Cici, Gibson, and Merrick (2011), and Goldstein, Jiang, and Ng (2015).

compared to many other fixed-income asset classes, even controlling for the bonds' rating and maturity, thus providing funds an opportunity to engage in reaching for yield.

Our key findings can be summarized as follows. Corporate bond funds are more likely to reach for yield when the level and slope of the yield curve are low and the default spread is narrow, and thus when high-yielding investment opportunities in fixed-income markets are scarcer in aggregate. Reaching for yield is also associated with greater risk-taking in other dimensions, as the funds that reach for yield also have lower levels of liquidity buffers (e.g., cash or Treasuries), tend to hold bonds that are more illiquid, hold a greater fraction of equity, and are exposed to more extreme redemption risks. Funds with poor year-to-date performance rankings shift holdings into higher yield corporate bonds. We further show that the funds that reach for yield attract larger flows and generate higher returns. However, any superior raw returns that funds earn from reaching for yield can be explained by betas on common risk factors. If anything, fund alphas tend to be even negative.

We start by examining whether term structure variables predict reaching for yield by corporate bond funds. Feroli et al. (2014) and Acharya and Naqvi (2015) show theoretically that asset managers reach for yield when interest rates are low. But it is an open empirical question whether fund managers are actually more likely to engage in reaching for yield in low-interest-rate environments.<sup>5</sup> We find evidence that funds reach for yield to a greater extent when both the level and slope of the yield curve are low, consistent with the hypothesis that, when interests are low, funds substitute towards relatively higher-yielding (and thus potentially riskier) bonds to enhance their yields. Furthermore, when the yield spread between BBB and AAA rated bonds (the default spread) is narrow and thus premia on corporate bonds are low, funds also reach for yield to a greater extent. In sum, corporate bond mutual funds shift towards relatively higher-yielding securities in times when there are fewer high-yield investment opportunities in aggregate.

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<sup>5</sup>For example, in her confirmation hearing to become the Chair of the Board of Governors of the Federal Reserve System, Janet Yellen noted that there is only limited evidence that Fed policies had resulted in reaching for yield. See transcript at <http://blogs.wsj.com/economics/2013/11/14/live-blog-janet-yellens-confirmation-hearing-for-fed-chair/>

Even though reaching for yield could be an intended outcome of unconventional monetary policies by encouraging investment in riskier projects (Rajan 2013), the agency problems of delegated asset managers can lead to other, unintended outcomes (Stein 2013). For example, Acharya and Naqvi (2015) show theoretically how the incentives of delegated asset managers result in over-investment in risky assets and underinvestment in safe assets under easy monetary policies. Feroli et al. (2014) show that when mutual fund managers have an incentive to boost relative performance, excessive flows to these funds can threaten financial stability.

Whether reaching for yield might be a concern to financial stability crucially depends on whether these funds are taking appropriate measures to prudently guard against redemption risk and runs. We thus next analyze whether funds that reach for yield also engage in greater risk-taking along other dimensions, or whether funds compensate for reaching for yield by adopting more conservative policies in liquidity management (e.g., by holding more cash). Because buying relatively high-yielding securities can put funds at particular risk of large redemptions in a crisis, we may expect funds that reach for yield to have particularly large cash buffers. In contrast, if reaching for yield is a sign of aggressive risk-taking in general, we may expect these funds to have a small cash buffer and also invest in a greater fraction of other relatively riskier securities such as equities. We find that funds that reach for yield tend to hold *less* cash and cash-like securities (e.g., Treasury bills), more illiquid corporate bonds, and more equities. These results also hold when controlling for fund style. We further show that funds that reach for yield more aggressively tend to be relatively younger and larger and that investment-grade (IG) funds reach for yield to a greater extent compared with high-yield (HY) funds.

An underlying reason why some funds engage in reaching for yield may be to showcase better performance and attract flows. To study these questions, we employ a novel decomposition of shifts in reaching for yield into active and passive components. The active component is the portion of changes in reaching for yield that can be attributed to a fund's portfolio choices, while the passive component is caused by bond price movements while holding the portfolio constant. When a bond's price falls, its yield rises (and vice versa),

so even if a fund makes no changes to its holdings, the yield of its portfolio can increase or decrease if bonds held by the fund experience price changes (and the reaching-for-yield measure may thus change mechanically depending on whether yield changes are greater than changes in benchmark yields).

We then show that funds “actively” reach for yield when they have stronger incentives (in the cross section of funds) to do so, and that flows respond positively to such changes in active reaching for yield. Specifically, similar to previous studies on tournament-like behavior among equity funds, we show that corporate bond funds with poor year-to-date performance relative to their peers engage in more active reaching for yield in the last quarter of the year. We then ask whether investors indeed direct greater flows towards the funds that reach for yield. We find that future fund flows respond positively to an increase in “active” reaching for yield. But, unsurprisingly, flows respond negatively to “passive” reaching for yield, as this component is associated with suffering poor returns. These results show that funds may want to actively change portfolio holdings towards higher-yielding bonds. The results are also consistent with anecdotal evidence that many mutual fund investors consider a fund’s current yield (in addition to its past performance) when they decide which funds to invest in.

Lastly, we examine the performance implications of reaching for yield.<sup>6</sup> In Fama-MacBeth regressions of individual mutual fund performance, we find that funds that reach for yield tend to generate higher returns. Similarly, in a calendar-time portfolio approach, returns on a portfolio consisting of mutual funds in the highest reaching-for-yield tercile are higher than are those on a portfolio of funds in the lowest reaching-for-yield tercile, by around 10–15 basis points monthly. However, the superior performance achieved by funds that reach for yield is fully explained by higher risk. When we regress returns on high-minus-low reaching-for-yield portfolios on the bond-level risk factors of Fama and French (1993), alphas are all indistinguishable from zero or even negative for IG funds.

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<sup>6</sup>The literature on mutual fund performance is vast. Studies include Brown and Goetzmann (1995), Ferson and Schadt (1996), Daniel, Grinblatt, Titman, and Wermers (1997), Wermers (2000) Chen, Hong, Huang, and Kubik (2004), Berk and Green (2004), and Kacperczyk, Sialm, and Zheng (2005) among many others.

These results show that superior fund returns generated by reaching for yield are due mainly to taking on more risk, rather than a result of bond-picking skills.

Our paper is closely related to recent studies on preferences for higher-yielding securities in other settings, particularly in times of easy monetary policies. In the money market fund industry, Di Maggio and Kacperczyk (2016) show that these funds take on greater risk by investing in longer-maturity and riskier asset classes in response to zero interest rate policies, even though these funds are intended to hold only safe, short-term assets and therefore are strictly regulated based on ratings and maturities. Becker and Ivashina (2015) show that insurance companies also tend to invest in relatively higher-yielding securities within each rating class, which is consistent with regulatory arbitrage as their capital requirements are based on ratings. Finally, Hanson and Stein (2015) document evidence of reaching for yield among commercial banks.

Unlike insurance companies, corporate bond funds that reach for yield are unlikely to be motivated by regulatory arbitrage, since these funds do not face capital requirements based on ratings. Further, even though every fund’s prospectus describes its overall investment strategy (e.g., that a fund will invest mainly in investment-grade bonds)—unlike money market funds—these investment guidelines are often not binding or strictly regulated. Instead, corporate bond funds have strong incentives to showcase superior returns to attract inflows.<sup>7</sup> If funds can beat their benchmarks by taking on more risk, and if some investors chase returns but do not properly evaluate each fund’s performance on a risk-adjusted basis (Sensoy (2009) and Del Guercio and Reuter (2014)), that may provide a strong incentive to reach for yield even absent regulatory frictions.<sup>8</sup>

Our paper thus also contributes to the large body of literature on mutual fund incentives and risk-taking behaviors (*i.e.*, “risk-shifting”). To the best of our knowledge we are the first paper to examine risk-shifting by corporate bond funds. For example, Brown, Harlow, and Starks (1996), Chevalier and Ellison (1997), Chen and Pennacchi (2009), and

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<sup>7</sup>The body of work that documents the relation between flow and performance, includes, among many other studies, Sirri and Tufano (1998) and Chevalier and Ellison (1997).

<sup>8</sup>While much research has shown that equity funds on average do not beat a passive index, a study by Morningstar suggested that a majority of corporate bond funds beat their index in large part by investing outside their benchmarks (see *Wall Street Journal*, Sept. 12, 2012, “Funds Leap Beyond Their Benchmarks”).

Christoffersen and Simutin (2014), among many others, show how risk-taking by equity mutual funds is affected by their incentives. Goetzmann, Ingersoll, Spiegel, and Welch (2007) show how mutual funds can manipulate performance measures, and Sensoy (2009) presents evidence that funds use self-designated indices to beat benchmarks and attract more flows. A closely related paper on equity funds is Huang, Sialm, and Zhang (2011), who use fund-level holdings data on equity mutual funds to show that excess risk-taking by these funds has a negative impact on their performance.<sup>9</sup> Similarly, Kacperczyk and Schnabl (2013) examine the relation between risk-taking by money market funds and their flows during the financial crisis.

## 2 Data and Variable Construction

To examine reaching for yield by corporate bond mutual funds, we combine multiple datasets, including (i) CRSP for mutual fund characteristics and returns, (ii) Morningstar for detailed holdings data of these funds, including their holdings of corporate bonds, (iii) the Fixed Income Securities Database (FISD) from Mergent for bond characteristics data (e.g., ratings), and (iv) the Bridge EJV database (more recently known as Thomson Reuters Pricing Service) and TRACE for corporate bond prices and yields.

### 2.1 Mutual Funds and Holdings Data

We start with a sample of bond funds from the CRSP Survivor-Bias-Free Mutual Fund Database. Because this paper focuses on funds that invest in corporate bonds, we first limit the sample to only funds classified as either corporate bond funds or general funds based on their CRSP fund styles.<sup>10</sup> We obtain monthly returns and net asset values

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<sup>9</sup>Cremers and Petäjistö (2009), among others, also study risk-taking using holdings-level data among equity funds.

<sup>10</sup>Specifically, we limit the sample of funds to CRSP style categories I, ICQH, ICQM, ICQY, ICDI, ICDS, or IC. After we match all funds' holdings to FISD, we also further limit the sample to funds that, at least at one point during the sample period, held a bond identifiable as a corporate bond in FISD. In some tests, we further limit the sample to only funds whose holdings consist of corporate bonds to an even larger extent (over 75%).



(NAV) as well as quarterly data on turnover, expense ratios, fund age, and other fund characteristics from the CRSP database.

We then merge the CRSP fund data with bond holdings data which are obtained from Morningstar spanning the period from 2002 through 2012. The Morningstar database provides holdings of U.S. open-end taxable fixed-income funds at a quarterly frequency. From Morningstar, we obtain information on bond identifiers (bond CUSIP) and the number of each bond held, as well as data on other securities held by the fund such as Treasuries and equities. This database includes both surviving and dead funds.

Our main analysis is performed at the fund level, so if the same portfolio is held by several share classes, all fund-level characteristics (e.g., age) are calculated as the asset-weighted average of these characteristics across all share classes that belong to the same fund. The merged sample consists of around 24,000 fund-quarters covering the period from January 2002 through June 2012.<sup>11</sup>

## 2.2 Corporate Bond Data

We next merge these holdings data with detailed bond characteristics data from the Fixed Income Security Database (FISD) from Mergent. FISD is a comprehensive database for corporate bond issues, providing detailed data on issuers (e.g., industry) and issue characteristics (ratings, terms and conditions, etc).

We obtain bond pricing and yield data as well as historical amounts outstanding from the Thomson Reuters Fixed Income Database. The database contains daily bid quotes provided by major dealers in corporate bond markets. The database is fairly comprehensive, covering most corporate bonds held by mutual funds in the merged database. A potential issue with pricing data based on dealer quotes is price staleness. In our paper, however, we employ only quarterly yield data, which mitigates a possible concern about price staleness at higher frequencies. For example, Choi and Richardson (2015) and Choi (2013) show that corporate bond prices in the Thomson Reuters database do not exhibit

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<sup>11</sup>The principal limitation on our sample period is imposed by the Morningstar bond holdings data, which starts only in 2002.

significant price staleness over a one-month horizon and that Thomson Reuters prices follow transaction-based prices quite well.<sup>12</sup> If pricing data from Reuters are missing for a bond, we instead use pricing data from TRACE if available.

## 2.3 Measures of Reaching for Yield

We next describe how we calculate the extent to which each fund engages in reaching for yield. First, for each fund-quarter, we calculate the value-weighted average (across all corporate bonds held by a fund) of the deviation of each bond’s yield from the yields of a benchmark index. We call this average deviation measure the “total” reaching for yield. Specifically, for each fund  $i$ , bond  $j$ , and quarter  $t$  we calculate

$$RFY_{i,t}^{Total} \equiv \sum_j w_{j,i,t} (y_{j,t} - y_t^{AGG}) \quad (1)$$

where  $w_{j,i,t}$  is bond  $j$ ’s market weight in fund  $i$ ’s bond holdings,  $y_{j,t}$  is the yield of bond  $j$ , and  $y_t^{AGG}$  is a value-weighted benchmark yield. We calculate the benchmark yield as follows: We start with all corporate bonds in the FISD database that satisfy inclusion in the Barclays Aggregate Corporate Bond Index, and calculate the average yield across all the Index-eligible securities. The Barclays bond index is by far the most prevalent benchmark for bond mutual funds, and thus this total reaching-for-yield measure allows us to gauge funds behaviors relative to this common benchmark.

In addition, the measure represents how much funds “tilt” their portfolios towards higher yields compared with their peers (or their benchmark), and the measure therefore implicitly controls for any possible confounding effect coming from time-series variation in the supply of bonds (e.g., suppose more risky firms issue bonds in certain times, then all investors on average must also hold riskier holds in those times; but what we measure is whether corporate bond mutual funds tilt their portfolios more or less compared to this aggregate benchmark of outstanding bonds). We thus isolate reaching for yield by mutual funds. By design, we thus do not study the question of whether the aggregate supply

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<sup>12</sup>This database is commonly used in the financial industry for pricing bonds, and used by many major Wall Street firms for marking their books.

of bonds might respond to the interest rate environment (e.g., if corporate bond issuers might respond by issuing more bonds of a certain kind, as in Greenwood, Hanson, and Stein (2010))

We further decompose the total reaching-for-yield measure in (1) into three components: reaching for rating ( $RFR$ ), reaching for maturity ( $RFM$ ), and reaching for yield within a rating and maturity ( $RFY^{WRM}$ ). Specifically, we decompose (1) as follows:

$$\begin{aligned}
RFY_{i,t}^{Total} &\equiv \sum_j w_{j,i,t} (y_{j,t} - y_t^{AGG}) \\
&= \sum_j w_{j,i,t} \left( (y_{j,t} - y_{j,t}^{R,M}) + (y_{j,t}^{R,M} - y_{j,t}^R) + (y_{j,t}^R - y_t^{AGG}) \right) \\
&= \underbrace{\sum_j w_{j,i,t} (y_{j,t}^R - y_t^{AGG})}_{\text{Reaching for Rating}} + \underbrace{\sum_j w_{j,i,t} (y_{j,t}^{R,M} - y_{j,t}^R)}_{\text{Reaching for Maturity}} + \underbrace{\sum_j w_{j,i,t} (y_{j,t} - y_{j,t}^{R,M})}_{\text{RFY within Rating and Maturity}} \\
&\equiv RFR_{i,t} + RFM_{i,t} + RFY_{i,t}^{WRM} \tag{2}
\end{aligned}$$

where  $y_{j,t}^R$  is the weighted average yield of all Barclay-Index-eligible corporate bonds with the same rating notch as bond  $j$  and  $y_{j,t}^{R,M}$  is the weighted average yield of all Barclay-Index-eligible corporate bonds with the same rating notch and maturity bucket (we use five buckets for maturity: <3 years, 3-5 years, 5-7 years, 7-10 years, and >10 years) as bond  $j$ , and weights are determined by amounts outstanding.<sup>13</sup> Because we principally use the bid prices from Thomson Reuters to calculate yields, all yields will generally be higher than those implied by average transaction prices. However, because our reaching-for-yield measures are defined as deviations of a bond's yield from the yield of other matched bonds from the same data source, any possible bias due to bid-ask spreads will on average be cancelled out.<sup>14</sup>

Equation (2) thus illustrates three dimensions in which funds can reach for yield: reach-

<sup>13</sup>We calculate reaching-for-yield measures only for corporate bonds. As a consequence, this measure captures reaching for yield only among these corporate bonds, and does not capture the risk and yield characteristics of any potential structured bonds, equity holdings, etc.

<sup>14</sup>For example, suppose bid-ask spreads are wider for lower-rated bonds; then the measured yield using bid prices would overstate the actual yields more so for these bonds, but that would not affect the RFY measures because we subtract rating-matched yields that on average would have the same bias between bids and actual prices.

ing for rating ( $RF R_{i,t}$ ), reaching for maturity ( $RF M_{i,t}$ ), and reaching for yield within-rating-and-maturity ( $RF Y_{i,t}^{WRM}$ ). Bond yields are strongly correlated with both ratings and maturity, and thus a high total reaching-for-yield measure might simply indicate that a fund holds lower-rated or longer-maturity bonds. The first component, reaching for rating, captures the higher yield that can be attributed to holding bonds with lower ratings. Naturally, we would expect this measure to be higher for high-yield bond funds than investment-grade funds. The second component, reaching for maturity, captures the yield that can be attributed to holding longer-maturity bonds (keeping the average rating constant). Typically, yields on longer-maturity bonds are higher due to term premia. The third component captures investing in bonds with relatively higher yields within a given rating-and-maturity category ( $RF Y_{i,t}^{WRM}$ ). Separating out this third dimension from the other two is particularly important, as the investment mandates of corporate bond mutual funds are typically based on credit ratings and maturities (although only loosely as these guidelines aren't strictly binding). Funds' average rating and the average maturity of their holdings are often reported directly as part of quarterly reports and prospectus. Thus, reaching for yield in the third dimension,  $RF Y_{i,t}^{WRM}$ , is more difficult to observe from quarterly reports and funds have more leeway to freely engage in reaching for yield along this dimension.

## 2.4 Measures for Active vs. Passive Reaching for Yield

Yields of funds' bond holdings may shift not only due to funds' active portfolio choices but also as a result of past performance. Even if a fund makes no changes to its portfolio, its measured reaching for yield will increase if its portfolio suffers poor returns (as bond prices and yields move in opposite directions), and, conversely, the fund will appear to reach for yield less if it experiences high returns. To distinguish between a fund's active portfolio choices towards more reaching for yield from the passive effect of past returns on bond yields, we decompose the change in reaching for yield ( $\Delta RF Y_{i,t}$ ) into the following

components ( $\Delta RFY1_{i,t}$ ,  $\Delta RFY2_{i,t}$ , and  $\Delta RFY3_{i,t}$ ):

$$\begin{aligned}
\Delta RFY_{i,t}^{Total} &\equiv \sum_j \Delta (w_{j,i,t}(y_{j,t} - y_t^{AGG})) \\
&= \underbrace{\sum_j (\Delta w_{j,i,t})(y_{j,t-1} - y_t^{AGG})}_{\text{Active Reaching for Yield}} + \underbrace{\sum_j w_{j,i,t-1} \Delta(y_{j,t} - y_t^{AGG})}_{\text{Poor Returns}} \\
&\quad + \underbrace{\sum_j (\Delta w_{j,i,t}) \Delta(y_{j,t} - y_t^{AGG})}_{\text{Doubling Down/Locking-in Gains}} \\
&\equiv \Delta RFY1_{i,t} + \Delta RFY2_{i,t} + \Delta RFY3_{i,t} \tag{3}
\end{aligned}$$

The first component,  $\Delta RFY1_{i,t}$ , captures funds’ active shifts in portfolio holdings towards bonds with relatively high yields (“active reaching for yield”). The second component,  $\Delta RFY2_{i,t}$ , is the mechanical shift in reaching for yield driven by price changes (“poor returns”): If a fund’s holdings suffer relatively poorer returns than the benchmark and the fund continues to hold these bonds, the bonds’ yield as well as the fund’s reaching-for-yield measure mechanically increases, and vice versa. The third component,  $\Delta RFY3_{i,t}$ , is the interaction of portfolio shifts and price shifts (“doubling down/locking-in gains”). This component is positive when a fund acts in a contrarian fashion by increasing portfolio weights in bonds that have become less expensive compared with the benchmark, or when a fund reduces the weight of bonds that have become more expensive relative to the benchmark (conversely, the third component is negative if funds sell recent losers or buy recent winners). It is important to decompose shifts in reaching for yield into these components, particularly to cleanly separate the  $\Delta RFY1_{i,t}$  and  $\Delta RFY2_{i,t}$  components: one of which is due to active changes in portfolio composition, and the other which is “accidental” in the sense that it is simply a result of price movements (*i.e.*, “passive”).

## 2.5 Summary Statistics

Table 1 presents summary statistics. We report fund-level characteristics after aggregating share class level characteristics, weighted by assets. In Panel A, the average assets

across the fund-quarters in our sample are \$2.3 billion (median \$427 million), average flow is 4%, and average turnover 150%. The mean expense ratio is 0.85%. Funds have an average age of around 11 years with an average manager tenure of 6.6 years.

Panel A further reports statistics on the holdings for these funds. The funds in our sample on average invest 46.7% (median 39.2%) of their assets in corporate bonds. Corporate bonds thus make up by far the largest asset class for these funds on average, but notably these funds also invest in many other asset classes, e.g., agency securities, treasuries, and asset-backed securities (unsurprisingly, these funds, which are taxable, invest only a very small fraction in municipal bonds). The mix of assets is a result of the fact that mutual funds' investment mandates are not very strict. Therefore, even funds that are nominally called corporate bond funds are not restricted from holding also many other types of assets. We will mainly study the characteristics of these funds' corporate bond holdings, as corporate bonds offer funds with ample opportunity to engage in reaching-for-yield. The reason is that there is a large variation in yields across various corporate bonds compared to many other fixed-income asset classes, particularly when controlling for ratings and maturity.

Among the corporate bond holdings, the average rating is BBB (equivalent to 13 on the numerical rating scale between 1 and 21).<sup>15</sup> The average remaining time-to-maturity is just over 7 years, and the average yield is 6.27%. In terms of liquidity, these corporate bonds trade on average 12.75 days per month.

Panel A also shows that the funds in our sample on average exhibit negative reaching for yield (both total and within-rating-and-maturity). That is, corporate bond funds on average do not hold higher-yielding securities than the universe of bonds in the same rating and maturity category. There is nevertheless wide dispersion in degrees of reaching for yield, as shown by the interquartile range of -1.53 to 1.33 for total reaching for yield and -0.35 and 0.04 for within-rating-maturity reaching for yield. Thus, some funds are very conservative (*i.e.*, “play it safe”), whereas other funds strongly reach for yield. In

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<sup>15</sup>Panel A of Table A.1 in the Appendix shows the distribution of portfolio weights across ratings, and compares these weights to the aggregate supply of corporate bonds across ratings (which all investor must hold on average). The table shows that mutual funds on average tend to overweight high-yield bonds (rated C to BB) relative to aggregate supply, and tend to underweight investment-grade bonds.

Section 3, we will further investigate the extent to which funds reach for yield (or play it safe) in both the time series and the cross section.

In Panel B, we compare fund-level statistics between investment grade (IG) and high yield (HY) funds, with a split based on the fund’s Lipper style.<sup>16</sup> Notably, HY funds received greater flows during the sample period as the popularity of these funds has grown. The fraction of the fund held in corporate bonds is also much higher among HY funds compared with IG funds: HY funds invest on average more than 65% of their assets in corporate bonds, while IG funds invest around 31% of their assets in corporate bonds. The corporate bond holdings of HY funds are more illiquid than those of IG funds based on the average trading days statistic. Both IG and HY funds hold on average 5% of their assets in cash (or “cash-like” assets like certificates of deposits), but IG funds hold significantly more Treasury bonds. As we would expect, HY funds show a higher “total” reaching for yield, driven by investing larger fractions of their portfolios in lower-rated securities (i.e., the “Reaching for rating” term in Equation (2)). By contrast, IG funds on average show higher reaching for yield *within* each rating and maturity category. This result is quite intuitive as IG funds are more constrained from holding lower-rated bonds, so to the extent that IG funds want to take bonds on higher yields, they need to do so while not walking down ratings.<sup>17</sup>

### 3 Reaching for Yield in Corporate Bond Mutual Funds

Delegated asset managers may have particularly strong incentives to search for higher-yielding securities in times when interest rates are low as suggested by Rajan (2005), Borio

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<sup>16</sup>IG funds are classified as those with style codes A, BBB, IID, SII, SID, and USO in the CRSP mutual fund database; HY funds as those with style codes HY, GB, FLX, MSI, and SFI.

<sup>17</sup>Because the lower-rated bonds that are held by HY funds tend to be less liquid on average, we would also expect HY funds to be more worried about taking on too much liquidity risk and thus engage in less reaching for yield in terms of capturing possible liquidity risk premia if these funds are worried about having to quickly liquidate bonds in case of high outflows. By contrast, IG bonds on average tend to hold more liquid bonds with a larger base of potential buyers, and these funds may thus be less worried about suffering from a potential fire sale if faced with outflows.

and Zhu (2012), and Rajan (2013) among many others. Feroli et al. (2014) and Acharya and Naqvi (2015) also show theoretically how asset managers incentives and preferences might lead to reaching for yield. Empirically, however, whether mutual fund managers actually engage in reaching for yield in low-interest-rate environments is an open empirical question, as can be seen from Janet Yellen’s 2013 remark that there is limited evidence that expansive policies of the Federal Reserve had resulted in reaching for yield.<sup>18</sup>

In this section, we first examine how reaching for yield by corporate bond funds relates to interest rates, or more generally, to the aggregate investment opportunities in bond markets. Once we document time variation in reaching for yield, we then move on to a cross-sectional variation across funds. In particular, we investigate whether funds that reach for yield appropriately manage liquidity and thus are less prone to redemption risk (*i.e.*, “runs”) and fire sales, since high-yielding corporate bonds can be highly illiquid. In addition, we show other cross-sectional characteristics of the funds that reach for yield, including fund size, age, and expense ratios.

### 3.1 Reaching for Yield over Time

An important dimension of investment opportunity sets for fixed-income investors can be summarized by term structure variables. We thus investigate how reaching for yield varies with term structure variables. In particular, we regress the reaching-for-yield measures defined in (2),  $RFY^{Total}$  and  $RFY^{WRM}$ , on the level (1-year Treasury rate) and slope (30-year minus 1-year Treasury rate) of the term structure,  $Level$  and  $Slope$ , and the default spread (BBB minus AAA),  $Def$ . To aid the interpretation of the regression coefficients, all the independent variables are standardized to a mean of 0 and standard deviation of 1.

Table 2 reports the results. In column (1) where we use  $RFY^{Total}$  as the measure of reaching for yield, we find that mutual funds reach for yield to a greater extent when one-year Treasury rates are low. For example, a one-unit standard deviation decrease in the level of the term structure (or 1-year Treasury yield) is associated with a 10 basis-point increase in the yields of funds’ holdings relative to aggregate yields, although the

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<sup>18</sup><http://blogs.wsj.com/economics/2013/11/14/live-blog-janet-yellens-confirmation-hearing-for-fed-chair/>



t-statistic is only -1.60. Although not statistically at the conventional level, this coefficient is consistent with the argument that low yields predicate greater risk-taking by asset managers (e.g., Rajan (2013), Feroli et al. (2014), and Acharya and Naqvi (2015)), and Greenwood and Hanson (2013) who note that the compensating investment managers based on nominal absolute returns may encourage risk shifting when interest rates are low.

In addition, we find in column (1) a negative association of total reaching for yield with both the slope of the term structure (*Slope*) and the default spread on corporate bonds. Specifically, a one-standard-deviation decrease in the slope of the term structure and the default spread is associated with 19 and 27 basis point increases in total reaching for yield, respectively. These results thus imply that, when term premia are lower or lower-rated corporate bonds become more expensive, corporate bond mutual funds shift towards buying relatively cheaper (higher-yielding) bonds. In all, the results are consistent with the notion that funds prefer to hold higher-yielding securities when investment opportunities in bond markets in general are scarce.

The results shown in column (2) where we use  $RFY^{WRM}$  as the measure for reaching for yield provide cleaner evidence for reaching for yield and interest rates. All three coefficients on the term structure variables are negative and statistically significant at the 1% level, indicating that funds tilt towards higher-yielding securities within each rating-and-maturity category when interest rates and spreads are low. It may in fact generally be easier for a fund to vary the extent to which it reaches for yield within a rating and category, as doing so is typically unconstrained based on a fund’s prospectus.<sup>19</sup>

In columns (3) through (6), we regress reaching-for-yield measures on term structure variables separately for IG and HY funds. IG funds in columns (3) and (4) show that they reach for yield, similar to the results for all funds. In column (5) for HY funds, they do not reach for yield when the slope of the yield curve or the default spread is low. However,

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<sup>19</sup>Note that the results shown in columns (1) and (2) are not driven by demand for fixed-income securities by corporate bond funds. In other words, one might be concerned about “reverse causality,” or concerned that corporate bonds in aggregate could become more expensive and the default spread could narrow if corporate bond funds’ demand for corporate bonds has an effect on prices. However, our measures of reaching for yield control for any aggregate demand effect, as these measures are defined as a yield *deviation* of mutual funds’ holdings from aggregate corporate bonds.

from column (6), it is clear that HY funds do reach for yield within-rating-and-maturity, which also highlights the importance of the decomposition of total reaching for yield.<sup>20</sup>

In Figure 1, we show this result graphically by plotting the reaching-for-yield measures and aggregate corporate bond yields over time. The figure shows that high reaching for yield tends to coincide with episodes of low interest rates, and vice versa. In the earlier and later parts of the sample (2003-2004 and 2009-2011) mutual funds increased their holdings of relatively higher yielding corporate bonds as the Fed’s monetary policies drove down interest rates. Interestingly, over the 2003-2007 period, total reaching for yield kept increasing, which might appear counterintuitive in light of our regression results as short-term interest rates were increasing during this time. However, during this period, the default spread was also decreasing, which is consistent with our regression results.<sup>21</sup> Given the low yields on high yield bonds and thus scarcer investment opportunities in “junk,” mutual funds shifted their holdings towards relatively higher-yielding securities. During the financial crisis, particularly in 2008, however, the figure shows how mutual funds sharply switched their holdings into relatively lower-yielding bonds, suggesting that playing-it-safe or flight-to-quality motives become stronger when credit risk is particularly high.

In Figure A.1 in the Appendix, we further examine the large variation in reaching for yield by using the decomposition of changes in reaching for yield in Equation (3). We particularly notice that most of the shifts in reaching for yield take place during the financial crisis: At the peak of the crisis (the second half of 2008), the passive component  $\Delta RFY2$ , or “poor returns,” spiked, which shows the relatively poor performance of corporate bond mutual funds (the bonds held by mutual funds performed relatively more poorly than benchmarks). At the same time, the third component,  $\Delta RFY3$ , or “doubling down,” decreased substantially, which implies that these mutual funds were selling dis-

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<sup>20</sup>In Panel B of Table A.1 in the Appendix we further study if the weight across bonds of different ratings varies with these time series variables (level, slope, and default spread). The results show that funds hold more low-rated bonds (C to BBB) and less highly-rated bonds (A-AAA) when yields and spreads are low (all portfolio weights are measured relative to aggregate supply of bonds, to control for possible variation across time in the composition of outstanding bonds). These changes in weights are thus also consistent with more reaching-for-yield (here, across rating categories) in times of low yields and spreads.

<sup>21</sup>According to the Bank of America Merrill Lynch High Yield Index available in FRED, from 2003 to 2007, yields on junk bonds fell from approximately 9% to 2.41% on June 1, 2007, near a historic low.

tressed bonds (“fire sales”) or buying recently appreciated bonds (“flight to quality”), or perhaps a combination of these. Towards mid-2009, as the corporate bond market calmed down, funds started “actively” increasing reaching for yield, as shown by positive values of  $\Delta RFY1$ , or “reaching for higher yield.”

An additional way with which funds might engage in reaching for yield is to increase the fraction (weight) of a portfolio that is invested in corporate bonds or other relatively riskier assets compared to, for example, Treasuries and agency securities. In Figure A.2 in the Appendix we therefore plot the time series of aggregate mutual funds’ portfolio weights in corporate bonds and aggregate corporate bond yields. The correlation of aggregate yields with funds’ corporate bond weights appears to be negative, but not as strongly as the correlation with funds’ reaching for yield. In unreported regression results, we confirm that the correlation between corporate bond weights and the level of the yield curve is negative, but not statistically significant. On the other hand, there is a significant negative correlation between the default spreads and corporate bond portfolio weights. That is, when the default spreads are low, these funds invest relatively more in corporate bonds, in addition to engaging more in reaching for yield (as shown in Table 2).

### **3.2 Liquidity Management vs. Risk Taking**

The results we have reported show that funds in aggregate reach for yield when investment opportunities are scarce. As shown in Table 1, there is also considerable variation in reaching for yield across funds. In this section, we examine reaching for yield in the cross section, by asking, in particular whether liquidity management motives and other fund characteristics including fund size, age, and expense ratio are linked to reaching for yield.

Corporate bonds are highly illiquid (Bao, Pan, and Wang (2011)) and a substantial portion of bond yields can be attributed to illiquidity (e.g., Longstaff, Mithal, and Neis (2005) and Huang and Huang (2012)). Thus, funds that are engaging in more reaching for yield are also likely exposed to greater illiquidity. In the event that such funds are faced with sudden large outflows (potentially fueled by sudden shifts in interest rates as was the case during the “Taper Tantrum” of May 2013), funds with low liquidity buffers and

illiquid holdings face particularly high risks of redemptions and fire sales. Bond fund’s liquidity management has also received increasing scrutiny from regulators, and the Securities and Exchange Commission (SEC) has proposed new liquidity management rules for these funds.<sup>22</sup>

If funds are prudent liquidity managers, then funds with high reaching for yield are likely to hold higher liquidity buffers or more liquid corporate bonds. For example, we might then expect to see a positive relationship between a fund’s reaching for yield and its cash position. On the other hand, mutual funds are also limited regarding how much leverage they can take on (the “130/30” rule), and reaching for yield may allow a fund to attain a higher risk profile while not using leverage. If reaching for yield is a sign of greater risk-taking, we would expect to find a negative relationship between reaching for yield and cash. If that is the case, these funds may be particularly vulnerable to redemption risk.

By employing holdings-level data on funds’ liquidity, we examine how reaching for yield is associated with liquidity. We employ various proxies for liquidity management. Our first liquidity variable is a measure of funds’ liquidity buffers, constructed as cash and Treasury holdings out of total net assets using Morningstar data. Likewise, we construct equity holdings variables for each fund-quarter. The second liquidity variable is the liquidity of funds’ corporate bond holdings, calculated as the average trade days per month of corporate bonds held in each fund-quarter.<sup>23</sup> In addition, we also include in our regressions a measure of redemption risk, as proxied by a fund’s minimum flow in any of the past eight quarters.

We also consider fund characteristics that previous studies have found to be related to mutual funds’ risk-taking incentives (e.g., Huang et al. (2011)): Fund age, net assets, and expense ratio. For example, young funds may have strong incentives to catch up to more established funds by reaching for yield. Engaging in reaching for yield has risk features that are economically similar to selling out-of-the-money put options (see Section

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<sup>22</sup><http://www.sec.gov/news/pressrelease/2015-201.html>

<sup>23</sup>We calculate the average trade days per month based on transactions in TRACE for each bond and month in the Morningstar holdings database. Because the TRACE reporting rule started covering a comprehensive universe of bonds only after Feb. 2005, this data is more limited than those that comprise the rest of our sample.

4.3 for a formal analysis of risk factors), which can result in particularly significant losses if there are major systemic defaults, and young funds might be more willing to take that risk, knowing that they're not sacrificing reputational capital in such an adverse event. The effect of size is theoretically more ambiguous. On the one hand, large funds may be more worried about the risk of possible losses from reaching for yield. On the other hand, larger funds might engage in more aggressive reaching for yield if they have difficulty finding sufficiently attractive investment strategies due to decreasing returns to scale (as assumed, e.g., in Berk and Green (2004)). We control for fund-style fixed effects (based on Lipper styles), as IG funds tend to reach for yield differently compared with HY funds (e.g., IG funds are on average more likely to reach for yield within a rating-and-maturity, as shown in Panel B of Table 1).

Table 3 reports the panel regression of funds' reaching for yield on liquidity variables and fund characteristics. All regressions control for fund style and year-quarter fixed effects (based on the Lipper fund style category). We find that high reaching-for-yield funds on average do not engage in prudent liquidity management. Cash/Treasury holdings are negatively related to reaching for yield, indicating that high reaching-for-yield funds hold lower liquidity buffers. One reason for this could be that these funds' corporate bond holdings are actually liquid. However, we find funds' reaching for yield is actually negatively related to trade days of their holdings. These results indicate that high reaching-for-yield funds are holding illiquid corporate bonds and lower liquidity buffers, a result that is consistent with the idea that reaching for yield is a manifestation of funds' taking on more risk. In addition, we find that high reaching-for-yield funds hold more equity, potentially to generate even higher returns, and thus also behaving in a way that is consistent with risk-shifting. One possible bright side of holding equity is that equity securities are generally much more liquid than corporate bonds; but few corporate bond funds hold nearly enough equity to buffer large redemption events (the average (median) equity holdings are 1.3% (0.1%)). Large past outflows are negatively related to reaching for yield, which suggests that funds exposed to high redemption risks do not reduce reaching for yield.

Taken together, these results show that high reaching for yield by funds is associated with excessive risk rather than prudent liquidity management.

Table 3 also shows how other fund characteristics are linked to reaching for yield. We find that young funds tend to reach for yield more aggressively, a relationship that is particularly strong for HY funds. This result is consistent with the idea that young funds have stronger incentives to seek higher returns through taking on more risk. We further find that larger funds in the cross section are more likely to reach for yield. In contrast, we do not find a reliable link between reaching for yield and expense ratios: expense ratios are only marginally related to reaching for yield and only for IG funds (significant at the 10% level).<sup>24</sup>

Interestingly, we find that past fund returns are positively related to reaching for yield, especially for high yield funds. One might wonder that this result is inconsistent with the well-documented risk taking behaviors of mutual funds (i.e., Brown et al. 1996) that funds with low performance increase risk taking to the extent that reaching for yield is associated with higher risk taking. However, this result should be interpreted with caution, because reaching for yield measures are comingled with mechanical components of bond yields driven by past returns (i.e., passive reaching for yield). We use a cleaner measure of active reaching for yield and further investigate in greater depth the relation between past returns and future reaching for yield in Section 3.3.

### **3.3 Active Reaching for Yield and Past Performance Ranks**

It is widely documented that fund flows respond positively to past performance. In this section, we examine a setting in which fund incentives to showcase superior performance with respect to others might drive reaching for yield. In particular, we focus on a tournament-like behavior, which is well-documented in previous studies (e.g., Brown et al. 1996). A tournament hypothesis states that funds will increase risk taking espe-

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<sup>24</sup>In unreported results, we find that the results in Table 3 are unchanged if we additionally control for past performance. On average, funds that reach for yield tend to have higher past returns; however, this result is not consistent across fund styles. Sections 4.2 and 4.3 has a more thorough analysis of fund returns and reaching for yield.

cially in the latter part of a year when their year-to-date relative performance is poor. If reaching for yield is an easy way to earn high returns, which we show in the later section, funds with poor relative performance will increase reaching for yield during the remaining part of the year.

Given the well-documented evidence from equity funds, one might simply argue that we should also observe similar risk-taking behaviors from corporate bond funds. Note, however, that tournament-like behaviors, or risk shifting by funds in general, presumes a convex flow-performance relationship (e.g., Chevalier and Ellison 1997). A few recent studies suggest that the flow-performance relationship is not necessarily convex for funds holding illiquid assets (e.g. Chen, Goldstein, and Jiang 2010a and Goldstein et al. 2015). Thus, risk-shifting can be potentially counter-productive for poorly-performing funds if potential liquidation due to performance-driven outflows are costly. It is an open empirical question whether corporate bond funds would necessarily take higher risk given poor past performance.

In Table 4, we test whether funds increase active reaching for yield more when year-to-date relative rankings are low. As dependent variables, we examine active changes in reaching for yield, because the mechanical link between past returns and current bond yields can contaminate the relationship between past performance and funds' portfolio choices. We then regress the changes in active reaching for yield on tercile indicators on past relative rankings and their interaction with an indicator variable for the last quarter of a year.

The results provided in Table 4 show that funds that perform well (poorly) in the first three quarters of a year tend to decrease (increase) future active reaching for yield. In column (1), for example, the coefficient on the indicator for the last quarter is 0.019 with a t-statistic of 5.74, showing that all funds tend to increase reaching for yield. This positive effect of last quarter flips for top 30% performers for the past three quarters; the coefficient on the interaction of the last quarter indicator with the top performer indicator is -0.038, which is highly statistically significant. Thus, top performers in the past three quarters actually decrease reaching for yield in the last quarter by 0.019 ( $= 0.038 - 0.019$ ). In column (2) we control for fund style by time fixed effects and in columns (3) and (4) we

employ changes in total reaching for yield instead of within-rating-and-maturity reaching for yield, and we obtain qualitatively similar results.

In sum, we find that funds with poor year-to-date performance increase reaching for yield, whereas top performing funds decrease reaching for yield. These results are consistent with tournament-inspired behavior among corporate bond mutual funds.

## 4 Implications for Fund Flows and Returns

The incentives of mutual fund managers to reach for yield differ from those of other large institutional investors in corporate bond markets. In Becker and Ivashina (2015), insurance companies reach for yield to exploit regulatory arbitrage. Unlike insurance companies, mutual funds are not subject to rating-based regulation or capital requirements. Rather, mutual funds are incentivised to attract more flows by showcasing superior returns.<sup>25</sup> If funds can beat benchmarks simply by taking on more risk and if unsophisticated investors do not evaluate performance on a risk-adjusted basis (Sensoy (2009) and Del Guercio and Reuter (2014)), funds have strong incentives to reach for yield. Thus, we examine whether reaching-for-yield funds attract more flows and generate higher returns after adjusting for risk.

### 4.1 Does Reaching for Yield Attract More Flows?

Bond funds regularly report the yield-to-maturity of their bond portfolios, so we ask whether investors reward funds as they increase or decrease their yields. Specifically, we employ the decomposition of shifts in reaching for yield into the active and passive components, as provided in Equation (3):  $\Delta RFY_{i,t} \equiv \Delta RFY1_{i,t} + \Delta RFY2_{i,t} + \Delta RFY3_{i,t}$ . If investors respond to funds' active shifts in holdings towards higher-yielding bonds, we expect future fund flows to respond positively to such an active shift in reaching for yield  $\Delta RFY1_{i,t}$ .

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<sup>25</sup>The body of work that documents the relationship between flow and performance includes, among many other studies, Sirri and Tufano (1998) and Chevalier and Ellison (1997).



We examine the extent to which future fund flows respond to these active or passive shifts in reaching for yield by regressing the next quarter’s fund flows on the three components in Equation (3). As additional controls, we include variables commonly employed in the literature in fund flow regressions: fund age, assets under management, turnover, expense ratio, past flows, past returns. We also control for squared past returns to control for possible nonlinearities in the return-flow relation (Chevalier and Ellison (1997), Sirri and Tufano (1998) and Goldstein et al. (2015)), as well as Fund Style\*Quarter fixed effects.

Table 5 (columns (2) through (4)) shows that future fund flows respond positively to active shifts in reaching for yield ( $\Delta RFY1_{i,t}$ ). The coefficient estimates on  $\Delta RFY1_{i,t}$  are highly statistically significant with t-statistics above 3 across all specifications. The composition into active and passive shifts is important: If we instead consider only the total shift in reaching for yield,  $\Delta RFY_{i,t}$  (in column (1)), we find no evidence that flows respond. Overall, the coefficient estimates on  $\Delta RFY1_{i,t}$  in Table 5 indicate that investor flows into mutual funds respond positively to active shifts in reaching for yield.

The passive shift in reaching for yield,  $\Delta RFY2_{i,t}$ , due to bond price shifts is negatively related to future fund flows, consistent with the well-known stylized fact that fund flows respond negatively to fund performance. When the bonds held by funds experience low returns compared with benchmarks, the measure  $\Delta RFY2_{i,t}$  is positive, which in turn predicts lower future flows. The third component, the interaction of holdings shifts with shifts in yields ( $\Delta RFY3_{i,t}$ ), tends to be positively related to flows, although not statistically significantly so.<sup>26</sup>

The results show that fund investors tend to respond to shifts in reaching for yield and direct more flows towards funds that have actively shifted their portfolio towards relatively higher-yield bonds. These results are quite intuitive. Bond funds advertise the current yield-to-maturity of their investments. Fund investors will take both past performance and also current yields into account, because the latter might capture future expected returns (other things being equal). High promised yields are particularly attractive if

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<sup>26</sup>Among our control variables, past flows and past returns enter as expected, but we particularly note that squared returns are negatively linked to future fund flows, which is consistent with the result documented for corporate bond funds in Goldstein et al. (2015).

a fund's risk profile does not look any riskier based on average ratings and maturities, which is precisely what the within-rating-and-maturity reaching-for-yield measure captures. Table A.2 in the Appendix shows results using the decomposition of shifts in total reaching-for-yield; results are broadly similar.

## 4.2 Does Reaching for Yield Result in Higher Returns?

In the previous section we showed that funds are rewarded with increased flows when they increase their active reaching for yield. The natural question is whether investors are correct in directing their money towards funds that engage in reaching for yield; or, in other words, whether reaching for yield is a source of superior returns. In this section, we analyze and compare the raw return performance of funds that engage in reaching for yield to a greater extent with those that reach for yield to a lesser extent. In the next section, we then analyze whether any performance differences are due to beta (risk) or alpha (risk-adjusted excess returns).

Table 6 begins by showing results of Fama-MacBeth regressions of monthly returns on the fund's (lagged) reaching for yield. In each specification, we control for fund characteristics that might be correlated with returns such as expense ratio, age, total net assets, flow, and fund-style fixed effects (based on Lipper style codes). In these regressions, we limit the sample to include only fund-months in which over 75% of the portfolio is held in corporate bonds. We limit the sample this way because we do not want returns on other types of securities these funds may hold to unduly influence the fund-level returns.

The Fama-MacBeth regression results show that, perhaps not surprisingly, higher reaching for yield does predict higher future returns. In column (1), total reaching for yield positively predicts future fund returns with a t-statistic of 2.63. The magnitude of the coefficient estimate indicates 7bp (84bp per year) higher monthly returns for a one-percent increase in total reaching for yield. In column (2), we also find that the within-maturity-and-rating reaching-for-yield measure is also positively associated with higher fund returns with a t-statistic of 1.99. The economic magnitude is still quite sizable: A one-percent reaching-for-yield measure for a fund (above the bond-by-bond

rating-matched benchmark yield) predicts around a 6.7bp higher return per month, *i.e.*, around 80bp per year. This result suggests that each unit of reaching for yield corresponds with almost-as-great higher returns on an annual basis.

We next analyze the relationship between reaching for yield and returns using the calendar-time portfolio method. At the end of each quarter, we sort IG and HY funds separately into three terciles based on each fund's within-rating-and-maturity reaching for yield ( $RFY^{WRM}$ ). Within these two-by-three sorts of funds, we equal-weight the funds into portfolios that we hold for the three months over the following quarter.

Table 7 Panel A reports the average monthly returns on high-minus-low portfolios for IG and HY funds. The right-most column further reports the monthly returns on high-minus-low portfolios using all funds. We find that higher reaching for yield tends to be related to future returns. Although statistically not significant at conventional levels, the returns on high-minus-low portfolios are all positive for both IG and HY funds. Overall, funds in the highest reaching-for-yield tercile tend to outperform funds in the lowest tercile by an average of 9.0bp per month, *i.e.*, around 1.1% on an annualized basis.

Reaching for yield results in higher performance and thus is a relatively easy-to-implement way of enhancing returns to investors. These positive returns are nevertheless raw returns, and not adjusted for potential risk factors. In the next section, we therefore control for common bond risk factors, and analyze whether or not reaching for yield also results in risk-adjusted outperformance.

### 4.3 Is This Alpha or Beta?

The results thus far show that funds may reach for yield due to an incentive to boost performance and attract more flows. Many bond funds claim to be superior bond pickers. Consistently picking bonds with high yields (low prices) but with low risk would be a sign of such skill. That is, higher-yielding bonds are not necessarily riskier than otherwise similar bonds, they may just represent better deals (e.g., because they have been overlooked by other money managers). Thus, it is plausible that the returns attributable to reaching for yield could be due in part to such picking of cheaper-but-not-riskier bonds, and thus a

sign of skill. But if, on the other hand, the higher returns are simply due to funds' loading up on risk factors (or more precisely, because we employ the within-rating-and-maturity reaching for yield, factors that are not perfectly captured by the distribution of ratings and maturities in a portfolio), these fund managers may not have superior bond-picking skills. Thus, it is an empirical question as to whether reaching for yield is simply an easy way of boosting performance by taking on more risk or a sign of true skill.

To analyze whether the raw outperformance of reaching for yield is due to risk (beta) or superior bond-picking skill (alpha), we take the high-minus-low calendar-time portfolios analyzed in the previous section and regress these monthly returns on common bond risk factors. As described in the previous section, these high-minus-low portfolios are sorted on within-rating-and-maturity reaching for yield for IG, HY, and all sample funds. The bond risk factors we consider are a market factor (the CRSP value-weighted stock return minus the T-bill rate), a term factor (the 30-year Treasury minus 1-year Treasury bond return), and a default factor (the value-weighted corporate bond return minus the T-bill rate).

Table 7 presents the estimation results for the factor loadings and alphas of the high-minus-low portfolios. We find that controlling for common risk factors dramatically reduces the excess returns of the high-minus-low portfolios formed on reaching for yield, compared with raw returns reported in Panel A. For the IG funds in particular, the alpha is even negative, -0.15% monthly, and statistically significant at the 1% level (column (1)). For the high yield portfolio in column (2), the alpha is negative 2 bps, although statistically insignificant. In column (3), we find that the alpha is again negative (-0.08) and statistically significant at the 10% level.

This reduction in performance is due mainly to high reaching-for-yield funds' loading more heavily on the risk factors we consider. The main risk-loading is on the default factor (*Def*), which is to be expected if reaching for yield involves exposure to higher corporate default risk (specifically, default risk that is manifested in yields but not captured by each bond's rating). For the high-rated portfolio in column (1), we find that the portfolio also has exposure to the term factor, while the term factor does not show up in the HY portfolio in column (2).

In addition to being vulnerable to the usual factor risks analyzed above, corporate bond funds are also potentially particularly sensitive to downside risk, since holding corporate bonds might have similar exposure as selling out-of-the-money put options. Also, corporate bonds are illiquid, and, under severe market conditions and subsequent outflows, these funds might experience inefficient liquidation, as is suggested by Goldstein et al. (2015), which also implies that corporate bond funds can be particularly vulnerable to downside risk. To account for this possibility, we also add the put option factor by Agarwal and Naik (2004) in our factor regressions.

Panel C of Table 7 shows that high reaching-for-yield funds are indeed more sensitive to the downside risk. The loadings on the put option factor are all negative (although not statistically significant), indicating that the high reaching for yield funds tend to perform poorly when the market crashes. More importantly, the alphas are more negative in columns (1) and (3) compared with those in Panel B and are also statistically significant at the 5% and 10% levels, respectively. These results show that the high raw returns for these high reaching-for-yield funds are at least partially due to greater downside risk.

In summary, the higher returns of funds that engage in reaching for yield can thus be explained by common risk factors and, as a result, are not consistent with superior bond-picking skills on the part of these funds.

## 5 Conclusion

In this paper, we document the extent to which corporate bond mutual funds engage in reaching for yield. Our results thus address the growing literature on reaching for yield, and our study is the first to specifically examine the special risk-taking incentives that apply to corporate bond mutual funds. We show that funds engage in more aggressive reaching for yield when the level and slope of the yield curve are low and when the default spread is narrow. These results are consistent with greater risk-taking on the part of delegated money managers in low-interest-rate environments.

The funds that reach for yield do not compensate for their greater risk-taking with

stronger liquidity management, but instead tend to be exposed to greater liquidity concerns and thus to greater risks of large-scale redemptions and fire sales. We also show that younger and larger funds on average engage in reaching for yield more aggressively.

We then show the implications of reaching for yield for investors by examining flows and performance. When funds actively shift their portfolios towards relatively higher-yielding bonds, they receive higher inflows. The funds that engage in reaching for yield also tend to generate higher raw returns. But after adjusting for common risk factors, there is no evidence that these funds have superior skill.

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Figure 1

### Holders of U.S. Corporate bonds

This figure shows a breakdown of the types of investors in U.S. Corporate bonds (for 2013). The data based on aggregating Table L.213 from the Federal Reserve Flow of Funds by investor type.

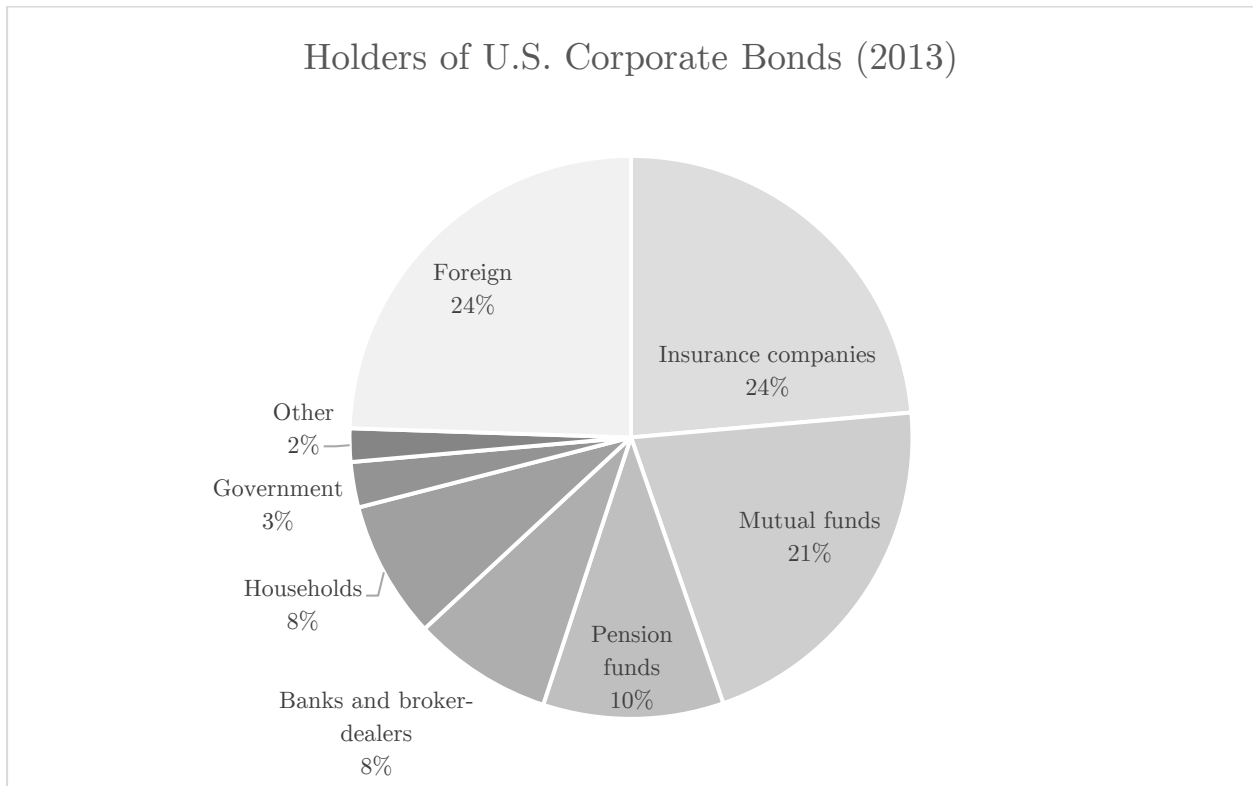


Figure 2

**Average corporate bond yields and reaching for yield by mutual funds**

This figure shows the time series of the value-weighted average corporate bond yield (solid line), the average total reaching for yield across corporate bond mutual funds (dotted line), and the average reaching for yield within-rating-and-maturity (dashed line). The sample of bond funds include all bond funds in the CRSP Mutual Funds database categorized as either corporate or general bond funds (*i.e.*, CRSP style categories I, ICQH, ICQM, ICQY, ICDI, ICDS, or IC) and that at least at one point during the sample period have held at least some securities identifiable as corporate bonds in FISD. The reaching-for-yield measure for a particular *bond-date* is calculated as the bond’s yield less a benchmark yield (the value-weighted yield of bonds in the Barclays Corporate Bond index, either using all corporate bonds in the index for the “total” reaching for yield, or using only bonds within the same rating and maturity-category for the “within-rating-and-maturity” reaching for yield). To compute a reaching-for-yield measure at the *fund-quarter* level, we then value-weight the reaching for yield across all bonds held by the fund at that particular date. These reaching-for-yield measures are defined formally in Equations (1) and (2).

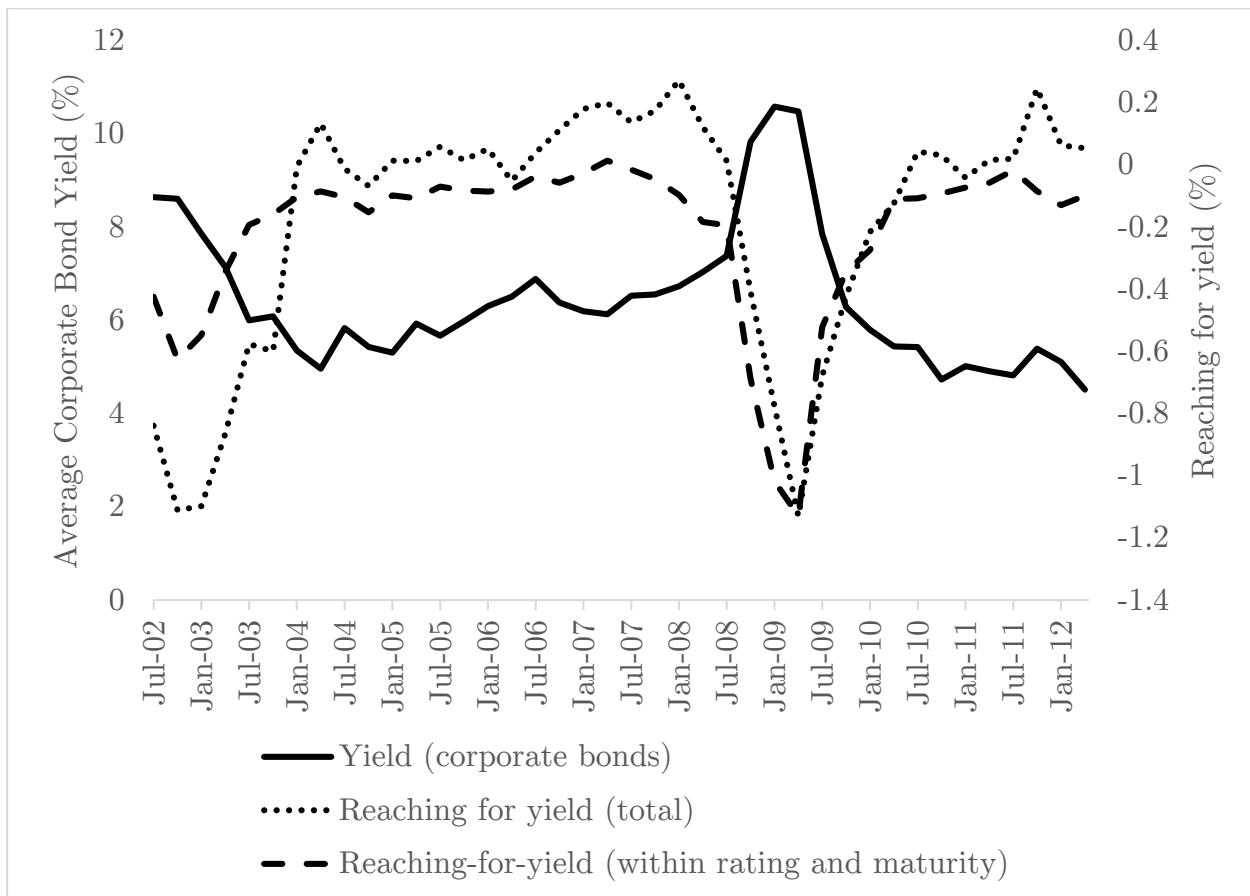


Table 1

**Summary Statistics**

This table reports summary statistics. The sample of mutual funds consists of all bond funds in the CRSP Mutual Funds database categorized as either corporate or general bond funds (*i.e.*, CRSP style categories I, ICQH, ICQM, ICQY, ICDI, ICDS, or IC) and that at least at one point during the sample period have held at least some securities identifiable as corporate bonds in FISD. The sample period is from January 2002 through June 2012. The observations are at the fund-quarter level. If there are multiple share classes for the same fund, the portfolio characteristics are calculated as the asset-weighted average across share classes. Panel A reports average fund characteristics, and Panel B shows the differences between Investment-grade (IG) and High-yield (HY) funds. IG funds are classified as those with a Lipper style code of either A, BBB, IID, SII, SID, or USO and HY funds are those coded HY, GB, FLX, MSI, or SFI. The quarterly *return*, *total net assets*, *flow*, *turnover*, *expense ratio*, *fund age*, and *tenure* are calculated based on CRSP data. *Weight in corporate bonds* is the fraction of the fund's assets held in corporate bonds (based on Morningstar holdings data); *weight in cash* (also including commercial paper, CDs), *weight in Treasuries*, *equities*, *asset-backed securities*, *agencies*, *munis*, and *others* are defined analogously. *Rating* and *Time-to-maturity* are calculated as the value-weighted average within a fund-quarter, and based on the corporate bonds that are matched to FISD. *Yield* is the value-weighted yield based on Thomson-Reuters quotes or TRACE transactions where available. *Trading days per month* is calculated based on the number of days that a transaction is recorded in TRACE; these data only start in October 2004. The measures of reaching for yield, reaching for maturity, and reaching for rating are defined in Equation (1). All variables are winsorized at the 1% level.

## PANEL A: Portfolio characteristics

	mean	sd	p1	p25	p50	p75	p99	N
Return (% , quarterly)	1.4	3.1	-10.4	0.0	1.3	2.7	12.4	23,585
Total net assets (\$M)	2,308	6,069	2	115	427	1,610	44,471	24,308
Flow	0.04	0.20	-0.31	-0.04	0.00	0.05	1.38	22,081
Turnover	1.5	1.6	0.1	0.5	0.9	1.9	8.3	22,917
Expense ratio (%)	0.85%	0.35%	0.17%	0.60%	0.81%	1.08%	1.87%	23,041
Fund age (years)	11.3	7.5	0.6	5.7	10.1	15.2	37.6	23,673
Tenure (years)	6.6	4.4	0.7	3.2	5.7	9.1	20.2	15,567
Weight in corporate bonds	46.7%	28.1%	1.8%	24.2%	39.2%	71.5%	98.3%	21,845
Weight in cash	4.9%	6.6%	0.0%	1.1%	3.0%	6.3%	29.3%	21,845
Weight in Treasuries	10.9%	11.9%	0.0%	0.4%	7.6%	17.1%	51.0%	21,845
Weight in equities	1.3%	4.6%	0.0%	0.0%	0.1%	1.0%	16.6%	21,845
Weight in ABS (%)	10.1%	12.7%	0.0%	0.6%	5.4%	15.5%	55.0%	21,845
Weight in agencies (%)	18.8%	17.4%	0.0%	0.6%	16.5%	31.9%	63.0%	21,845
Weight in munis (%)	0.9%	4.3%	0.0%	0.0%	0.0%	0.5%	14.0%	21,845
Weight in others (%)	6.3%	12.7%	0.0%	0.0%	1.2%	6.0%	63.3%	21,845
Rating	13	3	6	9	14	15	18	23,424
	BBB		B-	BB-	BBB+	A-	AA-	
Time-to-Maturity (years)	7.17	3.60	0.75	4.93	7.15	9.07	21.33	23,426
Yield (%)	6.27	2.55	1.39	4.62	5.86	7.73	15.58	23,426
Trading days (per month)	12.75	3.42	4.47	10.26	12.69	15.21	20.47	17,669
Reaching for yield (total)	-0.17	2.26	-5.08	-1.53	-0.55	1.33	6.53	23,426
Reaching for yield (within-rating-and-maturity)	-0.22	0.62	-3.12	-0.35	-0.11	0.04	1.57	23,210
Reaching for maturity	-0.16	0.48	-1.72	-0.30	-0.06	0.08	1.05	23,210
Reaching for rating	0.22	2.28	-3.81	-1.16	-0.51	1.56	7.95	23,210

Table 1, continued

PANEL B: Portfolio characteristics – investment-grade vs. high-yield funds

	Investment-grade funds (N=16,270)			High-yield funds (N=7,436)			Diff. in means
	mean	sd	median	mean	sd	median	
Return (% , quarterly)	1.2	2.2	1.1	1.9	4.4	2.0	-0.738***
Total net assets (\$M)	2,180	6,057	405	2,245	5,254	444	-64.787
Flow	0.03	0.19	0.00	0.05	0.23	0.00	-0.021***
Turnover	1.7	1.8	1.0	1.0	1.1	0.7	0.725***
Expense ratio (%)	0.75%	0.30%	0.72%	1.09%	0.35%	1.08%	-0.003***
Fund age (years)	11.7	7.4	10.6	10.5	7.8	8.7	1.201***
Tenure (years)	6.9	4.4	6.2	5.9	4.2	4.7	1.050***
Weight in corporate bonds	35.8%	20.6%	31.7%	72.8%	25.9%	84.8%	-0.370***
Weight in cash	5.0%	6.8%	2.9%	4.8%	6.3%	3.3%	0.002*
Weight in Treasuries	12.8%	11.3%	10.7%	5.0%	10.0%	0.0%	0.077***
Weight in equities	0.7%	3.7%	0.0%	2.7%	6.0%	1.0%	-0.020***
Weight in ABS (%)	13.6%	13.4%	10.4%	2.8%	6.9%	0.6%	0.108***
Weight in agencies (%)	24.8%	16.1%	24.6%	4.2%	9.9%	0.0%	0.207***
Weight in munis (%)	1.0%	2.9%	0.0%	0.8%	6.5%	0.0%	0.002***
Weight in others (%)	6.3%	13.0%	0.8%	6.9%	12.3%	2.4%	-0.006***
Rating	15	2	15	8	2	8	6.227***
	A-		A-	B+		B+	
Time-to-Maturity (years)	6.96	4.04	7.00	7.45	2.16	7.13	-0.489***
Yield (%)	5.20	1.76	5.28	8.74	2.34	8.29	-3.542***
Trading days (per month)	13.63	3.23	13.76	10.58	2.76	10.37	3.055***
Reaching for yield (total)	-1.26	1.48	-1.00	2.32	1.70	2.28	-3.585***
Reaching for yield (within- rating-and-maturity)	-0.09	0.45	-0.06	-0.50	0.84	-0.32	0.404***
Reaching for maturity	-0.22	0.54	-0.10	-0.05	0.28	-0.04	-0.166***
Reaching for rating	-0.95	1.08	-0.83	2.89	2.02	2.77	-3.836***

Table 2

**Reaching for yield: Time series evidence**

This table reports results from a time-series regression of reaching for yield among corporate bond funds. The observations are at the fund-quarter level; fund characteristics are calculated as the asset-weighted average across share classes. The dependent variables are reaching for yield for a fund-date, either measured as total reaching for yield or as reaching for yield within-rating-and-maturity, as defined in Equations (1) and (2). The independent variables are the yield *level* (one-year Treasury yield), *slope* (the difference between the 30-year and one-year Treasury yields), and *default spread* (the yield difference between BBB- and AAA-rated corporate bonds). All independent variables are standardized to a mean of 0 and standard deviation of 1. Columns (1) and (2) present results for all funds, while Columns (3)-(6) present results separately for IG (investment grade) and HY (high-yield) funds. All regressions include fund fixed effects to control for possible differences in the composition of funds over time. Standard errors are two-way clustered at the fund- and quarter-levels. t-stats are presented in parentheses; \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	All funds		IG funds		HY funds	
	(1)	(2)	(3)	(4)	(5)	(6)
	Reaching for yield (total)	Reaching for yield (within- rating- and- maturity)	Reaching for yield (total)	Reaching for yield (within- rating- and- maturity)	Reaching for yield (total)	Reaching for yield (within- rating- and- maturity)
Yield (level)	-0.10 (-1.60)	-0.10*** (-3.96)	0.04 (0.49)	-0.05** (-2.02)	-0.46*** (-3.30)	-0.21*** (-3.09)
Yield (slope)	-0.19*** (-2.83)	-0.11*** (-4.57)	-0.28*** (-3.15)	-0.05** (-2.33)	0.04 (0.33)	-0.25*** (-3.63)
Default spread	-0.27*** (-5.60)	-0.24*** (-8.54)	-0.46*** (-11.20)	-0.13*** (-5.55)	0.20* (1.85)	-0.49*** (-10.21)
Fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.798	0.454	0.672	0.349	0.710	0.564
N	23426	23210	15692	15508	7143	7111

Table 3

**Reaching for Yield and Liquidity Management**

This table studies the relation between reaching for yield and other measures of portfolio risk management. The observations are at the fund-quarter level. The dependent variable is reaching for yield (within-rating-and-maturity) as defined in Equation (2). The main independent variables are the portfolio weight in *cash/Treasuries*, the portfolio weight in *equities*, *trade days* (value-weighted across bonds based on the number of transactions in TRACE), and the minimum of flows over the last eight quarters. Additional control variables include fund age, assets, expense ratio, past performance (cumulative return over the last four quarters), fund-style fixed effects (based on Lipper styles), and year-quarter fixed effects (the year-quarter fixed effects non-parametrically control for the time-series variables analyzed in Table 2). Column (1) presents results for all funds, while Columns (2) and (3) present results separately for Investment-grade (IG) and High-yield (HY) funds. The constant term is omitted. Standard errors are clustered at the fund level. t-stats are presented in parentheses; \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable: Reaching for yield (within-rating-and-maturity)	(1) All funds	(2) IG funds	(3) HY funds
Cash/Treasury weight	-0.310*** (-3.35)	-0.231** (-2.22)	-0.505** (-2.28)
Equity weight	2.628*** (3.27)	2.742 (1.54)	1.919*** (2.70)
Trade days per month	-0.016*** (-3.47)	-0.016*** (-3.42)	-0.025* (-1.96)
Lowest flow (past 8 quarters)	-0.409*** (-4.72)	-0.346*** (-3.48)	-0.322** (-2.16)
Fund Age (log)	-0.061*** (-3.07)	-0.022 (-1.03)	-0.136*** (-3.78)
Total Net Assets (\$M, log)	0.017*** (2.90)	0.019*** (2.89)	0.013 (1.07)
Expense Ratio (%)	2.742 (0.76)	-6.194 (-1.49)	13.795** (2.21)
Return (past year)	1.672*** (9.73)	-0.122 (-0.44)	0.754** (2.05)
Fund style fixed effects	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
R <sup>2</sup>	0.385	0.187	0.595
N	13460	9335	4125



Table 4

**Active Reaching for Yield and Past Performance Ranks**

This table reports results from panel regressions of active shifts in reaching for yield on return ranks of funds. The observations are at the fund-quarter level. The dependent variable is the active change in reaching for yield ( $\Delta RFY1$ ), *i.e.* the first component in the decomposition in Equation (3). We use the decomposition of the within-rating-and-maturity reaching for yield in columns 1-2), and total reaching for yield in columns 3-4. The independent variables is the tercile of the return rank of the fund over the previous three quarters (the funds are ranked within Lipper code). The regressions further study the difference in the relation between active reaching for yield and return rank, depending on whether we are in the last quarter of the calendar year or not. The regressions also control for lagged flows, lagged level of reaching for yield, as well as Time (year-quarter) fixed effects, and FundStyle\*Time fixed effects. Standard errors are clustered at the fund level. t-stats are presented in parentheses; \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	$\Delta RFY1$ , within ("active reaching for higher yield, within rating and maturity")		$\Delta RFY1$ , total ("active reaching for higher yield, total")	
	(1)	(2)	(3)	(4)
Last quarter (indicator)	0.019*** (5.74)	0.017*** (4.83)	0.007 (1.04)	-0.005 (-0.61)
Return rank tercile: Middle (over last three quarters)	-0.000 (-0.06)	-0.007*** (-3.76)	0.012*** (2.72)	-0.016*** (-3.17)
Return rank tercile: Top (over last three quarters)	-0.003 (-1.51)	-0.009*** (-3.89)	0.027*** (4.63)	-0.014** (-2.33)
Return rank tercile Middle (last three quarters) * Last quarter (indicator)	-0.024*** (-6.28)	-0.017*** (-4.27)	-0.020** (-2.31)	-0.004 (-0.47)
Return rank tercile Top (last three quarters) * Last quarter (indicator)	-0.038*** (-9.96)	-0.039*** (-9.71)	-0.060*** (-6.30)	-0.042*** (-4.25)
Flow (lagged)	-0.037*** (-14.12)	-0.037*** (-12.02)	-0.020*** (-13.25)	-0.024*** (-6.77)
Reaching for yield (lagged)	0.027*** (4.64)	0.025*** (4.42)	0.035** (2.37)	0.034** (2.45)
Year fixed effects	Yes	Yes	Yes	Yes
Fund Style*Year fixed effects	No	Yes	No	Yes
R <sup>2</sup>	0.161	0.189	0.145	0.175
N	18766	18766	18766	18766

Table 5

**Active Reaching for Yield and Fund Flows**

This table reports results from the regressions of future fund flows on active vs. passive shifts in reaching for yield. The observations are at the fund-quarter level. The dependent variable is the quarterly fund flows. The main independent variables are the components of a decomposition of shifts in reaching for yield ( $\Delta RFY$ ) within-rating-and-maturity into (i) an active portfolio change  $\Delta RFY1$  (“reaching for higher yield”), (ii) a passive change due to poor returns  $\Delta RFY2$ , and (iii) an interaction  $\Delta RFY3$  (“doubling down”). This decomposition is described in Equation (3). All regressions further include the following fund-level controls: fund age (log), assets under management (log), turnover, and expense ratio, as well as Time (year-quarter) fixed effects, and FundStyle\*Time fixed effects. The control variables are lagged by one quarter. Columns (3) and (4) show further controls for a lagged flow (the average over the last four quarters), and Column (4) additionally shows the result after controlling for lagged return (the cumulative return over the past four quarters) as well as the square of the return. The constant term is omitted. Standard errors are clustered at the fund level. t-stats are presented in parentheses; \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable: Fund Flow				
All independent variables are lagged by one quarter				
	(1)	(2)	(3)	(4)
$\Delta RFY$	-0.000			
(within-rating-and-maturity)	(-0.04)			
$\Delta RFY1$		0.128***	0.082***	0.069**
(“active reaching for higher yield”)		(4.42)	(2.76)	(2.41)
$\Delta RFY2$		-0.012*	-0.013*	-0.018**
(“poor returns”)		(-1.77)	(-1.65)	(-2.24)
$\Delta RFY3$		0.037	0.017	-0.018
(“doubling down”)		(1.48)	(0.63)	(-0.70)
Flow (past year average)			0.166***	0.159***
			(10.35)	(9.96)
Return (past year)				0.554***
				(8.66)
Return (past year) <sup>2</sup>				-1.204***
				(-6.33)
Fund controls	Yes	Yes	Yes	Yes
Fund Style*Year-Quarter fixed effects	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.060	0.064	0.080	0.090
N	19593	19593	15800	15800

Table 6

**Reaching for Yield and Returns: Fama-MacBeth Regressions**

This table reports results from Fama-MacBeth regressions of monthly fund returns on reaching for yield and other fund characteristics. The observations are at the fund-month level. For these return regressions, we limit the sample to fund-quarters that have at least 50% of the portfolios invested in corporate bonds. Column (1) reports the result for total reaching for yield (Equation 1), and Column (2) reports the result for reaching for yield within-rating-and-maturity (first component in the decomposition in Equation 2); these variables are lagged by one quarter. We control for a lagged flow and the other lagged fund characteristics described in Table 4 (age, assets under management, turnover, expense ratio), as well as Fund-style fixed effects (based on Lipper style). t-stats are presented in parentheses; \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Fama-MacBeth regressions		
Dependent variable: Monthly fund return (%)		
	(1)	(2)
Reaching for yield (total) <sub>t-1</sub>	0.070*** (2.63)	
Reaching for yield (within-rating-and-maturity) <sub>t-1</sub>		0.067** (1.99)
Flow <sub>t-1</sub>	0.001 (0.05)	-0.014 (-0.41)
Fund controls	Yes	Yes
Fund Style fixed effects	Yes	Yes
R <sup>2</sup>	0.512	0.448
N	19,674	19,671

Table 7

**Reaching for Yield and Returns: Alpha or Beta?**

This table reports alphas and betas of monthly high-minus-low calendar-time portfolios sorted on the reaching-for-yield measure (within-rating-and-maturity). For these return regressions, we limit the sample to fund-quarters that have at least 50% of the portfolios invested in corporate bonds. The funds are double-sorted into portfolios, first on whether the fund style is Investment-grade or High-yield (these styles are based on Lipper codes as described in Table 1), and, second, into terciles based on the fund's reaching for yield within-rating-and-maturity (Equation 2). We then calculate the high-minus-low difference (*Hi-Lo*) between the highest tercile and lowest tercile reaching-for-yield portfolios. Panel A reports average excess returns on these *Hi-Lo* portfolios. Panels B and C report results from the time-series regressions of the high-minus-low portfolio returns on common risk factors. The risk factors are *Market* ( $R_m - R_f$ ), *Term* (30-year bond return - 1-year bond return), *Def* (equal-weighted corporate bond return less  $R_f$ ), and *Put* (put option return) by Agarwal and Naik (2004). Standard errors are reported in parentheses; \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% levels, respectively.

**PANEL A: AVERAGE RETURNS ON HIGH-MINUS-LOW REACHING-FOR-YIELD PORTFOLIOS**

Fund style:	Investment grade (1)	High yield (2)	All funds (3)
Average excess return	0.1254 (0.1088)	0.0544 (0.0576)	0.0899 (0.0711)
N	120	120	120

**PANEL B: ALPHAS AND BETAS OF HIGH-MINUS-LOW REACHING-FOR-YIELD PORTFOLIOS**

Fund style:	Hi-Lo Reaching-for-yield portfolios		
	Investment grade (1)	High yield (2)	All funds (3)
$\beta^{\text{Mkt}}$	0.04** (0.02)	0.05*** (0.02)	0.05*** (0.01)
$\beta^{\text{Term}}$	-0.01 (0.01)	0.05*** (0.01)	0.02** (0.01)
$\beta^{\text{Def}}$	0.42*** (0.03)	0.04 (0.03)	0.23*** (0.02)
Alpha	-0.15*** (0.06)	-0.02 (0.05)	-0.08* (0.04)
$R^2$	0.776	0.249	0.709
N	114	114	114

Table 7, continued

PANEL C: EXPANDED FACTOR REGRESSIONS			
Fund style:	Hi-Lo Reaching-for-yield portfolio returns		
	Investment grade (1)	High yield (2)	All funds (3)
$\beta^{\text{Mkt}}$	0.03 (0.02)	0.04* (0.02)	0.04** (0.02)
$\beta^{\text{Term}}$	-0.01 (0.01)	0.05*** (0.01)	0.02** (0.01)
$\beta^{\text{Def}}$	0.42*** (0.03)	0.03 (0.03)	0.23*** (0.02)
$\beta^{\text{Put option}}$	-0.07 (0.11)	-0.10 (0.10)	-0.08 (0.08)
Alpha	-0.16*** (0.06)	-0.03 (0.06)	-0.10** (0.04)
$R^2$	0.777	0.255	0.712
N	114	114	114

APPENDIX

Figure A.1

**Changes in reaching for yield over time: decomposition**

This figure shows the changes in the components of shifts in total reaching for yield over time for corporate bond mutual funds. These components are: (1) active portfolio changes towards higher-yielding bonds (“active reaching for yield”, plotted with a solid line), (2) passive changes in reaching for yield due to bond price changes (“poor returns”, dotted line), and (3) an interaction (“doubling down”, dashed line). The decomposition into these three components of changes in reaching for yield is described in Equation (3).

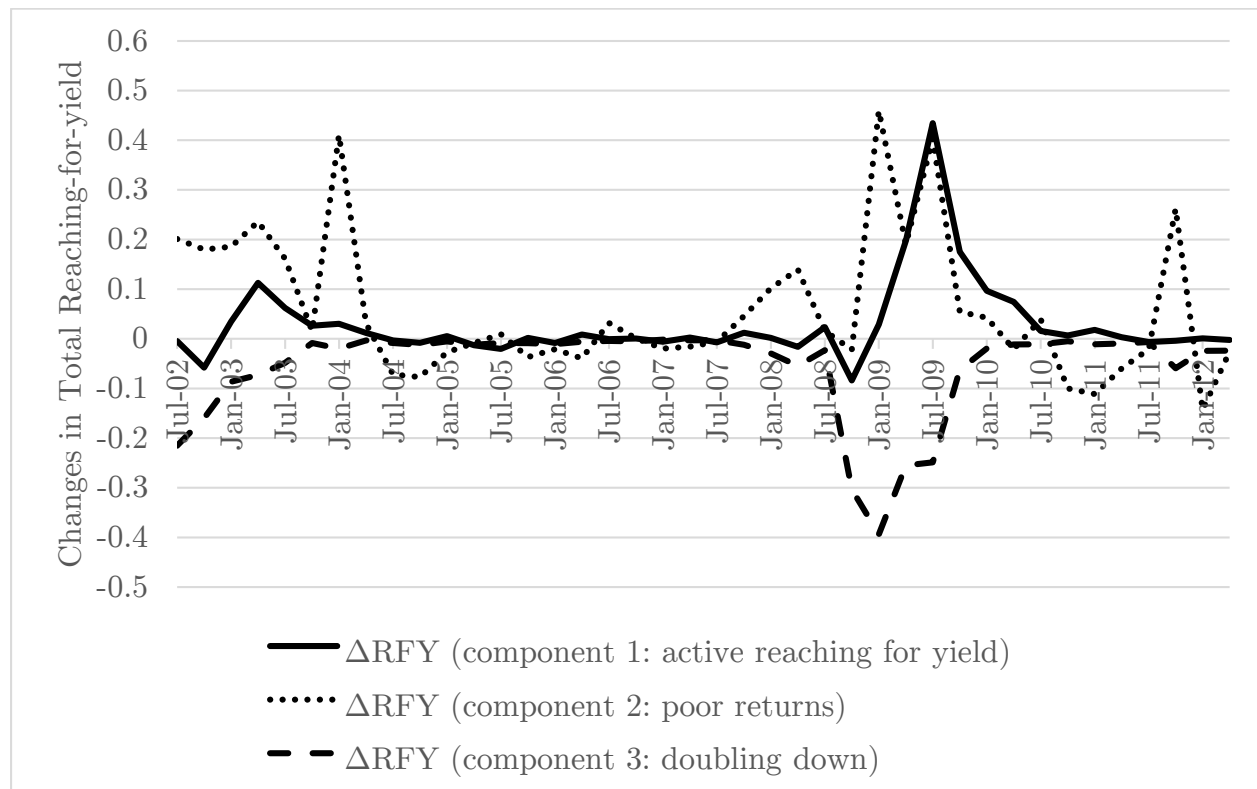


Figure A.2

**Average corporate bond yields and portfolio weights in corporate bonds**

This figure shows the time series of the value-weighted average corporate bond yield (solid line), and the fraction of portfolio holdings that are made up of corporate bonds (dashed line). The sample of funds include all bond funds in the CRSP Mutual Funds database categorized as either corporate or general bond funds (*i.e.*, CRSP style categories I, ICQH, ICQM, ICQY, ICDI, ICDS, or IC) and that at least at one point during the sample period have held at least some securities identifiable as corporate bonds in FISD.

