**The Role of Debt Analyst Reports for
Firms in Financial Distress**

by

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Dedication

To my parents: Lynn and Ann who believed in me from the very beginning and gave me the courage to believe in myself. I inherited your love for economics, and it has been a privilege to follow in your footsteps and share this journey with you. To my coach, Charlie Wasley, who still goes above and beyond to turn me into the best researcher that I can be.

Biographical Sketch

The author was born in Austin, Texas and raised in Atlanta, Georgia. She attended the University of Georgia Honors Program and graduated with a Bachelor of Business Administration degree in Accounting. After graduation, she worked as a certified public accountant at Deloitte and Bethel Church. She began her doctoral studies in Accounting at the University of Rochester in 2011, where she was awarded a doctoral student fellowship and a Provost's Fellowship from 2011 to 2016. She earned a Master of Science in Business Administration degree from the University of Rochester in 2014, and she pursued her research in Accounting under the direction of Professors Charles Wasley and Jerry Zimmerman.

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Abstract

I examine the role of sell-side debt analyst reports in the corporate bond market for financially distressed firms. Debt analysts are not subject to the same conflict-of-interest regulations as equity analysts, and for this reason it is an open question whether their primary function lies in reducing information asymmetry between investors and firm managers in public debt markets (i.e., information role) or in marketing their investment bank and underwriting clients (i.e., marketing role). I test whether debt analyst reports convey new information regarding changes in default risk and recovery rates. I find that debt analysts' bankruptcy and covenant violation predictions are incrementally informative to corporate bond investors, and I find that their reports are more informative for private equity firms (consistent with the information role). However, I also find that the majority of debt analyst reports (57.8%) piggyback on corporate news announcements (i.e., reiterate the information conveyed by other sources) and contain little new information, and the accuracy of the information in their reports is affected by investment banking conflicts of interest (consistent with the marketing role).

Contributors and Funding Sources

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Table of Contents

Dedication	ii
Biographical Sketch	iii
Acknowledgements	iv
Abstract	v
Contributors and Funding Sources	vi
List of Tables	ix
List of Figures	x
1. Introduction	1
2. Literature Review	7
2.1. Information Intermediaries	7
2.2. Sell-Side Equity Analysts	8
2.3. Sell-Side Debt Analysts	9
3. Hypothesis Development	10
3.1. Abnormal Bond Market Returns to Debt Analysts' Distress Predictions	10
3.2. The Economic Determinants of the Accuracy of Debt Analysts' Distress Predictions	14
4. Research Design	18
4.1. Data and Sample Selection	18
4.2. Empirical Tests	22
5. Results	28
5.1. Descriptive Statistics	28

5.2. Regression Results: The Bond Market Reaction to Debt Analysts' Distress	
Predictions	35
5.3. The Economic Determinants of Debt Analysts' Accuracy	41
6. Additional Analyses	46
6.1. Bond Market Illiquidity	46
6.2. Alternative Measures for the Information Content of Debt Analyst	
Reports	47
6.3. Recommendation Revisions versus Reiterations	48
7. Conclusion	49
References	51
Appendix A: Detailed Variable Definitions	56
Appendix B: Examples of Debt Analyst Reports Classified as Correct, Incorrect,	
Uncertain, and No Discussion of Distress	59

List of Tables

Table 1: Summary Statistics for the Length of Debt Analyst Reports by Credit Quality	62
Table 2: Descriptive Statistics for Variables Defined at the Bond Level	63
Table 3: Descriptive Statistics for Variables Defined at the Report and Firm Level	64
Table 4: Frequency of Debt Analysts' Bankruptcy, Covenant Violation, and Liquidity Predictions	65
Table 5: Distribution of Debt Analysts' Distress Predictions Based on the Sign of the News and <i>Ex Post</i> Accuracy	66
Table 6: Timing of Credit Rating Changes around Debt Analysts' Distress Predictions	67
Table 7: Abnormal Bond Market Returns to Debt Analyst Reports Containing Distress Predictions	68
Table 8: Abnormal Bond Market Returns to Debt Analysts' Bankruptcy, Covenant Violation, and Liquidity Predictions	70
Table 9: Abnormal Bond Market Returns Conditional on the Accuracy of Debt Analyst Reports with a Distress Prediction	72
Table 10: Abnormal Bond Market Returns to Debt Analysts' Distress Predictions Conditional on Private versus Public Equity	74
Table 11: Economic Determinants of Debt Analysts' Accuracy when Predicting the Outcomes of Financial Distress	76
Table 12: Economic Determinants of Debt Analysts' Accuracy using Alternative Benchmarks	77

List of Figures

Figure 1: Industry Composition of the Sample of Debt Analyst Reports	60
Figure 2: Bond Trading Activity Prior to Bankruptcy Filing Dates	61

1. Introduction

A large literature in finance and accounting has focused on whether information intermediaries such as equity analysts (EAs) and credit rating agencies (CRAs) provide value-relevant information to securities markets. Interestingly, the role of sell-side debt analysts (DAs) is relatively less researched vis-à-vis EAs and CRAs, even though firms raised over \$15.0 trillion in the U.S. corporate bond market from 2000 to 2014 (roughly four and a half times more than the equity market) (SIFMA, 2015). Beyer et al. (2010) state that empirical evidence on sell-side DAs would further our understanding of the firm's information environment. I provide evidence along these lines by exploring whether the qualitative content of DA reports affects bond prices and whether the information content of their reports varies as a function of investment banking conflicts of interest and the quality of firms' information environments.

The EA literature has produced mixed evidence on the extent to which sell-side analyst reports provide value-relevant information to capital markets. Several studies find significant market reactions to revisions in EA recommendations (e.g., Bradley et al., 2014; Li et al., 2015; Yezegel, 2015), yet other papers argue that the information content of EA reports has been overstated (e.g., Altinkilic and Hansen, 2009; Altinkilic et al., 2013; Kim and Song, 2015). For example, Altinkilic and Hansen (2009) argue that EAs piggyback on corporate news announcements and revisions in EAs' stock recommendations are "information-free" after controlling for these confounding events. Further, Loh and Stulz (2011) find that only 12% of EAs' recommendation changes have a visible impact on stock returns. I exploit a unique setting to test the information role of sell-side analysts by examining whether DAs provide value-relevant information to bond market investors about changes in default risk and recovery rates or

whether their reports largely piggyback on corporate news announcements or contain little new information.

Since the role of sell-side DAs in the public debt market differs from the role of sell-side EAs in the equity market, one cannot simply generalize the results of prior research on the properties and economic effects of EA activities to those of DAs. For example, unlike equity securities, corporate bonds are traded on an over-the-counter (OTC) exchange, and the structure of the corporate bond market drives a number of important differences between this market and the equity market. These differences include higher opacity (e.g., limited last sale information), higher transactions costs, higher institutional investor participation, and fewer regulations regarding DAs' communication with the sales and trading as well as the underwriting divisions of the investment bank (Bond Market Association, 2004; SIFMA, 2011).

Until July 16, 2015, DAs were not subject to the same conflict-of-interest regulations as EAs (e.g., Global Settlement in 2003). This was the case because the opacity of the corporate bond market requires communication between DAs and the other divisions of the investment bank. Thus, unlike EAs, DAs work closely with the sales and trading divisions of their investment banks to assess the current prices and liquidity of corporate bonds. In addition, DAs play an integral role in the underwriting process by attending road shows, screening underwriting clients, and performing due diligence for their investment banking clients (Bond Market Association, 2004; GAO, 2012; SIFMA, 2011). While these other divisions of the investment bank may try to influence DAs to bias their research reports (see GAO, 2012), the traditional arguments for why EAs may issue biased reports do not necessarily apply to DAs due to differences in the structure of the equity market and corporate bond market (as discussed more fully in Section 3).

However, the SEC extended the EA conflict-of-interest regulations to DA research in 2015 based on the claim that investment banking conflicts of interest have impaired the objectivity and usefulness of DA research to market participants (SEC, 2015). An implication of this regulation is that DA reports perform a marketing role as opposed to an information role (although these two roles are not mutually exclusive). If an analyst report serves a marketing role, then the objective of the report is to promote the brand name and advisory services of the investment bank, to increase trading volume and maximize brokerage trading revenue, and/or to advertise the securities of their underwriting clients (see, e.g., Li et al., 2015; Mehran and Stulz, 2007). If analyst reports serve a marketing role, then their reports will either piggyback on corporate news announcements or contain biased information.

I test the hypothesis that DA reports have information content for bond investors (i.e., perform an information role) alongside the hypothesis that DA reports contain little new information because they piggyback on corporate news releases or provide biased information (i.e., perform a marketing role). To do this, I focus on DA reports for firms that are financially distressed to investigate whether sell-side DAs' predictions of covenant violations and bankruptcy filings are informative to the bond market as measured by their effect on bond returns. The rationale to focus on firms in financial distress is that bond values are more sensitive to changes in firm value as default risk increases because bond values are a function of the likelihood of default and the loss given default (i.e., recovery rate). When a firm enters financial distress, bondholders become residual claimants of the firm and are likely to have heightened information demands regarding changes in the value of a firm's assets. Since EA coverage decreases as firms enter financial distress (Johnston et al., 2009), DAs can add value by assessing the likelihood of bankruptcy and forecasting bond recovery rates. As firms attempt to resolve

financial distress, the likelihood of default and recovery rates vary significantly with changes in the priority and asset coverage of different fixed claims, and DAs provide investment recommendations for individual bond issues. As a result, examining the information content of DA reports for firms in financial distress is a powerful setting to assess their informational role because if DAs do not produce value-relevant information for firms in financial distress, it seems unlikely that their reports would convey value-relevant information for firms with higher credit quality (i.e., where default risk is low).

To more precisely measure the information conveyed by DA reports, I analyze the qualitative discussions in their reports. By reading each report, I can identify DAs' financial distress predictions that are unique from the public information released by the firm or that is available from other information sources. While previous studies in the EA literature use intraday stock returns to control for confounding events (e.g., Altinkilic and Hansen, 2009; Li et al., 2015), I control for concurrent news announcements by reading each DA report because using intraday bond returns is problematic due to the relative illiquidity of the corporate bond market. This allows me to conduct a more powerful test of the information content of DA reports by isolating the bond market response to DAs' new predictions rather than reiterations of public information. Additionally, while empirical research traditionally utilizes quantitative measures of the information contained in EA reports such as EPS forecasts, stock recommendations, and target prices, recent empirical evidence suggests that the primary contribution of sell-side research reports lies in their qualitative discussions. In a survey of buy-side EAs, Brown et al. (2014) find that buy-side analysts do not find the quantitative portions (e.g., EPS forecasts and stock recommendations) of sell-side EAs to be useful because "less than 3% of buy-side analysts indicate that sell-side stock recommendations are a very useful input to their own stock

recommendations (p.12).” Instead, buy-side EAs use the soft information in sell-side EA research which conveys sell-side analysts’ industry expertise and access to management (Brown et al., 2014). According to FINRA officials, bond market investors also find DAs’ investment recommendations less useful than the other aspects of their reports (GAO, 2012).

To provide evidence of the information versus marketing role of DAs, I collect a sample of DA reports for all firms with a bond-level credit rating of C+ or below between 2006 and 2015. The sample includes firms that eventually file for bankruptcy and those that do not. By reading each DA report, I find that the majority (57.8%) of reports in this setting piggyback on other news announcements in the sense that these reports reiterate public news without providing unique predictions regarding changes in default risk or recovery rates. I find that the remaining 42.2% of DA reports contain a forecast of whether the firm: has sufficient liquidity to service its debt obligations; will violate a debt covenant; or will file for bankruptcy. I document that DAs’ bad news and uncertain predictions of debt covenant violations and bankruptcy (i.e., predictions that the firm will (or may) violate a debt covenant and predictions that the firm will (or may) file for bankruptcy) are informative on average; however, these predictions constitute less than 13% of the sample.

I also investigate how the information role of DAs varies with the quality of firms’ information environments and with investment banking conflicts of interest. I find that DA reports are more informative for private equity firms because private equity firms operate in more opaque information environments. Specifically, I document that DAs’ liquidity predictions are informative on average for private equity firms but not for public equity firms. I also investigate whether the accuracy of DAs’ distress predictions is a function of DAs’ investment banking conflicts of interest. I find that only 17% of DA reports contain an accurate prediction

(based on *ex post* outcomes), and that incorrect distress predictions are more likely when the DA's investment bank is an underwriter in the firm's securities. In addition, I find that DAs are more likely to refrain from issuing a distress prediction when their investment bank has a significant investment in the firm. Taken together, my results suggest that the information role of DAs increases with the opacity of the firm's information environment and decreases with investment banking conflicts of interest.

At a general level, my paper contributes to the debate on the role of information intermediaries (e.g., analysts, rating agencies, and the media) by examining whether DAs simply piggyback on prior disclosures or provide new information to debt market participants. By studying DAs in the financial distress setting, I provide new evidence on whether analysts are able to provide new information about changes in default risk and recovery values, a question that cannot be answered by examining EAs because EA coverage for these firms is rare given that EA coverage declines with financial distress (Johnston et al., 2009) and almost half of the firms in the sample are private equity firms.

In addition, my paper provides new evidence on the mechanisms that drive transparency and efficiency in public debt markets by examining the extent to which DA reports contain information content. My paper is the first to document that DAs predict bankruptcy and covenant violations for some firms in financial distress and that these predictions have information content for the bond market. My study builds on prior studies that have examined the stock market responses to the issuance of DA reports (Johnston et al., 2009), the bond volume responses to the recommendation levels of DA reports (De Franco et al., 2009), and the bond market responses to DAs' discussions of bondholder-shareholder conflicts using textual analysis (De Franco et al., 2014). Although the prior literature suggests that DA reports have information content, my

results provide evidence on whether the information role of DAs has been overstated because DAs piggyback on corporate news announcements and how this information role varies with investment banking conflicts of interest and the quality of firms' information environments. Finally, my paper sheds light on the costs and benefits of regulating DAs' reporting behavior by documenting how debt market participants use DA reports and the extent to which the accuracy of DAs' predictions is affected by investment banking conflicts of interest.

The remainder of the paper is organized as follows. Section 2 provides a literature review. Section 3 develops the hypotheses. Section 4 discusses the data, sample selection, and empirical tests. Section 5 reports the main results. Section 6 discusses the additional analyses, and Section 7 concludes.

2. Literature Review

2.1. Information Intermediaries

My paper is related to the role of information intermediaries in capital markets and how they affect the demand for accounting information. Information intermediaries include equity analysts (EAs), credit rating agencies (CRAs), and debt analysts (DAs). In their review paper, Healy and Palepu (2001) state that the information asymmetry between capital providers and firm managers drives the demand for "information intermediaries, such as financial analysts and rating agencies, who engage in private information production to uncover managers' superior information (p.408)." Consistent with this, a large literature in finance and accounting examines the consequences of EA research. For example, higher EA coverage is associated with a lower cost of raising equity capital and higher liquidity (Bowen et al., 2008; Roulstone, 2003), and the quality of mandatory and voluntary firm disclosures affects the properties of EAs' EPS forecasts and recommendations (e.g., Botosan and Harris, 2000; Bowen et al., 2002; Healy et al., 1999;

Lang and Lundholm, 1996). Among other issues, the literature on CRAs has examined the behavior of certified and non-certified CRAs, their role in capital markets, and their use of accounting information. For example, Kraft (2015) examines adjustments to U.S. GAAP financial statements made by Moody's and finds that rating adjustments to U.S. GAAP financial statements are on average credit-risk increasing, and are associated with higher credit spreads and a flatter term structure, while Alissa et al. (2013) find that firms use earnings management to influence their certified credit ratings.

2.2. Sell-Side Equity Analysts

The EA literature has examined whether EA reports contain value-relevant information for pricing equity securities as opposed to serving as a marketing tool for their investment bank (e.g., Altinkilic and Hansen, 2009; Bradley et al., 2014; Li et al., 2015; Loh and Stulz, 2011; Mehran and Stulz, 2007). The empirical evidence has been mixed, with some papers arguing that the information content of EA reports has been overstated by the prior literature (e.g., Altinkilic and Hansen, 2009; Altinkilic et al., 2013; Kim and Song, 2015; Loh and Stulz, 2011). For example, Altinkilic and Hansen (2009) argue that prior studies have attributed the market impact of confounding news announcements to EA reports released on the same day. To address this issue, they use intraday stock returns to measure the information content of EA recommendation changes, and they find that the average stock price reaction to EA reports is insignificant after controlling for concurrent information announcements. In contrast, several papers find that EA reports that are issued around concurrent news events are informative (e.g., Bradley et al., 2014; Li et al., 2015; Yezegel, 2015). Bradley et al. (2014) finds that EAs' recommendations are informative after controlling for time stamp delays in I/B/E/S. Further, Li et al. (2015) examine the intraday stock returns to EA recommendation revisions issued during regular hours and after

hours, and they find that revisions in EA recommendations are informative both before and after hours even after controlling for a comprehensive set of confounding news events.

2.3. Sell-Side Debt Analysts

Similar to sell-side EAs, sell-side DAs are employed by the research departments of investment banks. DAs provide investment recommendations and research reports for buy-side analysts, institutional investors, and retail investors primarily for corporate bonds, although occasionally for credit default swaps as well. In recent years, active trading and retail investor participation in the corporate bond and derivatives markets has increased, such that average daily trading volume in the U.S. corporate bond market increased from \$17.8 billion in 2002 to \$26.7 billion in 2014 (SIFMA, 2015). This increase in the liquidity of fixed-income markets has naturally led to an increase in the demand for timely investment research for fixed-income securities. In terms of economic importance, sell-side DA coverage has grown from 475 reports in 2000 to over 1,720 in 2012. In total, there are 16,288 DA reports available in the Thomson ONE Analytics database from 2000 to 2014, covering 2,322 unique firms.

Recently, several papers have examined the outcomes of sell-side DA research. Johnston et al. (2009) investigate the determinants of DA coverage, and they find that both EA and DA following is increasing in return volatility and the correlation between the company's stock return and the market return, and decreasing in market-to-book and interest coverage. However, opposite of EA coverage, they find that DA coverage increases with the probability of default (measured using Moody's credit ratings), increases with firm leverage, increases with the number of business segments, and decreases with the presence of convertible bonds for a given issuer. De Franco et al. (2009) investigate the properties of DAs' investment recommendations. They find that the distribution of DAs' recommendations is more optimistic when the DA is

affiliated with the firm (i.e., when the DAs' broker is the lead underwriter for a bond or the lead arranger of a syndicated loan), and they find that the optimistic bias in affiliated DAs' recommendations is greater than that of EAs (where EAs are defined as affiliated when their investment bank is part of the underwriting syndicate for a firm's initial or secondary equity offering). De Franco et al. (2009) also find a significant bond market volume and return response to DA reports that is associated with the level of DAs' investment recommendations. De Franco et al. (2014) use textual analysis to show that DAs discuss bondholder-shareholder conflicts and that more negative discussions of conflict events (compared to equity analyst reports) are associated with increased spreads and trading volume in debt markets. Finally, Gurun et al. (2016) examine the role of DA coverage on bond market efficiency and find that increased liquidity stemming from DA coverage is associated with a shorter lag between price movements in the equity market and corporate bond market.

3. Hypothesis Development

3.1. Abnormal Bond Market Returns to Debt Analysts' Distress Predictions

I examine the corporate bond market response to DA reports for firms in financial distress to test whether DA reports have information content or if DA reports are uninformative after controlling for DA reports that piggyback on corporate news announcements. I also examine variation in the bond market response to DA reports based on the nature of the news conveyed by DAs (i.e., good news versus bad news), based on investors' *ex ante* expectation that the firm will file for bankruptcy, and based on the quality of the firm's information environment. Since corporate bond prices are determined by the probability of default and the loss given default (i.e., recovery rate), I expect that DA reports will be informative if and when they provide new and

unbiased information about the likelihood of default and the recovery rate of the bond.¹ Given that the likelihood of default is determined by the liquidity of firm assets relative to the maturity of its debt obligations, I expect DA reports to be more informative when they predict the likelihood that the firm has sufficient (or insufficient) liquidity to repay its maturing debt obligations. For example, I expect DAs to discuss changes in free cash flow, asset sales, the ability of the firm to refinance existing obligations, and its access to external capital markets. I also expect DAs to be more informative when they predict covenant violations (including covenants on the firm's private and public debt obligations) and formal bankruptcy filings (i.e., Ch. 11 and Ch. 7 bankruptcy filings). While covenant violations and bankruptcy filings are events of default, they also affect expected recovery rates as a result of wealth transfers between lenders around these events.²

Bond recovery rates are determined by the structural priority of the bond relative to other claimants. The finance literature shows that bondholder-bondholder conflicts resulting from covenant violations and the choice between out-of-court restructuring vis-à-vis formal bankruptcy significantly affect observed recovery rates (e.g., Asquith et al., 1994; Chatterjee et al., 1995; DeAngelo et al., 2002; Franks and Torous, 1994; Gilson et al., 1990). When a covenant violation is waived by a private lender, the lender typically renegotiates a higher interest rate and increased collateral (e.g., Beneish and Press, 1993; Chen and Wei, 1993; DeAngelo et al., 2002;

¹ The outcomes of financial distress include default, bankruptcy, and liquidation. As noted in Smith (1993), "Default is the breach of a promise made under a contract (p. 291)." It is an event of default if the firm violates a debt covenant, and the lender has the right to demand accelerated repayment of the loan. If the firm is unable to repay their loan, then the lender has the right to force the firm into bankruptcy (see, e.g., Chen and Wei, 1993; Smith 1993). As stated in Smith (1993), "Bankruptcy is a legal proceeding for the court-supervised administration of a firm in financial distress. Most large corporations file under Chapter 11, which allows reorganization of the firm's outstanding contracts. Under Chapter 7, the firm is liquidated. Liquidation is the sale of the firm's assets and distribution of the proceeds to the firm's claimants according to their priority (p. 291)."

² The majority of corporate bonds contain cross-default provisions, meaning that an event of default on any of the firm's private or public debt obligations constitutes an event of default on the remaining debt obligations (see Billett et al., 2007).

Smith, 1993). As a result, the asset coverage (and therefore the expected recovery rate) for all other claimants is reduced. In addition to covenant violations, the mechanism by which the firm resolves financial distress significantly influences recovery rates, and recovery rates are higher in private out-of-court restructurings than in formal bankruptcies (see Franks and Torous, 1994). Based on this evidence, I expect DA reports that predict whether the firm will formally file for Ch. 11 or Ch. 7 bankruptcy or violate a debt covenant will be more informative if they are not reiterations of previous announcements by the firm or other information sources (later I discuss how DAs' conflicts of interest may affect the information content of their reports). In summary, if DA reports in fact play an information role, then their predictions regarding liquidity, covenant violations, and formal bankruptcy filings will explain variation in bond market returns at the time of their release.

I expect DAs' bad news distress predictions (e.g., predictions that the firm will violate a covenant or file for bankruptcy) to be more informative than their good news predictions (i.e., predictions that the firm will *not* violate a covenant or file for bankruptcy) for two reasons. First, due to their concave payoff function, bondholders have an asymmetric demand for bad news over good news (see, e.g., Easton et al., 2009; Shivakumar et al., 2011).³ Second, if DAs' reporting incentives (e.g., to curry favor with firm managers to secure underwriting business) lead them to avoid providing bad news about their investment banking clients, then I expect bad news predictions, when they are given, to be more credible information signals than their good news predictions (see, e.g., Hutton et al., 2003).

I also expect the information content of DAs' distress predictions to vary cross-sectionally with the market's *ex ante* expectation that the firm will file for bankruptcy. When the market's

³ The extent to which this asymmetric demand for bad news holds in my sample depends on the extent to which bondholders' payoff function resembles equity for financially distressed firms.

expectation that the firm will file for bankruptcy is higher, I expect DAs' bad news distress predictions (e.g., predictions that the firm will file for bankruptcy) to be less informative because that prediction is less surprising. In contrast, I expect DAs' good news distress predictions (e.g., predictions that the firm will *not* file for bankruptcy) to be more informative when the market's expectation that the firm will file for bankruptcy is higher because good news is more surprising in that case. Analogously, I expect DAs' uncertain distress predictions (e.g., reports that discuss the likelihood of bankruptcy without issuing a direct prediction) to convey relatively more good news when the market's expectation that the firm will file for bankruptcy is higher (and vice versa) because when the market expects a firm to file for bankruptcy, a DA report suggesting that a bankruptcy filing is uncertain should be viewed as good news.

I further examine whether sophisticated bond market investors find more accurate DA predictions (based on *ex post* outcomes) to be more informative. The bond market is dominated by sophisticated institutional investors that perform their own buy-side market research and who are presumed to be less susceptible to biased or inaccurate DA research than retail investors (Bond Market Association, 2004; Mehran and Stulz, 2007). In fact, it is for this reason that DAs have been exempt from conflict-of-interest regulations until the passage of the "Debt Rule" in 2015, and even this regulation largely excludes DAs that only provide research to institutional investors.⁴ I test whether the bond market returns to DA reports with accurate predictions (based on *ex post* outcomes) are larger in magnitude, suggesting that sophisticated bond market investors are able to discern (*ex ante*) which DA distress predictions are more likely to be correct.

⁴ On July 16, 2015, the SEC adopted Financial Industry Regulatory Authority (FINRA) Rule 2242 (the "Debt Rule") that extends the EA conflict-of-interest regulations to DA research (SEC, 2015).

Lastly, I examine whether DA reports are more informative for private equity firms than for public equity firms. Private equity firms are likely to operate in more opaque information environments relative to public equity firms because the public information available about a firm tends to improve when the firm is listed on a stock exchange (e.g., Pagano et al., 1998; Saunders and Steffen, 2011). Private equity firms receive less press coverage than public equity firms and are less likely to be covered by equity analysts (Badertscher et al., 2015; Katz, 2009). Kovner and Wei (2012) find that the cost of debt in the bond market is higher for firms with private equity as opposed to public equity. They attribute their findings to the fact that bondholders find the information produced by the equity market useful and this loss of information increases the information asymmetry between managers and public bondholders. Taken together, these results suggest that if DAs play an information role then the marginal effect of DAs' distress predictions will be higher for private equity firms because these firms are more opaque. Further, differences in the information content of DA reports for private and public equity firms should be driven by differences in their information environments rather than DAs' incentives to perform a marketing role. DAs' incentives to advertise the brand name of their investment bank to bond market participants, to maximize brokerage trading revenue, and to market the bond issues of their underwriting clients are unlikely to differ between private and public equity firms.

3.2. The Economic Determinants of the Accuracy of Debt Analysts' Distress Predictions

In the section above, I discussed the extent to which DAs may perform an information role by documenting whether the qualitative discussions in their reports have information content and whether this information content varies with the quality of the firm's information environment. I also examine whether the information content of DA reports is affected by their affiliation with

the covered firm (i.e., is biased as a result of that affiliation), suggesting that DA reports play a marketing role. Although the information role and marketing role are not mutually exclusive, the EA literature defines the information role and marketing role based on differences in analysts' underlying incentives. If an analyst report serves an information role, then the objective of the report is to provide useful and reliable (i.e., unbiased) information to investors. On the other hand, if an analyst report serves a marketing role, then the objective of the report is to promote the brand name and advisory services of the investment bank, to increase trading volume and maximize brokerage trading revenue, and/or to advertise the securities of their underwriting clients (see, e.g., Li et al., 2015; Mehran and Stulz, 2007). Since brokerage clients do not pay for sell-side research directly, the analyst division of an investment bank is a cost center (see Mehran and Stulz, 2007). As such, sell-side analysts play an integral role in facilitating their investment bank's relationship with institutional investors and corporate managers in order to boost investment banking and brokerage trading revenue. If analyst reports serve a marketing role, then their reports will contain biased information. On the other hand, if DAs perform an information role, then the information content of their reports should be unbiased.

The relationship between the investment bank and the firm covered in a DA research report can take the following three forms: (1) the investment bank is seeking or has performed underwriting or financial advisory services for the firm, (2) the investment bank serves as a market maker for the firm's securities, or (3) the investment bank has a significant investment in the firm's securities. Corporate bond issuers pay investment banks to provide underwriting services and DA coverage. If DAs perform a marketing role, then DA reports for underwriting clients will be less accurate either because they are optimistically biased or they are silent with respect to bad news. In the EA literature, the marginal benefit of issuing optimistically biased

research is the additional underwriting revenue generated from pleasing firm management, and the marginal cost is the decrease in the investment bank's reputation for providing quality analyst coverage (see Mehran and Stulz, 2007).⁵

On one hand, DAs are likely to issue optimistically biased reports (or to withhold bad news) for underwriting clients because they are not regulated by the same conflict-of-interest regulations as EAs. DAs often participate in the underwriting process because of their ability to inform underwriters about the demand for certain structural features within a given debt contract, and they participate in marketing new debt issues by attending road shows (see Bond Market Association, 2004). In the financial distress setting, investment banks can generate a large amount of investment banking business by securing underwriting revenue from firms that need to refinance their existing debt obligations or issue new securities after emerging from Ch. 11 bankruptcy. As such, it is likely that DAs will be influenced by the demands of the underwriting division of the investment bank to issue optimistic reports (see GAO, 2012; SEC, 2015). At the same time, the marginal benefit of pleasing firm managers might be smaller in the distress setting because CEO turnover is higher for firms in financial distress (e.g., Gilson, 1989). As such, it is not obvious that investment banks have strong incentives to pressure DAs to issue optimistic reports for firms with low credit quality.⁶

In addition to underwriting new securities, investment banks may serve as market makers for the public debt securities of firms covered in DA research reports. The EA literature documents that more optimistic EA recommendations generate more trade and higher brokerage

⁵ In the equity analyst literature, affiliated EAs are slower to downgrade their investment recommendations than independent analysts (O'Brien, McNichols, and Lin, 2005), and affiliated EA recommendations are optimistically biased (Lin and McNichols, 1998; Michaely and Womack, 1999).

⁶ Mehran and Stulz (2007) claim that investment banks maximize their long-run underwriting revenue by increasing their reputational capital. If that is true, then DAs will try to provide more accurate distress predictions when the firm is an underwriting client of the investment bank.

commissions for investment banks (see Jackson, 2005). In the equity market, buy recommendations generate more trade because the pool of investors that would buy the stock based on a buy recommendation is larger than the pool of investors that would sell the stock based on a sell recommendation (this argument in the EA literature ignores the options markets). In addition, the brokerage commission on trades is relatively fixed in the equity market. Extending these arguments from the EA literature, if investment banks act opportunistically then DAs' distress predictions will be optimistically biased (or withhold bad news) when their investment bank is a market maker in the firm's securities. As noted above, DAs are not prohibited from communicating with the sales and trading divisions of the investment bank, and this may increase the likelihood that these divisions of the investment bank pressure DAs to issue optimistic reports or remain silent regarding bad news (see GAO, 2012; SEC 2015). However, it is unclear whether optimistic reports maximize trading commissions in the corporate bond market because brokerage commissions are not fixed, the pool of investors in the bond market is more concentrated, and trading volume is relatively higher in the 60 days surrounding default announcements (see Jankowitsch et al., 2014).⁷ Thus, whether investment banks have incentives to pressure DAs to issue optimistic reports when they are a market maker in the firm's securities is ambiguous due to differences in the structural features between the equity and bond markets.

Lastly, investment banks often have a significant investment in the firms covered by their DAs (e.g., an investment bank may hold a significant portion of a firm's debt obligations). When an investment bank has a material investment in the firm, the investment bank has stronger incentives to correctly interpret the firm's financial condition and to accurately predict whether the firm will file for bankruptcy (i.e., to correctly price the debt). As a result, it is likely that DAs

⁷ This may induce a pessimistic bias in DA reports because predictions that the firm will file for bankruptcy may serve to increase trading volume and maximize brokerage commission revenue.

will make more accurate distress predictions when their investment bank has a significant investment in the firm, especially since DAs are allowed to communicate with the other divisions of the investment bank. However, one can also envision a scenario where the investment bank may pressure DAs to issue biased reports until the bank is able to liquidate its position. If investment banks act opportunistically and DAs perform a marketing role, then DAs are less likely to issue accurate distress predictions when their investment bank has a significant investment in the firm's securities. In summary, if DAs issue optimistically biased reports (or withhold bad news) when their investment bank is an underwriter, market maker, or holds a significant investment in a firm, that would be evidence in favor of the marketing role.

4. Research Design

4.1. Data and Sample Selection

My sample consists of financially distressed firms with DA coverage in Thomson One Analytics between January 1, 2006 and August 15, 2015. Consistent with the finance literature, I define firms in financial distress as those firms with at least one bond with a credit rating equivalent to C+ or below from S&P, Moody's, or Fitch (see for example, Jankowitsch et al., 2014).⁸ Firms with DA coverage are those with at least one DA report issued in the two years surrounding the firm's C+ rating (the 2-year period is described below). I collect bond price data using TRACE, and I restrict the sample to firms with a C+ rating or below beginning in 2006 because TRACE coverage of high-yield bonds is limited prior to 2004 (see Asquith et al., 2013; Bessembinder and Maxwell, 2008). Using Python (to identify the report date, historical firm name, and analyst name for all DA reports in Thomson ONE Analytics) and the CUSIP Masterfile, I match the sample of DA reports available on Thomson ONE Analytics to the

⁸ As noted in Jankowitsch et al. (2014), a credit rating of C+ from Moody's, S&P, or Fitch indicates that the firm is close to default, but there is some prospect of recovery.

sample of firms with C+ ratings or below in Mergent FISD using historical firm name and the DA report date (after eliminating 3 firms which are financial institutions).

The final sample consists of firms that eventually file for bankruptcy as well as those that do not.⁹ If the firm files for bankruptcy, I collect all DA reports issued in the 2 years prior to the bankruptcy filing date (filing dates are obtained from Mergent FISD). Using Mergent FISD, I find that for firms that file for bankruptcy, the average number of days between the first assignment of a C+ rating or below and the bankruptcy filing date is 208 calendar days. To replicate DA coverage in the 2 years (730 days) prior to bankruptcy for the subsample that does not file for bankruptcy, I collect all DA reports in the 522 days prior to the first C+ or below credit rating date and for the 208 days thereafter. The sample used in the empirical tests consists of 1,642 DA report-bond level observations, 65 unique firms, and 188 unique bonds. This sample covers 502 unique DA reports issued between July 21, 2004 and May 16, 2013 from 12 unique investment banks and 41 unique debt analysts.¹⁰

For the 502 DA reports for financially distressed firms, I extract data from each report to calculate the independent variables of interest as well as a number of control variables. From each report I collect the name of the investment bank, analyst, and the report date. Using the required disclosures at the end of each report, I code the relationship between the investment bank and the covered firm to capture cases where the DA's investment bank has an underwriting relationship with the firm, serves as a market maker for the firm's securities, or has a significant

⁹ The sample of firms that do not file for bankruptcy contains 3 firms that eventually file for bankruptcy several years after my sample period.

¹⁰ The sample of bankrupt firm reports contains 735 DA report-bond level observations consisting of 293 unique DA reports covering 35 unique firms and 88 unique bonds. The sample of DA reports for financially distressed firms that do not file for bankruptcy contains 907 DA report-bond level observations consisting of 209 unique DA reports covering 30 unique firms and 100 unique bonds. The sample period ends on May 16, 2013 because access to Mergent FISD is limited to bond issuances through July 5, 2013.

debt or equity investment in the firm.¹¹ I also collect the bond-level investment recommendations from each report. I obtain credit rating data and the structural features of each bond (e.g., bond seniority, priority, coupon, amount outstanding, and maturity date) from Mergent FISD.

I code DAs' distress predictions by reading the qualitative content of each report and categorizing it into one of four categories (see Appendix B for examples of DA reports in each of these four categories). A DA report is categorized as discussing financial distress if it mentions the likelihood that the firm has sufficient liquidity to service its future debt obligations, the likelihood that the firm will violate a debt covenant, or the likelihood that the firm will file for bankruptcy. For later analysis, I use actual outcomes to classify DA reports into those with correct predictions (Correct Prediction) and incorrect predictions (Incorrect Prediction). Reports that mention the outcomes of financial distress (i.e., liquidity, covenant violations, and bankruptcy) but do not make a prediction are coded as Uncertain Prediction. For example, a report is categorized as Uncertain Prediction if the DA discusses the factors affecting the likelihood that the firm will file for bankruptcy but refrains from issuing a prediction. If a report does not mention financial distress, it is categorized as No Discussion of Distress. To verify the accuracy of DAs' covenant violation predictions, I use Michael Robert's covenant violation database as well as SEC filings available on EDGAR.¹² I also categorize DAs' distress predictions into good and bad news. The DA report is categorized as Bad (Good) News Distress Prediction if the analyst predicts that the firm will (not) file for bankruptcy, the firm will (not)

¹¹ The disclosures related to underwriting affiliation appear when the investment bank has managed or co-managed a private or public offering for the firm (i.e., has served as the lead or co-lead arranger of the underwriting syndicate) or is seeking to provide underwriting services in this capacity.

¹² Michael Robert's covenant violation database can be found at <http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-11/index.html>.

violate a debt covenant, or the firm does not have (has) sufficient liquidity to service its maturing debt obligations.¹³

Using the bond-level characteristics obtained from each report, I manually match each bond to TRACE and Mergent FISD. Using TRACE, CRSP, and Mergent FISD, I calculate the 5-day (day t-2 to day t+2) bond market return centered on each DA report (issue date = day 0). I calculate abnormal bond returns using trading data from TRACE, Treasury bond return data from CRSP, and accumulated interest (i.e., the accumulated interest payable to the bondholder since the previous interest payment date) data from Mergent FISD. Raw daily bond market returns are calculated as:

$$R_{it} = \frac{(P_{it} - P_{i,t-1} + AI_{it})}{P_{i,t-1}}, \quad (1)$$

where R_{it} is the raw return for bond issue i , and AI_{it} is the accrued interest from day $t-1$ to day t . Following Bessembinder et al. (2009), the daily price for a given bond, P_{it} , is calculated as the trade-weighted price. If a bond trades on one day in the return window, the return is calculated as the daily return based on the trading price on the last date that the bond traded. Following Easton et al. (2009) and Bessembinder et al. (2009), I subtract the U.S. Treasury bond return from the raw return to measure the abnormal return (AR_{it}):

$$AR_{it} = R_{it} - TR_{it}, \quad (2)$$

where TR_{it} is the daily Treasury buy-and-hold return cumulated over the same window as the firm's bond return (i.e., the Treasury issue has a similar remaining time to maturity as the firm's

¹³ My definition of “good” and “bad” news according to the tone in the DA reports does not account for the market's expectation of the information contained in the reports. The difference between my categorization of good and bad news and the true surprise contained in DAs' distress predictions will add noise to my analysis of the information content of DA reports to the bond market. I try to partially address this issue by partitioning the data based on the *ex ante* expectation of bankruptcy (see Section 4.2.1).

bond). I exclude all cancelled, corrected, reversal, and commission trades, and any trade with a negative price or price exceeding \$500 (see Bessembinder et al., 2009).

4.2. Empirical Tests

4.2.1. Bond Market Reaction to Debt Analysts' Distress Predictions

To examine the predictions outlined in Section 3, I estimate the following regression at the DA report-bond level:

$$\begin{aligned}
 AbRet_{i,j,k,t} = & \beta_0 + \beta_1(Distress Prediction_{i,j,k,t}) + \beta_2(Downgrade_{i,j,k,t}) + \beta_3(Upgrade_{i,j,k,t}) + \\
 & \beta_4(Reiteration_{i,j,k,t}) + \beta_5(Credit Flash Report_{i,j,k,t}) + \\
 & \beta_6(Underwriting Affiliation_{i,j,k,t}) + \\
 & \beta_7(Bond Complexity High_{i,j,k,t}) + \beta_8(Bond Highly Traded_{i,j,k,t}) + \\
 & \beta_9(Bond Length to Maturity_{i,j,k,t}) + \beta_{10}(Bond Credit Rating_{i,j,k,t}) + \\
 & \beta_{11}(Credit Rating Change_{i,j,k,t}) + \beta_{12}(Equity Recommendation Change_{i,j,k,t}) + \\
 & \beta_{13}(Press Release_{i,j,k,t}) + \beta_{14}(Financial Statement Filing_{i,j,k,t}) + \\
 & \beta_{15}(Management Disclosure_{i,j,k,t}) + \beta_{16}(Unexpected Earnings_{i,j,k,t}) + \varepsilon_{i,j,k,t}
 \end{aligned} \tag{3}$$

where the dependent variable, $AbRet$, is the 5-day abnormal bond return for bond i of firm j in response to DA report issued by analyst k at time t (see Eq. (2)). The independent variable of interest is Distress Prediction, an indicator variable equal to 1 if the DA report mentions potential liquidity concerns, covenant violations, or bankruptcy, and 0 otherwise. Since Eq. (3) examines the overall bond market reaction to all distress predictions, I do not make a prediction on the sign of β_1 because Distress Prediction will capture the net effect of both good and bad news predictions. Ultimately, the sign, the magnitude, and the significance of β_1 will depend on the relative magnitudes of the bond market's reactions to DAs' bad news versus good news distress predictions.¹⁴

¹⁴ Eq. (3) includes control variables to capture other features of DA reports, structural characteristics of each bond, and concurrent information announcements (following De Franco et al. (2009) and De Franco et al. (2014)). See Appendix A for definitions of the control variables.

To examine the differential bond market response to bad news and good news predictions separately, I estimate the following regression:

$$AbRet_{i,j,k,t} = \beta_0 + \beta_1(Bad\ News\ Distress\ Prediction_{i,j,k,t}) + \beta_2(Good\ News\ Distress\ Prediction_{i,j,k,t}) + \beta_3(Uncertain\ Distress\ Prediction_{i,j,k,t}) + \beta_X(Control\ Variable_{X_{i,j,k,t}}) + \varepsilon_{i,j,k,t} . \quad (4)$$

If DAs' bad news distress predictions convey new value-relevant negative information to bond market investors, then the coefficient β_1 will be negative. Analogously, β_2 will be positive if DAs' good news distress predictions convey new value-relevant positive information to the bond market (and I have no prediction on the coefficient on Uncertain Distress Prediction, β_3).¹⁵

To examine the differential effect of DAs' distress predictions based on the *ex ante* likelihood that the firm will file for bankruptcy, I estimate the following model:

$$AbRet_{i,j,k,t} = \beta_0 + \beta_1(Bad\ News\ Distress\ Prediction_{i,j,k,t}) + \beta_2(Bad\ News\ Distress\ Prediction * Firm\ Rating\ Low_{i,j,k,t}) + \beta_3(Good\ News\ Distress\ Prediction_{i,j,k,t}) + \beta_4(Good\ News\ Distress\ Prediction * Firm\ Rating\ Low_{i,j,k,t}) + \beta_5(Uncertain\ Distress\ Prediction_{i,j,k,t}) + \beta_6(Uncertain\ Distress\ Prediction * Firm\ Rating\ Low_{i,j,k,t}) + \beta_7(Firm\ Rating\ Low_{i,j,k,t}) + \beta_X(Control\ Variable_{X_{i,j,k,t}}) + \varepsilon_{i,j,k,t} . \quad (5)$$

I measure bond investors' *ex ante* expectation that the firm will file for bankruptcy using the indicator variable, Firm Rating Low, which is equal to 1 if the bond with the highest credit rating for a given firm is equivalent to an S&P rating of CCC+ or below, and 0 otherwise.¹⁶ While firms that are included in the sample have at least one bond with a C+ rating or below, this

¹⁵ I recognize that the model in Eq. (4) does not match bad news and good news predictions issued at the same time from different analysts covering the same firm. Although this type of matching procedure would be beneficial, I cannot implement it due to lack of observations meeting this criteria.

¹⁶ I use credit ratings to measure the *ex ante* likelihood of bankruptcy because my sample contains private equity firms that do not have the market value of equity variables necessary to implement bankruptcy prediction models. The use of CCC+ as a cutoff is arbitrary, but my results are robust to using different cutoffs around the CCC+ rating.

indicator captures firms with a higher likelihood of bankruptcy because the *highest* rated bond for these firms is CCC+ or below.

To test whether the bond market response to DAs' distress predictions varies with the *ex ante* probability of bankruptcy, I interact Firm Rating Low with Bad News Distress Prediction, Good News Distress Prediction, and Uncertain Distress Prediction. If the bond market finds DAs' bad news distress predictions to be less informative when the *ex ante* likelihood of bankruptcy is higher to begin with, then the coefficient on Bad News Distress Prediction*Firm Rating Low (β_2) will be significantly positive. If the bond market finds Good News Distress Predictions to be relatively more informative when the *ex ante* probability of bankruptcy is higher to begin with, then the coefficient on Good News Distress Prediction*Firm Rating Low (β_4) will be significantly positive. Lastly, if the market finds DA reports with Uncertain Distress Predictions to convey relatively more positive news when the firm is more likely to file for bankruptcy, then the coefficient on Uncertain Distress Prediction*Firm Rating Low (β_6) will be significantly positive.

To take a closer look at the variation in DA report content, I estimate Eq. (6) to examine the differential bond return reaction to DAs' discussions of liquidity, covenant violations, and bankruptcy filings. To do so, I replace the variable Distress Prediction in Eq. (4) with three separate variables for Bankruptcy Prediction, Covenant Prediction, and Liquidity Prediction.

$$\begin{aligned}
 AbRet_{i,j,k,t} = & \beta_0 + \beta_1(Bad\ News\ Bankruptcy\ Prediction_{i,j,k,t}) + \\
 & \beta_2(Good\ News\ Bankruptcy\ Prediction_{i,j,k,t}) + \\
 & \beta_3(Uncertain\ Bankruptcy\ Prediction_{i,j,k,t}) + \beta_4(Bad\ News\ Covenant\ Prediction_{i,j,k,t}) + \\
 & \beta_5(Good\ News\ Covenant\ Prediction_{i,j,k,t}) + \beta_6(Uncertain\ Covenant\ Prediction_{i,j,k,t}) + \\
 & \beta_7(Bad\ News\ Liquidity\ Prediction_{i,j,k,t}) + \beta_8(Good\ News\ Liquidity\ Prediction_{i,j,k,t}) + \\
 & \beta_9(Uncertain\ Liquidity\ Prediction_{i,j,k,t}) + \beta_X(Control\ Variable_{X_{i,j,k,t}}) + \varepsilon_{i,j,k,t}
 \end{aligned} \tag{6}$$

The rationale to allow for differential effects of these items is simply that it is not obvious that DAs' discussions of bankruptcy, covenant violations, and liquidity will be equally informative to the bond market (i.e., have the same pricing coefficient as modeled in Eq. (4)). If DAs' bad news bankruptcy, covenant, and liquidity predictions convey new value-relevant information to bond market investors, then the coefficients β_1 , β_4 , and β_7 will be negative. If DAs' good news bankruptcy, covenant, and liquidity predictions convey new value-relevant information to bond market investors, then the coefficients β_2 , β_5 , and β_8 will be positive (and I have no predictions on the signs of the coefficients on uncertain bankruptcy, covenant, and liquidity predictions).

To examine whether sophisticated bond market investors find more accurate DA distress predictions (based on *ex post* outcomes) to be more informative *ex ante*, I interact Good News Distress Prediction with Correct in Eq. (7).

$$\begin{aligned} AbRet_{i,j,k,t} = & \beta_0 + \beta_1(Bad\ News\ Distress\ Prediction_{i,j,k,t}) + \beta_2(Good\ News\ Distress\ Prediction_{i,j,k,t}) + \\ & \beta_3(Good\ News\ Distress\ Prediction * Correct_{i,j,k,t}) + \beta_4(Uncertain\ Distress\ Prediction_{i,j,k,t}) + \\ & \beta_5(Correct_{i,j,k,t}) + \beta_X(Control\ Variable_{X_{i,j,k,t}}) + \varepsilon_{i,j,k,t} . \end{aligned} \quad (7)$$

In Eq. (7), I only interact Correct with good news distress predictions because almost all DAs' bad news distress predictions turn out to be correct (see Table 5). If bond market investors are able to discern (*ex ante*) which DA predictions are more likely to be accurate (*ex post*), then the coefficient on Good News Distress Prediction*Correct, β_3 , will be positive.¹⁷

Finally, to examine whether DAs' distress predictions are more informative when the firm operates in a more opaque information environment, I interact DAs' distress predictions with Private Firm, which equals 1 if the firm is a private equity firm and equals 0 if the firm is a public equity firm in Eq. (8).

¹⁷ The method in Eq. (7) is similar to Fama (1990) and Schwert (1990) who regress stock returns on future production growth rates. In a similar manner, I test whether bond market reactions to DA reports predict future realized outcomes in terms of financial distress (see also Kothari and Shanken, 1992).

$$\begin{aligned}
AbRet_{i,j,k,t} = & \beta_0 + \beta_1(Bad\ News\ Bankruptcy\ Prediction_{i,j,k,t}) + \\
& \beta_2(Good\ News\ Bankruptcy\ Prediction_{i,j,k,t}) + \\
& \beta_3(Uncertain\ Bankruptcy\ Prediction_{i,j,k,t}) + \beta_4(Bad\ News\ Covenant\ Prediction_{i,j,k,t}) + \\
& \beta_5(Good\ News\ Covenant\ Prediction_{i,j,k,t}) + \beta_6(Uncertain\ Covenant\ Prediction_{i,j,k,t}) + \\
& \beta_7(Bad\ News\ Liquidity\ Prediction_{i,j,k,t}) + \beta_8(Good\ News\ Liquidity\ Prediction_{i,j,k,t}) + \\
& \beta_9(Uncertain\ Liquidity\ Prediction_{i,j,k,t}) + \beta_{10}(Bad\ News\ Bankruptcy\ Prediction * \\
& Private\ Firm_{i,j,k,t}) + \beta_{11}(Good\ News\ Bankruptcy\ Prediction * Private\ Firm_{i,j,k,t}) + \\
& \beta_{12}(Uncertain\ Bankruptcy\ Prediction * Private\ Firm_{i,j,k,t}) + \beta_{13}(Bad\ News\ Covenant\ Prediction * \\
& Private\ Firm_{i,j,k,t}) + \beta_{14}(Good\ News\ Covenant\ Prediction * \\
& Private\ Firm_{i,j,k,t}) + \beta_{15}(Uncertain\ Covenant\ Prediction * Private\ Firm_{i,j,k,t}) + \\
& \beta_{16}(Bad\ News\ Liquidity\ Prediction * Private\ Firm_{i,j,k,t}) + \beta_{17}(Good\ News\ Liquidity\ Prediction * \\
& Private\ Firm_{i,j,k,t}) + \beta_{18}(Uncertain\ Liquidity\ Prediction * \\
& Private\ Firm_{i,j,k,t}) + \beta_{19}(Private\ Firm_{i,j,k,t}) + \beta_X(Control\ Variable_{X_{i,j,k,t}}) + \varepsilon_{i,j,k,t}
\end{aligned} \tag{8}$$

If DAs' bankruptcy, covenant, and liquidity predictions are incrementally more informative for private equity firms, then the coefficients β_{10} , β_{13} , and β_{16} will be negative and significant, and β_{11} , β_{14} , and β_{17} will be positive and significant (I have no predictions on the signs of the coefficients on uncertain predictions, β_{12} , β_{15} , and β_{18}).

4.2.2. Economic Determinants of the Accuracy of Debt Analysts' Distress Predictions

To investigate whether investment banks and DAs act opportunistically as predicted by the marketing role hypothesis, I examine the association between the investment bank's affiliation with the firm (i.e., underwriter, market maker, or significant investment) and the type of report issued by the DA (i.e., correct prediction, incorrect prediction, uncertain prediction, and no discussion of distress). If DAs choose to bias their reports, they will issue an incorrect prediction. If DAs choose to remain silent, they will issue a report with an uncertain prediction or no discussion of distress. As each of these alternatives are distinct from one another, one can model DAs' decision to issue an incorrect prediction, uncertain prediction, and no discussion of distress report using a discrete choice model with multiple outcomes.

I estimate the multinomial logistic (MNL) regression in Eq. (9) to capture the likelihood that a DA issues an incorrect prediction, uncertain prediction, or no discussion of distress report *relative* to issuing a correct prediction based on their affiliation with the firm. The MNL regression model does not assume an ordered structure to the dependent variable, which means that issuing an uncertain prediction is not assigned a higher value than issuing a report with no discussion of distress. MNL is designed to estimate the likelihood of each discrete outcome relative to a given benchmark. I choose correct predictions as the benchmark because I am interested in the likelihood that investment banks act opportunistically relative to the likelihood that their DAs issue accurate, unbiased reports (i.e., correct predictions). Using MNL, I model the likelihood of issuing each type of DA report as a function of the DA's affiliation characteristics, the firm's accounting information environment, and macroeconomic conditions (estimation uses a sample of 236 unique DA reports with accounting and market value of equity data available data in Compustat, excluding private equity firms for example).

$$\begin{aligned}
 Prob(\text{Issue Prediction Type}_{j,k,t} = 1) = & \beta_0 + \beta_1(\text{Underwriting Affiliation}_{j,k,t}) + \beta_2(\text{Market Maker}_{j,k,t}) + \\
 & \beta_3(\text{Significant Investment}_{j,k,t}) + \beta_4(\text{Ln(Investment Bank MVE)}_{j,k,t}) \\
 & + \beta_5(\text{Altman Z - Score}_{j,k,t}) + \beta_6(\text{FCF}_{j,k,t}) + \beta_7(\text{ROA}_{j,k,t}) + \\
 & \beta_8(\text{NBER Recession}_{j,k,t}) + \varepsilon_{j,k,t}
 \end{aligned} \tag{9}$$

The MNL model estimates Eq. (9) separately for each discrete choice variable such that the dependent variable, Issue Prediction Type, takes the values of Incorrect Prediction, Uncertain Prediction, and No Discussion of Distress. The independent variables, Underwriting Affiliation, Market Maker, and Significant Investment are indicator variables equal to 1 when the DA's investment bank serves as an underwriter or is seeking to provide underwriting services to the firm; the DA's investment bank serves as a market maker in the firm's securities; or the DA's investment bank has a significant investment in the firm, respectively, and 0 otherwise.

If DAs are more likely to issue an incorrect versus a correct prediction when the DA's investment bank is an underwriter, market maker, or has a significant investment in the firm, then the coefficients β_1 , β_2 , and β_3 will be significantly positive when Issue Prediction Type equals Incorrect Prediction.¹⁸ If DAs are more likely to withhold issuing a distress prediction when the DA's investment bank is an underwriter, market maker, or has a significant investment in the firm, then the coefficients β_1 , β_2 , and β_3 will be significantly positive when Issue Prediction Type equals Uncertain Prediction or No Discussion of Distress. Model estimation controls for: the reputational capital and information resources of the DA's investment bank by including the investment bank's market value of equity; the firm's accounting information environment by including Altman Z-Score (Z-Score), free cash flow (FCF), and return on assets (ROA); and changes in macroeconomic conditions using an NBER Recession indicator variable which is equal to 1 if the DA report is issued during an economic recession (as defined by the NBER), and 0 otherwise.

5. Results

5.1. Descriptive Statistics

Figure 1 describes the industry composition of the sample using 2-digit SIC codes. The frequency of DA reports is highest for paper products (SIC=26, N=81, %=12%), hotels (SIC=70, N=74, %=11%), transportation equipment (SIC=37, N=73, %=11%), holding and other investment companies (SIC=67, N=51, %=7%), and amusement and recreation services (SIC=79, N=51, %=7%). Overall, while the distribution spans a wide variety of industries, DA reports are more frequent for industries with more tangible assets (e.g., manufacturing and

¹⁸ Since all DA distress predictions (except 3 cases) that are incorrect are good news distress predictions (see Table 5), the interpretation of the likelihood of issuing an incorrect distress prediction is akin to the likelihood of issuing an optimistic prediction.

hotels) because such industries issue relatively more public debt as a function of their investment opportunity sets (see, e.g., Myers, 1977; Smith and Watts, 1992).

Using Python, I calculated the number of characters in each DA report available on Thomson ONE for firms with public equity and credit rating data in Mergent FISD (10,656 reports). Table 1 provides descriptive statistics for the length of DA reports as a function of credit quality. This table shows that DA reports for distressed firms are significantly longer than for firms of higher credit quality. For example, the average (median) length of DA reports of 23,424.0 (22,010.0) for non-investment grade firms is longer than 18,612.2 (17,199.0) for investment grade firms. I also find that the average (median) length of DA reports for firms rated AAA to BBB+ is 19,210.9 (17,290.0) characters (approximately 6 pages), while the average (median) length of DA reports for firms rated CCC- to D- (i.e., distressed firms) is 32,020.6 (26,857.5) characters (approximately 9 pages). A simple takeaway from Table 1 is that DAs write longer reports for firms that are financially distressed.

Table 1 also shows the number of DA reports as a function of credit quality. Specifically, DAs issue more reports for non-investment grade firms (6,137 reports) than for investment grade firms (4,519 reports). In addition, the largest number of reports are written for firms with credit ratings between BBB and CCC (8,147 reports and 76% of the sample), and the fewest are written for firms with credit ratings between CCC- and D- (62 reports and 1% of the sample). This result is both a function of DAs' coverage decisions as well as the number of firms within each rating category. For example, analyzing the Compustat S&P ratings database over the same time period reveals that 35% of firm-year observations have a credit rating between AAA and BBB+ (compared to 23% of DA reports); 63% have a credit rating between BBB and CCC (compared to 76% of DA reports); and 3% have a credit rating between CCC- and D- (compared to 1% of

DA reports). As a result, the small number of DA reports for firms with ratings between CCC- and D- is largely determined by the small number of firms within this rating category.

Figure 2 describes bond trading activity in the 2 years prior to the bankruptcy filing date by plotting the average number of bond trades per day in each month prior to the bankruptcy filing date. For firms that do not file for bankruptcy, the bankruptcy filing date is set equal to the estimated date that the firm would have filed for bankruptcy (i.e., 208 days plus the first assignment of a C+ rating or below, as described in Section 4.1). This plot demonstrates that the trading activity of bonds does not decline as the bankruptcy filing date approaches. It shows that for firms that file for bankruptcy, the number of bond trades per day increases as the firm approaches bankruptcy, where the number of bond trades is defined as the number of transactions in a given bond per day. For example, the average number of daily bond trades is 3.24 in month -24 (2 years prior to bankruptcy) and 6.8 in month -1 (the month prior to the bankruptcy filing date). The takeaway from this figure is that although firm performance is declining, there is still trading activity in these bonds, hence demand for DA reports. The increase in trading activity may imply that the demand for DA reports actually increases as firms approach a bankruptcy filing date. This result holds when comparing the trading activity of these bonds to a prior period (Bankrupt Firms: Benchmark), defined as the 48 to 24 months prior to bankruptcy. Further, the results hold for the sample of firms that do not file for bankruptcy, as the average number of daily trades for Distress Firms does not decline prior to the estimated date that the firm would have filed for bankruptcy. In untabulated analysis, I find that DA coverage (i.e., the number of debt analyst reports per firm) is relatively constant throughout the sample period. Thus, while firm performance is decreasing as firms approach bankruptcy, DA coverage shows no decline.

Table 2 (Panel A) provides descriptive statistics for the sample of 1,642 DA report-bond observations for variables defined at the bond level. The average (median) 5-day abnormal bond return centered on the DA report date is 0.004 (0.001), and the 25th (75th) percentile of abnormal bond returns is -0.021 (0.022). Approximately half of the abnormal returns in the sample are positive (853 reports, 52%) and the other half are negative (789 reports, 48%). The average abnormal bond returns to DA reports with positive (negative) values is 0.054 (-0.049). On average, the bonds in the sample have 5.1 years remaining to maturity (maximum of 24.4 years), but the distribution is skewed closer to the minimum time to maturity of 0.03 years (approximately 10 days). Evidence that the firms in the sample are in financial distress is that the maximum credit rating is 13, equivalent to a BBB- (which is the lowest investment-grade rating); the median bond credit rating is 6, equivalent to CCC+ (indicating that the issue is vulnerable to nonpayment); and the mean of Firm Rating Low is 0.303 (indicating that 30.3% of the bonds belong to firms where the highest-rated bond is CCC+ or below). Thirty-nine percent of the sample consists of DA reports issued for bonds of private equity firms (mean=0.386), and 30 out of the 65 unique firms in the sample are private equity firms (untabulated). Approximately 9% (mean=0.088) of the DA report-bond observations are issued in the 5 days surrounding a credit rating change or affirmation. Other characteristics worth noting are that the distribution of DAs' investment recommendations is 26% Buy, 41% Hold, and 16% Sell, with the remaining reports not containing a recommendation. The majority of recommendations are reiterations (71.3%), and fewer than 10% of the recommendations constitute a recommendation change with 4.9% upgrades and 4.1% downgrades.

Panel B provides descriptive statistics at the bond level (for 188 unique bonds) designed to capture whether bond prices and credit ratings at the beginning of the sample period can predict

whether the firm will file for bankruptcy or not. For firms that file for bankruptcy, the average (median) bond price 24 months prior to the bankruptcy filing date is 97.91 (101.01), and the average (median) credit rating is 6.69 (6) (where 6 is equivalent to an S&P rating of CCC+).¹⁹ For firms that do not file for bankruptcy, the pseudo-bankruptcy filing date is equal to the estimated date that the firm would have filed for bankruptcy (i.e., 208 days plus the first assignment of a C+ rating or below, as described in Section 4.1) as in Figure 2. The average (median) bond price 24 months prior to the pseudo-bankruptcy filing date is 88.32 (92.97), suggesting that bond prices at the beginning of the sample period do not predict whether the firm will file for bankruptcy since the mean (median) bond price is smaller for firms that do not file for bankruptcy. In contrast, the average (median) credit rating is 7.75 (8) (8 is equivalent to a B rating), slightly higher than for firms that file for bankruptcy. This provides some evidence that credit ratings at the beginning of the sample period predict whether the firm is more likely to file for bankruptcy.

Table 3 provides descriptive statistics for variables defined at the DA report level (Panel A) and the firm level (Panel B). Select features worth noting are that across the sample of 502 unique DA reports, 6.97% are bad news, 24.50% are good news, 14.34% contain an uncertain prediction, and 57.77% do not discuss financial distress (the total exceeds 100% because some DA reports contain multiple predictions). These results provide preliminary evidence as to whether DAs perform an information role versus a marketing role. By classifying DA reports into those that only reiterate corporate news versus provide new information, I find that 57.77%

¹⁹ Note that the number of observations for bond prices is 136 (and 171 for credit ratings). The number of observations is smaller than the number of unique bonds (188) because some bonds are issued in the middle of the sample period and bond prices are not available for those bonds 24 months prior to bankruptcy. Further, the number of observations for bond prices is smaller than for credit ratings because bonds receive a credit rating in Mergent FISD prior to having trade data available in TRACE, presumably because bonds require a credit rating before they are publically issued and traded on the secondary market.

of reports piggyback on corporate news without providing unique predictions regarding changes in default risk or recovery rates. With respect to the accuracy of DAs' distress predictions based on *ex post* outcomes, 16.9% turn out to be correct and 14.1% turn out to be incorrect. In other words, conditional upon observing a DA report that predicts the outcome of financial distress, the likelihood that the prediction is correct is approximately 50 percent.

Turning to the conflict of interest variables, for 54.4% of the reports the DA is affiliated with the firm through seeking or providing underwriting services; the DA's investment bank serves as a market maker in the firm's securities in 55.6% of the observations; and the investment bank has a significant investment in the firm's securities 54.2% of the time. With respect to other news announcements, 15.9% of DA reports are issued in the 5 days surrounding a firm press release, 1.8% around a financial statement filing, 7.4% around a management disclosure, 12.5% around an equity analyst report, and 39.2% around an earnings announcement. Turning to Panel B with descriptive statistics at the firm level, the main takeaway is that the average number of DA reports per firm is 7.7 (max = 27 and min=1), and that at the median, each firm has 2 DAs covering their bonds and has 2 bonds outstanding (mean=3.185 and max=17).

Table 4 shows the number of reports containing a bankruptcy, covenant violation, or liquidity prediction. Of the total 502 unique DA reports in the sample, 41 reports (8.17%) contain a bankruptcy prediction, 64 reports (12.75%) contain a covenant prediction, and 170 reports contain a liquidity prediction (33.86%). The category with the largest number of reports is Good News Liquidity Prediction (106 reports, 21.12%), where reports in this category predict that the firm has sufficient liquidity to services its maturing debt obligations. One additional feature of Table 4 worth noting is that the number of bad news bankruptcy, covenant, and liquidity predictions is smaller than the number of good news or uncertain news bankruptcy, covenant,

and liquidity predictions respectively (consistent with the aggregate numbers in Table 3 Panel (A)).²⁰

Table 5 provides a cross-tabulation of the nature of the news in DA reports and the *ex post* accuracy of DA reports (as defined in Table 3). The information in this table is designed to analyze whether DAs' incorrect distress predictions are equally likely to result in Type I versus Type II errors (i.e., whether the number of incorrect predictions is similar for good and bad news predictions). Remarkably, there are only 3 predictions that convey bad news that turn out to be incorrect *ex post*. Simply put, DAs rarely predict bad news (i.e., bankruptcy, covenant violations, or lack of sufficient liquidity) when their predicted outcome does not occur, suggesting they are unlikely to predict bad news unless they are certain of the outcome. This preliminary evidence indicates that DAs' incentives are aligned with providing good news (I formally test the likelihood that DAs issue optimistically biased reports in Tables 10 and 11).²¹

The final set of descriptive statistics, reported in Table 6, are designed to provide evidence on whether DAs' distress predictions piggyback on CRAs' predictions by documenting the number of CRA reports prior to DAs' distress predictions. The evidence shows that out of 223 DA distress predictions (i.e., reports with bad news, good news, or uncertain distress predictions), only 26 are preceded by a CRA report in the 5 days prior to the DA report date (or issued on the same day as a CRA report). Thus, DAs do not appear to piggyback on CRA reports. To control

²⁰ Note that the total number of reports conveying bad news, good news, and uncertain news in Table 4 differs slightly from those in Table 3 (Panel A) because some reports contain multiple types of distress predictions (e.g., both a covenant prediction and a liquidity prediction).

²¹ Note that the number of predictions in Table 5 is smaller than those reported in Table 4 because Table 4 includes DA reports with uncertain predictions and because some reports contain multiple types of distress predictions (see Footnote 20). Table 5 aggregates predictions at the report level such that the only reports that are counted twice in Table 5 are those with both a bad news and good news prediction (6 reports) and those with both an incorrect and correct prediction (1 report).

for the 12% of DA reports that are preceded by a CRA report, I include a control variable for credit rating changes in Eq. (3).

5.2. Regression Results: The Bond Market Reaction to Debt Analysts' Distress Predictions

5.2.1. Bond Market Reaction to All Distress Predictions

Table 7 reports the results testing the extent to which DA reports play an information role in the bond market where the dependent variable is the signed abnormal bond market return centered on the DA report. In Column (1), the independent variable of interest is the Distress Prediction (equal to 1 if the DA report mentions liquidity, covenant violations, or bankruptcy concerns, and 0 otherwise) whose coefficient is -0.001 (insignificant), evidence that the bond market response to DA reports with distress predictions is no different from the bond market response to DA reports that do not discuss financial distress. An insignificant coefficient on this variable can occur either because DAs' distress predictions convey no new value-relevant (or no credible) information on average, or more likely because the effect of good news and bad news predictions on abnormal bond returns nets to zero when all reports are treated the same as in Column (1).

To take a closer look at the results, Column (2) breaks DAs' distress predictions out into bad news distress predictions, good news distress predictions, and uncertain distress predictions. The results reveal that the coefficient on Bad News Distress Prediction is -0.022 (significant at the 5% level), evidence that bond returns to DA reports are 2.2% lower when DAs predict that the firm will file for bankruptcy, the firm will violate a debt covenant, or the firm does not have sufficient liquidity to service its maturing debt obligations. This is evidence that DA reports play an information role in the bond market (at least when they convey bad news). In contrast, the coefficients on Good News Distress Prediction and Uncertain Distress Prediction are insignificant, indicating that abnormal bond returns to DA reports with good news and uncertain

distress predictions are not significantly different from those that do not discuss financial distress. This is evidence that such reports do not play an information role in the bond market, or in the case of good news, do not convey credible information.²² Overall, these results confirm my hypothesis that DAs' bad news distress predictions are more informative than their good news predictions. Two economic interpretations of these results are that bond values are asymmetrically more affected by bad news as a function of their concave payoff functions or bad news is more credible than good news.

To explore whether the information content of DA reports varies with the market's (*ex ante*) expectation that the firm will file for bankruptcy, I estimate the model in Column (3) of Table 7. As described above, I measure the *ex ante* likelihood of bankruptcy using the indicator variable, Firm Rating Low, which is equal to 1 if the highest-rated bond for a given firm is CCC+ or below, and 0 otherwise. This coding is designed to better isolate cross-sectional variation in the potential for DAs' distress predictions to play an information role for firms with higher versus lower *ex ante* probabilities of bankruptcy. Turning to the results, the coefficient on Bad News Distress Prediction*Firm Rating Low in Column (3) is insignificant as is that on Good News Distress Prediction*Firm Rating Low. Thus, the bond market responses to DAs' bad news distress predictions are not statistically different for firms with higher (*ex ante*) probabilities of bankruptcy, and the bond market responses to DA reports with good news distress predictions

²² To distinguish between these hypotheses (i.e., lack of information content versus lack of credibility), I examine whether the bonds that receive good news DA reports in this sample respond to positive earnings announcements over the same period. I find that the response to positive earnings surprises is significantly positive at a 10% level. This suggests that it is the lack of credibility of DAs' good news forecasts that generates a lack of response to good news forecasts, a result confirmed later by the evidence in Table 9.

are not statistically different from reports that do not discuss financial distress, regardless of the market's expectation of the likelihood of bankruptcy.²³

Turning to the coefficient on Uncertain Distress Prediction*Firm Rating Low, it is 0.082 (significant at the 1% level), consistent with my prediction that uncertain predictions are relatively more positive news when the *ex ante* likelihood of bankruptcy is higher. The underlying intuition is that when investors believe that a firm will file for bankruptcy, a DA report with a prediction that the likelihood of bankruptcy is uncertain (as opposed to certain) is likely to be interpreted as good news. The coefficient on the main effect, Uncertain Distress Prediction, is negative (coeff. = -0.018 and significant at the 10% level), which indicates that abnormal bond returns to DA reports for firms with a lower *ex ante* probability of bankruptcy are 1.8% lower when DAs issue an uncertain distress prediction. In contrast, abnormal bond returns to DA reports with uncertain distress predictions for firms with a higher *ex ante* probability of bankruptcy are 6.5% higher (significant at a 10% level). Together these results suggest that when the market assigns a higher probability to a firm filing for bankruptcy, DAs' uncertain distress predictions convey relatively good news, consistent with the information role hypothesis.²⁴

²³ Other possible interpretations are that: 1) my measure of the *ex ante* probability of bankruptcy is a noisy measure of the market's expectation meaning that my tests lack power to identify a relation, or more likely, 2) that given the nature of my sample, there is little variation in the *ex ante* probability of bankruptcy to begin with.

²⁴ With regard to the control variables in Table 7: the coefficient on Downgrade is negative and significant at a 5% level, evidence that bond returns are lower when DAs downgrade their bond recommendations. The coefficient on Bond Highly Traded is negative and significant at a 10% level, indicating that bonds that are traded more frequently respond more negatively to DA reports (on average). In Columns (2) and (3), the coefficient on Equity Recommendation Change is positive and significant (10% level), modest evidence that bond returns are higher (lower) when EAs upgrade (downgrade) their recommendation on the firm's stock. Unexpected Earnings (UE) is positive and significant (10% level) in Column (3), indicating that abnormal bond returns are positively associated with earnings surprises. (Note that not all DA reports are concurrent with an earnings announcement and UE is set to 0 in those cases.)

5.2.2. Bond Market Returns to Different Types of Distress Predictions

Table 8 reports the results of tests designed to uncover variation in the bond market's response to DAs' bankruptcy predictions, covenant violation predictions, and liquidity predictions. The rationale for breaking the sample out this way is to allow the pricing coefficients on these differential DA predictions to vary since there is no *ex ante* reason to expect that DAs' bankruptcy, covenant violation, and liquidity predictions should be equally informative.

Turning first to the results in Column (1) (where the sign of the news is ignored) the coefficients on Bankruptcy Prediction and Liquidity Prediction are insignificant, while the coefficient on Covenant Prediction is -0.040 (significant at 5% level). To better capture variation in the nature of the information contained in DAs' predictions, in Column (2), the coefficients on bankruptcy, covenant, and liquidity predictions are estimated conditional on the nature of the news (i.e., bad news, good news, uncertain). These results reveal that the coefficient on Bad News Bankruptcy Prediction is -0.071 (significant at the 5% level), indicating that abnormal bond returns to DA reports are 7.1% lower when the DA predicts that the firm will file for bankruptcy. On the other hand, the coefficient on Good News Bankruptcy Prediction is insignificant. Somewhat surprisingly, the coefficient on Uncertain Bankruptcy Prediction is 0.090 (significant at the 10% level), evidence that abnormal bond returns to DA reports with uncertain bankruptcy predictions are 9.0% higher (on average). Although the abnormal bond returns to DA reports with uncertain bankruptcy predictions have a maximum value of 1.404, the estimated coefficient on uncertain bankruptcy predictions is robust to winsorizing or truncating this maximum observation.

Turning to DAs' covenant violation predictions, the coefficient on Bad News Covenant Prediction is -0.027 (significant at the 5% level), indicating that bond returns to DA reports are

2.7% lower when DAs predict that the firm will violate a debt covenant. In contrast, the coefficient on Good News Covenant Prediction is insignificant, while that on Uncertain Covenant Prediction is -0.106, indicating that abnormal bond returns are 10.6% lower when DAs discuss the likelihood of a covenant violation, but do not issue a prediction. It is interesting that the coefficient on Uncertain Bankruptcy Prediction is positive, while that on Uncertain Covenant Prediction is negative. The most basic interpretation of this difference is simply that the news conveyed by DAs' discussion of distress-related events is not the same across all types of uncertain distress predictions. Finally, all of the coefficients on DAs' liquidity predictions are insignificant, indicating that DA reports that discuss whether the firm will have sufficient liquidity to service its maturing debt obligations do not convey value-relevant information to the bond market.²⁵

Collectively, the results in Table 8 suggest that DAs' bankruptcy and covenant violation predictions are more informative to the bond market than their liquidity predictions. One explanation for this result is that while liquidity predictions contain information about the likelihood of default, predictions regarding covenant violations and formal bankruptcy filings contain new information about the likelihood of default as well as changes in recovery rates resulting from wealth transfers between residual claimants. Overall, I find that DAs' bad news and uncertain predictions of bankruptcy and covenant violations are incrementally informative, and these qualitative predictions are present in 12.35% of the reports in the sample (see Table 4). These predictions are issued from 8 out of the 12 unique investment banks in the sample, and the majority are issued by Deutsche Bank and J.P. Morgan. These results suggest that DA reports

²⁵ The results on the control variables are similar to Table 7 (see Footnote 24), and I do not discuss them in detail here to save space.

have information content in the small subset of cases when DAs predict covenant violations and bankruptcy filings.

5.2.3. Bond Market Returns to the Accuracy of Debt Analysts' Distress Predictions

In Table 9, I test the hypothesis that bond market investors find more accurate DA reports (based on *ex post* outcomes) to be more informative (*ex ante*) than inaccurate reports. The intuition underlying this analysis is that if sophisticated institutional investors in the bond market are able to discern which DA reports are more likely to be correct *ex ante*, then abnormal bond market returns at the time of those DA reports should be larger in magnitude. Turning to Table 9, I find some support for this hypothesis as the coefficient on Good News Distress Prediction*Correct of 0.034 is marginally significant (10% level). This result provides modest evidence that that bond investors find good news distress predictions to be more informative when that distress prediction turns out to be correct (*ex post*). In addition, the results in Table 9 provide some evidence that bond investors are able to discern (*ex ante*) which DA reports are more likely to turn out to be correct (*ex post*), and they respond more to these reports.²⁶

5.2.4. Bond Market Returns to Debt Analysts' Distress Predictions for Private Equity Firms

In Table 10, I examine whether DA reports are more informative for private equity firms because private equity firms operate in more opaque information environments. The regression results indicate that the bond market reaction to DAs' distress predictions differs for private equity firms and that the information content of DAs' liquidity predictions is higher for private equity firms. Specifically, the coefficient on Good News Liquidity Prediction*Private Firm is

²⁶ Model estimation in Table 9 excludes the interaction between Bad News Distress Prediction and Correct because all but 3 of the bad news distress predictions turn out to be correct (see Table 5). For this reason, the coefficient on Bad News Distress Prediction is insignificant in Table 9 because Correct is included in the model.

0.032 (significant at the 5% level), indicating that abnormal bond returns are 2.69% higher when DAs predict that a private equity firm has sufficient liquidity to service its debt obligations (significant at 5% level). Further, the coefficient on Uncertain Liquidity Prediction*Private Firm is 0.057 (significant at the 5% level), indicating that abnormal bond returns are 4.6% higher when DAs issue an uncertain liquidity prediction for a private equity firm (significant at the 5% level). Taken together, these results suggest that although DAs' liquidity predictions are not informative for public equity firms on average, they are informative for private equity firms. Further, these results are the first to show robust evidence that DAs' good news predictions are informative on average, albeit only for the sample of private firms.

Finally, the regression results in Table 10 suggest that the pricing coefficient on DAs' bankruptcy and covenant predictions differs for private firms. The coefficient on Uncertain Bankruptcy Prediction*Private Firm is -0.081 and significant at the 10% level, and the coefficient on Bad News Covenant Prediction*Private Firm is 0.090 and significant at the 5% level (the coefficient remains positive but smaller in magnitude after controlling for outliers in abnormal bond returns). The signs of these interaction terms differ from those on the main effects for public firms (i.e., Uncertain Bankruptcy Prediction and Bad News Covenant Prediction), suggesting that the bond market prices these predictions differently when the firm is private. Taken together, the results in Table 10 provide evidence that DAs play a greater information role for private firms, and the bond market response to DAs' distress predictions varies with the quality of firms' information environments.

5.3. The Economic Determinants of Debt Analysts' Accuracy

In this section I report the results of tests designed to quantify the effects of DAs' investment banking conflicts of interest on the accuracy of their distress predictions. As described above,

this analysis uses a multinomial logistic (MNL) regression model to examine the economic determinants of the accuracy of DAs' distress predictions. Table 11 reports the results where estimation in Column (1) models the likelihood that a DA issues an incorrect prediction relative to a correct prediction; Column (2) models the likelihood that a DA issues an uncertain prediction relative to a correct prediction; and Column (3) models the likelihood that a DA issues a report that does not discuss financial distress relative to a correct prediction.

As noted, estimation in Column (1) models the likelihood that the DA issues an incorrect prediction relative to a correct prediction. The coefficient on Underwriting Affiliation is significantly positive (5% level), indicating that DAs are more likely to issue an incorrect prediction when their investment bank is an underwriter in the firm's securities. Given that all but 3 incorrect DA predictions are optimistic, this result can be interpreted as evidence that DAs optimistically bias their distress predictions when the firm is an underwriting client. I repeated the analysis in Table 11 after deleting the 3 observations where DAs' predictions are incorrect and convey bad news. By doing so, the estimation in Column (1) is based only on DA predictions that are incorrect and optimistic. I find that the coefficient on Underwriting Affiliation remains significantly positive (untabulated). In contrast, I do not find evidence that DAs are more likely to issue incorrect reports when their investment bank is a market maker or has a significant investment in the firm as the coefficients on those variables are insignificant. The coefficient on NBER recession is significantly positive (1% level), indicating that DAs are more likely to issue incorrect predictions during an economic recession. The empirical analysis cannot perfectly disentangle whether the optimism in affiliated DAs' predictions is generated from intentional misrepresentation or from self-selection (i.e., affiliated analysts have inherently more optimistic outlooks for their underwriting clients). However, I believe that the self-

selection story makes less sense in my sample of financially distressed firms relative to other samples because the financial performance of these firms is poor.

Turning to DAs' uncertain predictions in Column (2), I find no evidence that DAs' affiliation with the firm affects the likelihood that a DA issues an uncertain versus a correct prediction, as the coefficients on Underwriting Affiliation, Market Maker, and Significant Investment in Column (2) are all insignificant. The estimation provides evidence that DAs are more likely to issue uncertain predictions (versus correct predictions) during an economic recession (NBER coeff. = 1.511, significant at the 5% level) and when the firm's free cash flow (FCF coeff. = -11.736, significant at the 10% level) is lower. Finally, in Column (3) I do not find evidence that DAs' affiliation with the firm influences the likelihood that a DA refrains from discussing financial distress versus issues a correct prediction (the coefficients on Underwriting Affiliation, Market Maker, and Significant Investment are all insignificant).

To sharpen the focus on the inferences that can be drawn from Table 11's results, I performed several additional tests in Table 12. The results in Table 11 compare the likelihood of issuing an incorrect, uncertain, or no discussion of distress report to the likelihood of issuing a correct prediction report. In Table 12, I analyze the decision to issue an incorrect, uncertain, and no discussion of distress report using different comparison groups other than only correct reports. First, I use a logistic regression in Column (1) to compare the likelihood that a DA issues an incorrect prediction versus a correct or an uncertain prediction. The coefficient on Underwriting Affiliation is positive and significant, similar to Table 11. The coefficient on Underwriting Affiliation is also positive and significant when comparing the likelihood that a DA issues an incorrect prediction report versus all other report types. In summary, the result that DAs with

underwriting affiliation are more likely to issue optimistically biased reports is robust to using different benchmarks (i.e., Correct, Uncertain, No Discussion of Distress reports).

In Column (2), I use a logistic regression to model the likelihood that a DA issues an uncertain distress prediction as opposed to an incorrect or correct prediction (i.e., I compare the likelihood that a DA issues an uncertain prediction versus a specific prediction). The results are similar to those reported in Table 11 in that the Underwriting Affiliation, Market Maker, and Significant Investment variables remain insignificant. This result also holds when I estimate the likelihood that a DA issues an uncertain prediction report compared to all other types of reports (i.e., Correct, Incorrect, and No Discussion of Distress reports). Overall, the results suggest that DAs do not issue uncertain predictions as a means to avoid explicitly predicting bad news (the likelihood of issuing an uncertain prediction is not correlated with any of the affiliation variables in Tables 11-12).

Lastly, in Table 12 Column (3) I use a logistic regression to examine the likelihood that a DA issues a report that does not discuss financial distress compared to a report that discusses distress in some capacity (i.e., a correct, incorrect, or uncertain prediction). I find that the coefficient on Market Maker is negative and modestly significant (10% level) and Significant Investment is significantly positive (5% level). This suggests that when the DAs' investment bank is a market maker in the firm's securities, they are less likely to ignore financial distress by issuing a report that is silent with respect to financial distress. In addition, the results in Column (3) suggest that when DAs' investment bank has a significant investment in the firm, DAs are more likely to refrain from issuing a distress prediction. One interpretation of this result is that investment banks act opportunistically by asking DAs to delay issuing correct (or uncertain) distress predictions that convey bad news until they can liquidate their position in the firm. Further

analysis shows that the positive coefficient on Significant Investment in Column (3) holds in the sample of firms that file for bankruptcy (i.e., firms with bad news) and does not hold in the sample of firms that do not file for bankruptcy (i.e., firms with good news) (untabulated). This evidence supports the hypothesis that DAs are silent with respect to bad news, consistent with the story that DAs are waiting to discuss the potential outcomes of financial distress until their investment bank can sell their position in the firm.

Collectively, the results in Tables 11 and 12 provide evidence consistent with the hypothesis that investment banks act opportunistically by having their DAs issue optimistically biased reports for investment banking clients and by having their DAs issue reports that are silent with respect to financial distress for firms in which the investment bank has a significant investment (consistent with the marketing role). However, the result that DAs are more likely to refrain from discussing financial distress holds in Table 12 (where the benchmark is the likelihood of issuing a report that discusses distress in some capacity) and not in Table 11 (where the benchmark is the likelihood of issuing a correct prediction). Although a DA's decision to issue a report that is silent with respect to bad news is more naturally benchmarked against their decision to issue a report that issues a correct, incorrect, or uncertain prediction, this result is nonetheless affected by the types of reports used as the benchmark comparison group.

Finally, the results regarding the accuracy of DAs' predictions provide insight on how DAs bias the information content of their reports. For example, the evidence suggests that DAs with an underwriting affiliation with the firm are more likely to bias their reports by issuing optimistic distress predictions (as opposed to issuing an uncertain prediction or issuing a report that is silent regarding financial distress). However, when the DAs' investment bank has a significant investment in the firm, DAs are more likely to bias the information content of their reports by

issuing a report that is silent regarding financial distress (as opposed to issuing an optimistically biased prediction or issuing an uncertain prediction). Lastly, the results indicate that DAs are not more likely to issue biased reports when their investment bank is a market maker in the firm's securities, consistent with the hypothesis that differences in the structural features between the equity and corporate bond market reduce the benefits from issuing optimistic reports in the bond market.

6. Additional Analyses

6.1. Bond Market Illiquidity

To address the concern that illiquidity in the corporate bond market biases the results in favor of the null hypothesis that DA reports are not informative, I perform additional analyses to bolster the inferences from the main result that 12.35% of DA reports are informative to the corporate bond market (suggesting that DAs perform more of a marketing role than an information role). In untabulated analysis, I find that the bonds in my sample trade an average (median) of 167 (182) days per year. This contrasts with the sample in Easton et al. (2009) where bonds trade an average (median) of 7 (4) days per year. The difference in bond liquidity is driven by the selection of bonds in my sample of lower credit quality, with debt analyst coverage, and from a more recent sample period. The sample in Easton et al. (2009) is comprised of all bonds in Mergent FISD with available return data in TRACE (a sample of 71% investment-grade bonds and 29% speculative-grade bonds). In addition, the bonds in my sample trade an average (median) of 36 (20) times in the 5 days surrounding a given DA report, and an average (median) of 7 (4) times per day in this same window (untabulated). The total volume traded over the 5 days surrounding a DA report is \$19,502,488 on average (\$9,013,500 median). These results

suggest that the bonds in my sample are relatively liquid, strengthening the inference of the main result that DA reports are largely uninformative.²⁷

6.2. Alternative Measures for the Information Content of Debt Analyst Reports

I examine two alternative measures for the information content of DA reports to provide a benchmark for whether 12.35% of informative DA reports is high or low. First, I examined the percentage of firms for which DAs accurately predict bankruptcy as an alternative benchmark for the information content of DA reports. In untabulated analyses, I find that for the 35 firms that file for bankruptcy in the sample, DAs accurately predict that the firm will file for bankruptcy (i.e., issue a bad news bankruptcy prediction) for only 4 firms (11% of bankrupt firms). For 24 out of the 35 firms that file for bankruptcy (69%), none of the DA reports predict bankruptcy at all (i.e., the only reports issued for these firms either incorrectly predict that the firm will not file for bankruptcy or do not discuss financial distress). These results reinforce the main result that the majority of DA reports piggyback on corporate news announcements and do not provide new information to bond market investors for financially distressed firms.

Second, I analyze whether 12.35% is high or low by estimating the number of DA reports with a visible bond-price impact (i.e., influential) using a measure similar to what Loh and Stulz (2011) use to measure the percentage of influential EA reports. In Table 8, I find that DAs' bad news and uncertain predictions regarding covenant violations and bankruptcy significantly affect bond returns on average, and the percentage of DA reports containing one of these predictions is 12.35%. Alternatively, I follow Loh and Stulz (2011) and define a given information event as having a visible bond-price impact (i.e., influential) if the CAR is in the same direction as the

²⁷ Note that this is a lower bound estimate as TRACE truncates reported volume measures. For investment-grade bonds, trades greater than \$5,000,000 are reported as \$5,000,000 trades. For high-yield bonds, trades greater than \$1,000,000 are reported as \$1,000,000 trades.

news in the announcement and the absolute value of the CAR exceeds $(2.00 * \sqrt{t} * \sigma_i)$, where t is equal to the days used to calculate CAR and σ_i is the estimated standard deviation of abnormal bond returns over the 200 days prior to the information event. Using this measure, I find that 6.4% of DA reports are influential (untabulated). The percentage of DA reports that are informative using the Loh and Stulz (2011) measure is smaller in magnitude because this measure calculates the information content of DA reports on an individual basis. The DA reports that contain a bad news or uncertain prediction regarding covenant violations or bankruptcy that do not significantly affect bond returns are excluded using the Loh and Stulz (2011) measure. In other words, these results suggest that while 12.35% of DA reports issue distress predictions that are on average informative, this result is driven by a smaller subset of 6.4% of DA reports.

Although this strengthens the inference that the majority of DA reports are uninformative, I find similar percentages for credit rating changes and earnings announcements for the same bonds over the sample period. Specifically, 5.9% of credit rating changes are influential using the Loh and Stulz (2011) measure (6.8% of credit rating downgrades), and 8.2% of earnings announcements are influential. In summary, although 57.8% of DA reports do not discuss financial distress and only 12.35% contain a bankruptcy or covenant violation prediction that is on average informative to bond market investors, the ability of DA reports to visibly affect bond prices is comparable to credit rating changes and earnings announcements.

6.3. Recommendation Revisions versus Reiterations

I examine whether the information content of DA reports is stronger when the report contains a recommendation revision as opposed to a reiteration. It is common in the EA literature to estimate the market reaction to revisions in EA recommendations and to exclude reiterations

(e.g., Li et al., 2015; Yezegel, 2015). I find that 12.35% of DA reports contain a distress prediction that is informative on average, yet 71.3% of the sample contains reiterations. It is possible that the percentage of DA reports that are informative would be higher if I excluded reports with a recommendation reiteration. In untabulated analyses, I investigate whether the mean abnormal bond market reaction to DAs' distress predictions is larger for reports that contain a recommendation change versus a reiteration. I find that the mean bond return reaction to DA reports with a distress prediction is significantly more negative when DAs downgrade their recommendation versus when they reiterate their recommendation. However, I find that the mean bond return to DA reports with a distress prediction are insignificantly different between those reports with an upgrade versus a reiteration. Collectively, these results suggest that the percentage of DA reports that provide value-relevant information is higher when conditioning on those reports that contain recommendation changes.

7. Conclusion

In this study, I examine the role of sell-side debt analyst (DA) reports in the corporate bond market for financially distressed firms. The objective is to ascertain the extent to which DAs promote efficiency and transparency in public debt markets versus merely performing a marketing role for their investment banks. I find that DAs' bankruptcy and covenant violation predictions conveying bad or uncertain news are incrementally informative to corporate bond investors on average, yet the percentage of DA reports containing these predictions constitutes 12.35% of the overall sample. I also document that the majority (57.8%) of DA reports do not discuss financial distress and instead piggyback on corporate news announcements, suggesting that the majority of DA reports do not provide new information to bond investors. In addition, I document that DA reports are more informative for private equity firms that operate in more

opaque information environments, consistent with an information role. However, I also find that DAs are more likely to issue optimistic predictions when their investment bank is an underwriter in the firm's securities and more likely refrain from discussing financial distress when their investment bank is significantly invested in the firm, consistent with a marketing role.

Collectively, the results of a variety of tests suggest that DAs perform both an information role and a marketing role for firms in financial distress (i.e., these roles are not mutually exclusive). However, the conclusions in the paper are subject to the caveat that since I focus on financially distressed firms (including private equity firms), the results may not be generalizable to the activities and behavior of DAs in other settings.

Broadly speaking, my results are relevant to the debate on the role of information intermediaries in capital markets, and the results of my study point to avenues for future research on DAs. My study examines DAs' information role in public debt markets as defined by the effect of DA reports on corporate bond returns, but it is possible that DAs add value to public debt investors by monitoring the real activities of managers or by increasing investor recognition of the firm's bonds and reducing the firm's cost of capital. In addition, my study suggests that DAs do not piggyback on credit rating agencies (CRAs), which indicates that DAs likely play a significant monitoring role by reducing opportunistic behavior by CRAs under certain circumstances. Finally, future research could explore whether DA reports are informative in the secondary loan market regarding lender-bondholder conflicts.

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Appendix A

Detailed Variable Definitions

VARIABLE	DEFINITION
<i>Abnormal Bond Return</i>	Raw bond return less the maturity-matched Treasury bond return (see Bessembinder et al. (2009) and Easton et al. (2009)). Abnormal bond returns are calculated over a 5-day window (day $t=-2$ to day $t=+2$) centered on the debt analyst report date (day $t=0$).
<i>Altman Z-Score</i>	Altman Z-Score defined as: $(1.2*A) + (1.4*B) + (3.3*C) + (0.6*D) + (1.0*E)$, where A is (Current Assets - Current Liabilities) / Total Assets; B is Retained Earnings / Total Assets; C is EBIT / Total Assets; D is Market Value of Equity / Book Value of Debt; and E is Sales / Total Assets.
<i>Bad News Bankruptcy Prediction</i>	An indicator variable equal to 1 if the debt analyst report predicts that the firm will file for bankruptcy and 0 otherwise.
<i>Bad News Covenant Prediction</i>	An indicator variable equal to 1 if the debt analyst report predicts that the firm will violate a debt covenant and 0 otherwise.
<i>Bad News Distress Prediction</i>	An indicator variable equal to 1 if the debt analyst report contains a distress prediction that is bad news (i.e., the firm will file for bankruptcy, the firm will violate a debt covenant, or the firm does not have sufficient liquidity to service its debt obligations) and 0 otherwise.
<i>Bad News Liquidity Prediction</i>	An indicator variable equal to 1 if the debt analyst report predicts that the firm does not have sufficient liquidity to service its maturing debt obligations and 0 otherwise.
<i>Bankruptcy Prediction</i>	An indicator variable equal to 1 if the debt analyst report discusses the likelihood that the firm will file for bankruptcy and 0 otherwise.
<i>Bond Complexity High</i>	An indicator variable equal to 1 if the complexity of a bond's characteristics is above the sample median and 0 otherwise (see De Franco et al. (2009) and De Franco et al. (2014)). The complexity of the bond is defined as the sum of the following characteristics (each characteristic is assigned a value of 1): (1) callable, (2) convertible, (3) credit enhancement, (4) puttable, (5) foreign currency, (6) floating rate coupon, (7) variable rate coupon, (8) combination of floating/fixed coupon, (9) pay-in-kind, and (10) sinking fund.
<i>Bond Credit Rating</i>	The numerical equivalent of the bond's credit rating, where 13 is equivalent to an S&P rating of BBB- (the lowest investment-grade rating) and 6 is equivalent to CCC+, indicating that the issue is currently vulnerable to nonpayment.
<i>Bond Highly Traded</i>	An indicator variable equal to 1 if the median daily trading volume of a given bond in the 6 months prior to the first debt analyst report is greater than the sample median and 0 otherwise. Daily trading volume is defined as the dollar volume of principal traded scaled by the amount of principal outstanding on that day.
<i>Bond Length to Maturity</i>	The number of years remaining until maturity as of the date of the debt analyst report.
<i>Buy</i>	An indicator variable equal to 1 if the debt analyst's bond-level recommendation is a buy and 0 otherwise.
<i>Correct Distress Prediction</i>	An indicator variable equal to 1 if the debt analyst report accurately predicts the outcome of financial distress and 0 otherwise.
<i>Covenant Prediction</i>	An indicator variable equal to 1 if the debt analyst report mentions the likelihood that the firm will violate a debt covenant and 0 otherwise.

Appendix A Continued

<i>Credit Flash</i>	An indicator variable equal to 1 if the debt analyst report is labeled as a "Credit Flash." Credit Flash Reports are typically one paragraph summaries of public news announcements issued on the day of the announcement.
<i>Credit Rating Report</i>	An indicator variable equal to 1 if the debt analyst report is issued within 5 days of a credit rating change or affirmation and 0 otherwise.
<i>Credit Rating Change</i>	Credit Rating Change is the numerical equivalent of the change in the credit rating if a bond, where 0 indicates that the rating of the bond did not change in the 5 days surrounding a debt analyst report and -1 indicates that the bond was downgraded 1 notch.
<i>Distress Prediction</i>	An indicator variable equal to 1 if the debt analyst report discusses financial distress and 0 otherwise.
<i>Downgrade</i>	An indicator variable equal to 1 if the debt analyst report downgrades the investment recommendation on the bond and 0 otherwise.
<i>Earnings Announcement</i>	An indicator variable equal to 1 if the debt analyst report is issued in the 5 days surrounding an earnings announcement and 0 otherwise.
<i>Equity Report Indicator</i>	An indicator variable equal to 1 if the debt analyst report is issued in the 5 days surrounding an equity analyst report and 0 otherwise.
<i>Equity Analyst Recommendation Change</i>	The numerical equivalent of the change in an equity analyst's investment recommendation (where -1 indicates that the equity analyst downgraded the recommendation by 1 notch and +1 indicates an upgrade by 1 notch).
<i>Financial Statement Filing</i>	An indicator variable equal to 1 if the debt analyst report is issued in the 5 days surrounding a financial statement filing such as a 8K, 10-K, or 10-Q and 0 otherwise.
<i>Firm Rating Low</i>	An indicator variable equal to 1 if the bond with the highest credit rating for a given firm is equivalent to a S&P rating of CCC+ or below and 0 otherwise.
<i>Free Cash Flow (FCF)</i>	Operating Cash Flow less Capital Expenditures scaled by beginning of the year Total Assets.
<i>Good News Bankruptcy Prediction</i>	An indicator variable equal to 1 if the debt analyst report predicts that the firm will not file for bankruptcy and 0 otherwise.
<i>Good News Covenant Prediction</i>	An indicator variable equal to 1 if the debt analyst report predicts that the firm will not violate a debt covenant and 0 otherwise.
<i>Good News Distress Prediction</i>	An indicator variable equal to 1 if the debt analyst report contains a distress prediction that is good news (i.e., the firm will not file for bankruptcy, the firm will not violate a debt covenant, or the firm has sufficient liquidity to service its maturing debt obligations) and 0 otherwise.
<i>Good News Liquidity Prediction</i>	An indicator variable equal to 1 if the debt analyst report predicts that the firm has sufficient liquidity to service its maturing debt obligations and 0 otherwise.
<i>Hold</i>	An indicator variable equal to 1 if the bond-level investment recommendation is a hold and 0 otherwise.
<i>Incorrect Distress Prediction</i>	An indicator variable equal to 1 if the debt analyst report inaccurately predicts the outcome of financial distress and 0 otherwise.
<i>Investment Bank Market Value of Equity</i>	The market value of equity of the debt analyst's investment bank.
<i>Liquidity Prediction</i>	An indicator variable equal to 1 if the debt analyst report discusses the likelihood that the firm has sufficient liquidity to service its maturing debt obligations and 0 otherwise.

Appendix A Continued

<i>Management Disclosure</i>	An indicator variable equal to 1 if the debt analyst report is issued in the 5 days surrounding a conference call or management earnings forecast and 0 otherwise.
<i>Market Maker</i>	An indicator variable equal to 1 if the debt analyst's investment bank is a market maker in the firm's securities and 0 otherwise.
<i>NBER Recession Indicator</i>	An indicator variable equal to 1 if the debt analyst report is issued within an economic recession as defined by the National Bureau of Economic Research (NBER) and 0 otherwise.
<i>No Discussion of Distress</i>	An indicator variable equal to 1 if the debt analyst report does not mention financial distress and 0 otherwise.
<i>Press Release</i>	An indicator variable equal to 1 if the debt analyst report is issued in the 5 days surrounding a firm press release and 0 otherwise.
<i>Private Firm</i>	An indicator variable equal to 1 if the firm is a private equity firm, and 0 otherwise.
<i>Reiterate</i>	An indicator variable equal to 1 if the debt analyst reiterates their investment recommendation level on the bond and 0 otherwise.
<i>Return on Assets (ROA)</i>	EBIT (earnings before interest and taxes) scaled by beginning of the year total assets.
<i>Sell</i>	An indicator variable equal to 1 if the bond-level investment recommendation is a sell and 0 otherwise.
<i>Significant Investment</i>	An indicator variable equal to 1 if the debt analyst's investment bank has a significant investment (i.e., > 1% stake) in the firm's securities and 0 otherwise.
<i>Uncertain Bankruptcy Prediction</i>	An indicator variable equal to 1 if the debt analyst report discusses the likelihood that the firm will file for bankruptcy, but does not make a specific prediction and 0 otherwise.
<i>Uncertain Covenant Prediction</i>	An indicator variable equal to 1 if the debt analyst report discusses the likelihood that the firm will violate a debt covenant, but does not make a specific prediction and 0 otherwise.
<i>Uncertain Distress Prediction</i>	An indicator variable equal to 1 if the debt analyst report mentions financial distress, but does not make a specific prediction and 0 otherwise.
<i>Uncertain Liquidity Prediction</i>	An indicator variable equal to 1 if the debt analyst report discusses the likelihood that the firm has sufficient liquidity to service its maturing debt obligations, but does not make a specific prediction and 0 otherwise.
<i>Underwriting Affiliation</i>	An indicator variable equal to 1 if the debt analyst's investment bank provides or is seeking to provide underwriting services for the firm and 0 otherwise.
<i>Unexpected Earnings</i>	The change in seasonally-adjusted quarterly net income, scaled by the absolute value of net income in the same quarter in the previous year, winsorized at the 1% and 99% level to minimize the effect of outliers resulting from the small denominator problem.
<i>Upgrade</i>	An indicator variable equal to 1 if the bond-level investment recommendation is an upgrade and 0 otherwise.

Appendix B

Examples of Debt Analyst Reports Classified as Correct, Incorrect, Uncertain, and No Discussion of Distress*

- I. **Correct (Bad News) Distress Prediction:** J.P. Morgan report on Visteon Corp. issued on February 25, 2009. Visteon Corp. filed for Ch. 11 bankruptcy on May 27, 2009.

“...We maintain our **Sell** recommendation on Visteon’s bonds, as we believe the near-term risk of a court restructuring is likely. We expect Visteon’s North America cash to be absorbed by negative free cash flow in FY09...”

- II. **Incorrect (Good News) Distress Prediction:** R.W. Pressprich report on Exide Technologies issued on May 16, 2013. Exide Technologies filed for Ch. 11 bankruptcy on June 10, 2013.

“...We do not believe the company will file for bankruptcy even though such a move might be in its long-term interest. In our view, even if Lazard fails to find financing the convertible holders will be amendable to an exchange offer which eases near-term liquidity concerns and allows the company to stage a recovery to more normal levels of EBITDA...”

- III. **Uncertain Distress Prediction:** Deutsche Bank report on Tropicana Entertainment issued on December 13, 2007. Tropicana Entertainment filed for Ch. 11 bankruptcy on May 5, 2008.

“...**Uncertain Times Ahead for Tropicana – Bankruptcy May be An Alternative.** As the trustee takes command of operations of the property and its eventual sale, many details remain unclear as we are now in virgin territory. According to the Company, unless the company is successful in its appeal by December 19, 2007, an event of default will result under the Company’s Senior Credit Facility. If an event of default occurs under the Senior Credit Facility, the lenders will be entitled to accelerate the unpaid principal amount of, and accrued interest on, borrowings there under. Such an acceleration of the Senior Credit Facility would constitute an event of default under the Indenture governing the Company’s Senior Subordinated Notes as well as the Company’s Las Vegas Term Loan. The Company has said in a release that they will work with their lenders under its Senior Credit Facility to prevent acceleration from occurring. Bankruptcy protection may end up being an alternative...”

- IV. **No Discussion of Distress:** Deutsche Bank report on NewPage Corp. issued on May 12, 2011. NewPage Corp. filed for Ch. 11 bankruptcy on September 7, 2011.

“...1Q11 free cash flow (based on DB-calculated EBITDA-cash interest-capex) was negative \$18 million after \$14 million of capital expenditures and \$83 million of cash interest. Total operating company net debt at March 31, was \$3.154 billion, up approximately \$5 million from 4Q10 (no bond coupon payments made in 1Q). Approximately \$1.780MM in debt became current in the quarter. NewPage ended the quarter with liquidity of \$9 million of cash and \$161 million available on the revolver...”

***Source: Excerpts from the cited debt analyst reports.**

Figure 1
Industry Composition of the Sample of Debt Analyst Reports

The figure shows the number of unique debt analyst reports (dark blue columns) and unique firms (light blue columns) for each industry in the sample (left y-axis) and the percentage of firms from each industry in the sample (black line, right y-axis). Industries (x-axis) are defined as 2-digit SIC codes.

Figure 2
Bond Trading Activity Prior to Bankruptcy Filing Dates

The figure portrays daily bond trading activity prior to bankruptcy by plotting the average number of bond trades per day (y-axis) in the months prior to bankruptcy (x-axis) (e.g., month -1 on the x-axis denotes the month prior to the bankruptcy filing date). For firms that do not file for bankruptcy, the bankruptcy filing date is set equal to the estimated date that the firm would have filed for bankruptcy (i.e., 208 days plus the first assignment of a C+ rating or below, as described in Section 4.1). The number of bond trades is calculated as the number of transactions in a given bond per day. Bankrupt (Distress) Firms describes the average number of bond trades in the 24 months prior to the (estimated) bankruptcy filing date. Bankrupt (Distress) Firms: Benchmark describes the average number of bond trades in the 48 to 24 months prior to the (estimated) bankruptcy filing date (i.e., these lines represent the average trading activity of the Bankrupt (Distress) bonds in the 2 years before the 24-month period prior to (estimated) bankruptcy).

Table 1
Summary Statistics for the Length of Debt Analyst Reports by Credit Quality

This table provides the mean and median length of debt analyst (DA) reports as a function of credit quality. Length of Debt Analyst Report is the number of characters in a given report measured using textual analysis in Python. To convert characters into page length, the minimum (maximum) average length of 18,612.2 (32,020.6) characters is approximately 5 (9) pages. Investment Grade is defined as firms with an S&P issuer-level credit rating of BBB- and above, and Non-Investment Grade indicates an issuer-level credit rating of BB+ and below. *** indicates that the difference in means (t-test) and the difference in medians (Wilcoxon test) are significant at the 1% level.

	Length of Debt Analyst Report				
	N	Mean		Median	
Investment Grade	4,519	18,612.2		17,199.0	
Non-Investment Grade	6,137	23,424.0		22,010.0	
Difference		4,811.9	***	4,811.0	***
AAA to BBB+	2,447	19,210.9		17,290.0	
BBB to CCC	8,147	21,955.1		19,704.0	
Difference		2,744.2	***	2,414.0	***
BBB to CCC	8,147	21,955.1		19,704.0	
CCC- to D-	62	32,020.6		26,857.5	
Difference		10,065.5	***	7,153.5	***

Table 2
Descriptive Statistics for Variables Defined at the Bond Level

This table provides descriptive statistics at the report-bond level (Panel A) and at the bond level (Panel B). In Panel A, Abnormal Bond Return is the 5-day bond return centered on the debt analyst (DA) report date measured as the raw return less the maturity-matched Treasury return (see Bessembinder et al., 2009; Easton et al., 2009); Bond Length to Maturity is the remaining years to maturity of a given bond as of the DA report date; Bond Complexity High is an indicator variable equal to 1 if the bond contains more complex structural characteristics than the sample median, and 0 otherwise; Bond Highly Traded is an indicator variable equal to 1 if the median daily trading volume of the bond in the 6 months prior to the first DA report is higher than the sample median, and 0 otherwise; Bond Credit Rating is the numerical equivalent of the bond's credit rating (13 is equivalent to an S&P rating of BBB-, the lowest investment-grade rating, and 6 is equivalent to CCC+, indicating that the issue is currently vulnerable to nonpayment); Firm Rating Low is an indicator variable equal to 1 if the highest-rated bond for a given firm is CCC+ or below, and 0 otherwise; Credit Rating Report is an indicator variable equal to 1 if the DA report is issued within 5 days of a credit rating change or affirmation, and 0 otherwise; Credit Rating Change is the numerical equivalent of the change in the credit rating of a bond where 0 (-5) indicates that the rating of the bond did not change (was downgraded 5 notches) in the 5 days surrounding a DA report. See Appendix A for definitions of the remaining control variables. In Panel B, Bond Price 24 Months Prior to Bankruptcy Date is the price of the bond 24 months prior to the bankruptcy filing date (for firms that do not file for bankruptcy, the pseudo-bankruptcy filing date is set equal to the estimated date that the firm would have filed for bankruptcy as described in Section 4.1). Credit Rating 24 Months Prior to Bankruptcy Filing Date is the numerical equivalent of the bond's credit rating 24 months prior to the bankruptcy filing date (or pseudo-bankruptcy filing date).

Panel A: Variables at the Report-Bond Level

Variable	N	Mean	Median	Min	25th Percentile	75th Percentile	Max	Std Dev
Main Variable								
Abnormal Bond Return	1642	0.004	0.001	-0.557	-0.021	0.022	1.404	0.101
Abnormal Bond Return: Positive Values	853	0.054	0.021	0.000	0.008	0.058	1.404	0.100
Abnormal Bond Return: Negative Values	789	-0.049	-0.023	-0.557	-0.055	-0.010	0.000	0.071
Control Variables								
Bond Length to Maturity	1642	5.092	5.122	0.027	3.058	6.707	24.378	3.040
Bond Complexity High	1642	0.065	0.000	0.000	0.000	0.000	1.000	0.247
Bond Highly Traded	1642	0.509	1.000	0.000	0.000	1.000	1.000	0.500
Bond Credit Rating	1642	6.232	6.000	1.000	4.000	8.000	13.000	2.645
Firm Rating Low	1642	0.303	0.000	0.000	0.000	1.000	1.000	0.460
Private Firm	1642	0.386	0.000	0.000	0.000	1.000	1.000	0.487
Credit Rating Report	1642	0.088	0.000	0.000	0.000	0.000	1.000	0.284
Credit Rating Change	1642	-0.131	0.000	-5.000	0.000	0.000	5.000	0.645
Buy	1642	0.255	0.000	0.000	0.000	1.000	1.000	0.436
Hold	1642	0.407	0.000	0.000	0.000	1.000	1.000	0.492
Sell	1642	0.161	0.000	0.000	0.000	0.000	1.000	0.368
Upgrade	1642	0.049	0.000	0.000	0.000	0.000	1.000	0.215
Reiterate	1642	0.713	1.000	0.000	0.000	1.000	1.000	0.453
Downgrade	1642	0.041	0.000	0.000	0.000	0.000	1.000	0.198

Panel B: Variables at the Bond Level

Bankrupt Firms								
Bond Price 24 Months Prior to Bankruptcy Filing Date	67	97.914	101.016	41.096	95.000	104.972	121.425	13.425
Credit Rating 24 Months Prior to Bankruptcy Filing Date	80	6.688	6.000	1.000	5.000	8.500	12.000	2.608
Non-Bankrupt Firms								
Bond Price 24 Months Prior to Pseudo-Bankruptcy Filing Date	69	88.323	92.968	37.560	80.289	101.194	115.297	17.395
Credit Rating 24 Months Prior to Pseudo-Bankruptcy Filing Date	91	7.747	8.000	4.000	6.000	10.000	13.000	2.497

Table 3
Descriptive Statistics for Variables Defined at the Report and Firm Level

This table provides descriptive statistics at the debt analyst (DA) report level (Panel A) and at the firm level (Panel B). In Panel A, the News in Debt Analyst Reports is defined as follows: Bad News Distress Prediction is an indicator variable equal to 1 if the DA report issues a distress prediction that is bad news (e.g., the firm will file for bankruptcy), and 0 otherwise; Good News Distress Prediction is an indicator variable equal to 1 if the DA report issues a distress prediction that is good news (e.g., the firm will *not* file for bankruptcy), and 0 otherwise; Uncertain Distress Prediction is an indicator variable equal to 1 if the DA report mentions financial distress but does not make a specific prediction, and 0 otherwise; No Discussion of Distress is an indicator variable equal to 1 if the DA report does not mention financial distress, and 0 otherwise. Accuracy of Debt Analyst Reports is defined as follows: Correct Distress Prediction is an indicator variable equal to 1 if the DA report accurately predicts the outcome of financial distress, and 0 otherwise; Incorrect Distress Prediction is an indicator variable equal to 1 if the DA report inaccurately predicts the outcome of financial distress, and 0 otherwise; and Uncertain Distress Prediction and No Discussion of Distress follow from the definitions above. Some DA reports have multiple predictions which is why the total of News in Debt Analyst Reports and the total of Accuracy of Debt Analyst Reports exceed 100%. For the control variables, the indicator variables for concurrent information events (e.g., Press Release, Equity Report, Earnings Announcement) indicate that the DA report is issued within 5 days of the given information announcement. In Panel B, Number of Debt Analyst Reports is equal to the total number of DA reports issued for each firm; Number of Analysts Following the Firm is equal to the number of unique analysts covering the firm; and Number of Bonds Outstanding is equal to the number of bonds per firm. See Appendix A for definitions of the remaining variables.

Panel A: Debt Analyst Report Level

	N	Bad News Distress Prediction	Good News Distress Prediction	Uncertain Distress Prediction	No Discussion of Distress	
News in Debt Analyst Reports	502	6.97%	24.50%	14.34%	57.77%	
	N	Correct Distress Prediction	Incorrect Distress Prediction	Uncertain Distress Prediction	No Discussion of Distress	
Accuracy of Debt Analyst Reports	502	16.93%	14.14%	14.34%	57.77%	
Control Variables	N	Mean	Median	Min	Max	Std Dev
Underwriting Affiliation	502	0.544	1.000	0.000	1.000	0.499
Market Maker Affiliation	502	0.556	1.000	0.000	1.000	0.497
Significant Investment Affiliation	502	0.542	1.000	0.000	1.000	0.499
Credit Flash	502	0.299	0.000	0.000	1.000	0.458
Press Release	502	0.159	0.000	0.000	1.000	0.366
Financial Statement Filing	502	0.018	0.000	0.000	1.000	0.133
Management Disclosure	502	0.074	0.000	0.000	1.000	0.262
Equity Report	502	0.125	0.000	0.000	1.000	0.332
Equity Analyst Recommendation Change	502	-0.046	0.000	-2.000	2.000	0.433
Earnings Announcement	502	0.392	0.000	0.000	1.000	0.489
Unexpected Earnings	502	-1.118	0.000	-22.000	3.327	4.192
Investment Bank Market Value of Equity	236	70254.0	64843.0	11.3	209633.0	39753.0
Altman Z-Score	236	1.561	1.222	-1.446	9.083	1.983
Free Cash Flow	236	-0.017	-0.014	-0.158	0.103	0.050
Return on Assets (ROA)	236	0.050	0.047	-0.044	0.167	0.037
NBER Recession	502	0.542	1.000	0.000	1.000	0.499

Panel B: Firm Level

Variable	N	Mean	Median	Min	Max	Std Dev
Number of Debt Analyst Reports	65	7.723	6.000	1.000	27.000	5.962
Number of Analysts Following the Firm	65	1.708	2.000	1.000	4.000	0.824
Number of Bonds Outstanding	65	3.185	2.000	1.000	17.000	3.221

Table 4
Frequency of Debt Analysts' Bankruptcy, Covenant Violation, and Liquidity Predictions

This table describes the frequency of debt analysts' (DAs') bankruptcy, covenant violation, and liquidity predictions. N is equal to the number of reports with a given type of distress prediction, and Percent of 502 Total Reports is equal to N divided by 502. Bad (Good) News Bankruptcy, Covenant, and Liquidity Prediction are indicator variables equal to 1 if the DA report predicts that the firm will (not) file for bankruptcy, the firm will (not) violate a covenant, or the firm does not have (has) sufficient liquidity to service its maturing debt obligations, respectively, and 0 otherwise. Uncertain Bankruptcy, Covenant, and Liquidity Prediction are indicator variables equal to 1 if the DA report mentions bankruptcy, covenant violations, or liquidity, respectively, but does not issue a prediction, and 0 otherwise.

Distress Prediction	N	Percent of 502 Total Reports
Bad News Bankruptcy Prediction	4	0.80%
Good News Bankruptcy Prediction	18	3.59%
Uncertain Bankruptcy Prediction	19	3.78%
Total Bankruptcy Predictions	41	8.17%
Bad News Covenant Prediction	17	3.39%
Good News Covenant Prediction	25	4.98%
Uncertain Covenant Prediction	22	4.38%
Total Covenant Predictions	64	12.75%
Bad News Liquidity Prediction	15	2.99%
Good News Liquidity Prediction	106	21.12%
Uncertain Liquidity Prediction	49	9.76%
Total Liquidity Predictions	170	33.86%
Bad News Bankruptcy and Covenant Predictions & Uncertain Bankruptcy and Covenant Predictions	62	12.35%

Table 5**Distribution of Debt Analysts' Distress Predictions Based on the Sign of the News and *Ex Post* Accuracy**

This table describes the distribution of debt analysts' (DAs') distress predictions as a function of their *ex post* accuracy (i.e., Incorrect or Correct) and the sign of the news (i.e., Good News or Bad News). Incorrect (Correct) is an indicator variable equal to 1 if the DA report inaccurately (accurately) predicts the outcome of financial distress, and 0 otherwise. Bad (Good) News is an indicator variable equal to 1 if the DA report predicts that the firm will (not) file for bankruptcy, the firm will (not) violate a covenant, or the firm does not have (has) sufficient liquidity to service its maturing debt obligations, and 0 otherwise. The sample is comprised of 159 DA distress predictions contained in 152 unique DA reports (6 reports contain both a good news and bad news prediction, and 1 report contains both a correct and incorrect prediction).

	Good News	Bad News	Total
Incorrect	68	3	71
Correct	56	32	88
Total	124	35	159

Table 6
Timing of Credit Rating Changes around Debt Analysts' Distress Predictions

This table provides evidence on the number of credit rating changes issued in the 5 days prior to a debt analyst (DA) report containing a distress prediction. The number of credit rating changes is equal to the number of firms for which there was at least one credit rating change on a given day preceding a DA report (e.g., a value of 2 indicates that there were 2 firms with a credit rating change on that day). The percent of DA reports is equal to the number of credit rating changes (or DA distress predictions) divided by the total number of DA reports.

Days Prior to Debt Analyst Distress Prediction	Number of Credit Rating Changes per Day	Percent of Debt Analyst Reports
5 Days	2	1%
4 Days	2	1%
3 Days	7	3%
2 Days	3	1%
1 Day	4	2%
On the Same Day	8	4%
Total Number of Debt Analyst Distress Predictions	223	100%
Debt Analyst Distress Predictions Preceded by a Credit Rating Change	26	12%
Debt Analyst Distress Predictions <i>Not</i> Preceded by a Credit Rating Change	197	88%

Table 7
Abnormal Bond Market Returns to Debt Analyst Reports Containing Distress Predictions

This table reports the estimated coefficients and t-statistics (in parentheses) for the regression of abnormal bond market returns on debt analysts' (DAs') discussions of financial distress. Variable definitions for the variables of interest are: Abnormal Bond Return is the raw bond return less the maturity-matched Treasury return (see Bessembinder et al., 2009; Easton et al., 2009) for the 5-day window (day $t=-2$ to day $t=+2$) centered on the DA report date; Distress Prediction is an indicator variable equal to 1 if the DA report mentions liquidity, covenant violations, or bankruptcy, and 0 otherwise; Bad News Distress Prediction is an indicator variable equal to 1 if the DA report predicts that the firm does not have sufficient liquidity to service its maturing debt obligations, the firm will violate a covenant, or the firm will file for bankruptcy, and 0 otherwise; Good News Distress Prediction is an indicator variable equal to 1 if the DA report predicts that the firm has sufficient liquidity to service its maturing debt obligations, the firm will not violate a covenant, or the firm will not file for bankruptcy, and 0 otherwise; Uncertain Distress Prediction is equal to 1 if the DA report mentions liquidity, covenant violations, or bankruptcy, but does not issue a prediction, and 0 otherwise; Firm Rating Low is an indicator variable equal to 1 if the highest-rated bond for a given firm is rated CCC+ or below, and 0 otherwise (see Appendix A for detailed definitions of the control variables). Predicted signs are shown (not shown) for the independent (control) variables of interest. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 1%, 5%, and 10% level respectively.

<i>Dependent Variable: 5-Day Abnormal Bond Market Return</i>				
	<i>Predicted Sign</i>	(1)	(2)	(3)
Intercept		0.030 (1.16)	0.034 (1.21)	0.018 (0.95)
Distress Prediction	+ / -	-0.001 -(0.06)		
Bad News Distress Prediction	-		-0.022 ** -(2.02)	-0.015 * -(1.88)
Bad News Distress Prediction*Firm Rating Low	+			-0.005 -(0.22)
Good News Distress Prediction	+		-0.004 -(0.67)	-0.001 -(0.09)
Good News Distress Prediction*Firm Rating Low	+			-0.014 -(0.93)
Uncertain Distress Prediction	+ / -		0.007 (0.40)	-0.018 * -(1.87)
Uncertain Distress Prediction*Firm Rating Low	+			0.082 *** (2.76)
Firm Rating Low				-0.009 (-0.88)

Table 7 Continued

Downgrade	-0.040 **	-0.041 **	-0.035 **
	-(2.09)	-(2.01)	-(2.02)
Upgrade	0.014	0.011	0.013
	(0.71)	(0.56)	(0.54)
Reiteration	-0.001	-0.004	-0.002
	-(0.13)	-(0.35)	-(0.20)
Credit Flash Report	-0.013	-0.015	-0.012
	-(1.08)	-(1.39)	-(0.95)
Underwriting Affiliation	0.002	0.000	0.003
	(0.27)	(0.07)	(0.53)
Bond Complexity High	0.005	0.005	0.005
	(0.62)	(0.60)	(0.83)
Bond Highly Traded	-0.010 *	-0.011 *	-0.008 *
	-(1.77)	-(1.88)	-(1.73)
Bond Length to Maturity	-0.001	-0.001	-0.001
	-(0.88)	-(0.72)	-(1.11)
Bond Credit Rating	-0.002	-0.002	
	-(1.00)	-(0.98)	
Credit Rating Change	-0.0020	-0.002	-0.004
	-(0.14)	-(0.14)	-(0.32)
Equity Recommendation Change	0.006	0.006 *	0.006 *
	(1.61)	(1.77)	(1.75)
Press Release	0.016	0.016	0.016
	(1.28)	(1.20)	(0.99)
Financial Statement Filing	-0.024	-0.019	-0.025
	-(1.53)	-(1.20)	-(1.12)
Management Disclosure	-0.015	-0.016	-0.020
	-(1.03)	-(1.12)	-(1.57)
Unexpected Earnings	0.001	0.001	0.001 *
	(1.56)	(1.52)	(1.65)
N	1642	1642	1642
R-Squared	0.028	0.032	0.053

Table 8
Abnormal Bond Market Returns to Debt Analysts' Bankruptcy, Covenant Violation, and Liquidity Predictions

This table reports the estimated coefficients and t-statistics (in parentheses) for the regression of abnormal bond market returns on debt analysts' (DAs') discussions of financial distress. Variable definitions for the variables of interest are: Abnormal Bond Return is the raw bond return less the maturity-matched Treasury return (see Bessembinder et al., 2009; Easton et al., 2009) for the 5-day window (day $t=-2$ to day $t=+2$) centered on the DA report date; Bankruptcy Prediction is equal to 1 if the DA report mentions bankruptcy, and 0 otherwise; Covenant Prediction is an indicator variable equal to 1 if the DA report mentions the likelihood of violating a debt covenant, and 0 otherwise; Liquidity Prediction is an indicator variable equal to 1 if the DA report mentions liquidity, and 0 otherwise; Bad (Good) News Bankruptcy, Covenant, and Liquidity Prediction are indicator variables equal to 1 if the DA report predicts that the firm will (not) file for bankruptcy, the firm will (not) violate a covenant, or the firm does not have (has) sufficient liquidity to service its maturing debt obligations, respectively, and 0 otherwise; Uncertain Bankruptcy, Covenant, and Liquidity Prediction are indicator variables equal to 1 if the DA report mentions bankruptcy, covenant violations, or liquidity, respectively, but does not issue a prediction, and 0 otherwise (see Appendix A for detailed definitions of the control variables). Predicted signs are shown (not shown) for the independent (control) variables of interest. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 1%, 5%, and 10% level respectively.

<i>Dependent Variable: 5-Day Abnormal Bond Market Return</i>			
	<i>Predicted Sign</i>	(1)	(2)
Intercept		0.028 (1.30)	0.023 (1.10)
Bankruptcy Prediction	+ / -	0.022 (0.99)	
Covenant Prediction	+ / -	-0.040 ** -(2.07)	
Liquidity Prediction	+ / -	0.009 (0.73)	
Bad News Bankruptcy Prediction	-		-0.071 ** -(2.13)
Good News Bankruptcy Prediction	+		-0.011 -(1.23)
Uncertain Bankruptcy Prediction	+ / -		0.090 * (1.98)
Bad News Covenant Prediction	-		-0.027 ** -(2.25)
Good News Covenant Prediction	+		-0.013 -(1.32)
Uncertain Covenant Prediction	+ / -		-0.106 ** -(2.59)
Bad News Liquidity Prediction	-		0.005 (0.33)
Good News Liquidity Prediction	+		0.005 (0.64)
Uncertain Liquidity Prediction	+ / -		0.003 (0.18)

Table 8 Continued

Downgrade	-0.037 **	-0.025 *
	-(2.26)	-(1.71)
Upgrade	0.009	0.008
	(0.50)	(0.45)
Reiteration	0.001	0.002
	(0.09)	(0.19)
Credit Flash Report	-0.010	-0.006
	-(0.76)	-(0.39)
Underwriting Affiliation	0.002	0.002
	(0.39)	(0.34)
Bond Complexity High	-0.001	0.000
	-(0.10)	(0.01)
Bond Highly Traded	-0.014 **	-0.013 **
	-(2.58)	-(2.58)
Bond Length to Maturity	-0.001	-0.001
	-(0.71)	-(0.54)
Bond Credit Rating	-0.002	-0.002
	-(1.35)	-(1.07)
Credit Rating Change	-0.0021	0.000
	-(0.14)	-(0.02)
Equity Recommendation Change	0.003	0.005
	(0.71)	(1.35)
Press Release	0.014	0.017
	(0.99)	(1.19)
Financial Statement Filing	-0.007	0.012
	-(0.70)	(0.81)
Management Disclosure	-0.012	-0.008
	-(0.89)	-(0.57)
Unexpected Earnings	0.001	0.001 *
	(1.37)	(1.92)
N	1642	1642
R-Squared	0.048	0.084

Table 9
Abnormal Bond Market Returns Conditional on the Accuracy of Debt Analyst Reports with a Distress Prediction

This table reports the estimated coefficients and t-statistics (in parentheses) for the regression of abnormal bond market returns on the accuracy of debt analysts' (DAs') discussions of financial distress. Variable definitions for the variables of interest are: Abnormal Bond Return is the raw bond return less the maturity-matched Treasury return (see Bessembinder et al., 2009; Easton et al., 2009) for the 5-day window (day $t=-2$ to day $t=+2$) centered on the DA report date; Bad News Distress Prediction is an indicator variable equal to 1 if the DA report predicts that the firm will file for bankruptcy, will violate a debt covenant, or does not have sufficient liquidity to service its maturing debt obligations, and 0 otherwise; Good News Distress Prediction is an indicator variable equal to 1 if the DA report predicts that the firm will not file for bankruptcy, the firm will not violate a debt covenant, or the firm has sufficient liquidity to service its maturing debt obligations, and 0 otherwise; Correct is an indicator variable equal to 1 if the DA prediction was accurate based on *ex post* outcomes; Uncertain Distress Prediction is an indicator variable equal to 1 when the DA report discusses financial distress but does not make a prediction, and 0 otherwise (see Appendix A for detailed definitions of the control variables). NOTE: Correct is not interacted with Bad News Distress Prediction because all but 3 of the bad news predictions in the sample are correct predictions (see Table 5). Predicted signs are shown (not shown) for the independent (control) variables of interest. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 1%, 5%, and 10% level respectively.

<i>Dependent Variable: 5-Day Abnormal Bond Market Return</i>		
	<i>Predicted Sign</i>	
Intercept		0.033 (1.20)
Bad News Distress Prediction	-	0.002 (0.18)
Good News Distress Prediction	+	-0.009 -(0.96)
Good News Distress Prediction*Correct	+	0.034 * (1.72)
Uncertain Distress Prediction	+ / -	0.006 (0.39)
Correct		-0.030 * -(1.73)

Table 9 Continued

Downgrade	-0.039 *
	-(1.93)
Upgrade	0.011
	(0.58)
Reiteration	-0.004
	-(0.33)
Credit Flash Report	-0.015
	-(1.40)
Underwriting Affiliation	0.002
	(0.23)
Bond Complexity High	0.005
	(0.71)
Bond Highly Traded	-0.010 *
	-(1.82)
Bond Length to Maturity	-0.001
	-(0.81)
Bond Credit Rating	-0.002
	-(0.98)
Credit Rating Change	-0.0020
	-(0.14)
Equity Recommendation Change	0.006 *
	(1.75)
Press Release	0.016
	(1.17)
Financial Statement Filing	-0.024
	-(1.42)
Management Disclosure	-0.016
	-(1.13)
Unexpected Earnings	0.001
	(1.47)
N	1642
R-Squared	0.033

Table 10
Abnormal Bond Market Returns to Debt Analysts' Distress Predictions Conditional on Private versus Public Equity

This table reports the estimated coefficients and t-statistics (in parentheses) for the regression of abnormal bond market returns on debt analysts' (DAs') discussions of financial distress conditional on whether the firm has private or public equity. Variable definitions for the variables of interest are: Abnormal Bond Return is the raw bond return less the maturity-matched Treasury return (see Bessembinder et al., 2009; Easton et al., 2009) for the 5-day window (day $t=-2$ to day $t=+2$) centered on the DA report date; Bankruptcy Prediction is equal to 1 if the DA report mentions bankruptcy, and 0 otherwise; Covenant Prediction is an indicator variable equal to 1 if the DA report mentions the likelihood of violating a debt covenant, and 0 otherwise; Liquidity Prediction is an indicator variable equal to 1 if the DA report mentions liquidity, and 0 otherwise; Bad (Good) News Bankruptcy, Covenant, and Liquidity Prediction are indicator variables equal to 1 if the DA report predicts that the firm will (not) file for bankruptcy, the firm will (not) violate a covenant, or the firm does not have (has) sufficient liquidity to service its maturing debt obligations, respectively, and 0 otherwise; Uncertain Bankruptcy, Covenant, and Liquidity Prediction are indicator variables equal to 1 if the DA report mentions bankruptcy, covenant violations, or liquidity, respectively, but does not issue a prediction, and 0 otherwise; Private Firm is an indicator variable equal to 1 if the firm is a private equity firm, and 0 otherwise (see Appendix A for detailed definitions of the control variables). Predicted signs are shown (not shown) for the independent (control) variables of interest. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 1%, 5%, and 10% level respectively.

<i>Dependent Variable: 5-Day Abnormal Bond Market Return</i>		
		<i>Predicted Sign</i>
Intercept		0.037 (1.38)
Bad News Bankruptcy Prediction	-	-0.026 * (-1.89)
Good News Bankruptcy Prediction	+	-0.008 (-0.70)
Uncertain Bankruptcy Prediction	+ / -	0.097 ** (2.12)
Bad News Covenant Prediction	-	-0.034 *** (-3.86)
Good News Covenant Prediction	+	-0.001 (-0.16)
Uncertain Covenant Prediction	+ / -	-0.115 *** (-2.73)
Bad News Liquidity Prediction	-	0.004 (0.21)
Good News Liquidity Prediction	+	-0.005 (-0.47)
Uncertain Liquidity Prediction	+ / -	-0.012 (-0.71)
Bad News Bankruptcy Prediction*Private Firm	-	-0.051 (-1.32)
Good News Bankruptcy Prediction*Private Firm	+	-0.013 (-1.03)
Uncertain Bankruptcy Prediction*Private Firm	+ / -	-0.081 * (-1.60)

Table 10 Continued

Bad News Covenant Prediction*Private Firm	-	0.090 *** (7.38)
Good News Covenant Prediction*Private Firm	+	-0.022 -(1.31)
Uncertain Covenant Prediction*Private Firm	+ / -	0.098 (1.57)
Bad News Liquidity Prediction*Private Firm	-	-0.008 -(0.31)
Good News Liquidity Prediction*Private Firm	+	0.032 ** (2.54)
Uncertain Liquidity Prediction*Private Firm	+ / -	0.057 ** (2.27)
Private Firm		-0.021 * -(1.86)
Downgrade		-0.021 -(1.49)
Upgrade		0.010 (0.65)
Reiteration		0.004 (0.38)
Credit Flash Report		-0.004 -(0.29)
Underwriting Affiliation		0.004 (0.60)
Bond Complexity High		-0.007 -(0.79)
Bond Highly Traded		-0.015 *** -(2.76)
Bond Length to Maturity		-0.001 -(0.61)
Bond Credit Rating		-0.003 -(1.36)
Credit Rating Change		-0.001 -(0.06)
Press Release		0.019 (1.33)
Financial Statement Filing		0.014 (1.06)
Management Disclosure		-0.013 -(1.00)
Unexpected Earnings		0.001 ** (2.11)
N		1642
R-Squared		0.097

Table 11

Economic Determinants of Debt Analysts' Accuracy when Predicting the Outcomes of Financial Distress

This table reports the estimated coefficients and t-statistics (in parentheses) for a multinomial logistic regression modeling the likelihood of issuing an Incorrect Prediction (Column 1), Uncertain Prediction (Column 2), or No Discussion of Distress debt analyst (DA) report (Column 3) relative to issuing a Correct Prediction. Variable definitions for the variables of interest are: Underwriting Affiliation is an indicator variable equal to 1 when the DA's investment bank provides underwriting services or is seeking to provide underwriting services to the firm, and 0 otherwise; Market Maker is an indicator variable equal to 1 when the DA's investment bank serves as a market maker in the firm's securities, and 0 otherwise; Significant Investment is an indicator variable equal to 1 when the DA's investment bank has a significant investment in the firm, and 0 otherwise; Ln(Investment Bank MVE) is equal to the natural log of the investment bank's market value of equity; Altman Z-Score is equal to the Altman Z-Score of the firm; FCF is equal to the free cash flow of the firm scaled by beginning of year total assets; ROA is equal to EBIT scaled by beginning of year total assets; NBER Recession is an indicator variable equal to 1 if the DA report is issued in an economic recession as defined by the National Bureau of Economic Research (NBER), and 0 otherwise. Predicted signs are shown (not shown) for the independent (control) variables of interest. *, **, *** indicate significance at the 1%, 5%, and 10% level respectively.

		PROB(ISSUE INCORRECT PREDICTION)=1	PROB(ISSUE UNCERTAIN PREDICTION)=1	PROB(ISSUE NO DISCUSSION)=1
	<i>Benchmark</i>	CORRECT PREDICTION	CORRECT PREDICTION	CORRECT PREDICTION
	<i>Predicted Sign</i>	(1)	(2)	(3)
Intercept		-1.022 (-0.34)	2.733 (1.23)	0.084 (0.04)
Underwriting Affiliation	+	1.878 ** (2.54)	0.795 (1.09)	0.429 (0.61)
Market Maker	+	-1.225 (-1.22)	-0.185 (-0.17)	-1.520 (-1.59)
Significant Investment	+	-0.607 (-0.98)	-0.167 (-0.26)	1.243 (1.97)
Ln(Investment Bank MVE)		0.123 (0.45)	-0.319 (-1.55)	0.159 (0.77)
Altman Z-Score		-0.202 (-1.05)	-0.005 (-0.04)	-0.122 (-0.99)
FCF		-5.728 (-0.85)	-11.736 * (-1.72)	1.363 (0.21)
ROA		-3.121 (-0.34)	-2.433 (-0.27)	4.245 (0.47)
NBER Recession		1.603 *** (2.71)	1.511 ** (2.35)	0.205 (0.36)
N			236	
-2 LOG LIKELIHOOD			495.45	

Table 12
Economic Determinants of Debt Analysts' Accuracy using Alternative Benchmarks

This table reports the estimated coefficients and t-statistics (in parentheses) for logistic regressions modeling the likelihood of issuing an Incorrect Prediction (Column 1), Uncertain Prediction (Column 2), or No Discussion of Distress debt analyst (DA) report (Column 3). Variable definitions for the variables of interest are: Underwriting Affiliation is an indicator variable equal to 1 when the DA's investment bank provides underwriting services or is seeking to provide underwriting services to the firm, and 0 otherwise; Market Maker is an indicator variable equal to 1 when the DA's investment bank serves as a market maker in the firm's securities, and 0 otherwise; Significant Investment is an indicator variable equal to 1 when the DA's investment bank has a significant investment in the firm, and 0 otherwise; Ln(Investment Bank MVE) is equal to the natural log of the investment bank's market value of equity; Altman Z-Score is equal to the Altman Z-Score of the firm; FCF is equal to the free cash flow of the firm scaled by beginning of year total assets; ROA is equal to EBIT scaled by beginning of year total assets; NBER Recession is an indicator variable equal to 1 if the DA report is issued in an economic recession as defined by the National Bureau of Economic Research (NBER), and 0 otherwise. Predicted signs are shown (not shown) for the independent (control) variables of interest. *, **, *** indicate significance at the 1%, 5%, and 10% level respectively.

	<i>Benchmark</i> <i>Predicted Sign</i>	PROB(ISSUE INCORRECT PREDICTION)=1	PROB(ISSUE UNCERTAIN PREDICTION)=1	PROB(ISSUE NO DISCUSSION)=1
		CORRECT PREDICTION OR UNCERTAIN DISCUSSION	ISSUING A PREDICTION (INCORRECT OR CORRECT)	DISCUSSING DISTRESS (ALL OTHER PREDICTION TYPES)
		(1)	(2)	(3)
Intercept		-2.984 (-1.12)	2.281 (1.29)	-1.904 (-1.45)
Underwriting Affiliation	+	1.615 ** (2.38)	-0.475 (-0.70)	-0.469 (-1.21)
Market Maker	+	-1.087 (-1.29)	0.525 (0.58)	-0.901 * (-1.75)
Significant Investment	+	-0.537 (-1.10)	0.358 (0.74)	0.792 ** (2.41)
Ln(Investment Bank MVE)		0.253 (1.05)	-0.349 ** (-2.06)	0.272 ** (2.30)
Altman Z-Score		0.016 (0.10)	0.013 (0.10)	-0.041 (-0.49)
FCF		0.856 (0.18)	-7.885 (-1.64)	8.416 ** (2.52)
ROA		-8.304 (-1.03)	-2.275 (-0.30)	3.674 (0.78)
NBER Recession		0.748 (1.54)	0.509 (1.00)	-0.783 ** (-2.55)
N		112	112	236
-2 LOG LIKELIHOOD		136.73	133.96	293.47