

Beware of Chasing Yield: Bond Fund Yield, Flows and Performance*

Hao Jiang

Michigan State University

Yuanzhi Li

Villanova University

Lu Zheng

University of California–Irvine

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Abstract

This paper studies how bond fund yield drives flows and performance. Using fund-reported SEC yield and 12-month distribution yield, we find that investors tend to chase high yield bond funds, after controlling for fund returns and ratings. The tendency of yield chasing is particularly strong when interest rates are low. Although high yield bond funds achieve higher average returns, the realized return spread is less than one half of the quoted yield spread, which is attributable to higher fund risk. During the LTCM collapse, Lehman Brothers bankruptcy, and Covid-19 crisis, high yield bond funds suffer sharp losses, triggering large outflows.

JEL: G10, G11, G12, G23

Keywords: Bond Funds; SEC Yield; Distribution Yield; Flows; Fund Performance.

*Hao Jiang, Phone: 1-517-353-2920; E-mail: jiangh@broad.msu.edu. Yuanzhi Li: Phone: 610-519-4500; E-mail: yli@villanova.edu. Lu Zheng: Phone: 1-949-824-8365; E-mail: luzheng@uci.edu. We thank participants in the Inquire UK Business School Seminar and the seminar held at McMaster University for helpful comments.

1 Introduction

Investors actively switch money across mutual funds. The resulting fund flows appear to drive asset prices, for individual securities, return factors, and the aggregate market.¹ What determines fund flows? The standard answer from the literature is fund performance—a voluminous literature studies how investors react to mutual fund returns.² However, mutual fund performance is a multidimensional concept. Mutual funds often disclose to investors not only fund returns but fund yield. In fact, financial regulators set strict standards for mutual funds to compute their yield for investor disclosure and advertising. In this paper, we address the often neglected question: How do mutual fund investors react to the information of fund yield?

We focus on open-end bond funds, a growingly important asset class, to which the concept of yield is most important. According to the Investment Company Institute, during the past decade from 2010 to 2019, bond funds received net new cash inflows of \$1.29 trillion, in contrast to the net new cash outflows of \$1.23 trillion from equity funds. In 2020, such shifts continued, which leads commentators from the *Wall Street Journal* to claim that “bond funds are hotter than Tesla.”³

Our focus on bond funds is also driven by an important economic reason. Viewed as a pool of bonds, bond funds provide a convenient access for individual investors to the broad universe of fixed-income assets, beyond their traditional savings vehicles. Because yield dominates the valuation of fixed-income assets, investors may evaluate bond funds in a similar way. By transferring their experience or knowledge, investors may emphasize fund yield in evaluating bond funds. This type of behavior is consistent with economic models based on “coarse thinking” (e.g., [Mullainathan, Schwartzstein, and Shleifer, 2008](#)), which posits that people tend to categorize situations into groups and use the same model of inference for the situations in the same group. However, bond yield is informative of an investor’s return if the bond is held to maturity; it may not be informative of an investor’s return if the bond is sold before its maturity. Open-end bond funds turn over their

¹See, e.g., [Coval and Stafford \(2007\)](#), [Frazzini and Lamont \(2008\)](#), [Vayanos and Woolley \(2013\)](#), [Ben-David, Li, Rossi, and Song \(2021\)](#), and [Gabaix and Koijen \(2021\)](#).

²See, e.g., [Ippolito \(1992\)](#), [Brown, Harlow, and Starks \(1996\)](#), [Chevalier and Ellison \(1997\)](#), [Sirri and Tufano \(1998\)](#), [Lynch and Musto \(2003\)](#), and [Huang, Wei, and Yan \(2007\)](#) for studies on equity funds as surveyed by [Christoffersen, Musto, and Wermers \(2014\)](#). Recently, this literature studies also bond funds (e.g., [Goldstein, Jiang, and Ng, 2017](#)).

³“Bond funds are hotter than Tesla,” Jason Zweig, *The Wall Street Journal*, February 7, 2020.

portfolios frequently for various reasons, e.g., to achieve fund duration and credit risk targets and to accommodate investor redemptions by selling bonds before maturity. Moreover, quoted bond yields may differ from expected bond returns when the bond loads on default risk. Therefore, transferring the concept of yield from evaluating bonds to evaluating bond funds is not straightforward and requires a sophisticated understanding. This makes our empirical analyses of the relationships among bond fund yield, flows, and performance particularly relevant.

Our empirical tests use a comprehensive sample of bond funds (fixed-income funds excluding money market funds and municipal bond funds) from 1993 to 2019. We use two measures of mutual fund yield, the 30-day SEC yield that captures the interest income from a fund’s assets in the past 30 days net of the fund’s expense divided by its offer price, and the 12-month distribution yield that captures the fund’s cash distribution in the past year divided by its offer price. Using both measures, we document strong evidence that investors tend to chase bond funds with higher yields, after controlling for total fund returns and Morningstar fund ratings. In terms of magnitudes, a 1% increase in the (annualized) SEC yield predicts a 0.11% increase in investor flows in the next month, which amounts to \$0.61 million per month for an average fund with a net asset of \$550 million in our sample. This effect is quantitatively larger than that of a 1% increase in the annual fund return. Using the distribution yield, we find similar evidence that investors prefer bond funds with higher yields. The effects are robust to the inclusion of fund style \times month fixed-effects, which absorb the variation in investor flows across different styles of funds through time. These findings are noteworthy because a mutual fund’s total return embeds the information on its yield; the incremental effect of fund yield on investor flows shows that mutual fund investors indeed pay special and extra attention to the yield component of a fund’s return.

There is a difference between the SEC yield and distribution yield: the former reflects a fund’s net interest income whereas the latter captures any form of fund distribution to investors, including the disposition of fund assets. Thus, the SEC yield reflects the property of underlying assets while the distribution yield is at the discretion of fund management. To examine whether investors distinguish between these two measures of yield, we compute the difference between the distribution yield and SEC yield, as the distribution spread. We find that both the SEC yield and the distribution spread are positively related to future fund flows; however, the coefficient for the SEC yield is three times

as large as that for the distribution spread. This result shows that fund investors attach high importance to the SEC yield and also value higher dividend payments from bond funds, albeit to a lesser degree. To have a better understanding of the difference between the SEC yield and distribution yield, we group bond funds into two groups: retail and institutional funds. Separate analysis for each group shows that a higher SEC yield strongly attracts both individuals and institutions, whereas a higher distribution yield attracts only individuals.

The finding that investors chase bond funds with higher yields is naturally related to the broad phenomenon of reaching for yield in the financial system (e.g., [Rajan, 2006](#); [Stein, 2013](#)). Because yields are easily observable for bonds, there is growing evidence of reaching for yield in the bond market (e.g., [Hanson and Stein, 2015](#); [Becker and Ivashina, 2015](#); [Choi and Kronlund, 2018](#)). The common economic driver for the behavior of reaching for yield across asset markets is the low interest rate, which intensifies the tendency of financial institutions to tilt their portfolio toward higher yielding bonds. To study how interest rate might influence the behavior of bond fund investors, we group our sample period into five buckets based on the level of interest rate (the 10-year Treasury bond yield). We refer to the top 20% of the sample months as the high interest rate period and bottom 20% as the low interest rate period. Separate analysis for each of the two periods shows that in the low interest rate period, the sensitivity of investor flows to fund yield is particularly high, whereas in the high interest rate period it is substantially weakened. For instance, in the case of the SEC yield, the slope coefficient of the SEC yield more than doubles from the high interest rate to low interest rate periods. This result provides a microfoundation for why asset managers have greater incentives to invest in high yielding bonds when interest rate is low.

Does chasing yield benefit bond fund investors? We study the performance implication of investing in high-yield bond funds. Specifically, we form 10 portfolios of bond funds based on the fund's yield at the end of each quarter from 1993Q1 to 2019Q3, holding the funds for one quarter and then rebalancing the portfolios. We compute both equal-weighted and value-weighted returns on these portfolios, focusing on the spread in the performance between high (decile 10) and low (decile 1) yield funds. For both the SEC yield and distribution yield, bond funds with higher yields tend to generate higher average returns. However, the difference in average total returns

largely falls below one half of the difference in yields. Taking the SEC yield as an example, we find that the difference in average returns between high and low yield funds is 3.31% per year on an equal-weighted basis and 3.06% on a value-weighted basis, although the difference in yields is as high as 6.40%. Thus, half of the difference in bond fund yield is offset by the difference in fund capital gains/losses.

To understand the investment risk of high yield bond funds, we examine the difference in risk exposures of high and low yield funds. We start by examining the time-series variation of the difference in returns between high and low yield funds. Over the period from 1993 to 2019, we identify two episodes of sharp drops in the relative performance of high yield bond funds: one in August 1998, the Long-Term Capital Management turmoil, and another following the bankruptcy of Lehman Brothers in September 2008. During the first episode, bond funds with high SEC yield underperformed their low yield peers by 17.6% on an equal-weighted basis and 14.5% on a value-weighted basis. During the second episode, they underperformed by 28.7% in a three-month window from September to November 2008 on the equal-weighted basis and by 30.3% on the value-weighted basis. These negative returns are extraordinarily large, considering that the standard deviation of monthly returns for bond funds is only 1.58% in the full sample period. Clearly, high yield bond funds are “picking up nickels in front of a steam roller,” consistent with the conjecture of [Rajan \(2006\)](#).

Formal tests of performance attribution show that high yield bond funds have higher exposures to the interest rate risk and credit risk, the two prominent bond market risk factors emphasized by [Fama and French \(1993\)](#). After adjusting for the bond market, interest-rate and default risk premiums, we find the average return difference between high and low yield funds shrinks from 3.31% to 1.25% and from 3.06% to 1.06% per year on the equal- and value-weighted bases, respectively. We also find that bond funds with higher yields tend to have larger stock market exposures. After further accounting for the stock market beta, the difference in average returns decreases to 0.97% and 0.94% per year, neither of which is statistically significant. These results show that the higher returns on bond funds with higher yields are attributable to higher risk. They are consistent with the results reported in an early study of the performance of low-grade bond funds by [Cornell and Green \(1991\)](#). As a robustness test, we also sort bond funds into deciles based on

their style-adjusted yields, i.e., the deviation in a fund’s yield from the average yield of funds in the same investment style. We find a similar pattern that the higher returns on bond funds with higher style-adjusted yields can be explained by their higher risk.

To complement the return-based analyses, we examine how bond fund yield is related to the asset allocation decisions of bond funds across credit ratings. The results show that an increase in bond fund yield is associated with decreased allocations to investment grade bonds rated above BBB but increased allocations to BBB-rated bonds, the lowest rating ladder in the investment grade bonds. An increase in bond fund yields is also associated with increased allocations to non-investment grade bonds. In terms of magnitudes, the increased allocation to BBB-rated bonds is close to five times that to BB-rated bonds and approximately equal to that to the rest of non-investment grade bonds. This pattern of bond fund managers reaching for yield resonates with the findings of [Becker and Ivashina \(2015\)](#) in the context of insurance companies. We also find that this tendency to reach for yield is stronger when the interest rate is low. These results provide further support to the notion that higher fund yield is essentially a manifestation for a bond fund’s higher risk taking. In terms of mutual fund investor behavior, we find that, during the episodes of financial crises, investors tend to flock away from high yield bond funds when their performance plummeted.

Finally, the bond market turmoil brought about by the Covid-19 pandemic in 2020 provides a natural experiment and out-of-sample test to examine the relation between the bond fund yield and performance. For this event, we use daily fund returns and daily investor flows to sharpen the inference on the behavior of bond fund investors around the Covid-19 crisis. We first sort bond funds into deciles based on their yield at the end of 2019 and then track the difference in daily returns and in daily investor flows between high and low yield bond funds. We find that the performance of bond funds with high yield started to deteriorate around late February, diving sharply in the first three weeks in March as the concern about the pandemic abruptly disrupted the bond market. In response to the bond market turmoil, the Federal Reserve released a number of monetary policy initiatives to stabilize the bond market. An important turning point is March 23 2020, when the Fed announced a rich set of emergency measures to support the mortgage-backed securities, corporate bonds, and asset-backed securities markets. Up to this point, the

cumulative underperformance of bond funds with high SEC yield relative to their low-yield peers reached 19.1% on an equal-weighted basis and 20.7% on a value-weighted basis. From the next day, the performance of high-yield bond funds recovered gradually. Turning to flows, investors pulled out \$41 billion of investments from high-yield bond funds more than their low-yield peers up to the height of the bond market turmoil. For those investors who failed to reinvest, they missed the subsequent recovery of the bond fund performance.⁴ Overall, the evidence from the Covid-19 episode reinforces the thesis that bond fund yield manifests the fund risk, which does not appear to be fully appreciated by bond fund investors.

The literature on reaching for yield has been growing since the economy enters into a prolonged period of low interest rate, due partially to unconventional monetary policy around the world. It has focused on the issues resulting from delegated portfolio management, emphasizing agency problems and frictions faced by particular groups of financial institutions. For instance, [Hanson and Stein \(2015\)](#) find that banks tend to tilt their portfolio holdings toward longer-duration bonds in response to lower interest rate, which is associated with lower term premia in the Treasury bond market; [Becker and Ivashina \(2015\)](#) report that insurance companies exhibit a systematic bias for corporate bonds with higher yields, conditional on their credit rating; [Di Maggio and Kacperczyk \(2017\)](#) report evidence of reaching for yield for money market funds when the policy rate hit the zero lower bound; [Lu, Pritsker, Zlate, Anadu, and Bohn \(2019\)](#) study the behavior of public pension funds in risk taking during the low interest rate environment; [Campbell and Sigalov \(2020\)](#) derive reaching for yield by endowments and sovereign wealth funds faced with the constraint of sustainable spending. In the context of corporate bond funds, [Choi and Kronlund \(2018\)](#) find that corporate bond funds tend to tilt their bond holdings toward bonds with yields higher than their benchmarks; [Jiang, Ou, and Zhu \(2020\)](#) find that bond funds tend to sell CDS with higher spread in a given rating category to enhance their portfolio yield; [Chen, Cohen, and Gurun \(2020\)](#) report that bond funds may misreport the credit risk of their portfolios, in an attempt to enhance their perceived performance. Our paper focuses on the behavior of principals in the delegated portfolio management. We study how reported mutual fund yield influences the behavior of mutual fund

⁴[Falato, Goldstein, and Hortaçsu \(2020\)](#) examines the patterns of investor flows for corporate bond funds during the Covid-19 episode. They focus on the asset illiquidity of bond funds, but do not look at bond fund yield, which is our focus.

investors and the implications for investor wealth. The behavior of mutual fund investors shapes the incentive environment of investment agents.

In the equity market, a number of recent studies explore how investors tend to chase high dividend stocks when interest rate goes down. For instance, [Hartzmark and Solomon \(2019\)](#) focus on the distinction between dividends and capital gains and report evidence on the dividend disconnect; [Jiang and Sun \(2020\)](#) study the time-varying incentives for equity income fund managers to tilt toward high dividend stocks and their resulting high interest rate risk; [Daniel, Garlappi, and Xiao \(2020\)](#) study the transmission of monetary policy through the mechanism of investor reaching for income. Using experimental data, [Lian, Ma, and Wang \(2019\)](#) study the tendency of individuals to reach for yield in a low rate environment. These studies rely on behavioral biases of individual investors to explain the behavior of reaching for yield, which is related to our analyses. Our study differs from them by providing a systematic micro-level study of the behavior of investors in bond funds in response to bond fund yield.

2 Sample Construction and Summary Statistics

Our sample of bond funds comes from the intersection of the CRSP Survivor-Bias-Free US Mutual Fund Database and Morningstar Direct. We select all actively managed fixed-income funds in the database, excluding money market funds due to their cash-like nature⁵ and municipal bond funds because of the special tax treatment of municipal bonds. Our core sample includes 1,237 unique bond funds with 3,857 share classes, covering the period from 1992 to 2019. Because we use past one year data to measure performance, our statistical tests start from 1993.⁶ Finally, we use the Covid-19 pandemic as an out-of-sample test for the behavior of bond fund investors and bond fund performance. For these tests, the sample ranges from January to July 2020.

Figure 1 shows the dramatic expansion of bond funds in our sample period. At the beginning of 1993, there were 107 bond funds with less than \$67 billion under management;⁷ toward the end of 2019, there were 2,965 funds managing more than \$2.1 trillion of assets. This exponential growth of

⁵Moreover, the seven-day money market fund yield is equivalent to the annualized seven-day money market fund total return.

⁶Prior to 1992, the coverage of yield information on bond funds by Morningstar is rather incomplete.

⁷We use mutual fund share classes as the unit of count and analyses, unless otherwise specified.

bond funds coincides with a secular decline in the level of interest rates. For instance, the 10-year Treasury rate dived by seven tenths from 6.35% in 1993 to 1.90% in 2019.

Figure 2 presents the distribution of bond funds across investment styles (Morningstar category classifications) at the end of 2019. It shows that the intermediate core-plus bond funds enjoy the highest popularity among bond fund investors (31.4% of all bond fund assets), followed by the intermediate core bond funds (15.5%), multisector bond funds (12.9%), short-term bond funds (11.6%), and high yield bond funds (10.4%). Together the top five categories of bond funds represent more than 80% of total bond fund assets.

The key fund attribute we focus on is the fund yield, which we measure in two ways: the SEC yield and 12-month distribution yield. The SEC yield is standardized by the SEC based on a common formula, which divides the interest income accrued by the fund in the past 30 days net of the fund’s expense by the fund’s maximum offering price on the last day of the period. The 12-month distribution yield is based on the dollar amount of dividends distributed by the bond fund in the trailing twelve months divided by its offer price. Both yield measures are reported on an annualized basis. The main difference is that the SEC yield considers only the income from the bond holdings and subtracts the fund’s expense ratio, but the distribution yield includes all forms of distributions and does not subtract the expense ratio.

Table 1 shows the summary statistics of the key variables used in this study. The average monthly flow for these bond funds is 0.75% per month; these flows are highly volatile, with a standard deviation of 7.74%. The average monthly bond fund return is 0.36%; although the return volatility is relatively low, only 1.58% per month, bond fund return has fat tails and is left-skewed. The average SEC yield is 3.58%, which is lower than the average 12-month distribution yield, 4.14%. The higher value of the distribution yield comes mainly from the fact that the SEC yield is net of fund expenses, which drives down the SEC yield. Interestingly, the distribution yield is more fat-tailed, with a much larger kurtosis than the SEC yield: 27.82 versus 2.32. This could be due to the fact that fund managers have more discretion over the fund distributions, which can lead to more extreme values; by contrast, the SEC yield is based on the formula provided by the SEC, mainly driven by the investment income from the bond fund asset holdings. The average bond fund in our sample has more than \$550 million of assets under management, is less than 11

years old, and charges an expense ratio of 0.98% and rear-end load of 0.26%.

3 Chasing Bond Fund Yield: Evidence of Investor Flows

To examine how investors react to bond fund yields, we extend the conventional flow-performance regression by including the fund yield variable in various forms, as follows:

$$Flow_{i,t+1} = \alpha + \beta \times Yield_{i,t} + \gamma \times Return_{i,t} + \lambda \times Controls_{i,t} + \epsilon_{i,t+1}. \quad (3.1)$$

$Flow_{i,t+1}$ is the proportional flow for fund i during month $t + 1$; $Yield_{i,t}$ is the fund yield variable observable at the end of month t , including the SEC yield, 12-month distribution yield, the difference between the two yields referred to as *Distribution Spread*, and the peer-adjusted yields for the aforementioned three yield variables referred to as *Excess Yield*; and $Return_{i,t}$ is past one-year return ending in month t , measured as the sum of fund i 's monthly returns from $t - 11$ to t . The control variables include Morningstar Rating, *Past Flow* $Flow_{i,t}$, the log of fund *Total Net Assets*, the log of fund *Age* in years, the *Expense Ratio* and *Rear-end Load*. In these regressions, we include style fixed effects and time fixed effects or style×time fixed effects, and cluster standard errors by fund.

3.1 Baseline Results

Table 2 shows the regression results, which indicate a strong relation between investor flows and fund yield. Column 1 shows that a bond fund with a higher SEC yield tends to receive more inflows from investors, after controlling total fund returns and other fund characteristics. In terms of magnitudes, the slope coefficient for the SEC yield is 0.11, which indicates that a 1% increase in the SEC yield predicts a 0.11% increase in investor flows in the next month. As a comparison, the slope coefficient for the past one-year return is 0.082, which is lower than that of the SEC yield. Interestingly, we shall note that fund yield is a component of total fund returns. The incremental effect of fund yield on investor flows shows that mutual fund investors indeed pay special and extra attention to the yield component of a fund's return.

Column 2 shows that the 12-month distribution yield plays a similar role in attracting investor flows. Do the two measures of fund yield contain the same information for mutual fund investors? Because these two variables are highly correlated with a correlation coefficient of approximately 80%, we construct a measure of Distribution Spread that captures the spread of the distribution yield (12-Month yield – SEC yield). Column 3 shows that after controlling for the SEC yield and total fund returns, bond funds distributing higher dividends attract more flows from investors; in terms of magnitudes, the effect of higher dividends is approximately one third the effect of the SEC yield. This result suggests that some investors prefer higher dividend payouts from bond funds.

In the fixed-income universe, there is substantial variation in yields across different asset classes. In other words, bond funds have large differences in yields across investment styles. Do the preceding results simply capture the differences in yields across fund styles? To address this question, we proceed in two ways. First, for each measure of fund yields, we compute a style-adjusted excess yield, which subtracts the average fund yield in a given fund style from a particular bond fund’s yield. Columns 4–6 present the results based on the excess yields, which indicate similar effects: bond funds with higher yields compared with their peers in the same groups enjoy higher inflows, both for the SEC and 12-month distribution yields. Second, we include style \times time fixed effects in the regressions, which absorb all the variations in flows across fund styles. Columns 7–9 show the results, which deliver a similar message. The effects of fund-level variation in yields on investor flows remain large and statistically significant. A comparison of the regression coefficients across Columns 1–3 and Columns 7–9 indicates that style-level variation is a relatively small contributor to the total effect of bond fund yields on fund flows. In the remainder of the paper, we focus largely on bond fund yields, instead of the style-adjusted yields.

Before leaving this subsection, we note that the relation between fund yield and flows is fairly robust. In Table A.1 of the Appendix, we control for alternative specifications of the flow performance relations. First, instead of using 12-month returns, we include 12 monthly returns in the past year to allow for the possibility that mutual fund investors may attach different importance to fund returns measured in different horizons. Second, in addition to past returns, we include an interaction between past returns and a negative return dummy to control for non-linear flow performance relations. The predictive power of mutual fund yield for investor flows is robust.

3.2 Retail versus Institutional Investors

To understand further the relation between bond fund yield and investor flows, we segregate institutional and retail fund shares and re-estimate Equation 4.3 separately for each group. The idea behind this analysis is that institutions and individuals can differ in their investment objectives and sophistication, which can lead to a different relation between fund yield and investor flows. As compared with adding an interaction term between yield and an investor type indicator in Equation 4.3, the advantage of this separate regression approach lies in its flexibility that allows the relation between other fund characteristics and flows to vary with investor types.

The results in Table 3 show that both retail investors and institutions tend to prefer bond funds with high SEC yields. In terms of magnitudes, the effect of the SEC yield is larger than that of the total fund return for both investor types. They differ, however, in terms of the response to the distribution yield: retail investors have a strong preference for bond funds with higher distributions, whereas institutions do not appear to base their investment decisions on the distribution yield. For instance, the coefficient for the 12-Month Yield in Columns 2 is large and statistically significant for retail investors, but it is close to zero in Column 5 both in terms of magnitudes and statistical significance. The slope coefficients for the Yield Spread in Columns 3 and 6 provide further supporting evidence. This difference between retail and institutional investors in their response to distribution yield could reflect differences in their investment objectives; for instance, retail investors may be more dependent on the income flow from bond funds to finance their consumption needs. It could also reflect the difference in investor sophistication: an abnormally high distribution yield as compared with the SEC yield suggests that fund managers may simply dispose fund assets to enhance current distributions, but the long-term fund performance may suffer.

To conclude this subsection, we find that retail investors tend to chase higher distribution yield, while institutions do not. However, both groups of investors tend to chase bond funds with higher SEC yield.

3.3 Interest Rate Environment

The literature on reaching for yields emphasizes that investors have a stronger tendency to invest in assets with higher yields in a low interest rate environment. Do bond fund investors show such a behavior? To address this question, we sort our sample periods into five groups based on the level of interest rate as reflected in the 10-year Treasury yield. We refer to the time periods in the top quintile as the high interest rate period and those in the bottom quintile as the low interest rate period. Then we estimate Equation 4.3 separately for each time period.

The results in Table 4 show a striking difference between high and low interest rate periods. In particular, bond fund investors are insensitive to the performance of individual bond funds when interest rate is high; by contrast, they switch their investments in bond funds actively in response to their performance when interest rate is low. For instance, the coefficients for fund yields and fund returns are large and strongly significant in Columns 1 to 3, but are close to zero in Columns 4 to 6. This result suggests that when the interest rate is high, investor perceive bond funds as a more homogeneous asset class, but when the interest is low, they are more selective in picking bond funds, with a particularly high preference for higher-yielding funds. It resonates with the theme in the reaching for yield literature, as elaborated in [Rajan \(2006\)](#), [Stein \(2013\)](#) and [Campbell and Sigalov \(2020\)](#).

4 Bond Fund Yield and Performance

Given that investors tend to chase bond fund yield, it is natural to study the relation between bond fund yield and performance, which is the focus of this section.

4.1 High Returns on High Yield Bond Funds

In theory, a bond's yield is approximately equal to the sum of the bond's expected return if the bond is held to maturity and its expected default loss. The expected return component is the sum of the risk-free rate, the bond risk premium and potential abnormal return or α of the bond ([Becker and Ivashina, 2015](#)). A bond fund, which is a dynamic portfolio of bonds, may achieve a higher yield either by taking higher risk, which boosts the risk premium and expected default

loss, or by exploiting potential mispricing in the bond market to achieve a higher α . The latter activity entails the fund manager to actively trade individual bonds. This, in combination with the fact that open-end bonds have to trade bonds to accommodate investor redemptions, may lead to a high fund turnover and generate a gap between the fund yield and average fund returns, either positive or negative. Therefore, the relation between bond fund yield and bond fund performance is largely an empirical issue.

To shed light on it, we use the portfolio approach, which is easy to interpret for bond fund investors. Specifically, at each quarter end from 1993 to 2019, we sort bond funds into ten deciles based on the reported fund yield (either the SEC yield or the 12-month distribution yield). For each decile, we form equal- and value-weighted portfolios with quarterly rebalancing, and compute the average returns on each portfolio.

Table 5 shows the results, with Panel A (B) based on the SEC yield (12-month distribution yield). The first row of Panel A shows the average yield for each portfolio, which indicates a sizable spread. For instance, the average SEC yield for decile 1 is 1.92% per year, whereas that for decile 10 is 8.32%. The difference of 8.32% is economically large and statistically strong. Moving to average returns, we find that the average fund return increases with fund yield. For funds in decile 1, the average equal-weighted portfolio return is 3.31% per year, while funds in decile 10 deliver an average equal-weighted return of 6.62%. However, the return difference of the two portfolios is 3.31%, which is about half of the yield spread of the two. When we calculate the value-weighted portfolio returns, we find a similar pattern: higher yield bond funds deliver higher returns, but the return spread is even smaller than half of the yield spread between the top and bottom decile portfolios. This pattern emerges also in Panel B based on the 12-month yield: The yield spread between decile 10 and decile 1 portfolios is as high as 6.72%, but the return spread of equal-weighted (value-weighted) portfolios is merely 2.50% (3.06%).

On surface, these results indicate that bond fund investors have the potential to achieve higher return by investing in high yield bond funds, but they may be disappointed if they believe that quoted fund yields represent average future fund returns. In the following subsection, we examine the nature of the higher average returns on high yield bond funds. Before we conclude this subsection, we first analyze a cynical interpretation of our results: the relation between fund yield and

fund return we document may simply reflect the difference in average returns between different asset classes. For instance, since long-duration bonds quote higher yields and earn higher average returns than short-duration bonds, long-term bond funds naturally post higher yields and returns than short-term bond funds.

To tackle this issue, we use the fund style-neutral excess yield to construct bond fund portfolios. Its advantage is that the ranking of funds is based on the deviation of a fund’s yield from its peers focusing on the same asset class, without reflecting the average difference in yields across asset classes. We report the results in Table 6. Panel A shows that the difference in the excess SEC yield between bond funds in deciles 10 and 1 is still sizable, as large as 4.03% per year, but the difference in average future returns shrinks to less than one half of the yield spread, only 1.71% on an equal-weighted basis and 1.20% on a value-weighted basis. The results in Panel B based on the 12-month yield show a similar pattern. These results support the notion that bond fund yield is a meaningful fund-level characteristic related to future fund returns. However, about half of the difference in bond fund yield is offset by the difference in fund capital gains/losses.

4.2 Vulnerability of High Yield Bond Funds

To understand the nature of the high returns on high yield bond funds, we consider the difference in the risk exposures between high and low yield bond funds. To start, we plot in Figure 3 the monthly returns on the spread portfolio that buys high yield bond funds in Decile 10 and sells low yield bond funds in Decile 1, as constructed in Table 5. Over the period from 1993 to 2019, it shows two episodes of steep declines in the relative performance of high yield bond funds. The first one took place in August 1998, when the Russian debt default led to the collapse of the giant hedge fund, Long-Term Capital Management, disrupting the financial markets; the second following the bankruptcy of Lehman Brothers in September 2008, engendering panics across the financial system. During the first episode, bond funds with high SEC yield underperformed their peers with low yield by 17.6% on an equal-weighted basis and 14.5% on a value-weighted basis. During the second episode, they underperformed by 28.7% in a three-month window from September to November 2008 on the equal-weighted basis and by 30.3% on the value-weighted basis. These negative returns are extraordinarily large, considering that the standard deviation of monthly returns for bond funds is

only 1.58% in the full sample period. Overall, the behavior of high yield bond fund returns suggests that high yield bond funds tend to accumulate small gains over an extended period of time, but when small-probability events such as financial crisis arrived, they were hard hit with extremely large losses. This is in line with the conjecture of [Rajan \(2006\)](#) that investment managers tend to take on hidden risks, in an attempt of reaching for yield.

To more formally analyze the drivers of the performance of bond funds, we consider a number of risk factors. In the spirit of the CAPM, we consider both the stock and bond market returns, captured by the CRSP value-weighted stock market return and the Vanguard total bond market index fund return, respectively (see, e.g., [Friend, Westerfield, and Granito, 1978](#); [Goldstein, Jiang, and Ng, 2017](#)). R_{Stock} and R_{Bond} denote the stock and bond market returns in excess of the risk-free rate. We also consider two prominent bond market risk factors proposed by [Fama and French \(1993\)](#): the interest-rate and default risk. In our main performance evaluation tests, we use the tradable returns on these two factors, with the difference in returns between the Vanguard long-term Treasury index fund and short-term Federal fund to capture the term premium R_{Term} , and the difference in returns between the Vanguard high-yield corporate bond fund and long-term Treasury index fund to capture the default premium $R_{Default}$. We shall note that although perfectly measured term and default premiums might fully capture the bond market risk in an ideal world, it is not the case in practice. For instance, a regression of R_{Bond} on R_{Term} and $R_{Default}$ has a positive and statistically significant intercept of more than 1% per year. Therefore, it is important to consider all the three bond market factors for bond fund performance evaluation. Our performance evaluation regressions are specified as follows:

$$HML_{i,t} = \alpha + \beta_{Bond} \times R_{Bond,t} + \beta_{Stock} \times R_{Stock,t} + \beta_{Term} \times R_{Term,t} + \beta_{Default} \times R_{Default,t} + \epsilon_{i,t}, \quad (4.2)$$

where $HML_{i,t}$ refers to equal-weighted or value-weighted return spread in month t between high and low yield bond funds sorted on the basis of the SEC yield or 12-month distribution yield.

Table [7](#) shows the results. Since the SEC yield and distribution yield generate similar results, we focus our discussion on the results in Panel A using the SEC yield. Columns 1 and 2 report

the univariate regression results, which indicate that high yield bond funds tend to have smaller exposures to the Vanguard bond market than their low yield peers. This result may appear initially surprising, but we shall note that the Vanguard bond market index fund has a large tilt toward investment-grade bonds such as Treasury bonds. Figure 3 shows that high yield bond funds tend to tumble during crisis periods, when risky assets suffer whereas Treasury bonds tend to be safe haven. The smaller exposure to the aggregate bond market of high yield bond funds is consistent with this observation. Indeed, when we augment the regression equation with the stock market return in columns 3 and 4, we find that high yield bond funds tend to have a larger stock market beta, with a magnitude between 0.35 and 0.37. In columns 5 and 6 where we include bond market return together with the interest-rate and default risk factors, we find that high yield bond funds have larger loadings on interest-rate and default risk factors, with magnitudes close to one. The three bond market risk factors explain more than 80% of the variation in the return spread between high and low yield bond funds. In Columns 7 and 8, we include all the risk factors. The results show that high yield bond funds look less like safe-haven assets, but more like high-duration, low-quality bonds and more like equities. The higher average returns on high yield bonds (3.31% per year on an equal-weighted basis and 3.06% on an value-weighted basis) dissipate to below 1%, economically small and statistically insignificant.

In Table 8, we report the results based on the style-adjusted yield, which show a similar pattern. In the Appendix, we consider non-traded risk factors, using the change in the spread between 10-year and 1-year Treasury yields to capture the interest-rate risk, the change in the spread between Moody’s seasoned Baa corporate bond yield and 10-year Treasury yield to capture the credit risk, and change in the CBOE volatility index (VIX) to capture bond market liquidity risk. The results, as reported in Tables A.2 and A.3, show that high yield bond funds are more risky along these dimensions than their low yield peers. In a nutshell, the results in this subsection support the notion that the higher average returns on high yield bond funds represent compensation for the higher risk taken by these funds.

4.3 High Risk of High Yield Bond Funds: Evidence from Asset Allocations

To study the behavior of bond funds more closely, in this subsection we examine the asset allocation decision of bond funds in relation to fund yield. We first study the unconditional relation between fund yield and the allocation of fund assets across bonds with different credit rating. Then we look at how the relation varies with the interest rate, building upon the observation in a low interesting rate environment, bond fund investors tend to have a stronger tendency to chase high yield bond funds. We are especially interested in bond funds' allocation to BBB-rated bonds, which have the highest yield within the investment grade bonds. In comparison, BB-rated bonds have higher yields, but they belong to non-investment grade bonds. For bond funds seeking to enhance the fund yield without allocating excessively to non-investment grade bonds, BBB-rated funds have a special appeal.

Table 9 shows the results, with Panels A and B focusing on the SEC yield and 12-month distribution yield, respectively. Because the results are similar, our discuss centers on the SEC yield. Column (1) shows that a 1% increase in the SEC yield is associated with a decline in allocation of fund assets to bonds rated above BBB by 4.30%. In contrast, Column (3) shows that a 1% increase in the SEC yield is associated with an increase in allocation of fund assets to BBB-rated bonds by 2.04%. It is also associated with an increase in BB-rated bonds, but the increase is much weaker, only 0.42% shown in Column (5). Finally, Column (7) shows that a 1% increase in the SEC yield is associated with an increase in allocation of fund assets to bonds rated below BB by 2.15%.⁸ These results show that high yield bond funds tend to have higher allocations to bonds with higher credit risk, which is consistent with the results based on the factor loadings of bond fund returns. Interestingly, we find that BBB-rated bonds play a particularly important role in driving the holdings of high yield bond funds. This result resonates with the findings of [Becker and Ivashina \(2015\)](#) in the context of insurance companies.

In Section 3.3, we show that the interest rate is an important state variable that drives the variation in the strength of investor preferences for bond funds with higher yield. Since the preference of bond fund investors shapes the incentive environment of bond fund managers, it is reasonable to

⁸There is a residual bond category, namely unrated bonds, held by bond funds. Because their magnitude is small, we do not include them in the analysis.

conjecture that bond fund managers have stronger incentives to tilt their portfolios toward higher-yielding bonds when their clients have stronger desires to buy higher-yielding funds in a low-rate environment. To examine this idea, we interact bond fund yield with the level of interest rate and estimate its relation to bond fund asset allocations. The results of Table 9 show that when interest rate goes down by 1%, a 1% increase in the SEC yield is associated with a further decline of allocations to bonds rated above BBB by 1.15% (Column (2)), a further increase of allocations to BBB-rated bonds by 0.66% (Column (4)) and to bonds rated below BB by 0.54% (Column (8)). These results provide further support to the idea that a bond fund’s yield reveals its risk taking, particularly when interest rate is low.

4.4 Investor Behavior During Crisis Periods

An interesting feature in Figure 3 is that the sharp decline in the performance of high yield bond funds during the crisis periods is associated with a large and swift rebound. This pattern suggests that to enjoy the higher average returns on a high yield bond fund, an investor needs to withstand the loss during financial panics and remain invested in the fund. The question is: how do investors behave during the crisis episodes?

To address it, we construct an indicator variable *Crisis* that represents the start of financial panics in our sample period; it equals to one for August 1998 and September 2008 and zero otherwise. We interact this variable with mutual fund yield in the preceding month and examine whether the behavior of reaching for yield changes during the crisis episodes, using the following regression:

$$Flow_{i,t+1} = \alpha + \beta_0 \times Yield_{i,t} + \beta_1 \times Yield_{i,t} \times Crisis + \gamma \times Return_{i,t} + \lambda \times Controls_{i,t} + \epsilon_{i,t+1}. \quad (4.3)$$

The results, as reported in Table 10, show that when crisis hits the financial market, investors tend to stampede away from high yield bond funds, instead of reaching for yield. For instance, Column 1 indicates that the slope coefficient for the interaction terms is -0.43, which is almost four times the magnitude of the slope coefficient for the SEC yield variable, 0.11. Using the 12-month distribution yield and style-adjusted yields generates even stronger results. These results show that

investors in high yield bond funds appear to panic and withdraw money from the funds, when they are hit hard by the crisis. This behavior has unfortunate implications for investor wealth: they would miss the subsequent recovery in high yield bond fund returns, unless they swiftly reinvest in the funds, which is not very likely. Therefore, for many investors reaching for high yield bond funds, they would not be able to enjoy the higher average return on these bond funds, which is only less than one half of the higher quoted yield.

5 Selling in Panic: The Covid-19 Crisis

The Covid-19 global pandemic provides an interesting natural experiment for us to understand the performance and investor flows of high yield bond funds. First, it is out of sample, taking place after we have finished our main empirical tests for the period from 1993 to 2019. Second, it is exogenous to the financial system, which helps us to understand the vulnerability of high yield bond funds. Third, we have both fund returns and flows at the daily frequency, which allow us to look at the dynamics more closely. A number of studies, such as [Pástor and Vorsatz \(2020\)](#) and [Falato, Goldstein, and Hortaçsu \(2020\)](#), examine the pattern of mutual fund flows during the Covid-19 pandemic. Our analysis complements these studies by examining the heterogeneity in returns and flows among bond funds based on a simple but important fund attribute, the fund yield.

We sort bond funds into ten deciles based on the reported SEC yield or the 12-month distribution yield at the end of 2019. To examine the performance, we compute the difference in daily returns between high yield bond funds in decile 10 and their low yield peers in decile 1. [Figure 4](#) shows the cumulative (sum of) daily returns on the high-minus-low portfolio from January 2020 to July 2020. It indicates that high and low yield bond funds have similar performance in January and most of the days in February. Starting from late February, however, amid increased cases of coronavirus in Europe and its reported presence in the US, the performance of high yield bond fund starts to deteriorate and plummet in the first three weeks in March. In response to the turmoil brought about by the pandemic, the Federal Reserve takes unprecedented actions to stabilize the financial market. An important turning point is March 23, 2020 when the Fed launched a bundle of new credit

facilities to mitigate market distress: the Primary Market Corporate Credit Facility (PMCCF), the Secondary Market Corporate Credit Facility (SMCCF), and the Term Asset- Backed Securities Loan Facility (TALF). The performance of high yield bond funds starts to rebound following these extraordinary monetary policy actions.

Turning to flows, Figure 5 shows the cumulative (sum of) daily dollar flows of high yield bond funds over the same period. It indicates that high yield bond funds start 2020 with net inflows in January, which peak around mid February. Subsequently, investors start to withdraw money, which leads to net outflows on a cumulative basis at the beginning of March. Investor redemptions then accelerate, reaching close to \$29 billion on March 25, 2020 in the case of high SEC yield funds and more than \$35 billion in the case of high distribution yield funds. When the financial panic abates, flows turn into positive. Around the middle of April, net cumulative flows become positive, followed by the renewed interest in reaching for yield.

This narrative of the performance and investor flows of high yield bond funds during the Covid-19 crisis reinforces the thesis that high yield bond funds are inherently more risky, and investors tend to sell these funds in panic when the crisis hits them.

6 Conclusions

We study the role of mutual fund yield in driving investor flows and performance of bond funds. Using the SEC yield and 12-month distribution yield, we find that investors tend to chase bond funds with higher yields, after controlling for total fund returns and fund rating. Although bond funds with higher yields achieve higher average total returns, the return spread is less than one half of the yield spread, and is attributable to higher fund risk. We also show that high yield bond funds suffer sharp losses during episodes of the LTCM turmoil and Lehman Brother bankruptcy, which trigger large outflows.

Finally, we use the Covid-19 crisis as an out-of-sample, natural experiment to study the performance and flows of high yield bond funds during market stress. We find evidence that high yield bond funds are hit hard by this shock exogenous to the financial system; the tumbling fund performance is associated with investor panic and heavy redemptions. These results indicate that

many investors in high yield bond funds may not fully understand the inherent but hidden risks of the funds; by fleeing away and missing the subsequent recovery, they may not capture the higher average returns.

The strong investor reaction to mutual fund yield implies a strong incentive for bond fund managers to boost their quoted yield. In our study of the asset allocation decision of bond funds, we find evidence that bond fund managers respond to their incentives by allocating more fund assets to lower-rated, higher yielding bonds, especially when interest rate is low. But much more can be done using detailed information on bond fund holdings. The literature has provided scattered evidence on the behavior of fund bond managers, emphasizing various aspects of bond fund holdings. For instance, bond funds may achieve a higher yield by investing in riskier corporate bonds with higher yields ([Choi and Kronlund, 2018](#)), by writing CDS contracts ([Jiang, Ou, and Zhu, 2020](#)), or by investing in unrated corporate bonds ([Chen, Cohen, and Gurun, 2020](#)). It would be interesting to provide a systematic analysis of the reaction of bond fund managers to their incentives.

References

- Becker, Bo, and Victoria Ivashina, 2015, Reaching for yield in the bond market, *The Journal of Finance* 70, 1863–1902.
- Ben-David, Itzhak, Jiacui Li, Andrea Rossi, and Yang Song, 2021, Ratings-driven demand and systematic price fluctuations, *The Review of Financial Studies*.
- Brown, Keith C, W Van Harlow, and Laura T Starks, 1996, Of tournaments and temptations: An analysis of managerial incentives in the mutual fund industry, *The Journal of Finance* 51, 85–110.
- Campbell, John Y, and Roman Sigalov, 2020, Portfolio choice with sustainable spending: A model of reaching for yield, *The Journal of Financial Economics* forthcoming.
- Chen, Huaizhi, Lauren Cohen, and Umit Gurun, 2020, Don’t take their word for it: The misclassification of bond mutual funds, *The Journal of Finance* forthcoming.
- Chevalier, Judith, and Glenn Ellison, 1997, Risk taking by mutual funds as a response to incentives, *Journal of Political Economy* 105, 1167–1200.
- Choi, Jaewon, and Mathias Kronlund, 2018, Reaching for yield in corporate bond mutual funds, *The Review of Financial Studies* 31, 1930–1965.
- Christoffersen, Susan EK, David K Musto, and Russ Wermers, 2014, Investor flows to asset managers: Causes and consequences, *Annual Review of Financial Economics* 6, 289–310.
- Cornell, Bradford, and Kevin Green, 1991, The investment performance of low-grade bond funds, *The Journal of Finance* 46, 29–48.
- Coval, Joshua, and Erik Stafford, 2007, Asset fire sales (and purchases) in equity markets, *Journal of Financial Economics* 86, 479–512.
- Daniel, Kent, Lorenzo Garlappi, and Kairong Xiao, 2020, Monetary policy and reaching for income, *The Journal of Finance* forthcoming.
- Di Maggio, Marco, and Marcin Kacperczyk, 2017, The unintended consequences of the zero lower bound policy, *Journal of Financial Economics* 123, 59–80.
- Falato, Antonio, Itay Goldstein, and Ali Hortaçsu, 2020, Financial fragility in the covid-19 crisis: The case of investment funds in corporate bond markets, Discussion paper, National Bureau of Economic Research.
- Fama, Eugene F, and Kenneth R French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3–56.
- Frazzini, Andrea, and Owen A Lamont, 2008, Dumb money: Mutual fund flows and the cross-section of stock returns, *Journal of financial economics* 88, 299–322.
- Friend, Irwin, Randolph Westerfield, and Michael Granito, 1978, New evidence on the capital asset pricing model, *The Journal of Finance* 33, 903–917.
- Gabaix, Xavier, and Ralph SJ Koijen, 2021, In search of the origins of financial fluctuations: The inelastic markets hypothesis, Discussion paper, National Bureau of Economic Research.
- Goldstein, Itay, Hao Jiang, and David T Ng, 2017, Investor flows and fragility in corporate bond funds, *Journal of Financial Economics* 126, 592–613.
- Hanson, Samuel G, and Jeremy C Stein, 2015, Monetary policy and long-term real rates, *Journal of Financial Economics* 115, 429–448.

- Hartzmark, Samuel M, and David H Solomon, 2019, The dividend disconnect, *The Journal of Finance* 74, 2153–2199.
- Huang, Jennifer, Kelsey D Wei, and Hong Yan, 2007, Participation costs and the sensitivity of fund flows to past performance, *The Journal of Finance* 62, 1273–1311.
- Ippolito, Richard A, 1992, Consumer reaction to measures of poor quality: Evidence from the mutual fund industry, *The Journal of Law and Economics* 35, 45–70.
- Jiang, Hao, and Zheng Sun, 2020, Reaching for dividends, *Journal of Monetary Economics* 115, 321–338.
- Jiang, Wei, Jitao Ou, and Zhongyan Zhu, 2020, Mutual fund holdings of credit default swaps: Liquidity, yield, and risk taking, *The Journal of Finance* forthcoming.
- Lian, Chen, Yueran Ma, and Carmen Wang, 2019, Low interest rates and risk-taking: Evidence from individual investment decisions, *The Review of Financial Studies* 32, 2107–2148.
- Lu, Lina, Matt Pritsker, Andrei Zlate, Kenekchukwu Anadu, and James Bohn, 2019, Reach for yield by us public pension funds, *FRB Boston Risk and Policy Analysis Unit Paper No. RPA* pp. 19–29.
- Lynch, Anthony W, and David K Musto, 2003, How investors interpret past fund returns, *The Journal of Finance* 58, 2033–2058.
- Mullainathan, Sendhil, Joshua Schwartzstein, and Andrei Shleifer, 2008, Coarse thinking and persuasion, *The Quarterly Journal of Economics* 123, 577–619.
- Pástor, L’uboš, and M Blair Vorsatz, 2020, Mutual fund performance and flows during the covid-19 crisis, *The Review of Asset Pricing Studies* 10, 791–833.
- Rajan, Raghuram G, 2006, Has finance made the world riskier?, *European Financial Management* 12, 499–533.
- Sirri, Erik R, and Peter Tufano, 1998, Costly search and mutual fund flows, *The Journal of Finance* 53, 1589–1622.
- Stein, Jeremy C, 2013, Overheating in credit markets: origins, measurement, and policy responses, in *Speech given to the symposium on Restoring Household Financial Stability After the Great Recession, Federal Reserve Bank of St. Louis, St. Louis, Missouri, February* vol. 7.
- Vayanos, Dimitri, and Paul Woolley, 2013, An institutional theory of momentum and reversal, *Review of Financial Studies* 26, 1087–1145.

Figure 1: **Growth of Bond Funds**

This figure reports the growth of bond funds from January 1993 to December 2019. The left panel shows the total assets under management in \$billion and interest rate (10-year Treasury yield) over time. The right panel shows the number of bond funds (at the unit of share classes). Our sample excludes municipal bond funds and money market funds.



Figure 2: **Major Bond Fund Styles based on Morningstar Categories**

This figure shows the proportional distribution of bond fund styles based on their assets under management at the end of 2019. To classify bond funds, we use the Morningstar category classifications. Our sample excludes municipal bond funds and money market funds.

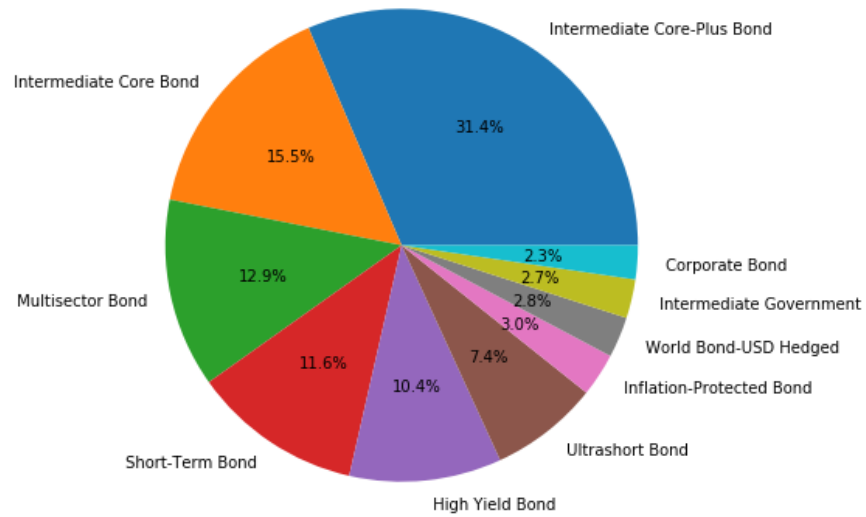


Figure 3: **Performance Difference between Bond Funds with High and Low Yields**

This figure shows the difference in monthly returns between bond funds with high and low yields during 1993-2019. At the end of each December from 1992 to 2018, we group bond funds into decile portfolios based on their fund yield. High (low) yield funds refer to those in decile 10 (1). The top (bottom) two panels show equal-weighted (value-weighted) bond fund portfolio returns. The left (right) two panels group bond funds based the SEC (12-month dividend) yield.

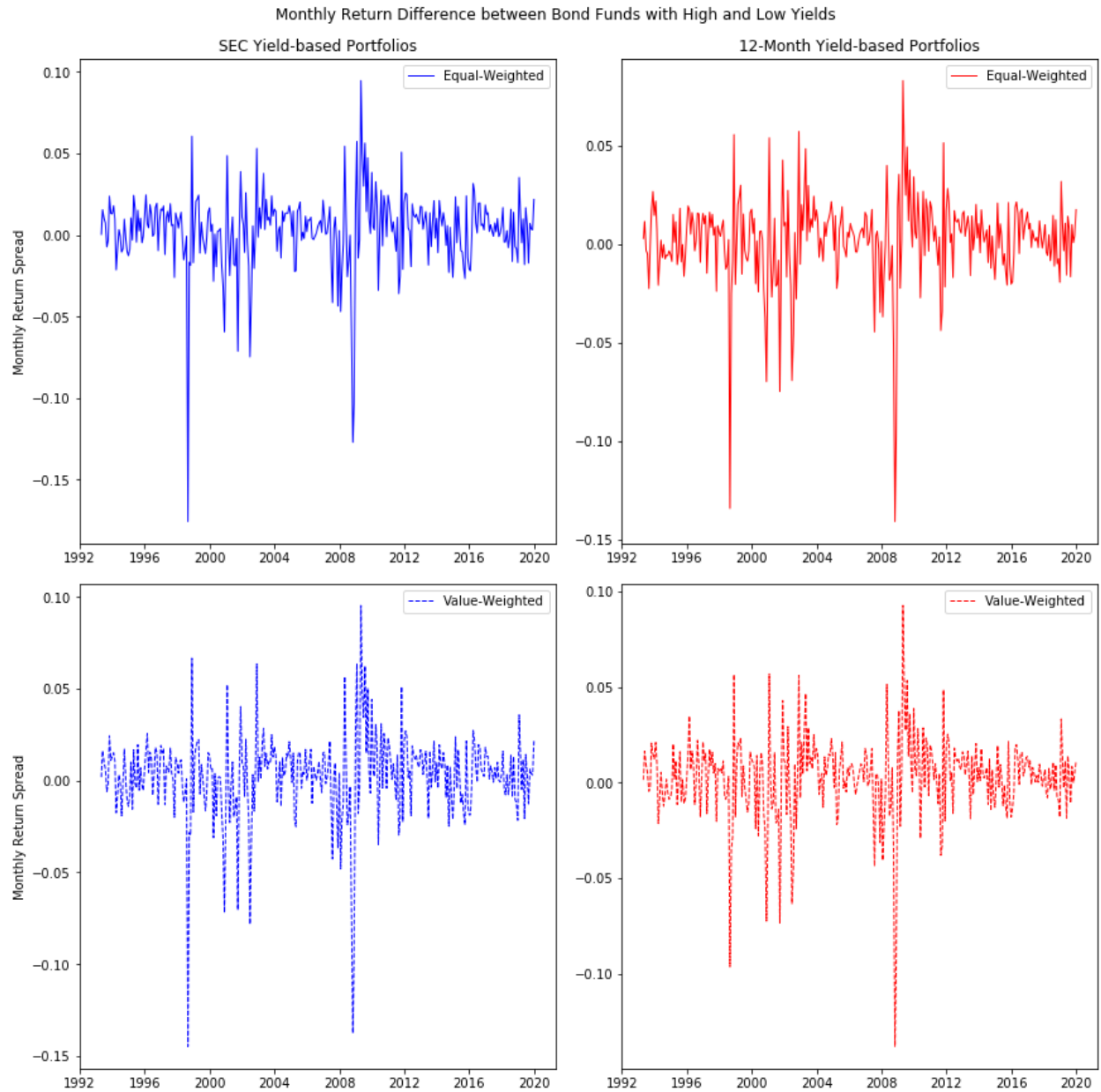


Figure 4: Daily Performance Gap between High- and Low-Yield Bond Funds during the Covid-19 Pandemic

This figure shows the cumulative daily return difference between high- and low-yield bond funds during the Covid-19 pandemic. At the end of 2019, we sort bond funds into ten deciles based on their yield. We compute the daily return difference between funds in deciles 10 and 1, and plot the sum of the daily return gap through time in 2020. The top (bottom) two panels show equal-weighted (value-weighted) bond fund portfolio returns. The left (right) two panels group bond funds based the SEC (12-month dividend) yield.



Figure 5: **Cumulative Dollar Flows of High-Yield Bond Funds during the Covid Pandemic**

This figure shows the cumulative dollar flows of high-yield bond funds during the Covid-19 pandemic. At the end of 2019, we sort bond funds into ten deciles based on their yield. We compute the daily dollar flows of funds in deciles 10, and plot the sum of the flows through time in 2020. The left (right) panel shows the results based the SEC (12-month dividend) yield.

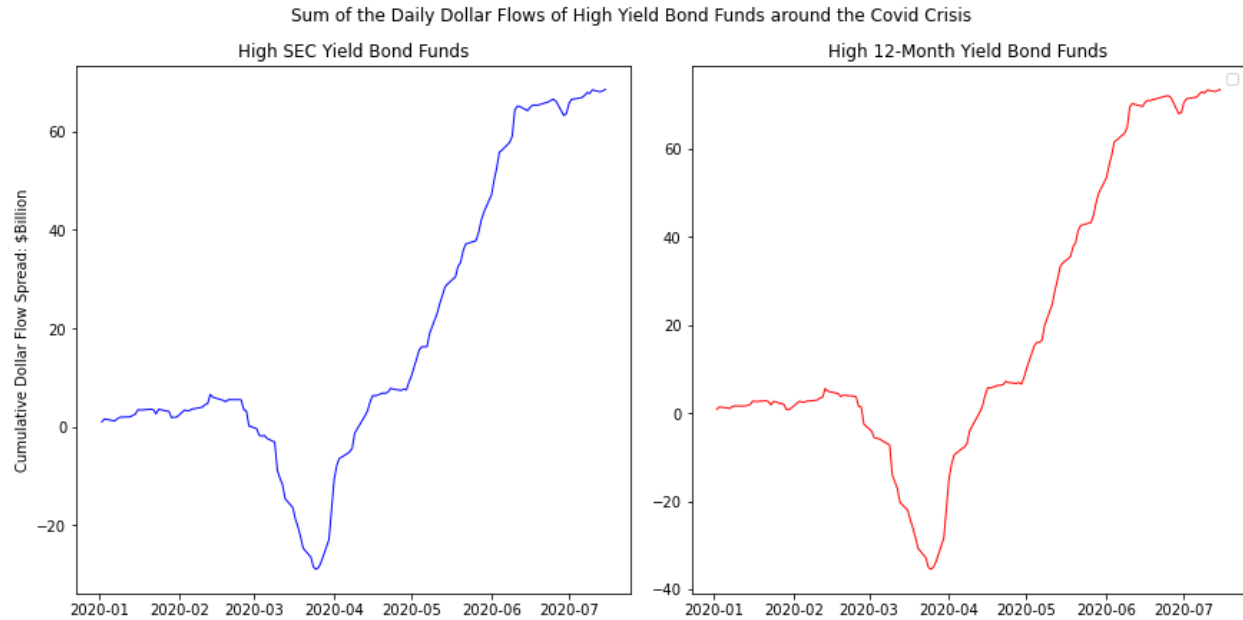


Table 1: Summary Statistics

This table shows the summary statistics of bond fund characteristics. The fund characteristics include monthly proportional fund flows, monthly fund returns, the SEC yield, 12-month dividend yield, Morningstar rating (from 1 to 5 with higher rating indicating stronger funds rated by Morningstar), total net assets (TNA), fund age (the number of years since the fund inception), expense ratio, and rear-end loads. Except for fund rating, TNA and Age, other variables are in per cent. Our sample covers 3,857 unique bond funds at the unit of share classes from January 1993 to December 2019. Municipal bond funds and money market funds are excluded.

	N	Mean	Std Dev	P25	P50	P75	Skewness	Kurtosis
Flow	442,904	0.75	7.74	-1.75	-0.14	1.80	2.52	14.14
Return	443,124	0.36	1.58	-0.19	0.33	1.01	-1.80	38.41
SEC Yield	343,621	3.58	2.24	1.92	3.21	4.95	1.07	2.32
12M Yield	443,112	4.14	2.49	2.41	3.83	5.49	2.45	27.82
MS Rating	443,175	2.62	1.42	2	3	4	-0.36	-0.57
TNA	443,175	550.37	2814.86	14.22	72.64	308.91	28.22	1264.86
log(TNA)	443,175	4.11	2.36	2.65	4.29	5.73	-0.50	0.78
Age	443,175	10.58	7.64	4.83	8.75	14.58	1.45	3.12
log(Age)	443,161	2.09	0.77	1.58	2.17	2.68	-0.33	-0.45
Expense	443,055	0.98	0.46	0.65	0.89	1.25	0.66	-0.15
Rear Load	443,175	0.26	0.44	0	0	1	1.07	-0.86

Table 2: Bond Fund Yield Driving Investor Flows

This table shows the results for the relation between investor flows and bond fund yield. The dependent variable is monthly proportional bond fund flows, and the explanatory variables are lagged by one month. The Yield Spread is the difference between the 12-month yield and the SEC yield. The Excess SEC (12-month) Yield is the difference between a bond fund's SEC (12-month) yield and the average SEC (12-month) yield of the fund's peers as grouped by the Morningstar category classifications. 12-Month Return is the sum of monthly returns in the past 12 months. Other variables are defined in Table 1. Columns 1–6 include style fixed effects and time fixed effects; Column 7–9 include style \times time fixed effects. Standard errors are clustered by fund. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	Yield			Style Adjusted Yield			Yield		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SEC Yield	0.110*** (6.44)		0.136*** (6.72)				0.0900*** (4.54)		0.117*** (4.84)
12-Month Yield		0.0616*** (2.84)						0.0500** (2.06)	
Yield Spread			0.0462** (2.45)						0.0462** (2.03)
Excess SEC Yield				0.0685*** (3.47)		0.0934*** (4.09)			
Excess 12-Month Yield					0.0369* (1.76)				
Excess Yield Spread						0.0441** (2.20)			
12-Month Return	0.0819*** (16.24)	0.0735*** (16.57)	0.0818*** (16.37)	0.0787*** (15.70)	0.0723*** (16.17)	0.0786*** (15.78)	0.168*** (13.12)	0.145*** (12.35)	0.168*** (13.35)
Rating Scale	0.00363*** (18.35)	0.00405*** (21.46)	0.00360*** (18.17)	0.00369*** (18.60)	0.00408*** (21.65)	0.00366*** (18.43)	0.00325*** (15.99)	0.00370*** (19.17)	0.00321*** (15.83)
Past Flow	0.202*** (31.59)	0.198*** (29.11)	0.202*** (31.58)	0.202*** (31.61)	0.198*** (29.11)	0.202*** (31.61)	0.187*** (29.84)	0.184*** (27.58)	0.187*** (29.84)
Log(Total Net Assets)	-0.00176*** (-13.51)	-0.00180*** (-15.03)	-0.00176*** (-13.50)	-0.00175*** (-13.43)	-0.00179*** (-14.99)	-0.00175*** (-13.40)	-0.00178*** (-13.41)	-0.00182*** (-15.01)	-0.00178*** (-13.40)
Log(Age)	-0.0115*** (-29.22)	-0.0114*** (-30.10)	-0.0115*** (-29.27)	-0.0116*** (-29.37)	-0.0114*** (-30.13)	-0.0116*** (-29.44)	-0.0116*** (-29.42)	-0.0115*** (-30.39)	-0.0117*** (-29.48)
Expense Ratio	-0.877*** (-14.09)	-0.777*** (-13.08)	-0.864*** (-13.89)	-0.893*** (-14.24)	-0.788*** (-13.24)	-0.878*** (-14.03)	-0.867*** (-13.81)	-0.782*** (-13.01)	-0.853*** (-13.61)
Rear Load	-0.000595 (-1.02)	-0.00143** (-2.51)	-0.000587 (-1.01)	-0.000648 (-1.12)	-0.00144** (-2.56)	-0.000639 (-1.10)	-0.000604 (-1.03)	-0.00139** (-2.41)	-0.000590 (-1.00)
Style FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Style \times Month FE							Y	Y	Y
Observations	304,453	387,380	304,447	304,453	387,380	304,447	304,250	387,212	304,244
Adj. R-squared	0.0930	0.0891	0.0931	0.0928	0.0890	0.0929	0.117	0.113	0.117

Table 3: Bond Fund Yield and Investor Flows: Retail versus Institutional Investors

This table shows the results for the relation between investor flows and bond fund yield, separately for retail and institutional investors. The dependent and independent variables follow the definitions in Table 2. Columns 1–3 use retail share classes; Columns 4–6 institutional. All the specifications have style fixed effects and time fixed effects. Standard errors are clustered by fund. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	Retail Investors			Institutional Investors		
	(1)	(2)	(3)	(4)	(5)	(6)
SEC Yield	0.109*** (5.39)		0.139*** (5.72)	0.118*** (4.05)		0.130*** (3.63)
12-Month Yield		0.103*** (4.21)			-0.00880 (-0.36)	
Yield Spread			0.0537** (2.17)			0.0199 (0.69)
12-Month Return	0.0901*** (15.54)	0.0845*** (16.03)	0.0902*** (15.82)	0.0709*** (7.54)	0.0577*** (7.29)	0.0706*** (7.53)
Rating Scale	0.00383*** (15.66)	0.00417*** (17.55)	0.00379*** (15.52)	0.00381*** (11.40)	0.00443*** (14.30)	0.00379*** (11.31)
Net Flow	0.220*** (24.72)	0.210*** (20.68)	0.219*** (24.71)	0.174*** (19.52)	0.175*** (21.33)	0.174*** (19.52)
Log(Total Net Assets)	-0.00136*** (-8.16)	-0.00145*** (-9.17)	-0.00136*** (-8.17)	-0.00251*** (-11.48)	-0.00253*** (-12.69)	-0.00251*** (-11.48)
Log(Age)	-0.0111*** (-25.29)	-0.0111*** (-25.60)	-0.0111*** (-25.35)	-0.0132*** (-18.75)	-0.0135*** (-20.07)	-0.0132*** (-18.74)
Expense Ratio	-0.871*** (-12.05)	-0.779*** (-10.92)	-0.858*** (-11.90)	-1.211*** (-7.98)	-1.102*** (-7.89)	-1.202*** (-7.90)
Rear Load	-0.000747 (-1.14)	-0.00178*** (-2.69)	-0.000706 (-1.07)	-0.00160 (-1.28)	-0.000705 (-0.61)	-0.00163 (-1.30)
Style FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
Observations	202,124	258,792	202,120	102,329	128,588	102,327
Adj. R-squared	0.111	0.105	0.111	0.0706	0.0684	0.0706

Table 4: Low Interest Rate and Investor Preference for Bond Fund Yield

This table shows how the interest rate shapes the relation between investor flows and bond fund yield. The dependent and independent variables follow the definitions in Table 2. Columns 1–3 report the results for the low interest rate period when the 10-year Treasury yield falls below the 20th percentile; Columns 4–6 for the high interest rate period when the 10-year Treasury yield rises above the 80th percentile. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	Low Interest Rate period			High Interest Rate period		
	(1)	(2)	(3)	(4)	(5)	(6)
SEC Yield	0.196*** (6.50)		0.223*** (6.07)	0.0780 (1.58)		0.141* (1.75)
12-Month Yield		0.117*** (2.65)			0.0756 (1.16)	
Yield Spread			0.0501 (1.32)			0.106 (1.35)
12-Month Return	0.110*** (10.99)	0.105*** (11.04)	0.109*** (10.91)	0.0350 (1.09)	0.0504* (1.96)	0.0353 (1.13)
Rating Scale	0.00346*** (12.84)	0.00363*** (13.14)	0.00340*** (12.47)	0.00148* (1.93)	0.00156** (2.22)	0.00153*** (1.97)
Past Flow	0.184*** (21.67)	0.173*** (19.25)	0.184*** (21.66)	0.105*** (3.33)	0.0967*** (3.60)	0.105*** (3.33)
Log(Total Net Assets)	-0.00200*** (-11.50)	-0.00195*** (-11.62)	-0.00201*** (-11.52)	-0.00119* (-1.85)	-0.00172*** (-2.79)	-0.00125* (-1.93)
Log(Age)	-0.0113*** (-22.95)	-0.0115*** (-24.07)	-0.0113*** (-22.92)	-0.00887*** (-6.64)	-0.00798*** (-6.44)	-0.00912*** (-6.73)
Expense Ratio	-0.987*** (-11.11)	-0.897*** (-9.81)	-0.972*** (-10.92)	-0.758*** (-3.58)	-0.779*** (-3.75)	-0.797*** (-3.81)
Rear Load	0.000910 (1.11)	0.000113 (0.14)	0.000893 (1.09)	-0.00268 (-1.20)	-0.00318 (-1.48)	-0.00248 (-1.12)
Style FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
Observations	125,825	141,591	125,822	8,578	11,813	8,578
Adj. R-squared	0.0807	0.0731	0.0807	0.0696	0.0642	0.0702

Table 5: Bond Fund Yield and Future Fund Performance

This table reports the average yield and returns on portfolios of bond funds formed on the basis of the SEC yield and 12-month yield, respectively. At each quarter end from 1993Q1 to 2019Q3, we form 10 portfolios of bond funds based on their SEC yield or 12-month yield. We report the average yield and the average equal- and value-weighted returns for each bond fund portfolio. The high–Low refers to the difference in yields or returns between deciles 10 and 1. The monthly return series ranges from April 1993 to December 2019. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Fund Portfolios based on the SEC Yield											
	Low	2	3	4	5	6	7	8	9	High	High–Low
Ave. Yield	1.92	2.90	3.34	3.70	4.03	4.40	4.88	5.63	6.77	8.32	6.40*** (31.98)
Ave. EW Returns	3.31	3.75	4.15	4.44	4.67	4.98	5.38	5.77	6.62	6.62	3.31** (2.10)
Ave. VW Returns	3.30	4.05	4.29	4.82	5.01	5.24	5.46	6.12	6.60	6.36	3.06* (1.95)
Panel B: Fund Portfolios based on the 12-Month Yield											
	Low	2	3	4	5	6	7	8	9	High	High–Low
Ave. Yield	2.35	3.29	3.71	4.05	4.38	4.76	5.28	6.22	7.39	9.08	6.72*** (44.26)
Ave. EW Returns	3.80	3.74	3.99	4.39	4.60	5.04	5.26	5.74	6.22	6.29	2.50** (1.68)
Ave. VW Returns	3.51	3.82	4.26	4.71	4.85	5.37	5.22	5.56	6.50	6.56	3.06** (2.11)

Table 6: Style-Adjusted Bond Fund Yield and Future Performance

This table reports the average style-adjusted yield and returns on portfolios of bond funds formed on the basis of the SEC yield and 12-month yield, respectively. At each quarter end from 1993Q1 to 2019Q3, we form 10 portfolios of bond funds based on their peer-adjusted SEC yield or 12-month yield. We report the average yield and the average equal- and value-weighted returns for each bond fund portfolio. The high–Low refers to the difference in yields or returns between deciles 10 and 1. The monthly return series ranges from April 1993 to December 2019. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Fund Portfolios based on the SEC Yield											
	Low	2	3	4	5	6	7	8	9	High	High–Low
Ave. Yield	-2.08	-0.99	-0.60	-0.32	-0.09	0.13	0.35	0.61	0.97	1.95	4.03*** (26.17)
Ave. EW Returns	4.15	4.30	4.54	4.94	4.83	5.14	5.25	5.39	5.22	5.86	1.71** (2.60)
Ave.VW Returns	4.37	4.07	4.80	4.64	4.77	5.20	5.97	5.53	5.57	5.57	1.20** (2.21)
Panel B: Fund Portfolios based on the 12-Month Yield											
	Low	2	3	4	5	6	7	8	9	High	High–Low
Ave. Yield	-2.04	-1.03	-0.66	-0.39	-0.15	0.06	0.29	0.56	0.94	2.34	4.37*** (41.50)
Ave. EW Returns	4.47	4.28	4.62	4.76	4.74	5.05	5.33	5.37	5.11	5.33	0.86* (1.74)
Ave. VW Returns	3.96	4.49	4.45	4.89	4.97	5.51	5.59	5.60	5.30	5.43	1.47*** (3.28)

Table 7: Bond Fund Yield and Risk Exposures

This table reports the risk exposures of high-yield bond funds relative to their low-yield peers. Specifically, we run time-series regressions of the difference in equal- and value-weighted monthly returns between high- and low-yield bond funds (High-Low portfolio in Table 5) on proxies for asset market risks. R_{Bond} is the excess return on the Vanguard total bond market index fund return; R_{Term} the difference in returns between the Vanguard long-term Treasury index fund and short-term Federal fund; $R_{Default}$ the difference in returns between the Vanguard high-yield corporate bond fund and long-term Treasury index fund; R_{Stock} the excess return on the CRSP value-weighted portfolio. We report the regression coefficients and t -statistics. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: The Difference in Returns between Bond Funds with High and Low SEC Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	-0.218*	-0.230*	-0.194**	-0.206**	-0.283***	-0.438***	-0.296***	-0.443***
	(-1.69)	(-1.78)	(-2.01)	(-2.09)	(-2.68)	(-4.53)	(-2.84)	(-4.59)
R_{Term}					0.985***	1.088***	0.916***	1.057***
					(15.81)	(19.09)	(14.20)	(17.66)
$R_{Default}$					1.039***	1.076***	0.955***	1.038***
					(32.95)	(37.29)	(24.15)	(28.29)
R_{Stock}			0.370***	0.356***			0.0613***	0.0275
			(16.13)	(15.11)			(3.39)	(1.64)
Intercept	0.00325**	0.00306**	0.000681	0.000593	0.00104*	0.000884	0.000806	0.000781
	(2.42)	(2.29)	(0.68)	(0.57)	(1.76)	(1.64)	(1.38)	(1.45)
Observations	321	321	321	321	321	321	321	321
Adjusted R-squared	0.009	0.010	0.455	0.424	0.813	0.843	0.820	0.844

Panel B: The Difference in Returns between Bond Funds with High and Low 12-Month Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	-0.227*	-0.230*	-0.204**	-0.207**	-0.348***	-0.441***	-0.362***	-0.448***
	(-1.86)	(-1.93)	(-2.30)	(-2.32)	(-3.78)	(-5.15)	(-4.03)	(-5.27)
R_{Term}					0.982***	1.018***	0.906***	0.978***
					(18.09)	(20.20)	(16.30)	(18.57)
$R_{Default}$					1.006***	0.998***	0.914***	0.950***
					(36.62)	(39.11)	(26.81)	(29.40)
R_{Stock}			0.359***	0.334***			0.0673***	0.0356**
			(17.00)	(15.72)			(4.32)	(2.41)
Intercept	0.00259**	0.00306**	9.48e-05	0.000740	0.000492	0.00105**	0.000240	0.000922*
	(2.04)	(2.49)	(0.10)	(0.79)	(0.96)	(2.22)	(0.48)	(1.94)
Observations	321	321	321	321	321	321	321	321
Adjusted R-squared	0.011	0.012	0.482	0.444	0.841	0.855	0.850	0.857

Table 8: Style-Adjusted Bond Fund Yield and Risk Exposures

This table reports the risk exposures of high style-adjusted yield bond funds relative to their low-yield peers. Specifically, we run time-series regressions of the difference in equal- and value-weighted monthly returns between high and low style-adjusted yield bond funds (High–Low portfolio in Table 6) on proxies for asset market risks. R_{Bond} is the excess return on the Vanguard total bond market index fund return; R_{Term} the difference in returns between the Vanguard long-term Treasury index fund and short-term Federal fund; $R_{Default}$ the difference in returns between the Vanguard high-yield corporate bond fund and long-term Treasury index fund; R_{Stock} the excess return on the CRSP value-weighted portfolio. We report the regression coefficients and t -statistics. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: The Difference in Returns between Bond Funds with High and Low Style-Adjusted SEC Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
R_{Bond}	0.123** (2.28)	0.193*** (4.43)	0.132*** (3.02)	0.198*** (4.97)	0.115* (1.67)	0.101 (1.59)	0.107 (1.58)	0.102 (1.60)
R_{Term}					0.325*** (8.01)	0.279*** (7.44)	0.282*** (6.70)	0.284*** (7.18)
$R_{Default}$					0.350*** (17.03)	0.255*** (13.45)	0.298*** (11.53)	0.261*** (10.78)
R_{Stock}			0.135*** (12.96)	0.0758*** (7.99)			0.0384*** (3.26)	-0.00450 (-0.41)
Intercept	0.00115** (2.06)	0.000569 (1.26)	0.000214 (0.47)	4.33e-05 (0.10)	0.000394 (1.03)	8.87e-05 (0.25)	0.000250 (0.66)	0.000106 (0.30)
Observations	321	321	321	321	321	321	321	321
Adjusted R-squared	0.016	0.058	0.356	0.215	0.546	0.431	0.561	0.432

Panel B: The Difference in Returns between Bond Funds with High and Low Style-Adjusted 12-Month Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	0.0595 (1.46)	0.0893** (2.42)	0.0657* (1.92)	0.0913** (2.52)	-0.0350 (-0.68)	0.104* (1.71)	-0.0380 (-0.74)	0.112* (1.89)
R_{Term}					0.301*** (9.92)	0.135*** (3.78)	0.284*** (8.91)	0.180*** (4.90)
$R_{Default}$					0.278*** (18.11)	0.155*** (8.55)	0.257*** (13.17)	0.210*** (9.30)
R_{Stock}			0.0939*** (11.53)	0.0299*** (3.46)			0.0154* (1.73)	-0.0405*** (-3.94)
Intercept	0.000582 (1.39)	0.00103*** (2.70)	-6.89e-05 (-0.19)	0.000822** (2.17)	5.39e-05 (0.19)	0.000680** (2.02)	-3.85e-06 (-0.01)	0.000832** (2.51)
Observations	321	321	321	321	321	321	321	321
Adjusted R-squared	0.007	0.018	0.300	0.054	0.548	0.248	0.552	0.283

Table 9: Bond Fund Yield and Asset Allocation across Credit Ratings

This table reports the relation between a bond fund's yield and its allocation of fund assets to bonds with different credit ratings. In particular, bonds are classified into four groups: investment grade bonds with credit ratings above and of BBB, and non-investment grade bonds with ratings of and below BB. Panel A (B) shows the results using the SEC yield (12-month yield). Interest rate is measured by the 10-year treasury yield. Other independent variables follow the definitions in Table 2. All the variables, except Log(TNA) and Log(Age), are measured in percentages. We report the regression coefficients and t -statistics. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: The SEC Yield and Asset Allocation								
	Investment Grade: Above BBB		Investment Grade: BBB	Non-Investment Grade: BB		Non-Investment Grade: Below BB		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SEC Yield	-4.296*** (-9.31)	-7.834*** (-6.93)	2.041*** (6.69)	4.083*** (5.40)	0.420** (2.27)	0.396 (0.84)	2.146*** (9.40)	3.812*** (6.54)
SEC Yield×Interest Rate		1.148*** (4.18)		-0.662*** (-3.74)		0.00804 (0.08)		-0.540*** (-3.53)
12-Month Return	-0.510*** (-6.01)	-0.499*** (-5.96)	0.391*** (5.86)	0.385*** (5.87)	0.0812** (2.50)	0.0813** (2.51)	0.0683* (1.75)	0.0631 (1.61)
Rating Scale	-0.387 (-1.16)	-0.322 (-0.98)	0.0210 (0.08)	-0.0165 (-0.07)	-0.0395 (-0.30)	-0.0390 (-0.30)	0.197 (1.19)	0.166 (1.01)
Log(Total Net Assets)	0.765*** (2.96)	0.772*** (3.03)	-0.654*** (-3.35)	-0.658*** (-3.40)	-0.185** (-1.99)	-0.185** (-1.99)	-0.0601 (-0.51)	-0.0634 (-0.55)
Log(Age)	-0.706 (-0.83)	-0.738 (-0.87)	0.209 (0.31)	0.227 (0.34)	0.410 (1.35)	0.410 (1.35)	0.562 (1.37)	0.577 (1.41)
Expense Ratio	0.000216 (0.35)	0.000142 (0.24)	-0.000617 (-0.83)	-0.000574 (-0.78)	0.000220** (2.07)	0.000219** (2.04)	0.0000956 (0.39)	0.000130 (0.54)
Rear load	-3.135*** (-2.64)	-3.141*** (-2.64)	0.485 (0.64)	0.488 (0.64)	0.141 (0.22)	0.141 (0.22)	1.349 (1.43)	1.352 (1.44)
Intercept	71.49*** (25.19)	70.97*** (25.63)	9.018*** (4.35)	9.314*** (4.58)	8.074*** (7.11)	8.071*** (7.24)	4.305*** (3.52)	4.547*** (3.81)
Style×Month FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	27,242	27,242	27,242	27,242	27,242	27,242	27,242	27,242
Adj. R-squared	0.842	0.844	0.537	0.540	0.774	0.774	0.896	0.897

Panel B: The 12-Month Yield and Asset Allocation

	Investment Grade: Above BBB		Investment Grade: BBB		Non-Investment Grade: BB		Non-Investment Grade: Below BB	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
12-Month Yield	-2.636*** (-4.81)	-4.688*** (-4.39)	1.322*** (4.30)	2.741*** (3.95)	0.230** (2.04)	0.521* (1.90)	1.387*** (5.49)	1.585*** (3.25)
12-Month Yield×Interest Rate		0.653*** (2.67)		-0.452*** (-2.94)		-0.0923 (-1.22)		-0.0632 (-0.48)
12-Month Return	-0.424*** (-5.63)	-0.407*** (-5.53)	0.331*** (6.47)	0.320*** (6.44)	0.0655** (2.45)	0.0632** (2.39)	0.0584 (1.49)	0.0568 (1.46)
Rating Scale	-0.342 (-1.15)	-0.280 (-0.94)	-0.0154 (-0.07)	-0.0584 (-0.27)	-0.0378 (-0.31)	-0.0465 (-0.39)	0.165 (1.09)	0.159 (1.06)
Log(Total Net Assets)	0.625*** (2.64)	0.619*** (2.63)	-0.533*** (-3.14)	-0.529*** (-3.13)	-0.141 (-1.64)	-0.140 (-1.63)	-0.0384 (-0.36)	-0.0377 (-0.36)
Log(Age)	-0.329 (-0.41)	-0.350 (-0.44)	0.125 (0.20)	0.140 (0.23)	0.257 (0.91)	0.260 (0.92)	0.267 (0.70)	0.269 (0.70)
Expense Ratio	0.000992 (1.48)	0.000978 (1.48)	-0.00137* (-1.65)	-0.00136* (-1.65)	0.000219** (2.27)	0.000221** (2.33)	0.000208 (0.10)	0.000222 (0.11)
Rear Load	-2.971*** (-2.69)	-2.950*** (-2.67)	0.507 (0.71)	0.492 (0.69)	0.152 (0.26)	0.149 (0.26)	1.278 (1.52)	1.276 (1.52)
Intercept	67.42*** (22.51)	66.87*** (22.82)	9.608*** (4.71)	9.990*** (5.04)	8.585*** (8.93)	8.663*** (9.13)	7.165*** (5.39)	7.218*** (5.39)
Style × Month FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	34,218	34,218	34,218	34,218	34,218	34,218	34,218	34,218
Adj. R-squared	0.838	0.839	0.521	0.523	0.763	0.763	0.888	0.888

Table 10: Investor Flows During Crisis Episodes

This table shows the results for the relation between investor flows and bond fund yield during the crisis episodes. The crisis indicator variable is equal to one in August 1998 (LTCM meltdown) and September 2008 (Lehman Brothers bankruptcy) and zero otherwise. The dependent variable is monthly proportional bond fund flows, and the fund characteristics are lagged by one month. The Excess SEC (12-month) Yield is the difference between a bond fund's SEC (12-month) yield and the average SEC (12-month) yield of the fund's peers as grouped by the Morningstar category classifications. 12-Month Return is the sum of monthly returns in the past 12 months. Other variables are defined in Table 1. All the regressions include style fixed effects and time fixed effects. Standard errors are clustered by fund. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	Yield		Style-Adjusted Yield	
	(1)	(2)	(3)	(4)
SEC Yield	0.113*** (6.59)			
SEC Yield \times Crisis	-0.430*** (-3.66)			
12-Month Yield		0.0626*** (2.88)		
12-Month Yield \times Crisis		-0.728*** (-6.91)		
Excess SEC Yield			0.0707*** (3.57)	
Excess SEC Yield \times Crisis			-0.348** (-2.19)	
Excess 12-Month Yield				0.0382* (1.81)
Excess 12-Month Yield \times Crisis				-0.541*** (-4.01)
12-Month Return	0.0817*** (16.20)	0.0729*** (16.48)	0.0787*** (15.70)	0.0722*** (16.17)
MS Rating	0.00364*** (18.36)	0.00405*** (21.49)	0.00370*** (18.60)	0.00408*** (21.65)
Past Flow	0.202*** (31.59)	0.198*** (29.11)	0.202*** (31.61)	0.198*** (29.11)
Log(Total Net Assets)	-0.00176*** (-13.50)	-0.00180*** (-15.02)	-0.00175*** (-13.42)	-0.00179*** (-14.98)
Log(Age)	-0.0115*** (-29.21)	-0.0114*** (-30.09)	-0.0116*** (-29.37)	-0.0114*** (-30.12)
Expense Ratio	-0.876*** (-14.07)	-0.779*** (-13.11)	-0.892*** (-14.23)	-0.789*** (-13.27)
Rear Load	-0.000590 (-1.02)	-0.00143** (-2.51)	-0.000647 (-1.11)	-0.00145** (-2.57)
R-squared	0.094	0.090	0.094	0.090
Style FE	Y	Y	Y	Y
Month FE	Y	Y	Y	Y
Observations	304,453	387,380	304,453	387,380
Adj. R-squared	0.0931	0.0892	0.0928	0.0890

Appendix

Figure A.1: Performance Gap between Bond Funds with High and Low Style-Adjusted Yields

This figure shows the difference in monthly returns between bond funds with high and low style-adjusted yields during 1993-2019. We adjust a bond fund's yield by subtracting the average yield of a bond fund's peers, as defined by the Morningstar category classifications. At the end of each December from 1992 to 2018, we group bond funds into decile portfolios based on their adjusted fund yield. High (low) yield funds refer to those in decile 10 (1). The top (bottom) two panels show equal-weighted (value-weighted) bond fund portfolio returns. The left (right) two panels group bond funds based the adjusted SEC (12-month dividend) yield.

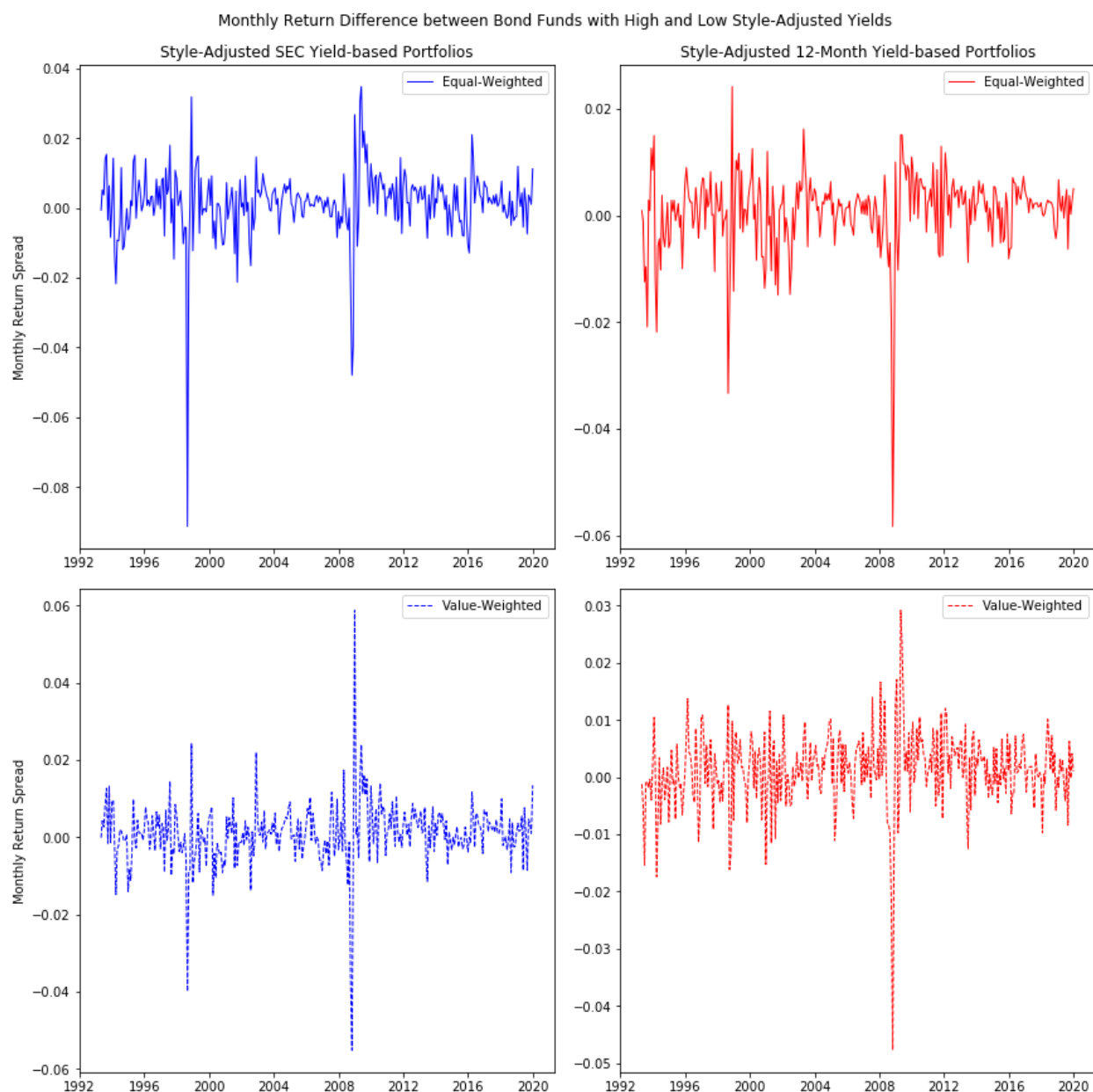


Table A.1: Bond Fund Yield Driving Investor Flows: Alternative Specifications

This table shows the results for the relation between investor flows and bond fund yield using alternative regression specifications. The dependent variable is monthly proportional bond fund flows, and the explanatory variables are lagged by one month. In Panel A, we include 12 monthly returns in the past year to allow for the possibility that investors might attach different importance to fund returns measured in different horizons. In Panel B, we include 12-month returns and an interaction term between 12-month returns and a negative return dummy to control for non-linear flow performance relations. The Yield Spread is the difference between the 12-month yield and the SEC yield. The Excess SEC (12-month) Yield is the difference between a bond fund's SEC (12-month) yield and the average SEC (12-month) yield of the fund's peers as grouped by the Morningstar category classifications. Other variables are defined in Table 1. Columns 1–6 include style fixed effects and time fixed effects; Column 7–9 include style \times time fixed effects. Standard errors are clustered by fund. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	Panel A: Flexible Coefficients of Past Monthly Returns								
	Yield			Style Adjusted Yield			Yield		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SEC Yield	0.109*** (6.34)		0.135*** (6.63)				0.0896*** (4.52)		0.116*** (4.81)
12-Month Yield		0.0621*** (2.84)						0.0509** (2.07)	
Yield Spread			0.0467** (2.46)						0.0458** (2.01)
Excess SEC Yield				0.0674*** (3.41)		0.0921*** (4.03)			
Excess 12-Month Yield					0.0375* (1.77)				
Excess Yield Spread						0.0438** (2.18)			
Control Variables	Y	Y	Y	Y	Y	Y	Y	Y	Y
Style FE	Y	Y	Y	Y	Y	Y			
Month FE	Y	Y	Y	Y	Y	Y			
Style \times Month FE							Y	Y	Y
Observations	304,453	387,380	304,447	304,453	387,380	304,447	304,250	387,212	304,244
Adj. R-squared	0.0935	0.0896	0.0936	0.0933	0.0895	0.0934	0.117	0.113	0.117

Panel B: Non-linear Flow Performance Relations

	Yield			Style Adjusted Yield			Yield		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SEC Yield	0.113*** (6.39)		0.139*** (6.63)				0.0770*** (3.86)		0.0982*** (4.07)
12-Month Yield		0.0518** (2.41)						0.0288 (1.30)	
Yield Spread			0.0439** (2.35)						0.0342 (1.59)
Excess SEC Yield				0.0664*** (3.34)		0.0888*** (3.87)			
Excess 12-Month Yield					0.0246 (1.24)				
Excess Yield Spread						0.0387** (1.98)			
Control Variables	Y	Y	Y	Y	Y	Y	Y	Y	Y
Style FE	Y	Y	Y	Y	Y	Y			
Month FE	Y	Y	Y	Y	Y	Y			
Style times Month FE							Y	Y	Y
Observations	304,453	387,380	304,447	304,453	387,380	304,447	304,250	387,212	304,244
Adj. R-squared	0.0936	0.0898	0.0936	0.0934	0.0897	0.0934	0.117	0.114	0.117

Table A.2: Fund Yield and Risk Exposures: Alternative Specifications

This table reports the risk exposures of high-yield bond funds relative to their low-yield peers. Specifically, we run time-series regressions of the difference in equal- and value-weighted returns between high- and low-yield bond funds (High-Low portfolio in Table 5) on proxies for asset market risks. R_{Bond} is the excess return on the Vanguard total bond market index fund return; R_{Stock} the excess return on the CRSP value-weighted portfolio; ΔVIX the change in the CBOE volatility index; $\Delta Term$ the change in the spread between 10-year and 1-year Treasury yields; $\Delta Term$ the change in the spread between the Moody's seasoned Baa corporate bond yield and the 10-year Treasury yield. We report the regression coefficients and t -statistics. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: The Difference in Returns between Bond Funds with High and Low SEC Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	-0.218* (-1.69)	-0.230* (-1.78)	-0.194** (-2.01)	-0.206** (-2.09)	-0.216** (-2.26)	-0.229** (-2.33)	-0.0876 (-0.73)	-0.104 (-0.89)	-0.134 (-1.45)	-0.148 (-1.59)	-0.160* (-1.74)	-0.174* (-1.87)
R_{Stock}			0.370*** (16.13)	0.356*** (15.11)	0.309*** (9.36)	0.294*** (8.70)			0.313*** (14.73)	0.294*** (13.72)	0.259*** (8.76)	0.241*** (8.06)
ΔVIX					-0.000847** (-2.57)	-0.000844** (-2.50)					-0.000746** (-2.55)	-0.000738** (-2.50)
$\Delta Term$							-0.505 (-0.75)	-0.665 (-1.00)	-0.751 (-1.44)	-0.897* (-1.71)	-0.826 (-1.60)	-0.971* (-1.86)
$\Delta Default$							-7.160*** (-11.12)	-7.401*** (-11.71)	-4.948*** (-9.54)	-5.322*** (-10.16)	-4.892*** (-9.51)	-5.266*** (-10.13)
Intercept	0.00325** (2.42)	0.00306** (2.29)	0.000681 (0.68)	0.000593 (0.57)	0.00115 (1.13)	0.00106 (1.02)	0.00289** (2.53)	0.00270** (2.40)	0.000862 (0.97)	0.000793 (0.88)	0.00128 (1.42)	0.00121 (1.33)
Observations	321	321	321	321	321	321	321	321	321	321	321	321
Adjusted R-squared	0.009	0.010	0.455	0.424	0.466	0.435	0.287	0.309	0.577	0.567	0.586	0.575

Panel B: The Difference in Returns between Bond Funds with High and Low 12-Month Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	-0.227* (-1.86)	-0.230* (-1.93)	-0.204** (-2.30)	-0.207** (-2.32)	-0.224** (-2.54)	-0.221** (-2.48)	-0.0920 (-0.82)	-0.109 (-1.01)	-0.137 (-1.63)	-0.150* (-1.79)	-0.161* (-1.91)	-0.165* (-1.97)
R_{Stock}			0.359*** (17.00)	0.334*** (15.72)	0.303*** (9.99)	0.296*** (9.62)			0.304*** (15.72)	0.277*** (14.42)	0.256*** (9.49)	0.246*** (9.13)
ΔVIX					-0.000772** (-2.54)	-0.000532* (-1.73)					-0.000670** (-2.52)	-0.000431 (-1.62)
$\Delta Term$							-0.342 (-0.54)	-0.556 (-0.92)	-0.582 (-1.23)	-0.774 (-1.64)	-0.649 (-1.38)	-0.818* (-1.73)
$\Delta Default$							-6.882*** (-11.41)	-6.880*** (-11.90)	-4.731*** (-10.01)	-4.920*** (-10.47)	-4.681*** (-9.98)	-4.887*** (-10.42)
Intercept	0.00259** (2.04)	0.00306** (2.49)	9.48e-05 (0.10)	0.000740 (0.79)	0.000523 (0.56)	0.00104 (1.09)	0.00223** (2.08)	0.00272*** (2.65)	0.000259 (0.32)	0.000922 (1.14)	0.000634 (0.77)	0.00116 (1.42)
Observations	321	321	321	321	321	321	321	321	321	321	321	321
Adjusted R-squared	0.011	0.012	0.482	0.444	0.492	0.449	0.299	0.317	0.607	0.588	0.615	0.591

Table A.3: Style-Adjusted Bond Fund Yield and Risk Exposures: Alternative Specifications

This table reports the risk exposures of high style-adjusted yield bond funds relative to their low-yield peers. Specifically, we run time-series regressions of the difference in equal- and value-weighted returns between high and low style-adjusted yield bond funds (High-Low portfolio in Table 6) on proxies for asset market risks. R_{Bond} is the excess return on the Vanguard total bond market index fund return; R_{Stock} the excess return on the CRSP value-weighted portfolio; ΔVIX the change in the CBOE volatility index; $\Delta Term$ the change in the spread between 10-year and 1-year Treasury yields; $\Delta Default$ the change in the spread between the Moody's seasoned Baa corporate bond yield and the 10-year Treasury yield. We report the regression coefficients and t -statistics. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: The Difference in Returns between Bond Funds with High and Low Style-Adjusted SEC Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	0.123** (2.28)	0.193*** (4.43)	0.132*** (3.02)	0.198*** (4.97)	0.122*** (2.79)	0.182*** (4.69)	0.176*** (3.44)	0.223*** (5.31)	0.159*** (3.67)	0.215*** (5.39)	0.146*** (3.39)	0.195*** (5.02)
R_{Stock}			0.135*** (12.96)	0.0758*** (7.99)	0.106*** (7.07)	0.0327*** (2.45)			0.112*** (11.26)	0.0559*** (6.12)	0.0858*** (6.20)	0.0157 (1.26)
ΔVIX					-0.000405*** (-2.71)	-0.000595*** (-4.45)					-0.000364*** (-2.66)	-0.000563*** (-4.58)
$\Delta Term$							-0.177 (-0.62)	-0.279 (-1.18)	-0.265 (-1.09)	-0.323 (-1.44)	-0.302 (-1.25)	-0.379* (-1.74)
$\Delta Default$							-2.788*** (-10.16)	-2.116*** (-9.38)	-1.997*** (-8.23)	-1.721*** (-7.71)	-1.969*** (-8.19)	-1.678*** (-7.74)
Intercept	0.00115** (2.06)	0.000569 (1.26)	0.000214 (0.47)	4.33e-05 (0.10)	0.000439 (0.95)	0.000373 (0.91)	0.00101** (2.07)	0.000472 (1.18)	0.000285 (0.68)	0.000110 (0.29)	0.000488 (1.16)	0.000425 (1.12)
Observations	321	321	321	321	321	321	321	321	321	321	321	321
Adjusted R-squared	0.016	0.058	0.356	0.215	0.371	0.262	0.258	0.263	0.470	0.341	0.482	0.382

Panel B: The Difference in Returns between Bond Funds with High and Low Style-Adjusted 12-Month Yield

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW
R_{Bond}	0.0595 (1.46)	0.0893** (2.42)	0.0657* (1.92)	0.0913** (2.52)	0.0599* (1.75)	0.0874** (2.40)	0.0935** (2.49)	0.116*** (3.22)	0.0825** (2.50)	0.115*** (3.17)	0.0760** (2.30)	0.111*** (3.05)
R_{Stock}			0.0939*** (11.53)	0.0299*** (3.46)	0.0781*** (6.64)	0.0191 (1.53)			0.0741*** (9.78)	0.0113 (1.36)	0.0609*** (5.73)	0.00323 (0.28)
ΔVIX					-0.000218* (-1.86)	-0.000148 (-1.19)					-0.000185* (-1.76)	-0.000113 (-0.98)
$\Delta Term$							-0.259 (-1.22)	-0.165 (-0.81)	-0.317* (-1.71)	-0.174 (-0.85)	-0.336* (-1.81)	-0.185 (-0.91)
$\Delta Default$							-2.236*** (-11.08)	-1.662*** (-8.54)	-1.712*** (-9.25)	-1.582*** (-7.80)	-1.698*** (-9.20)	-1.574*** (-7.75)
Intercept	0.000582 (1.39)	0.00103*** (2.70)	-6.89e-05 (-0.19)	0.000822** (2.17)	5.21e-05 (0.14)	0.000904** (2.35)	0.000477 (1.33)	0.000949*** (2.75)	-2.60e-06 (-0.01)	0.000876** (2.51)	0.000101 (0.31)	0.000939*** (2.65)
Observations	321	321	321	321	321	321	321	321	321	321	321	321
Adjusted R-squared	0.007	0.018	0.300	0.054	0.307	0.058	0.284	0.202	0.450	0.207	0.456	0.209