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# The role of debt contracts in analyst earnings forecasts☆

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ABSTRACT

Financial analysts evaluate a firm's performance and provide earnings forecasts for future periods. Analysts have limited access to firm financial information, particularly following the enactment of Regulation Fair Disclosure (Reg FD) on October 23, 2000, which may result in information asymmetry between analysts and firm insiders. However, banks are exempt from the Reg FD, and they can still access private information to qualify borrowing firms for better terms on loans. Analysts may accordingly use loan contracts as a source of information to reduce information asymmetry and improve their earnings forecasts. We find that during the quarters wherein companies sign loan contracts, analysts provide more accurate earnings forecasts with lower forecast errors. More importantly, we find that analysts revise their earnings forecasts upward following the issuance of loans with low interest rates, while they revise them downward following the issuance of loans with high interest rates. Overall, these results are consistent with financial analysts using the information provided in debt contracts to better evaluate a firm's performance and provide more precise earnings forecasts.

## 1. Introduction

Equity analysts and banks are among the two main users of financial information. Analysts follow several firms, monitoring their material corporate events and financial information to provide updated earnings forecasts and recommendations that are used by market participants to make various decisions (Asquith, Beatty, & Weber, 2005; Brown, 1993; Hickox, Lin, Oppenheimer, & Zhang, 2016; Huang, Zang, & Zheng, 2014; Schipper, 1991). The extant literature has largely focused on the use of analyst reports by private banks in lending decisions. Coyne and Stice (2018) investigate the role of analyst earnings forecasts on debt contracts by examining the relevance of analyst forecasts to lenders when designing private debt contracts. However, analysts have limited access to private information of firms, particularly following the enactment of Reg FD, which may result in information asymmetry between companies and financial analysts. Analysts may attempt to reduce such information asymmetry by using a debt contract as an additional source of information to learn more about firms and provide more precise forecasts (Brown, Call, Clement, & Sharp, 2015).

Banks, on the other hand, are not subject to such Reg FD-related restrictions. Banks may use borrowers' public and private financial information to make decisions regarding lending and the terms of lending. Since Reg FD does not impose limitations on firms to selectively disclose private information to banks, borrowing firms may provide private information to banks to reduce borrowing costs and/or get favorable terms. As a result, banks know more about the prospects of the firms they lend to than do others; thus, bank loan agreements should convey useful information to the market (Best & Zhang, 1993). Accordingly, we argue that

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banks' access to such private information gives them an advantage relative to financial analysts who do not have access to such private information. Because analysts are aware that Reg FD does not restrict the exchange of private information between banks and borrowing firms, we investigate whether financial analysts use information in debt contracts in their earnings forecasts.

We use revision in analysts' earnings forecasts following the issuance of new loans to test whether the direction of this revision is consistent with the information in debt contracts. More specifically, we test whether analysts increase (decrease) their earnings forecasts after companies receive loans with low (high) interest rates. We use the interest rate as our main independent variable because Yu (2013) documents that at the loan's initiation, banks have "priced in" borrowers' future earnings surprise, which is unexpected by the stock market; i.e., interest spread conveys information about the future earnings prospects of the loan's borrowers, which is unexpected by others. Since earnings reflect cash flow forecasts (Dechow, Kothari, & Watts, 1998), the idea here is that borrowers with poorer (better) prospects of future earnings get loans with higher (lower) interest rates. So, the interest rate information in debt contracts can help analysts update their beliefs about the earnings and consequently about the cash flows prospects of borrowing firms.

We provide evidence consistent with this argument that analysts use the interest rate information from debt contracts and consequently revise their forecasts. We show that there is a significantly negative association between interest rates and earnings forecast revisions, indicating that when interest rates are high (low), analysts revise their forecasts downward (upward). The result suggests that since debt contracts contain valuable information about future earnings, analysts use the interest rate information to revise their forecast. Moreover, we find that during the quarters in which companies sign loan contracts, analysts provide more accurate earnings forecasts with lower forecast errors, especially for financially distressed firms.

This paper contributes to the existing analyst literature by exploring the effects of debt contracts on analyst forecasts. Unlike prior studies that have primarily focused on market participants, including banks, which use the information provided by analysts (Coyne & Stice, 2018; Hasan, Park, & Wu, 2012), we investigate whether and how analysts use the information contained in the debt contract to revise their forecasts. To this end, we document how analysts revise their earnings forecast downward (upward) in response to the high (low) interest rate in a syndicated loan setting. Moreover, our results suggest that the private information shared between banks and borrowing firms not only help banks in deciding the loan terms but also help analysts in learning more about the firm to provide more accurate earnings forecast.

Gallimberti, Lee, and Lo (2017) also use a private loan setting to investigate whether analysts use information in debt contracts to revise their forecast for borrowing firms. Our study differs from that of Gallimberti et al. (2017) because our primary focus is on how the interest rate and changes in interest rate components of debt contract affect forecast revision, while Gallimberti et al. (2017) examine how covenants affect forecast revision. Our choice of interest rate as a "variable of interest" is motivated by three important factors. First, the interest rate is a readily available component of any loan contract as opposed to covenants that suffer from data availability issues.[1] Second, the interest rate does not suffer from the various measurement issues that covenant does.[2] Third, by observing the interest rate on a loan contract, analysts can update their beliefs about the borrower's future earnings prospect (Bharath, Dahiya, & Saunders, 2011; Gallimberti et al., 2017; Yu, 2013). Hence, our study is much more comprehensive than Gallimberti et al.'s (2017) because we incorporate a more widely used element of information disclosed in the loan contracts, which analysts may use to revise and improve forecasts for the borrowing firms.

This study also contributes to research investigating the effects of Reg FD. Reg FD prohibits the disclosure of material nonpublic information to select individuals or groups, such as financial analysts or institutional investors. Studies have shown that in the post-Reg FD period, analysts' coverage and the quality of analyst forecast has declined (Agrawal, Chadha, & Chen, 2006; Gintschel & Markov, 2004; Mohanram & Sunder, 2006), while analysts' forecast dispersion has increased (Bailey, Li, Mao, & Zhong, 2003; Mohanram & Sunder, 2006). Moreover, Palmon and Yezegel (2011) find that Reg FD considerably reduced analysts' comparative advantage in identifying earnings surprises. We add to this body of research by documenting that since private communication with managers is no longer an option, analysts are more likely to rely on public information, such as debt contracts, in the post-Reg FD period than in the pre-Reg FD period to learn more about the firms and increase the accuracy of their forecast.

Finally, our study contributes to the literature that examines the information sources analysts use in arriving upon and revising their earnings forecast. Prior studies have investigated the role of stock market information, especially earnings announcements (Altınkılıç & Hansen, 2009; Yezegel, 2015), in affecting analysts' earnings forecasts. We add to this body of research by investigating the role of information on debt contracts in affecting analysts' earnings forecasts.

The paper proceeds as follows. Section 2 reviews the relevant literature and develops hypotheses. Sections 3 describes the sample and empirical methodology. Section 4 presents the results. Section 5 presents robustness tests and additional results. Section 6 concludes.

[1] Gallimberti et al. (2017) use the minimum EBITDA covenant from loan contracts. They start with more than 60,000 observations in Table 3 but end up with only 386 observations in Table 4 to test the covenant- related hypothesis.

[2] The accounting measures used for covenants can be ambiguous. For example, covenants such as "debt to equity/assets/net worth," etc., may refer to long-term debt, total interest-bearing debt, total liabilities, secured debt, etc. Chava and Roberts (2008) argue that covenants using leverage or interest payments face similar difficulties. Moreover, they argue that even for a conceptually straightforward covenant, such as current ratio, the measurement of the covenant threshold, and consequently the covenant violation, pose several challenges.

## 2. Related literature and hypotheses development

Firms finance their operations through debt or equity. The syndicated loan market – where two or more borrowers fund a single loan – is a popular debt option available to firms. In the syndicated lending setting, lenders typically have access to a borrower's private information and are in direct contact with the borrower's management. Also, banks may perform on-site visits and request confidential information to minimize the risk of lending. Borrowers provide requested information to lower their debt and get loans with favorable terms (Bradley & Roberts, 2015). One implication of all this access to management and special information is that when banks initiate loans, they know more about the borrowing company than others. Yu (2013) finds that Banks can use such "superior information" to set interest rates as if they anticipate the values of future earnings surprises, which is news that is unexpected by other market participants.

Prior studies have examined how the debt market benefits from analysts' forecasts. Mansi, Maxwell, and Miller (2011) find that analysts' forecasts provide valuable information to reduce bond spread. Similarly, Coyne and Stice (2018) investigate the role of analysts' earnings forecasts in private debt contracts and document that precision is associated with lower loan spreads and a lower likelihood of requiring collateral. However, Reg FD prohibits management from disclosing private market-moving information to analysts, which may lead to information asymmetry between firms and analysts. Analysts could potentially reduce such information asymmetry by paying closer attention to any information available to learn more about the firms. Not surprisingly, Kross and Suk (2012) find that analysts respond more to the firm's public disclosures such as earnings announcements, management forecasts, and conference calls following after Reg FD. In the United States, public companies disclose loan-related information on an 8-k form within four business days of the event. We argue that analysts have valuable experience and expertise in the companies and industries that they follow, and such expertise may allow analysts to use loan contracts to extract information that may have implications for the stock market. Current literature, except for Gallimberti et al. (2017), [1] have largely ignored this implication of loan contracts on analyst forecast revision and accuracy.

We focus on the interest rate component of debt contracts. Our choice of interest rate is motivated by the fact that it is a readily available component of any loan contract and by observing the interest rate on loan, analysts could potentially update their beliefs about the borrower's future earnings prospects (Bharath et al., 2011; Gallimberti et al., 2017; Yu, 2013). Since earnings reflect cash flow forecasts (Dechow et al., 1998), analysts could update their belief using interest rate information in the loan contract, which can manifest in the revision of their quarterly earnings forecast. The lower (higher) the interest rates, the "better" ("poorer") the prospect of the borrowing firm. Taken together, we posit that analysts revise their earnings forecast after the loan information becomes publicly available, depending on the pricing terms of the loan. This is formalized in Hypothesis 1 in an alternate form.

**H1.** Analyst forecast revision is negatively associated with the loan spread.

Next, we examine whether analysts forecasts during quarters joined with debt contract announcements are more accurate than forecasts during quarters without loan contract announcements. Since debt contracts contain information relevant to future earnings (Yu, 2013) and earnings reflect cash flow forecasts (Dechow et al., 1998), analysts could expand their information set during quarters joined with debt contract announcements. The forecast error of the analysts revising after the loan contracts should decrease for borrowing firms since the information contained in the loan contracts is useful. Studies have shown that forecast accuracy is important to analysts because of career concerns (Hong & Kubik, 2003; Mikhail, Walther, & Willis, 1997; Mikhail, Walther, & Willis, 1999) and that analysts use accurate earnings forecasts as inputs to their own stock recommendations (Brown et al., 2015) and top-tier investment banks employ significantly more accurate forecasters (e.g., Clement, 1999; Cowen, Groysberg, & Healy, 2006; Malloy, 2005). Since analysts have strong incentive to lower forecast errors and loan contracts provide useful information, they could use loan contracts to extract information that has implications for future earnings and cash flows to lower their forecast errors. Hence, we hypothesize that a loan contract's existence during a given quarter reduces analysts' earnings forecast errors in that quarter. This is formalized in Hypothesis 2 in an alternate form.

**H2.** Analyst forecast error is negatively associated with loan issuance.

With the intention of "leveling the playing field" for all investors, Reg FD prohibits the disclosure of material nonpublic information to select individuals or groups such as financial analysts or institutional investors. Studies have shown that post-Reg FD period analysts' forecasts have become less precise (Agrawal et al., 2006; Gintschel & Markov, 2004); analysts' forecast dispersion has increased (Bailey et al., 2003; Mohanram & Sunder, 2006); analysts' coverage has declined (Mohanram & Sunder, 2006); and analysts' comparative advantage in identifying earnings surprises has declined (Palmon & Yezegel, 2011). The results collectively suggest that analysts have lost a major source of information, which has adversely impacted the quantity and quality of the information they provide.

Since private communication with managers is no longer an option, analysts are likely to rely more on public information. Yu and Webb (2017) find that market participants adapted to Reg FD by mining a new source of industry data, which they argue reflects one way in which analysts and other investors have sought new sources of information to supplement or replace information previously available to them. We similarly argue that analysts rely more on debt contracts in the post-Reg FD period than in the pre-Reg FD period to learn more about the firms and increase the accuracy of their forecast. Hence, we hypothesize that analysts' forecasts during quarters joined with a debt contract announcement are more precise than forecasts during quarters without loan contracts in the post-Reg-FD period compared to the pre-Reg FD period. This is formalized in Hypothesis 3 in an alternate form.

**H3.** The negative association between analyst forecast error and loan issuance is more pronounced in the post-Reg FD period.

## 3. Sample selection and research design

Our sample consists of the quarterly analysts' earnings forecasts between 1990 and 2014. We use Compustat quarterly data to gather the firm's financial information, I/B/E/S detail files to collect analyst earnings forecasts, CRSP to obtain stock price and stock return information, and Dealscan to collect debt contract information. Dealscan provides information on debt contracts. The basic unit of observation in DealScan is a loan, also referred to as a facility or tranche. We use loan facilities as loan contracts, and we merge DealScan with Compustat quarterly files based on Chava and Roberts (2008), using the linking table last updated on April 17, 2018.[3] We use I/B/E/S detail data to calculate the forecast revision, since it includes information regarding individual analysts' forecasts. We use CRSP daily stock files to calculate the stock return during the revision horizon when analysts revise their forecasts. We follow BC (2018), among others, and winsorize the continuous variables used in the regression models on the 1st and 99th percentiles to deal with outliers. Merging data sources and eliminating observations without available data for the variables used in the regression models results in a sample of 6,038 loan contracts and 15,864 forecast revisions.

### 3.1. Effect of loan spread on forecast revisions

To test H1, i.e., the effect of loan spread on analysts' earnings forecasts, we use the ordinary least square (OLS) regression model. We test the effect of loan spread on forecast revision (measured as changes in analysts' earnings forecasts pre- and post- the loan activation date, as normalized by the beginning of the quarter stock price) using the following regression model:

$$\begin{aligned} Revision_{it} = {} & \alpha_0 + \beta_1 Spread_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 Earn\_Volatility_{it} + \beta_5 Return_{it} + \beta_6 MTB_{it} + \beta_7 specialitem\_dummy_{it} \\ & + \beta_8 Trading\_vol_{it} + \beta_9 Analyst\_firm\_exp_{it} + \beta_{10} Analyst\_general\_exp_{it} + \beta_{11} Horizon_{it} + \beta_{12} Firm\_following_{it} \\ & + \beta_{13} Analyst\_following_{it} + \beta_{14} Brokerage\_size_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

where *Revision* is the amount of change in the analyst earnings forecast following the issuance of a loan normalized by the beginning of the quarter stock price[4] ; *Spread* refers to the natural log of the interest rate measured as the basis points above the LIBOR rate; *Size* is the natural log of the total company assets; *ROA* is the Operating income before depreciation scaled by total assets at the beginning of the quarter; *Earn_Volatility* is the standard deviation of ROA over the last 12 quarters.; *Return* is the cumulated company stock return between the analyst earnings forecast announcement date and its revision following the loan issuance; *MTB* stands for the market-to-book ratio; *specialitem_dummy* is an indicator variable that equals one if a firm reported negative special items in quarter t; *Trading_vol* refers to the trading volume in millions of dollars for the quarter t; and *Analyst_firm_exp* measures the number of years the analyst has covered that specific firm. The firm experience measure is adjusted by subtracting the minimum experience for all other analysts covering the firm. *Analyst_general_exp* measures the number of years since the analyst first started to issue research on any stock. *Horizon* is the number of days between the analyst earnings forecast announcement and its revision following the loan issuance; $Firm\_following_{it}$ comprises the number of firms that an analyst follows; *Analyst_following* denotes the number of analysts following each borrowing company; and *Brokerage_size* is the number of analysts employed by a brokerage.

We expect a negative sign for the coefficients of *Spread*. To improve the validity of these results, we include the stock returns during the revision period as a control variable. We thereby control all information available within the stock market, which may affect analysts' earnings forecasts.

### 3.2. Reg FD and effect of debt contracts on forecast errors

To test H2, i.e., whether or not analysts' forecasts during quarters joined with a debt contract announcement are more precise than forecasts during quarters without loan contracts, we use the following regression model:

$$\begin{aligned} Forecast\_Err_{it} = {} & \alpha_0 + \beta_1 Debt\_Dummy_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 Earn\_Volatility_{it} + + \beta_5 Return_{it} + \beta_6 Leverage_{it} \\ & + \beta_7 Analyst\_following_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

where *Forecast_Error* is the ratio of the mean and median of analyst forecast errors (*Mean_Error*, and *Median_Error*), as well as the standard deviation of analyst forecasts (*Stdev_Forecasts*) to the share price of the firms at the beginning of the quarter. *Debt_Dummy* is also defined as a dummy variable equal to one if there is a debt contract issued during the quarter when analysts provide earnings forecasts and zero otherwise. We expect to find a negative relation between the debt dummy variable and dependent variables, consistent with the explanation that the existence of a debt contract increases analysts' available information and helps provide more precise earnings forecasts.

Finally, we test H3 using a regression model similar to that used in Eq. (2), with the addition of a dummy variable for the post-Reg FD period and its interaction with debt issuance as follows:

[3] We link Dealscan with Compustat using the data available at http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-12/index.html.

[4] We also calculate the earnings forecast revision, as normalized by the book value of each share, and re-run the tests; the results are qualitatively similar.

**Table 1**
Descriptive Statistics.

| Variable | N | Mean | Std Dev | Lower Quartile | Median | Upper Quartile |
|---|---|---|---|---|---|---|
| *Revision* | 15,864 | 0.10 | 1.39 | −0.18 | −0.02 | 0.09 |
| *Spread* | 15,864 | 129.83 | 104.93 | 42.50 | 100.00 | 187.50 |
| *Log_Spread* | 15,858 | 4.51 | 0.90 | 3.75 | 4.61 | 5.23 |
| *Chg_Spread* | 12,727 | 5.98 | 88.77 | −25.00 | 0.00 | 25.00 |
| *Size* | 15,864 | 8.33 | 1.62 | 7.15 | 8.29 | 9.57 |
| *ROA* | 15,864 | 0.02 | 0.10 | 0.02 | 0.04 | 0.06 |
| *Earn_Volatility* | 15,864 | 0.05 | 0.08 | 0.01 | 0.01 | 0.04 |
| *Return* | 15,864 | −0.65 | 18.07 | −9.39 | 0.70 | 9.53 |
| *MTB* | 15,851 | 1.86 | 1.01 | 1.24 | 1.55 | 2.12 |
| *specialitem_dummy* | 15,864 | 0.42 | 0.49 | 0.00 | 0.00 | 1.00 |
| *Trading_vol* | 15,864 | 127.36 | 205.94 | 11.75 | 47.24 | 144.35 |
| *Analyst_firm_exp* | 15,864 | 3.13 | 3.27 | 1.00 | 2.00 | 5.00 |
| *Analyst_general_exp* | 15,864 | 7.36 | 4.43 | 4.00 | 7.00 | 10.00 |
| *Horizon* | 15,864 | 59.82 | 21.62 | 45.00 | 63.00 | 77.00 |
| *Firm_Following* | 15,864 | 19.81 | 9.55 | 14.00 | 18.00 | 24.00 |
| *Analyst_Following* | 15,864 | 26.96 | 14.26 | 16.00 | 25.00 | 36.00 |
| *Brokerage_Size* | 15,864 | 5.46 | 1.00 | 4.80 | 5.72 | 6.28 |

Variables definitions are provided in the Appendix A.

$$Forecast\_Err_{it} = \alpha_0 + \beta_1 Debt\_Dummy_{it} + \beta_2 Debt\_Dummy_{it} * Post\_RegFD_{it} + \beta_3 Post\_RegFD_{it} + \beta_4 Size_{it} + \beta_5 ROA_{it} + \beta_6 Earn\_Volatility_{it} + \beta_7 Return_{it} + \beta_8 Leverage_{it} + \beta_9 Analyst\_following_{it} + \varepsilon_{it} \quad (3)$$

If analysts provide more precise forecasts when a debt contract is issued following the enactment of Reg FD versus the previous period, then we expect to see a negative sign for the interaction between the debt dummy and the post-Reg FD variable ($\beta_2 < 0$).

## 4. Results

Table 1 presents descriptive statistics. Analysts, on average, revise their earnings 0.1 percent upward, while the average spread of debt contracts is 129.83 basis points above the LIBOR rate. On average, analysts have firm experience of 3.13 years and general experience of 7.36 years, and they follow approximately 20 firms.

### 4.1. Loan spread and quarterly forecast revisions

Table 2 presents the correlation between the variables. Analysts' forecast revision is negatively correlated with the spread, which is consistent with the argument that analysts use the information (loan spread) in the debt contracts to revise their earnings forecasts. Return is positively correlated with analysts' forecast revision. This is expected and it implies that a positive return indicates a positive performance signal, so that analysts would also revise their forecasts upward.

Table 3 provides the results from Eq. (1) using quarterly earnings forecasts. In Model (1), only the main variable of interest (spread over LIBOR rate) is included. The coefficient of interest ($\beta_1$) is negative (−0.097) and significant (t-stat = −3.82). In Model (2), we add the control variables known to play a role in forecast revisions according to the literature (See Bharatha, Dahiya, Saunders, & Srinivasan, 2007; Cicero, Kalpathy, & Sulaeman, 2011; Clement, 1999; Drucker & Puri, 2005; Jacob, Lys, & Neale, 1999; Kim, Lobo, & Song., 2011, among others) and the results are similar. Based on the results, the spread is negatively associated with the revision of analyst earnings forecast. This is consistent with the notion that analysts use loan spread from debt contracts to revise their earnings forecasts.

Table 4 also shows the results of quarterly regression from Eq. (1), with a difference in the method used to calculate the forecast revision. In this table, we calculate the mean and median for all analyst forecasts, both pre- and post-debt contract issuance, and then calculate the change in the means and medians following the loan activation date versus pre-loan activation date. This results in 5840 forecast revisions. Similar to the results in Table 3, loan spread is negatively associated with the revision of earnings forecasts, at a 1 % significance level. Fig. 1 presents the timeline used to calculate the mean and median of earnings forecasts, as well as the earnings forecast revisions. Overall, Tables 3 and 4 provide evidence that analysts use loan pricing information contained in the debt contracts to revise their earnings forecasts. Analysts revise their earnings forecasts upward (downward) when the interest rate is lower (higher), which is consistent with H1.

### 4.2. Debt contracts and analyst forecast accuracy

In the previous sections, we document that loan pricing is significantly related to the analyst earnings forecast revisions. In other words, we show that after the issuance of a debt contract, analysts revise their forecasts based on the loan spread. Table 5 shows the results for H2. We calculate the forecast errors measured as the mean and median of the absolute value of the differences between actual earnings and analyst earnings forecasts, normalized by the beginning of the quarter stock price. We introduce a dummy

**Table 2**
Correlation.

| | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Revision* | | | | | | | | | | | | | | | | |
| 2 | *Spread* | **−0.04** | | | | | | | | | | | | | | | |
| 3 | *Log_Spread* | **−0.03** | **0.91** | | | | | | | | | | | | | | |
| 4 | *Chg_Spread* | **−0.04** | **0.40** | **0.27** | | | | | | | | | | | | | |
| 5 | *Size* | **0.04** | **−0.27** | **−0.39** | **0.08** | | | | | | | | | | | | |
| 6 | *ROA* | **0.07** | **0.01** | **0.02** | −0.01 | **0.02** | | | | | | | | | | | |
| 7 | *Earn_Volatility* | **−0.03** | 0.00 | 0.00 | **−0.03** | **−0.11** | **−0.37** | | | | | | | | | | |
| 8 | *Return* | **0.16** | **0.02** | **0.01** | **0.02** | **0.04** | **0.06** | **−0.07** | | | | | | | | | |
| 9 | *MTB* | **0.02** | **−0.23** | **−0.26** | **−0.13** | **−0.13** | **0.08** | **0.09** | **0.07** | | | | | | | | |
| 10 | *specialitem_dummy* | 0.01 | **0.15** | **0.12** | **0.05** | **0.13** | **−0.03** | **0.02** | **−0.05** | **−0.11** | | | | | | | |
| 11 | *Trading_vol* | −0.01 | **−0.17** | **−0.25** | **0.05** | **0.54** | 0.01 | 0.01 | **−0.04** | **0.21** | **0.08** | | | | | | |
| 12 | *Analyst_firm_exp* | **0.05** | 0.02 | 0.01 | **0.09** | **0.26** | **0.04** | **−0.10** | 0.02 | **−0.10** | **0.08** | **0.10** | | | | | |
| 13 | *Analyst_general_exp* | **0.04** | **0.05** | **0.05** | **0.06** | **0.17** | **0.03** | **−0.02** | **0.02** | **−0.05** | **0.07** | **0.10** | **0.21** | | | | |
| 14 | *Horizon* | **0.09** | 0.00 | 0.00 | 0.01 | **0.04** | **−0.02** | −0.02 | 0.02 | 0.00 | **0.04** | **0.03** | **0.04** | **0.06** | | | |
| 15 | *Firm_Following* | **0.02** | **0.04** | **0.05** | **0.02** | **−0.03** | **0.03** | **−0.04** | 0.01 | **−0.05** | **−0.05** | **−0.05** | **0.06** | **0.25** | −0.01 | | |
| 16 | *Analyst_Following* | **0.05** | **−0.23** | **−0.28** | **0.03** | **0.56** | **0.08** | **−0.09** | **0.04** | **0.18** | −0.01 | **0.43** | **0.24** | **0.05** | −0.01 | **0.03** | |
| 17 | *Brokerage_Size* | −0.01 | −0.01 | **−0.03** | **0.06** | **0.20** | **0.02** | **−0.03** | 0.00 | **−0.02** | **0.06** | **0.08** | **0.08** | **0.16** | **0.03** | **0.04** | **0.06** |

Bold values indicate that the correlation coefficient is significantly different from zero at the $p < 0.05$ level (two-tailed).
Variables definitions are provided in the Appendix A.

**Table 3**
Effect of debt contract specifications on revision of analysts' ***quarterly*** earnings forecast.

| Dependent Variable: | (1) | | (2) | |
|---|---|---|---|---|
| *Revision* | Coeff. | t-stat | Coeff. | t-stat |
| ***Spread*** | **–0.097** | **−3.82***** | **−0.070** | **−2.25**** |
| Company Information | | | | |
| *Size* | | | 0.016 | 0.66 |
| *ROA* | | | 0.741 | 2.96*** |
| *Earn_Volatility* | | | 0.151 | 0.54 |
| *Return* | | | 0.011 | 10.00*** |
| *MTB* | | | 0.023 | 1.30 |
| *specialitem_dummy* | | | 0.054 | 1.26 |
| *Trading_vol* | | | 0.000 | −3.60*** |
| Analyst Information | | | | |
| *Analyst_firm_exp* | | | 0.011 | 1.67* |
| *Analyst_general_exp* | | | 0.006 | 1.78* |
| *Horizon* | | | 0.005 | 6.33*** |
| *Firm_Following* | | | 0.003 | 1.91* |
| *Analyst_Following* | | | 0.004 | 1.71* |
| *Brokerage_Size* | | | −0.035 | −2.27** |
| *Intercept* | 1.110 | 3.83*** | 0.625 | 1.69* |
| Time Fixed Effect | YES | | YES | |
| Adj R squared | 0.013 | | 0.050 | |
| Number of Observations | 15,858 | | 15,858 | |

***, **, and * indicate significance at the 1 %, 5 %, and 10 % level respectively. Standard errors are clustered by firm. Variables definitions are provided in the Appendix A. This table provides the results of regressing quarterly earnings forecast revisions on the characteristics of debt contracts and control variables.

**Table 4**
Effect of debt contract specifications on the median/mean of the analysts' ***quarterly*** earnings forecasts after the issuance of a debt contract.

| Dependent Variable: | *Median_Revision_Qrt* | | *Mean_Revision_Qrt* | |
|---|---|---|---|---|
| | Coeff. | t-stat | Coeff. | t-stat |
| ***Spread*** | **−0.051** | **−2.65***** | **−0.059** | **−2.94***** |
| Company Information | | | | |
| *Size* | 0.028 | 2.07** | 0.029 | 2.19** |
| *ROA* | 0.527 | 4.31*** | 0.514 | 4.11*** |
| *Earn_Volatility* | 0.185 | 1.06 | 0.076 | 0.46 |
| *Return* | 0.007 | 7.80*** | 0.007 | 7.54*** |
| *MTB* | 0.045 | 5.25*** | 0.028 | 3.32*** |
| *specialitem_dummy* | −0.035 | −1.24 | −0.016 | −0.55 |
| *Trading_vol* | 0.000 | −2.66*** | 0.000 | −1.94* |
| Analyst Information | | | | |
| *Analyst_firm_exp* | 0.006 | 1.36 | 0.006 | 1.30 |
| *Analyst_general_exp* | 0.007 | 2.15** | 0.010 | 2.92*** |
| *Horizon* | −0.001 | −1.32 | 0.002 | 3.39*** |
| *Firm_Following* | −0.003 | −2.09** | −0.003 | −2.28** |
| *Analyst_Following* | −0.001 | −0.93 | 0.000 | 0.04 |
| *Brokerage_Size* | −0.012 | −0.97 | −0.012 | −0.93 |
| *Intercept* | 0.283 | 1.33 | 0.389 | 1.76* |
| Time Fixed Effect | YES | | | YES |
| Adj R squared | 0.039 | | | 0.037 |
| Number of Observations | 5840 | | | 5840 |

***, **, and * indicate significance at the 1 %, 5 %, and 10 % level respectively. Standard errors are clustered by firm. Variables definitions are provided in the Appendix A. This table provides the results of regressing mean and median of quarterly earnings forecast revisions on the characteristics of debt contracts and control variables.

variable, which is equal to one if the firm signs a loan contract during a quarter, and zero otherwise, and test its effect on the forecast errors. In Model (1) of Panel A, we test the effect of the existence of a debt contract on the mean of analyst forecast errors based on Eq. (2). As expected, we find a negative relation between the announcement of a debt contract and analysts' earnings forecast errors.

In Panels B and C of Table 5, we use the median of forecast errors and the standard deviation of the forecasts as other proxies for forecast error in testing Eq. (2). Consistent with the results in Panel A, we find a negative relation with the activation of a debt contract and analyst forecast errors. These results support the argument that debt contracts provide information over and above analysts' existing knowledge of the firms they follow, and analysts use this information in order to reduce their information asymmetry and provide more accurate earnings forecasts.

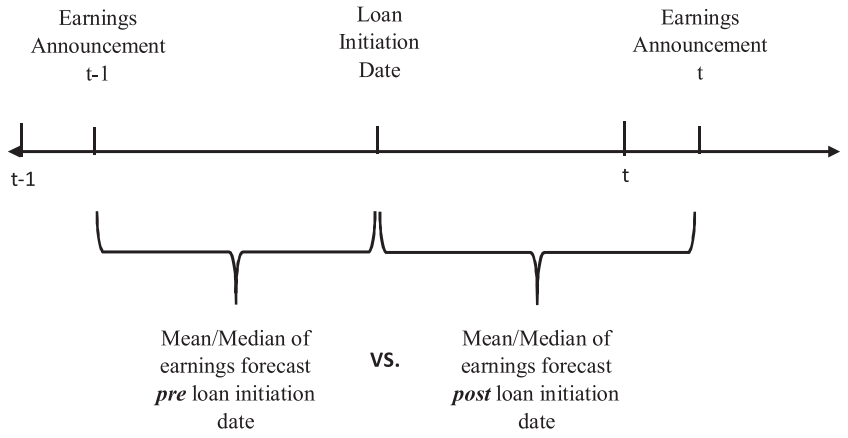


**Fig. 1.** Timeline for the calculation of earnings forecast revision.

**Table 5**

**Panel A** Effect of debt contracts pre and post Reg FD on the analysts forecast accuracy measured as the ***mean*** of the absolute value of the differences between the actual earnings and the analysts' earnings forecasts.

| Dependent Variable: | Predicted | (1) | | | (2) | | |
|---|---|---|---|---|---|---|---|
| *Mean_Error* | Sign | Coeff. | t-stat | Sig. | Coeff. | t-stat | Sig. |
| ***Debt*** | – | **−0.36** | **−4.65** | *** | 0.33 | 2.98 | *** |
| ***Debt*Post_RegFD*** | – | | | | **−0.62** | **−4.23** | *** |
| *Post_RegFD* | + | | | | 2.24 | 27.56 | *** |
| *Controls* | | | YES | | | YES | |
| *Intercept* | | 7.78 | 39.65 | *** | 7.07 | 37.16 | *** |
| Adj R squared | | | 0.081 | | | 0.101 | |
| Number of Observations | | | 141,072 | | | 141,072 | |

**Panel B** Effect of debt contracts pre and post Reg FD on the analysts forecast accuracy measured as the ***median*** of the absolute value of the differences between the actual earnings and the analysts' earnings forecasts

| Dependent Variable: | Predicted | (1) | | | (2) | | |
|---|---|---|---|---|---|---|---|
| *Median_Error* | Sign | Coeff. | t-stat | Sig. | Coeff. | t-stat | Sig. |
| ***Debt*** | – | **−0.34** | **−4.45** | *** | 0.33 | 2.96 | *** |
| ***Debt*Post_RegFD*** | – | | | | **−0.60** | **−4.06** | *** |
| *Post_RegFD* | + | | | | 2.22 | 27.36 | *** |
| *Controls* | | | YES | | | YES | |
| *Intercept* | | 7.71 | 39.33 | *** | 7.01 | 36.81 | *** |
| Adj R squared | | | 0.080 | | | 0.099 | |
| Number of Observations | | | 141,072 | | | 141,072 | |

**Panel C** Effect of debt contracts pre and post Reg FD on the analysts forecast accuracy measured as the ***standard deviation*** of the analysts' earnings forecasts

| Dependent Variable: | Predicted | (1) | | | (2) | | |
|---|---|---|---|---|---|---|---|
| *Stdev_Forecasts* | Sign | Coeff. | t-stat | Sig. | Coeff. | t-stat | Sig, |
| ***Debt*** | – | **−0.15** | **−4.97** | *** | **0.18** | **4.42** | *** |
| ***Debt*Post_RegFD*** | – | | | | **−0.31** | **−5.58** | *** |
| *Post_RegFD* | + | | | | 1.04 | 31.37 | *** |
| *Controls* | | | YES | | | YES | |
| *Intercept* | | 3.11 | 36.98 | *** | 2.78 | 35.28 | *** |
| Adj R squared | | | 0.077 | | | 0.110 | |
| Number of Observations | | | 141,215 | | | 141,215 | |

***, **, and * indicate significance at the 1 %, 5 %, and 10 % level respectively.
Standard errors are clustered by firm.
Variables definitions are provided in the Appendix A.

**Table 6**
Effect of changes in the debt contracts' interest rates on the revision of analysts' ***quarterly*** earnings forecast.

| Dependent Variable: | (1) | | (2) | |
|---|---|---|---|---|
| *Revision* | Coeff. | t-stat | Coeff. | t-stat |
| ***Chg_Spread*** | **−0.001** | **−2.54**** | **−0.001** | **−2.56**** |
| Company Information | | | | |
| *Size* | | | 0.022 | 0.88 |
| *ROA* | | | 0.731 | 2.40** |
| *Earn_Volatility* | | | 0.263 | 0.86 |
| *Return* | | | 0.011 | 8.35*** |
| *MTB* | | | 0.040 | 2.04** |
| *specialitem_dummy* | | | 0.085 | 1.81* |
| *Trading_vol* | | | 0.000 | −3.44*** |
| Analyst Information | | | | |
| *Analyst_firm_exp* | | | 0.009 | 1.34 |
| *Analyst_general_exp* | | | 0.005 | 1.57 |
| *Horizon* | | | 0.006 | 6.11*** |
| *Firm_Following* | | | 0.004 | 2.57** |
| *Analyst_Following* | | | 0.003 | 1.44 |
| *Brokerage_Size* | | | −0.032 | −1.81* |
| *Intercept* | 0.393 | 1.80* | −0.076 | −0.26 |
| Time Fixed Effect | | YES | | YES |
| Adj R squared | | 0.011 | | 0.048 |
| Number of Observations | | 12,727 | | 12,727 |

***, **, and * indicate significance at the 1 %, 5 %, and 10 % level respectively.
Standard errors are clustered by firm.
Variables definitions are provided in the Appendix A.

### 4.3. Debt contracts and analyst forecast accuracy post-reg FD

Model (2) of Table 5 presents results for H3. Consistent with the hypothesis, the coefficient on the interaction term has a negative sign and is significant at a 1% significance level. This implies that during the post-Reg FD period compared to the pre-Reg FD period, analysts rely more on debt contracts to reduce analyst forecast errors. These results are similar to those in Panel B and Panel C of Table 5, in which we used different measures for forecast error. Finally, the significantly positive coefficient of the dummy variable *Post_RegFD* in Model (2) of Table 5 also indicates that during the post-Reg FD period, analyst forecast errors (accuracy) have increased (decreased), which is consistent with the prior studies documenting that analysts' forecast accuracy has decreased in recent years due to the regulations imposed after the year 2000.

## 5. Robustness tests and additional analysis

### 5.1. Change in the interest rate

So far, we have used the spread, as noted in the debt contracts, as the main variable of interest in the regression models. However, different companies in various industries generally face a range of risk levels, and as a result, it is logical that banks provide debt contracts with different interest rates for companies operating in various industries. Moreover, some firms are generally riskier to invest in, even when holding industry constant, and banks would charge different interest rates based on the riskiness of their investment. Therefore, a given amount of interest rate would be considered high for one company, while the same amount of interest rate would be considered low for another company. To address this concern, we replace loan spread with a *change* in the loan spread and test our main hypothesis (H1).

Table 6 provides the results of regressions using the change in the spread. The coefficient on *Chg_Spread* is negative and statistically significant in both Models 1 and 2. The results indicate that analysts forecast higher (lower) earnings for borrowing firms when banks decrease (increase) the interest rate for their loans.

### 5.2. Forecast revision and loan purpose

In this section, we test the effectiveness of debt contracts on analysts' earnings forecasts by decomposing the sample to investment and non-investment loans. As investment loans would be more related to the revenue-generating processes of a company, analysts would be more interested in following investment loans to provide their earnings forecasts than non-investment ones. Therefore, we expect to find a stronger association between information provided in the debt contracts and analysts' earnings forecasts for investment loans than for non-investment loans. To do so, we define investment loans as the loans that have corporation purposes as their primary purpose.

In Table 7, we divide the sample into two subsamples of investment and non-investment loans, and test the effect of spread on

**Table 7**
Effect of debt contract specifications on revision of analysts' quarterly earnings forecast on the samples of investment and non-investment loans.

| Dependent Variable: | Investment Loans | | Non-investment Loans | |
|---|---|---|---|---|
| *Revision* | Coeff. | t-stat | Coeff. | t-stat |
| ***Spread*** | **−0.104** | **−2.31**** | **−0.009** | **−0.20** |
| Company Information | | | | |
| *Size* | −0.014 | −0.45 | 0.018 | 0.57 |
| *ROA* | 1.269 | 3.59*** | 0.026 | 0.06 |
| *Earn_Volatility* | 0.095 | 0.26 | 0.210 | 0.55 |
| *Return* | 0.011 | 7.42*** | 0.012 | 6.65*** |
| *MTB* | 0.031 | 1.40 | 0.005 | 0.18 |
| *specialitem_dummy* | 0.104 | 1.88* | −0.043 | −0.67 |
| *Trading_vol* | 0.000 | −2.71*** | −0.000 | −2.97*** |
| Analyst Information | | | | |
| *Analyst_firm_exp* | 0.010 | 1.31 | 0.014 | 1.39 |
| *Analyst_general_exp* | 0.005 | 1.17 | 0.009 | 1.62 |
| *Horizon* | 0.006 | 5.78*** | 0.005 | 3.52*** |
| *Firm_Following* | 0.006 | 3.10*** | −0.003 | −1.59 |
| *Analyst_Following* | 0.004 | 1.50 | 0.004 | 1.01 |
| *Brokerage_Size* | −0.026 | −1.26 | −0.054 | −2.72*** |
| *Intercept* | 0.516 | 1.13 | 0.876 | 1.35 |
| Time Fixed Effect | YES | | | YES |
| Adj R squared | 0.056 | | | 0.059 |
| Number of Observations | 10,278 | | | 5580 |

***, **, and * indicate significance at the 1 %, 5 %, and 10 % level respectively. Standard errors are clustered by firm. Variables definitions are provided in the Appendix A. This table provides the results of regressing quarterly earnings forecast revisions on the characteristics of debt contracts and control variables.

analysts' earnings forecast revision.

As shown in Table 7, the coefficient on loan spread is negative and significant for investment loans but insignificant for non-investment loans. Overall, we interpret this evidence as analysts paying more attention to the investment loans, and revising their earnings for investment loans but not for non-investment loans.

### 5.3. Forecast errors and bankruptcy risk

An additional source of information is more valuable to analysts following financially distressed firms that could delay financial and non-financial reports (Altman, Sabato, & Wilson, 2010) or do not report at all (Lukason, 2013). Frino, Jones, and Wong (2007) find little evidence of any systematic disclosure leading up to bankruptcy announcement by failed firms. They also find evidence - consistent with the presence of information asymmetry argument - that the bid-ask-spread of such failed firms widens significantly up to a year before failure. Frino, Jones, Lepone, and Wong (2014) find similar evidence i.e. financially distressed firms do not disclose that drives the increase in information asymmetry before the company's' failure. Taken together, the aforementioned studies provide evidence that financially distressed face more information asymmetry. We then argue that the loan contract of a financially distressed firm should be much more helpful to an analyst in reducing forecast error compared to the loan contract of a financially sound firm. We test this argument by creating a dummy variable "Bankruptcy" which is equal to one if Z-Score of a firm is less than 1.8 and zero otherwise. We interact this dummy variable for bankruptcy with the dummy variable for debt issuance. A negative coefficient on this interaction variable is consistent with our argument that analysts use the loan contract of a financially distressed firm to reduce their forecast error. Panel A of Table 8 shows the results for this test. The coefficient on the interaction term "Debt*Bankruptcy" is consistent with our expectation.

### 5.4. Forecast errors and types of covenants

Finally, we test whether some types of covenants are more related to the reduction of analysts' forecast errors. We start with a broad classification of financial covenants vs. non-financial covenants. Financial covenants include debt to equity covenant, net worth covenant, etc. whereas non-financial covenants include sweep provisions, dividend restrictions, etc. (Prilmeier, 2017). We also use a net worth covenant which is a frequently used financial covenant in loan contracts. We find in Panel B (Panel C) of Table 8 that financial covenants (Net worth covenants) are associated with a reduction of analyst forecast errors.

## 6. Conclusion

In this paper, we test the relationship between analysts' earnings forecasts and debt contracts. Banks may require borrowing firms to provide private information in order to assess the riskiness of their loans. The more information banks have, the better they can specify the terms of debt contracts and reduce their risk. Firms are also willing to provide private financial information to the banks to

**Table 8**
Panel A - Effect of debt contracts and bankruptcy risk on the analysts forecast accuracy.

| Dependent Variable: | *Mean_Error* | | | *Median_Error* | | |
|---|---|---|---|---|---|---|
| | Coeff. | t-stat | Sig. | Coeff. | t-stat | Sig. |
| *Debt* | 0.10 | 0.55 | | 0.08 | 0.43 | |
| ***Debt*Bankrupty*** | **−0.53** | **−2.69** | *** | **−0.48** | **−2.51** | ** |
| *Bankrupty* | 1.67 | 19.13 | *** | 1.66 | 19.05 | *** |
| *Controls* | | YES | | | YES | |
| *Intercept* | 6.53 | 33.24 | *** | 6.47 | 32.93 | *** |
| Adj R squared | | 0.086 | | | 0.085 | |
| Number of Observations | | 141,072 | | | 141,072 | |

Panel B - Effect of Financial covenant in debt contracts on the analysts forecast accuracy.

| Dependent Variable: | *Mean_Error* | | | *Median_Error* | | |
|---|---|---|---|---|---|---|
| | Coeff. | t-stat | Sig. | Coeff. | t-stat | Sig. |
| ***Fin Cov*** | **−0.45** | **−4.72** | *** | **−0.43** | **−4.44** | *** |
| *Controls* | | YES | | | YES | |
| *Intercept* | 7.79 | 39.7 | *** | 7.72 | 39.37 | *** |
| Adj R squared | | 0.081 | | | 0.080 | |
| Number of Observations | | 141,072 | | | 141,072 | |

Panel C - Effect of net worth covenant in debt contracts on the analysts forecast accuracy.

| Dependent Variable: | *Mean_Error* | | | *Median_Error* | | |
|---|---|---|---|---|---|---|
| *Stdev_Forecasts* | Coeff. | t-stat | Sig. | Coeff. | t-stat | Sig, |
| ***NW Cov*** | **−0.72** | **−4.62** | *** | **−0.72** | **4.58** | *** |
| *Controls* | | YES | | | YES | |
| *Intercept* | 7.80 | 39.7 | *** | 7.73 | 39.38 | *** |
| Adj R squared | | 0.081 | | | 0.081 | |
| Number of Observations | | 141,072 | | | 141,072 | |

***, **, and * indicate significance at the 1 %, 5 %, and 10 % level respectively.
Standard errors are clustered by firm.
Variables definitions are provided in the Appendix A.

secure better pricing and non-pricing terms on their loans.

Financial analysts are always seeking relevant information to improve their earnings forecasts. However, following the enactment of Reg FD, firms are prohibited from selectively disclosing material information to analysts. Analysts, therefore, may not be able to access private firm information, while banks still can access such information. This difference in access to private firm information can result in an information asymmetry that may prevent analysts from making precise earnings forecasts. We argue that analysts use the information contained in debt contracts as a signal regarding the type of information communicated between firms and banks which, in turn, allows analysts to make more precise forecasts.

We document that analysts revise their prior forecasts after a new loan is issued. Specifically, we also document that when debt contracts have high (low) interest rates, analysts revise their forecasts downward (upward). Moreover, we show that analysts provide more precise forecasts during the quarters in which firms issue new loans, especially for financially distressed firms. This is consistent with our argument that debt contracts provide information above and beyond the current level available to analysts.

We examine, finally, the effect of debt contracts on analyst forecast error following the enactment of Reg FD. We hypothesize and document that analysts react more strongly to the issuance of debt contracts following the implementation of Reg FD. This evidence, as we interpret it, indicates that upon having less access to private firm information during the post-Reg FD period, analysts rely more on other sources of information such as debt contracts.

## Appendix A. Variable Description

| Variable Name | Description | Source |
|---|---|---|
| Revision | Amount of change in the analyst earnings forecast after the loan issuance normalized by the beginning of the quarter/year stock price | I/B/E/S |
| Spread | Natural log of the loan contract interest rate measured as the basis points above the LIBOR rate | Dealscan |
| Chg_Spread | Change in the natural log of the loan contract interest rate with respect to the previous contract measured as the basis points above the LIBOR rate | Dealscan |
| Size | Natural log of total assets of the company | Compustat |

| | | |
|---|---|---|
| ROA | Operating income before depreciation scaled by total assets at the beginning of the quarter | Compustat |
| Earn_Volatility | The standard deviation of Operating income before depreciation scaled by total assets in the last 12 quarters. | Compustat |
| Return | Cumulated stock return of the company between the analyst earnings forecast announcement and its revision after the loan issuance | CRSP |
| MTB | Market to book ratio | Compustat |
| specialitem_dummy | is an indicator variable that equals one if a firm reported negative special items in quarter t; | Compustat |
| Trading_vol | is the trading volume in millions of dollars for the quarter t | CRSP |
| Analyst_firm_exp | The number of years the analyst has covered that specific firm.The firm experience measure is adjusted by subtracting the minimum experience for all other analysts covering the firm | I/B/E/S |
| Analyst_general_exp | The number of years since the analyst first started to issue research on any stock | I/B/E/S |
| Horizon | Number of days between the analyst earnings forecast announcement and its revision pre and post the loan issuance | I/B/E/S |
| Firm_Following | Number of firms that an analyst follows | I/B/E/S |
| Analyst_Following | Number of analysts following each borrowing company | I/B/E/S |
| Brokerage_Size | Natural logarithm of the number of analysts employed by a brokerage house | I/B/E/S |
| Debt | Dummy variable equal to one if there is a debt contract issued during the quarter/year in which analysts provide earnings forecasts, and zero otherwise | Dealscan |
| RegFD | Dummy variable equal to one if the forecast is made after the enactment of Regulation Fair Disclosure, and zero otherwise | Dealscan |
| Mean_Error | Mean of the absolute value of the differences between the actual earnings and the analyst earnings forecasts normalized by the beginning of the quarter stock price | I/B/E/S |
| Median_Error | Median of the absolute value of the differences between the actual earnings and the analyst earnings forecasts normalized by the beginning of the quarter stock price | I/B/E/S |
| Stdev_Forecasts | Standard deviation of the analysts' earnings forecasts normalized by the beginning of the quarter stock price | I/B/E/S |
| Mean_Revision | Amount of change in the mean of analysts' earnings forecasts after the issuance of a loan normalized by the beginning of the quarter stock price | I/B/E/S |
| Median_Revision | Amount of change in the median of analysts' earnings forecasts after the issuance of a loan normalized by the beginning of the quarter stock price | I/B/E/S |
| Bankrupty | Dummy variable equal to one if Z-Score of a borrowing firm is less than 1.8, and zero otherwise. | Compustat |
| Fin Cov | Dummy variable equal to one if a loan has financial covenant, and zero otherwise. | Dealscan |
| NW cov | Dummy variable equal to one if a loan has net-worth covenant, and zero otherwise. | Dealscan |

## Appendix B. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.jeconbus.2020.105929.

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# Update

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# Erratum regarding missing Declaration of Competing Interest statements in previously published articles

Declaration of Competing Interest statements were not included in the published version of the following articles that appeared in previous issues of Journal of Economics and Business.

The appropriate Declaration/Competing Interest statements, provided by the Authors, are included below.

1 "An event study analysis of too-big-to-fail after the Dodd-Frank act: Who is too big to fail?" [Journal of Economics and Business, 2018; 98: 19–31] https://doi.org/10.1016/j.jeconbus.2018.03.003

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

2 "A preferred habitat for liquidity in term repos: Before, during and after the financial crisis" [Journal of Economics and Business, 2018; 99: 1–14] https://doi.org/10.1016/j.jeconbus.2018.07.002

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

3 "Nominal GDP versus price level targeting: An empirical evaluation" [Journal of Economics and Business, 2020; 109: 105890] https://doi.org/10.1016/j.jeconbus.2019.105890

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4 "GDP announcements and stock prices" [Journal of Economics and Business, 20191; 08: 105872] https://doi.org/10.1016/j.jeconbus.2019.105872

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

5 "Do fiscal communication and clarity of fiscal announcements affect public debt uncertainty? Evidence from Brazil" [Journal of Economics and Business, 2018; 103: 38–60] https://doi.org/10.1016/j.jeconbus.2018.12.002

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relationships that could have appeared to influence the work reported in this paper.

6 "Monetary and implicit incentives of patent examiners" [Journal of Economics and Business, 2020; 110: 105906] https://doi.org/10.1016/j.jeconbus.2020.105906

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7 "The role of debt contracts in analyst earnings forecasts" [Journal of Economics and Business, 2020; 111: 105929] https://doi.org/10.1016/j.jeconbus.2020.105929

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8 "Financial liberalization and access to credit in emerging and developing economies: A firm-level empirical investigation" [Journal of Economics and Business, 2019; 107: 105861] https://doi.org/10.1016/j.jeconbus.2019.105861

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9 "Determinants of capital structure complexity" [Journal of Economics and Business, 2020; 110: 105905] https://doi.org/10.1016/j.jeconbus.2020.105905

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10 "CEOs' power and perks: Evidence from Chinese banks" [Journal of Economics and Business, 2018; 97: 19–27] https://doi.org/10.1016/j.jeconbus.2018.02.003

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11 "Excess liquidity and net interest margins: Evidence from Vietnamese banks" [Journal of Economics and Business, 2020; 110: 105893] https://doi.org/10.1016/j.jeconbus.2020.105893

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12 "The volatility of mutual fund performance" [Journal of Economics and Business, 2019; 104: 105835] https://doi.org/10.1016/j.jeconbus.2019.02.001

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13 "Systematic risk factors and bank failures" [Journal of Economics and Business, 2018; 98: 1–18] https://doi.org/10.1016/j.jeconbus.2018.05.001

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14 "Applying the Pre-Commitment Approach to bottom-up stress tests: A new old story" [Journal of Economics and Business, 2020; 112: 105931] https://doi.org/10.1016/j.jeconbus.2020.105931

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15 "Corruption, economic development, and auto loan delinquency: Evidence from China" [Journal of Economics and Business, 2018; 99: 28–38] https://doi.org/10.1016/j.jeconbus.2018.08.001

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