The Informational Role of the Media in Private Lending

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In this paper, we examine the informational role of the business press in the private debt market. We find that the media content leading up to a loan origination significantly affects the interest spread on syndicated loans, with more positive content leading to lower spreads. This effect is more pronounced for more information-sensitive loans and is substantially enhanced by broad dissemination. We also find that the amplification effect of dissemination on the impact of media content is more pronounced for more opaque non-rated borrowers. We further show that the sensitivity of loan spreads to media content significantly differs between relationship and non-relationship lenders, with relationship lenders under-reacting to positive media content, consistent with their information advantage protecting them from competition. We also demonstrate that the broad dissemination of positive media content undermines relationship lenders' information advantage and enhances the competitiveness of the loan market, as borrowers are more likely to switch to non-relationship lenders following a positive public signal provided by the media. Overall, we view our findings as supporting the importance of the media as an information intermediary in the private debt market.

1. Introduction

Banks incorporate a diverse information set derived from both public and private sources when assessing borrowers' creditworthiness and structuring loan contracts. As a natural consequence of the private lending process, incumbent lenders have ongoing access to private borrower-specific information not available to new lenders, typically endowing them with a substantial information advantage. For example, lenders may access nuanced information about firm fundamentals that is not fully reflected in hard information, such as accounting performance measures. Lenders also obtain soft information regarding intangible characteristics such as managers' skills, abilities and honesty. Further, lenders may access proprietary information related to new product developments and strategic plans, some of which are subject to lender approval due to the covenant restrictions imposed by lending contracts.[1] Incumbent lenders' information advantage can create a threat of adverse selection, thus weakening competition from prospective lenders for a borrower's loans. The differential availability of borrower-specific information across potential lenders, if substantial, may provide incumbent lenders with an information monopoly, significantly affecting a borrower's access to debt capital and it's pricing (e.g, Sharpe, 1990, and Rajan, 1992).

In this paper, we investigate whether the publication and dissemination of business press articles about a borrower influence loan spreads and reduce the information advantage of relationship lenders relative to other potential lenders.[2] Miller (2006) emphasizes that the business press undertakes original investigation and analysis and rebroadcasts information from

[1] This information is gathered by lenders in the process of pre-loan due diligence activities and the post-loan monitoring of borrowers. The idea that incumbent banks may have an information advantage is well established in the literature (e.g., Kane and Malkiel, 1965, Fama, 1985, Greenbaum, Kanatas, and Venezia, 1989, Sharpe, 1990, Rajan, 1992, Petersen and Rajan, 1994, 1995, and Dell'Aricciaa and Robert Marquez, 2004).

[2] Following Hauswald and Marquez (2003) and Schenone (2010), we use the intensity of the lending relationship between a bank and a borrower to proxy for the magnitude of an incumbent bank's private information advantage over other lenders. We use the terms "incumbent lender" and "relationship lender" interchangeably. We discuss this further in Section 2 of the paper.

other information intermediaries, while Tetlock et al. (2008) suggest that media content captures otherwise hard-to-quantify aspects of firms' fundamentals.[3] Bushee et al. (2010) demonstrate that the press influences a firm's information environment by reducing information asymmetry in the equity market, incremental to firm-initiated disclosure and disclosures by other information intermediaries.[4] However, the extent to which business press articles actually inform syndicated loan market lenders is not clear, as these lenders are sophisticated financial institutions with access to multiple sources of information and extensive experience in processing borrower-related information. Syndicated loans are issued primarily to large public borrowers with rich information environments, potentially reducing the scope for the business press to inform lenders. Therefore, whether the media serves as an important information intermediary in the private debt market is an empirical question.[5]

To address the media's informational role, we provide insight into three primary issues. First, we explore whether media coverage affects loan pricing. Second, we examine the differential effects of media coverage on loan pricing across relationship and non-relationship lenders. Third, we test if media coverage increases the competition relationship lenders face from non-relationship lenders. To examine these questions, we consider two aspects of media coverage: media content and dissemination. We define media content as the general information content of press articles about the borrower leading up to the initiation of a loan. Using data from RavenPack News Analytics, we create a media content measure that captures the average content

[3] Three main sources of information about firms' fundamentals are analysts' forecasts, publicly disclosed accounting variables, and linguistic descriptions of firms' current and future profit-generating activities. Tetlock et al. (2008) argue that if analyst and accounting variables are incomplete or biased measures of firms' fundamentals, linguistic variables extracted from press articles may have incremental explanatory power for firms' future earnings and returns. See also Li (2006), Davis et al. (2006), and Bushee et al. (2010), among others.

[4] In contrast, a number of recent papers suggest that media coverage might exacerbate information asymmetry and inefficient trading behavior (e.g., Frankel and Li, 200, Green et al., 2012, and Soltes et al., 2013).

[5] Bushee et al. (2010) define an information intermediary as an agent that provides information that is new and useful to other parties, either because it has not previously been publicly released or because it has not been widely disseminated.

or nature (positive vs. negative) of borrower-specific articles, thus reflecting the general tenor of media coverage about a firm's prospects.[6] We define dissemination as the frequency of press articles about the borrower and expect it to capture the media's effect on the visibility and exposure of the borrower to prospective lenders. We create a measure of dissemination by counting the number of articles about the borrower in the period preceding the loan contract date.

We first examine whether media content transmits borrower-specific information that is reflected in banks' loan pricing decisions. We find that interest spreads are inversely associated with media content, with more positive news reducing spreads. Economically, the effect of media content on loan pricing is comparable to the effect of key credit risk measures, such as interest coverage, leverage and Altman's Z-score. Our results are robust to controlling for the impact of firm-initiated press releases (both content and the number of press releases), credit watches and credit ratings, a variety of firm- and loan-specific characteristics and a borrower's abnormal stock returns over the period preceding loan issuance. We also find that the effect of media content on loan pricing is concentrated in the loans of more risky borrowers, who are presumably more sensitive to information than more creditworthy firms are (Easton et al., 2009, De Franco et al., 2009, and Dang et al., 2012).

While these findings show that spreads are sensitive to information contained in media articles, they do not speak to whether the media is actually the source of the information, as lenders may simply be pricing information accessed from other sources. To analyze this important issue, we examine whether the effect of media content on interest spreads is magnified by dissemination. If the media provides meaningful new information to lenders, we predict that

[6] RavenPack employs a variety of textual analysis algorithms to quantify the extent of positive or negative sentiment in news articles. The term sentiment is being used here to simply capture the nature (i.e., positive or negative) of the news contained in the article. This use of the term is distinct from the notion of investor sentiment, which generally refers to beliefs not supported by prevailing fundamentals. For example, Tetlock (2007) defines investor sentiment as the level of noise traders' beliefs relative to Bayesian beliefs. See also Baker and Wurgler (2006) for an extensive discussion of investor sentiment.

the relation between media content and interest spreads will be enhanced by greater news dissemination. However, if media content simply reflects information available to lenders from other sources, its effect on interest spreads should not vary with dissemination. We find that the impact of media content on spreads is significantly higher when dissemination is higher.

We acknowledge the possibility that this result may not reflect lenders being informed by the widespread news dissemination, but rather that the dissemination itself is simply a reflection of the general "importance" of news. To address this possibility we further partition the sample into rated and non-rated firms. If lenders are already fully informed, then the amplification effect of dissemination on media content should not vary across rated and non-rated borrowers. In contrast, if lenders learn from the media and dissemination reflects the distribution and visibility of media coverage, we expect the impact of dissemination to be greater for more opaque non-rated firms, as their reduced transparency obscures a firm's fundamentals and increases the scope for learning. Consistent with lenders' learning, we find that the amplification effect of dissemination on media content is more pronounced for more opaque non-rated borrowers.[7]

We next examine whether media affects the economics of relationship lending. If relationship lenders enjoy an information monopoly, the spreads on their loans should be relatively less sensitive to media content than are the spreads on non-relationship loans. Specifically, we predict that relationship lenders will under-react to positive media content as monopoly power allows them to extract rents, but will more fully incorporate negative media content in spreads to avoid underpricing loans. This hypothesis is consistent with Rajan (1992) and Hauswald and Marquez (2003, 2006). In these models, an incumbent bank uses its ability to distinguish between good and bad credit risks to opportunistically structure its lending strategy,

[7] To further address this issue, all specifications control for abnormal stock returns over the same period as media content is measured to control for cross-sectional differences in the importance of overall news arrival from all sources, including media.

thereby exposing less informed lenders to adverse selection risks. Facing the significant risk of being stuck with bad loans, outside lenders temper the aggressiveness with which they bid for loans. The net result is that incumbent lenders extract rents from borrowers deemed to be of high quality by exploiting their informational advantage over competitors to capture some of the upside from successful projects. Consistent with this hypothesis, we disaggregate media content into positive and negative components and find that spreads on non-relationship loans respond significantly to both positive and negative content, while, in contrast, spreads on relationship loans are sensitive only to negative content.

Next, we examine whether the broad dissemination of media content decreases relationship lenders' information advantage. We hypothesize that in low dissemination environments, non-relationship lenders will respond to both positive and negative content, while relationship lenders will respond significantly only to negative content, as low dissemination allows them to maintain their information advantage and price good news opportunistically. In contrast, in high dissemination environments, where competitive pressures are high, relationship lenders will more fully price positive, as well as negative, news. While we find evidence consistent with our predictions when dissemination is low, we do not find that the interest spread on relationship loans becomes significantly more sensitive to positive media content when dissemination is high. We conjecture that the lack of a dissemination effect is the result of borrowers switching to non-relationship lenders following the high dissemination of positive news, leading to a lower frequency of relationship loans in these circumstances.

We examine this proposition in our final set of analyses by exploring the extent to which media content and dissemination impact the probability of a non-relationship lender originating a loan. We find that positive media content preceding a loan significantly increases this

probability. Economically, a one standard deviation increase in positive media content increases the probability that a loan is issued by a non-relationship lender by 2.1%, substantially exceeding the respective effects of other key firm-specific characteristics. We also show that the effect of positive media coverage on the propensity of a loan being issued by a non-relationship lender is enhanced by high dissemination, consistent with the media informing a wider range of banks. The effect of positive media content on the probability of a loan being issued by a non-relationship lender doubles with high dissemination. In contrast, we find that negative media content has only a marginal effect on the probability of a non-relationship lender originating a loan, and that this effect does not vary with dissemination. These results are consistent with Rajan (1992), who shows that public good news signals about a firm's prospects increase the aggressiveness with which outside lenders bid for a loan, increasing the probability of an outside lender winning the loan. In contrast, bad news signals decrease the bidding aggressiveness of outside lenders for a borrower's loan due to heightened adverse selection concerns.

Our study contributes to the literature across several dimensions. First, our paper extends the growing body of empirical literature on the role played by the business press. Previous studies focus primarily on how media content and dissemination affect firms' governance and strategic choices (e.g., Dyck and Zingales, 2002, Core et al., 2008, Bednar et al., 2012, Kuhnen and Niessen, 2012) and the information environment in equity markets (e.g., Dyck and Zingales, 2003, Frankel and Li, 2004, Tetlock et al., 2008, Fang and Peress, 2009, Bushee et al., 2010, Soltes, 2010, Green et al., 2012, Rogers et al., 2013). We provide new evidence suggesting that the media serves as an important information intermediary in the private debt market by expanding the information set available to bank lenders.

Our study also builds on and contributes to a large and expanding literature on the role of

information intermediaries in shaping firms' information environments. Brennan and Subrahmanyam (1995), Yohn, (1998), Frankel et al. (2006), and Kothari et al. (2009), among others, demonstrate that equity analysts' coverage reduces adverse selection and the cost of capital, while Johnston et al. (2008) and De Franco et al. (2009) highlight the role of debt analysts in enhancing firm transparency. The importance of disclosures by rating agencies in reducing information asymmetry is documented by Hand et al. (1992), Ederington and Goh (1998), Dichev and Piotroski (2001), Jorion et al. (2005) and Beaver et al. (2006). Our study extends their work by showing that media coverage helps to level the playing field between informed relationship lenders and other debt market investors, enhancing a firm's access to debt capital and reducing its costs. Our findings also underscore the importance of dissemination in achieving these debt market effects.

Finally, we contribute to the extensive research on relationship lending. Petersen and Rajan (1994, 1995), Boot and Thakor (1994), Berger and Udell (1995) and Brahrath et al. (2009), among others, demonstrate the benefits to borrowers from an established banking relationship. However, Sharpe (1990) and Rajan (1992) emphasize its dark side: borrowers may become "locked-in" due to information asymmetry, which allows incumbent lenders to extract rents via their loan pricing decisions. We provide evidence consistent with the business press fundamentally altering the information structure and the nature of competition in the loan market by undermining the private information advantage of incumbent lenders. Our evidence suggests that relationship lenders extract rents from borrowers by under-reacting to the arrival of positive news, thus providing evidence in support of the theories of Rajan (1992) and Hauswald and Marquez (2003, 2006). However, while relationship lenders may earn rents conditional on winning a loan deal, positive media content appears to decrease the probability of a relationship

lender winning a loan deal by mitigating adverse selection concerns and empowering outside lenders to compete more aggressively for the loan. The fact that positive media content has a greater impact on loan pricing and bank competition dynamics than negative content does stands in stark contrast to prior research showing that negative media content has a stronger impact than positive news on equity market outcomes (e.g., Tetlock, 2007, and Tetlock et al., 2008).

The remainder of the paper is organized as follows. Section 2 presents the prior research that motivates our analyses. Section 3 describes the sample and data. Section 4 reports our main results and section 5 concludes the paper.

2. Related literature

In this paper, we examine the role played by the business press in private debt markets. While a growing literature examines the role of the media in equity capital markets, private lending markets operate differently than equity markets and involve substantially different asymmetric information issues. The private lending process allows incumbent lenders to access private, and often proprietary, borrower-specific information not available to outside lenders.

Hauswald and Marquez (2003) posit two countervailing forces bearing on the degree of asymmetric information between relationship lenders and potential lenders as a lending relationship evolves: increased information-processing capacity and information spillover effects. As a relationship deepens, enhanced information processing capacity increases asymmetric information between lenders and prospective lenders by improving the relationship bank's capacity for gathering, processing, and interpreting firm-specific information. Hauswald and Marquez (2003) argue that banks become better at processing borrower-specific information over time, leading to higher information collection efforts, which further enhance their information advantage. In contrast, information spillovers reduce the degree of asymmetric

information between lending and non-lending banks. When a lender grants its current borrower a loan renewal or a new loan, increasing relationship intensity, some firm-specific information is transmitted to non-lending banks (e.g., observing a loan renewal reveals relevant borrower-specific information). Such a spillover levels the information field between the relationship bank and outside banks, ameliorates the latter's adverse selection problem, and increases competition for the lending relationship.

Schenone (2010) argues that for low values of relationship intensity, spillovers are likely to dominate information-processing capacity as, for example, non-lenders would likely learn more from observing a first loan renewal than they would from the tenth loan renewal. Also, lenders are still at an early stage in learning about the firm and how to become more effective and efficient in processing firm-specific information. For larger values of relationship intensity, the relationship bank's information-processing capacity is likely to dominate spillover effects as the bank has gathered firm specific expertise over the course of the relationship, allowing it to be an increasingly efficient information acquirer.

Prior literature recognizes the potential costs to the borrower of relationship lending (e.g., Rajan, 1992, and Petersen and Rajan, 1994, 1995). The incumbent lenders' information advantage can create an adverse selection threat, weakening competition from prospective lenders and thereby affecting a borrower's access to debt capital and loan pricing. This problem is illustrated by Rajan (1992), who examines the competition between an informed (inside) bank that is already lending to a risky firm and an uninformed (outside) bank not currently lending to the firm. The inside bank knows whether the firm will succeed or fail, while the outside bank only knows that the firm has a certain probability of success. Under these conditions, the outside bank is at a disadvantage in bidding to lend to the firm. Rajan (1992) shows that incumbent

lenders exploit their private information to extract rents from borrowers that they know will succeed, while not bidding for loans to borrowers that they know will fail. In response to adverse selection concerns, an uninformed lender tempers the aggressiveness with which it competes for a loan, allowing the inside bank space to extract rents from borrowers with successful projects by capturing some of the upside from the project. The incumbent opportunistically prices loans to high quality borrowers, knowing that they will win the loan and receive high profits whenever the uninformed lender fails to bid. The incumbent bank's information advantage thus gives it limited monopoly power over the borrower (see also Hauswald and Marquez, 2003, and 2006).

The empirical literature investigating whether relationship banks exploit their information advantage is mixed. Petersen and Rajan (1994), using data from the National Survey of Small Business Finances, find that borrowing costs are *unrelated* to the length of the lending relationship. However, if lending costs decrease with relationship length, Petersen and Rajan's evidence suggests that banks extract rents from their informationally captured borrowers. Degryse and Van Cayseele (2000), using data from small businesses in Belgium, report that interest rates *increase* with the length of the lending relationship, suggesting that banks exploit their information advantage. Using a large sample of U.S. syndicated loans, Santos and Winton (2009) examine Rajan's (1992) hypothesis that the hold-up power of an incumbent bank increases with a firm's risk of failure, and so banks with exploitable information should be able to raise their rates in recessions by more than is justified by borrower risk alone. They compare the pricing of loans for bank-dependent borrowers to the pricing of loans for borrowers with access to public debt markets. They find that loan spreads rise in recessions, but bank-dependent borrowers pay higher spreads and their spreads rise relatively more in recessions, consistent with the existence of hold-up problems. While Schenone (2010) documents that interest spreads on

relationship loans are lower for low levels of relationship lending intensity, she finds that relationship loans become more expensive for high intensity levels. These findings are consistent with the information-processing capacity effect dominating the information spillover effect at high levels of relationship intensity, thus allowing relationship lenders to extract rents.

In contrast, using data from the National Survey of Small Business Finances, Berger and Udell (1995), focusing only on firms' lines of credit, find that firms with longer lending relationships pay *lower* interest rates than do firms with shorter relationships. They conclude that banks share the benefits of their privileged information with their clients. In a related vein, Bharath et al. (2009) use a large sample of U.S. syndicated loans to document that repeated borrowing from the same lender results in loan spreads that are lower by 10 and 17 basis points over their sample period of 1986-2003.

In addition to the interest spread related effects of relationship lending, prior research also focuses on the potential benefit of relationship lending via greater access to credit, particularly for credit-constrained borrowers (Rajan and Zingales, 1998). Petersen and Rajan (1994) use data from the National Survey of Small Business Finances to show that a key benefit of building close ties with a lender is greater availability of financing. Petersen and Rajan (1995) further show that relationship lending is especially beneficial to young, more credit rationed firms. Bolton et al. (2013) rely on the credit register information for Italian banks before and after the Lehman Brothers' default and demonstrate that while relationship banks charge higher interest spreads in normal times, they offered continuation-lending at more favorable terms during the crisis.

Most pertinent to our study are two recent papers that exploit significant changes in a firm's information environment to identify whether banks price their informational monopoly. Hale and Santos (2009) examine how the pricing of firms' syndicated loans changes following

bond IPOs. During the IPO process, firms publicly reveal significant new information about their creditworthiness, potentially reducing the lender's information monopoly. They find that firms pay lower spreads on their loans after they undertake a bond IPO. Moreover, they provide evidence that the nature of the information revealed is important, by showing that interest savings are more pronounced for firms that are identified as more creditworthy at the time of the bond IPO. Schenone (2010), mentioned above, studies changes in bank loan pricing around initial public offerings of equity. Consistent with public information undermining relationship lenders' information advantage and increasing competition, she finds that interest rates decrease in relationship intensity following an IPO.

Hale and Santos (2009) and Schenone (2010) focus on loan spreads before and after significant information events to identify the effects of banks' information monopolies. In contrast, we complement and extend the literature by focusing on how loan spreads set by relationship and non-relationship lenders are differentially influenced by information transmitted by media-initiated business press articles in the period prior to the closing of a syndicated loan. We employ two distinct dimensions of press coverage. Our media content measure captures the average positive or negative tenor of the overall flow of borrower-specific articles leading up to a loan deal and so reflects the general directional thrust of the media coverage about a firm's prospects. Second, we use the number of articles published about the firm to capture article dissemination and its effect on the firm's overall visibility and exposure to prospective lenders.

Following Hauswald and Marquez (2003) and Schenone (2010), we use the intensity of the lending relationship between a bank and a borrower to proxy for the magnitude of an incumbent bank's private information advantage over other lenders. We classify loans as relationship lending transactions if the lender has syndicated a majority of a borrower's prior

loan deals by volume over the five-year period preceding the loan issuance date. To identify the impact of informational capture, we exploit the idea that spreads set by relationship lenders with pricing power should be less responsive to new information than spreads set by non-relationship lenders. Building on Rajan (1992) and Hauswald and Marquez (2003, 2006), we hypothesize that conditional on winning a loan deal, high intensity relationship lenders extract rents from borrowers deemed to be of high quality, as indicated by positive media content, by capturing some of the upside from successful projects. Specifically, we predict that the spreads on relationship loans will be less responsive to positive than to negative media content, as relationship lenders will resist lowering spreads in response to good news in order to extract rents, but will fully react to negative news to avoid underpricing the loan.

However, while relationship lenders may earn rents conditional on winning a loan deal, we argue that positive media content can also undermine a relationship lender's monopoly power and decrease the probability of a relationship lender winning a loan. Rajan (1992) shows that public good news signals about a borrower's prospects increase outside lenders' assessments of a borrower's credit quality, which mitigates adverse selection problems. Lower adverse selection risk increases the aggressiveness with which an outside lender bids against a relationship lender for a loan, increasing the probability of a relationship lender losing the loan to an outside lender. In contrast, bad news signals decrease the bidding aggressiveness of outside lenders for a borrower's loan due to heightened adverse selection concerns. Building on Rajan (1992), we hypothesize that positive media content will be associated with a higher probability that a loan is made by a non-relationship lender, and that this effect will be larger when the positive news content is widely disseminated.

Finally, it is useful to contrast our analysis using positive and negative media content with the extant literature on the impact of the media on equity markets. Tetlock (2007) and Tetlock et al. (2008) find that negative media content has a stronger impact on equity market outcomes than does positive content. For example, Tetlock (2007) finds that negative words have a much stronger correlation with stock returns than do other words. Tetlock et al. (2008) notes that this is consistent with a large body of literature in psychology—for example, Baumeister et al. (2001) and Rozin and Royzman (2001)—that argues that negative information has more impact and is processed more thoroughly than positive information is, across a wide range of contexts. In contrast, in our study, distinguishing between positive and negative media content is important because of the differential effects each generates on loan pricing and competition.

3. Sample, data and descriptive statistics

3.1. Data sources and sample selection

We employ the DealScan database provided by the Thomson Reuters Loan Pricing Corporation (TRLPC) to obtain loan-specific characteristics. Media coverage and media content scores are from RavenPack News Analytics, which covers all news disseminated via Dow Jones Newswires. RavenPack employs a variety of advanced textual analysis techniques to create news sentiment scores for business news stories. We obtain firm characteristics from COMPUSTAT. Firms' senior debt ratings, watchlist additions and outlook changes (at the firm level) are retrieved from the S&P historical database. For borrowers for which we could not obtain rating data from the S&P historical database, we hand-collect the S&P, Moody's and Fitch ratings from the Internet-based version of TRLPC.

Table 1 summarizes the sample selection process. For the period 2000 to 2012, DealScan reports 31,974 facilities outstanding to U.S. public firms and issued in U.S. dollars (we

previously linked DealScan to Compustat using the borrower's name, industry and location). We focus on this time period to align DealScan with the availability of media data from RavenPack. Merging this sample with firms covered by RavenPack leaves us with 25,518 facilities. Next, we exclude facilities with insufficient loan data; this restricts the sample to 12,397 facilities. We also require borrowers in the sample to have sufficient COMPUSTAT data for estimating borrower characteristics and sufficient RavenPack data for estimating media coverage measures prior to loan issuance. We estimate borrower characteristics in the quarter prior to the loan issuance and media coverage over 180 days prior to the loan issuance.[8] We limit media data to full-size articles - we exclude news flashes (news articles composed only of a headline and no body text), news articles composed of a headline and mostly tabular data and firm-initiated press releases. We further restrict our sample to full-size articles with a relevance score of 75 and above. The relevance score is assigned by Raven Pack to indicate when the firm is strongly related to the underlying news story. The scores range from 0 (low relevance) to 100 (high relevance). Our final sample contains 7,244 facilities related to 2,031 firms.

3.2. Descriptive statistics

Table 2 presents the descriptive statistics for the variables we use in our tests. Our main variable of interest, *Media Content*, is estimated as the average news content over the 180 days prior to a loan origination date. We are utilizing RavenPack's Composite Sentiment Score (CSS), which represents the news sentiment of a given story by combining various sentiment analysis techniques.[9] In contrast to prior research on sentiment, we do not assume that *Media Content*

[8] We focus on 180 days prior to the loan issuance to allow a sufficient time period prior to the start of the syndication process, which typically takes around 3 months. Our findings and inference do not change if we estimate media coverage over 90 or 60 days prior to the loan issuance.

[9] CSS combines 5 sentiment scores (PEQ, BEE, BMQ, BCA and BAM), while insuring that there is no sentiment disagreement amongst these scores. The PEQ score represents the news sentiment of a given news item according to the PEQ classifier, which specializes in identifying positive and negative words and phrases in articles about firms

captures beliefs about future cash flows and/or discount rates that are not supported by the fundamentals (Baker and Wurgler, 2006). Instead, our *Media Content* variable simply reflects the nature (i.e., positive or negative) of the news in the articles.

CSS scores range between 0 to 100, with a score above 50 indicating positive news; scores equal to 50, neutral news; and scores below 50, negative news. We apply a linear transformation to the CSS score and define *Media Content = (CSS-50)/50*, so that the *Media Content* ranges from -1 to 1, with zero being equivalent to neutral content. The mean (median) value of *Media Content* is -0.0046(0.0000), suggesting that news content is typically neutral over the 180 days prior to a loan announcement. The mean (median) value of the number of full-size articles (*#Articles*) over this period is 25.6 (13.0); there is a substantial variation in this variable, as reflected by a standard deviation of 60.87.

The average interest rate spread (*Spread*) is 159.5 basis points, which is typical for the DealScan population (all variables are described in detail in Appendix B). In untabulated analysis we find that *Spread* is significantly and negatively correlated with *Media Content* (Pearson correlation is -0.09 at the 1% significance level). Sample loans have, on average, a size (*Amount*) of $167.0M and a maturity (*Maturity*) of 47.9 months. 71.4 percent of the sample loans have performance pricing provisions (*PP*), 63.9 percent are secured (*Collateral*) and loans have, on average, 2.3 financial covenants (*#Covenants*). The majority of the loans in the sample are revolvers (62.3 percent) and 29 percent are term loans B and below (these loans are typically issued to non-bank institutional investors and have a back-end-loaded repayment structure).

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with publicly traded equity. The BEE score represents the news sentiment of a given story according to the BEE classifier, which specializes in news stories about earnings evaluations. The BMQ score represents the news sentiment of a given story according to the BMQ classifier, which specializes in short commentary and editorials on global equity markets. The BCA score represents the news sentiment of a given news story according to the BCA classifier, which specializes in reports on corporate action announcements. The BAM score represents the news sentiment of a given story according to the BAM classifier, which specializes in news stories about mergers, acquisitions and takeovers. PEQ and BEE classifiers are dictionary-based measures, while BMQ, BCA and BAM classifiers are based on the Bayesian learning approach.

We also present firm-specific characteristics. The average ratio of earnings before extraordinary items to total assets (ROA) is 0.85% and the average interest coverage ratio (*Interest coverage*) is 10.5. Sample firms have an average Altman's (1968) bankruptcy score (*Z-score*) of 2.24 (a higher score indicates a lower credit risk) and an average *Leverage*, measured as the ratio of total liabilities to total assets, of 0.25. These firms are relatively large, with a mean value of total assets of $1,411M. The average market-to-book ratio is 3.01. Sample borrowers experience, on average, a 2.2% abnormal return over the 180 days prior to the loan issuance.

4. Empirical results

4.1. The effect of media content on loan pricing

We start our analyses by testing the relation between the interest rate spread and the content of media articles in the 180 days prior to the loan issuance, controlling for the number of articles over the same time period, firm characteristics and loan characteristics that are likely to be associated with the spread. We estimate the following OLS model:

$$Spread = \alpha_0 + \beta_1 Media\ Content + \beta_2 \#\ Articles + \beta_3 Loan\ Controls + \beta_4 Firm\ Controls + \varepsilon, \qquad (1)$$

where *Spread* is the logarithm of the interest rate spread in basis points above LIBOR. Our primary variable of interest, *Media Content*, is the average news sentiment over 180 days prior to a loan origination date. We predict a negative coefficient on this variable. *#Articles* is the number of full-size articles over the same period. We control for a variety of firm- and loan-specific characteristics that prior research suggests significantly affect loan spreads (e.g., Booth, 1992, Beatty et al., 2002, Asquith et al., 2005, Zhang, 2008, Costello and Wittenberg-Moerman, 2011, and Lim et al., 2013). We also control for a borrower's abnormal stock returns over the 180 days prior to a loan's issuance to proxy for the borrower-specific news over the same period during

which media content is measured. Finally, all the analyses include loan purpose, industry and year fixed effects and we cluster the standard errors at the firm and calendar quarter levels.

We present our primary findings in Panel A of Table 3. We find that the interest spread is inversely associated with media content, with more positive news reducing the interest spread. In terms of economic significance, a one standard deviation change in *Media Content* translates into a 7.3 basis point increase in the spread. While this effect is relatively modest, it is similar to the effect of a one standard deviation change in other key credit risk measures, such as *Interest Coverage* (3.3 basis points), *Leverage* (9.6 basis points) and *Z-score* (10.5 basis points).[10] Surprisingly, the number of articles is not significantly related to the interest spread.[11] As the higher number of articles is likely to be associated with a firm's more transparent information environment, we would expect to find a negative relation between *#Articles* and the spread.

The coefficients on control variables are generally consistent with prior research. Larger loans and loans with performance pricing provisions are associated with lower spreads (Booth, 1992, and Asquith et al., 2005). We do not find a significant relation between the interest rate and maturity. Longer maturity is typically associated with more uncertainty, but lenders may be willing to issue longer term loans to more creditworthy borrowers. Due to the endogenous determination of loan contractual terms, we observe a positive relation between the interest spread and both *Collateral* and *#Covenants* (Berger and Udell, 1990, and Bradley and Roberts,

[10] The Raven Pack database also includes an Event Sentiment Score (ESS), which represents the news sentiment of a main event discussed in the story (this measure is based on Bayesian learning approach). ESS is estimated only for stories matched to Raven Pack's event categories, such as earnings, analysts' rating, credit rating agencies' actions, mergers and acquisitions and insider trading activities. In contrast to CSS, which represents the news sentiment of the entire article, ESS is restricted to the sentiment of the article's headline only. While Raven Pack documents ESS's efficiency in predicting immediate trading responses to the publication of a news story, we view this measure as less appropriate for our paper's setting, which utilizes media sentiment over the long-term horizon. In any case, we replicate our tests for a sub-sample of borrowers whose media coverage includes at least one article with an available ESS score. While the ESS score is positively and significantly related to the interest spread, this measure loses its economic and statistical significance when CSS is also incorporated into the interest rate model.

[11] This result does not change if we substitute #Articles with an indicator variable reflecting high versus low news dissemination or when we include in the model a logarithm of the number of articles.

2004).[12] While we cannot concurrently endogenize all loan terms, in untabulated analyses we estimate the interest rate model without controlling for loan-specific characteristics; our findings are unchanged. We find that revolvers (Term Loans B and below) are priced at lower (higher) rates (Harjoto et al., 2004, Zhang, 2008, Nandy and Shao, 2010, and Lim et al., 2013). We also report a negative relation between the interest rate and a borrower's profitability, Z-Score, size and market-to-book ratios, consistent with higher values of these variables being associated with higher creditworthiness. As predicted, interest rate increases with leverage.[13] While we expected a negative relation between the interest rate and abnormal returns, we document a positive coefficient on the *Return* variable. This coefficient can be potentially explained by returns not only capturing borrower-specific news, but also reflecting a borrower's riskiness. The positive relation between the interest rate and *Return* does not change if we utilize size-adjusted abnormal returns or abnormal returns based on the Fama-French three factor model. In untabulated analyses, we also incorporate a return volatility measure and find that a significant effect of *Media Content* on the interest spread is not affected by this additional control.

In Panel B of Table 3, we present robustness analyses. In Column 1, using a sub-sample of borrowers who have issued firm-initiated press releases prior to the loan issuance, we examine whether the releases' content subsumes the *Media Content* effect.[14] We augment Equation (1) with the *Press Release Content* variable, which is estimated as the average news content in firm-initiated press releases over the180 days prior to a loan origination date. We also control for the

[12] Agency theory suggests that there is a trade-off between restrictions imposed by the loan agreement and the interest spread (Jensen and Meckling, 1979, Myers, 1977, Smith and Warner, 1979). However, because more risky borrowers are likely to have higher spreads and lenders may simultaneously impose a higher number of covenants and/or require them to provide collateral, empirical tests typically reveal a positive relation between these variables.
[13] While liquidity, measured by the interest coverage ratio, should decrease the spread, we find the opposite result. The correlation between these variables is negative and significant; the positive relation in the multivariate tests may be attributed to multi-collinearity due to a high correlation (0.37) between the interest spread and profitability.
[14] To ensure that we are capturing firm-initiated press releases, we impose a more stringent relevance criterion and require a relevance score of 90 or greater. Press releases with the relevance score above 75 and below 90 often relate to cases where the firm is mentioned in the press releases of other firms.

number of firm initiated press releases over this period. We report that *Media Content* continues to significantly affect the interest spread, controlling for the content and number of firm-initiated press releases. This result suggests that our *Media Content* variable is not simply picking up the rebroadcast of firm-initiated news. Further, controlling for *#Press Release Articles* helps alleviate a concern that borrowers may influence media coverage by originating more firm-initiated news prior to the loan issuance.[15]

In Columns 2 through 4 of Table 3, Panel B, we focus on a sub-sample of borrowers with available credit rating data. The mean S&P credit rating for our sample is BB+ (we convert Moody's and Fitch ratings to an equivalent S&P rating). In addition to controlling for credit rating (*Credit Rating*) and credit rating *changes (ΔCredit Rating),* we also control for whether the firm is on a credit watch list at the time of a loan issuance or over the 180 days prior to the issuance, as *Media Content* may simply capture credit watch related news. We find *Credit Rating*, *Current Watch* and *Prior 180 Watch* variables to be strongly associated with the interest spread, but the relation between the spread and news content continues to be significant. In untabulated tests, we also control for whether a borrower has experienced a change in its long-term credit rating outlook over the 180 days prior to the loan issuance; we find that the results are robust to this control.[16]

To provide further evidence for the importance of media news content in determining loan spread, in Panel C of Table 3 we re-estimate Equation (1) for two sub-samples based on the firm's credit riskiness. Because lenders are more sensitive to information when there is a higher probability of default (e.g., Easton et al., 2009, De Franco et al., 2009, and Dang et al., 2012), we

[15] Ahern and Sosyura (2013) find that by issuing a substantially higher number of press releases, bidders in stock mergers influence their stock price after the start of merger negotiations, but before the public announcement, thus substantially affecting the takeover price.

[16] For 10.6% of the loans in Columns 2 and 3, credit ratings are obtained from the Internet-based version of TRLPC. For these loans, we do not have information about watch list and outlook changes. However, our results are unchanged when we exclude from the analyses loans without watch list and outlook data.

expect media content to have a greater impact on the spreads of more risky borrowers. As credit ratings are available for only slightly more than 60 percent of our sample loans, we classify loans into information-sensitivity sub-samples based on the Altman's Z-score. We follow the frequently used cutoff of a Z-score of 3 or below to identify more risky borrowers and term this group 'information-sensitive' borrowers. Borrowers with a Z-score above 3 are classified as 'information-insensitive'. Our findings reveal that the effect of the media on loan pricing is concentrated in the high information sensitivity sub-sample: the coefficient on *Media Content* is negative and highly significant in Column 2. A one standard deviation increase in *Media Content* decreases the interest spread by 7.86 basis points (for comparison, the effect on the spread of a one standard deviation change in *Interest Coverage* (*Leverage*) is 3.3 (12.7) basis points).

To summarize, the analyses presented in Table 3 reveals that the interest spread is sensitive to *Media Content.*[17] However, it is plausible that *Media Content* simply reflects information already available to lenders that is not captured by the firm characteristics and loan controls included in the analyses. Because private lenders intensively collect and analyze soft, proprietary and hard-to-quantify information (e.g., Petersen and Rajan, 1994, Rajan and Zingales, 1998, and Berger et al., 2005), the pricing effect that we show does not speak to whether the media is the source of the information for lenders or whether the media content is simply picking up lenders' pricing of information (e.g., soft, proprietary and hard-to-quantify information) they have already obtained through their private sources. We address this issue in the next section.

[17] It is important to note that we do not perform an analysis of the effect of *Media Content* on the interest spread across RavenPack's event categories (e.g., earnings, analysts' rating, credit rating agencies' actions, mergers and acquisitions and insider trading activities). The classification into the event categories is based primarily on the articles' headline and therefore is rather coarse. More importantly, event categories do not reflect the entirety of the article's content and often omit hard-to-quantify information analyzed in the article. For example, the Wall Street Journal article related to the Sprint Corp. and Nextel Communications merger, classified into the mergers and acquisitions category, contained an extended discussion of industry trends and the latest technology developments, including interviews with various customers and business owners, and their potential implications for the merged firm's future prospects.

4.2. The Interactive Effect of Media Content and Media Dissemination

In Table 4, Panel A, we re-estimate our spread model from Equation (1) and distinguish between the low and high dissemination of media articles. In the equity market setting, a number of recent papers emphasize the importance of the broad dissemination of information in efficiently conveying information to investors (Bushee et al., 2010, Blankespoor et al., 2012, and Rogers et al., 2013). If *Media Content* simply proxies for information already available to lenders, we should not expect its effect on the spread to vary with the breadth of dissemination. However, if the media provides meaningful new information to lenders, we predict a significantly stronger relation between news content and the interest spread for the high media dissemination partition.

To begin, we classify a loan as high dissemination if, over the 180 days prior to a loan's issuance, the borrower's media coverage falls into the top quintile of the media coverage distribution for our sample. The coefficient on *Media Content* for the high dissemination sub-sample is substantially higher than it is for the low dissemination sub-sample and the two coefficients are significantly different from each other at the 1 percent level, indicating that dissemination does amplify the impact of media content. In a high dissemination environment, the economic significance of *Media Content* is much higher than what we report for the entire sample. A one standard deviation increase in *Media Content* decreases the interest spread by 17.9 basis points, which is comparable to the 19.0 basis point decrease in the spread due to a one standard deviation increase in *Z-score* (in contrast, the effect of a one standard deviation change in interest coverage and leverage is much smaller – 5.3 and 2.4 basis points, respectively).[18] We

[18] In untabulated tests, we classify loans into the high dissemination group if a borrower's media coverage is above the sample median or falls in the top tercile or quartile of the media coverage distribution. We continue to find that the effect of media coverage on the interest rate is significantly higher for the high dissemination partition, but the economic significance of the *Media Content* for this partition becomes slightly smaller.

infer from this analysis that lenders seem to incorporate the content of media news when they price loans and that this information at least partially supplements lenders' information from other sources.

In Panel B of Table 4, we examine whether the importance of news dissemination varies between rated and non-rated borrowers. Credit rating agencies are important information intermediaries in the syndicated loan market and the existence of a credit rating is often used as a measure of a borrower's information opacity (e.g., Sufi, 2007, Bharath et al., 2009, and Lim et al., 2013). If *Media Content* represents new information that lenders learn from the media, rather than simply capturing information already available to them from other sources, we expect the effect of the dissemination to be more pronounced for more opaque non-rated borrowers.

The tests reported in Table 4, Panel B provide supporting evidence for our predictions. For both rated and non-rated borrowers, the effect of *Media Content* on *Spread* is more pronounced when media dissemination is high, but this effect is significantly larger for non-rated firms. Specifically, the coefficient on *Media Content* of -3.6455 for the non-rated partition (Column 4) is significantly higher (p-value < 0.05) than the coefficient of -1.639 on *Media Content* for the rated partition (Column 2). It is also important to point out that the amplification effect of high dissemination on the impact of *Media Content* is more pronounced for more opaque firms, as the difference in the coefficients between Columns 1 and 2 is significantly smaller (p-value < 0.05) relative to the difference in the coefficients between Columns 3 and 4. However, when dissemination is low, the effect of *Media Content* is similar for rated and non-rated borrowers (the coefficients on *Media Content* in Columns 1 and 3 are not statistically different from each other). Taken together, these results further support our proposition that the media is informative to private lenders.

4.3. Media Content and Relationship Lenders' Information Advantage

To provide additional insight into whether the media serves as an important information intermediary in the loan market, we investigate whether media coverage affects the economics of relationship lending. As we demonstrate in Tables 3 and 4, *Media Content* provides price-relevant public information about a borrower and therefore has the potential to undermine the information advantage of relationship lenders, exposing them to competitive pressures from less informed lenders. We investigate this proposition with two sets of analyses: we first examine how the sensitivity of loan spreads to *Media Content* varies across relationship and non-relationship lenders, then focus on the effect of *Media Content* on the probability that a loan is issued by a non-relationship versus a relationship lender.

4.4.1. Is Media Content Priced by Relationship Lenders?

In Panel A of Table 5, we estimate Equation (1) for relationship-lender-based partitions. Following prior research (e.g., Sufi, 2007, Bharath, 2008, Bushman et al., 2010), we classify loans into relationship or non-relationship categories based on the lead arranger of syndication, because the lead arranger performs the primary screening and monitoring of the borrower and is responsible for negotiating the loan contractual terms. To account for the intensity of the lending relationship (Hauswald and Marquez, 2003 and Schenone, 2010), we define a lead arranger as a relationship lender if it has syndicated more than 50 percent of a borrower's prior loan deals by volume over the five-year period preceding the loan issuance date. We find that the impact of *Media Content* on *Spread* is significantly larger for non-relationship than relationship lenders (the difference in coefficients on *Media Content* in Columns 1 and 2 is significant at the 5 percent level). The fact that the spreads set by relationship lenders are less responsive to public

information provided by the media provides preliminary evidence in support of relationship lenders' information "monopoly" that protects them from competition.

To better understand what causes the lower sensitivity of spread to media content for relationship loans, we distinguish between positive and negative content. We hypothesize that if relationship lenders have an information monopoly, they will primarily under-react to positive media content as the monopoly endows them with bargaining power in setting loan spreads, but will fully incorporate negative media content into the spread to avoid underpricing the loan.

To examine this prediction, we incorporate into the interest rate model variables capturing positive (*Pos. Media Content*) and negative (*Neg. Media Content*) media content; Table 5, Panel B reports the results. We show that the spreads on non-relationship loans respond significantly to both the positive and negative media content. In contrast, as predicted, the spreads on loans from relationship lenders are sensitive only to the negative content. The comparison of the coefficients on the positive and negative media content between the two partitions provides further support for relationship lenders' information monopoly. Non-relationship lenders are significantly more sensitive to positive media content than relationship lenders are (the coefficients on *Pos. Media Content* in Columns 1 and 2 are significantly different from each other at the 5 percent level). However, the sensitivity to negative media news is not significantly different across the two relationship-based partitions.

The natural next question is whether the media content for firms in a high dissemination environment might significantly decrease the relationship lenders' information advantage, thus weakening their information monopoly. We hypothesize that when news is not disseminated broadly, in line with our findings in Table 5, Panel B, the spreads on relationship loans will respond significantly only to negative media content, not to positive content, as the lack of

dissemination serves to preserve relationship lenders' information advantage. Non-relationship lenders, however, are expected to respond significantly to both positive and negative media content. In contrast, when news is broadly disseminated, the competitive pressure on relationship lenders is likely to increase, and we predict that relationship lenders will price not only negative but also positive news sentiment, similar to non-relationship lenders.

Table 6 presents our results. Consistent with our predictions, in the low dissemination environment, non-relationship lenders price both the positive and negative media content but relationship lenders do not. Specifically, for non-relationship lenders (Column 1), the coefficients on both *Pos. Media Content* and *Neg. Media Content* are significant. For relationship lenders (Column 2), only the coefficient on *Neg. Media Content* is significant. Although relationship lenders do not price *Pos. Media Content*, their reaction to *Neg. Media Content* is not significantly different from that of relationship lenders (the coefficients on *Neg. Media Content* are not significantly different from each other in Columns 1 and 2).

In a high media dissemination environment, non-relationship lenders, as expected, react strongly to *Neg. Media Content*. While the coefficient on *Pos. Media Content* is significant only at the 10% one-sided level, potentially due the small sample size of only 818 loans, its economic significance is large. Consistent with our expectations, relationship lenders react similarly to non-relationship lenders with respect to *Neg. Media Content* (the coefficients on *Neg. Media Content* are not significantly different from each other in Columns 3 and 4). However, we find only weak support for our prediction regarding relationship lenders' reaction to *Pos. Media Content* – while the coefficient on this variable is substantially higher in the high dissemination environment, it remains insignificant.

This empirical evidence might indicate that even when disseminated broadly, media content does not diminish relationship lenders' information monopoly. But it is also possible that the high dissemination of positive news helps borrowers to obtain credit from non-relationship lenders, resulting in a low frequency of relationship loans in these circumstances and thus leading to our insignificant findings. Indeed, out of the 665 loans in the high dissemination-relationship lender partition (Column 4), only 219 are issued when the news content is positive prior to a loan's issuance.[19] To more directly address our proposition that borrowers are likely to switch to non-relationship lenders following a positive public signal provided by the media, we next estimate a lender's prediction model.

4.3.2. Does Media Content Affect the Probability of a Loan Being Issued by a Non-relationship Lender?

In Panel A of Table 7, we estimate a borrower's propensity to receive a loan from a non-relationship lender, using the following logistic regression:

$$\begin{aligned} Non-relationship = {} & \alpha_0 + \beta_1 Pos.MediaContent + \beta_2 Neg.MediaContent + \\ & \beta_3 \#Articles + \beta_4 LoanControls + \beta_5 FirmControls + \\ & \beta_6 TightCreditSupply + \varepsilon, \end{aligned} \tag{2}$$

where *Non-relationship* is an indicator variable equal to 1 if a loan is issued by a non-relationship lender, and zero otherwise. We incorporate the loan and firm controls suggested by Gopalan et al. (2011) and Li et al. (2013) as potential determinants of the probability that a loan is issued by a non-relationship lender. We also control for the tightness of the credit supply in the economy as borrowers may be less likely to obtain credit from non-relationship lenders when the credit supply is tight (Bolton et al., 2013). We proxy for credit supply using changes in bank

[19] The dissemination of positive news is generally low relative to the dissemination of negative news. Green et al. (2012) document that while the number of good news events reported in the business press is very similar to the number of bad news events, bad news is more widely disseminated.

lending standards for mid-sized and large commercial loans, as reported in the Federal Reserve Board's quarterly Senior Loan Officer Opinion Survey on Bank Lending Practices (e.g., Bassett et al. 2012). The *Tight Credit Supply* variable takes the value of 1 if the change in lending standards in the quarter of a loan's origination is in the top quartile of the sample's distribution, and 0 otherwise. We restrict the analyses to the sub-sample of borrowers who issued at least one loan over the 5 year period prior to a current loan's origination date. 59 percent of the loans in this sample are issued by non-relationship lenders.[20]

A significant and positive coefficient on the *Pos. Media Content* variable indicates that positive news sentiment preceding the loan issuance increases the probability of a non-relationship loan. In terms of economic significance, a one standard deviation increase in positive media content increases the probability that a loan is issued by a new lender by 2.1%. This effect is meaningful and substantially higher than the effect of a one standard deviation change in *Z-score* (0.8%) and *MTB* (0.3%), two other firm-specific characteristics that we find to significantly affect a loan's probability of being issued by a new lender. Negative media content is only marginally related to a borrower's propensity to obtain a non-relationship loan, suggesting that the effect of media is not symmetric across positive and negative contents.

In terms of control variables, we find, surprisingly, that the coefficient on *#Articles* is negative and significant. As we expect a higher number of articles to be associated with a more transparent information environment, this result indicates that more transparent firms are more likely to approach a relationship lender for their repeat credit needs. In line with this finding, Gopalan et al. (2011) and Li et al. (2013) show a negative relation between non-relationship lending and some information transparency measures. With respect to loan characteristics, when

[20] In light of Greene's (2004) criticism of the inclusion of fixed effects in non-linear models, we do not incorporate year and industry fixed effects into the lending relationship logistic regression.

borrowers issue larger loans or loans with a longer maturity, they are less likely to obtain credit from non-relationship lenders. These results are consistent with higher information asymmetry between the borrower and non-relationship lenders potentially preventing these lenders from extending larger and longer term credit. Consistent with Gopalan et al. (2011) and Li et al. (2013), we do not find that loan type, estimated by the *Revolver* and *Term Loan B* indicator variables, affects the propensity of a non-relationship transaction. Similar to these studies, we also control for whether a firm's previous loan is still outstanding when the current loan is issued (*Outstanding*) and the time period between the current and the previous loan (*Time Between*). We find that these variables do not affect the probability of a non-relationship transaction.[21]

Similar to prior research, we show that many variables associated with a borrower's creditworthiness, such as leverage, interest coverage, profitability and size do not affect the probability of a loan of being issued by a non-relationship lender. Only a firm's market-to-book ratio and Z-score are marginally related to this probability. To proxy for a borrower's information opacity, we also incorporate into the model an indicator variable reflecting whether a borrower is rated (*Rated*) and a variable reflecting the number of equity analysts covering the firm *(#Analysts*). The positive coefficient on *Rated* is consistent with more transparent firms being more likely to obtain credit from non-relationship lenders (e.g., Petersen and Rajan, 1994). However, similar to the association we document for the number of articles, the coefficient on the number of analysts is negative and significant, which again suggests that transparency decreases the propensity of a loan's being issued by a non-relationship lender. Gopalan et al. (2011) and Li et al. (2013) also find that the number of analysts is negatively related to the

[21] We do not include other loan-specific characteristics, such as the interest spread and the number of financial covenants, which are determined during the negotiation process between a lead arranger and the borrower and therefore cannot affect the choice of the lender. In contrast, when a borrower approaches a potential lender, it typically has a good idea about the amount and tenure of the credit desired. In any case, we find that our results are robust to the inclusion of the interest spread, the number of financial covenants, and indicator variables reflecting whether a loan is secured or includes a performance pricing provision.

probability of a non-relationship transaction. With respect to the tightness of the credit supply, we do not find this variable to significantly affect the probability of a borrower to obtain credit from a non-relationship lender.[22]

We next examine whether the effect of positive media coverage on the probability of a non-relationship loan increases with high dissemination. We predict that positive media content is more likely to undermine a relationship lender's information monopoly when it is broadly disseminated, thus informing a wider range of potential lenders. We augment the lender choice model in Equation (2) with interaction terms between positive and negative media content and the high dissemination indicator variable. In Panel B of Table 7, we only present the coefficient and standard errors on our main variable of interest, although we include the same set of control variables as in Panel A test. Control variable coefficients are similar to those previously presented and are omitted for brevity.

We find a positive and significant coefficient on the interaction term between *Pos. Media Content* and *High Dissemination*. Based on the Norton et al. (2004) adjustment for interaction terms in a non-linear model, the effect of positive media content on the probability of a loan being issued by a non-relationship lender doubles with high dissemination (Panel C, Column 1).[23] This suggests that positive media content, conditional on its broad dissemination, undermines relationship lenders' information monopoly, causing them to lose some of their borrowers to competition from new lenders. In contrast, the interaction term between *Neg. Media Content* and *High Dissemination* is not significantly different from zero.

[22] The effect of *Media Content* on the interest spread is robust to incorporating alternative measures of the tightness of the supply of credit, such as the percentage of banks tightening standards for loans to large and middle-market firms, an indicator variable taking value of one if the percentage of banks tightening standards for loans to large and middle-market firms is above a sample median and the syndicated loan volume in the quarter of a loan's issuance. The results also do not change when we incorporate year fixed effects into the model.

[23] Recent papers, such as Green (2010) and Kolasinski and Siegel (2010), dispute the need for this adjustment and suggest that it is correct to use just the interaction term in non-linear models.

The results in this section strongly suggest that the media serves as an important information intermediary that influences the intensity of the competition relationship lenders face from non-relationship lenders. We find that the probability of a non-relationship lender originating a loan is increasing in the level of positive media content, and that this effect is enhanced by dissemination. Negative media content, however, has only a marginal effect on the probability of a non-relationship lender originating a loan, and this effect does not vary with dissemination. These results are consistent with Rajan (1992), who shows that public good news signals about a borrower's prospects increase the aggressiveness with which outside lenders bid for a loan, increasing the probability of an outside lender winning it. The idea is that good news signals increase outside lenders' assessment of the borrower's credit quality, which reduces adverse selection risk. On the other hand, Rajan (1992) shows that bad news signals decrease the bidding aggressiveness of outside lenders for a borrower's loan, as bad news signals lower assessments of credit quality, which heightens adverse selection concerns. Our results about new lenders refraining from providing credit following negative news disclosure are also broadly consistent with the prior relationship lending literature arguing that established banking relationships are most valuable to borrowers in bad times (e.g., Petersen and Rajan, 1994, Rajan and Zingales, 1998, Bolton et al., 2013).

5. Conclusion

In this paper, we investigate whether the publication and dissemination of business press articles about a borrower influence loan spreads and reduce the information advantage of relationship lenders relative to other potential lenders. We consider two aspects of media coverage: media content and dissemination. Using data from RavenPack News Analytics, we create a media content measure that captures the average content or nature (positive vs. negative)

of borrower-specific articles, thus reflecting the general tenor of the media coverage about a firm's prospects. We define dissemination as the frequency of press articles about a borrower and expect it to capture the media's effect on the borrower's visibility and exposure to prospective lenders. We create a measure of dissemination by counting the number of articles about the borrower in the period preceding the loan contract date.

We first examine whether media content transmits borrower-specific information that is reflected in banks' loan pricing decisions, finding that interest spreads are inversely associated with media content, with more positive news reducing spreads. While these findings show that spreads are sensitive to the information contained in media articles, they do not speak to whether the media is actually the source of the information, as lenders may simply be pricing information accessed from other sources. To address this issue, we examine whether the effect of media content on interest spreads is magnified by dissemination, noting that if media content simply reflects information available to lenders from other sources, its effect on interest spreads should not vary with dissemination. Consistent with lenders learning from the media, we find that the impact of media content on spreads is significantly higher when dissemination is higher.

We also examine whether the media affects the economics of relationship lending. Following the models of Rajan (1992) and Hauswald and Marquez (2003, 2006), we hypothesize that the spreads on relationship loans will be less responsive to positive media content than to negative content, as relationship lenders will resist lowering spreads in response to good news in order to extract rents, but will fully react to negative news to avoid underpricing the loan. Consistent with this hypothesis, we find that spreads on non-relationship loans respond significantly to both positive and negative content, while, in contrast, spreads on relationship loans are sensitive only to negative content. Finally, we examine whether media content

decreases relationship lenders' information advantage and increases the level of competition from outside lenders for loans. We find that positive media content preceding a loan significantly increases the probability of a non-relationship lender making a loan, consistent with media coverage mitigating adverse selection problems and increasing the aggressiveness with which outside lenders bid against relationship lenders for a loan. We also show that the effect of positive media coverage on the propensity of a loan being issued by a non-relationship lender is enhanced by high dissemination, consistent with the media informing a wider range of lenders.

Our study contributes to the literature across several dimensions. First, we extend the growing body of empirical literature on the role played by the business press, providing new evidence suggesting that the media serves as an important information intermediary in the private debt market by expanding the information set available to lenders. Second, we contribute to the relationship lending literature by providing evidence suggesting that relationship lenders appear to exploit their private information advantage, extracting rents from borrowers by under-reacting to the arrival of positive news. Finally, we contribute to the literature on bank competition by providing evidence consistent with the business press fundamentally altering the information structure and the nature of competition in the loan market by undermining the private information advantage of incumbent lenders and increasing the aggressiveness with which outside lenders bid against relationship lenders for loans.

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Appendix A: Variable Definitions

Variable	Definition
Amount	The natural logarithm of the loan amount in US dollars. (DealScan)
Collateral	An indicator equal to 1 if the loan is secured, 0 otherwise. (DealScan)
Credit Rating	The numerical equivalent of the senior debt rating at the time of a loan's issuance. It is set as equal to 1 if the S&P senior debt rating is AAA, through 22 when the S&P senior debt rating is D. For firms not rated by S&P, we assign the Moody's senior debt rating, converted to an equivalent S&P rating. For firms not rated by S&P or Moody's, we assign the Fitch senior debt rating, converted to an equivalent S&P rating (DealScan and S&P historical database).
Current Watch	The variable equal to -1 (1) if a borrower is on a negative or developing (positive) credit watch list at a loan's issuance date. The variable is equal to 0 if a borrower is not on a credit watch at a loan's issuance date (S&P historical database).
High Dissemination	An indicator variable equal to 1 if over the 180 day period prior to a loan's issuance the borrower's media coverage falls into the top quintile of media coverage distribution for our sample (RavenPack).
Interest Coverage	Earnings before interest and tax divided by the interest expense, estimated in the quarter preceding a loan's issuance (Compustat).
Lev	Total liabilities divided by total assets, estimated in the quarter preceding a loan's issuance (Compustat).
Maturity	The number of months to maturity (DealScan).
Media Content	The average Composite Sentiment Score (CSS) over the 180 day period prior to a loan's issuance date for full-size articles, conditional on the article's relevance score above 75. Firm-initiated press releases are excluded from this estimation. CSS combines 5 sentiment scores (PEQ, BEE, BMQ, BCA and BAM), while insuring that there is no sentiment disagreement amongst these scores. The PEQ score represents the news sentiment of the given news item according to the PEQ classifier, which specializes in identifying positive and negative words and phrases in articles about global equities. The BEE score represents the news sentiment of a given story according to the BEE classifier, which specializes in news stories about

	earnings evaluations. The BMQ score represents the news sentiment of a given story according to the BMQ classifier, which specializes in short commentary and editorials on global equity markets. The BCA score represents the news sentiment of a given news story according to the BCA classifier, which specializes in reports on corporate action announcements. The BAM score represents the news sentiment of a given story according to the BAM classifier, which specializes in news stories about mergers, acquisitions and takeovers. CSS scores ranges from 0 to 100, with the score above 50 indicating positive news sentiment; equal to 50, neutral news sentiment; and below 50, negative news sentiment. We apply a linear transformation to the CSS score and define *Media Content = (CSS-50)/50*, so that the *Media Content* ranges from -1 to 1, with zero being equivalent to neutral sentiment (RavenPack).
MTB	The market value of equity divided by the book value of equity, estimated in the quarter preceding a loan's issuance (Compustat).
Neg. Media Content	Equal to the *Media Content* if *Media Content* is less than 0, and 0 otherwise.
(Non)Relationship	An indicator variable equal to 1(0) if a loan's lead arranger has syndicated less (more) than 50 percent of a borrower's prior loan deals by volume over the five year period preceding the loan issuance date (DealScan).
Outstanding	An indicator variable equal to 1 if the borrower's previous deals are still outstanding at the current loan's issuance date, 0 otherwise (DealScan).
Pos. Media Content	Equal to *Media Content* if *Media Content* is greater than 0, 0 otherwise.
Prior 180 Watch	The average of the *Current Watch* variable over the 180 day period prior to a loan's issuance date. *Credit Watch* is equal to -1 (1) if a borrower is on a negative or developing (positive) credit watch at a loan's issuance date. The variable is equal to 0 if a borrower is not on a credit watch at a loan's issuance date (S&P historical database).
Press Release Content	The average CSS for firm-initiated press releases with relevance score greater than 90, estimated over the 180 day period prior to a loan's issuance date (Raven Pack).
PP	An indicator variable equal to 1 if the loan has a performance pricing provision, 0 otherwise (DealScan).

Rated	An indicator variable equal to 1 if the borrower has a senior debt rating from S&P, Moody's or Fitch, zero otherwise (DealScan and S&P historical database).
Revolver	An indicator variable equal to 1 if the loan is a revolving line of credit, 0 otherwise (DealScan).
Return	The firm's market adjusted (value-weighted) cumulative return over the 180 day period prior to a loan's issuance date.
ROA	Return on assets, defined as earnings before extraordinary items divided by total assets and estimated in the quarter preceding a loan's issuance (Compustat).
Spread	The natural logarithm of the loan spread over LIBOR (DealScan).
Size	The natural logarithm of total assets, estimated in the quarter preceding a loan's issuance (Compustat).
Term Loan B	An indicator variable equal to 1 if the loan type is Term loan B or below (C, D, E and F), 0 otherwise (DealScan).
Tight Credit Supply	An indicator variable equal to 1 if the change in bank lending standards for mid-sized and large commercial loans, as reported in the Federal Reserve Board's quarterly Senior Loan Officer Opinion Survey on Bank Lending Practices, in the quarter of a loan's origination is in the top quartile of the sample's distribution, and 0 otherwise.
Time-Between	The number of days between the loan's issuance date and the previous deal (DealScan).
Z-Score	Altman's (1968) bankruptcy measure, estimated by the following model: $Z= 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$ where X_1 is defined as working capital (total current asset minus total current liabilities) divided by total assets. X_2 is defined as retained earnings divided by total assets. X_3 is defined as earnings before interest and taxes divided by total assets. X_4 is the market value of equity divided by total liabilities. X_5 is total sales divided by total assets. All measures are estimated in the quarter preceding a loan's issuance (Compustat).
#Article	The number of full-size articles, excluding firm-initiated press releases, over the 180 day period prior to the loan issuance date (Raven Pack).
#Press Releases Articles	The number of firm-initiated press releases over the 180 day

	period prior to the loan issuance date (Raven Pack).
#Analysts	The number of analysts that follow the firm (I/B/E/S).
#Covenants	The number of financial covenants (DealScan).

Table 1 – Sample Selection

This table presents the sample selection process.

Filters	Number of facilities
Syndicated loans to public U.S. borrowers, in U.S. dollars, issued over the period 2000-2012	31,974
After elimination of facilities of firms not covered by Raven Pack	24,308
After elimination of facilities with missing loan data	12,397
After elimination of facilities with insufficient firm and media data	**7,244**

Table 2 – Descriptive Statistics

This table provides descriptive statistics (see Table 1 for the sample selection procedure). Variables are defined in Appendix A.

Variable	Mean	Median	StdDev
Media Content	-0.0046	0.0000	0.0386
#Articles	25.6275	13.0000	60.8675
Spread	5.0720	5.1648	0.7221
Amount	18.9334	19.1138	1.4854
Maturity	47.9482	57.0000	21.4141
PP	0.7143	1.0000	0.4519
Collateral	0.6392	1.0000	0.4802
#Covenants	2.3109	2.0000	1.0131
Revolver	0.6229	1.0000	0.4846
Term Loan B	0.1002	0.0000	0.3006
ROA	0.0085	0.0102	0.0253
Interest Coverage	10.5052	2.1228	40.9157
Z-Score	2.2403	1.6907	2.2198
Lev	0.2520	0.2373	0.1789
Size	7.2521	7.2688	1.6609
MTB	3.0102	2.0201	3.7461
Return	0.0558	0.0216	0.3121

Table 3 – The Impact of Media Content on Interest Spreads

This table presents the analysis of the impact of media content on the interest spread (*Spread*). Panel A presents our main specification. Panel B presents robustness tests for the sample of firms with available firm-initiated press release data (Column 1) and rating data (Columns 2-4). Panel C presents robustness tests for sub-samples based on a loan's information sensitivity. We estimate each model with year and two digit industry fixed effects and cluster the standard errors at the firm level and calendar quarter levels. Standard errors are in parentheses. ***, **, and * indicates significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Appendix A.

Panel A: Main Specification

Variable	**Prediction**	**Dependent Variable: *Spread***
	(1)	(2)
Media Content	−	-1.1629***
		(0.1928)
#Articles	−	-0.0001
		(0.0001)
Amount	−	-0.0706***
		(0.0074)
Maturity	?	-0.0005
		(0.0004)
PP	−	-0.1161***
		(0.0224)
Collateral	?	0.5125***
		(0.0519)
#Covenants	?	0.0910***
		(0.0082)
Revolver	−	-0.0654***
		(0.0232)
Term Loan B	+	0.1868***
		(0.0382)
ROA	−	-3.3746***
		(0.4343)
Interest Coverage	−	0.0005**
		(0.0002)
Z-Score	−	-0.0288***
		(0.0066)
Lev	+	0.3277***
		(0.0502)
Size	−	-0.0396**
		(0.0169)
MTB	−	-0.0046*
		(0.0028)
Return	−	0.0437**
		(0.0194)
Fixed Effects		Year/Industry/Purpose
N		7,244
R^2		0.6826

Panel B: Robustness Analysis – Controlling for Firm-Initiated Press Releases and Rating-Related Data

Variables	**Dependent Variable: *Spread***			
	(1)	(2)	(3)	(4)
Media Content	-1.0556***	-0.9778***	-1.0319***	-0.9779***
	(0.2131)	(0.2426)	(0.2463)	(0.2425)
#Articles	-0.0001	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Amount	-0.0708***	-0.0458***	-0.0446***	-0.0458***
	(0.0076)	(0.0087)	(0.0088)	(0.0087)
Maturity	-0.0005	-0.0005	-0.0005	-0.0005
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
PP	-0.1125***	-0.0591***	-0.0616***	-0.0591***
	(0.0222)	(0.0209)	(0.0209)	(0.0209)
Collateral	0.5043***	0.2932***	0.2973***	0.2932***
	(0.0529)	(0.0336)	(0.0339)	(0.0336)
#Covenants	0.0921***	0.0661***	0.0666***	0.0661***
	(0.0085)	(0.0095)	(0.0094)	(0.0095)
Revolver	-0.0658***	-0.0431**	-0.0454***	-0.0431**
	(0.0241)	(0.0172)	(0.0175)	(0.0171)
Term Loan B	0.1815***	0.1326***	0.1309***	0.1326***
	(0.0386)	(0.0274)	(0.0276)	(0.0274)
ROA	-3.3414***	-0.9640**	-0.9713**	-0.9640**
	(0.5002)	(0.4397)	(0.4546)	(0.4399)
Interest Coverage	0.0005**	-0.0000	-0.0000	-0.0000
	(0.0002)	(0.0000)	(0.0000)	(0.0000)
Z-Score	-0.0282***	-0.0003	-0.0013	-0.0003
	(0.0072)	(0.0061)	(0.0064)	(0.0061)
Lev	0.3332***	0.1130*	0.1081*	0.1130*
	(0.0532)	(0.0580)	(0.0581)	(0.0580)
Size	-0.0432**	0.0178	0.0168	0.0178
	(0.0171)	(0.0121)	(0.0122)	(0.0121)
MTB	-0.0046	-0.0080***	-0.0076***	-0.0080***
	(0.0028)	(0.0022)	(0.0022)	(0.0022)
Returns	0.0487**	-0.0110	-0.0199	-0.0111
	(0.0213)	(0.0297)	(0.0301)	(0.0299)
Press Release Content	-0.9152***			
	(0.2641)			
#Press Release Articles	0.0000			
	(0.0002)			
Current Watch		-0.1349***		-0.1335***
		(0.0294)		(0.0318)
Prior 180 Watch			-0.1216***	-0.0032
			(0.0406)	(0.0418)
Credit Rating		0.1273***	0.1258***	0.1273***
		(0.0079)	(0.0078)	(0.0079)
ΔCredit Rating		0.0025	-0.0033	0.0023
		(0.0111)	(0.0122)	(0.0114)
Fixed Effects	Y/I/P	Y/I/P	Y/I/P	Y/I/P
N	6,964	4,536	4,536	4,536
R^2	0.6829	0.7901	0.7886	0.7901

Panel C: Robustness Analysis – Tests for Sub-Samples Based on a Loan's Information Sensitivity

	Dependent Variable: *Spread*	
Variable	**Information-sensitive**	**Information-insensitive**
	(1)	(2)
Media Content	-1.2470***	-0.3481
	(0.2274)	(0.4524) ❖❖❖
#Articles	-0.0000	-0.0002
	(0.0001)	(0.0002)
Amount	-0.0795***	-0.0402***
	(0.0103)	(0.0120)
Maturity	-0.0003	-0.0005
	(0.0005)	(0.0007)
PP	-0.1238***	-0.1144***
	(0.0269)	(0.0401)
Collateral	0.5360***	0.3710***
	(0.0573)	(0.0461)
#Covenants	0.0819***	0.1171***
	(0.0096)	(0.0168)
Revolver	-0.0622**	-0.0664**
	(0.0243)	(0.0286)
Term Loan B	0.1735***	0.1785***
	(0.0436)	(0.0378)
ROA	-3.2872***	-2.8159***
	(0.4890)	(0.9956)
Interest Coverage	0.0005	-0.0001
	(0.0005)	(0.0002)
Lev	0.4272***	0.1638
	(0.0501)	(0.1300)
Size	-0.0234	-0.1195***
	(0.0166)	(0.0193)
MTB	-0.0022	-0.0134***
	(0.0030)	(0.0036)
Return	-0.0018	0.1645***
	(0.0221)	(0.0591)
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
N	5,587	1,657
R^2	0.6777	0.7177

❖❖❖, ❖❖, ❖ indicates that the difference across columns (1) and (2) is significant at the 1%, 5%, and 10% levels, respectively.

Table 4 – Media Content and Dissemination

This table presents the analysis of the impact of media content on the interest spread (*Spread*), conditional on dissemination. Panel A presents the analysis for sub-samples based on media dissemination. We classify loans into the high dissemination group if, over the 180 days prior to a loan's issuance, the borrower's media coverage falls into the top quintile of media coverage distribution for our sample. Panel C extends the analysis presented in Panel B by performing the tests for rated and non-rated borrowers. We estimate each model with year and two digit industry fixed effects and cluster the standard errors at the firm level and calendar quarter levels. Standard errors are in parentheses. ***, **, and * indicates significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Appendix A.

Panel A: High versus Low Dissemination

	Dependent Variable: *Spread*	
Variable	**Low Dissemination**	**High Dissemination**
	(1)	(2)
Media Content	-0.8350***	-2.7523***
	(0.1904)	(0.7332)❖❖❖
Amount	-0.0721***	-0.0498***
	(0.0080)	(0.0167)
Maturity	-0.0004	-0.0010
	(0.0004)	(0.0008)
PP	-0.1283***	-0.1088***
	(0.0207)	(0.0365)
Collateral	0.4889***	0.5213***
	(0.0466)	(0.0695)
#Covenants	0.0837***	0.1817***
	(0.0082)	(0.0361)
Revolver	-0.0726***	-0.0370
	(0.0279)	(0.0354)
Term Loan B	0.1626***	0.2606***
	(0.0399)	(0.0647)
ROA	-3.1521***	-5.0013***
	(0.4027)	(0.9168)
Interest Coverage	0.0005*	0.0008
	(0.0002)	(0.0006)
Z-Score	-0.0257***	-0.0508***
	(0.0075)	(0.0128)
Lev	0.3751***	0.0818
	(0.0652)	(0.1609)
Size	-0.0482**	-0.0404
	(0.0212)	(0.0252)
MTB	-0.0037	-0.0060
	(0.0029)	(0.0054)
Return	0.0509**	0.0186
	(0.0220)	(0.0869)
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
N	5,796	1,448
R^2	0.6497	0.7592

❖❖❖, ❖❖, ❖ indicates that the difference across columns (1) and (2) is significant at the 1%, 5%, and 10% levels, respectively.

Panel B: Does the Importance of News Dissemination Vary between Rated and Non-Rated Borrowers?

Variable	Dependent Variable: *Spread*			
	Rated Borrowers		Non-Rated Borrowers	
	Low Dissemination	High Dissemination	Low Dissemination	High Dissemination
	(1)	(2)	(3)	(4)
Media Content	-0.9354***	-1.6390***	-0.6102***	-3.6455***❖❖
	(0.2019)	(0.5914)	(0.2207)	(1.3953)
Amount	-0.0707***	-0.0152	-0.0507***	0.0045
	(0.0095)	(0.0161)	(0.0103)	(0.0354)
Maturity	0.0020***	-0.0011	-0.0016***	-0.0022
	(0.0004)	(0.0008)	(0.0005)	(0.0020)
PP	-0.0851***	-0.0615*	-0.1361***	-0.1968***
	(0.0185)	(0.0323)	(0.0198)	(0.0710)
Collateral	0.6365***	0.7231***	0.4651***	0.2312***
	(0.0199)	(0.0354)	(0.0225)	(0.0701)
#Covenants	0.0887***	0.2064***	0.0696***	0.1422***
	(0.0081)	(0.0198)	(0.0093)	(0.0484)
Revolver	-0.0189	-0.0669**	-0.1396***	-0.1374**
	(0.0180)	(0.0328)	(0.0203)	(0.0638)
Term Loan B	0.1688***	0.2770***	0.2460***	0.7129***
	(0.0271)	(0.0558)	(0.0452)	(0.2000)
ROA	-2.2819***	-2.5806***	-1.0623***	-2.8207***
	(0.2500)	(0.4586)	(0.2074)	(1.0507)
Interest Coverage	0.0015***	0.0012**	0.0000	0.0000
	(0.0003)	(0.0005)	(0.0002)	(0.0005)
Z-Score	-0.0266***	-0.0624***	-0.0296***	-0.0371***
	(0.0059)	(0.0118)	(0.0041)	(0.0115)
Lev	0.1994***	-0.0375	0.2723***	-0.7068**
	(0.0572)	(0.1230)	(0.0680)	(0.2727)
Size	-0.0802***	-0.0372**	-0.0629***	-0.1062***
	(0.0097)	(0.0173)	(0.0120)	(0.0383)
MTB	-0.0081***	-0.0102***	0.0007	0.0094
	(0.0022)	(0.0031)	(0.0025)	(0.0066)
Return	0.0557**	-0.0617	0.0266	0.4346***
	(0.0239)	(0.0555)	(0.0252)	(0.1072)
Fixed Effects	Y/I/P	Y/I/P	Y/I/P	Y/I/P
N	3,287	1,247	2,509	199
R^2	0.6960	0.7422	0.7510	0.5787

❖❖❖, ❖❖, ❖ indicates that the difference across columns (1) and (3) or (2) and (4) is significant at the 1%, 5%, and 10% levels, respectively.

Table 5 – Media Content and Relationship Lending

This table presents the analysis of the impact of media content on the interest spread (*Spread*), conditional on whether the loan is issued by a relationship or non-relationship lender. We classify a loan as issued by a relationship lender if its lead arranger has syndicated more than 50 percent of a borrower's prior loan deals by volume over the five year period preceding the loan issuance date. Panel A presents the analysis based on the aggregate measure of media content (Media Content), while Panel B distinguishes between positive (*Pos. Media Content*) and negative (*Neg. Media Content*) media content. We estimate each model with year and two digit industry fixed effects and cluster the standard errors at the firm level and calendar quarter levels. Standard errors are in parentheses. ***, **, and * indicates significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Appendix A.

Panel A: The Sensitivity of Loan Spread to Media Content across Relationship and Non-Relationship Lenders

	Dependent Variable: *Spread*	
Variable	**Non-relationship**	**Relationship**
	(1)	(2)
Media Content	-1.4964***	-0.9281**
	(0.1951)	(0.4188)❖❖
#Articles	-0.0000	-0.0002
	(0.0001)	(0.0002)
Amount	-0.0592***	-0.0891***
	(0.0091)	(0.0108)
Maturity	-0.0002	-0.0016***
	(0.0004)	(0.0005)
PP	-0.1622***	-0.0817**
	(0.0239)	(0.0368)
Collateral	0.5675***	0.4741***
	(0.0452)	(0.0589)
#Covenants	0.0902***	0.0973***
	(0.0117)	(0.0111)
Revolver	-0.0982***	-0.0170
	(0.0301)	(0.0223)
Term Loan B	0.1428***	0.2544***
	(0.0381)	(0.0574)
ROA	-1.9001***	-2.2416**
	(0.3824)	(0.9083)
Interest Coverage	0.0000	-0.0001
	(0.0000)	(0.0001)
Z-Score	-0.0095**	-0.0061
	(0.0041)	(0.0078)
Lev	0.4004***	0.5259***
	(0.0803)	(0.0685)
Size	-0.0414**	-0.0274
	(0.0188)	(0.0194)
MTB	-0.0056	-0.0133***
	(0.0034)	(0.0045)
Return	0.0319	0.0373
	(0.0203)	(0.0396)
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
N	4,621	2,623
R^2	0.6558	0.7065

❖❖❖, ❖❖, ❖ indicates that the difference across columns (1) and (2) is significant at the 1%, 5%, and 10% levels, respectively.

Panel B: The Effect of Positive versus Negative Sentiment

	Dependent Variable: *Spread*	
Variable	**Non-relationship**	**Relationship**
	(1)	(2)
Pos. Media Content	-1.7257***	0.1527
	(0.5931)	(0.8176)❖❖
Neg. Media Content	1.0259***	1.4217***
	(0.3729)	(0.4412)
#Articles	-0.0000	-0.0002
	(0.0002)	(0.0002)
Amount	-0.0593***	-0.0887***
	(0.0091)	(0.0110)
Maturity	-0.0002	-0.0016**
	(0.0004)	(0.0007)
PP	-0.1619***	-0.0820***
	(0.0238)	(0.0294)
Collateral	0.5687***	0.4734***
	(0.0448)	(0.0325)
#Covenants	0.0905***	0.0992***
	(0.0117)	(0.0134)
Revolver	-0.0977***	-0.0171
	(0.0298)	(0.0217)
Term Loan B	0.1439***	0.2529***
	(0.0381)	(0.0345)
ROA	-1.9161***	-2.2261***
	(0.3848)	(0.6922)
Interest Coverage	0.0000	-0.0001
	(0.0000)	(0.0001)
Z-Score	-0.0095**	-0.0064
	(0.0041)	(0.0075)
Lev	0.4001***	0.5225***
	(0.0811)	(0.0873)
Size	-0.0411**	-0.0266**
	(0.0187)	(0.0127)
MTB	-0.0055	-0.0133***
	(0.0035)	(0.0051)
Return	0.0293	0.0403
	(0.0200)	(0.0449)
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
N	4,621	2,623
R^2	0.6553	0.7070

❖❖❖, ❖❖, ❖ indicates that the difference across columns (1) and (2) is significant at the 1%, 5%, and 10% levels, respectively.

Table 6 – The Effect of Dissemination on Lenders' Sensitivity to Media Content

This table presents the analysis of the impact of positive and negative media content on the interest spread (*Spread*), conditional on whether the loan is issued by a relationship or non-relationship lender and on media dissemination. We classify a loan as issued by a relationship lender if its lead arranger has syndicated more than 50 percent of a borrower's prior loan deals by volume over the five year period preceding the loan issuance date. We classify loans into the high dissemination group if, over the 180 days prior to a loan's issuance, the borrower's media coverage falls into the top quintile of media coverage distribution for our sample. We estimate each model with year and two digit industry fixed effects and cluster the standard errors at the firm level and calendar quarter levels. Standard errors are in parentheses. ***, **, and * indicates significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Appendix A.

	Dependent Variable: *Spread*			
	Low Dissemination		**High Dissemination**	
Variable	**Non-relationship**	**Relationship**	**Non-relationship**	**Relationship**
	(1)	(2)	(3)	(4)
Pos. Media Content	-1.1669***	-0.1975	-2.8723	-1.4701
	(0.3896)	(0.6589)❖❖	(2.2755)	(2.1704)
Neg. Media Content	0.8857***	1.0959***	2.4081**	3.2274**
	(0.3158)	(0.4143)	(1.2130)	(1.6656)
Amount	-0.0588***	-0.0967***	-0.0460*	-0.0514**
	(0.0113)	(0.0122)	(0.0257)	(0.0202)
Maturity	-0.0003	-0.0013*	0.0002	-0.0032***
	(0.0004)	(0.0007)	(0.0013)	(0.0011)
PP	-0.1652***	-0.1007***	-0.1530***	-0.0535
	(0.0245)	(0.0316)	(0.0536)	(0.0440)
Collateral	0.5326***	0.4611***	0.5879***	0.4602***
	(0.0412)	(0.0320)	(0.0657)	(0.0657)
#Covenants	0.0836***	0.0852***	0.1699***	0.2172***
	(0.0098)	(0.0142)	(0.0313)	(0.0357)
Revolver	-0.0940***	-0.0260	-0.0689*	0.0283
	(0.0348)	(0.0232)	(0.0406)	(0.0501)
Term Loan B	0.1370***	0.2072***	0.1607**	0.3610***
	(0.0400)	(0.0349)	(0.0770)	(0.0741)
ROA	-1.6111***	-1.7624***	-4.3048***	-3.8241***
	(0.3987)	(0.6216)	(0.6728)	(1.2932)
Interest Coverage	0.0000	-0.0000	-0.0000	0.0003
	(0.0000)	(0.0000)	(0.0000)	(0.0010)
Lev	0.3790***	0.5394***	0.3876**	0.1602
	(0.0769)	(0.0854)	(0.1601)	(0.2078)
Z-Score	-0.0150*	-0.0043	-0.0020	-0.0476***
	(0.0079)	(0.0077)	(0.0040)	(0.0160)
Size	-0.0481**	-0.0301**	-0.0245	-0.0264
	(0.0215)	(0.0149)	(0.0318)	(0.0276)
MTB	0.0000***	-0.0054**	-0.0054	-0.0049
	(0.0000)	(0.0026)	(0.0043)	(0.0047)
Return	0.0218	0.0621	0.0991	-0.0471
	(0.0176)	(0.0429)	(0.1052)	(0.1031)
Fixed Effects	Y/I/P	Y/I/P	Y/I/P	Y/I/P
N	3,803	1,958	818	665
R^2	0.6245	0.6889	0.7692	0.7904

❖❖❖, ❖❖, ❖ indicates that the difference across columns (1) and (2) or (3) and (4) is significant at the 1%, 5%, and 10% levels, respectively.

Table 7 – The Effect of Media Content on Relationship Lending

This table presents the analysis of the impact of positive and negative media content on a propensity of a loan being issued from a non-relationship lender (*Non-relationship*). We classify a loan as issued by a non-relationship lender if its lead arranger has syndicated less than 50 percent of a borrower's prior loan deals by volume over the five year period preceding the loan issuance date. To properly measure the banking relationship, the analyses in this table are restricted to a sample of borrowers who had issued at least one loan over the 5 year period prior to a current loan's origination date. Panel A presents our main specification, while Panel B conditions on the media dissemination. In Panel C, we report the Norton et al. (2004) correction and the marginal effects for the main variables of interest. We classify loans into the high dissemination group if, over the 180 days prior to a loan's issuance, the borrower's media coverage falls into the top quintile of media coverage distribution for our sample. Standard errors are in parentheses. ***, **, and * indicates significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Appendix A.

Panel A: Positive versus Negative Media Content and Relationship Lending

Variable	**Prediction**	**Dependent Variable: Non-relationship**
	(1)	(2)
Pos. Media Content	+	5.8531**
		(2.6686)
Neg. Media Content	+	2.4192*
		(1.4083)
#Articles	+	-0.0004**
		(0.0002)
Amount	−	-0.1427***
		(0.0353)
Maturity	−	-0.0053***
		(0.0018)
Revolver	?	-0.0317
		(0.0659)
Term Loan B	?	0.1361
		(0.1111)
Outstanding	-	0.0538
		(0.0884)
Time-Between	+	0.0001
		(0.0001)
ROA	+	-1.7831
		(1.1998)
Interest Coverage	+	0.0007
		(0.0010)
ZScore	−	-0.0379**
		(0.0185)
Lev	−	-0.2488
		(0.2752)
Size	+	-0.0349
		(0.0409)
MTB	+	0.0103*
		(0.0056)
Rated	+	0.1576*
		(0.0905)
#Analysts	+	-0.0133*
		(0.0069)
Return	?	0.3080***
		(0.1099)
Tight Credit Supply	?	-0.0074
		(0.1005)
N		6,348

Panel B: Does High Dissemination Help Diminish the Relationship Lender's Information Advantage?

Variable	Dependent Variable: Non-relationship
*Pos. Media Content *High Dissemination*	8.3610**
	(4.1478)
Neg. Media Content High Dissemination*	3.7264
	(2.3218)
Pos. Media Content	2.6508
	(2.2558)
Neg. Media Content	1.2661
	(1.1389)
High Dissemination	-0.2609***
	(0.0820)
Control Variables	Yes
N	6,348

Panel C: Norton et al. (2004) Correction and Marginal Effects

	Marginal Effect	Standard Error	Z-Statistic	P-Value
Pos. Media Content High Dissemination*				
Mean	1.98	0.96	2.06	0.0394**
StdDev	0.18	0.10	0.07	
Neg. Media Content High Dissemination*				
Mean	0.89	0.55	1.63	0.1031
StdDev	0.09	0.06	0.06	