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Local Preference for Bonds with Longer Maturity

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Abstract

Despite the local preference is widely documented among equity investors, little is known whether the preference also extends to bondholders. We document a different form of local preference of bondholders, the tendency to hold more long-term bonds from local issuers in the portfolio. Controlling for bond creditworthiness and time-to-maturity, local bond portfolios have higher yield spreads and earn better returns. The local effect is most pronounced for speculative-grade and long-term bonds, suggesting that the preference is driven by local information advantage.

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1. Introduction

Diversification is a key underpinning for modern investment theory. Prior studies, however, show that instead of holding a fully diversified market portfolio, equity investors tend to invest more stocks offered by nearby companies in their holdings, a stylized fact labeled as local preference. The local preference is prevalent and has been found among individual investors (Ivkovic and Weisbenner (2005)), mutual funds (Coval and Moskowitz (1999)), and hedge funds (Sialm, Sun, and Zheng (2020)). The local investments made by the investor also tend to earn better returns, suggesting that the local preference is driven by the investor's information advantage over local companies (Coval and Moskowitz (2001)).

Most of the early studies, if not all, focus on the universe of equities. It is not clear whether the documented local preference exists among corporate bond investors, and if so, to what extent. The question is important for two reasons. First, the total market size of corporate bonds is significantly larger than that of equities. According to Securities Industry and Financial Markets Association (SIFMA), the total size of US corporate bond issuance is $2.3 trillion in 2020, whereas the equity issuance is only $390 billion. The local preference by bond investors, therefore, would possibly bear greater impacts on asset allocation and cost of capital (Hong, Kubik, and Stein (2008)). Second, and more importantly, unlike the junior claim such as equities, bonds are senior debt claim and are less sensitive to information (Myers and Majluf (1984); Gorton and Pennacchi (1990); Holmström (2015)). Thus, the local preference of bond investors cannot be simply extrapolated and may be significantly different from equity investors.

In this paper, we focus on insurance companies, and study the relationship between the maturity of their bond holdings and bond issuers' geographic locations.[4] Insurance companies

[4] In the rest of the paper, we use the word "maturity" to refer to the remaining time to maturity for brevity.

are the largest institutional holders of US corporate bonds of which the cash flows reasonably well match their long-horizon obligations (Bessembinder and Maxwell (2008)). According to the US Flow of Funds Accounts, insurance companies' holdings of corporate and foreign bonds are $4.33 trillion, surpassing the combined bond holdings of both pension funds and mutual funds.[5] Unlike the previous literature that underscores the relationship between the geographic distance and portfolio *weight*, we study investors' local preference through the lens of maturity, a feature that is specific to bond contracts.

Although bonds are generally less sensitive to information compared to equities, their information sensitivity varies with the bond's time-to-maturity. Theory suggests that long-term bonds are more sensitive to information than short-term bonds. We first formally characterize the relationship between bond information sensitivity and its maturity in the dynamic setting of Diamond and He (2014). Assuming that the investors have exclusive access to some information about local firms, an immediate implication of the theory is that investors would hold more long-term bonds issued by local firms in order to make the best use of the information advantage.

We start our empirical analysis by investigating whether the portfolios composed of local bonds have longer maturity than those composed of distant bonds. A critical empirical challenge to identify the local preference over the maturity is the confounding effect of overweighting local bonds that also arises from (a different form of) local preference. In addition to the intuitively appealing measure of weighted average maturity, therefore, we also employ the simple average maturity and median maturity, two alternative measures of bond portfolio maturities that are *neutral* to portfolio weighting. Throughout all measures, we find strong evidence that local bond holdings have a longer maturity than distant bond holdings.

[5] Becker and Ivashina (2015) document that insurance companies have strong incentive to manage their bond holdings and "reach for yield".

The difference in maturity ranges from 3 months (the simple mean) to 8 months (the median), and is robust to different empirical specifications.

We also document a substantial cross-sectional variation in the local preference over bond maturity. The local preference appears to be related to both fund and bond characteristics. Our evidence shows that the local preference is more prominent among larger bondholders and is stronger towards speculative-grade bonds. This is consistent with the information-driven channel, given that larger investors are more likely to possess local information advantage and that speculative-grade bonds are more information-sensitive compared to investment-grade bonds.

The holding pattern we documented between maturity and localities has implications on the investment performance. We divide the bond holdings into four different groups based on bond credit ratings and maturity, and measure the investment performance with two metrics: bond yield spreads and portfolio returns. For all groups of bonds, we find that the local portfolios present better investment performance than the distant portfolios, and the relative outperformance strengthens with the information sensitivity. The yield spreads of local investment-grade bonds are higher than those of similarly-rated yet remote bonds by 53 basis points, whereas the difference in yield spreads of speculative-grade bonds rises to 175 basis points. Controlling for credit ratings (Investment grade (IG) vs Speculative grade (SG)), the locality has a greater impact on long-dated bonds: within IG (SG) bonds, the difference in yield spreads for long-term bonds is 100 (184) basis points, significantly higher than 35 (179) basis points for short-term bonds. Analysis using bond returns yields similar results. The return to local portfolios of IG bonds exceeds that to distant portfolios by 0.68% per annum, and the magnitude of the outperformance is on a par with other portfolio effects reported in the equity studies, e.g., Coval and Moskowitz (2001) and Pool, Stoffman, and Yonker (2012). The return difference for SG bonds is substantially greater and increases to 1% per annum. A breakdown by bond maturity shows a more pronounced effect of locality on returns of long-term bonds. Together, the results of yield spreads and portfolio returns support the information-based explanation for the maturity differences between local and distant bond holdings.

Our paper extends the current literature on investors' local preference. In a seminal study, Coval and Moskowitz (1999) document that fund managers outweigh in the portfolios of the stocks that are in the vicinity of their funds. In a follow-up study, Coval and Moskowitz (2001) show that the selected local stocks outperform other stocks in the fund's portfolios, suggesting that the selection and the greater portfolio weights are driven by information advantage. Subsequent studies present mixed evidence, however, casting doubt on the information-based argument.[6] Prior literature exclusively focuses on equity investments, and only looks over the portfolio weights of local stocks. Our paper, instead, studies the holdings of corporate bonds, an investment vehicle that is less information sensitive but has a much larger market. More importantly, we explore the local preference over bond maturity, a form of local preference different from more portfolio weights over local stocks, and, hence, provide an alternative and powerful setting to examine the information advantage by local investors.

Given the size and importance of corporate bond market, a thriving literature studies bond investors. Bretscher et al. (2021) and Li and Yu (2021) highlight that investor heterogeneity has important implications on corporate bond pricing. Bai, Massa, and Zhang (2020) argue that bond investors' preference to long-term bonds as security lenders boost the bond price and elicit the firms to issue more long-term bonds. Zhu (2021) shows the bond investors that hold a firm's existing bonds are more likely to acquire new issuances from the same issuers, and

[6] Previous studies that suggest information advantage of local investors include Hau (2001), Choe, Kho, and Stulz (2005), Malloy (2005), Gaspar and Massa (2007), Bae, Stulz, and Tan (2008), Butler (2008), Baik, Kang, and Kim (2010), Korniotis and Kumar (2013), Bai and Massa (2021), and Jagannathan, Jiao, and Karolyi (2022). Other papers, e.g., French and James (1991), Froot, O'Connell, and Seasholes (2001), Seasholes and Zhu (2010), Pool, Stoffman, and Yonker (2012), Hochberg and Rauh (2013), Sulaeman (2014) and Giannetti and Laeven (2016) present evidence inconsistent with the local information advantage conjecture.
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this can lower the issuer's cost of capital and prompt them to issue more bonds. An early paper close to ours is Dass and Massa (2014) who show that institutional bond investors prefer issuers that offer bonds of various maturities because of lower information-collection cost. Our paper furthers the understanding of bond investors by studying the relationship between geographical distances, bond maturities and investment performances.

Finally, our paper contributes to the literature on bond maturities. The literature primarily looks at the bond maturities from the issuer's perspective, showing that firm characteristics (Guedes and Opler (1996)), term structure of interest rates (Barclay and Smith (1995)), private information (Flannery (1986); Diamond (1991)), and the gap in the maturity spectrum of government debt (Greenwood, Hanson, and Stein (2010)) can affect a firm's decision on the debt maturity. Our paper joins Dass and Massa (2014) and sheds light on the bond maturities from the investor's viewpoint.

The rest of the paper proceeds as follows. Section 2 lays out the theory foundation of how information sensitivity of bonds changes with maturity, and proposes the main empirical hypothesis. Section 3 describes our data and variable construction. Section 4 presents the baseline empirical test and shows that investors' holdings of local bonds have longer maturity. Section 5 presents the effects of local preference over bond maturities on investment performances. Section 6 concludes.

2.Theory Foundation

Prior literature maintains that investors have exclusive access to some information about local companies, causing them to overweight selected local stocks in the portfolios. This argument is well grounded, given that equity is a junior claim over a firm's assets and is very sensitive to information. On the contrary, bond is a senior claim and is less information sensitive. It is not clear that the local preference and the information-driven argument can be extended to the bondholders.

The information sensitivity of bonds differs with maturities, however. Relative to short-term bonds, long-term bonds are more sensitive to new arrival of information regarding the bond issuers. The relationship between information sensitivity and bond maturity is partly owning to the option value embedded in the bond. In fact, Diamond and He (2014) characterize the relationship in the setting of Black and Scholes (1973) and Merton (1974). For the paper to be self-contained, we briefly describe the results as follows.

Assuming that a firm's asset value V_t follows a geometric Brownian motion, i.e.,

$$\frac{dV_t}{V_t} = \mu dt + \sigma dW_t \tag{1}$$

where μ is the return on the assets and σ is the asset volatility. The firm's assets are financed by equity and a single outstanding zero-coupon bond with face value K and maturity m. The market is frictionless, and there is no transaction cost and bankruptcy cost. Upon the bond maturing at time m, if the firm's asset value V_m is less than K, the bondholders receive the liquidation value of V_m; otherwise, the bondholders are paid in full with K. Following Merton (1974), the bond value $D(V_t; K, m)$ is

$$D(V_t; K, m) = V_t\left(1 - N(d_1)\right) + e^{-rm} K\, N\left(d_1 - \sigma\sqrt{m}\right) \tag{2}$$

where $d_1 = \frac{\log\left(\frac{V_t}{K}\right) + (r + \frac{\sigma^2}{2})m}{\sigma\sqrt{m}}$, and $N(\cdot)$ is the cumulative distribution function of the standard normal distribution.

Consider a short-term bond *i* with face value K_i and time to maturity m_i, and a long-term bond *j* with face value K_j and time to maturity m_j. By assumption, $0 < m_i < m_j$. The following proposition summarizes the relationship between the information sensitivity of bonds and their maturity.

Proposition 1 in Diamond and He (2014) **:** *Suppose two types of bonds have the same market value at time 0, i.e.,*

$$d(V_0; K_i, m_i) = d(V_0; K_j, m_j) \tag{3}$$

Then

$$0 < \frac{\partial d(V_0; K_i, m_i)}{\partial V_0} < \frac{\partial d(V_0; K_j, m_j)}{\partial V_0} \tag{4}$$

Proposition 1 shows that the sensitivity of debt $d(V_0; K, m)$ to information shock ∂V_0 changes with maturities: long-term debt is more sensitive to information shock. [7]

Provided the relationship between information sensitivity and the bond maturity, assuming that investors have unique information about local firms, they would probably invest in more

[7] Diamond and He (2014) assume a zero risk-free rate for simplification. They also interpret the results in a context of debt overhang. Part of the new value of the assets ∂V_0 accrues to bondholders in the amount of $\frac{\partial d(V_0; k, m)}{\partial V_0}$. Proposition 1, therefore, suggests that long-term debt imposes higher debt overhang than short-term debt.

long-term bonds from local issuers in order to make the best use of the information advantage. Therefore, we conjecture and test Hypothesis 1 in the following sections.

Hypothesis 1: *Investors hold more long-term bonds issued by local firms in their portfolios to take advantage of the local information advantage.*

3. Data and Summary Statistics

This section details the data and variables that we use to conduct the empirical analysis. We collect bond holdings of insurance companies from the Thomson Reuters eMaxx database, covering from the beginning of 2002 to the end of 2019. eMaxx reports quarterly positions of corporate bonds held by US and international institutional investors, including insurance companies, mutual funds, and pension funds. It collates the holding information from various sources: the insurance companies' corporate bond positions come from National Association of Insurance Commissioners (NAIC) disclosures; the holding information of mutual funds primarily comes from mandatory SEC filings; the bond ownership information of pension funds is typically gleaned from voluntary disclosures.

As Dass and Massa (2014) highlight, eMaxx reports holding positions both at the investor firm level and at the fund level. "Fund" refers to a pool of assets managed by an institutional investor, e.g., Fidelity Advisor Balanced Fund, and the total assets in all funds managed by an institutional investor are aggregated to the institutional investor's quarterly holdings. Insurance companies, especially large insurance companies, can have several bond funds with different mandates and characteristics under management. For example, Fidelity as an institutional investor has different types of bond funds, such as Fidelity Advisor Balanced Fund, Fidelity Investment Grade Bond Fund, and Fidelity Advisor Intermediate Bond Portfolio. Therefore, we conduct our analysis at the fund/account level.

In addition to reporting bond holdings and their par values by each fund within each quarter, eMaxx also provides the locations of the managing firms. We focus on the funds located in the US that are also managed by US firms. The locations of the fund managers are measured at the 5-digit ZIP code level. Furthermore, to mitigate potential confounding effects, we exclude funds that are co-managed and fund managers that are not located in contiguous US states.

We obtain bond characteristics from Mergent Fixed Income Securities Database (FISD) and link them to the bond holdings by CUSIPs. Similar to our restriction on US funds, we require bond issuers to reside in the contiguous US states. We apply standard filtering rules and exclude bonds that are denominated in foreign currencies, issued under Rule 144a and/or by US government agencies, mortgage-backed, inflation-linked, payment-in-kind, pass-through securities, corporate strips, or corporate unit investment trust. Credit ratings for each bond are collected at the end of a quarter. We use their ratings if a bond is rated by either S&P or Moody; otherwise, we draw on Fitch's rating before concluding the bond is not rated.

FISD also provides the locations of bond issuers at 5-digit ZIP code level. To gauge the distance between the institutional investors and bond issuers, we map the ZIP code locations to geographic coordinates using ZIP Code Distance Database of NBER.[8] The distance between the institutional investor *a* and bond issuer *b* is calculated as

$$\begin{aligned} d(a,b) = \arccos\{&cos(a_1)cos(a_2)cos(b_1)cos(b_2) \\ &+\cos(a_1)\sin(a_2)\cos(b_1)\sin(b_2) \\ &+\sin(a_1)sin(b_1)\}\times r \end{aligned} \tag{5}$$

where a_1 and b_1 (a_2 and b_2) are the latitudes (longitudes) of the investor and the issuer (measured in radians), respectively, and r is the radius of the earth (approximately 6371 km). The distance $d(\cdot)$ measures the great circle distance between two points on the surface of the

[8] The data source of NBER ZIP Code Distance Database comes from the US Census Bureau's Gazetteer Place and ZIP Code Database.

earth. Following Coval and Moskowitz (1999) and Coval and Moskowitz (2001), we classify a bond issuer as local (distant) to an investor if the distance between them is less than or equal to (greater than) 100 km.[9]

As a fund may disclose its holdings on any day in a quarter, the maturity for a bond in a quarter is defined as the number of years between the end of the quarter and the bond's maturity date. If a bond matures in a quarter, the maturity in this quarter would be slightly negative. To assuage the impacts of the negative maturity and of the extremely long-dated bonds, we winsorize the bonds with the top and bottom 1% of maturities for each quarter.[10] We then aggregate the maturities of bond holdings at the fund level. The most straightforward approach is to use the weighted average of bond maturities. Specifically, the maturity of local bond portfolio for an investor a is

$$ws_{a,t}(local) = \frac{\sum_{j \in local} p_{a,j,t} \times s_{j,t}}{\sum_{j \in local} p_{a,j,t}} \tag{6}$$

where $s_{j,t}$ is the maturity of bond *j* in quarter *t*, and $p_{a,j,t}$ is the par value amount of bond *j* in *a*'s holdings. Equation (6) indicates that the maturity of local portfolio held by investor *a* in quarter *t* is the weighted average over the maturities of all bonds from local issuers in *a*'s holdings. We denote the measure as $ws_{a,t}(local)$ and refer to it as the weighted maturity. The maturity of distant holdings in a quarter can be calculated in a similar manner.

Despite its intuitive appeal, the above measure suffers a major disadvantage. As local preference probably drives the investors to overweight local securities in the portfolio as well, the weighted maturity measure confounds the investor's local preference over maturity with

[9] We also tried an alternative cutoff of 250 km that has also been used in the literature, and our findings, albeit slightly weaker, still remain.

[10] An alternative approach of removing all bonds with negative maturities and winsorizing the bonds with the top 1% of tenors yields similar results.

the security overweighting. In other words, a longer weighted maturity of local holdings relative to distant holdings does not necessarily imply that the investor prefers holding long-term bonds from local issuers, but could emerge from the investor's tendency of investing more bonds from local issuers irrespective of bonds' maturities.

We, therefore, use two alternative *weight-neutral* measures of bond holding maturity to address the empirical challenge. The first one is the simple mean of bond maturities in the holdings, and defined as

$$ms_{a,t}(local) = \frac{\sum_{j \in local} s_{j,t}}{\sum_{j \in local} 1}, \qquad ms_{a,t}(distant) = \frac{\sum_{j \in distant} s_{j,t}}{\sum_{j \in distant} 1} \tag{7}$$

The simple mean maturity, compared to the weighted maturity measure, remove the component of portfolio weight and thus accentuates investors' preference to the maturity of local bonds. The second measure is the median of bond maturity:

$$meds_{a,t}(local) = median\{s_{j,t}, \forall j \in local\}, \qquad meds_{a,t}(distant) = median\{s_{j,t}, \forall j \in distant\} \tag{8}$$

In addition to being weight-neutral, the median maturity measure is also less susceptible to impacts from very long-dated bonds.

Unlike common equity shares that are fully fungible, bond issuers have great discretion over the maturity of bonds being issued. If local firms are more inclined to issue long-dated bonds, then the investor's local bond holdings might end up with a longer maturity than their distant holdings. In order to capture the investor's preference to the maturity of local bonds, it is crucial to control for the maturity of bonds supplied by the local and distant issuers. We obtain all outstanding bonds in a quarter from issuers within (local) and outside (distant) 100km radius of the investors, and calculate the simple average maturity of the bonds, respectively.

We label the variable as "*average maturity by regional issuers*", a control variable that we will use in the empirical analysis.

The hypothesis that bond investors prefer holding long-dated bonds from local issuers implies that deviations of the investor's portfolio maturity from a prespecified benchmark should be correlated with distance. When examining that the equity investor overweighs local stocks, prior literature employs a market portfolio as the benchmark, e.g., S&P 500 index. To be consistent with the literature on the equity, we mimic a market portfolio that comprises all outstanding corporate bonds in a quarter from eMaxx. We then calculate the deviations of bond holding maturity, which include both deviations of the investor's local and distant bond portfolios and those of the average maturity by local and distant issuers. Since we use three metrics to measure the investor's bond holding maturities, we also calculate three maturity measures of the market portfolio and, consequently, the deviations. Using the deviations of portfolio maturity attenuates the effect of common shocks to the bond market, e.g., new bond offerings and buybacks, on the maturities of investors' bond holdings. For this reason, our analysis will primarily use the deviations of maturities from the market benchmark rather than the raw maturities. Empirically, this is equivalent to imposing time fixed effects in the regressions, and does not substantially alter the results.

Table 1 reports the summary statistics of our sample. Indeed, it suggests that the investor's local bond holdings have a longer maturity than their distant holdings. This does not depend on which measure is employed, and does not depend on whether we look at raw maturity of bond holdings or their deviations from the market benchmark. The difference is most significant using the median tenor, approximately amounting to 0.6 years, and slightly decreases to 0.4 years if measured with the weighted or simple average maturity. The simple average (raw) maturity of the investor's bond holdings is half a year longer than their median maturity, and the average (raw) maturity of the benchmark is 2.6 years greater than its median, suggesting that both bond holdings and the benchmark have a heavier right tail of maturity. Empirical results using the median maturity measure, therefore, might better quantitatively capture the investor's preference to the maturity over local bonds.

Table 1 also displays the summary statistics of fund size, defined as the total par value of bond holdings of a fund in a quarter. It is an important control variable to include in our regression analysis, as larger funds typically have more access to the local information. The average (median) fund that holds bonds from local issuers is 0.46 (0.033) billion US dollars, whereas the average (median) fund that holds bonds from distant issuers is only 0.28 (0.014) billion US dollars.

4. Do Bond Investors Prefer Long-dated Bonds from Local Issuers?

As a prelude to our more formal analysis, Figure 1 plots the average of two weight-neutral maturity measures of local and distant portfolios held by investors. It shows that not only do the local bond holdings have longer maturities, but the difference persists throughout the sample period.

We start our empirical investigation by exploring whether local bond holdings have longer maturity with the following econometric specification:

$$\begin{aligned} Maturity_{i,j,k,t} = {} & \alpha \times Local_j + Fund\,Size_{i,t} + Average Maturity\,Of\,Regional\,Issuers_{j,t} \\ & + \theta_k + \xi_t + \epsilon_{i,j,k,t} \end{aligned} \tag{9}$$

where $Maturity_{i,j,k,t}$ is one of the three maturity measures of bond holding *j* by fund *i* (located in *k*) in quarter *t*. $Local_j$ is a dummy variable that equals 1 if the bonds in the holding come from local issuers, i.e., within 100 km of radius. $Fund\,Size_{i,t}$ is the size of fund *i* in quarter *t*. $Average Maturity Of\,Regional\,Issuers_{j,t}$, as defined in Section 3, is the average maturity of outstanding bonds by the issuers in the same geographical region as covered by the holding j. θ_k is the ZIP code fixed effects, and ξ_t is the time fixed effects. $\epsilon_{i,j,k,t}$ is the error term. The coefficient of α , thus, captures the investor's preference to the maturity of local bonds.

Table 2 presents the regression results. The standard errors are clustered at the fund level, accounting for heteroskedasticity and correlation within the same fund over time. The first three columns employ the measure of weighted average maturity. Column (1) only controls for the fixed effects, and shows that the maturity of local bond holdings is longer than that of distant holdings by roughly 4 months. Column (2) further controls for the fund size, and obtains similar results. The coefficient of interest is still significant at 1% level, suggesting a maturity difference of a quarter between the local and the distant holdings. In addition, the positive and significant coefficient of the fund size indicates that larger funds tend to hold more long-dated bonds in their portfolios. Column (3) additionally includes the average maturity of regional issuers as a covariate. Unsurprisingly, the coefficient is positive and significant at 1% level, indicating that outstanding bonds in the same regions as the holdings have a strong impact on the maturity of the bond holdings. A one-year increase in the maturity of outstanding bonds in the region approximately raises the maturity of investors' bond holdings by a quarter year. Our hypothesis, however, still holds, although the coefficient of interest slightly decreases and accounts for 5% of one standard deviation of the bond holding's maturity overall.[11]

Our results are robust to alternative maturity measures of the bond holdings. Column (4) to Column (6) employ the measure of simple average maturity. The results are similar to those using the weighted average maturity, and even stronger to some extent. For each specification, we obtain greater coefficients (0.292, 0.266, 0.233) using the simple average than using the weighted average (0.282, 0.250, 0.216). Note while the weighted average measure is sensitive

[11] When local and distant portfolios are pooled together, the mean (standard deviation) of the weighted maturity, simple average maturity and median maturity is 7.09 (4.67), 7.06 (4.45), and 6.31 (4.45), respectively.

to portfolio weights, the simple average measure is weight-neutral. This suggests that our results are not driven by well-documented preference of investors holding more local bonds in the portfolio, but are consistent with the preference of holding longer-term bonds from local issuers.

The results employing the median maturity are reported in the last three columns of Table 2. The median measure is also independent of portfolio weights, and is not susceptible to the heavy right tail of the portfolio maturity as suggested by Table 1. The coefficient estimates indicate that the maturity of local bond holdings is 0.6 years (7~8 months) longer than that of distant holdings by the investors. The coefficients are robust, barely change with the specifications, and are all significant 1% level.

Overall, the results from our baseline regressions support the hypothesis that investors prefer holding bonds with longer maturity from local issuers. The results are robust to alternative maturity measures of bond holdings and to different control variables. Interestingly, the coefficient estimates from baseline regressions are very close to those concluded from Table 1 (0.6 years using the median maturity and 0.4 years using the weighted/simple average maturity). Although the control variables and fixed effects themselves have strong explanatory power for the variation in maturities of bond holdings, they do not alter the basic patterns that we observe from summary statistics.

4.1 Cross-sectional Variation of Local Preference

Although Table 2 suggests the inclination of bondholders to invest in local bonds with longer time to maturity, it does not show any evidence indicating that the inclination is driven by information advantage. An alternative hypothesis is that investors are willing to make long-term investment and hold long-dated bonds in the region where they work, reside and live, as it may bring them non-pecuniary benefits. In addition, Table 2 only exploits the localities of bonds in the investor's holdings, but ignores other heterogeneities. This section, therefore, studies how bond and investor characteristics affect the documented investor preference in the previous section, shedding light on the information-based explanation.

One of the important bond characteristics is credit ratings. Speculative-grade bonds (BB+ and below) are generally more information sensitive than investment-grade bonds (BBB- and above). Under the information-based argument, the investor would present a stronger preference towards long-term speculative-grade bonds from local issuers. To test this implication, we first sort the investor's bond holdings into investment-grade (IG) and speculative-grade (SG) groups, then compute the maturity measures of holdings within each rating groups, and repeat our regression equation (9) to each group.

Table 3 presents the results grouped by credit ratings. Similar to Table 2, the first four columns employ the weighted average measures. Without controlling for the average maturity of regional issuers, Column (1) shows that for IG bonds, the maturity of local bond holdings is 0.25 years longer than that of distant holdings. The magnitude, nevertheless, more than doubles for SG bonds, as evidenced in Column (2). Column (3) and (4) further account for the average maturity by regional issuers, and observe smaller coefficient estimates for both groups of bonds. Yet, the coefficient of SG group of bonds still doubles that of IG group of bonds, suggesting heterogenous effects of locality on the bond holding maturities across credit ratings.

We obtain similar results using alternative maturity measures of bond holdings. The results in Column (5)-(8) employ the simple mean of maturities, and also indicate that the difference in maturities between local and distant SG bonds is as twice as the one between local and distant IG bonds. The final set of results in Table 3 uses the median maturities. Although the percentage difference of coefficient estimates between IG and SG bonds diminishes, the absolute difference of 0.2 years is similar to those obtained with the weighted/simple average measures. The robust results highlight a stronger preference to hold long-dated speculative-grade bonds from local issuers, and, therefore, provide evidence to support the information-based argument.

In addition to heterogenous information sensitivities among bonds, investors also differ in their access to local information. Larger funds, given their sizes, resources and social networks, are more likely to possess and take advantage of the unique local information. The difference in maturities between local and distant bond holdings, hence, should be more conspicuous for larger funds than for smaller funds. To empirically test the insight, we run the follow the regression:

$$\begin{aligned} Maturity_{i,j,k,t} &= \alpha \times Local_j \times Small_{i,t} + Local_j + Fund\,Size_{i,t} \\ &+ AverageMaturityOf\ Regional\,Issuers_{j,t} + \theta_k + \xi_t + \epsilon_{i,j,k,t} \end{aligned} \tag{10}$$

We augment our baseline specification with an interaction term $Local_j \times Small_{i,t}$. $Small_{i,t}$ is a dummy variable that equals 1 if fund *i*'s size is less than the median fund size during quarter *t*. We use a dummy variable, instead of the actual fund size, in the interaction term to increase the power of the test.

Table 4 reports the results of regression (10). The coefficients of the interaction term are all negative, suggesting that small funds are less prone to have a longer maturity for their local bond holdings compared to large funds. Correspondingly, when compared to Table 2, the coefficients of $Local$ increase roughly by 0.3 years for all specifications. This is consistent with the presumption that large funds are more likely to access and exploit the local information advantage.[12]

[12] As mentioned in Section 3, our analysis is conducted at the fund level. It is possible that information is shared across different funds within the same managing firm. To capture the information sharing, we also estimate the equation (10) with managing firm fixed effects, and report the results in Table A.1 of Appendix. The results stay very similar.

In summary, Table 3 and Table 4 underscore that the preference for long-dated bonds from local issuers is closely related to both bond and investor characteristics. The fact that the preference is more prominent among SG bonds and among larger funds, hence, supports the information-driven channel.

4.2 Further Robustness Checks

In this section, we perform several further tests, from different perspectives, to substantiate the robustness of the investor's preference to local long-dated bonds.

4.2.1 Excluding NYC-based Funds

A substantial proportion (16%) of funds in our sample are housed in the New York City. To make sure that our results are not driven by NYC-based funds, we follow Coval and Moskowitz (1999), exclude all NYC-based funds, and repeat our baseline regression (9). Table 5 reports the results, and shows even stronger preference by investors to long maturities over local bonds. In fact, for every maturity measure and for all specifications, Table 5 presents coefficients greater than those reported in Table 2, confirming that our results are not driven by a few funds located in NYC.

4.2.2 Bond Durations

The empirical results thus far come with a caveat. While the Proposition 1 in Section 2 is derived for *zero-coupon* bonds, our sample primarily comprises coupon bonds. To address the discrepancy between the theory foundation and empirical analysis, we consider a bond's duration, another measure of bond maturity that also accounts for periodic coupon payments. Two commonly used concepts of bond durations are Macaulay duration (MacD) and modified duration (ModD). Assuming continuously compounding, two durations are the same for a bond with price *p*, yield to maturity *y* and periodic cash flows $\{CF_i\}_{i=1,\ldots,n}$,

$$ModD = MacD = \sum_{i=1}^{n} s_i \times \frac{CF_i \times e^{-y \times s_i}}{p} \quad (11)$$

where s_i is the time until the *i*th cash flow CF_i is received (the tenor of payment *i*). Essentially, bond duration is a weighted average of maturity of a bond's remaining coupon and principal payments, and it is easy to see that

$$ModD = MacD \leq s_n \quad (12)$$

i.e., a bond's duration is typically less than its tenor.

We obtain the bond's durations from WRDS Bond Returns database. As WRDS calculates the monthly modified durations, to be consistent with the reporting frequency of eMaxx, we take the average of monthly durations within a quarter. Note that durations are only reported for bonds with fixed coupons, and thus, a small proportion of floating-rate bonds are excluded from the duration analysis. In line with the previous sections where we study maturity of bond holdings, we calculate three measures of durations for local and distant bond holdings, respectively.

Figure 2 plots the two weight-neutral durations of bond holdings, and shows that the durations of local holdings are greater than those of distant holdings for every year during the sample period, although the differences are smaller compared to the maturities in Figure 1. The decreased difference might arise due to the fact that a bond's duration is the weighted average of coupon and principal maturities and is less than a bond's years to maturity, which substantially affects the long-term bonds mostly held in the local holdings.

We apply the baseline specification (9) to bond durations, and report the results in Table 6. Table 6 shows that our conclusions from studying the maturities of bond holdings also extend to durations. Column (1) to (3) employ the measure of weighted average durations, and indicate that the durations of local holdings are 0.3 years longer than those of distant holdings. The result is robust to the inclusion of different covariates. The magnitude of the estimated coefficient slightly decreases to 0.2 years and 0.1 years when we use median durations and simple mean durations, respectively. Given that the standard deviation of bond holding durations in the sample is 2.2 years, the locality raises the holding durations by roughly 5% to 13% of a standard deviation, and the magnitude is comparable to that in Table 2 using bond maturities. Table 6, therefore, confirms that our findings are robust to accounting for coupons, and that investors keep more long-term bonds from local issuers in their holdings.

4.2.3 Bond-level Evidence

Previously, our discussion focuses on the *portfolio* maturities. In this section, we delve into a more granular level, and document the investor's preference at the bond level. More importantly, our bond-level analysis looks at a bond's weight in the investor's holdings, and thus bridges our paper to the prior literature that studies the role of local preference in asset allocation.

We study how a bond's maturity affects its share in the investor's portfolio. We calculate a bond's share in a fund during a quarter, and then run the following regression:

$$\frac{Holding\,Amt_{m,i,t}}{Fund\,Size_{i,t}} = \alpha_1 \times Local_{m,i} + \alpha_2 \times Local_{m,i} \times Long_{m,t} + Long_{m,t} + Fund\,Size_{i,t} + \mathbf{X}_{m,t} + \gamma_m + \xi_t + \epsilon_{m,i,t} \tag{13}$$

where $\frac{Holding\,Amt_{m,i,t}}{Fund\,Size_{i.t}}$ measures the share of bond *m* in the fund *i*'s holdings during time *t*. $Local_{m,i}$ is a dummy variable that equals 1 if the distance between the issuer of bond *m* and the fund *i* is less than 100km. $Long_{m,t}$ is an indicator variable and is equal to 1 if the maturity of bond *m* is less than the median maturity of the bond universe at the moment. $\mathbf{X}_{m,t}$ is a set of bond characteristics, including amount outstanding and credit ratings of bond *m*. γ_m is bond fixed effects. Other notations are defined the same as in the baseline regression (9). Roughly speaking, α_1 captures the relative overweight of local short-term bonds (in terms of being less than the median maturity), if any, in the investor's portfolio, whereas α_2 gauges the relative overweight of long-term bonds *within* the investor's local portfolio.

Table 7 presents the results of our bond-level regressions. Given the long horizon of the sample period, the number of bond-by-fund-by-quarter observations is large and around 10 million. We cluster the standard errors at the fund level. Column (1) controls for time and bond fixed effects along with bond ratings, and shows that investors hold more local bonds of long maturity in their portfolios. However, as the coefficient of $Local$ indicates, the overweighting by the investor does not extend to local bonds of short maturity. The coefficient is negative, but is only significant at 10% level. Column (2) further includes fund size and the outstanding amount of bonds, and shows a stronger tendency for investors to hold local bonds of long maturity. The coefficient of $Local \times Long$ almost doubles to 0.08%, and is significant at 1% level. Holding of short-term bonds, still, does not seemingly vary with the locality. The coefficient estimate of α_1 is not statistically significant, and, in fact, is consistent with the proposition that short-term bonds are information-insensitive and are difficult to make a profit from local information advantage. Finally, Column (3) accounts for time-varying bond characteristics and investor demand over different segments of credit qualities by including bond-by-time and ratings-by-time fixed effects, and obtains very similar results. Overall, Table 7 exploits the variation in the individual bond's ownerships, echoes the portfolio-level results, and provides auxiliary support for our hypothesis.

How does the local preference to long-term bonds compare to other portfolio effects documented in prior literature? Given that the average fund has 7 local bonds in the portfolio, the back-of-the-envelope calculation suggests that within local bonds the long-term ones cumulatively outweigh the short-term ones by $7 \times 0.08\% = 0.56\%$ or 56 basis points. This is roughly 45% of the local overweighting effect reported in the equity literature, which is 123 basis points, and approximately 87% of the home-state tilt effect by fund managers, which is 87 basis points (Pool, Stoffman, and Yonker (2012)).

5. Investment Performance Implications

The holding pattern we find between maturities and localities may have implications on the investment performance. In this section, we explore the implication and focus on two performance metrics: yield spreads and returns. Studying the investment performance also provides a prospective to differentiate the mechanisms underlying the holding pattern. Recall an alternative mechanism that the investors are willing to make long-term investment in the local regions for non-pecuniary benefits. While this hypothesis may lead to portfolio underperformance, the information-driven argument predicts better investment performance for local holdings, especially local holdings of long-term bonds.

5.1 Bond Yields

We obtain trading-volume weighted yields of individual bonds from WRDS Bond Return database, and calculate the value-weighted yield spreads of bond holdings.[13] For each fund, we sort its holdings into different groups, depending on an individual bond's credit rating (IG/SG), its maturity (whether the maturity is greater than the median maturity of the bond universe or

[13] The WRDS Bond Return database reports monthly bond yields, and we take the average of monthly bond yields within a quarter. To calculate the yield spreads, we collect the daily term structure of Treasury par yields from the Federal Reserve website https://www.federalreserve.gov/data/nominal-yield-curve.htm, and take the average within a quarter. Similar to Xu and Pennacchi (2021), we then use cubic spline interpolation to obtain risk-free rates corresponding to each bond's tenor, and compute the differences between bond yields and risk-free rates as the yield spreads.

not) and its locality. Holdings within each sorted group are rescaled to sum to one, thereby creating different credit rating-by-maturity-by-locality portfolios for each fund.

Figure 3 plots the portfolio yield spreads over time. Interestingly, local holdings have higher yield spreads for all rating and maturity categories. Within each maturity group, the differences in yield spreads between local and distant holdings are greater for SG bonds than for IG bonds. Within each rating category, the differences appear greater for long-dated bonds than for short-dated bonds.

To formally explore the impact of geographical distances on the yield spreads of bond holdings, we regress the yield spreads of bond holdings on the dummy variable of *Local* and fund size,

$$y_{i,j,t} = \alpha \times Local_j + Fund\ Size_{i,t} + \xi_t + \delta_i + \epsilon_{i,j,t} \tag{14}$$

where $y_{i,j,t}$ is the yield spreads of portfolio *j* held by fund *i* during time *t*. $Local_j$ is a dummy variable that equals 1 if portfolio *j* is composed of local bonds. $Fund\ Size_{i,t}$ is fund *i*'s size during time *t*. In addition, we account for time and fund fixed effects ξ_t and δ_j, respectively.

Table 8 reports the regression results for each rating-and-maturity group. The first three columns present the results for IG bond holdings. On average, the yield spreads of local IG bond holdings are 53 basis points higher than distant bond holdings. Within IG ratings, the impact of locality is more pronounced for long-dated bonds, and difference between local and distant holdings rises to 100 basis points. The last three columns show the results for SG bond holdings. The yield spreads of SG bonds from local issuers are 175 basis points higher than similarly-rated bonds from distant issuers. Thus, compared to IG bonds, locality has a greater effect on SG bond holdings. This is consistent with SG bonds being more information-sensitive.

A breakdown by maturity still suggests a stronger effect on long-term bonds, though it is not as striking as for IG bonds.

Overall, the results of yield spreads indicate that investors tend to keep lower priced, probably riskier, bonds from local issuers in their portfolios, earning superior yields to maturity. This can be rationalized if they know more information about the quality of local firms that are not easily accessible to remote investors and rating agencies.

5.2 Bond Returns

The literature on equities highlights that the investor's portfolio composed of local stocks typically outperforms others, shedding light on the possible channel of information advantage. To emulate the literature, in this section, we also study the relationship between the distance and bond portfolio returns. The bond returns also provide an alternative metric of investment performance of the bondholder, complementing our analysis of the yield spreads.

The monthly returns of individual bonds are also from WRDS Bond Return database. WRDS computes the bond returns based on the last price at which a bond is traded in a month and the accrued coupon interest. We take the average of monthly bond returns within a quarter to match the data of quarterly bond holdings. Similar to our analysis of the bond yield spreads, we sort the bonds held by a fund during a quarter into 8 rating-by-maturity-by-locality portfolios, and calculate the value-weighted returns, respectively.

Our empirical specification is the same as equation (14), except that we substitute the the yield spreads with bond portfolio returns. Table 9 reports the regression results for each rating-and-maturity group. Through all groups, we find superior returns of local portfolios relative to distant portfolios. The first three columns of Table 9 focus on bonds with IG ratings. Column (1) shows that the local portfolios outperform distant portfolios by approximately 0.7% per annum. Column (2) and (3) further break down the performance by maturities, and demonstrate the critical role played by maturiy in portfolio returns. Column (2) shows that the impact of locality on portfolio returns is moderate for short-term bonds, with the annual return of local portfolios exceeding that of distant portfolios by 0.6%. In contrast, the annual return difference between the two types of portfolios for long-term bonds almost doubles to 1%, highlighting the significant effect of locality on returns of long-term bonds.

The last three columns of Table 9 instead focus on SG bonds, and in general, show stronger influence of the distance on portfolio returns compared to IG bonds. Column (4) shows that, on average, the return difference between local portfolio and distant portfolio is roughly 0.96% per annum. The maturity has a similar effect on investment performance of SG bonds, but not as notable as its effect on IG bonds. Column (5) shows that the annual return of local portfolios surpasses that of distant portfolios by 0.94% for short-term bonds, and the outperformance increases to 1.2% for long-term bonds, as evidenced by Column (6).

In summary, the results of portfolio return echo the previous findings from equity markets that local portfolios outperform distant portfolios. More importantly, our novel analysis shows that the outperformance is more prominent for bonds with longer maturity and for bonds with speculative ratings, both of which feature greater sensitivity to information. Our results, therefore, provide more evidence of the information-based argument for the local preference displayed by bond investors.

6. Conclusion

Bonds, unlike equities, are less information sensitive, and, thus, it is not clear that the local preference documented among stock investors also extends to bond investors. This paper looks at this question, and highlights a different form of local preference, the tendency to hold more long-term bonds from local issuers. As a consequence, the local bond holdings have a longer maturity than distant holdings by 3 to 7 months. The results are robust to different measures of maturities, are more pronounced for speculative-grade bonds and larger funds, and also hold for bond durations.

We provide evidence suggesting that the preference is driven by the investor's information advantage over local companies. Controlling for creditworthiness and maturity, we find that the local holdings persistently have higher yield spreads and earn superior returns. In particular, the effect of locality is most prominent among long-term bonds and speculative-grade bonds.

The paper underscores the intricate interaction between local information advantage and bond contract features. Although our analysis focuses on bond maturity, similar relations are expected on other bond features, e.g., bond seniority and covenants. We leave this question for future research.

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Figures

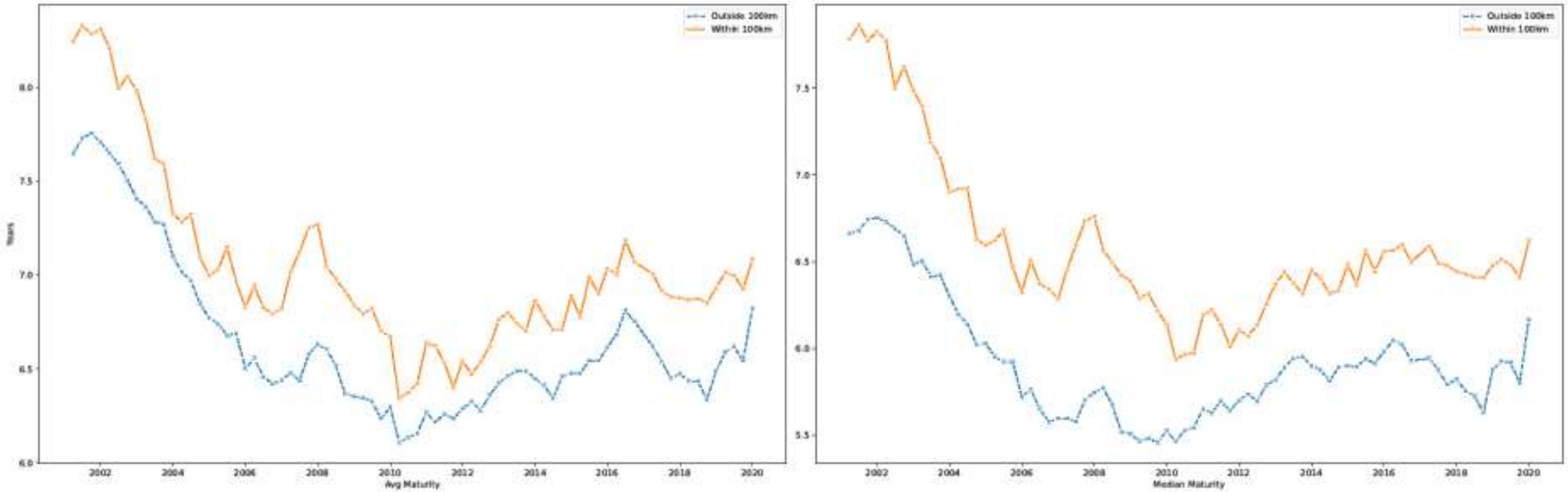

Figure 1

This figure plots the average maturity (left) and median maturity (right) of local and distant bond holdings from 2002 to 2019.

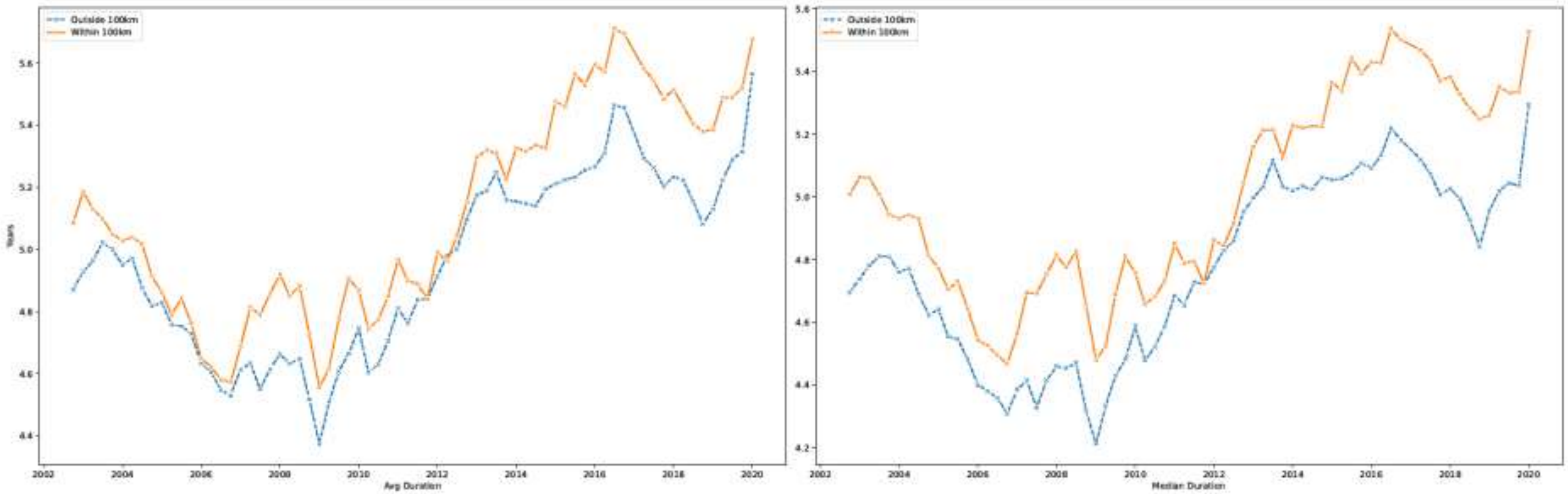

Figure 2

This figure plots the average modified durations (left) and median modified durations (right) of local and distant bond holdings from 2002 to 2019. Duration data are from WRDS Bond Return Database.

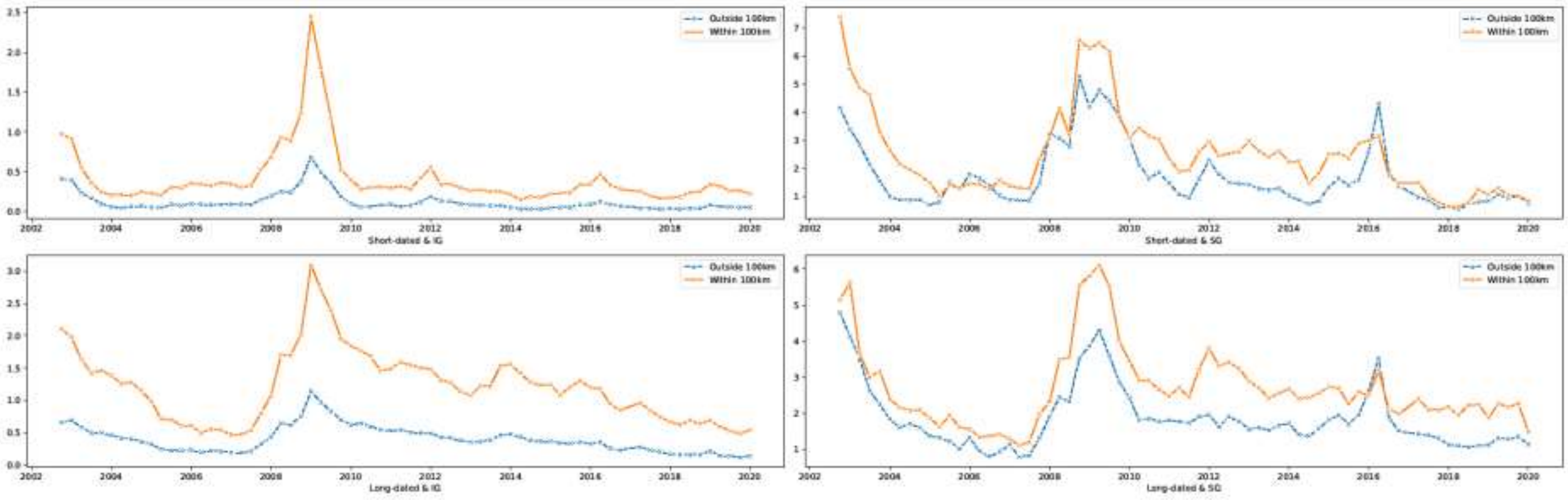

Figure 3

This figure plots the quarterly yield spreads (in percentage points) of local and distant portfolios for each rating-and-maturity group of bonds.

Table 1: Summary Statistics

This table presents the summary statistics of bond holding and maturity data. It shows several statistics of bond portfolio's maturity, market benchmark maturity, average maturity by regional issuers and fund size (in $billion). The data are bond holdings and tenors between 2002 and 2019 collected from eMaxx and Mergent FISD. Bond portfolio tenors and market benchmark tenors are reported in three metrics: the weighted tenors, the simple mean tenors and the median tenors. Average tenors by regional issuers are the simple average tenors of outstanding bonds issued by local or distant issuers. Deviations are defined as the differences between raw tenors of the variable of interest and the market benchmark.

	Local						Distant					
Statistic	N	Mean	St. Dev.	Q1	Median	Q3	N	Mean	St. Dev.	Q1	Median	Q3
Weighted Avg Maturity (Raw)	76,270	7.104	5.301	3.674	5.562	8.589	139,335	6.753	4.177	4.042	5.627	8.212
Avg Maturity (Raw)	76,270	7.027	5.012	3.774	5.693	8.633	139,335	6.653	3.887	4.087	5.684	8.217
Median Maturity (Raw)	76,270	6.573	5.096	3.504	5.296	7.674	139,335	5.916	3.919	3.605	5.044	7.008
Avg Maturity by Regional Issuers (Raw)	76,270	8.967	0.933	8.515	9.007	9.504	139,335	8.728	0.196	8.571	8.756	8.852
Mkt Weighted Avg Maturity	76,270	9.378	0.328	9.113	9.263	9.617	139,335	9.396	0.334	9.114	9.29	9.624
Mkt Avg Maturity	76,270	8.744	0.194	8.582	8.771	8.865	139,335	8.745	0.198	8.582	8.775	8.865
Mkt Median Maturity	76,270	6.135	0.254	5.923	6.208	6.353	139,335	6.139	0.253	5.923	6.214	6.373
Weighted Avg Maturity (Dev)	76,270	-2.274	5.289	-5.689	-3.787	-0.788	139,335	-2.643	4.164	-5.357	-3.725	-1.202
Avg Maturity (Dev)	76,270	-1.717	5.024	-4.98	-3.053	-0.087	139,335	-2.092	3.903	-4.675	-3.06	-0.498
Median Maturity (Dev)	76,270	0.439	5.109	-2.627	-0.833	1.542	139,335	-0.223	3.934	-2.5	-1.1	0.9
Avg Maturity by Regional Issuers (Dev)	76,270	0.223	0.905	-0.139	0.254	0.659	139,335	-0.017	0.048	-0.026	-0.005	0.004
Fund Size (Bil)	76,270	0.463	2.136	0.009	0.033	0.152	139,335	0.276	1.611	0.003	0.014	0.066

Table 2: Preference to Long-Term Bonds from Local Issuers

This table presents the regression results of maturities of local and distant bond portfolios on the dummy variable of *Local*. The data are quarterly bond holdings of US insurance funds. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. *Fund Size* is the size of assets under management by the fund. *Ave Maturity by Regional Issuers* is the average maturity of outstanding bonds by issuers in the same geographical area as the bond portfolio. Column (1) to (3), Column (4) to (6), and Column (7) to (9) measure the portfolio maturities with the weight average maturity, average maturity and median maturity, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Maturity of Fund Holdings								
	Weighted Avg Maturity			Avg Maturity			Median Maturity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local	0.282***	0.250***	0.216***	0.292***	0.266***	0.233***	0.647***	0.634***	0.606***
	(0.062)	(0.062)	(0.063)	(0.059)	(0.059)	(0.060)	(0.060)	(0.060)	(0.061)
Fund Size		0.290***	0.290***		0.236***	0.236***		0.111***	0.111***
		(0.048)	(0.048)		(0.036)	(0.036)		(0.022)	(0.022)
Avg Maturity by Regional Issuers			0.249***			0.248***			0.213***
			(0.061)			(0.058)			(0.059)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	215,605	215,605	215,605	215,605	215,605	215,605	215,605	215,605	215,605
Adjusted R^2	0.268	0.279	0.280	0.275	0.283	0.284	0.253	0.255	0.255

Table 3: Preference to Long-Term Bonds from Local Issuers (By Ratings)

This table presents, for each rating group, the regression results of maturities of local and distant bond portfolios on the dummy variable of *Local* . The data are quarterly bond holdings of US insurance funds. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. *Fund Size* is the size of assets under management by the fund. *Ave Maturity by Regional Issuers* is the average maturity of similarly-rated outstanding bonds by issuers in the same geographical area as covered by the bond portfolio. Column (1) to (3), Column (4) to (6), and Column (7) to (9) measure the portfolio maturity with the weight average maturity, average maturity and median maturity, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Maturity of Fund Holdings											
	Weighted Avg Maturity				Avg Maturity				Median Maturity			
	IG	SG	IG	SG	IG	SG	IG	SG	IG	SG	IG	SG
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Local	0.252***	0.558***	0.225***	0.454***	0.255***	0.601***	0.226***	0.499***	0.637***	0.826***	0.611***	0.743***
	(0.063)	(0.156)	(0.064)	(0.145)	(0.060)	(0.149)	(0.061)	(0.137)	(0.062)	(0.152)	(0.063)	(0.139)
Fund Size	0.306***	0.064***	0.305***	0.064***	0.265***	0.039***	0.264***	0.038***	0.142***	0.013	0.142***	0.012
	(0.049)	(0.018)	(0.049)	(0.018)	(0.039)	(0.013)	(0.039)	(0.013)	(0.028)	(0.010)	(0.028)	(0.010)
Avg Maturity by Regional Issuers			0.187***	0.599***			0.199***	0.586***			0.176***	0.481***
			(0.062)	(0.154)			(0.060)	(0.151)			(0.062)	(0.158)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	212,749	75,090	212,749	75,090	212,749	75,090	212,749	75,090	212,749	75,090	212,749	75,090
Adjusted R^2	0.283	0.262	0.284	0.264	0.289	0.268	0.290	0.270	0.263	0.248	0.263	0.249

Table 4: The Impact of Fund Size on the Local Preference

This table presents the regression results of maturities of local and distant bond portfolios on the interaction of the dummy variable of *Local* and the dummy variable *Small* . The data are quarterly bond holdings of US insurance funds. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. The indicator *Small* equals 1 if the fund size is less than the median fund size during a quarter. *Fund Size* is the size of assets under management by the fund. *Ave Maturity by Regional Issuers* is the average maturity of outstanding bonds by issuers in the same geographical areas as covered by the bond portfolios. Column (1) to (3) measure the portfolio maturities with the weight average maturity, average maturity and median maturity, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Maturity of Fund Holdings		
	Weighted Avg Maturity	Avg Maturity	Median Maturity
Local	0.530***	0.542***	0.826***
	(0.085)	(0.079)	(0.080)
Local×Small	-0.945***	-0.930***	-0.661***
	(0.145)	(0.137)	(0.135)
Fund Size	0.277***	0.224***	0.103***
	(0.047)	(0.034)	(0.021)
Avg Maturity by Regional Issuers	0.239***	0.238***	0.205***
	(0.061)	(0.058)	(0.059)
Time FE	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes
Observations	215,605	215,605	215,605
Adjusted R^2	0.283	0.287	0.257

Table 5: Preference to Long-Term Bonds from Local Issuers (w/o NYC-based Funds)

This table presents the regression results of tenors of local and distant bond portfolios on the dummy variable of *Local*. The data are quarterly bond holdings of US insurance funds excluding those based in NYC. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. *Fund Size* is the size of assets under management by the fund. *Average Maturity by Regional Issuers* is the average maturity of outstanding bonds by issuers in the same geographical areas as covered by the bond portfolios. Column (1) to (3), Column (4) to (6), and Column (7) to (9) measure the portfolio maturity with the weight average maturity, average maturity and median maturity , respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Maturity of Fund Holdings								
	Weighted Avg Maturity			Avg Maturity			Median Maturity		
Local	0.307***	0.268***	0.232***	0.307***	0.275***	0.239***	0.740***	0.726***	0.696***
	(0.074)	(0.074)	(0.075)	(0.071)	(0.070)	(0.071)	(0.072)	(0.072)	(0.073)
Fund Size		0.296***	0.295***		0.242***	0.242***		0.112***	0.111***
		(0.053)	(0.053)		(0.038)	(0.038)		(0.025)	(0.025)
Avg Maturity by Regional Issuers			0.237***			0.240***			0.196***
			(0.062)			(0.059)			(0.060)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	182,374	182,374	182,374	182,374	182,374	182,374	182,374	182,374	182,374
Adjusted R^2	0.291	0.301	0.302	0.299	0.307	0.307	0.274	0.276	0.277

Table 6: Preference to Long-Term Bonds from Local Issuers: Modified Durations

This table presents the regression results of durations of local and distant bond portfolios on the dummy variable of *Local*. The data are quarterly bond holdings of US insurance funds. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. *Fund Size* is the size of assets under management by the fund. *Ave Duration by Regional Issuers* is the average durations of outstanding bonds by issuers in the same geographical areas as covered by the bond portfolios. Column (1) to (3), Column (4) to (6), and Column (7) to (9) measure the portfolio durations with the weight average durations, average durations and median durations, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Durations of Fund Holdings								
	Weighted Avg Durations			Avg Duratons			Median Durations		
Local	0.330***	0.317***	0.315***	0.119***	0.104***	0.103***	0.209***	0.198***	0.197***
	(0.032)	(0.032)	(0.032)	(0.030)	(0.030)	(0.030)	(0.031)	(0.031)	(0.031)
Fund Size		0.122***	0.122***		0.135***	0.135***		0.096***	0.096***
		(0.018)	(0.018)		(0.019)	(0.019)		(0.017)	(0.017)
Avg Duration by Regional Issuers			0.325***			0.281***			0.257***
			(0.065)			(0.063)			(0.065)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	170,133	170,133	170,133	170,133	170,133	170,133	170,133	170,133	170,133
Adjusted R^2	0.231	0.240	0.241	0.276	0.285	0.286	0.254	0.258	0.259

Table 7: Preference to Long-Term Bonds from Local Issuers: Bond-level Evidence

This table presents the panel regression results of a bond's share in a fund on the dummy variable of *Local*. The data are quarterly bond holdings of US insurance funds. The indicator *Local* equals 1 if the bond is issued within 100 km of the fund, and 0 otherwise. The indicator *Long* equals 1 if the bond's maturity is greater than the median maturity of the bond universe during a quarter. *Fund Size* is the size of assets under management by the fund. *Amt Outstanding* is the outstanding amount ($billion) of the bond during a quarter. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Bond/Fund Share		
Local	-0.097*	-0.047	-0.048
	(0.052)	(0.040)	(0.041)
Local × Long	0.048**	0.081***	0.083***
	(0.024)	(0.027)	(0.030)
Long	0.001	-0.002	
	(0.008)	(0.008)	
Fund Size		-0.044***	-0.044***
		(0.008)	(0.008)
Amt Outstanding		0.059***	
		(0.006)	
Bond FE	Yes	Yes	No
Time FE	Yes	Yes	No
Bond Ratings	Yes	Yes	No
Bond × Time FE	No	No	Yes
Bond Ratings × Time FE	No	No	Yes
Observation	10,572,579	10,572,579	10,5725,79
Adj R	0.195	0.22	0.25

Table 8: The Local Preference and Investment Performance: Bond Yield Spreads

This table presents the panel regression results of portfolio yield spreads on the dummy variable of *Local*. The data are quarterly bond holdings of US insurance funds. Fund holdings are further sorted into portfolios based on the locality, credit ratings and maturity. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. *Fund Size* is the size of assets under management by the fund. Column (1) to (3) and Column (4) to (6) study the investment-grade and speculative-grade bond portfolios, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	Portfolio Yield Spreads					
	Full(IG)	Short Term(IG)	Long Term(IG)	Full(SG)	Short Term(SG)	Long Term(SG)
	(1)	(2)	(3)	(4)	(5)	(6)
Local	0.529***	0.346***	0.996***	1.745***	1.796***	1.843***
	(0.014)	(0.011)	(0.021)	(0.077)	(0.083)	(0.087)
Fund Size	0.004	0.003	0.005	0.031***	0.028*	0.013
	(0.003)	(0.004)	(0.005)	(0.012)	(0.016)	(0.009)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	167,980	155,195	132,927	55,923	45,951	38,195
Adjusted R^2	0.289	0.243	0.451	0.452	0.456	0.516

Table 9: The Local Preference and Investment Performance: Portfolio Returns

This table presents the panel regression results of portfolio returns on the dummy variable of *Local*. The data are quarterly bond holdings of US insurance funds. Fund holdings are further sorted into portfolios based on the locality, credit ratings and tenors. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. *Fund Size* is the size of assets under management by the fund. Column (1) to (3) and Column (4) to (6) study the investment-grade and speculative-grade bond portfolios, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	Portfolio Returns					
	Full(IG)	Short Term(IG)	Long Term(IG)	Full(SG)	Short Term(SG)	Long Term(SG)
	(1)	(2)	(3)	(4)	(5)	(6)
Local	0.168***	0.157***	0.246***	0.242***	0.234***	0.301***
	(0.004)	(0.003)	(0.006)	(0.017)	(0.018)	(0.021)
Fund Size	0.002*	0.001	0.001	-0.002	-0.004	-0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	155,500	143,843	123,394	53,650	44,306	35,904
Adjusted R^2	0.166	0.188	0.233	0.216	0.234	0.221

Appendix

Table A.1: The Impact of Fund Size on the Local Preference

This table presents the regression results of maturiy of local and distant bond portfolios on the interaction of the dummy variable of *Local* and the dummy variable *Small* . The data are quarterly bond holdings of US insurance funds. The indicator *Local* equals 1 if the constructed portfolio is composed of local bonds issued within 100 km of the fund, and 0 otherwise. The indicator *Small* equals 1 if the fund size is less than the median fund size during a quarter. *Fund Size* is the size of assets under management by the fund. *Average Maturity by Regional Issuers* is the average maturity of outstanding bonds by issuers in the same geographical areas as covered by the bond portfolios. In addition to the ZIP code and quarter fixed effects, all specifications also include managing firm fixed effects. Column (1) to (3) measure the portfolio tenors with the weight average maturity, average maturity and median maturity, respectively. Robust standard errors are clustered at the fund level. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	The Maturity of Fund Holdings		
	Weighted Avg Maturity	Avg Maturity	Median Maturity
Local	0.435***	0.451***	0.762***
	(0.083)	(0.077)	(0.078)
Local ×Small	-0.800***	-0.788***	-0.560***
	(0.140)	(0.134)	(0.131)
Fund Size	0.261***	0.198***	0.086***
	(0.047)	(0.037)	(0.024)
Avg Maturity by Regional Issuers	0.247***	0.245***	0.209***
	(0.060)	(0.057)	(0.058)
Time FE	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes
Managing Firm FE	Yes	Yes	Yes
Observations	215,605	215,605	215,605
Adjusted R^2	0.336	0.342	0.304