The Informational Role of the Media in Private Lending

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Abstract

We investigate whether a borrower's media coverage influences syndicated loan origination and participation decisions of informationally disadvantaged lenders, loan syndicate structures and interest spreads. In syndicated loan deals, information asymmetries can exist between lenders that have a relationship with a borrower and less informed, non-relationship lenders competing to serve as lead arranger on a syndicated loan, and also between lead arrangers and less informed syndicate participants. Theory suggests that the aggressiveness with which less informed lenders compete for a loan deal increases in the sentiment of public information signals about a borrower. We extrapolate and extend this theory to syndicated loans and hypothesize that the likelihood of less informed lenders serving as lead arranger or joining a loan syndicate is increasing in the sentiment of media-initiated, borrower-specific articles published prior to loan origination. We find that as media sentiment increases (1) outside, non-relationship lenders have a higher probability of originating loans; (2) syndicate participants are less likely to have a previous relationship with the borrower or lead bank; (3) lead banks retain a lower percentage of loans and (4) loan spreads decrease.

1. Introduction

An important source of public information about a firm is the business press. There is substantial evidence that the business press provides information about firm fundamentals to equity market participants, incremental to that provided by other information intermediaries and accounting data (e.g., Tetlock et al., 2008), and reduces information asymmetries between equity investors (e.g., Bushee et al., 2010). However, there is little research examining the role played by the media in private lending markets. In this paper, we investigate the extent to which media coverage of borrowers influences the loan origination and participation decisions of informationally disadvantaged lenders, loan syndicate structures and interest rate spreads.

A defining feature of equity markets is that investors do not generally have privileged access to firms' confidential information as securities law prohibits unequal access to such information. This creates scope for the media to serve as an information intermediary to equity investors seeking information from sources external to the firm.[1] In contrast, private debt markets are not subject to securities laws, allowing lenders significant access to private information from borrowers as an integral part of the lending process. Syndicated loans involve multiple lenders where the degree of access to borrowers' inside information can differ substantially across lenders. Such differential access to information creates information asymmetries between lenders at two levels.

First, syndicated lending involves information asymmetry between inside lenders with a prior relationship with a borrower and outside, non-relationship lenders competing for a mandate to serve as lead arranger on a borrower's loan.[2] Non-relationship lenders are typically at an

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[1] 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 been publicly released or widely disseminated.

[2] A lead arranger establishes a relationship with the borrower and has primary responsibility for information collection, ex-ante due diligence, distributing shares of the loan to syndicate participants and ex-post monitoring,

information disadvantage relative to relationship lenders. Through sustained engagement, relationship lead banks gain extensive inside knowledge of a borrower's operations and develop private channels of communication with its managers. Borrowers are also inclined to reveal sensitive private information to relationship lenders (e.g., Greenbaum and Thakor, 1995, Boot, 2000, and Bharath et al., 2009).[3] Second, information asymmetries exist between lead banks and other syndicate participants.[4] Although syndicate participants may receive some private information from the lead bank or borrower, they are generally at an information disadvantage relative to the lead bank because they primarily maintain an arm's-length relationship with the borrower, while the lead bank has the primary due diligence and monitoring responsibilities (e.g., Lee and Mullineaux, 2004, Sufi, 2007, and Ivashina, 2009).

Outside lenders, analogous to equity investors, have incentives to seek credit-relevant information about a borrower to mitigate their information disadvantage relative to more informed inside lenders.[5] To the extent that the media transmits information to less informed lenders about a borrower's credit fundamentals that is incremental to information they receive from other sources, it can directly impact *relative* information asymmetries across lenders and influence loan syndicate formation and pricing. We investigate the informational role of the media in syndicated lending by employing a quantitative measure of media sentiment in business press articles about a borrower. Using data from RavenPack News Analytics, we construct a measure that reflects the average sentiment across all full size borrower-specific articles

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among other duties. The lead arranger receives a fee for arranging and managing the syndicated loan. We discuss institutional aspects of syndicated lending in more detail in section 2.1.

[3] The idea that inside banks 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'Ariccia and Marquez, 2004).

[4] We use the terms lead arranger and lead bank interchangeably.

[5] For parsimony, we often refer to lead arrangers with a relationship to a borrower and participant banks with a relationship to the lead arranger or a borrower as inside lenders, and other lenders as outside lenders. The premise is that inside lenders are better informed than outside lenders.

published over the six-month period preceding loan origination (*Media Sentiment*). RavenPack's sentiment measure reflects assessments of the tone of the news in a given article (i.e., positive or negative news) as well as the strength of the news the article contains.[6]

We first investigate if media influences competition between inside and outside lenders for the mandate to serve as lead arranger on a borrower's loan. This analysis builds on the model from Rajan (1992) in which an informed (inside) bank in a current lending relationship with a risky borrower competes with less informed (outside) banks to supply new financing to a borrower. Inside banks exploit their information advantage by opportunistically bidding only for good loans while avoiding bad loans. Because inside banks avoid bad loans, outside lenders are exposed to adverse selection as they face significant risk of loss if they bid. Outside lenders respond by moderating how aggressively they compete, becoming more reluctant to participate as their assessed probability that a loan is bad increases. Rajan (1992) further considers how public information signals about a borrower shape competitive dynamics, showing that outside lenders' willingness to compete increases in the sentiment of the signal. A more favorable signal increases outside lenders assessment of loan quality, reducing their risk of getting stuck with a bad loan and increasing the aggressiveness with which they compete against an inside lender. In contrast, a less favorable signal decreases outside lenders' willingness to compete due to heightened adverse selection concerns driven by lower assessed loan quality.

A direct implication of Rajan (1992) is that the more (less) aggressively outsiders bid, the higher (lower) is the probability of their winning the loan deal. We extrapolate this economic reasoning to syndicated loans where inside, relationship lenders and outside, non-relationship

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[6] RavenPack employs a variety of textual analysis algorithms to quantify the extent of positive or negative sentiment in news articles. Its sentiment measure is distinct from the notion of investor sentiment, which generally refers to beliefs not supported by prevailing fundamentals (e.g., Tetlock, 2007, and Baker and Wurgler, 2006).

lenders compete to be selected by a borrower as a lead arranger of the syndication.[7] We empirically investigate whether media sentiment is associated with the probability that the lead arranger of a loan is an outside lender with no established relationship with a borrower. Consistent with the impact of more favorable public signals on outsiders' bidding strategy as shown by Rajan (1992), we hypothesize that the aggressiveness with which outside lenders compete to arrange a loan is increasing in media sentiment, thus raising their probability of winning the loan. We find that the probability of a non-relationship lender serving as a lead arranger is higher when media sentiment is more positive. A one standard deviation increase in media sentiment increases the probability that a loan is syndicated by a non-relationship lead arranger by 6.2%.

Having examined competition between inside and outside lenders for the lead arranger job, we next consider whether the media influences the willingness of lenders to participate in a loan syndicate. We classify as more informed inside participants those lenders who have a previous relationship with either the borrower or a loan's lead arranger (e.g., Sufi, 2007, and Ivashina, 2009), and as less informed outside participants those without a relationship. We hypothesize that the willingness of less informed lenders to participate in a loan syndicate is increasing in media sentiment. Because a lead arranger has an information advantage relative to syndicate participants and its monitoring effort after a loan closes is unobservable, participants face both adverse selection and moral hazard problems (e.g., Sufi, 2007, Ivashina, 2009, and Mora, 2015). While it is difficult to empirically distinguish between adverse selection and moral hazard, we argue that media can influence lenders' participation through either channel.

To motivate an adverse selection explanation, we extend the economic reasoning from

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[7] The first step in the syndication process is for a borrower to select the lead arranger from the set of competing banks. After being selected, the lead arranger begins the task of inviting potential participant lenders to fund part of the loan. Once participants agree to fund part of the loan, the loan agreement is signed by all parties.

Rajan (1992) to loan syndicates where loan participants compete to become syndicate members. In forming a syndicate, a lead bank sends out invitations to a large set of potential lenders who choose whether to bid on joining the syndicate (Champagne and Kryzanowski, 2007). As noted by Ivashina and Sun (2011), the syndication process can be viewed as an auction where loan participants submit sealed bids to the lead arranger. The same winner's curse issue developed in Rajan (1992) plausibly operates here to the extent that inside participants pursue good loans, leaving bad loans for less informed bidders. Analogous to Rajan (1992), media can influence the severity of the winner's curse problem, where more positive media signals increase the willingness of non-relationship (less informed) lenders to bid for loan participation.

Under moral hazard, syndicate participants are concerned about ex-post monitoring efforts of the lead arranger, where monitoring becomes more crucial for troubled borrowers (Sufi, 2007). If media reveals negative news, outside participants plausibly downgrade their assessment of loan quality, which increases their concern about the lead arranger shirking. Thus outside participants may be less likely to join a syndicate than relationship participants with superior information about the lead arranger and/or the borrower. Similar to the adverse selection case, outside lenders may either not submit bids or submit bids that are rejected by the lead arranger in favor of superior bids by relationship participants. Based on these arguments, we predict that the probability of non-relationship syndicate participants joining the syndicate increases in media sentiment. We find evidence consistent with this prediction: a one standard deviation increase in *Media Sentiment* increases the probability that a participant without a prior relationship with the borrower (lead arranger) joins the syndicate by 7.1% (9.3%).

Next, we examine the proportion of a loan retained by the lead bank. Due to adverse selection and moral hazard concerns, syndicate participants require lead arrangers to put skin in

the game by holding a proportion of the loan that is increasing in the severity of the agency problem (e.g., Leland and Pyle, 1977, Holmstrom and Tirole, 1997, and Sufi, 2007). Because, as argued above, more positive public signals are expected to decrease both adverse selection and moral hazard risks faced by less informed syndicate participants, we hypothesize that the loan share retained by the lead arranger (i.e., the lead's skin in the game) is decreasing in media sentiment. We show that a one standard deviation increase in media sentiment decreases this proportion by 5.3%.

Finally, we investigate whether more positive media sentiment is associated with lower interest rate spreads. We hypothesize that if, as argued earlier, loan attractiveness to non-relationship lead arrangers and syndicate participants increases when media sentiment is more positive, the expanded set of potential lenders willing to fund the loan will increase the supply of credit available to the borrower and put downward pressure on interest spreads. We find that interest rate spreads are decreasing in media sentiment: a one standard deviation increase in *Media Sentiment* translates into a 6.9 basis point decrease in the spread.

Our previous analyses presume that the media provides new information to less informed lenders by publicly revealing either private information known to inside but not outside lenders, or information not previously known by either inside or outside lenders. To bolster this claim, we show that our findings with respect to lead arranger choice, syndicate participation, lead arranger share and interest spreads are robust to controlling for alternative public information sources, including equity analysts, credit rating agencies and firm-initiated press releases. Further, we split our sample into partitions based on the extent of borrowers' analyst coverage. Prior research suggests that financial analysts provide useful information to lenders (e.g., Guntay and Hackbarth, 2010, and Mansi et al., 2011). This suggests that when analyst information is scarce,

lenders face more uncertainty about borrowers' prospects and rely more on alternative information sources. We predict that if media is informative to outside lenders, then the effect of media sentiment on private lending practices will be stronger when equity analyst coverage is less intensive. Consistently, we find that syndicate structure and loan spreads are more sensitive to media sentiment when analyst coverage is lower. We further find some evidence that the effect of media sentiment is stronger for borrowers that experience an exogenous reduction in analyst coverage preceding loan issuance.

While our findings are consistent with the media providing incremental information to outside lenders, the media may also influence private lending deals through alternative channels. We explore one such channel by examining the possibility that the media influences consumers' perceptions of a borrower, changing their future purchasing decisions and consequently a borrower's future cash flows. For example, news that a consumer-product firm acted irresponsibly towards the environment may cause some consumers to abandon the firm's products. It is plausible that lenders would incorporate the expected impact of changes in consumer behavior on a borrower's future sales and cash flows into loan pricing.[8] We thus hypothesize that the media, operating through a consumer perception channel, impacts the interest spreads of consumer-product borrowers more intensively than the spreads of other borrowers. We indeed find that interest spreads are more sensitive to media sentiment for consumer-product-oriented borrowers. This evidence suggests that media can affect loan pricing via at least two channels - by informing outside lenders with limited access to private information and by changing consumers' perception of the borrower, which is in turn priced by lenders.

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[8] While there is no reason to believe that lenders' access to private information or public information sources would systematically differ for consumer-product-oriented firms relative to other firms, prior literature shows that consumer behavior is sensitive to consumer perceptions about a firm (Fisman et al., 2006, and Lev et al., 2009).

While our analyses provide robust evidence consistent with the media being a direct source of information to lenders, we cannot fully rule out the possibility that media sentiment proxies for information from other sources. However, whether the media is a direct source of information or simply mimics information from other sources, our results contribute to the literature by providing substantive evidence on the role of information signal *sentiment* in shaping loan deals. The evidence that lenders' decisions are influenced by media sentiment is consistent with the theory of Rajan (1992) and differentiates our analysis from prior studies that focus primarily on the availability of public information about a borrower without considering a role of its sentiment (e.g., Sufi, 2007, Ball et al., 2008, Ivashina, 2009 and Schenone, 2010). We extend the literature by demonstrating that critical aspects of syndicate lending, such as lead arranger choice, syndicate participation decisions, loan share retained by the lead arranger and loan pricing are significantly associated with the sentiment of business press articles, controlling for alternative information sources about the borrower. We also provide novel evidence consistent with media sentiment impacting loan pricing via its influence on consumer perceptions and behavior.

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

2. Motivation and Related Literature

2.1. Information asymmetry between lenders competing to serve as a lead arranger

Private debt contracts rely on the flow of confidential information between lenders and borrowers (e.g., Diamond, 1984, and Fama 1985). Confidential information includes hard information, such as timely financial disclosures, covenant compliance information, amendment and waiver requests, financial projections, and plans for acquisitions or dispositions (Standard

and Poor's, 2011), as well as softer information, such as observations about a management team's abilities, honesty, and how they react under pressure (Petersen, 2004). Lenders with access to borrowers' confidential information are surely less reliant on public information than are equity investors. However, not all lenders have equivalent access to borrowers' private information, and information asymmetries across lenders create a demand from informationally disadvantaged lenders for public information.

A syndicated loan is a loan issued to a firm jointly by more than one financial institution. Members of a syndicate can be classified as either lead arrangers or participant lenders. The lead arranger initiates a loan, negotiates with a borrower and then syndicates shares of the loan to participant lenders. Before any loan participants are invited to join a syndicate, the borrower first selects the lead arranger from the set of competing lenders. Information asymmetry can affect the competition among lenders competing for a mandate to serve as a lead arranger on a loan. Here we must distinguish between inside lenders with a prior relationship with a borrower and outside, non-relationship lenders.

Relationship lenders interact repeatedly with borrowers over an extended time period, and in the process gain extensive inside knowledge of borrowers' operations and develop private channels of communication with managers. Due to this information advantage, relationships are an important source of an incumbent bank's comparative advantage over new lenders without a relationship (Boot, 2000). Thus, when lenders compete to serve as lead arranger, outside, non-relationship lenders face adverse selection risk due to their pre-bidding information disadvantage. This adverse selection issue is the focus of Rajan (1992).

Rajan models competitive dynamics in private lending markets in a setting where a relationship bank competes for a borrower's loan with less informed (outside) banks. The

premise is that the inside bank acquires private information through privileged access to the borrower, while an outside bank lacks access. The model assumes that the inside bank knows for sure whether the firm will succeed or fail, while an outside bank has an assessed probability of success.[9] Under these conditions, an outside bank is at a disadvantage in bidding against the inside lender. The outside bank understands that if it adopts an aggressive strategy of always bidding, the inside bank will exploit this predictability and always win good loans by offering the borrower slightly better terms than does the outsider in the good state (when the firm will succeed) and leaving outside lenders with bad loans by not bidding in the bad state (when the firm will fail). This exposes the outsider to a Winner's Curse problem in which it would finance only bad projects.

To deal with this problem, an outside lender plays a mixed strategy in which it randomizes between bidding and not bidding. This implies that with some probability the outside lender will not participate in the bidding process. Rajan (1992) shows that outsiders bid less frequently as their assessed probability that the loan is bad increases. Taking as given the outsider's mixed strategy, the insider's equilibrium strategy is to bid for good loans, but not for bad loans. For good loans, the insider offers higher interest rates than outsiders do, knowing that when the outsider does not bid they will win the loan and earn high profits, but lose the loan and earn zero profits if the outsider bids. In an important extension, Rajan (1992) shows that public disclosure influences outside lenders' probability of bidding by changing their assessments of loan quality. While a more positive signal increases outside lenders' assessments of loan quality, a more negative signal increases the adverse selection problem.

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[9] Hauswald and Marquez (2006) demonstrate similar economic consequences of relationship lending in a model where inside banks are imperfectly informed, but better informed than outside banks.

This leads to the result that the probability of an outsider bidding for a loan is higher for signals with higher sentiment.[10] Further, the greater the probability of outsiders' bidding, the higher is their probability of winning the loan. Building on this intuition, we hypothesize that the probability of an outside, non-relationship lender serving as the lead arranger of a syndicated loan is increasing in media sentiment. Following Schenone (2010), we classify a loan as syndicated by a relationship lead arranger if the lender has syndicated a majority of the borrower's prior loan deals by volume over the five-year period preceding the loan issuance date, and syndicated by a non-relationship lender otherwise. We construct a media sentiment variable using the RavenPack database to proxy for the sentiment of public information signals in Rajan.

While Rajan (1992) describes well competition among differentially informed lenders to win a loan deal, the model does not directly consider information asymmetry issues associated with loan syndicate formation. We turn to this issue next.

2.2. Information asymmetry within loan syndicates

We examine whether the media influences the willingness of lenders to participate as members in a loan syndicate. Participant lenders generally do not directly communicate with the borrower and maintain an arm's-length relationship through the lead arranger. The lead arranger establishes and maintains a relationship with the borrower and acts as an agent for the syndicate by collecting and processing information about the borrower. Prior to syndication, the lead bank conducts due diligence and presents an assessment of the borrower's quality to potential participants. Thus, participants face adverse selection risk because the lead bank may have an incentive to syndicate low quality loans. Lead banks may, for example, originate and then

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[10] While Rajan's model is analyzed in terms of only a good and bad signal, it is straightforward to generalize this result to a setting with more than two signals. What is required is that the Monotone Likelihood Ratio Property holds such that higher signals indicate a higher likelihood that the loan is good (Rajan's two signal model implicitly assumes MLRP). In this case, higher signals result in a greater probability of bidding. In the language of our paper, the probability of an outsider bidding for a loan monotonically increases in the sentiment of the information signal.

syndicate low quality loans to capture private benefits or future cross-selling opportunities with the borrower (Mora, 2015). After syndication, the lead bank is charged with monitoring the borrower. This introduces moral hazard risk as lead banks only retain part of the loan, which reduces incentives to monitor.

Both adverse selection and moral hazard expose syndicate participants to risk of wrongdoing by the lead bank (Sufi, 2007, and Ivashina, 2009). The vast majority of research on syndicate lending does not distinguish between moral hazard and adverse selection risks (e.g., Ball et al., 2008, Ivashina, 2009, Dennis and Mullineaux, 2000, Jones, Lang, and Nigro, 2005). An exception is Sufi (2007), who does provide some evidence that moral hazard is an operative risk in syndicates. However, Sufi does not claim that his evidence rules out a role for adverse selection in the syndicate. In fact, separating these two risks empirically is very challenging. As noted by Cohen and Siegelman (2009), the consequences of moral hazard and adverse selection are generally observationally equivalent, and thus very difficult to disentangle. In our paper, we do not attempt to distinguish the two. Rather, as we argue next, the media can influence lenders' participation through either an adverse selection or moral hazard channel.

The syndication process seeks to match borrowers with a set of lenders that value the loan most highly. To form a syndicate, a lead bank sends out invitations to a large set of potential lenders who choose whether to submit bids to join the syndicate. It is the case that invitations to bid generally outnumber acceptances, implying that many invitees choose not to participate (Champagne and Kryzanowski, 2007). Lenders that accept the invitation submit sealed bids directly to the lead bank. After bids are in, a minimum clearing spread is determined and investors

who bid that spread or below are awarded a share of the loan on a pro-rata basis (Ivashina and Sun, 2011).[11]

Given this institutional setting, we extend the adverse selection dynamics reasoning from Rajan (1992) to competition among differentially informed participant lenders to become syndicate members. We consider as more informed inside participants those lenders who have a previous relationship with either the borrower or a loan's lead arranger, and as less informed outside participants those without a previous relationship (e.g., Sufi, 2007, and Ivashina, 2009). We posit that syndicate participants with a previous relationship face less severe information risks than participants without a relationship. A participant's familiarity with the lead bank or borrower allows them access to alternative sources of information or assurances about loan quality not available to participants without a relationship. Thus, the winner's curse issue developed in Rajan (1992) is likely to play a role in lender syndicate participation decisions to the extent that inside participants pursue good loans, leaving bad loans for less informed bidders. In line with Rajan (1992), media can influence the severity of the winner's curse problem, where more positive media signals increase the willingness of non-relationship (less informed) lenders to bid for loan participation. Note that outside lenders that do not join the syndicate can either not submit bids or submit bids that are rejected by the lead arranger in favor of superior bids by relationship participants.

Further, syndicate participants also face the moral hazard risk that the lead arranger may shirk on supplying monitoring effort after a loan closes. While Rajan (1992) does not address moral hazard issues, it is plausible that media sentiment can influence bidding strategies of outside participants facing moral hazard by influencing their assessments of potential losses from

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[11] If the loan is under-subscribed, it can remain open for some period of time as the lead banks tries to determine whether the loan is over-priced or if investors with significant search costs will ultimately appear and participate at the given price. See Ivashina and Sun (1011) for additional discussion of the syndication process.

lead arranger shirking. The idea is that the severity of potential losses due to a lack of monitoring effort is likely to be higher for troubled borrowers (Sufi, 2007). Negative media news can lower outside participants' assessments of loan quality and so increase their concerns about the lead arranger shirking. This can in turn increase the information disadvantage of non-relationship participants relative to relationship participants possessing enhanced channels of communication with the borrower or lead arranger. Thus outside participants may be less willing to bid against relationship lenders to join a syndicate or demand terms that are less favorable than those demanded by relationship participants and therefore are rejected by the lead arranger. Based on these arguments, we hypothesize that the probability of non-relationship syndicate participants joining the syndicate increases in media sentiment also through the moral hazard channel.

We further examine the effect of media on information asymmetry within syndicates by investigating whether media sentiment is associated with the proportion of the loan retained by the lead bank. Theory posits that a key mechanism for resolving information asymmetry issues and securing potential syndicate lenders' willingness to join the loan syndicate is to require lead banks to have skin in the game by holding a stake in the loan that increases in the severity of agency problems (e.g., Leland and Pyle, 1977, Diamond, 1984, and Holmström and Tirole, 1997). Empirical research provides evidence consistent with the theory. Sufi (2007) shows that lead banks hold a larger share of the loan when borrowers are more opaque, while Ball et al. (2008) show that the share retained by lead banks is decreasing in the debt contracting value of the borrower's accounting numbers. We extend and innovate on this literature by conjecturing that the share retained by the lead arranger depends not only on the fact that there is public disclosure, but also on the sentiment conveyed by the disclosure. Because, as argued earlier, a

more positive public signal decreases adverse selection and moral hazard risk, we predict that the loan share retained by the lead arranger is decreasing in media sentiment.

2.3. Media sentiment and loan pricing

In addition to lenders' willingness to originate or participate in a loan, we also hypothesize that more favorable media sentiment decreases interest rate spreads. This hypothesis is motivated by Rajan (1992) who shows that more positive disclosure increases the aggressiveness of outside lenders in bidding for a loan, which decreases the rents that inside lenders can extract from borrowers and thus results in lower interest rate spreads. Our hypothesis is also related to recent empirical research that exploits changes in a firm's information environment to identify whether the information advantage of inside banks is reflected in loan pricing. Specifically, Hale and Santos (2009) examine how loan pricing changes following bond IPOs. They predict that when public information released during the IPO process reveals positive news about a borrower – that a borrower is creditworthy – it increases outside banks' willingness to bid on its loans and consequently reduces the information advantage of inside lenders. Consistently, Hale and Santos (2009) find that firms revealed as having investment grade credit ratings pay lower spreads on their loans after they undertake a bond IPO.

Hale and Santos (2009) rely on a significant information event to identify the effects of public disclosure on reducing inside banks' ability to extract rents from borrowers. We complement Hale and Santos (2009) by examining whether more favorable media sentiment results in lower spreads. In a syndicated loan setting, we expect more favorable media sentiment to increase both the aggressiveness with which outside lenders bid to arrange loans and to participate in loan syndicates, thus expanding the set of lenders willing to fund the loan. This expansion of potential lenders should increase the supply of credit available to the borrower. To

the extent that interest spreads are negatively associated with the supply of credit (e.g., Ivashina and Sun, 2011), we predict that the wider range of syndicate participants and arrangers associated with more positive media sentiment results in lower loan pricing.

2.4. The role of the business press in capital markets

The main premise of our paper is that the business press plays an important role in the private lending market by mitigating information asymmetries between differentially informed lenders. While there has been little research to date on this topic, a growing body of research demonstrates a substantive role played by the business press in the equity market. Although the information structures and contractual features of private lending differ from those of the equity markets, prior research supports the plausibility of our premise that the media can be informative to less informed outside lenders and influence their behavior.

Miller (2006) finds that the press serves as a watchdog for accounting fraud by rebroadcasting information from other information intermediaries and by undertaking original investigations that provide new information to the markets. Several papers find that media articles pressure firms to alter governance structures and strategic decisions. Dyck and Zingales (2002) show that the media affects firms' environmental policies and the amount of corporate resources diverted to the advantage of controlling shareholders, while Bednar et al. (2012) show that negative media coverage prompts firms to change their resource allocations. Kuhnen and Niessen (2012) find that following negative press coverage of CEO pay, firms reduce option grants and increase less contentious types of compensation, such as salary. Joe et al. (2009) find that media exposure about board ineffectiveness pressures firms to take corrective actions. For lenders without privileged access to a borrower, media articles that reveal fraud or pressure firms to alter governance and strategic choices can plausibly convey new information about the

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integrity of a borrower's executives, litigation risk or changes in managerial incentives. These are important aspects of lenders' assessments of a borrower's future prospects and creditworthiness.

Further, there is evidence that the business press provides information about firm fundamentals to equity market participants over and above that provided by other information intermediaries and accounting data.[12] Bushee et al. (2010) demonstrate that the press reduces information asymmetry in the equity market, incremental to firm-initiated disclosure and disclosures by equity analysts. Fang and Peress (2009) show that stocks with no media coverage earn higher future returns than do stocks with high media coverage. Tetlock et al. (2008) finds that the fraction of negative words in firm-specific news stories forecasts low firm earnings and that equity prices quickly respond to the information in negative words. They suggest that linguistic media sentiment captures otherwise hard-to-quantify aspects of firms' fundamentals. Further, using textual analysis to distinguish press articles that reflect relevant news from those that do not, Boudoukh et al. (2012) find a strong relation between news and stock price changes.[13] Overall, this literature provides evidence that the media informs equity market participants by providing information on hard-to-quantify aspects of firms' fundamentals.[14]

It is thus plausible that the media can also impact private lending markets by providing information on hard-to-quantify aspects of firms' fundamentals underpinning credit quality. Lenders' assessments of firms' credit risk can be affected by information about products,

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[12] Engelberg and Parsons (2011) establish the causal impact of the media in financial markets by comparing the behaviors of investors with access to different media coverage of the same information event. For all earnings announcements of S&P 500 Index firms, they find that *local* media coverage strongly predicts local trading, after controlling for earnings, investor, and newspaper characteristics (see also Dougal et al. (2012) on causal relations).

[13] In contrast to the result in Roll (1988) showing little relation between stock prices and news, Boudoukh et al. (2012) find that market model (four-factor model) R-squares are significantly lower on news versus no news days.

[14] See also Kothari et al. (2009) and Rogers et al. (2013). In contrast, a number of recent papers suggest that media coverage might exacerbate information asymmetry and inefficient trading behavior (e.g., Frankel and Li, 2004, Green et al., 2012, and Soltes et al., 2013).

competitors, customers, industry growth potential, top executive teams, governance, strategic plans, acquisitions, labor markets, regulation and legal issues, among many other topics (Green et al., 2012). The information revealed by the media may be new information not available to lenders from other sources, or it could be a signal that confirms, corroborates or substantiates noisy information that lenders received from a different source. In this later case, the media could, for example, confirm soft information the lender obtained about the borrower elsewhere, or allow the lender to filter noise from signals received from other sources. While our research design does not allow us to distinguish the specific topics covered in the media articles underpinning our media sentiment measure, extant research shows the power of a computational linguistics approach to quantify the language of a wide swath of firms' media coverage rather than focusing on specific categories of news. As noted by Tetlock et al. (2008), by quantifying language, researchers can examine the directional impact of a wide variety of events, rather than focusing on particular event types.

In addition to providing direct information to lenders about a borrower's circumstances, media can indirectly influence private lending deals by changing a borrower's circumstances through its impact on the behavior of a borrower's stakeholders. We explore one such channel by examining the possibility that the media influences consumers' perceptions of a borrower, changing their future purchasing decisions and consequently a borrower's future cash flows. The idea is that lenders would incorporate the expected consequences of these changes into the loan terms offered to the borrower.

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 sentiment 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 and outlook data (at the firm level) are retrieved from the S&P historical database. For borrowers with no rating data in the S&P database, we 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 from 2000 to 2012, DealScan reports 31,974 facilities issued to U.S. public firms in U.S. dollars. This time period reflects the availability of media data from RavenPack. Merging this sample with RavenPack leaves us with 24,308 facilities. Next, we exclude facilities with insufficient loan data, reducing the sample to 12,397 facilities. We also require borrowers to have sufficient Compustat data to estimate borrower characteristics and sufficient RavenPack data to estimate media sentiment prior to loan issuance. We estimate borrower characteristics in the quarter prior to the loan issuance and media sentiment over the 180 days prior to the loan issuance.[15] We limit media data to full-size articles, excluding 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 RavenPack 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

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[15] We focus on the 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 inferences do not change if we estimate media coverage over 90 or 60 days prior to the loan issuance.

Table 2 presents descriptive statistics for the main variables used in our tests (all variables are described in detail in Appendix A). *Media Sentiment* is estimated as the average news sentiment over the 180 days prior to a loan's origination date. We utilize RavenPack's Composite Sentiment Score (CSS), which represents the news sentiment of a given story by combining various textual analysis techniques.[16] CSS scores range between 0 to 100, with a score above 50 indicating positive news; a score equal to 50, neutral news; and a score below 50, negative news. We apply a linear transformation to the CSS score and define *Media Sentiment = (CSS-50)/50*, so that the *Media Sentiment* ranges from -1 to 1, with zero being equivalent to neutral sentiment. The mean (median) value of *Media Sentiment* is -0.0046 (0.0000), suggesting that sentiment is typically neutral over the 180 days prior to a loan announcement.

We examine five primary loan characteristics. Our first measure reflects the previous relationship of the lead arranger and a borrower. The mean value of *Borr-Lead No-Relationship* indicates that 63.8% of loans are issued by non-relationship lead arrangers. The next two measures are concerned with previous relationships of syndicate participants. The mean value of *Part-Borr No-Relationship* indicates that 56.75% of syndicate participants have not participated in a borrower's syndicated loans in the five years preceding a loan's issuance. The mean value of *Part-Lead No-Relationship* indicates that 15.25% of syndicate participants have not participated in syndicates arranged by the loan's lead arranger in the five years preceding the loan's issuance. We also examine the proportion of a loan retained by the lead arranger. For loans with sufficient data, the mean (median) value of *Lead Share* is 21.05% (13.38%). With respect to loan pricing, the average interest rate spread is 159.5 basis points (*Spread* is the logarithm of the interest spread).

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[16] See the Appendix A for a more detailed description of RavenPack's CSS measure.

With respect to sample firm characteristics, the average ratio of earnings before extraordinary items to total assets (*ROA*) is 0.85%. Sample firms have an average interest coverage ratio (*Interest coverage*) of 10.51, and an average *Leverage*, measured as the ratio of total liabilities to total assets, of 0.25. The firms in our sample are relatively large, with a mean value of total assets of $1,411M (*Size* is measured by the logarithm of the total assets). An average Altman's (1968) bankruptcy score (*Z-score*) is 2.24 (a higher score indicates a lower credit risk). The average market-to-book ratio is 3.01. 14.76% of the sample observations relate to the borrowers experiencing losses.

We report statistics for loan characteristics that serve as controls. Sample loans have an average size of $167.0M (*Amount* is the logarithm of loan amount) and a maturity (*Maturity*) of 47.9 months. The majority of the loans are revolvers (62.3 percent) and 10 percent are term loans B and below, which are typically issued to non-bank institutional investors. 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*).

Finally, we provide statistics for three alternative sources of information about borrowers. First, we estimate the sentiment of all borrower-initiated press releases over the 180 days prior to a loan's origination date. To isolate firm-initiated press releases, we impose a more stringent relevance criterion than the one applied to media articles and require a relevance score of 90 or greater. Press releases with a relevance score above 75 and below 90 often relate to cases where the firm is mentioned in the press releases of other firms. We apply a linear transformation to the CSS score and define *Press Release Sentiment = (CSS-50)/50*, so that *Press Release Sentiment* ranges from -1 to 1, with zero being equivalent to neutral sentiment. The press release sentiment is typically positive, with a mean (median) value of *Press Release Sentiment* of 0.0243 (0.0264).

Second, we report on whether the borrower is rated by a credit rating agency. 56% of sample loans are issued to rated borrowers. Third, because prior research suggests that equity analysts are informative to lenders (e.g., Guntay and Hackbarth, 2010, and Mansi et al., 2010), we measure whether a borrower has equity analyst coverage at loan origination. 87.5% of sample loans are issued to borrowers with analyst coverage.

To reflect additional information available about a borrower, we also estimate a borrower's abnormal stock returns over the same period during which media sentiment is measured. Sample borrowers experience mean (median) abnormal returns of 5.6% (2.2%) over the 180 days prior to a loan's issuance (*Return*), with 42.75% of borrowers having a negative return over this period (*Negative Return*).

4. Empirical Results

We organize the discussion of our empirical findings into four subsections. Section 4.1 provides evidence on the association between media sentiment and the probability of a non-relationship bank leading the loan deal. Section 4.2 examines the relations between media sentiment and syndicate structure and section 4.3 between media sentiment and loan pricing. In section 4.4 we provide evidence consistent with the media being a direct source of information to less informed, outside lenders. Finally, in section 4.5 we examine an additional channel through witch media may affect loan pricing.

4.1. Media sentiment and the probability of a non-relationship bank leading the loan deal

In this section we examine whether media sentiment is positively associated with the probability of outside, non-relationship lenders serving as a lead arranger. Rajan (1992) theorizes that as public disclosure sentiment increases, outsider lenders will bid more aggressively for a loan, thereby increasing their probability of winning the loan. Extending this idea to competing

lead arrangers in the syndicated loan market, we predict that a more positive media sentiment is associated with a higher probability that a lender without an established relationship with the borrower originates the loan. We estimate the following logistic model:

$$Borr\text{-}Lead\ No\text{-}Relationship = \alpha_0 + \beta_1 Media\ Sentiment + \beta_2 Controls$$
$$+ \beta_3 Alternative\ Info\ Sources,$$

(1)

where *Borr-Lead No-Relationship* is an indicator variable equal to 1 if a loan is issued by a non-relationship lender, and zero otherwise.[17] *Media Sentiment* is our main variable of interest; we predict that $\beta_1 > 0$.

We control for a number of factors that prior research suggests are associated with the probability of non-relationship lead arranger syndicating the loan (e.g., Gopalan et al., 2011, and Bolton et al., 2013). We control for whether a firm's previous loan is still outstanding when the current loan is issued (*Outstanding*), the time between the current and previous loan (*Time Between*) and the tightness of the credit supply in the economy (*Tight Credit Supply*). We proxy for credit supply tightness using changes 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 (e.g., Bassett et al. 2012). The *Tight Credit Supply* variable takes a 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 also control for borrower characteristics reflecting its creditworthiness, including profitability (*ROA*), interest coverage ratio (*Interest Coverage*), leverage (*Leverage*), size of total assets (*Size*), z-score (*Z-score*), the market-to-book ratio (*MTB*) and an indicator variable reflecting whether the borrower has experienced losses (*Loss*). In terms of loan-specific

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[17] To be able to measure this relationship variable, we restrict the estimation of model (2) to the sample of borrowers who issued at least one loan over the five-year period prior to a current loan's origination date.

characteristics, we control for loan size (*Amount*), maturity (*Maturity*), whether the loan is a

revolving line of credit (*Revolver*) and if the loan is a term loan B and below (*Term Loan B*).

Finally, we control for alternative information sources about the borrower, including its

press release sentiment (*Press Release Sentiment*), whether it is rated (*Rated*) and whether it has

analysts' coverage (*Analyst Coverage*).[18] To reflect borrower-related news not captured by

additional information sources and firm controls, we also include a borrower's abnormal stock

returns (*Return*) and an indicator variable reflecting whether stock returns are negative (*Negative*

Return), measured contemporaneously with *Media Sentiment.* Although stock returns impound

all available information, there is still scope for *Media Sentiment* to play an independent role in

informing lenders. The idea here is that the weights placed on available information signals are

tailored to the specific decision context at hand. Our paper focuses on lenders' use of media

articles to assess credit quality and overcome information asymmetry. While stock prices imbed

valuation weights on information signals that are optimal for purposes of valuing equity, it is

plausible that lenders assessing credit quality would generally weigh these same signals

differently. Thus, the separate media variable can play an important role in allowing lenders to

optimally balance weights across information signals for credit evaluation purposes (Paul, 1992,

Bushman and Indjejikian, 1993).[19] Finally, we cluster the standard errors at the firm and calendar

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[18] In section 4.4 we include additional measures of alternative information sources in the specification.

[19] Consider a simple example. Assume that equity investors' information set consist of two signals, X_1 (e.g., media sentiment) and X_2 (another signal). This information gets impounded into price via trading activity resulting in equilibrium price. For valuation purposes, equilibrium price applies equal weights to the signals giving: Price = X_1+X_2. Assume that for credit purposes, a lender would optimally weight the signals as: Credit quality = $\gamma_1 X_1 + \gamma_2 X_2$. The lender cannot observe X_1 and X_2 separately, but instead observes X_1 and stock price. How would lenders use these signals? Given that they want to optimally weight the signals for credit purposes, they would construct the following estimate of credit quality: Credit Quality = $\gamma_1 X_1 + \gamma_2*(Price - X_1) = \gamma_1 X_1 + \gamma_2 X_2$. That is, even though price fully impounds X_1 (e.g., media sentiment), lenders find it optimal to use X_1 in addition to price in order to achieve the desired weights on X_1 and X_2.

quarter levels (this applies to all the remaining analyses).[20]

We present our findings Table 3. Consistent with the theory of Rajan (1992), we find that the coefficient on *Media Sentiment* is positive and significant, suggesting that the probability of a non-relationship lead arranger syndicating the loan is increasing in media sentiment. A one standard deviation increase in media sentiment increases the probability that a loan is syndicated by a non-relationship lead arranger by 6.2%.

With respect to control variables, similar to Gopalan et al. (2011), we find that the probability of a non-relationship lender syndicating the loan decreases when the borrower's previous loan is still outstanding when the current loan is issued (*Outstanding*), but increases when the time span between the current and the previous loan increases (*Time-Between*). We do not find that the tightness of the credit supply significantly affects the probability of a non-relationship lead arranger originating the loan.[21] The probability of a non-relationship lender syndicating the loan is also affected by a borrower's interest coverage, size, Z-score and market-to-book ratio. When borrowers issue larger loans or loans with a longer maturity, we find that it is less likely that these loans are arranged by non-relationship lenders. These results suggest that because non-relationship lenders have inferior access to a borrower's private information relative to relationship lenders, they are less willing to syndicate larger and longer term credit.

We find a negative coefficient on *Press Release Sentiment*. While this negative sign may be surprising, it is important to note that press releases are fundamentally different from press articles. Specifically, press releases are an aspect of firms' strategic disclosure decisions, where

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[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 and loan purpose fixed effects into the model. The same applies to the probability of non-relationship lender syndicate participation model.

[21] The effect of *Media Sentiment* on the probability of a non-relationship lead arranger syndicating the loans is robust to incorporating alternative measures of the tightness of the supply of credit, such as an indicator variable taking the value of one if the percentage of banks tightening standards for loans to large and middle-market firms is above the sample median (instead of the top quartile-based measure used in the primary analyses) and the syndicated loan volume in the quarter of a loan's issuance.

in contrast media articles are independent of a firm's disclosure strategy (note that the sentiment of press releases for our sample firms is typically positive). For example, firms may issue positive press releases when they are trying to counter negative events or to run-up stock prices around mergers (e.g., Davis and Tama-Sweet, 2012, and Ahern and Sosyura, 2014). Most important for our purposes is that our *Media Sentimnet* result is robust to including press release sentiment, ruling out the possibility that media sentiment simply echoes firm press releases. We also find a negative coefficient on *Analyst Coverage*; this result is in line with Gopalan et al. (2011).

4.2. The effect of media sentiment on syndicate participation and lead arranger share

We next investigate the relation between media sentiment and syndicate participation. As discussed previously, higher media sentiment is expected to reduce less-informed lenders' risk of funding a bad loan and to mitigate their concerns about lead arrangers shirking on monitoring effort. We predict that the likelihood of less informed lenders with no previous relationship with the borrower or the lead arranger participating in a syndicate is increasing in media sentiment. We follow Sufi (2007) and estimate the following logit model at the syndicate participant level:

$$Participation = \alpha_0 + \beta_1 Media\,Sentiment + \beta_2 Controls + \beta_3 Alternative\,Info\,Sources, \qquad (1)$$

where *Participation* is one of two participant relationship variables. *Part-Borr No-Relationship* is an indicator variable set equal to one if the participant has not participated in a borrower's loans in the five years prior to a loan's issuance date, and zero otherwise. *Part-Lead No Relationship* is an indicator variable set equal to one if the participant has not participated in a syndicate arranged by the loan's lead arranger in the five years preceding the loan's issuance, and zero otherwise. *Media Sentiment* is our main variable of interest, where we predict $\beta_1 > 0$.

In line with model 1, we control for borrower characteristics reflecting its creditworthiness.

We also extend the set of loan-specific controls. We add controls for a borrower's previous relationship with the lead arranger (*Borr-Lead No-Relationship*) and for whether this is the first deal syndicated by the lead arranger (*First Time Lead*), as both may affect the attractiveness of the loan deal to syndicate participants. We also control for whether the loan is secured (*Collateral*), the existence of performance pricing provisions (*PP*) and the number of covenants (*#Covenants*).[22] Similar to Model 1, we control for alternative information sources about the borrower and its stock returns.

We present our findings in Table 4. In column 1 we report the estimation of model (1) with *Part-Borr No-Relationship* as the dependent variable. Consistent with our predictions, the coefficient on *Media Sentiment* is positive and significant, indicating that the probability of a participant with no relationship with the borrower joining the syndicate increases with media sentiment. This result is also economically significant: a one standard deviation increase in *Media Sentiment* increases this probability by 7.1%.

With respect to controls, in line with lower information asymmetry between the lead arranger and syndicate participants when a borrower is more creditworthy, we find positive coefficients on *ROA*, *Interest Coverage* and *Z-Score* and negative coefficient on *Leverage*. We also find a positive coefficient on *Borr-Lead No-Relationship,* which suggests that the probability of non-relationship participants joining the syndicate increases when a new lead arranger without previous relationship with the borrower arranges the loan. The coefficient on *Press Release Sentiment* is insignificant, suggesting that while media sentiment influences less informed participants, the content of firm-initiated press releases does not incrementally affect the likelihood of their participation. When a borrower is rated, the probability of a non-

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[22] We do not control for these three additional loan characteristics in Model 1, because they are typically determined during the negotiation process between a lead arranger and the borrower and therefore cannot affect the choice of the lender. In any case, in untabulated analyses, we find that our results are robust to the inclusion of these variables.

relationship participant joining the syndicate is significantly higher, consistent with their higher confidence in a loan's quality when creditworthiness is assessed by an independent third party (e.g., Sufi, 2007). Note that the coefficients on *Return* and *Negative Return* are difficult to interpret. Stock returns consist of two components: changes in cash flow news and changes in discount rates (e.g., Vuolteenaho, 2002). Stock return controls therefore reflect both news about the borrower's performance and discount rate news associated with a borrower's riskiness.[23]

In column 2, we report the results from the estimation of model (1) with *Part-Lead No-Relationship* as the dependent variable and find similar results. The coefficient on *Media Sentiment* is positive and significant, suggesting that the probability of a participant without a previous relationship with the lead arranger joining the syndicate increases with media sentiment. A one standard deviation increase in *Media Sentiment* increases this probability by 9.3%. The coefficients on control variables are generally consistent with those in column 1.

Our results so far indicate that more positive media sentiment extends the range of participants willing to join the syndicate to those without a relationship with the borrower or the lead arranger. Column 3 focuses on the loan share retained by the lead arranger (*Lead Share*). Because more positive media sentiment is expected to increase syndicate participants' assessment of loan quality and thus decrease adverse selection and moral hazard risk, we predict that the share of a loan retained by the lead arranger is decreasing in media sentiment as participants require the lead to have less skin in the game.

We estimate model (1) as an OLS specification with *Lead Share* as the dependent variable. This specification also includes loan purpose, industry and year fixed effects. In line with our expectations, we find a negative and significant coefficient on *Media Sentiment*. Economically, a

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[23] Our findings do not change when we control for return volatility.

one standard deviation increase in media sentiment decreases the loan proportion held by the lead arranger by 5.3%. This evidence further supports a significant effect of media sentiment on syndicate structure and suggests that it operates via both channels – syndicate participants' willingness to join the syndicate and the loan share the lead arranger is required to retain.

With respect to control variables, a lead arranger retains a smaller proportion of the loan when the borrower is larger and more profitable. Consistent with lower agency problems within the syndicate when a borrower is more transparent (e.g., Sufi, 2007), the lead arranger retains a smaller proportion of the loan when a borrower is rated and has analyst coverage. We also find that a non-relationship lead arranger and the first time lead arranger hold a higher loan share, suggesting that participants require a lead arranger to have higher skin in the game in these cases.

4.3. The effect of media sentiment on loan pricing

Our analyses show that the decisions of less informed lenders to arrange and participate in syndicated loans are sensitive to media sentiment, where loan attractiveness is increasing in media sentiment. While it is important to show connections between media sentiment and lenders' decisions, our results thus far do not quantify the implications of media sentiment from the perspective of a borrower seeking financing. We examine this issue in this section.

As shown in Rajan (1992), more favorable public information signals can directly impact interest spreads by increasing outside, non-relationship lenders' aggressiveness in bidding for a loan, which results in a reduction in the rents that more informed inside lenders can extract from borrowers. Consistently, Hale and Santos (2009) find that the reduction in the information advantage of inside banks following a borrower's bond IPOs is reflected in lower loan pricing for borrowers identified as more creditworthy at the time of the IPO. We build on this evidence and examine the effect of more positive media signals about a borrower on interest spreads in a

syndicated loan setting, where, as we show in our previous analyses, higher media sentiment not only increases the non-relationship lead arrangers' aggressiveness in bidding for a loan, but also attracts less informed syndicate participants to join the syndicate. This expanded set of outside lenders is likely to increases the supply of financing available to fund the borrower's loan, exerting significant downward pressure on the interest rate spread.

To examine this hypothesis, we estimate the following OLS model:

$$Interest\ Spread = \alpha_0 + \beta_1 Media\ Sentiment + \beta_2 Controls + \beta_3 Alternative\ Info\ Sources,\qquad (3)$$

where *Spread* is the logarithm of the interest rate spread in basis points above LIBOR. We predict a negative coefficient on our main variable of interest - *Media Sentiment*. Variables reflecting controls and other information sources about the borrower are defined as previously. Further, the model includes loan purpose, industry and year fixed effects.

We present our findings in Table 5. Consistent with our predictions, we find that the interest spread is inversely associated with media sentiment, with more positive sentiment reducing the interest spread. In terms of economic significance, a one standard deviation increase in *Media Sentiment* translates into a 6.9 basis point decrease in spread. While this effect seems relatively modest, it is similar to the effect of a one standard deviation change in key credit risk measures, such as *ROA* (5.5 basis points) and *Leverage* (12.7 basis points).

With respect to controls, as expected, we report a negative relation between the spread and a borrower's profitability, size, Z-Score, and market-to-book ratios, and a positive relation between the spread and leverage and an indicator variable reflecting losses. The coefficients on loan-level controls 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).[24] Due to the endogenous determination of contractual terms, we observe a positive relation between the interest spread and both *Collateral* and *#Covenants* (Berger and Udell, 1990, Bradley and Roberts, 2004, and Costello and Wittenberg-Moerman, 2011).[25] While concurrently endogenizing all loan terms is beyond the scope of our paper, in untabulated analyses we estimate the interest rate model excluding loan controls; our findings are unchanged. We find that revolvers (Term Loans B and below) are priced at lower (higher) rates, consistent with prior research (Harjoto et al., 2004, Zhang, 2008, Nandy and Shao, 2010, and Lim et al., 2014). We also show that more positive press release sentiment and analyst coverage are negatively associated with the spread.

The results presented in Tables 4-6 are consistent with the media providing incremental information to less informed, non-relationship lenders. To further support our claim that these lenders learn directly from the media, in the next section we provide additional analyses that address alternative information sources available for lenders in more detail.

4.4 Is the media a direct source of information to less informed, outside lenders?

4.4.1 The effect of media sentiment, controlling for alternative public information sources

In Table 3, 4 and 5 we control for variables that reflect three alternative sources of information available to lenders: firm-initiated press releases, equity analysts and rating agencies. We also incorporate stock return related variables. To further identify whether non-relationship lenders learn from the media, we extend the analysis by including in models (1), (2) and (3) a large vector of additional information controls.

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[24] We do not find a significant relation between the spread and maturity. A longer maturity is typically associated with more uncertainty, but lenders may be willing to issue longer term loans to more creditworthy borrowers.
[25] Agency theory suggests that there is a trade-off between the restrictions imposed by the loan contract and the interest spread (Jensen and Meckling, 1979, Myers, 1977, and 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.

First, we add controls for the number of media articles (#*Articles*) and firm-initiated press releases (#*Press Releases*) over the 180 day period prior to loan issuance. With respect to rating agencies, we control for the level of credit rating (*Credit Rating*) at a loan's issuance date, the change in credit rating over the 180 day period prior to issuance (*ΔCredit Rating*); whether the borrower is on a credit watchlist at the time of issuance (*Current Watch*) or over the 180 days prior to the issuance (*Prior 180 Watch*); and a borrower's long-term credit outlook at loan issuance (*Current Outlook*) and over the 180 days prior to the issuance *(Prior 180 Outlook)*. With respect to equity analysts, we control for analysts' earnings forecasts (*Analyst Forecast*) and recommendations (*Analyst Recommendation*) at the time of a loan's issuance, and the forecast revisions (*Forecast Revision*) and recommendation revision (*Recommendation Revision*) over the 180 days prior to the issuance.

The results are reported in Table 6. In column 1, we find that the effect of media sentiment on the probability that a non-relationship lead arranger syndicates the loan continues to be statistically and economically significant after incorporating this wide set of additional information controls. One standard deviation increase in *Media Sentiment* increases this probability by 11.0%. As we report in columns 2 and 3, we continue to find a positive coefficient on *Media Sentiment* in both the *Part-Borr No-Relationship* and *Part-Lead No-Relationship* specifications respectively, although at a lower level of statistical significance. A one standard deviation increase in *Media Sentiment* increases the probability that a participant without a prior relationship with the borrower (lead arranger) joins the syndicate by 4.7% (8.7%). The relation between *Media Sentiment* and *Lead Share* is also robust to additional information controls. The coefficient on *Media Sentiment* is negative and significant in column 4. A one standard deviation increase in media sentiment decreases the loan share retained by the lead arranger by 5.0%.

Finally, for loan pricing analyses presented in column 5, we find that the coefficient on *Media Sentiment* continues to be negative and significant. A one standard deviation increase in *Media Sentiment* decreases the interest spread by 4.2 basis points.

The evidence in Table 6 suggests that it is unlikely that the effect of media sentiment on the probability of an outside lead arranger syndicating a loan, syndicate structure and loan pricing are explained by the media rebroadcasting information provided by other information sources.

4.4.2 The effect of media sentiment, conditional on the intensity of analyst coverage

To provide further evidence that media is a direct source of information to lenders, we conduct analyses conditional on the intensity of a borrower's analysts' coverage. We conjecture that if media sentiment is informative to less informed lenders, its effect on syndicate structure will be stronger when a borrower's coverage by other information intermediaries is less intensive. This prediction is motivated by prior evidence that analysts are an important information source to lenders (e.g., Guntay and Hackbarth, 2010, and Mansi et al., 2010). Therefore, outside lenders will rely more on alternative information sources, such as the media, when analyst following is relatively low. The general idea is that investors' posterior expectations will respond more intensively to an information signal of a given precision as prior uncertainty about a firm's prospects increases (e.g., Verrecchia, 2001). We classify borrowers as having highly intensive analyst coverage if the number of analysts covering the firm falls into the top quintile of the sample distribution, and as less intensive otherwise. We then estimate models (1), (2) and (3) for the two sub-samples – borrowers with highly intensive and less intensive coverage.[26] We report these tests in Table 7.

As we report in Table 7, Panel A, for the lead arranger analyses, the coefficient on *Media*

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[26] Our results are robust when we define borrowers as having highly intensive analyst coverage if the number of analysts covering the firm falls into the top quartile of the sample distribution (the same relates to the non-relationship lead arranger and the interest rate spread analyses).

Sentiment is positive and significant for the less intensive analyst coverage partition, but that it is not significant for the highly intensive coverage partition, although the difference in the coefficients between the two partitions is not significant. Economically, for the less intensive analysts' coverage partition, a one standard deviation increase in *Media Sentiment* increases the probability that a lender without a prior relationship with the borrower arranges the loan by 7.6%.

We find that for both the *Part-Borr No-Relationship* and *Part-Lead No-Relationship* specifications the coefficient on *Media Sentiment* is negative and significant for the less intensive analyst coverage partition, but it is not significant for the highly intensive coverage partition (Table 7, Panels B and C). The difference in coefficients on *Media Sentiment* between these partitions is also statistically significant. Economically, for the less intensive analysts' coverage sub-sample, one standard deviation increase in *Media Sentiment* increases the probability that a syndicate participant without a prior relationship with the borrower (lead arranger) joins the syndicate by 12.1% (12.1%). The results are similar when we examine the lead bank's loan share aspect of the syndicate structure (Table 7, Panel D). The effect of media sentiment is significant for borrowers with less intensive analyst coverage, but not for those with highly intensive coverage. The difference in coefficients on *Media Sentiment* between the two partitions is significant at the 10% level. For borrowers with less intensive analyst coverage, a one standard deviation increase in *Media Sentiment* decreases the proportion held by the lead arranger by 4.6%.

Based on our findings that the effect of media sentiment on the willingness of less informed lead arrangers and syndicate participants to fund a loan is stronger when the equity analysts' coverage is less intensive, we also predict that the effect of media sentiment on the interest

spread will be stronger for the less intensive analyst coverage partition. In Table 7, Panel E, we report that the coefficient on *Media Sentiment* is negative and significant for the less intensive coverage partition, but not significant for the highly intensive partition. The difference in coefficients on *Media Sentiment* between these partitions is statistically significant. For the less intensive analysts' coverage sub-sample, a one standard deviation increase in *Media Sentiment* translates into a 7.3 basis points decrease in the interest spread.

The results presented in Table 7, Panels A-E are in line with the media providing more informative public signals to syndicate participants when information production by other information intermediaries is less intensive. However, firms with intensive analyst coverage can potentially differ from firms with less intensive coverage across a number of dimensions. We therefore examine how the effect of media sentiment differs across borrowers that have experienced a reduction in analysts' coverage prior to loan initiation and those that have not. A reduction in analyst coverage has been shown to be associated with an exogenous (unrelated to changes in firm fundamentals) decrease in public information production about the firm (e.g., Kelly and Ljungqvist, 2012, and Balakrishnan et al., 2013). We hypothesize that media signals will provide be more informative to non-relationship lead arrangers and syndicate participants following coverage reductions. We report these analyses in Table 8.

We identify that 4.3% of observations in the lead arranger analyses, 6.3% in the syndicate participant analyses, 4.2% in the lender share analyses and 4.5% in the loan spread analysis relate to borrowers that have experienced a reduction in analyst coverage over the year preceding loan issuance.[27] Despite the small sample size, in table 8, Panel A we find a significantly higher coefficient on *Media Sentiment* (at the 10% level) for this partition. We also find that the

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[27] When we measure analyst coverage reduction over the 180 day period prior to the loan issuance, the proportion of borrowers that have experienced a reduction in analyst coverage becomes even smaller, preventing us from conducting empirical analyses.

coefficient on *Media Sentiment* is significantly higher at 10% level for analyst reduction partition for the *Part-Borr No-Relationship* specification (Table 8, Panel B). For the *Lead Share* analyses (Table 8, Panel D), the coefficient on *Media Sentiment* for the analyst coverage reduction partition is higher than the respective coefficient for the no coverage reduction partition, but the difference is not statistically significant. Finally, in Table 8, Panel E, we compare the effect of media coverage on loan pricing across borrowers that have experienced a reduction in the analyst coverage prior to the loan issuance and those that have not. The coefficient on *Media Coverage* is significantly larger for the analyst coverage reduction partition, further suggesting that media sentiment is more informative to lenders when information production by other information sources becomes less intensive.

Overall, the stronger effects of media sentiment on the likelihood of non-relationship lead arranger, syndicate structure and loan pricing for less intensive analyst coverage and reduction in analyst coverage partitions reinforce our inference that media serves as a direct source of information to less informed, outside lenders.

4.5 The sensitivity of interest spreads to media sentiment for consumer product firms

Results in Tables 3-8 suggest that the media influences loan pricing by providing incremental information to outside lenders, which increases the supply of credit by attracting non-relationship lead arrangers and syndicate participants. In this section, we explore one additional channel through which media may affect interest spreads by examining the possibility that media influences consumers' perceptions of a borrower, changing their future purchasing decisions and consequently a borrower's future cash flows.

Specifically, we examine whether spreads are more sensitive to media sentiment for consumer-product-oriented firms. Consumers' decisions to purchase a firm's products are

potentially influenced by positive or negative news about the firm. Previous literature provides evidence that consumer behavior is sensitive to perceptions of a firm. For example, Lev et al. (2009) find that charitable contributions are significantly positively associated with future revenue, particularly for consumer-product-oriented firms. Similarly, Fisman et al. (2006) find that corporate philanthropy and profits are positively related, but only for firms in industries where a firm's image is important to consumers. We posit that more positive media sentiment improves consumers' perceptions of a borrower, potentially increasing its future sales and cash flows. Because lenders are likely to incorporate a borrower's consumer behavior into loan pricing, we predict that the effect of media sentiment on loan pricing is more pronounced for more consumer-product oriented firms.

Following Fisman et al. (2006), we identify whether a borrower is consumer product oriented by the relative importance of its advertising expenses. We classify borrowers as having high consumer product intensity if the ratio of advertising expenses to sales revenue is above the sample median. We estimate the interest rate model for consumer product intensity partitions and report our findings in Table 9. We find that although the coefficient on *Media Sentiment* is negative and significant for both partitions, it is significantly larger for the high consumer product intensity partition relative to the low intensity partition. The difference in the coefficients across the two partitions is statistically significant. A higher sensitivity of interest rate spreads to media sentiment for more consumer-product-oriented firms is consistent with lenders accounting for the impact of media news on a borrower's future sales. In untabulated analyses, we include the additional controls for alternative information sources described earlier in Section 4.4.1. We continue to find that similar results.

Overall, our interest spread analyses suggests that media sentiment affects loan pricing both by informing less informed outside lenders and by changing consumers' perception of the borrower, the implications of which are priced by lenders.

5. Summary

This paper examines whether media coverage influences syndicated loan origination and participation decisions of informationally disadvantaged lenders, loan syndicate structures and interest spreads. We first investigate if media influences competition between inside and outside lenders to serve as lead arranger on a borrower's loan. This analysis builds on Rajan (1992) who shows that the aggressiveness with which less informed lenders compete for a loan deal increases in the sentiment of public information signals about a borrower. We extrapolate this economic reasoning to syndicated loans where inside, relationship lenders and outside, non-relationship lenders compete to be selected by a borrower as a lead arranger of the syndication. We find that the probability of a non-relationship lender serving as a lead arranger is higher when media sentiment is more positive.

We also consider whether the media sentiment influences the willingness of lenders to participate as members in a loan syndicate. Syndicate participants face both adverse selection and moral hazard problems (e.g., Sufi, 2007, Ivashina, 2009), where media can influence lenders' participation through either channel. We find that the probability of non-relationship syndicate participants joining the syndicate increases in media sentiment. Consistent with more positive media sentiment reducing agency problems faced by less informed syndicate participants, we also show that the loan share retained by the lead arranger (i.e., the lead's skin in the game) is decreasing in media sentiment. We finally document that more positive media sentiment is associated with lower interest rate spread. We attribute this finding to the increased

supply of credit available to the borrower due to more positive media sentiment attracting non-relationship lead arrangers and syndicate participants.

Further, we provide evidence consistent with the media being a direct source of information to lenders. First, we show that our results hold after controlling extensively for alternative public information sources, including analysts, rating agencies, and firm initiated press releases. Second, we show that loan origination and participation decisions, as well as the loan share retained by the lead arranger and loan pricing, are more sensitive to media sentiment when a borrower's analyst coverage is lower and for borrowers that have experienced an exogenous reduction in analyst coverage preceding loan issuance. Finally, we provide evidence that loan spreads are more sensitive to media sentiment for consumer product oriented borrowers, consistent with lenders accounting for the implications of the news for consumer' perception of a borrower and the resultant impact on its future sales and cash flows.

By providing evidence that the media serves as an important information intermediary in the private debt market, we extend the growing body of research on the role played by the media in capital markets. Our findings also add to the extensive literature on syndicated lending, as we demonstrate that the media fundamentally alters the information structure and the nature of competition in the loan market. In particular, an important insight gleaned from our work is that not only the availability of public information about a borrower, but also its sentiment significantly influences the central characteristics of syndicated lending.

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Appendix A: Variable Definitions

Variable	Definition
Amount	The natural logarithm of the loan amount in US dollars. (DealScan).
Analyst Coverage	An indicator variable equal to 1 if there are any analysts following the firm in the month prior to the loan issuance date, 0 otherwise (I/B/E/S).
Analyst Forecast	The last consensus earnings forecast prior to the loan issuance date (I/B/E/S).
Analyst Recommendation	The mean recommendation prior to the loan issuance date (1= Strong Buy; 2= Buy; 3= Hold; 4= Underperform; 5= sell/ I/B/E/S).
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).
ΔCredit Rating	The change in the firm's numerical credit rating over the 180-day period prior to the loan issuance date (DealScan and S&P historical database).
Current Outlook	The variable equal to -1 (1) if a borrower is on a negative or developing (positive) credit outlook at a loan's issuance date. The variable is equal to 0 if a borrower does not have either a positive or negative outlook at a loan's issuance date (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).
First Time Lead	An indicator variable equal to 1 if the lender serves as the lead arrangers for the first time, 0 otherwise (DealScan).
Forecast Revision	The revision in the consensus earnings forecast over the 180 days prior to the loan issuance date (I/B/E/S).
Interest Coverage	Earnings before interest and tax divided by the interest expense,

	estimated in the quarter preceding a loan's issuance (Compustat).
Lead Share	The share of the loan held by the lead arranger, expressed in percentages.
Leverage	Total liabilities divided by total assets, estimated in the quarter preceding a loan's issuance (Compustat).
Loss	An indicator variable equal to 1 if ROA is less than zero, 0 otherwise (Compustat).
Maturity	The number of months to maturity (DealScan).
Media Sentiment	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 range from 0 to 100, with a 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).
Negative Return	An indicator variable equal to 1 if *Return* is less than zero, 0 otherwise (CRSP).
Borr-Lead No-Relationship	An indicator variable equal to 1 if a loan's 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, 0 otherwise (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).
Part-Borr No-Relationship	An indicator variable equal to 1 if the participant has not been involved in a deal with the borrower over the five year period preceding the loan issuance date, 0 otherwise (DealScan).
Part-Lead No-Relationship	An indicator variable equal to 1 if the participant has not been involved in a deal with the lead arranger over the five year period preceding the loan issuance date, 0 otherwise (DealScan).
Prior Outlook	The average of the *Current Outlook* variable over the 180 day period prior to a loan's issuance data. *Current Outlook* is equal to -1 (1) if a borrower is on a negative or developing (positive) credit outlook at a loan's issuance date. The variable is equal to 0 if a borrower does not have either a positive or negative outlook at a loan's issuance date (S&P historical database).
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 Sentiment	The average CSS for firm-initiated press releases with a relevance score greater than 90, estimated over the 180 day period prior to a loan's issuance date (RavenPack).
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).
Recommendation Revision	The change in the mean recommendation over the 180 days prior to the contract date (I/B/E/S).
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 (RavenPack).
#Press Releases Articles	The number of firm-initiated press releases over the 180 day period prior to the loan issuance date (RavenPack).
#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 RavenPack	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	N	Mean	Median	StdDev
Media				
Media Sentiment	6,964	-0.0046	0.0000	0.0386
Primary Loan Characteristics				
Borr-Lead No-Relationship	7,255	0.6379	1.0000	0.4806
Part-Borr No-Relationship	60,082	0.5675	0.0000	0.4954
Part-Lead No-Relationship	60,082	0.1525	1.0000	0.3595
Lead Share (%)	4,613	21.0525	13.3750	20.4714
Spread	6,964	5.0720	5.1648	0.7221
Firm Characteristics				
ROA	6,964	0.0085	0.0102	0.0253
Interest Coverage	6,964	10.5052	2.1228	40.9157
Leverage	6,964	0.2520	0.2373	0.1789
Size	6,964	7.2521	7.2688	1.6609
Z-Score	6,964	2.2403	1.6907	2.2198
MTB	6,964	3.0102	2.0201	3.7461
Loss	6,964	0.1476	0.0000	0.3547
Additional Loan Characteristics				
Amount	6,964	18.9334	19.1138	1.4854
Maturity	6,964	47.9482	57.0000	21.4141
PP	6,964	0.7143	1.0000	0.4519
Collateral	6,964	0.6392	1.0000	0.4802
#Covenants	6,964	2.3109	2.0000	1.0131
Revolver	6,964	0.6229	1.0000	0.4846
Term Loan B	6,964	0.1002	0.0000	0.3006
Additional Information sources				
Press Release Sentiment	6,964	0.0243	0.0264	0.0287
Rated	6,964	0.5595	1.0000	0.4964
Analyst Coverage	6,964	0.8751	1.0000	0.3307
Returns				
Return	6,964	0.0558	0.0216	0.3121
Negative Return	6,964	0.4275	0.0000	0.4947

Table 3 – Media Sentiment and the Probability of a Non-Relationship Lead Arranger

This table presents the analysis of the effects of media sentiment on the probability of a non-relationship lender serving as a loan's lead arranger. ***, **, * indicates significance at the 0.01, 0.05, 0.10 level, respectively. All variables are defined in Appendix A.

Variables	Dependent Variable: *Borr-Lead No-Relationship*
Media Sentiment	1.5474**
	(0.6393)
Outstanding	-0.2217***
	(0.0808)
Time-Between	0.0003***
	(0.0001)
Tight Credit Supply	0.0280
	(0.0656)
ROA	0.1141
	(0.8343)
Interest Coverage	0.0017**
	(0.0007)
Leverage	-0.1801
	(0.1812)
Size	-0.0767**
	(0.0305)
Z-score	-0.0177*
	(0.0092)
MTB	0.0097***
	(0.0032)
Loss	0.3560***
	(0.0811)
Amount	-0.1487***
	(0.0323)
Maturity	-0.0068***
	(0.0014)
Revolver	0.1259*
	(0.0664)
Term Loan B	0.0462
	(0.1045)
Press Release Sentiment	-3.1423**
	(1.3519)
Rated	0.0743
	(0.0657)
Analyst Coverage	-0.2312***
	(0.0872)
Return	0.2028*
	(0.1194)
Negative Return	0.0244
	(0.0707)
N	7,255
R^2	0.0247

Table 4 – Media Sentiment and Syndicate Structure

The table presents the analyses of the effects of media sentiment on the characteristics of the syndicate's structure. In Column 1 (2) presents the analysis of the variable reflecting a participant's prior relationship with the borrower (the lead arranger), while Column 3 presents the analysis of the loan share retained by the lead arranger. ***, **, * indicates significance at the 0.01, 0.05, 0.10 level, respectively. All variables are defined in Appendix A.

	Dependent Variable		
Variable	Part-Borr No-Relationship	Part-Lead No-Relationship	Lead Share
Media Sentiment	1.7654**	2.3114**	-28.7105***
	(0.7714)	(1.1204)	(6.8194)
ROA	3.2091*	-0.9517	-101.6974***
	(1.6573)	(2.3441)	(24.5548)
Interest Coverage	0.0026**	0.0017	0.0013
	(0.0011)	(0.0014)	(0.0158)
Leverage	-0.4195**	0.4476	-6.2121*
	(0.1925)	(0.3423)	(3.5286)
Size	-0.1409***	-0.0646	-2.2487***
	(0.0301)	(0.0490)	(0.6833)
Z-score	0.0641***	-0.0190	0.1689
	(0.0192)	(0.0301)	(0.3279)
MTB	-0.0001	-0.0155*	-0.0041
	(0.0061)	(0.0092)	(0.1061)
Loss	0.1358	0.1263	0.5926
	(0.0833)	(0.1217)	(1.3263)
Amount	0.0196	-0.0358	-5.9624***
	(0.0256)	(0.0419)	(0.6365)
Maturity	0.0050***	-0.0041**	-0.1084***
	(0.0011)	(0.0019)	(0.0329)
Spread	0.3591***	0.2945***	0.1706
	(0.0343)	(0.0696)	(1.0446)
Collateral	0.1044*	0.0119	-0.2789
	(0.0603)	(0.0896)	(1.1808)
PP	0.2208***	-0.0365	-7.8570***
	(0.0543)	(0.0896)	(1.7009)
#Covenants	0.0377	0.1479***	-0.9175*
	(0.0287)	(0.0424)	(0.5226)
Revolver	-0.2142***	-0.1186**	1.0176
	(0.0362)	(0.0605)	(0.9951)
Term Loan B	0.2446***	0.5395***	15.4806***
	(0.0832)	(0.1224)	(2.2275)
Borr-Lead No-Relationship	0.4786***	0.5447***	2.2707***
	(0.0440)	(0.0750)	(0.4899)
First Time Lead	0.1061	1.7979***	4.8580*
	(0.1577)	(0.3378)	(2.7667)
Press Release Sentiment	0.0181	-0.6315	13.6202
	(0.7750)	(1.2702)	(16.4236)
Rated	0.1824***	0.1268	-2.0909*
	(0.0662)	(0.0986)	(1.1038)
Analyst Coverage	0.0117	-0.1215	-5.0446**
	(0.0910)	(0.1569)	(2.1421)
Return	0.3726***	0.3464**	-2.7937*
	(0.1203)	(0.1755)	(1.4571)
Negative Return	0.2131***	0.1245	0.4680
	(0.0616)	(0.0994)	(0.7463)
Model	Logit	Logit	OLS
Fixed Effects	None	None	Year/Industry/ Purpose
N	60,082	60,082	4,613
R^2	0.0561	0.0620	0.4900

Table 5 – Media Sentiment and Interest Rate Spread

This table presents the analysis of the effects of media sentiment on the interest spread. ***, **, * indicates significance at the 0.01, 0.05, 0.10 level, respectively. All variables are defined in Appendix A.

Variable	Dependent Variable: *Spread*
Media Sentiment	-1.0930***
	(0.2479)
ROA	-1.3283***
	(0.3475)
Interest Coverage	0.0000
	(0.0000)
Leverage	0.4288***
	(0.0581)
Size	-0.0396***
	(0.0106)
Z-score	-0.0078**
	(0.0035)
MTB	-0.0076**
	(0.0030)
Loss	0.1287***
	(0.0236)
Amount	-0.0676***
	(0.0078)
Maturity	-0.0004
	(0.0004)
Collateral	0.5123***
	(0.0252)
PP	-0.1143***
	(0.0192)
#Covenants	0.0939***
	(0.0085)
Revolver	-0.0733***
	(0.0157)
Term Loan B	0.1725***
	(0.0258)
Press Release Sentiment	-0.9077***
	(0.2519)
Rated	-0.0021
	(0.0235)
Analyst Coverage	-0.0607***
	(0.0218)
Return	0.0800***
	(0.0294)
Negative Return	0.0314**
	(0.0155)
Fixed Effects	Year/Industry/Purpose
N	6,964
R^2	0.6697

Table 6 – Media Sentiment, Controlling for Characteristics of Additional Public Information Sources

This table presents the analysis of the effects of media sentiment on the probability of a non-relationship lender serving as a loan's lead arranger (*Borr-Lead No-Relationship*), the probability a participant's prior relationship with the borrower (*Part-Borr No-Relationship*), the probability a participant's prior relationship with the lead arranger (*Part-Lead No-Relationship*), the loan share retained by the lead arranger (*Lead Share*) and interest spread (*Spread*). ***, **, * indicates significance at the 0.01, 0.05, 0.10 level, respectively. All variables are defined in Appendix A.

Variable	Dependent Variable				
	(1) Borr-Lead No-Relationship	(2) Part-Borr No-Relationship	(3) Part-Lead No-Relationship	(4) Lead Share	(5) Spread
Media Sentiment	2.7072**	1.1768*	2.1609*	-27.5116***	-0.6652**
	(1.313)	(0.966)	(1.466)	(10.528)	(0.305)
#Articles	-0.0007**	-0.0001	0.0003	0.0025	-0.0001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Press Release Sentiment	-4.9439***	0.9792	0.7456	-18.6461	-0.6796**
	(1.799)	(1.104)	(1.809)	(13.188)	(0.291)
#Press Release Articles	-0.0003	0.0003	-0.0008	-0.0029	0.0000
	(0.001)	(0.001)	(0.001)	(0.006)	(0.001)
Current Watch	-0.2634*	0.0885	0.0276	-0.9182	-0.1604***
	(0.147)	(0.105)	(0.205)	(1.485)	(0.026)
Prior 180 Watch	0.0460	-0.0513	-0.1795	2.3817	0.0777*
	(0.203)	(0.185)	(0.230)	(1.968)	(0.045)
Credit Rating	0.0190	-0.0804***	-0.0191	0.0448	0.1347***
	(0.016)	(0.018)	(0.031)	(0.241)	(0.010)
Δ Credit Rating	-0.0834	0.0904*	0.0399	-0.1315	-0.0040
	(0.057)	(0.053)	(0.065)	(0.760)	(0.010)
Current Outlook	-0.0192	0.0754	-0.2443*	0.3458	-0.0565**
	(0.109)	(0.082)	(0.144)	(1.360)	(0.028)
Prior 180 Outlook	-0.2293*	-0.0498	0.2101	-0.0384	0.0213
	(0.127)	(0.099)	(0.169)	(1.449)	(0.030)
Analyst Forecast	-0.0495**	-0.0431***	-0.0560*	-0.1925	-0.0050
	(0.021)	(0.014)	(0.030)	(0.225)	(0.005)
Forecast Revision	-0.0004**	-0.0031***	0.0002***	-0.0029	0.0001***
	(0.000)	(0.001)	(0.001)	(0.005)	(0.001)
Analyst Recommendation	-0.1573**	-0.0483	-0.1112	0.1314	0.0294
	(0.066)	(0.051)	(0.088)	(0.826)	(0.024)
Recommendation Revision	-0.1541	0.1069	-0.7033*	3.1323	-0.0226
	(0.222)	(0.184)	(0.370)	(2.552)	(0.066)
Model	Logit	Logit	Logit	OLS	OLS
Controls	Included	Included	Included	Included	Included
Fixed Effects	None	None	None	Year/Industry/Purpose	Year/Industry/Purpose
N	4,152	46,010	46,010	3,183	4,005
R²	0.0252	0.0601	0.0732	0.4301	0.7935

Table 7 – The Effect of Media Sentiment on Syndicate Structure, Conditional on Intensity of Analysts' Coverage

This table presents the analysis of the effects of media sentiment on the probability of a non-relationship lender serving as a loan's lead arranger (*Borr-Lead No-Relationship*), the probability a participant's prior relationship with the borrower (*Part-Borr No-Relationship*), the probability a participant's prior relationship with the lead arranger (*Part-Lead No-Relationship*), the loan share retained by the lead arranger (*Lead Share*) and interest spread (*Spread*), conditional on equity analysts' coverage intensity. *****, **, *** indicates significance at the 0.01, 0.05, 0.10 level respectively. ###, ##, # indicates that the difference across analyst coverage partitions is significant at the 0.01, 0.05 and 0.10 level respectively. All variables are defined in Appendix A.

Panel A: The probability of a non-relationship lead arranger, conditional on analyst coverage intensity

Variable	**Dependent Variable:** *Part-Borr No-Relationship*	
	Less Intensive Coverage	*Highly Intensive Coverage*
Media Sentiment	2.956***	-1.3446
	(0.908)##	(1.693)
Model	Logit	Logit
Controls	Included	Included
Observations	41,760	18,322
Pseudo R^2	0.0552	0.0577

Panel B: The syndicate participation of lenders without a prior relationship with the borrower, conditional on analyst coverage intensity

Variable	**Dependent Variable:** *Part-Borr No-Relationship*	
	Less Intensive Coverage	*Highly Intensive Coverage*
Media Sentiment	2.956***	-1.3446
	(0.908)##	(1.693)
Model	Logit	Logit
Controls	Included	Included
Observations	41,760	18,322
Pseudo R^2	0.0552	0.0577

Panel C: The syndicate participation of lenders without a prior relationship with the lead arranger, conditional on analyst coverage intensity

Variable	**Dependent Variable:** *Part-Lead No-Relationship*	
	Less Intensive Coverage	*Highly Intensive Coverage*
Media Sentiment	2.9520**	0.6063
	(1.259)##	(1.764)
Model	Logit	Logit
Controls	Included	Included
Observations	41,760	18,322
Pseudo R^2	0.0674	0.0529

Table 7 (continued) – The Effect of Media Sentiment on Syndicate Structure, Conditional on Analysts' Coverage Characteristics

This table presents the analysis of the effects of media sentiment on the probability of a non-relationship lender serving as a loan's lead arranger (*Borr-Lead No-Relationship*), the probability a participant's prior relationship with the borrower (*Part-Borr No-Relationship*), the probability a participant's prior relationship with the lead arranger (*Part-Lead No-Relationship*), the loan share retained by the lead arranger (*Lead Share*) and interest spread (*Spread*), conditional on equity analysts' coverage intensity. *****, **, *** indicates significance at the 0.01, 0.05, 0.10 level respectively. ###, ##, # indicates that the difference across analyst coverage partitions is significant at the 0.01, 0.05 and 0.10 level respectively. All variables are defined in Appendix A.

Panel D: The loan share retained by the lead arranger, conditional on analyst coverage intensity

Variable	**Dependent Variable:** *Lead Share*	
	Less Intensive Coverage	*Highly Intensive Coverage*
Media Sentiment	-25.175***	-10.1900
	(8.131)#	(20.378)
Model	OLS	OLS
Controls	Included	Included
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
Observations	3,108	1,505
R^2	0.4646	0.6451

Panel E: Loan pricing, conditional on analyst coverage intensity

Variable	**Dependent Variable:** *Spread*	
	Less Intensive Coverage	*Highly Intensive Coverage*
Media Sentiment	-1.1654***	-0.6627
	(0.209)###	(0.449)
Model	OLS	OLS
Controls	Included	Included
Fixed Effects	Y/I/P	Y/I/P
Observations	5,073	1,891
R^2	0.6492	0.7580

Table 8 – The Effect of Media Sentiment on Syndicate Structure, Conditional on Analysts' Coverage Reduction

This table presents the analysis of the effects of media sentiment on the probability of a non-relationship lender serving as a loan's lead arranger (*Borr-Lead No-Relationship*), the probability a participant's prior relationship with the borrower (*Part-Borr No-Relationship*), the probability a participant's prior relationship with the lead arranger (*Part-Lead No-Relationship*), the loan share retained by the lead arranger (*Lead Share*) and interest spread (*Spread*), conditional on equity analysts' coverage reduction. *****, **, *** indicates significance at the 0.01, 0.05, 0.10 level respectively. ###, ##, # indicates that the difference across analyst coverage partitions is significant at the 0.01, 0.05 and 0.10 level respectively. All variables are defined in Appendix A.

Panel A: The probability of a non-relationship lead arranger, conditional on analyst coverage reduction

	Dependent Variable: *Part-Borr No-Relationship*	
Variable	*No Coverage Reduction*	*Coverage Reduction*
Media Sentiment	1.3533*	7.9796*
	(0.957)	(5.079) #
Model	Logit	Logit
Controls	Included	Included
Observations	6,941	314
Pseudo R^2	0.0502	0.0731

Panel B: The syndicate participation of lenders without a prior relationship with the borrower, conditional on analyst coverage reduction

	Dependent Variable: *Part-Borr No-Relationship*	
Variable	*No Coverage Reduction*	*Coverage Reduction*
Media Sentiment	1.6771**	4.1932*
	(0.796)	(2.640)#
Model	Logit	Logit
Controls	Included	Included
Observations	56,274	3,807
Pseudo R^2	0.0571	0.0835

Panel C: The syndicate participation of lenders without a prior relationship with the lead arranger, conditional on analyst coverage reduction

	Dependent Variable: *Part-Lead No-Relationship*	
Variable	*No Coverage Reduction*	*Coverage Reduction*
Media Sentiment	2.4008**	0.6238
	(1.155)	(3.920)
Model	Logit	Logit
Controls	Included	Included
Observations	56,274	3,807
Pseudo R^2	0.0613	0.0873

Table 8 (continued) – The Effect of Media Sentiment on Syndicate Structure, Conditional on Analysts' Coverage Reduction

This table presents the analysis of the effects of media sentiment on the probability of a non-relationship lender serving as a loan's lead arranger (*Borr-Lead No-Relationship*), the probability a participant's prior relationship with the borrower (*Part-Borr No-Relationship*), the probability a participant's prior relationship with the lead arranger (*Part-Lead No-Relationship*), the loan share retained by the lead arranger (*Lead Share*) and interest spread (*Spread*), conditional on equity analysts' coverage reduction. *****, **, *** indicates significance at the 0.01, 0.05, 0.10 level respectively. ###, ##, # indicates that the difference across analyst coverage partitions is significant at the 0.01, 0.05 and 0.10 level respectively. All variables are defined in Appendix A.

Panel D: The loan share retained by the lead arranger, conditional on analyst coverage reduction

	Dependent Variable: *Lead Share*	
Variable	*No Coverage Reduction*	*Coverage Reduction*
Media Sentiment	-25.7339***	-35.0953
	(7.144)	(52.041)
Model	OLS	OLS
Controls	Included	Included
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
Observations	4,417	196
R^2	0.4890	0.7396

Panel E: Loan pricing, conditional on analyst coverage reduction

	Dependent Variable: *Spread*	
Variable	*No Coverage Reduction*	*Coverage Reduction*
Media Sentiment	-1.1771***	-3.2312**
	(0.206)	(1.396)##
Model	OLS	OLS
Controls	Included	Included
Fixed Effects	Year/Industry/Purpose	Year/Industry/Purpose
Observations	6,654	310
R^2	0.6619	0.8496

Table 9 – The Effect of Media Content on Loan Pricing, Conditional on a Borrower's Consumer Product Intensity

This table presents the analysis of the effects of media sentiment on the interest spread, conditional on a borrower's consumer product intensity. *****, **, *** indicates significance at the 0.01, 0.05, 0.10 level respectively. ###, ##, # indicates that the difference across consumer product intensity partitions is significant at the 0.01, 0.05 and 0.10 level respectively. All variables are defined in Appendix A.

Variable	Dependent Variable: *Spread*	
	Low Intensity	High Intensity
Media Sentiment	-0.636**	-1.0030***
	(0.327)	(0.343)##
Model	OLS	OLS
Controls	Included	Included
Fixed Effects	Y/I/P	Y/I/P
N	3,357	3,429
R²	0.6580	0.7107