Is Beauty in the Eye of the Beholder? Do Fair Value Estimates Depend on Whether you are the Issuer or the Investor in Debt Securities?

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Abstract

We investigate the practices in fair value (FV) estimation of liabilities by comparing issuers' FV estimates of their debt securities to the investors' FV estimates *for the exact same security*. Using a hand-collected dataset of FVs disclosed by issuers, we find that issuers tend to be at the extreme ends of the distribution of FVs and are more likely to assign Level 1 hierarchy than investors. We also find that issuers treat illiquid securities differently than investors: Issuers are more likely to assign Level 1 for more liquid securities and assign higher valuations for more illiquid ones. Jointly, our results suggest that issuers have both a lower threshold for the determination of a liquid market and assign lower illiquidity discounts on bonds, providing novel evidence of how differences in fair values arise in practice and their implications on future financing.

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1. Introduction

In 2007 the Financial Accounting Standards Board (FASB) released SFAS 159 (ASC 820 under the FASB's rules codification), which requires firms to mark most of their financial assets to the fair value (FV) on their balance sheets and provides them with the option to account for their debt instruments at historical cost or at FV. Further, all firms must disclose the aggregate fair values of each class of their assets and each class of their liabilities in their financial statements.[1] This accounting change was controversial, as it introduced substantial discretion into financial reporting, especially for assets or liabilities without readily quoted market prices (i.e., illiquid securities) (Annett 2007, Moore 2017).

While researchers have extensively studied the FV determinations of assets, we know relatively little about the FV determinations made for liabilities and the importance of liquidity in these estimates (See Section 2). We fill this gap by examining issuers' disclosures of the FV of their liabilities, specifically their public debt instruments, focusing on whether they systematically assign different FV estimates than the corresponding investors and whether issuers use different methods for determining FVs than do investors.

Comparing investors' FV estimates to those of issuers provides an interesting natural experiment to examine factors affecting FV determination for liabilities. Issuers and investors are valuing the same set of cash flows, over the same maturity, with the same credit risk. One would expect them to derive similar valuations, especially since ASC 820 requires both investors and issuers to use unadjusted quoted market prices in active markets whenever available. Thus, if the public debt were actively traded, we would expect issuers and investors to use the same approach

[1] For a more recent discussion of the accounting rules and disclosure obligations as they relate to the fair values of liabilities, see https://asc.fasb.org/1943274/2147481866 at the FASB's website (The "Broad Transactions" tab linking to rule number 820-10-50-2).

to valuing the security (Level 1) and arrive at the same FV. Similarly, ASC 820 requires issuers to consider the FV estimates provided by investors when determining the FV of their liabilities, and thus even in inactive markets, we would not expect the estimates and the measurement methods used by issuers and investors to differ systematically.[2]

However, the standard also allows issuers and investors to deviate from quoted market prices if, in their judgment, the market is determined to be inactive.[3] As a result, investors and issuers may make different assessments of the activity of the market and assign different liquidity designations (Level 1 versus Levels 2 or 3). Similarly, they may derive different valuations of the underlying security because they apply different techniques. For example, if no trades occur on the valuation date, issuers could value the security at the midpoint of the bid-ask spread, while investors could be using the ask price, leading to differences in valuations. While it is unclear whether these differences would be systematic, ASR 118 does require mutual funds (one of the primary investors studied here) to develop a rule for all OTC-traded securities that is consistently applied (e.g., valuing all securities in their portfolio that trade in the OTC market at the midpoint between the bid and ask). This requirement could lead to systematically different valuations between mutual funds and issuers.

Given this institutional setting, it is ex-ante unclear whether we would observe the same or systematically different fair values between issuers and investors. We suggest that one of the key drivers of differences between these groups is the determination that both issuers and investors must make regarding the liquidity of the market and how prices should reflect that liquidity. If

[2] Specifically, ASC 820-10-35-16B, and ASU 2011-04 paragraph BC 33 indicates that the FV of liabilities should be the same as those of the underlying FV estimates made by the asset holders and requires the issuers of the liabilities to consider the fair value estimates of the asset holders when determining making their FV. Thus, in a liquid market, FV estimates of the asset holders should be the same as those of the issuers, with limited exceptions (PwC 2022). See ASC 820-10-35-40 and 41 for further discussion of the FV rules when there are readily quoted market prices.
[3] For a discussion of measuring FVs in inactive markets, and indicators of inactive markets, see ASC 820-10-35-54.

issuers and investors both determine the market to be liquid, with readily quoted prices, they should have valuations that do not differ statistically. If they both determine the market to be illiquid, then whether they derive the same valuations will depend on the discount each group assigns to illiquidity. Finally, if they disagree on market liquidity, they are unlikely to have the same valuations; whether issuers or investors are more or less likely to view the market as liquid is an empirical question.

To explore these research questions, we hand-collect data from a set of issuers that disclose the FV of individual debt securities (specifically publicly traded debt) over the period of January 2017 through December 2019 (either because they only issued one tranche of debt securities or because they chose to make fair value disclosures of each tranche of debt they issued). We then identify the CUSIP of the security and match it to all mutual funds and insurers that we can identify as owning it. We thus identify 1,434 issuer-years for which we can ascertain the FV of at least one publicly traded debt security. For 1,385 issuer-security-years, we can match the issuer's valuation of the security to mutual fund data and obtain the valuation of the security made by the mutual fund. This results in 54,312 mutual fund-security-year valuations. For 895 issuer-security-years, we match the issuer's valuation to insurer data and obtain the valuation made by insurers. This results in 22,567 insurer-security-year valuations. Collectively, our sample consists of over 76,000 fair value estimates made by the issuer and either of these investors over a three-year panel, where each security is held by an average of 54 investors per year.

Our first analysis focuses on the question posed in our title—does the FV determination of a stream of cash flows and, in particular, the propensity to be at the extremes of the distribution depend on whether the evaluator is on the asset side or the liability side of the transaction? We start with some simple descriptive statistics. For the 1,434 debt securities where we can observe

fair values of the debt security for both the issuer and at least three asset holders, we estimate the probability that the issuer would provide the highest valuation based on pure chance. For instance, if there are 19 investors and one issuer for each security-date, we would expect the issuer to be at the maximum and minimum on 5% of the dates.

In our sample, we estimate that an issuer is expected to be either at the minimum or the maximum of the distribution 3.6% of the time based on pure chance, but we observe that an issuer is at the maximum 19.2% of the time and at the minimum 20.2% of the time. Thus, compared to random chance, the issuer is 5.3 times more likely to place a larger valuation than an average investor and 5.6 times more likely to provide a smaller valuation than an average investor. We confirm our results in multivariate regression analysis with security-year fixed effects, with the results being more robust for the maximum.[4] These results suggest that an issuer is more likely to overvalue securities (be at the maximum valuation) than an average owner of that debt.

We next explore whether differences in accounting rules and economic incentives across investor types drive our results. For instance, issuers typically only disclose FVs.[5] Insurers follow a similar approach, in that the FV of each security is disclosed in their statutory financial statements, but publicly traded insurers also recognize FVs on the balance sheet (when they classify the security as available for sale) but typically do not recognize changes in FVs in the income statement. Finally, mutual funds must recognize FVs on the balance sheet and income statement. Based on these differences, we compare issuers to each type of investor separately, to examine whether variation in the accounting influences this result. We find that an issuer is more likely to be at the maximum when compared to only insurers (relative to when compared to only

[4] We find significantly weaker results for the minimum, and they become insignificant in some specifications.
[5] While issuers have the option of recognizing the FV of debt in their financial statements, in practice this seldom happens outside of the financial services industry, and none of the firms in our sample elect this option.

mutual funds). We also find that issuers are significantly more likely to be at the maximum when compared to only mutual funds. Jointly, these results suggest that differences in accounting treatment or other incentives among investors are not causing the issuers to be systematically at the maximum compared to the investors.[6]

Having established that differences in security treatment *among* investors do not fully explain the issuer's propensity to have larger FV determinations, we next study the differences in security treatment *between* the issuer and investors. Specifically, we hypothesize that investors and issuers tend to have different time horizons (i.e., investors are more likely to actively trade the security before maturity) and thus will differ in how they incorporate a security's liquidity into the FV estimate. Consistent with there being significant differences in how different parties perceive liquidity, we find that issuers classify securities as Level 1 (i.e., traded in an active markets) 18.9% of the time, while mutual funds investors virtually never use Level 1, and insurers use Level 1 valuations 7.4% of the time. This implies that issuers have very different views as to what constitutes a liquid market. We further investigate issuers' and insurers' decision to use Level 1 valuations. While we find that they both are more likely classify securities as Level 1 when they are more liquid, consistent with the guidance provided in the accounting standard. We also find evidence that issuers respond more to market-based measures of liquidity in their decision to use Level 1 valuation techniques.

If issuers and investors price liquidity differently in their valuations, this can happen in at least two (non-mutually exclusive) ways. First, issuers and investors could disagree on *whether* the security is liquid. Second, they could agree that a security is illiquid but disagree on the extent

[6] For completeness, we also compare mutual funds to insurance companies and find that mutual funds are more likely to be at the maximum than insurance companies. This implies that the type of investor holding the security influences the investor's fair value determinations, but we do not explore this further in detail to focus on our main research question.

of the illiquidity discount. We consider each of these possibilities separately in our next set of analyses.

We first find that issuers are more likely to be at the maximum of the distribution across all three levels (Levels 1, 2, or 3), suggesting that the issuer's determination of the liquidity of the security cannot fully explain the differences in FVs we observe between issuers and investors. We also find that, when issuers and investors agree that a security does not trade in an active market, investors tend to take a larger discount for any observed illiquidity. Specifically, we collect data on the observability of prices and the liquidity of the market (volume of trading, number of investors) at the end of the period and examine the extent to which issuers and investors are likely to incorporate this illiquidity into their valuations. We find that issuers are less likely to be at the maximum when more investors hold the security and when there are high trading volumes at the end of the year when the security is being valued. These results suggest that the propensity for issuers to assign higher valuations than investors occur most often in the least liquid securities.

Finally, we investigate the consequences of these practices by studying the decision to raise debt in the public or private markets in subsequent years. We conjecture that the issuers that assign a higher credit quality to their publicly traded debt than investors have incentives to issue debt privately, where they can share proprietary information regarding their credit quality with lenders. We find that firms that overstate the value of their securities are more likely to borrow privately in the year after they make their FV disclosures. This effect is more pronounced when prices are unobservable (implying a thinly traded market). Similarly, when there are no observable prices, firms that value their securities less than investors appear to raise debt in the public market, taking advantage of public debtholders' higher valuations.

Our findings should matter to researchers, practitioners, and regulators. First, we add to the literature on FV accounting by studying FVs of *liabilities*, a topic that has been relatively underexplored. The closest line of research focuses on whether changes in FV of liabilities have implications for shareholders (e.g., Barth et al. 2008), yet we know little about the decision-making behind issuers' FV measurements. Our paper is one of the first attempts to fill this void by showing that issuers systematically assign higher valuations, designate securities as being more liquid, and price illiquidity differently than investors holding the same security.

Second, our evidence on how issuers define and price liquidity differently is important in light of the central role of FV accounting in capital markets. A recent paper by Longstaff (2017) highlights that the discounts for liquidity can be surprisingly large (30%–50%). Reduced liquidity can lead to markets freezing, with buyers and sellers unwilling to transact at any price (Easley and O'Hara 2009). Thus, our findings contribute to the discussion around whether FV accounting for illiquid securities can feed or mitigate a financial crisis (Laux and Leuz 2010).

Lastly, our novel dataset provides a powerful setting to examine whether issuers and investors have differences in FVs and the role of liquidity in explaining these differences.[7] We demonstrate that, for the same security, issuers are more likely to consider the market to be active (i.e., assign Level 1 hierarchy) than investors. Yet this *perceived* liquidity does not fully explain their valuation practices; rather they are more likely to assign higher valuations to illiquid securities based on market-based measures. These results are likely to be useful to the FASB, as well as the SEC and other regulators, as current FASB guidance indicates that the FV of liabilities

[7] A potential concern is that we examine issuers who voluntarily disclose security-level FV estimates in their footnotes, which can create selection bias. While finding differences in FV with firms of high accounting quality accounting makes our results even more meaningful, we also confirm that our results are robust to using a subsample of firms that issued only one debt security, which have to disclose their FV, regardless of their disclosure quality.

should be the same as that of the underlying asset, other than in exceptional circumstances. Our results suggest that this guidance is not followed systematically.

2. Literature Review and Hypothesis Development

Since the adoption of SFAS 115 by the FASB in 1993, researchers have explored various topics related to FV. These include investigating whether firms exercise discretion when valuing financial assets, the usefulness and relevance of their estimates, factors affecting that usefulness, and the role of estimates in regulatory capital calculation and the financial crisis (e.g., Barth 1994, Barth et al. 1996, Eccher et al. 1996, Hirst et al. 2004, Hodder et al. 2006, Laux and Leuz 2010, Song et al. 2010, Hanley et al. 2018). We augment the literature by adding three key features. First, much of the research has focused on the asset side of the balance sheet, examining the determinants and consequences of fair valuing *assets*, primarily in the context of financial firms. We focus on *liabilities*, which has been an area that has received less attention, despite its importance. Second, we use investors' valuations of the security on the same date as a benchmark to compare the valuations made by the issuers, which creates a powerful setting to test hypotheses on factors affecting FV estimates. Third, we add to the nascent literature examining security-level FV estimates.

2.1 Fair Valuing Liabilities

The research on fair valuing liabilities focuses primarily on the potential gains to equity investors when the FV of liabilities decreases (e.g., Evans et al. 2013, FASB 2010). In support of this theoretical idea, Barth et al. (2008) provide evidence of a negative relationship between equity returns and changes in credit risk, indicating that investors respond rationally to firms that mark debt to market value and recognize changes in market value through the income. However, an experiment by Gaynor et al. (2015) finds that over 70% of participants incorrectly assessed a

company's credit risk to be improving or deteriorating when a gain or loss associated with a FV adjustment to debt was recognized. In another experimental study, Koonce et al. (2011) find that investors views on FVs differ for liabilities versus assets. Collectively, it remains unclear how investors use the FV estimates of debt securities in their investment decisions (Lachmann et al. 2015) and whether firms (issuers) have a clear incentive to overvalue or undervalue these securities.

2.2 Combining Fair Values of the Investor and the Issuer

A key feature of our paper is that we combine the FV disclosures of liabilities with those made by the investors to derive one distribution of FV estimates. We consider two different types of investors. The first is mutual funds, who fair value all the securities in their portfolio on a daily basis. The second is insurers, who also hold (and report) their estimates of the FV of the debt securities in their portfolio at the end of each reporting period. By aligning mutual funds, insurers, and issuers in calendar time, we can observe the distribution of FVs for these three different constituents. This allows us to examine whether the nature of the appraiser (issuer or investor) that is providing FV estimates cluster in different parts of the distribution.

A key factor that may lead to differences in the valuation of the underlying securities across these three different constituencies is potential differences in valuation models employed by each group. Both issuers and investors must assign securities into three different categories, Level 1, 2, or 3, and use level-appropriate valuation methods, when making FV estimates. Each group (issuer, mutual fund, or insurer) can employ different valuation techniques in each category, if there is disagreement in the liquidity of the security, and these differences could also lead to issuers or either group of investors systematically over- or undervaluing the security.

Amihud et al. (2006) and Easley and O'Hara (2010) examine the implications for uncertainty and liquidity in the valuation of *assets*, where increased uncertainty leads to more illiquidity, which is likely to be reflected in the FV determination of these assets. It is much less clear whether the illiquidity in the market for the asset would affect the issuer's determination of its FV. If issuers do not incorporate this cost of illiquidity, then they are likely to value securities that have less liquidity higher than the investors. For instance, illiquidity often leads to an underpricing of the securities, creating arbitrage opportunities for the asset holders (Mitchell et al. 2007, Choi et al. 2009).[8] In the presence of recent price availability, a lower illiquidity discount would lead to a smaller difference between the market price and fair value for the issuers compared to investors.

A second factor that is likely to affect the dispersion in FV estimates across issuers and investors is differences in the incentives these different stakeholders face. The firms issuing the debt (on the liability side of the transaction) are disclosing their assessment of the default risk of the underlying instrument. They have access to private information that the investors do not have and have incentives to indicate that the securities are a higher credit quality, especially if they plan on accessing the debt markets in the near future. Some investors, like mutual funds, have incentives to increase their FV estimates, as the unrealized gains and losses flow through the income statement and thus the managers of these funds will be viewed as better performers if they increase their FV disclosures (Pulliam et al. 2007, Jacobson and Kowara 2021). Other investors, like insurers, face regulation on their capital adequacy and thus have incentives to increase their FV estimates to avoid regulatory scrutiny (e.g. Hanley et al. 2018). Thus, all three set of stakeholders

[8] The literature documents underpricing of convertible bonds upon issuance (Kang and Lee 1996, Chan and Chen 2007, Choi et al. 2010), with a potential explanation of investors asking for higher premium due to estimation risk.

have incentives for higher valuations, but it is unclear, *ex-ante*, which one has the strongest incentives.

A third factor that can lead to differences in valuations is the accounting model employed by the issuers and investors. At the most basic level, all of the issuers of the security in our sample do not recognize the changes in the FVs of these securities in the financial statements. Instead they disclose these values. The investors' treatment of these securities differs. Like issuers, privately held insurers also only disclose the FVs of each security (in their statutory financial statements). Publicly traded insurers recognize FVs on the GAAP balance sheet for securities held as available for sale but typically do not recognize changes in FVs in the income statement.[9] Mutual funds, on the other hand, mark the assets to FV and flow the gains and losses associated with FV changes through income. Thus, issuers disclose FVs, insurers also disclose these FVs, but some also reflect them on the balance sheet, while mutual funds recognize them. The research on the disclosure versus recognition decision suggests that investors are more likely to incorporate recognized amounts into their investment decisions (Michels 2016, Ahmed et al. 2006, Aboody 1996). Thus, from an accounting perspective, entities recognizing fair values are likely to have a stronger incentive to inflate values to affect investors, and thus these incentives are likely to be larger than the issuer's incentives.

2.3 Research on Fair Value Estimates at the Security Level

The last key feature of our paper is extending the nascent literature examining fair value estimates at the security level. This relatively new stream of research focuses on the asset side of the balance sheet, illuminating the factors affecting the dispersion of those fair value estimates.

[9] For both public and private insures, while FVs are disclosed, whether they are recognized in the statutory financial statements depends on the type of insurer (life versus property and casualty) and their riskiness of the security (e.g. the regulator-determined deterioration in the credit quality of the security). These rules impede ascertaining FV recognition in statutory financial statements.

For example, Cici et al. (2011) focus on the valuations of bonds in the mutual fund industry, examining the dispersion in prices of bonds held by the same funds. They show that the availability of quoted market prices and the methods used to value the bonds contribute to this dispersion. Berfeld (2022), Song (2021), and Hogan et al. (2023) examine the FV estimates made by insurers, providing evidence on whether auditor specialization, expertise, experience, and the general information environment affect the dispersion in fair value estimates. Jointly, these papers demonstrate that investors of debt securities have dispersion in their FV estimates, and this dispersion relates to both the investor incentives, characteristics of the firm (like its auditor), and characteristics of the market.

2.4 Hypotheses

Our discussion above highlights that differences in views on liquidity, along with different incentives and different accounting models, are all likely to affect the FV estimates of issuers relative to investors. Two other factors are likely to affect the distribution of valuations. First, during our sample period, mutual funds had to follow ASR 118. This rule requires each fund to develop a consistent approach to fair valuing all securities traded in the OTC markets. To the extent that mutual funds choose different approaches (e.g., some mutual funds may decide to value all securities in their portfolio that trade OTC at the midpoint between the bid and ask, while others may value them at the ask and still others at the bid), this could lead to mutual funds' valuations all clustering at some point in the distribution.

Second, ASC 820-10-35-16B, and ASU 2011-04 paragraph BC 33 indicates that, when issuers are fair valuing their liabilities, they should consider the FV estimates of the investors in their estimates. This would suggest that there should be no significant differences in FV estimates between the investors and the issuers.

Based on this discussion, we cannot make a signed prediction on whether investors are likely to value securities more or less than issuers. We formally state our first hypothesis as follows:

H1: The propensity for debt issuers to be at the top or the bottom range of the distribution of fair value estimates differs from the propensity of mutual funds, which also differs from the propensity of insurers.

Our second hypothesis focuses on the issuers' and investors' assessments of liquidity on the date that they value a security. Both issuers and investors must determine whether the security trades in an active market, or, if it trades in an inactive market, whether other securities with readily determinable market values can be used to value the security (e.g., both issuers and investors must classify the security as Level 1, 2, or 3). It is unlikely that issuers and investors will use the same liquidity classification schemes, and they have to consider the liquidity of the instrument in their valuations. Thus, they are likely to have sophisticated approaches to assess liquidity. Issuers make a liquidity determination once per year at the end of the year. While there are likely differences in the classifications of these securities across the issuer/investor partition, it is unclear whether either group will be more or less likely to classify securities as Level 1. This leads to our second hypothesis:

H2: The propensity for debt issuers to use Level 1, 2, or 3 classifications in determining the FV estimates of their securities differs from the propensity of investors.

Our third hypothesis focuses on the intersection of our first two hypotheses. If issuers are more likely to overvalue or undervalue securities, there are at least two non-mutually exclusive motivations for this difference related to the liquidity of the security. First, we hypothesize that issuers could be more likely to assess the security as being liquid (illiquid) and use Level 1 (Level 2 or 3) valuation techniques, and this difference in methodology drives the differences in valuations. Alternatively, issuers and investors can use the same classification levels (Level 1, 2,

or 3) but take larger or smaller valuation discounts, due to the illiquidity of the underlying security. This leads to our next two hypotheses:

H3A: The propensity for debt issuers to be at the top of the range of the distribution of FV estimates is due to the differences in level designations (Level 1, 2, or 3) used by issuers compared to investors.

H3B: The propensity for debt issuers to be at the top of the range of the distribution of FV estimates is due to the differences in the valuation discounts used by issuers (compared to investors) due to the illiquidity of the underlying security.

Our final hypothesis relates to the debt-market-consequences of the issuers' propensity to overvalue the security. Specifically, we posit that one reason that issuers may have higher valuations for their debt securities is that they have private information regarding their credit quality that is not reflected in security prices. If so, we would expect that, when issuers view their security as more valuable than investors do, they take advantage of this by sharing this private information with perspective lenders without violating security regulations. Thus, our final hypothesis is:

H4: Issuers that assign higher valuations to their debt instruments than investors are more likely to access private debt markets in future debt financing transactions.

3. Data and Research Design

3.1 Data and Sample Selection

Our analysis requires obtaining security-level FV estimates for both issuers and investors of a security. We identify two types of investors, mutual funds and insurers, which provide FV estimates on an individual security. To identify the universe of corporate-issued debt securities, we obtain FV estimates from N-PORT filings for the fourth quarter of 2019 and limit our sample to funds with at least one debt security investment. Since N-PORT filing requirement extends back

to only September 2019, we supplement N-PORT with observations for years 2017 and 2018 obtained from the CRSP Mutual Fund database.

Next we obtain FV estimates of life and property insurers from the National Association of Insurance Commissioners (NAIC). Insurers must report to their regulators (as part of Schedule D in their end of year regulatory submissions) the FV that they assign to each fixed income security in their portfolio. Following Hanley et al. (2018), who note that FVs are determined at the insurance group level, we aggregate our data on insurers' FV estimates at the group level.

Unlike mutual funds, which publicly report portfolio holdings quarterly, insurers disclose the FV of securities annually at the end of each calendar year. To ensure consistency in time periods when comparing security valuations between different groups of investors and between investors and issuers, we limit our analysis to fiscal issuers with calendar year-end. We further restrict our sample to securities with non-missing coupon and maturity and securities of issuers with sufficient Compustat data to calculate our control variables.

Next we turn to issuers' financial reports to obtain issuers' security-level FV estimates. We begin by manually reviewing the 2017 to 2019 annual reports of issuers with calendar year-ends and at least one debt security held by N-PORT filers. ASC 825 mandates that issuers disclose quarterly the FV of debt. This requirement is typically satisfied by disclosing the total FV of debt securities in the footnotes to regulatory filings. While accounting rules do not prescribe the more detailed security-level disclosure that is required for our analysis, we can obtain security-level FV estimates for about 30% of the companies reviewed, either because the issuer only issues one security or because it chose to provide a security-level disclosure.

Our data relies by construction on the voluntary reporting of issuers that choose to disclose the fair values of their debt instruments at the security level. That is, we select on issuers that

voluntarily provide security-level fair value estimates in the footnotes of their annual reports. A potential concern of this design is selection bias, where issuers in our sample are likely to be large established firms with high quality disclosure practices. We argue that this bias likely leads us to underestimate the true differences between issuers and investors' FVs in the population. To the extent that having higher disclosure quality is associated with having better accounting practices in general (and in particular with respect to FV valuation), we select on issuers that are likely to be more sophisticated in their FV valuations. Consequently, they are less likely to systematically differ from investors due to a lack of expertise in applying FV methodologies. To further alleviate this concern, in untabulated tests, we rerun the analysis on the subset of issuers that only have one public debt security (and thus disclose the FV at the security level, regardless of their disclosure quality) and continue to find similar results.

We also obtain the data required to construct size, leverage, ROA, and book-to-market variables from Compustat. Public debt issuance data is obtained from SDC and FISD datasets, and private debt issuances are collected from Dealscan. Trading volume data is obtained from TRACE. All continuous variables are winsorized at the first and 99th percentile. We normalize FV estimates of issuers by dividing the security-level fair values collected from financial reports by the principal outstanding at the end of the reporting period. Similarly, we construct investors' FV estimate measurement by dividing the FV of their holdings by the principle held.[10] A complete list of variables and their construction is available in Appendix A.

We match the investors' and issuers' FV estimates using security characteristics (coupon and maturity) and fair value measurement date (e.g., securities of issuers with fiscal year-end

[10] We round all FV estimates to the fourth digit to ensure better comparability between FV estimates reported in different units (e.g., thousands or millions of dollars). This methodology biases against finding results because it reduces the variation between issuers and investors.

December 31 would be matched to portfolios with reporting period end December 31). Additionally, we drop securities with issuers' FV denominated in foreign currency and securities that are held by fewer than three mutual funds or insurers. Finally, to ensure that our results are not driven by outliers and FV reporting errors, we trim our data by dropping observations where investors' and issuers' FV estimates differ by more than 5%.[11]

Table 1 summarizes sample selection. Our final sample consists of 54,312 fund-security-year observations that correspond to 267 issuers and 691 securities and 22,567 insurance group-security-year observations that correspond to 208 issuers and 501 securities. In this sample, there are 539 (49) security-years for securities held by mutual funds (insurers) only. There are 846 security-years for securities are held by both.

Table 2 presents the descriptive statistics of our final data. Panel A presents descriptive statistics at the issuer-security-year level. First, we show statistics for all available security-years (i.e., security-years held by mutual funds *or* insurers). This sample consists of 1,434 observations. On average (median), these securities have 54 (48) investors (both mutual funds and insurers). Our univariate statistics also indicate that, compared to both insurers and mutual funds, the issuer is at the maximum of the valuation range 19.2% of the time and at the minimum 20.2% of the time. On average, 16.5% of the securities are convertible; that is, they have an embedded option that allows the investor to convert the debt into equity. The average security has a coupon rate of 4.46% and 7.52 years to maturity and is 3.13 years old. We observe that 81.7% of securities have a market price available within three days of year-end. Securities have a trading volume of $2.29 million on

[11] We impose this restriction to ensure data errors are not the source of our results. Note that this restriction also reduces the economic significance of our results.

average over the three-day window prior to year-end. We also find that 18.9% of the securities are assigned Level 1 by their issuer. [12]

At the bottom of Table 2 Panel A, we provide the key summary statistics for the subset of securities held by mutual funds and insurers only. That sample contains 1,385 securities, which are held by an average (median) of 39 (31) mutual funds. The issuer is at the maximum (minimum) 19.8% (21.6%) of the time on average, compared to mutual funds. Finally, the subsample of securities only held by insurers contains 895 securities. They are held by an average (median) of 25 (22) insurers. The issuer is at the maximum (minimum) 32.4% (20.7%) of the time on average, compared to insurers.

Panels B presents data at the *investor*-security-year level (as opposed to the *issuer*-security-year level in Table 2 Panel A). We find that mutual funds are at the maximum and minimum of the valuation range in 8.2% and 15.8% of the security-years respectively. Additionally, insurers are at the maximum and minimum of the valuation range in 8.8% and 13.2% of the security-years respectively.

A striking finding in Table 2 is that issuers are far more likely to classify their securities as Level 1 than are mutual funds or insurers. In the bottom rows of Panels A, B, and C, we show that, while virtually none of the mutual funds classify the securities as Level 1 (three out of 54,312 observations, mean of 0.00), insurers and issuers classify securities as Level 1 approximately 7.4% and 18.9% of the time respectively.[13] Panels C and D of Table 2 formally test for the differences

[12] In 64 cases, we could not locate the disclosure or determine whether issuers classify their securities as Level 1 or Level 2, due to vagueness in wording. For instance, Everbridge Inc. (CIK: 1437352) disclosed: "The Company estimates the fair value of the convertible senior notes based on their last actively traded prices (Level 1) or market-observable inputs (Level 2). As of December 31, 2017 the fair value of the convertible senior notes was determined to be $126.9 million and the carrying value of the notes were $89.5 million."

[13] FV-level designations for mutual funds are available only for observations collected from form N-PORT in 2019. Based on the fact that level designations do not tend to change over time for the same security, we assume that these assignments are the same throughout the previous three years. Furthermore, in untabulated tests, we rerun our Level 1 tests on 2019 data only and find our inferences are unchanged.

in the propensity of issuers to assign Level 1 compared to mutual funds and insurers, respectively. We find that the differences are highly statistically significant. This suggests that issuers are more likely to perceive their debt securities as liquid, motivating one of our tests in examining whether the perceived liquidity explains the systematic difference in FVs between issuers and investors.

3.2 Research Design

To understand the differences in FV valuations between issuer and investors, we begin by assessing where the issuer lies in the distribution of FVs of security investors for each issued security. Specifically, we test whether an issuer is likely to be systematically overstating or understating the FVs of the security compared to an average investor. To do this, we use both univariate and regression analyses. Our regression design uses a stacked sample. For each security-year, we stack the issuer's FV valuation and the investors' valuations in a single dataset, resulting in variation at the *appraiser*-security-year level. We then compare, within each security-year, the likelihood of the issuer being at the minimum or maximum of the distribution. That is, we run the following regression:

$$Max\ (Min)\ Value_{a,s,t} = \beta_1 Issuer_{a,s,t} + \delta_{s,t} + \varepsilon_{a,s,t}, \quad (1)$$

where the dependent variable $Max\ Value_{a,s,t}$ is an indicator variable equal to one if the appraiser a is at the maximum of the distribution of FVs for security s at year t. Similarly, $Min\ Value_{a,s,t}$ is an indicator variable equal to one if the appraiser a is at the minimum of the distribution of FVs for security s at year t. $Issuer_{a,s,t}$ is an indicator variable equal to one if appraiser a is the issuer of security s. We include security-year fixed effects ($\delta_{s,t}$) to control for all time variant and invariant characteristics of the security and compare the propensity of the issuer to be at the maximum or minimum *within a security*. We cluster standard errors at the issuer level.

This stacked sample also allows flexibility in isolating the effects of issuers compared to only mutual funds and only insurers.

In the second part of our analysis, we study how views regarding liquidity affect the above relationship. First, we study issuers' and investors' propensity to assign Level 1 (the most liquid designation) to their securities by replacing the dependent variable in regression (1) with $Level\ 1_{a,s,t}$, an indicator variable that is equal to one if appraiser *a* assigns Level 1 to security *s* at time *t.*[14] We also examine how this relationship varies based on liquidity. To test these relationships, we estimate the following regression:

$$Level\ 1_{a,s,t} = \beta_1 Issuer_{a,s,t} + \beta_2 Issuer_{a,s,t} \times Liquidity_{s,t} + \delta_{s,t} + \varepsilon_{a,s,t}, \quad (2)$$

where $Liquidity_{s,t}$ refers to one of three proxies. First, we use *Log Volume*, defined as the natural log of trading volume within three trading days prior the fiscal year-end date. Next we use *Price Observability*, an indicator variable equal to one if there exists a market price for security *s* within three trading days prior to the fiscal year-end date. Lastly, we proxy for liquidity using the natural log of the number of investors holding the same security (*Log No. of Investors*). The main effect for *Liquidity* is absorbed by the security-year fixed effect.

In our next analysis, we study how liquidity affects the propensity for the issuer to be at the top or bottom on the range (i.e., the relationship we find in Eq. (1)). Using the same proxies for liquidity as defined above, we estimate the following regression. As before, the main effect of *Liquidity* is absorbed by the fixed effects.

$$Max\ (Min)\ Value_{a,s,t} = \beta_1 Issuer_{a,s,t} + \beta_2 Issuer_{a,s,t} \times Liquidity_{s,t} + \delta_{s,t} + \varepsilon_{a,s,t}. \quad (3)$$

[14] Mutual funds are not considered in this analysis, as they virtually never assign Level 1 hierarchy in our sample.

Finally, we examine the consequences of the issuer over- or understating its securities by examining their future issuance. To conduct this test, we use 660 issuer-year observations to run the following regression:

$$Issuance_{\mathrm{i,t+1}} = \beta_1 Overstate\ Score_{s,t} + \sum_{j,s,t} \beta_j\ Controls_{j,s,t} + \psi_t + \epsilon_{s,t}, \quad (4)$$

where *Issuance* refers to either *Public Issuance* or *Private Issuance*, an indicator variable equal to one if the firm issued public or private debt in the next year, respectively. $Overstate\ Score_{s,t}$ is calculated as follows. For each security-year, we define *overstate* as an indicator variable equal to one if the issuer's FV is above the 75th percentile in the distribution of FVs for that security-year. We then average *overstate* across all securities at the issuer-year level, weighted by the number of investors of the security. We control for leverage, the natural logarithm of assets, and each firm's ROA and book-to-market ratio. We also control for the presence of a Big 4 auditor and the number of securities that an issuer issues in our sample to account for the quality of the disclosure. Finally, we control for the dispersion in the investors' FV estimates of each security through a measure of the standard deviation of investors' values, to account for complexity. Further, we use year fixed effects in this design and cluster standard errors at the industry level.[15]

4. Results

4.1 Differences Between Issuers' and Investors' Valuations

We begin by performing univariate tests to understand the relationships we observe in the data between issuers' and investors' valuations (i.e., mutual funds and insurers). First, in Panel A of Table 3, for the 1,434 security-issuer-years in our sample, we compare the frequency with which

[15] We include year fixed effects only as including industry fixed effects results in negative adjusted R-squared. However, the results are robust to the inclusion of industry fixed effects.

the issuer is at the maximum and the minimum of the distribution of FVs with the average random chance that the issuer ends up at the minimum and maximum. For each security, we calculate the random chance of the issuer being at a given point in the distribution as one divided by one plus the number of investors of the security. For instance, if there are 19 investors and one issuer for each security-date, we would expect the issuer to be at the maximum on 5% of the dates and the minimum on 5% of the dates. We then compare the average probability with the actual observed likelihood of the issuer being at the maximum or minimum. We find that the issuer is significantly more likely to be at both the maximum (t-stat 15.27) and minimum (t-stat 15.67), which suggests that the issuer tends to be at the extremes of the distribution more often than would be expected by chance.

Next we compare the observed probability of an issuer and an average investor being at the extremes of the distribution of FVs for the same security-year in Panel B of Table 3. For the full sample of 1,434 security-years and 76,879 investor-years (consisting of 54,312 mutual fund investor-years and 22,497 insurer investor-years), we find that an issuer is more likely to both overvalue and, to a lesser extent, undervalue the security compared to an average investor. Further, to control for bond characteristics and time trends, we report the estimates from the multivariate regression from Eq. (1) in Table 4. We find that issuers are approximately 10% more likely to be at the maximum (t-stat 5.48), and, to a lesser extent (both economically and statistically), at the minimum (t-stat 1.92) than an average investor.

We next consider the *type* of investor. The type of investor, whether mutual fund or insurer, can affect the results for several reasons. First, accounting treatment may affect valuations. Insurers are not subject to the same fund accounting standards as mutual funds (i.e., ASR 118

during our sample period),[16] so any changes in FV flow through net income for mutual funds but not insurers.[17] Furthermore, insurers are subject to regulatory supervision that broadly makes them more conservative firms. These differences may provide more incentives for mutual funds to overstate FVs.

To consider how the type of investor is associated with the position in the FV distribution, in Table 5, we perform tests analogous to Table 4 separately for mutual fund and insurer investors. Panel A of Table 5 presents the results when comparing issuers to only mutual funds. We continue to find that issuers are more likely to be at the maximum of the FV distribution compared to an average fund. In particular, being an issuer is associated with 8.2% higher likelihood of being at the maximum (t-stat 3.99). Meanwhile, in column (2), we find that the coefficient for minimum, while still positive, is statistically insignificant and economically smaller than the coefficient on maximum in column (1).

Table 5 Panel B presents the results when comparing issuers to only insurers. We expect that, if our results are driven by differences in accounting treatment between investors, which give more incentives for mutual funds to inflate FVs than insurers, we would find stronger results. Indeed we find that the issuer tends to be at the maximum even more often compared with insurers (as opposed to mutual funds). In particular, being an issuer is associated with a 21.5% increase in the probability of being at the maximum of the distribution (t-stat 5.70) compared to an insurer investor. This is higher than the 8.2% found for mutual funds in Panel A, and this difference is both economically and statistically significant (chi-squared test statistic of 22.31). The coefficient

[16] ASR 118 was superseded by Rule 2A-5 in April 2021, which is after our sample period. The new rule was designed to better align the SEC rules with GAAP in terms of the definition of "readily available quoted market prices."
[17] As discussed above, public insurers classify most fixed income securities as available for sale, and therefore the balance sheet reflects their fair value (Hanley et al. 2018), and gains and losses flow through OCI. The treatment of fair values for private insurers varies on the factors discussed above.

on minimum is again economically smaller and statistically insignificant.[18] Moreover, when we compare the propensity of mutual funds to be at the maximum compared to that of insurers in Table 5 Panel C, we find that a mutual fund is more likely to be at the maximum, on average (t-stat 13.48). Overall, while these results are consistent with accounting treatment and incentive differences influencing the result we document in Table 4, they do not fully explain it.

4.1 Is Liquidity in the Eye of the Beholder?

Thus far, our findings in Tables 4 and 5 suggest that issuers consistently rank in the top of the distribution of security FVs of their investors, irrespective of the investor type under consideration. The findings regarding the bottom of the distribution are economically smaller and statistically weaker. Therefore, we concentrate on the drivers of issuers' propensity to be at the maximum for the remainder of our analyses. Panels C and D in Table 2 suggest that issuers tend to predominantly assign Level 1 to their securities, and that the propensity for Level 1 assignment varies by type of investors. Hence, we explore whether issuers' propensity to assign extreme values relates to differences in how issuers and investors interpret and account for liquidity in their FV estimates. We take advantage of the heterogeneity in our data to study this question from two perspectives.

First, we examine insurers, which we know from Panel D of Table 2 do hold some of their securities at Level 1, albeit less frequently than issuers (unlike mutual funds, which we know from Panel C of Table 2 almost never do). We compare how the propensity to assign Level 1 differs between issuers and these investors. Specifically, we first confirm that these investors are less

[18] The univariate analysis in Table 3 shows that the difference between issuers' and investors' propensities to be at the maximum is statistically and economically stronger than at the minimum. The result on minimum is further weakened with security-year fixed effects and becomes statistically insignificant when we consider each investor type on its own. In an untabulated analysis, we find that investors have a greater tendency to provide the same minimum value (eight investors on average) than the same maximum value (three investors on average). This can explain the loss of significance in the regression specification as greater weight is placed on securities with more investors.

likely to assign Level 1 compared to issuers for a given security in a multivariate regression setting. Specifically, we replace the dependent variable in Eq. (1) with *Level 1*, an indicator variable equal to one if the appraiser assigned Level 1 to the security. Table 6 Panel A presents the results. We find that the coefficient on *Issuer* is positive and significant at the 5% level (t-stat 2.39), suggesting an issuer is 10.9% more likely to assign Level 1 to a security than an insurer.

Next, we examine how liquidity relates to FV-level assignment by the issuer and insurers. Using three measures of liquidity (the natural log of trading volume, an indicator for price observability, and the natural log of the number of investors holding the same security), we present results of Eq. (2) in columns (1) through (3) of Panel B of Table 6. Columns (1) and (3) show that issuers are more likely to assign Level 1 to securities that have more volume and are held by more investors, respectively, as compared to insurers (t-stat of 1.67 and 2.50 respectively). We do not find a statistically significant result in column (2) for the price observability measure of liquidity. Overall the findings in Table 6, along with the finding that mutual funds almost never assign Level 1 to their securities, suggest that issuers tend to weight observable measures of liquidity more heavily than investors when determining whether Level 1 valuation is appropriate.

Next we explore the role of differences in valuation techniques (Levels 1, 2, or 3) on the results of our analyses. We focus on the sample where there is most disagreement on the appropriate valuation techniques (i.e., issuers use Level 1 valuation techniques almost 19% of the time, while mutual funds never use Level 1 valuation techniques). If the propensity to use Level 1 valuation techniques primarily drives our results, then we should find significant differences in the propensity to be at the maximum of the distribution across this partition. Panel A of Table 7 reports the results of our tests of this hypothesis. Specifically, we repeat Eq. (1) to examine whether our findings are more pronounced among securities where issuers use Level 1 (and mutual funds do

not) compared to when issuers use Level 2 or 3 (as do the mutual funds). Perhaps surprisingly in light of our previous findings, we find that, in both cases, the coefficients of interest are positive and significant at the 1% level (t-stat 3.26 and 3.32 respectively), suggesting that issuers are more likely to be at the maximum than an average investor, regardless of their FV classification. In column (3), we find that the coefficients across the two subsamples are statistically indistinguishable. Together, our results suggest that, while an issuer is far more likely to use Level 1 valuation techniques for their securities than an average investor, this is not the only explanation for the tendency to overstate the FVs.

In Table 7 Panel B, we further explore the potential role of disagreement regarding liquidity by comparing insurers (which also assign Level 1 to their securities but to a lesser extent than issuers) and mutual funds. In column (1), we find that mutual funds are still more likely to be at the maximum for those securities where at least one insurer assigned Level 1 (again disagreeing with mutual funds).[19] In column (2), those securities where none of the insurers assigned Level 1 are even more likely to be overstated by mutual funds. In column (3), we find that, when there exists disagreement, the mutual funds are less likely to be at the maximum compared to insurers. Thus, while differences in perceived liquidity can partially mitigate mutual funds' propensity to overstate fair values, this still does not fundamentally explain the propensity to assign maximum values. Taken together, our evidence suggests that perceived liquidity not only varies considerably across entities but also does not explain the systematic differences in FVs assigned by these entities.

4.2 The Price of Illiquidity

[19] An empirical challenge of this design is that, unlike issuers, there can be multiple insurers for a given security, which can also vary in their Level 1 assignment. While we conduct our cross-sectional test based on whether any insurer assigned Level 1 for simplicity, our results are robust to using a continuous variable based on percentage of insurers that assigned Level 1.

Having found that disagreement on *whether* a security is liquid does not appear to drive the differences in propensity of issuers to be at the maximum compared to investors, we now turn to examining the role of the illiquidity discount. While FASB emphasizes that FV is a market-based measurement, fixed income securities are traded relatively infrequently.[20] Therefore, the distribution of FVs among investors and issuers could be driven by the degree to which there is disagreement or uncertainty surrounding the discount taken for perceived illiquidity. To explore this idea, in Table 8 Panel A, we compare the average standard deviation of investor' valuations when there is and is not a market price available within one, three, and five days of the valuation date of the security. (This partition is motivated from regulatory guidelines that often stress the existence of readily quoted market prices in determining FV.) We find that, across all market price availability definitions we consider, when there is not a market price available, the standard deviation of valuations is significantly larger, which is consistent with price availability being an important driver in the degree of uncertainty around the FVs.

Further, in Table 8 Panel B, we compare the extent to which issuers versus investors rely on observable market prices in the FV they assign to a security by examining how much they deviate from the market price. When prices are observable within the three days of the valuation date, we do not find statistically significant differences between issuers and investors. When prices are unavailable within the three days, we use the most recent available market price within the 21-day window as a proxy of what issuers and investors could have used as a benchmark and examine whether issuers and investors deviate from that market price. We find that investors deviate more from the market price than the issuer.

[20] https://www.fasb.org/page/PageContent?pageId=/reference-library/superseded-standards/summary-of-statement-no-157.html&bcpath=tff

We turn to examining whether issuers and investors incorporate the relative illiquidity of bonds differently into their valuations. Specifically, we examine whether securities with more market-based liquidity are less likely to be at the maximum because there is a market-based benchmark they can use to estimate the fair value. To do so, we conduct a cross-sectional test using Eq. (3).

Table 9 Panel A presents the results for issuers compared to all investors. Our analyses suggest that issuers are less likely to be at the maximum compared to an average investor when there exists more liquidity around the date in which issuers value the security. Specifically, in columns (1) and (3), we find that the interaction terms are negative and significant at the 10% level, suggesting that higher volume and greater number of investors are associated with a reduced likelihood of the issuer being at the maximum compared to an average investor.

In Table 9 Panel B, we compare mutual funds to insurers. We find that a mutual fund is less likely to be at the maximum compared to an insurer when there exists more liquidity around the date in which issuers value the security. In particular, in column (1), we find that higher volume is associated with a reduced likelihood of the mutual fund being at the maximum by approximately 1.1 percentage points (t-stat -2.59), and, in column (2), we find that price observability around the valuation date is associated with a reduced likelihood of the issuer being at the maximum by approximately 3.9 percentage points (t-stat -2.81).[21] Jointly, our results suggest that investors incorporate securities' liquidity differently into FV valuations than do issuers, highlighting the role that the illiquidity discount plays in the differences in FV practices across entities, even for the same underlying security.

[21] In untabulated tests, we additionally examine whether aspects of the security that are likely correlated with liquidity affect the propensity of the issuer to assign a higher value. We consider three features: (1) maturity, (2) credit risk, and (3) convertibility into equity. We do not find that these features are statistically significant in explaining differences in propensity to assign higher values.

5. Consequences: Future Debt Financing

We conclude our paper by examining the issuers' behavior when they are overstated compared to the holders of their debt securities to know whether issuers act on the prices they disclose. We conjecture that firms that overstate their securities will consider their relative valuations in debt financing in the future. If issuers believe in (or have confidence in) their valuations, we predict that firms that value their debt higher than mutual funds will seek private debt financing as an alternative to public issuance if they act on their disclosed beliefs.[22]

We perform this analysis at the issuer-year level in Table 10. Panel A presents the descriptive statistics for the issuer-year dataset. There are 660 observations in the sample. On average, there are private (public) debt issuances in 11.8% (33.8%) of the sample. On average (median), issues have a leverage of 0.39 (0.36), assets of 8.5 (3.25) billion dollars, a book-to-market ratio of 0.581 (0.366), and an ROA of 0.001(0.024). The large majority of these issuers have a Big 4 auditor and are an overstater 41.3% of the time. Each issuer has an average (median) of just over two (one) securities outstanding in our sample.

We report the regression estimates from Eq. (4) in Table 10 Panel B, examining whether current period overstatement of fair value is associated with future public or private debt issuance. In columns (1) and (2), we consider the full sample. Column (1) examines issuers' debt financing in the public market, while column (2) considers issuers' debt financing in private markets. We find that, when issuers value their own debt higher than the market does, they appear to be more likely to turn to private markets for debt issuance (t-stat 2.16). This is consistent with issuers acting

[22] These tests assume that the market either does not react to these disclosures or is slow to fully incorporate the information in the market. In untabulated tests, we examine the market reaction to the disclosure of issuers' FVs upon 10-K release dates and do not find significant changes in bond returns.

on their FV valuations. Private lenders are likely to have their own views on liquidity, and private communication may facilitate agreement on its pricing. Notably, these results are inconsistent with issuers strategically disclosing overstated fair values in hopes of influencing the market to value their debt more highly in advance of future debt issuances.

In columns (3) through (6), we further split our sample based on market price observability, as firms are more likely to be able to act on differences in valuations when there is greater disagreement on the FV among market participants. Moreover, to the extent that issuers feel confidence in their valuations due to private information, the market is less likely to fully reflect it when price observability is low. Columns (3) and (4) examine issuers' debt financing in the public market. We find no evidence of public debt financing from overstaters. We repeat our analyses using private debt issuance and report the estimates in columns (5) and (6). Column (6), in particular, shows that, for issuers without an observable market price, a one standard deviation increase in *Overstate Score* results in increased likelihood of issuing private debt by 5.2 percentage points. Relative to the mean of 0.118, this represents an increase by 41.9%. We do not find significant changes in private debt issuance for overstaters that do have an observable price. Collectively, our findings suggest that issuers appear to act upon their FV estimates; that is, they put their money where they mouth is, particularly when their beliefs significantly deviate from that of market participants.

6. Conclusion

Our paper is among the first to provide empirical evidence on the FV disclosures firms make regarding their debts. The results of our analyses are provocative. Broadly, we demonstrate that debt security issuers are much more likely to assign FVs that are larger than an average investor owning the same asset. Additional tests suggest that this is driven by investors

incorporating illiquidity into their valuations more than issuers. That is, investors appear to weigh illiquidity more than issuers when making FV determinations. These results should be of interest to academics, regulators, and standard setters. One of the more concerning elements of FV accounting is the application of the standards to financial instruments where there are no readily observable prices. Critics of the standard indicate that the discretion in determining FVs will be used opportunistically. Our paper highlights that issuers appear to use discretion to overvalue the FV of their liabilities, but it is less clear whether this is opportunistic. Indeed our evidence suggests that the differences are driven by differences in views on liquidity.

Finally, by comparing the FV treatment of different sides *of the same security*, our paper provides a powerful setting to examine whether issuers and investors have different views regarding an important determinant of FV valuations—liquidity. We demonstrate that issuers are more likely to consider the market to be active than are investors. Jointly, these results are inconsistent with the FASB's guidance that the fair value of liabilities should be the same as the fair value of the underlying asset, other than in exceptional circumstances.

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Table 1: Sample Selection

This table presents the sample selection process. The data covers mutual funds' and insurers' reports for the years ended December 2017 through December 2019.

Number of security-year observations manually collected from 10-K: 1,434

Panel A – Mutual Funds Data

	Observations
Observations from N-PORT and CRSP with issuers' security level FV disclosure, FV not in USD and duplicate records	65,920
Remove observations of issuers with non-calendar fiscal year ends	56,804
Remove fund-security level observations with less than 3 asset-holders, issuers with delayed annual reports and observations where FV of issuers differs by more than 5% from that of the investors	54,312
Total fund-security-year observations	**54,312**
Total issuer-security-year observations held by mutual funds	1,385
Number of unique issuers that have at least one security held by at least three mutual funds	267
Number of unique securities held by at least three mutual funds	691

Panel B – Insurers Data

	Observations
Insurance group security-year observations with matching funds holdings	30,346
Remove fund-security level observations with less than 3 asset-holders, issuers with delayed annual reports and observations where FV of issuers differs by more than 5% from that of the investors	22,567
Total insurer-security-year observations	**22,567**
Total security-year observations held by insurers	895
Number of issuers	208
Number of securities	501

Table 2: Descriptive Statistics

This table reports descriptive statistics. Panel A presents descriptive statistics for 1,434 issuer-security-years in which fair value estimates are available. Panel B presents descriptive statistics at the security-investor-year level for mutual funds and insurers. Panels C and D compare the propensity to assign Level 1 of issuers compared to investors. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

Panel A: Security Data (Issuer-Security-Year Level)

Variable	N	Mean	SD	p10	p25	p50	p75	p90
All available security-years:								
Number of investors	1,434	54	36	12	26	48	74	101
Issuer Is Max (vs all)	1,434	0.192	0.394	0	0	0	0	1
Issuer Is Min (vs all)	1,434	0.202	0.402	0	0	0	0	1
Convertible	1,434	0.165	0.372	0	0	0	0	1
Coupon %	1,434	4.455	1.843	2.000	3.250	4.500	5.625	6.625
Years to Maturity	1,434	7.518	6.942	2.042	3.455	5.369	8.041	19.751
Years Since Issuance	1,434	3.129	2.980	0.353	0.953	2.313	4.383	6.823
Three Day Price Available	1,434	0.817	0.387	0	1	1	1	1
Volume ($ million)	1,434	2.290	4.165	0	0.050	0.554	2.549	6.536
Log Volume	1,434	0.760	0.824	0	0.049	0.441	1.267	2.020
Level 1	1,370	0.189	0.392	0.000	0.000	0.000	0.000	1.000
Security-years held by mutual funds:								
Mutual fund investors	1,385	39	30	10	17	31	52	81
Issuer Is Max (vs mutual funds)	1,385	0.198	0.399	0	0	0	0	1
Issuer Is Min (vs mutual funds)	1,385	0.216	0.412	0	0	0	0	1
Security-years held by insurers:								
Insurer investors	895	25	17	7	13	22	33	47
Issuer Is Max (vs insurer)	895	0.324	0.468	0	0	0	1	1
Issuer Is Min (vs insurer)	895	0.207	0.405	0	0	0	0	1

Panel B: Investor Data (Security-Investor-Year Level)

Variable	N	Mean	SD	p10	p25	p50	p75	p90
Mutual Funds								
Mutual Fund Is Max (vs. issuer)	54,312	0.082	0.274	0	0	0	0	0
Mutual Fund Is Min (vs. issuer)	54,312	0.158	0.365	0	0	0	0	1
Level 1[23]	14,995	0.000	0.014	0	0	0	0	0
Insurers								
Insurer Is Max (vs. issuer)	22,567	0.088	0.283	0	0	0	0	0
Insurer Is Min (vs. issuer)	22,567	0.132	0.339	0	0	0	0	1
Level 1	22,497	0.074	0.261	0	0	0	0	0

[23] FV level for mutual funds is available only for 2019 observations collected from form N-PORT.

Table 2: Descriptive Statistics (continued)

Panel C: Propensity to Assign Level 1, Issuers vs. Mutual Funds

	N	FV Level = 1
A. Issuer	1,332	0.191
B. Mutual Funds	14,995	0.000
Difference (A-B)		0.191***
(t-stat)		(17.73)

Panel D: Propensity to Assign Level 1, Issuers vs. Insurers

	N	FV Level = 1
A. Issuer	853	0.182
B. Insurers	22,497	0.074
Difference (A-B)		0.108***
(t-stat)		(8.11)

Table 3: Univariate Analyses

This table presents univariate analysis of issuers' and investors' propensity to assign extreme fair values. Panel A compares the propensity of issuers to be at the maximum and minimum of the distribution of fair values compared to random chance. Panel B compares the probabilities between issuers and investors to be at the maximum and minimum of the distribution of fair values.

Panel A: Comparing Issuers to Random Chance

	N	Average Likelihood
A. Issuer Is Max	1,434	0.192
B. Issuer Is Min	1,434	0.202
C. Average Random Chance*	1,434	0.036
Difference (A-C)		0.156***
(t-stat)		(15.27)
Difference (B-C)		0.166***
(t-stat)		(15.67)

Panel B: Comparing Issuers to All Investors (Mutual Funds and Insurers)

	N	Mean
A. Issuer Is Max	1,434	0.192
B. Investor Is Max	76,879	0.061
Difference (A-B)		0.132***
(t-stat)		(12.62)
A. Issuer Is Min	1,434	0.202
B. Investor Is Min	76,879	0.126
Difference (A-B)		0.076***
(t-stat)		(7.17)

* For each security, we calculate the random chance of the issuer being at a given point in the distribution as one divided by one plus the number of investors of the security.

Table 4: FV Comparison between Issuer vs. Investors (Mutual Funds + Insurers)

This table reports the estimates from the following regression for a stacked sample of issuer- and investor-level fair values: $Max\ (Min)\ Value_{a,s,t} = \beta_1 Issuer_{a,s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. $Issuer$ is an indicator variable equal to one if the fair value estimate comes from the issuer's financial statement (as opposed to investors' reports). $Max\ (Min)\ Value$ is an indicator variable equal to one if the fair value is the max (min) value among the investors and issuer for a given security-year. Parentheses contain t-statistics based on standard errors clustered by firm. *, **, *** indicate statistical significance at less than 10%, 5%, and 1%, respectively. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

	(1)	(2)
Dependent Variable:	Max Value	Min Value
Issuer	0.100***	0.043*
	(5.48)	(1.92)
Observations	78,313	78,313
Fixed Effects	Security-Year	Security-Year
Adj. R-Squared	0.113	0.254

Table 5: Cross-sectional Tests based on Investor Type

Panel A (Panel B) reports the estimates from the following regression using a stacked sample of issuer- and mutual fund (insurer)-level fair values: $Max\ (Min)\ Value_{a,s,t} = \beta_1 Issuer_{a,s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. $Issuer$ is an indicator variable equal to one if the fair value estimate comes from the issuer's financial statement (as opposed to investors' reports). $Max\ (Min)\ Value$ is an indicator variable equal to one if the fair value is the max (min) value among the distribution of fair values a given security-year. Panel C compares mutual funds to insurers. Parentheses contain t-statistics based on standard errors clustered by firm. *, **, *** indicate statistical significance at less than 10%, 5%, and 1%, respectively. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

Panel A: Issuer vs. Mutual Funds

Dependent Variable:	(1) Max Value	(2) Min Value
Issuer	0.082***	0.031
	(3.99)	(1.29)
Observations	55,697	55,697
Fixed Effects	Security-Year	Security-Year
Adj. R-Squared	0.120	0.224

Panel B: Issuer vs. Insurers

Dependent Variable:	(1) Max Value	(2) Min Value
Issuer	0.215***	0.021
	(5.70)	(0.75)
Observations	23,462	23,462
Fixed Effects	Security-Year	Security-Year
Adj. R-Squared	0.163	0.254
Chi-Squared Statistic on Difference in Coefficients from Table 5 Panel A	31.35***	0.38
Chi-Squared p-Value	0.000	0.539

Panel C: Mutual Funds vs. Insurers

Dependent Variable:	(1) Max Value	(2) Min Value
Mutual Fund	0.057***	-0.011
	(13.48)	(-1.21)
Observations	54,755	54,755
Fixed Effects	Security-Year	Security-Year
Adj. R-Squared	0.112	0.245

Table 6: Comparison of Views on Liquidity (Level 1 Assignment)

Panel A reports the estimates from the following regression using a stacked sample of issuer- and insurer-level fair values: $Level\ 1_{a,s,t} = \beta_1 Issuer_{a,s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. *Level 1* is an indicator variable equal to one if the issuer or insurer assigned Level 1 to the security. $Issuer$ is an indicator variable equal to one if the fair value estimate comes from the issuer's financial statements. In Panel B, we compare the propensity to assign Level 1 by liquidity through the following regression: $Level\ 1_{a,s,t} = \beta_1 Issuer_{a,s,t} + \beta_2 Issuer_{a,s,t} \times Liquidity_{s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. *Liquidity* refers to one of the following proxies: *Log Volume*, defined as the natural log of trading volume within three trading days prior the fiscal year-end date; *Price Observability*, an indicator variable equal to one if there exists a market price for a bond within three trading days prior to the fiscal year-end date; *Log No. of Investors*, defined as the natural log of number of mutual funds and insurers holding the same security. *, **, *** indicate statistical significance at less than 10%, 5%, and 1%, respectively. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

Panel A: Propensity to assign Level 1 FV (Issuer vs. Insurers)

	(1)
Dependent Variable:	Level 1
Issuer	0.109**
	(2.39)
Observations	23,350
Fixed Effects	Security-Year
Adj. R-Squared	0.026

Panel B: Cross-sectional tests based on Liquidity (Issuer vs. Insurers)

Dependent Variable:	Level 1		
Liquidity proxy:	*Log Volume*	*Price Obs.*	*Log No. of Investors*
	(1)	(2)	(3)
Issuer	0.068*	0.063*	-0.351**
	(1.82)	(1.92)	(-2.28)
Issuer × Liquidity	0.052*	0.054	0.115**
	(1.67)	(1.06)	(2.50)
Observations	23,350	23,350	23,350
Fixed Effects	Security-Year	Security-Year	Security-Year
Adj. R-Squared	0.026	0.026	0.028

Table 7: Cross-sectional Tests based on Disagreements of Liquidity

This table reports results from cross sectional tests of Eq. (1). Panel A, reports the estimates from the following regression for a stacked sample of issuer- and mutual fund-level fair values: $Max\ Value_{a,s,t} = \beta_1 Issuer_{a,s,t} + \beta_2 Issuer_{a,s,t} \times Issuer\ Level\ 1_{s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. $Issuer$ is an indicator variable equal to one if the fair value estimate comes from the issuer's financial statement. $Max\ Value$ is an indicator variable equal to one if the fair value is the max (min) value among the distribution of fair values a given security-year. $Issuer\ Level\ 1$ is an indicator variable equal to one if the issuer assigned Level 1 hierarchy to the security. $\delta_{s,t}$ refers to security-year fixed effects. Column (1) reports the estimates of the regression based on securities where the issuer assigned Level 1 hierarchy. Column (2) reports the estimates of the regression based on securities where the issuer assigned Levels 2 or 3. Panel B compares mutual funds to insurers: $Max\ Value_{a,s,t} = \beta_1 Mutual\ Fund + \beta_2 Mutual\ Fund_{a,s,t} \times Insurance\ Level\ 1_{s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. $Insurance\ Level\ 1$ is an indicator variable equal to one if at least one insurer assigned Level 1 hierarchy to the security. Column (1) reports the estimates of the regression based on securities where at least one insurer assigned Level 1. Column (2) reports the estimates based on securities where none of the insurers assigned Level 1. Column (3) compares the difference between columns (1) and (2). Parentheses contain t-statistics based on standard errors clustered by industry for Panel A, and by firm for Panel B. *, **, *** indicate statistical significance at less than 10%, 5%, and 1%, respectively. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

Panel A: Issuers vs. Mutual Funds based on Issuer FV Designation (Level 1 vs. Levels 2 & 3)

	(1)	(2)	(3)
Dependent Variable:	Max Value	Max Value	Max Value
Sample - Issuer assigned:	Level 1	Level 2 & 3	Full Sample
Issuer	0.087***	0.084***	0.084***
	(3.26)	(3.32)	(3.30)
Issuer × Issuer Level 1			0.003
			(0.08)
Observations	13,488	41,223	54,711
Fixed Effects	Security-Year	Security-Year	Security-Year
Adj R-squared	0.123	0.115	0.118

Panel B: Mutual Funds vs. Insurers based on Insurer FV Designation (Level 1 vs. Levels 2 & 3)

	(1)	(2)	(3)
Dependent Variable:	Max Value	Max Value	Max Value
Sample – Insurer assigned:	Level 1	Level 2 & 3	Full Sample
Mutual Fund	0.047***	0.083***	0.083***
	(10.02)	(10.76)	(10.78)
Mutual Fund × Insurer Level 1			-0.035***
			(-4.06)
Observations	36,976	17,779	54,755
Fixed Effects	Security-Year	Security-Year	Security-Year
Adj R-squared	0.104	0.122	0.112

Table 8: Illiquidity effect on FVs - Univariate Analysis

Panel A presents how price availability affects the dispersion in fair values across investors for a given security for the sample of 1,434 security-years. Panel B compares the absolute deviation from the most recent observable price (calculated as the absolute difference between the fair value and the most recent market price) between issuers and investors when a three-day price is available.

Panel A: Comparing to Most Recent Price (All Investors)

	One-Day Price Available		Three-Day Price Available		Five-Day Price Available	
	N	Average FV Dispersion	N	Average FV Dispersion	N	Average FV Dispersion
Price Not Observable	429	0.004	263	0.005	224	0.005
Price Observable	1,005	0.003	1,171	0.003	1,210	0.003
Difference		0.001***		0.001***		0.001***
(t-stat)		(6.95)		(5.11)		(5.07)

Panel B: Deviation from the Most Recent Observable Market Price

	N	Average Difference from Market Price (Absolute)
When three-day price is available:		
A. Issuer	1,171	0.0060
B. All investors	1,171	0.0062
Difference (A-B)		-0.0002
(t-stat)		(-1.26)
When three-day price is unavailable:[24]		
A. Issuer	232	0.0093
B. All investors	232	0.0109
Difference (A-B)		-0.0016***
(t-stat)		(-2.98)

[24] When three-day price is unavailable, we compute the difference between the fair value and the most recent price available within 21 trading days prior to the fiscal year end. 31 observations are dropped due to unavailability of market price within this horizon.

Table 9: Illiquidity effect on FVs - Regression Analysis

Panel A reports the estimates from the following regression for a stacked sample of issuer- and investor-level fair values: $Max\ Value_{a,s,t} = \beta_1 Issuer_{a,s,t} \times Liquidity_{s,t} + \delta_{s,t} + \epsilon_{a,s,t}$. $Issuer_{s,t}$ is an indicator variable equal to one if the fair value valuation comes from the issuer. $Max\ Value_{s,t}$ is an indicator variable equal to one if the fair value is the maximum (minimum) value among the distribution of fair values a given security-year. *Liquidity* refers to one of the following proxies: *Log Volume*, defined as the natural log of trading volume within three trading days prior the fiscal year-end date; *Price Observability*, an indicator variable equal to one if there exists a market price for a bond within three trading days prior to the fiscal year-end date; *Log No. of Investors*, defined as the natural log of number of mutual funds and insurers holding the same security. Panel B reports the estimates from the same regression using a stacked sample of mutual fund- and insurer-level FVs, where *Issuer* is replaced with *Mutual Fund*, an indicator variable equal to one if the fair value valuation comes from mutual funds. Parentheses contain t-statistics based on standard errors clustered by firm. *, **, *** indicate statistical significance at less than 10%, 5%, and 1%, respectively. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

Panel A: Issuer vs. Investors (Mutual Funds + Insurers)

Dependent Variable:	Max Value		
Liquidity proxy:	*Log Volume*	*Price Obs.*	*Log No. of Investors*
	(1)	(2)	(3)
Issuer	0.120***	0.117***	0.236***
	(5.46)	(3.23)	(3.43)
Issuer × Liquidity	-0.027*	-0.021	-0.037**
	(-1.83)	(-0.54)	(-2.15)
Observations	78,313	78,313	78,313
Fixed Effects	Security-Year	Security-Year	Security-Year
Adj. R-Squared	0.113	0.113	0.113

Panel B: Insurers vs. Mutual Funds

Dependent Variable:	Max Value		
Liquidity proxy:	*Log Volume*	*Price Obs.*	*Log No. of Investors*
	(1)	(2)	(3)
Mutual Fund	0.067***	0.093***	0.110***
	(10.99)	(6.84)	(3.07)
Mutual Fund × Liquidity	-0.011**	-0.039***	-0.012
	(-2.59)	(-2.81)	(-1.52)
Observations	54,755	54,755	54,755
Fixed Effects	Security-Year	Security-Year	Security-Year
Adj. R-Squared	0.112	0.112	0.112

Table 10: Consequences: Future Debt Financing

This table studies subsequent year debt origination behavior of issuers at the issuer-year level. Panel A presents the descriptive statistics of the sample. Panel B reports the estimates from the following regression at the issuer-year level: $Issuance_{i,t+1} = \beta_1 Overstate\ Score_{i,t} + Controls + \psi_t + \epsilon_{s,t}$. Columns (1) and (2) present results for the full sample. Columns (3) through (6) split the sample based on price observability. *(No) Market Price* is an indicator for whether the firm has (does not have) a market price available for at least one of its securities in the three days before valuation. Columns (1), (3), and (4) use *Public Issuance* as the dependent variable, while columns (2), (5), and (6) use *Private Issuance* as the dependent variable. $Overstate\ Score_{i,t}$ measures the extent to which an issuer is overstated in a security compared to the investors. For each security-year, we define *overstate* as an indicator variable equal to one if the issuer's FV is above the 75th percentile in the distribution of FVs for that security-year. We then average *overstate* across all securities at the issuer-year level, weighted by the number of investors of the security. The parentheses contain t-statistics based on standard errors clustered by industry. *, **, *** indicate statistical significance at less than 10%, 5%, and 1%, respectively. All continuous variables are winsorized at the 1% and 99% levels. Refer to Appendix A for variable definitions.

Panel A: Descriptive Statistics

Variable	N	Mean	SD	p10	p25	p50	p75	p90
Private Issuance	660	0.118	0.323	0	0	0	0	1
Public Issuance	660	0.338	0.473	0	0	0	1	1
Leverage	660	0.390	0.200	0.148	0.249	0.360	0.518	0.663
Log Assets	660	8.170	1.192	6.735	7.327	8.087	8.800	9.787
Assets (million $)	660	8,504	19,603	840.2	1,520	3,250	6,631	17,793
BTM	660	0.581	0.737	0.043	0.167	0.366	0.752	1.402
ROA	660	0.001	0.116	-0.116	-0.015	0.024	0.058	0.098
Big 4 Auditor	660	0.900	0.300	0.500	1	1	1	1
Overstate Score	660	0.413	0.449	0	0	0.189	1	1
FV Dispersion	660	0.004	0.003	0.001	0.002	0.003	0.005	0.007
No. of Securities	660	2.173	3.130	1	1	1	2	5

Panel B: Issuance

Sample	(1) Public Issuance	(2) Private Issuance	(3) Public Issuance	(4) Public Issuance	(5) Private Issuance	(6) Private Issuance
	Full Sample	Full Sample	Market Price	No Market Price	Market Price	No Market Price
Overstate Score	0.000	0.058**	0.013	-0.063	0.032	0.117*
	(0.01)	(2.16)	(0.30)	(-0.94)	(1.23)	(1.90)
Leverage	-0.032	0.212***	-0.017	-0.158	0.194***	0.394***
	(-0.43)	(3.32)	(-0.21)	(-0.81)	(2.89)	(3.00)
Log Assets	0.075***	0.020	0.068***	0.111	0.018	0.073
	(4.22)	(1.31)	(3.41)	(1.44)	(1.18)	(1.31)
ROA	-0.259	0.244*	-0.189	-0.605*	0.181	0.410*
	(-1.55)	(1.95)	(-0.92)	(-1.79)	(1.46)	(1.85)
BTM	-0.081***	-0.001	-0.079***	-0.102**	0.002	-0.026
	(-5.29)	(-0.07)	(-4.13)	(-2.53)	(0.11)	(-0.93)
Big 4 Auditor	-0.076	0.051	-0.034	-0.296	0.057*	0.004
	(-1.04)	(1.33)	(-0.40)	(-1.58)	(1.69)	(0.05)
No. of Securities	0.015***	-0.006	0.015***	0.043	-0.004	0.192*
	(2.89)	(-1.47)	(3.02)	(0.38)	(-1.29)	(1.75)
FV Dispersion	-3.839	-2.768	-4.788	-1.673	-9.620**	1.047
	(-0.69)	(-0.74)	(-0.51)	(-0.15)	(-2.09)	(0.22)
Observations	660	660	542	118	542	118
Fixed Effects	Year	Year	Year	Year	Year	Year
Adj. R-Squared	0.117	0.031	0.120	0.018	0.023	0.111

Appendix A – Variable Definitions

Variable	Definition
Key Dependent Variables	
Max Value	An indicator equal to one if the appraiser (issuer, mutual fund, insurer) is at the maximum of the distribution of fair values.
Min Value	An indicator equal to one if the appraiser (issuer, mutual fund, insurer) is at the minimum of the distribution of fair values.
Level 1	An indicator equal to one if the security is classified as Level 1 by the appraiser (issuer, mutual fund, insurer) in the fair value hierarchy.
Key Independent Variables	
Issuer	An indicator equal to one if the appraiser is the issuer of the security.
Mutual Fund	An indicator equal to one if the appraiser is the mutual fund investor of the security.
Liquidity Variables	
Issuer Level 1	An indicator variable equal to one if the issuer of the security assigned Level 1 fair value hierarchy.
Insurer Level 1	An indicator variable equal to one if any insurer holding the security assigned Level 1 fair value hierarchy.
Log Volume	Natural log of dollar amount of trading volume within the last three trading days prior to the fiscal year-end.
Price Observability	An indicator variable equal to one if the market price is available for a security within three trading days prior to the fiscal year-end.
Log No. of Investors	Natural log of number of mutual funds and insurers holding the security.
Other Variables	
Private issuance	An indicator variable equal to one if registrant obtained a term loan or delay term loan in the 12-month period following the FV measurement date; sourced from Dealscan.
Public Issuance	An indicator variable equal to one if registrant is listed as having issued public debt in the 12 months following the FV measurement date in either the FISD or SDC database.
Overstate Score	The extent to which an issuer is overstated in a security compared to the investors. For each security-year, we define *overstate* as an indicator variable equal to one if the issuer's FV is above the 75th percentile in the distribution of fair values for that security-year. We then average *overstate* across all securities at the issuer-year level, weighted by the number of investors in the security.
Leverage	Calculated as total debt/total assets ((*dlc*+*dltt*)/*at*).
Log Assets	Natural log of total assets (*at*).
ROA	Return on assets (*ib*/*at*).
BTM	Book-to-market (*ceq*/*mve*).
Big 4 Auditor	An indicator variable that equals one if the audit firm is Big 4.
No. of Securities	Number of debt securities held by a fund for which issuers disclosed security-level FV.
FV Dispersion	Standard deviation at the security year level of the FV of investors.