This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Bankruptcy, Overlapping Directors, and Bank Loan Pricing

IN-MU HAW
School of Business, Texas Christian University,
Fort Worth, TX 76129 USA

BYRON YANG SONG
School of Business, Hong Kong Baptist University,
Kowloon Tong, Hong Kong, People's Republic of China

WEIQIANG TAN*
Department of Social Sciences, Education University of Hong Kong,
Tai Po, Hong Kong, People's Republic of China

WENMING WANG*
Department of Finance and Accounting, Zhejiang University,
Hangzhou, People's Republic of China

July 2021

***Corresponding authors: Weiqiang Tan; Wenming Wang.**

Author information:
Haw: Neeley School of Business, Texas Christian University, Fort Worth, TX 76129 USA (email: i.haw@tcu.edu). Song: School of Business, Hong Kong Baptist University, Renfrew Road, Kowloon Tong, Hong Kong, People's Republic of China (yangsong@hkbu.edu.hk). Tan: Department of Social Sciences, Education University of Hong Kong, Tai Po, Hong Kong, People's Republic of China (wqtan@eduhk.hk). Wang: Department of Finance and Accounting, Zhejiang University, Hangzhou, People's Republic of China (wwming@zju.edu.cn). We thank Kee-Hong Bae, Jun-Koo Kang, Albert Tsang, Aris Stouraitis, Jian Zhang, Wenrui Zhang, and seminar participants at the Central University of Finance and Economics, the Hong Kong Baptist University, Hang Seng University of Hong Kong, University of Macau, the 4th Vietnam International Conference in Finance, 2017 American Accounting Association Annual Meeting for comments on earlier drafts. Song and Wang acknowledge the financial support from the Hong Kong Research Grants Council (GRF HKBU 12500215). Tan thanks Guangdong Basic and Applied Basic Research Foundation (Project No. 2019A1515011990) for financial support.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

ABSTRACT: Using a sample of loan facilities borrowed by firms that share directors with bankrupt firms, this study investigates whether the overlapping directors are a transmission channel of the bankruptcy contagion effect in the bank loan market and, if so, what the underlying mechanism is. We find that firms are charged higher loan spreads in the period following the bankruptcy filing of a firm with a common director and that overlapping directors are a relevant channel for the bankruptcy contagion effect, in addition to other channels identified in literature. We also find that the negative contagion effect on loan pricing is most likely driven by the overlapping directors' reputation loss due to their involvement in bankruptcy events, and not by competing hypotheses, such as director distraction and director career concern/experience. Further analyses reveal that the adverse contagion impact on loan spreads is more pronounced when overlapping directors have greater influence over corporate policies or when their reputation is more seriously damaged. Meanwhile, the contagion effect is mitigated when interlocked firms have a higher-quality board. These results further support our evidence of the director reputation loss hypothesis. We strengthen the identification strategy to establish causality. In sum, our study identifies common directors as a channel of bankruptcy contagion effects on loan pricing and director reputation loss as an underlying mechanism.

Keywords: Bankruptcy, overlapping director, contagion effect; loan spreads

JEL Classification: M41; G21; G32; G34; K22; D83

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

1. Introduction

Bank loans serve as a major source of corporate financing. A firm's loan financing costs can be affected not only by the condition of the focal borrower, but also by that of economically connected firms. As a high-profile corporate failure, bankruptcies have been documented to have a spillover effect on the loan financing costs of other firms in the same geographic location (Addoum, Kumar, Le, Niessen-Ruenzi 2020), industry (Hertzel and Officer 2012), and supply chain network (Houston, Lin, and Zhu 2016). However, little is known about the transmission channel and mechanisms of the bankruptcy spillover effects associated with common directors who simultaneously sit on the boards of bankrupt firms and the focal borrowing firms in the bank loan market. This study attempts to extend this line of research 1) by determining that common directors are a relevant transmission channel for the bankruptcy contagion effect, in addition to other channels documented in the literature, and 2) by differentiating three possible mechanisms of the inter-firm spillover effect of bankruptcy on loan financing costs through overlapping directors.

Boards of directors play a central role in corporate governance and firms contracting with outside parties.[1] In the United States, it is common for directors to sit on two or more corporate boards. Firms are said to be director interlocked if they share one or more common directors on their boards. We propose three different hypotheses that bankruptcy experienced by one firm can have a significant impact on the loan financing costs of its director-interlocked peers. First, bankruptcy, as an extreme firm failure, could be blamed on the directors of insolvent firms for having failed to preempt bad management decisions, which materially hurts the directors' reputation in the labor market (Gilson 1989, 1990). The presence of directors with tarnished reputations can raise concerns about the quality of the boards of interlocked firms, weakening board ability to secure support from resource providers (Cowen and Marcel 2011). Bank lenders can thus lower their evaluation of interlocked borrowers' prospects of debt repayment in the future and, accordingly, charge higher loan spreads in debt contracting. We label this effect as the director reputation loss hypothesis.

[1] While the effect of various board characteristics on corporate debt financing has long been examined in the literature (e.g., Anderson, Mansi, and Reeb 2004; Ashbaugh-Skaife, Collins, and LaFond 2006), a growing stream of research is paying special attention to the importance of individual directors' attributes in corporate loan contracting. For example, firms are found to enjoy favorable loan terms if they have bank-affiliated directors (Sisli-Ciamarra 2012), politically connected directors (Houston, Jiang, Lin, and Ma 2014), and certified inside directors (Lin, Song, and Tian 2016).

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Second, the time and effort available for overlapping directors to effectively fulfill their directorial responsibilities are limited. When one firm falls into financial distress and files for bankruptcy, overlapping directors may have to devote more time and effort to the bankrupt firm, diverting attention and resources away from their board activities at interlocked firms. The shift of an overlapping director's attention away from the interlocked firms can impair the board's monitoring quality (Falato, Kadyrzhanova, and Lel 2014; Stein and Zhao 2019) and lead to an increase in loan financing costs (Huang, Lobo, Wang, and Zhou 2018). On the other hand, if a bankrupt firm is liquidated, the overlapping director can become less busy and thus able to devote more time and effort to interlocked firms after losing that directorship, which could improve the board's monitoring at the interlocked firms (e.g., Brown, Dai, and Zur 2019). The spillover effect on the interlocked firm could thus reduce the cost of bank loans. We label this effect as the director distraction hypothesis.

Third, a firm's bankruptcy could have a favorable spillover effect on director-interlocked peers. Out of career concerns, directors involved in negative events at a firm can also be motivated to conduct greater due diligence at other firms, to avoid further damage to their reputation (Zhang 2021). Furthermore, direct engagement in a bankruptcy event could change the overlapping director's attitudes toward risk and thereby encourage the director to promote conservative corporate policies at interlocked firms. The overlapping director might also acquire useful risk management skills that can reduce future distress risk at interlocked firms (e.g., Ferris, Jagannathan, and Pritchard 2003; Field, Lowry, and Mkrtchyan 2013). Consequently, bank lenders could adjust their assessment of credit risk downward and charge lower loan spreads for interlocked borrowers in response to the overlapping director's bankruptcy experience. We label this effect as the director career concern/experience hypothesis.

Taken together, whether and how bank lenders respond to overlapping directors' engagement in bankruptcy events in pricing loans to borrowers that are director interlocked with bankrupt firms remain an empirical question. To probe into this topic, we begin with a list of all large public company bankruptcy filings in the United States from 1999 to 2017 from the UCLA–LoPucki Bankruptcy Research Database and identify 356 firms that share at least one director with the 138 firms that filed for bankruptcy at some point during our sample period. For brevity, we refer to these 356 firms as the interlocked borrowers in our sample.

Our baseline difference-in-differences (DiD) analyses show that bank lenders charge 10.1% higher interest rates (equivalent to an annual interest payment of $924,557 per average loan) following an overlapping director's engagement in a bankruptcy event at another firm, after controlling for borrower-specific, loan-specific, and economy-wide characteristics. This adverse spillover effect on loan costs via overlapping directors also extends beyond the industry and geographic contagion effects in the bank loan market found in prior literature (i.e., Hertzel and Officer 2012; Addoum et al. 2020). Our findings suggest that bank lenders perceive a higher credit risk of interlocked borrowers and thereby demand a higher interest premium in response to an overlapping director's engagement in bankruptcy at another firm. The findings indicate that common directors are a relevant transmission channel in the bank loan market, in addition to other possible channels, such as a shared industry and geographic location.

We then investigate three alternative mechanisms through which overlapping directors could transmit shocks, that is, director distraction, director career/experience, and director reputation loss hypotheses. Our baseline findings are consistent with the director reputation loss hypothesis and the director distraction hypothesis, but not with the director career concern/experience hypothesis. Therefore, we conduct additional tests to investigate whether the director distraction hypothesis or director reputation loss hypothesis explains the main mechanism through which an overlapping director's engagement in bankruptcy adversely affects the loan pricing of interlocked firms.

If the director distraction hypothesis holds, we predict that the contagion effect of an overlapping director's engagement in bankruptcy on loan pricing will increase with the overlapping director's busyness, since busy directors are more vulnerable to time and attention constraints. We define overlapping director busyness in terms of 1) whether the overlapping director holds three or more directorships (e.g., Ferris et al. 2003; Fich and Shivdasani 2006; Field et al. 2013) and 2) whether the overlapping director loses board seats at the bankrupt firm or other firms following the firm bankruptcy. We find no evidence that the contagion effect varies with overlapping director busyness. Therefore, our results are inconsistent with the director distraction hypothesis, leaving director reputation loss as the most likely mechanism underlying the contagion effect of a firm's bankruptcy on the loan pricing of its director-interlocked peers. Our results for the reputation loss hypothesis are robust to a series of cross-sectional tests and endogeneity checks. Our dynamic tests and falsification tests indicate that our results are driven neither by preexisting

common shocks to bankrupt firms and director-interlocked borrowers nor by endogenous firm–director matching based on unobservable characteristics.

To fully comprehend the contagion effect of a firm's bankruptcy via overlapping directors in the bank loan market, we perform various sets of cross-sectional analyses. First, we examine whether the bankruptcy contagion effect varies with the importance of the overlapping directors in both the bankrupt firms and interlocked borrower firms. The chief executive officer (CEO) and the board chair are supposed to be more directly responsible for major corporate decisions such as investment decisions and are thus more likely to be held liable for corporate failures. We find that the increase in loan spreads following a firm's bankruptcy is significantly larger when the overlapping directors serve as the CEO or board chair in either the bankrupt firm or an interlocked borrowing firm. A director can play a more influential role if the director's tenure is longer and when the board is comprised of fewer members. These directors could suffer a greater reputation loss if they are found to be engaged in a bankruptcy event. We find consistent evidence that the increase in loan spreads following a firm's bankruptcy is more pronounced for overlapping directors with a longer tenure in the bankrupt (interlocked borrowing) firm and for bankrupt (interlocked borrowing) firms with a smaller board. Our findings support the view that bank lenders devalue the reputation of overlapping directors to a greater degree if these directors presumably play a more important role in deciding corporate policies.

Second, we examine whether the bankruptcy contagion effect varies with the board quality of the interlocked borrowers. Fields, Fraser, and Subrahmanyam (2012) document that high-quality boards can complement the monitoring role of banks and thus reduce the costs of bank debt. Using board independence and board diversity as proxies for board quality, we find that the bankruptcy contagion effect on loan pricing is materially reduced for interlocked borrowers with higher board quality. These results indicate that good corporate governance can mitigate the adverse spillover effect of board members associated with external negative events. Since bank-affiliated directors can help obtain favorable loan terms (Sisli-Ciamarra 2012), we also use the presence of bank-affiliated directors as an additional proxy for board quality, and we find that the contagion effect of a firm's bankruptcy is mitigated for interlocked borrowers with bank-affiliated directors on their board.[2]

[2] In unreported tests, we reveal that the adverse impact on loan spreads is aggravated when the overlapping director's reputation is perceived as more severely damaged by another firm's bankruptcy. We also find that the bankruptcy

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

We contribute to the literature in several ways. First, we contribute to the literature on the transmission channels of financial contagion in capital markets, particularly the private debt market. Prior studies have examined the adverse effect of negative events experienced by one firm on the bank debt contracting of economically linked firms. In particular, Hertzel and Officer (2012) find that one firm's bankruptcy filing has an adverse impact on the bank debt contracting of its rivals in the same industry because of lenders' concerns about default clustering. Houston et al. (2016) find a firm's bank financing costs increase following the announcement of its customer's bankruptcy. Addoum et al. (2020) examine the contagion effect of corporate bankruptcies on the loan contracting of geographically proximate firms. We complement this literature by revealing an unexplored channel, that is, overlapping board directors, through which negative events such as bankruptcy adversely affect bank loan contracting, in addition to channels found in the literature.

Second, we extend the literature on the economic consequences of board directors' involvement in negative events to private debt markets. The literature shows that directors face labor market penalties from other corporate failures and that the investors of interlocked firms react negatively to lawsuit filings against the other firms with shared directors (e.g., Gilson 1990; Srinivasan 2005; Fich and Shivdasani 2007; Dou 2017; Gow, Wahid, and Yu 2018). Our study extends this line of literature to the contagion effects of an exogenous bankruptcy shock on the bank loan pricing of interlocked borrowers. Importantly, we differentiate three potential mechanisms that can explain the contagion effects and offer robust evidence that is consistent with the director reputation loss hypothesis, but not with the director distraction or director career/experience hypothesis. We thus provide a much more granular analysis of the role of common directors and the impact of director reputation on bank loan pricing.

Third, our study contributes to the growing literature on the impact of individual directors' characteristics on loan contracting. Prior studies have documented that bank loan terms are affected by a director's bank affiliations, political ties, and attention priority (Sisli-Ciamarra 2012; Houston, Lin, and Ma 2014; Huang et al. 2018). This study identifies another reason that a

contagion effect is more pronounced for interlocked borrowers that have poor performance or poor credit quality. The evidence suggests that bank lenders value director reputation to a greater extent when lending to borrowers with higher credit risk. The bankruptcy contagion effect on loan pricing is also mitigated when interlocked borrowers borrow from relationship lenders or reputable banks. The results indicate that the lower information asymmetry inherent in relationship lending and the better screening and monitoring ability of reputable banks can alleviate the adverse impact of an overlapping director's association with external negative events such as bankruptcy. The results are available on request.

director's involvement in corporate failures leads to the director's reputation loss, which induces bank lenders to adversely adjust the loan terms to interlocked borrowers. Moreover, this study documents that the impact of directors' reputation loss on loan pricing varies with board characteristics such as size, independence, and diversity.

Our study is closely related to that of Lin et al. (2016), who explore the role of non-CEO insider directors' reputation at a firm, which is captured by their outside directorships, in bank debt contracting. The authors find that borrowers with reputable inside directors on their boards enjoy more favorable loan terms. In contrast, our study focuses on economically linked firms via interlocked directors and identifies common directors as a relevant transmission channel of the bankruptcy contagion effects on the loan pricing for interlocked borrowers. Our study complements Lin et al. (2016) about the role of director reputation in the bank loan market and extends it to the network of interlocked directors in the shock of corporate bankruptcy.[3]

The remainder of the paper proceeds as follows. Section 2 reviews the literature and develops the hypothesis. Section 3 describes our sample and research design. Section 4 presents our main results, and Section 5 provides a series of robustness tests. Section 6 concludes the paper.

2. Literature and Hypothesis Development

2.1. Contagion effects of corporate bankruptcy

In the real business world, firms are economically connected in various ways. A growing literature has examined the contagion effects of corporate bankruptcies in capital markets. One line of research investigates how the stock prices of economically linked firms react to corporate announced bankruptcies. For example, Lang and Stulz (1992) document average negative intra-industry rival stock price reactions to a competitor's bankruptcy across all bankruptcy filings, except in highly concentrated industries with low leverage. Hertzel, Li, Officer, and Rodgers (2008) show that customer bankruptcy filings have significantly negative valuation consequences for supplier stock prices. Boone and Ivanov (2012) find that nonbankrupt strategic alliance partners, on average, experience a negative stock price reaction around their partner firm bankruptcy filing announcements.

[3] Given that insider directors simultaneously hold executive positions, Lin et al. (2016) cannot rule out the possibility that it is the executive's and not the director's reputation that lenders value in loan contracting.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Another line of research examines the contagion effects of corporate bankruptcies in debt markets. Hertzel and Officer (2012) reveal that corporate bankruptcy filings adversely affect the pricing of bank loans to other firms in the same industry. Houston et al. (2016) find that a firm's bankruptcy has negative contagion effects on the bank financing costs of its key suppliers. Addoum et al. (2020) show that corporate bankruptcies negatively influence the bank loan contracting of geographically proximate firms. Jorion and Zhang (2007, 2009) document the contagion effects of corporate bankruptcies on credit default swap spreads for industry competitors and suppliers. However, no study has examined whether common directors are a relevant channel for the bankruptcy contagion effect in the bank loan market.

2.2. Overlapping directors, bankruptcy, and bank loan costs

While the literature has investigated the contagion effects of corporate bankruptcies within industries, along supply chains, and among geographically proximate firms in bank debt markets, little is known about the existence and mechanisms of bankruptcy spillover effects associated with overlapping directors on loan pricing. In the United States, directors often sit simultaneously on two or more corporate boards. We propose that a firm's bankruptcy could have contagion effects on the cost of loans to its director-interlocked peers through the following three potential mechanisms.

First, as a significant negative event, a firm's financial distress and bankruptcy materially damage the image of its directors, such that they suffer the loss of concurrent directorships and future career opportunities in the labor market (Gilson 1989, 1990; Dou 2017). Overlapping directors bring about similar corporate governance practices to their firms (Bouwman 2011), such as earnings management (Chiu, Teoh, and Tian 2013), voluntary disclosure practices (Cai et al. 2014), stock option backdating and expensing (Bizjak, Lemmon, and Whitby 2009; Reppenhagen 2010), the use of corporate-owned life insurance tax shelters (Brown 2011), and the adoption of antitakeover provisions (Foroughi et al. 2021). On the one hand, a firm's bankruptcy could signal corporate governance failure and reveal new information about the capability and true type of its directors. Weaker governance in one firm leads to weaker governance in its director-interlocked peers, and vice versa (Levit and Malenko 2016). A firm's bankruptcy could call into question the quality of all the other boards on which the overlapping directors sit, which induces bank lenders

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

to lower their evaluation of the effectiveness of these boards and, in turn, adversely adjust loan contracting terms.

On the other hand, the involvement in negative events such as bankruptcies and lawsuits significantly damages the overlapping directors' reputation, such that they face labor market penalties and receive less support or more opposition from outsiders (e.g., Srinivasan 2005; Cai, Garner, and Walkling 2009; Brochet and Srinivasan 2014; Dou 2017). The presence of tainted directors could, in turn, impair a board's legitimacy to secure resources from outside resource providers (Arthaud-Day, Certo, Dalton, and Dalton 2006). Such erosion of preferential access to resources or support from outside parties undermines interlocked borrowers' prospects of cash flow generation and increases their credit risk. In sum, the damage to an overlapping director's reputation caused by a firm's bankruptcy could increase the cost of bank loans to interlocked firms. We label this effect as the director reputation loss hypothesis.

Second, the time and energy directors with multiple directorships have are limited in terms of effectively fulfilling their directorial responsibilities. Overlapping directors do not equally allocate their monitoring efforts to each directorship (Masulis and Mobbs 2014), and bank lenders determine loan terms in response to the attention that an overlapping director pays to their borrowers (Huang et al. 2018). When one firm falls into financial distress and files for bankruptcy, the overlapping directors might need to devote more time and effort to the bankrupt firm, shifting attention and resources away from their board activities at interlocked firms. Such diversion of an overlapping director's attention away from interlocked firms will impair their board monitoring quality (Falato et al. 2014; Stein and Zhao 2019) and, in turn, lead to an increase in loan financing costs. On the contrary, if the bankrupt firm is liquidated, the overlapping director could become less busy and thus be able to devote more time and efforts to interlocked firms after losing that directorship, which will improve their board monitoring effectiveness (e.g., Brown et al. 2019). Then, the spillover effect on interlocked firms could reduce the cost of bank loans. We label these contagion effects as the director distraction hypothesis.

Third, a firm's bankruptcy could have favorable spillover effects on its director-interlocked peers. Career concerns have long been recognized as a primary motivation of directors to exercise due diligence and proper oversight (Fama and Jensen 1983; Jiang, Wan, and Zhao 2016; Masulis and Mobbs 2017). For example, Zhang (2021) finds that overlapping directors experiencing a proxy contest at one firm are motivated to act preemptively and strengthen corporate governance

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

in other firms, to minimize the possibility of losing other board seat. Similarly, overlapping directors engaging in a firm's bankruptcy can also be induced to increase their monitoring efforts to reduce future distress risk at their other firms, since another bankruptcy would further damage their career prospects in the labor market. On the other hand, direct bankruptcy experience could lower an overlapping director's risk tolerance and promote a downward shift in risk taking at the other firms where the overlapping director serves. Furthermore, participation in bankruptcy events can provide overlapping directors with useful knowledge and skills to handle future financial distress risk at their other firms (e.g., Ferris et al. 2003; Field et al. 2013). Director-interlocked firms can therefore exhibit lower future financial distress risk following a firm's bankruptcy, leading to lower costs of bank loans. We label this favorable spillover effect as the director career concern/experience hypothesis.

The above discussions on the three mechanisms suggest that a firm's bankruptcy could have negative or positive contagion effects on the costs of bank loans to its director-interlocked firms. It is ex ante unknown which mechanism of the overlapping director's engagement in bankruptcy dominates in loan pricing. Therefore, we propose our hypothesis in null form, as follows.

Hypothesis*: Bank lenders do not charge different interest rates in loans to interlocked borrowers following the bankruptcy of other firms sharing common directors.*

3. Data and Methodology

3.1. Data sources and sample selection

Our sample starts with all 797 bankruptcy filings in 1999–2017 from the UCLA–LoPucki Bankruptcy Research Database (http://lopucki.law.ucla.edu), which includes all bankruptcy cases filed by U.S. public firms with book assets above $100 million (in constant 1980 dollars) at the time of filing since late 1979.[4] We keep only the first filing if a firm made more than one bankruptcy filing and exclude 84 duplicate filings by the same firms to ensure the unexpected nature of bankruptcy filings.[5]

We obtain board director information for bankrupt firms from the ISS database, which provides a wide range of variables regarding board directors for Standard & Poor's 1500 companies. We

[4] We start the sample of bankruptcy filings in 1999, because the Institutional Shareholder Services (ISS) database (formerly RiskMetrics) provides director information since 1996. We require at least three years before a firm's bankruptcy to identify the interlocked directorships of borrowing firms.

[5] The inclusion of these 84 duplicate filings does not affect our main findings.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

find director information for 221 bankrupt firms. We then identify interlocked firms that shared at least one director with the 221 bankrupt firms in the ISS database when they filed for bankruptcy. We keep only the earliest event if a firm had a board link to two or more bankruptcy events, leaving us with 547 interlocked firms that share a director(s) with 158 bankrupt firms. In other words, merging the data with the ISS database results in dropping 555 bankruptcy filings. If focal director data are missing from the ISS database, we manually collect detailed information on overlapping directors, such as their board positions and directorship terms, from the proxy statements of the sample firms on the U.S. Securities and Exchange Commission (SEC) EDGAR website.[6]

We extract bank loan data from the DealScan database, which is provided by Loan Pricing Corporation and contains a wide range of loan characteristics collected from SEC filings and/or from other sources that are self-reported by banks. The DealScan loan data are compiled for each transaction or deal. Each deal has either one facility or a package of several facilities with different price and non-price terms. We consider each facility an independent observation in our sample, since many loan characteristics and spreads vary across facilities. We include bank loans initiated between 1997 and 2019.

Following the spirit of Giroud's (2013) research design, we use a 10-year window around the bankruptcy filing year for director-interlocked borrowing firms. That is, loans to interlocked borrowers are included in our sample if they were initiated during the five years before and after the bankruptcy filings, respectively.[7] We obtain financial and stock price data from the Compustat database and the Center for Research in Security Prices (CRSP) stock price database. After excluding loans missing data for the control variables, leading to the loss of another 20 bankruptcy filings, we finally obtain a sample of 19,461 loan facilities, 2,979 of which, or about 15.31%, were borrowed by 356 firms with at least one director associated with one of the 138 bankruptcy filings by other firms.

[6] See https://www.sec.gov/edgar/searchedgar/companysearch.html.
[7] Our results still hold if we use all loans to interlocked borrowers during the sample period or apply a three- and two-year windows before and after the bankruptcy filing year.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

3.2. Basic empirical model

To examine the contagion effect of a firm's bankruptcy on the cost of loans to its director-interlocked borrowers, we adopt a DiD analysis framework used in prior literature (e.g., Bertrand and Mullainathan 2003; Giroud 2013) by estimating the following regression model:

$$\begin{aligned} Log(Loan\ Spread)_{ilt} = {} & \alpha_i + \alpha_t + \beta_1 Treat + \gamma_1 MidIndBankrupt + \gamma_2 LocalBankrupt \\ & + \gamma_3 Borrower\text{-}specific\ Control\ Variables_{it-1} + \gamma_4 Loan\text{-}specific\ Control\ Variables_{ilt} \\ & + \gamma_5 Economy\text{-}wide\ Control\ Variables_t + \varepsilon_{ilt} \end{aligned} \quad (1)$$

where the dependent variable, $Log(Loan\ Spread)_{ilt}$, is the natural logarithm of the all in drawn spread, measured as the amount the borrower pays in basis points (bps) over the London Interbank Offered Rate (LIBOR) or the LIBOR equivalent (prime-based spreads are converted into LIBOR-equivalent spreads) for each dollar drawn down, and α_i and α_t are firm and year fixed effects, respectively. The key explanatory variable *Treat* is an indicator variable that takes the value of one if a loan is borrowed by an interlocked firm in the period after bankruptcy filing, and zero otherwise. If bank lenders adversely adjust loan terms after the engagement of an overlapping director in a firm's bankruptcy, the coefficient β_1 is predicted to be significantly positive.

To detect the incremental effect of a firm's bankruptcy on loan costs via overlapping directors, we first control for the contagion effect of a firm's bankruptcy in the bank loan market through channels besides overlapping directors documented in prior literature (e.g., Hertzel and Officer 2012; Addoum et al. 2020). Specifically, we include *MidIndBankrupt* to control for an industry contagion effect and *LocalBankrupt* to control for a geographic contagion effect. Following Hertzel and Officer (2012), we define *MidIndBankrupt* as a dummy variable that equals one if a loan is taken out in the middle of an industry bankruptcy wave, and zero otherwise. A loan that is originated after multiple bankruptcy filings by rivals in the same (four-digit Standard Industrial Classification, or SIC, code) industry in the year prior and before multiple bankruptcy filings in the year after is in the middle of an industry bankruptcy wave. Following Addoum et al. (2020), we define *LocalBankrupt* as an indicator variable that equals one if a loan is taken out within one

year after a firm located in a 50-kilometer radius surrounding the borrower filed bankruptcy, and zero otherwise.[8]

Following the literature on bank loan contracting (e.g., Graham, Li, and Qiu 2008; Hertzel and Officer 2012; Addoum et al. 2020), we control for a set of borrower- and loan-specific characteristics that are known to influence loan costs. Specifically, the borrower-specific characteristics include *Size*, *Leverage*, *MB*, *Operating CF*, *Tangibility*, *CF Volatility*, *Return Volatility*, and *Z-score*. The variable *Size* is measured as the natural logarithm of a firm's total assets. The variable *Leverage* is defined as the ratio of long-term debt to total assets. We expect *Size* (*Leverage*) to be positively (negatively) related to credit quality. The variable *MB* is the ratio of the market value of assets to the book value of assets. To the extent that *MB* proxies for a borrower's growth potential, *MB* is expected to be inversely associated with interest rates. However, growth firms often face high risk, and *MB* could thus be likely to be positively associated with interest rates. The variable *Operating CF* is the ratio of operating cash flow to average total assets. Firms better able to generate operating cash flow can generally obtain loans at lower costs. The variable *Tangibility* is the ratio of tangible assets to total assets. Borrowers with more tangible assets can usually obtain loans at lower cost, because lenders can recover tangible assets in case the borrower defaults. The variable *CF Volatility* is measured as the standard deviation of quarterly cash flows from operations over the 16 fiscal quarters prior to the loan initiation, scaled by total debt. The variable *Return Volatility* is the standard deviation of the raw returns to the borrower firm's common stock over the 252-trading day window ending the day prior to the loan origination date. The variable *Z-score* is Altman's (1968) Z-score. We expect *CF/Return Volatility* (*Z-score*) to be positively (negatively) associated with loan spreads.

The set of loan-specific characteristics includes *Log(Loan maturity)*, *Log(Loan size)*, *Secured*, *Log(NumLender)*, *Relationship Lender*, *Performance Pricing*, *Refinancing*, and *Base Prime*, where *Log(Loan maturity)* is defined as the natural logarithm of loan maturity in months, and *Log(Loan size)* is defined as the natural logarithm of the loan amount. Since banks charge lower interest rates for loans with shorter maturity and larger amounts (e.g., Graham et al. 2008), we expect a positive coefficient on *Log(Loan maturity)* and a negative coefficient on *Log(Loan size)*.

[8] In untabulated tests, we further control for potential effects associated with connections through a shared bank, a shared auditor, and a shared major customer along the supply chain, but we find no significant results. The inclusion of these connection variables does not affect our main results. Therefore, we do not include them to avoid redundancy.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

The variable *Secured* is an indicator variable equal to one if a loan facility is secured by collateral, and zero otherwise; *Log(NumLender)* is defined as the natural logarithm of the number of lenders involved in the loan*; Relationship Lender* is an indicator variable equal to one if the lead arranger of the loan was the lead arranger of a different loan for the same borrower in the three years prior to the loan origination date, and zero otherwise; *Performance pricing* is an indicator variable that equals one (zero) for loans with (without) a performance pricing provision; *Refinancing* is a dummy variable that equals one if a loan is refinancing a previous loan, and zero otherwise; and *Base Prime* is an indicator variable that equals one if the base rate for a loan is the prime rate rather than the LIBOR, and zero otherwise. In addition, we control for loan type and loan purpose effects, since loans with different types and purposes can indicate different levels of risk and are priced differently.

Finally, we include two variables to control for macroeconomic conditions that could affect loan pricing: *Credit spread,* is the difference between the yields of BAA and AAA corporate bonds measured one month before loan initiation, and *Term spread,* is the difference between the yields of 10- and two-year Treasury bonds measured one month before loan initiation.

4. Empirical Results

4.1. Summary statistics and correlation analyses

Table 1 reports summary statistics of the variables in our main regressions. All continuous variables are winsorized at 1% and 99% to mitigate the potential effect of outliers. About 8.12% (1,580) of our sample loan facilities are borrowed by interlocked firms in the period following a firm whose directors filed for bankruptcy; 4.4% of loan facilities were initiated in the middle of an industry bankruptcy wave (*MidIndBankrupt*), and 37.3% were initiated within one year after a firm located within a 50-km radius surrounding the borrower that filed for bankruptcy (*LocalBankrupt*).

With respect to the main loan-specific characteristics, an average loan has a loan spread of 194.673 bps, a size of $470.226 million, and a maturity of about 50 months. On average, a loan facility in our sample involves about nine lenders. About 49.3% of loans are secured with collateral, 48.5% involve relationship lenders, and 43.3% include performance pricing provisions.

[INSERT TABLE 1 HERE]

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 2 reports the Pearson correlation between our main variables. The variable *Log(Loan Spread)* is significantly and negatively correlated with *Treat*, suggesting that interlocked firms obtain loans at lower interests in the period following a bankruptcy filed by firms with overlapping directors, seemingly consistent with the director career concern/experience hypothesis. The variable *Log(Loan Spread)* is significantly and positively associated with both *MidIndBankrupt* and *LocalBankrupt*, suggesting industry and geographic contagion effects associated with bankruptcies, consistent with the findings in prior studies (i.e., Hertzel and Officer 2012; Addoum et al. 2020).

[INSERT TABLE 2 HERE]

4.2. Transmission channels of the bankruptcy contagion effect on loan spreads

Table 3 reports the regression results with different sets of control variables included. All regressions include firm and year fixed effects, and the *t*-values, reported in parentheses, are based on robust standard errors with clustering by both firm and year. The key variable of interest, *Treat*, is positive and statistically significant in all the regressions, with and without control variables, which indicates that interlocked borrowers experience a larger increase in loan spreads after a peer firm with common directors filed for bankruptcy. The contagion effect of a director-interlocked firm's bankruptcy on interlocked borrowers' loan spreads is economically significant as well. Based on the results in Column (4) of Table 3, where all the control variables are included, interlocked borrowers are charged 10.1% higher loan spreads following a peer firm's bankruptcy filing, all other things being equal. Given that the mean loan spread is 194.673 bps and the average loan amount is $470.226 million, as shown in Table 1, the 10.1% increase in loan spreads implies an additional annual interest payment of $924,557 per average loan. This result indicates that a firm's bankruptcy has an economically meaningful contagion effect on the cost of the loans to director-interlocked peers, after controlling for other factors.

Turning to the other transmission channels, we find that the loan spread is positively associated with both *MidIndBankrupt* and *LocalBankrupt* at significant levels, corroborating the findings on industry and local contagion effects associated with bankruptcies in prior literature (i.e., Hertzel and Officer 2012; Addoum et al. 2020). Therefore, our results suggest that common directors are a relevant transmission channel for the bankruptcy contagion effect on loan pricing, in addition to the other channels.

Regarding the control variables, the loan spread is negatively associated with *Size*, *Operating CF*, *Tangibility*, *Z-score*, *Log(Loan Size)*, *Log(NumLender)*, *Relationship Lender*, *Performance Pricing*, and *Refinancing*, and positively associated with *Leverage*, *Return Volatility*, *Log(Loan Maturity)*, *Secured*, and *Term Spread*. These results are broadly consistent with those documented in the previous bank loan literature (e.g., Graham et al. 2008; Kim, Song, and Zhang 2011; Hertzel and Officer 2012; Lin et al. 2016; Addoum et al. 2020).

Given that common directors are a relevant channel of the bankruptcy contagion effect, we next investigate three possible underlying mechanisms through which common directors could transmit the shocks, namely, the director reputation loss hypothesis, the director distraction hypothesis, and the director career/experience hypothesis.

[INSERT TABLE 3 HERE]

4.3. Three potential mechanisms underlying the bankruptcy contagion effect via overlapping directors on loan pricing

In this section, we examine how or why common directors matter for the bankruptcy contagion effect. Our main findings in Table 3, that a firm's bankruptcy incurs a negative contagion effect on the loan pricing of its director-interlocked firms, are consistent with the director reputation loss hypothesis and the director distraction hypothesis, but contradict the director career concern/experience hypothesis. Therefore, we conduct tests to investigate whether the director reputation loss or director distraction hypothesis drives our main findings.

The director distraction hypothesis proposes that overlapping directors would shift their limited attention away from other directorships to a bankrupt firm after it has filed for bankruptcy. If this hypothesis is true, we predict the previously observed contagion effect will be stronger for those overlapping directors who hold more directorships, and weaker for those who lose directorships following bankruptcy. We conduct two tests to examine this prediction.

The first test decomposes the variable *Treat* into two dummies, *Treat_Busy* and *Treat_Nobusy*, denoting whether the overlapping director is a busy director or not, respectively. Following prior literature (e.g., Fich and Shivdasani 2006; Field et al. 2013), we define a busy director as a director who sits on the boards of three or more firms. Specifically, *Treat_Busy* equals one if a loan is initiated by a borrowing firm that shares busy directors with a bankrupt firm in the period following the bankruptcy filing, and zero otherwise. The variable *Treat_Nobusy* equals one if a loan is

initiated by a borrowing firm interlocked with a bankrupt firm, but not via busy directors, in the period following the bankruptcy filing, and zero otherwise. The variable *Treat_Busy* has a mean value of 2.89%, and *Treat_Nobusy* has a mean value of 5.23%. We then estimate equation (1), with *Treat_Busy* and *Treat_Nobusy* in place of *Treat*. Column (1) in Table 4 reports the results. It shows that both *Treat_Busy* and *Treat_Nobusy* are significantly positive and of similar magnitude (i.e., not significantly different), suggesting that the contagion effect of a firm's bankruptcy is not affected by the busyness of overlapping directors.

[INSERT TABLE 4 HERE]

Our second test decomposes the variable *Treat* into two dummies, *Treat_Loss* and *Treat_Noloss*, in terms of whether the overlapping director loses any directorships following a bankruptcy filing. The variable *Treat_Loss* equals one if a loan is initiated in the post-bankruptcy period by an interlocked firm whose overlapping director loses a directorship at the bankrupt or other firm following the bankruptcy filing, and zero otherwise, and *Treat_Noloss* equals one if a loan is initiated in the post-bankruptcy period by an interlocked firm whose overlapping director does not lose a directorship following the bankruptcy filing, and zero otherwise. The variable *Treat_Loss* has a mean value of 3.81%, and *Treat_Noloss* has a mean value of 4.31%. We then estimate equation (1) with *Treat_Loss* and *Treat_Noloss* in place of *Treat*. Column (2) in Table 4 reports the results. It shows that both *Treat_Loss* and *Treat_Noloss* are significantly positive and not significantly different in magnitude, suggesting that the decrease in the number of directorships held by the overlapping director does not influence the contagion effect of a firm's bankruptcy in the bank loan market. Altogether, the results in Table 4 indicate that the contagion effect of a firm's bankruptcy does not vary with the busyness of the overlapping directors, thus not supporting the prediction of the director distraction hypothesis. Therefore, our analyses in Tables 3 and 4 leave director reputation loss as the most plausible mechanism underlying the bankruptcy contagion effect on loan pricing. We conduct a series of cross-sectional analyses in Sections 4.5 to 4.9 to strengthen this evidence.

4.4. Endogeneity issues

Our DiD analyses in Table 3 indicate that a firm's bankruptcy induces a contagion effect via overlapping directors in the bank loan market. One could be concerned that the matching between

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

firms and directors is not random and that firms with common directors could have similar risk profiles. Omitted factors that drive a firm's bankruptcy could negatively affect its director-interlocked firms as well. Although our inclusion of firm fixed effects can control for the effects of any time-invariant firm characteristics, time-varying factors could still be driving our results. We carry out the following tests to address these endogeneity concerns.

First, we perform a test to examine the dynamic contagion effect of a firm's bankruptcy via overlapping directors. If a firm's bankruptcy is the outcome of preexisting common shocks that also hit director-interlocked firms as well, we should observe a negative effect on the loans to the interlocked firms already before the bankruptcy was filed. To investigate this issue, we replace the variable *Treat* with a set of dummies indicating the time interval between loan initiation and firm bankruptcy filings. Following the spirit of the research design of Bertrand and Mullainathan (2003) and Giroud (2013), we create seven indicators: *Treat_Prioryr1*, *Treat_Prioryr2*, and *Treat_Prioryr3* equal one if a loan is initiated by a director-interlocked firm within the first, second, and third year, respectively, prior to a firm's bankruptcy filing, and zero otherwise; *Treat_Postyr1*, *Treat_Postyr2*, and *Treat_Postyr3* equal one if a loan is initiated by a director-interlocked firm within the first, second, or third year, respectively, following a firm's bankruptcy filing, and zero otherwise; and *Treat_Postyr3+* equals one if a loan is initiated by a director-interlocked firm after the third year following a firm's bankruptcy filing, and zero otherwise.

[INSERT TABLE 5 HERE]

We include these seven dummies in place of *Treat* and re-estimate the regression in Column (4) of Table 3. Table 5 report the main results. As is shown, *Treat_Prioryr1*, *Treat_Prioryr2*, and *Treat_Prioryr3* are small in magnitude and insignificant, suggesting no preexisting trends. In contrast, the coefficients of *Treat_Postyr1*, *Treat_Postyr2*, and *Treat_Postyr3* are 0.157, 0.129, and 0.106, respectively, and all are statistically significant, which suggests that the contagion effect of a firm's bankruptcy emerges only after the bankruptcy is filed. It is interesting to note that the coefficients monotonically decrease over time after the bankruptcy filing. The coefficient of *Treat_Postyr3+* becomes smaller (0.075) and insignificant, suggesting that the contagion effect becomes minimal after the third year following the bankruptcy filing. In sum, these results on dynamic effects support that our main findings are not driven by preexisting common shocks to either bankrupt firms or their director-interlocked borrowers.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Second, we draw upon Zhang (2021) and conduct two falsification tests to further address concerns that our main findings could be confounded by endogenous firm–director matching based on unobservable characteristics. Our first falsification test investigates borrowing firms that share directors with bankrupt firms only before bankruptcy filings. Specifically, we define the variable *Pseudo Treat* as an indicator that equals one for loans initiated by these previously interlocked firms during the five-year period after bankruptcy filings, and zero otherwise. The variable *Pseudo Treat* has a mean value of 6.18%. We then estimate equation (1) with *Pseudo Treat* in place of *Treat*. Column (1) of Table 6 reports the results. It shows that *Pseudo Treat* is statistically insignificant, providing no evidence that previously interlocked firms are charged higher loan spreads following a firm's bankruptcy filing.

Outside directors could anticipate adverse firm events and step down ahead of negative events to protect their reputation (Dou 2017; Fahlenbrach, Low, and Stulz 2017). We thus investigate whether borrowers suffer an increase in loan spreads following bankruptcy filings if then-overlapping directors left the bankrupt firms within three years before bankruptcy filings.[9] Specifically, we further decompose the variable *Pseudo Treat* into two dummies, *Pseudo Treat_Leftbk* and *Pseudo Treat_Other*, in terms of whether then-overlapping directors left the bankrupt firms within three years before bankruptcy filings. The variable *Pseudo Treat_Leftbk* equals one for loans initiated by previously interlocked firms that ceased to be connected with bankrupt firms because then-overlapping directors left the bankrupt firms before bankruptcy filings or during the five-year period after bankruptcy filings, and zero otherwise. The variable *Pseudo Treat_Other* equals one for loans initiated by previously interlocked firms that ceased to be connected with bankrupt firms not because then-overlapping directors left the bankrupt firms before bankruptcy filings or during the five-year period after bankruptcy filings, and zero otherwise. The variable *Pseudo Treat_Leftbk* has a mean value of 4.04%, and *Pseudo Treat_Other* has a mean value of 2.14%. The results in Column (2) of Table 6 show that both *Pseudo Treat_Leftbk* and *Pseudo Treat_Other* are statistically insignificant, although positive. These results imply that bank lenders do not charge higher interest rates if overlapping directors leave the board of bankrupt firms prior to bankruptcy filings.[10]

[9] We find similar results when restricting the period to two years or one year before bankruptcy filings.

[10] Our findings seem inconsistent with Dou (2017) that directors who leave shortly before negative events suffer labor market penalties as well, though smaller in magnitude than directors who stay through the events experience. One possible explanation of our finding might be that the directors who leave shortly before negative events care more

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

[INSERT TABLE 6 HERE]

Our second falsification test investigates borrowing firms that were not director interlocked with bankrupt firms but with firms that shared at least one director with bankrupt firms when the bankruptcy was filed. We label these borrowing firms as indirectly interlocked firms. Similarly, we define the variable *Pseudo Treat* as an indicator that equals one for loans initiated by these indirectly interlocked firms during the five-year period after bankruptcy filings, and zero otherwise. The variable *Pseudo Treat* has a mean value of 10.24%. We then estimate equation (1) with *Pseudo Treat* in place of *Treat*. Column (3) in Table 6 reports the results. It shows that *Pseudo Treat* is statistically insignificant, providing no evidence that indirectly interlocked firms are charged with higher loan spreads following a firm's bankruptcy filing. Taken together, our two falsification tests mitigate concerns that our findings are mainly driven by endogenous firm–director matching based on unobservable characteristics.

4.5. Director importance and the effect of a director's reputation loss on loan spreads

So far, our analyses show that common directors are a relevant transmission channel for the bankruptcy contagion effect, in addition to other channels in the literature, and that director reputation loss is a mechanism through which overlapping directors transmit the adverse shocks in the bank loan market. We conduct several cross-sectional tests to strengthen the evidence of reputation loss as a mechanism.

Directors do not play an equal governance role in making corporate decisions, and those perceived to be more influential and directly responsible for corporate failures will suffer a greater degree of reputation loss when bankruptcy is filed. Consequently, an influential director's engagement in a bankruptcy could exacerbate bank lenders' downward adjustment of interlocked borrowers' creditworthiness and raise deeper concerns about the impairment of the interlocked board's legitimacy to secure support from outside parties. To test this prediction, we conduct the following tests by capturing the overlapping director's influence in different ways.

First, the CEO, at the very top of corporate leadership, is well recognized as playing the key role in determining firm operations and performance (e.g., Bertrand and Schoar 2003), whereas

about their reputation than those who stay, and in turn devote additional monitoring efforts to their remaining directorships to avoid negative events in those firms.

the board chair is endowed with the central responsibility of running board meetings and overseeing the process of hiring, firing, evaluating, and disciplining the top management team (Jensen 1993). Both the CEO and board chair are inevitably held more accountable for corporate failures (Gilson 1990; Eckbo, Thorburn, and Wang 2016). Therefore, we decompose the variable *Treat* into two dummies, *Treat_CEOChair* and *Treat_NCEOChair*, in terms of whether the overlapping director involved in bankruptcy is the CEO or the board chair of the bankrupt firm (the interlocked borrower). Based on the position in the bankrupt firms (interlocked borrowers), the variable *Treat_CEOChair* has a mean value of 2.90% (2.45%), and *Treat_NCEOChair* has a mean value of 5.22% (5.67%). We then estimate equation (1) with *Treat_CEOChair* and *Treat_NCEOChair* in place of *Treat*.

[INSERT TABLE 7 HERE]

Columns (1) and (2) in Table 7 report the results for the effect of the overlapping director's position in bankrupt firms and interlocked borrowers, respectively. In both regressions, *Treat_CEOChair* and *Treat_NCEOChair* are positive and statistically significant. However, *Treat_CEOChair* is significantly larger (more than double) than *Treat_NCEOChair* in both regressions, as indicated by their *F*-values. These results suggest that the adverse effect of a director's reputation loss by another firm's bankruptcy on loan spreads is more pronounced when the overlapping director serves as the CEO or board chair in either the bankrupt firm or an interlocked borrower.

Second, directors with longer tenure are believed to wield greater influence on board monitoring effectiveness (e.g., Fields et al. 2012). The reputation of overlapping directors with longer tenure would thus be damaged to a greater degree when they are involved in bankruptcy events. We decompose the variable *Treat* into two dummies, *Treat_LTenure* and *Treat_STenure*, in terms of whether the tenure of the reputation-tarnished director in the bankrupt firm (interlocked borrower) is longer than the sample median. Based on the director's tenure in the bankrupt firms (interlocked borrowers), the variable *Treat_ LTenure* has a mean value of 4.09% (3.87%) and *Treat_ STenure* has a mean value of 4.03% (4.25%). We then estimate equation (1) with *Treat_LTenure* and *Treat_STenure* in place of *Treat*.

Panel A of Table 8 reports the results, with Columns (1) and (2) showing the results based on directors' tenure in bankrupt firms and interlocked borrowers, respectively. In both regressions,

Treat_LTenure is positive and statistically significant, but *Treat_STenure* is statistically insignificant, though positive. These results suggest that the adverse effect of a director's reputation loss by another firm's bankruptcy is mostly driven by overlapping directors with longer tenure who have greater influence over the board.

[INSERT TABLE 8 HERE]

Third, each director could have greater say over smaller boards and, in turn, exert greater influence over corporate policies. The reputation of overlapping directors on smaller boards would thus be damaged to a greater degree when involved in bankruptcy events (e.g., Stain and Zhao 2019). Additionally, Fields et al. (2012) find that bank lenders view larger boards positively in terms of their appraisal of the borrower's credit risk. Therefore, larger boards could also mitigate the bankruptcy contagion effect via overlapping directors in the bank loan market. To test this prediction, we decompose the variable *Treat* into two dummies, *Treat_LBoard* and *Treat_SBoard*, in terms of whether the board size of the bankrupt firm (interlocked borrower) is larger than the sample median. Based on the board's size of the bankrupt firms (interlocked borrowers), the variable *Treat_ LBoard* has a mean value of 3.50% (3.43%) and *Treat_ SBoard* has a mean value of 4.62% (4.69%). We then estimate equation (1) with *Treat_LBoard* and *Treat_SBoard* in place of *Treat*.

Panel B of Table 8 reports the results, with Columns (1) and (2) based on the board size of bankrupt firms and interlocked borrowers, respectively. In both regressions, *Treat_SBoard* is positive and statistically significant, but *Treat_LBoard* is statistically insignificant, though positive. These results suggest that the adverse effect of a director's reputation loss by another firm's bankruptcy on loan spreads is mostly driven by overlapping directors on smaller boards where they have a greater influence.

4.6. Board quality and the effect of director reputation loss on loan spreads

Prior literature documents that board quality plays an important role in debt contracting with bank lenders (e.g., Fields et al. 2012). Boards of higher quality could mitigate the adverse impact of board members' reputation loss on loan pricing. To examine this possibility, we proxy for board quality using three board characteristics, that is, board independence (the number of independent directors divided by the total number of board members), board diversity (the number of female

directors divided by the total number of board members), and the presence of bank-affiliated directors, respectively. Fields et al. (2012) find that boards with greater independence and diversity are negatively associated with the overall costs of bank loans, whereas Sisli-Ciamarra (2012) shows that the presence of bank-affiliated directors on the board reduces loan costs.

An interlocked borrower's board is thus classified as being of higher quality if its independence/diversity is above the sample median and if includes a bank-affiliated director.[11] We then decompose the variable *Treat* into two dummies, *Treat_HQBoard* and *Treat_LQBoard*, in terms of whether the interlocked borrower has a higher-quality board and estimate equation (1) with *Treat_HQBoard* and *Treat_LQBoard* in place of *Treat*. The variables *Treat_HQBoard* and *Treat_LQBoard* have means of 3.61% and 4.51, 3.99% and 4.13, and 3.73% and 4.39%, respectively, in terms of board independence, board diversity, and the presence of a bank-affiliated director.

[INSERT TABLE 9 HERE]

Table 9 reports the results, with those in Column (1) based on board independence, those in Column (2) based on board diversity, and those in Column (3) based on the presence of bank-affiliated directors. Both *Treat_HQBoard* and *Treat_LQBoard* are positive and statistically significant in both Columns (1) and (2). Moreover, *Treat_HQBoard* is significantly smaller than *Treat_LQBoard* in both regressions, as indicated by the *F*-values. In Column (3), based on the presence of bank-affiliated directors, *Treat_LQBoard* is positive and statistically significant, and *Treat_HQBoard* remains positive but statistically insignificant. Altogether, the results in Table 9 suggest that the contagion effect of a firm's bankruptcy via overlapping directors can be mitigated by the board quality of the interlocked borrowers.

5. Robustness Tests

5.1. Impact of director turnover

Prior research demonstrates that interlocked firms likely dismiss reputation-compromised directors to distance themselves from those financially distressed firms (Ang and Chua 1981; Gilson 1990). In this section, we examine whether the adverse contagion impact on loan

[11] We collect data on bank-affiliated directors from the proxy statements filed by the interlocked firms on the SEC EDGAR website.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

contracting disappears after a reputation-compromised director leaves the board of interlocked borrowers. We decompose the variable *Treat* into two dummies, *Treat_NoDepart* and *Treat_Depart*, in terms of whether the overlapping director has left the interlocked borrower when a loan is initiated after bankruptcy filing. The variable *Treat_NoDepart* equals one if the overlapping director remains on the board of the interlocked borrower when a loan is initiated in the period after bankruptcy filing, and zero otherwise; *Treat_Depart* equals one if the overlapping director has left the board of the interlocked borrower when a loan is initiated in the period after bankruptcy filing, and zero otherwise. The variable *Treat_NoDepart* has a mean value of 5.40%, and *Treat_Depart* has a mean value of 2.72%. We then estimate equation (1) with *Treat_NoDepart* and *Treat_Depart* in place of *Treat*.

Table 10 reports the results. Both *Treat_NoDepart* and *Treat_Depart* are positive and statistically significant. However, the magnitude of *Treat_Depart* is about a half that of *Treat_NoDepart*, and the difference between the two variables is statistically significant, as indicated by *F*-values. This suggests that the departure of a reputation-tainted director can to some extent but not fully counteract the adverse contagion effect on the loan cost of interlocked borrowers.[12]

[INSERT TABLE 10 HERE]

5.2. Other robustness tests

To ensure the robustness of our main results, we conduct additional tests and report the results in Table 11. First, various loan contract terms can be chosen simultaneously (Dennis, Nandy, and Sharpe 2000; Bharath et al. 2011). The joint determination of loan terms could confound our main findings on loan spreads. To address this concern, we follow Lin et al. (2016) and adopt an instrumental variable framework to estimate a system of three equations where the three key terms, that is, the loan spread, maturity, and collateral requirement, are jointly determined. We assume that the loan spread is affected by the maturity and collateral requirement, but not vice versa, and that the maturity and collateral requirement are jointly determined, since non-price terms are

[12] One possible explanation could be that the departure of an overlapping director could foretell future bad events, as shown by Fahlenbrach et al. (2017). These authors find that the market infers bad news from surprise director departures. Then, bank lenders could raise concerns about bad news associated with a director's departure and charge higher interest rates.

normally determined before the loan interest rate is set (Dennis et al. 2000; Ivashina 2009; Bharath et al. 2011). Specifically, we follow Bharath et al. (2011) and employ *Default Spread*, defined as the difference between the yields on Moody's seasoned corporate bonds with a BAA rating and 10-year US government bonds, to instrument *Log(Loan Spread)*. Following prior literature (i.e., Bharath et al. 2008; Graham et al. 2008), we use asset maturity (*Asset Maturity*) to instrument loan maturity, and loan concentration (*LoanConc*) to instrument the collateral requirement.[13,14] We then estimate the three-equation structural models as follows:

$$Log(Loan\ Spread) = \gamma_A Treat + \gamma_{AS} Secured + \gamma_{AM} Log(Loan\ Maturity) + \delta_A Default\ Spread + \beta_A X_A + \varepsilon_A$$

$$Log(Loan\ Maturity) = \gamma_M Treat + \gamma_{MS} Secured + \delta_M Asset\ Maturity + \beta_M X_M + \varepsilon_M$$

$$Secured = \gamma_S Treat + \gamma_{SM} Log(Loan\ Maturity) + \delta_S LoanConc + \beta_S X_S + \varepsilon_S$$

where γ_{ij} are the coefficients of the interdependence effects of loan terms, and X_k are the exogenous variables that affect the *k*th dependent variable, which include the set of control variables used in equation (1). Since *Secured* is a discrete choice variable in the *Log(Loan Spread)* and *Log(Loan Maturity)* equations, we follow Wooldridge (2002) and use the fitted value from a logit model as an instrument for *Secured* in the instrumental variable estimations. Column (1) of Table 11 reports the result for *Log(Loan Spread)* as the dependent variable and shows that *Treat* remains significantly positive, although its magnitude decreases slightly.

[INSERT TABLE 11 HERE]

Second, we apply a propensity score matching approach and construct a matched sample for loans initiated by interlocked borrowers that share directors with bankrupt firms. Specifically, we use the set of borrower-specific characteristics in equation (1) as matching criteria. The control firms are matched to interlocked firms based on the matching criteria measured the year prior to a bankruptcy filing, to avoid the endogenous selection of any variables. We also require that the treatment and control firms belong to the same industry and that the control firms neither filed for bankruptcy nor had a director who ever sat on the board of any bankrupt firm during the sample

[13] Following prior literature (e.g., Bharath et al. 2008; Graham et al. 2008), we define *Asset Maturity* as the book value–weighted maturity of long-term and current assets, where the maturity of long-term assets is computed as gross property, plant, and equipment divided by depreciation expenses, and the maturity of current assets is computed as current assets divided by the cost of goods sold. In other words, asset maturity = [PPE/(CA + PPE)]*[PPE/Depreciation] + [CA/(CA + PPE)]*[CA/COGS], where PPE is gross property, plant, and equipment, CA is current assets, and COGS is the cost of goods sold.

[14] Following Bharath et al. (2011) and Lin et al. (2016), we define *LoanConc* as the deal amount divided by the sum of the deal amount and the borrower's total liabilities in the fiscal year prior to loan initiation, since collateral requirements are usually imposed at the deal level rather than at the facility level.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

period. We then estimate propensity scores using a probit model where the dependent variable is an indicator of whether a firm is board interlocked to the bankrupt firms or not, and the explanatory variables include all the matching variables, with industry and year fixed effects. We identify control firms based on propensity scores using nearest neighbor matching with a caliper of 0.01. We obtain a matched sample consisting of 5,707 loan facilities, 2,883 of which were initiated by interlocked borrowers and 2,824 by the control firms. Similarly, we define *Treat* as a dummy variable that equals one if a loan was taken out by a treatment firm during the period after its board-interlocked peer filed bankruptcy, and zero otherwise. The regression results using this matched sample are presented in Column (2) in Table 11. It shows that *Treat* remains positive and statistically significant.

Third, we conduct robustness tests using alternative samples. External auditors develop their own unique style of interpreting and implementing accounting and auditing rules (Kothari, Ramanna, Skinner 2010), and firms audited by a common auditor tend to have more comparable financial statements (Francis, Pinnuck, Watanabe 2014). Given the important role of financial reporting in debt contracting (Armstrong, Guay, and Weber 2010), our main findings could be affected by interlocked borrowers that share both directors and auditors with the bankrupt firms. To rule out this possibility, we re-estimate equation (1) by excluding interlocked borrowers that share an auditor with bankrupt firms. We find that our results remain qualitatively unchanged, as shown in Column (3) of Table 11. Although we include *MidIndBankrupt* to control for a bankruptcy industry contagion effect (e.g., Hertzel and Officer 2012), we further conduct a test by excluding interlocked borrowers operating in the same one-digit SIC code industry as their bankrupt peers and find similar results, as shown in Column (4).

Finally, we conduct a test by further including state–year and industry–year fixed effects to control for any potential local and industry varying shocks, respectively. Our results continue to hold, as shown in Column (5). To further examine whether the bankruptcy contagion effect via overlapping directors is also affected by industry- or macro-level shocks, we estimate equation (1) by additionally including the interactions between our key explanatory variable, *Treat*, and the industry bankruptcy wave variable, *MidIndBankrupt*, and the local bankruptcy variable, *LocalBankrupt*. Untabulated results show that neither of the interaction variables is statistically significant, suggesting that the bankruptcy contagion effect via overlapping directors does not vary

with industry- or local-level shocks. These results suggest that the negative bankruptcy contagion effects mostly derive from firm-level driven bankruptcy than industry- or local-level shocks.

6. Conclusions

A firm's bankruptcy has been found to have a contagion effect on economically linked firms, such as industry competitors and local peers, in the bank loan market. Firms in the United States are commonly connected by sharing directors on their boards. This study investigates whether common directors are a relevant transmission channel for the bankruptcy contagion effect on loan pricing and, if so, what is the mechanism through which common directors transmit the shock. How a firm's bankruptcy affects the costs of loans to director-interlocked firms is a priori unclear. On the one hand, a firm's bankruptcy, as a significant negative event, could damage overlapping directors' reputation (i.e., the reputation loss hypothesis) or distract their attention away from interlocked firms, impairing these firms' board monitoring effectiveness (i.e., the distraction hypothesis) and, in turn, adversely affecting bank financing costs. On the other hand, a firm's bankruptcy could motivate overlapping directors to improve their monitoring over other, interlocked firms to avoid another bankruptcy, and they might gain useful experience and skills that can reduce future distress risk at interlocked firms (i.e., the career concern/experience hypothesis). The increased monitoring efforts and useful skills gained can reduce the costs of bank loans.

Our study finds that firms are charged higher loan spreads in the period following director-interlocked firms' bankruptcy filings and that common directors are a relevant channel for the bankruptcy contagion effect on loan pricing, in addition to other channels found in the literature. We also report that this negative contagion effect via overlapping directors in the bank loan market is most likely induced by the damage that corporate bankruptcy causes to directors' reputation, and not by the director distraction or career/experience mechanism. Further cross-sectional analyses show that the adverse contagion impact on loan spreads is more pronounced when reputation-tainted directors have greater influence over corporate policies in either the bankrupt firm or interlocked borrowers. In contrast, the adverse contagion impact is mitigated when interlocked firms have a higher-quality board. These tests help strengthen the support of the reputation loss as the dominant mechanism underlying the contagion effect on loan pricing. Our

dynamic tests and falsification tests suggest that our results are robust to endogeneity and establish causality.

To the best of our knowledge, this is the first study to investigate the bankruptcy contagion effect via overlapping directors in the bank loan market. We extend the literature on the transmission channels of financial contagion in the capital market and the literature on the economic consequences of board directors' involvement in negative events. Importantly, we differentiate three alternative mechanisms for the contagion effect and reveal that a director's reputation loss induced by involvement in bankruptcy events is the most likely mechanism. Our study sheds light on the role played by common directors and director reputation as a mechanism through which common directors transmit the shock in the bank loan market.

References

Addoum, J., Kumar, A., Le, N., Niessen-Ruenzi, A., 2020. Local bankruptcy and geographic contagion in the bank loan market. *Review of Finance* 24, 997–1037.

Altman, E.I., 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance* 23, 589–609.

Anderson, R., Mansi, S., Reeb, D., 2004. Board characteristics, accounting report integrity, and the cost of debt. *Journal of Accounting and Economics* 37, 315–342.

Ang, J.S., Chua, J.H., 1981. Corporate bankruptcy and job losses among top level managers. *Financial Management* 10 (5), 70–74.

Armstrong, C., Guay, W., Weber, J., 2010. The role of information and financial reporting in corporate governance and debt contracting. *Journal of Accounting and Economics* 50, 179–234.

Arthaud-Day, M.L., Certo, S.T., Dalton, C.M., Dalton, D.R., 2006. A changing of the guard: Executive and director turnover following corporate financial restatements. *Academy of Management Journal* 49, 1119–1136.

Ashbaugh-Skaife, H., Collins, D., LaFond, R., 2006. The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics* 42, 203–243.

Bertrand, M., Mullainathan, S., 2003. Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy* 111, 1043–1075.

Bertrand, M., Schoar, A., 2003. Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics* 118 (4), 1169–1208.

Bharath, S.T., Dahiya, S., Saunders, A., Srinivasan, A., 2011. Lending relationships and loan contract terms. *Review of Financial Studies* 24 (4), 1141–1203.

Bharath, S.T., Sunder, J., Sunder, S.V., 2008. Accounting quality and debt contracting. *The Accounting Review* 83 (1), 1–28.

Bizjak, J., Lemmon, M., Whitby, R., 2009. Option backdating and board interlocks. *Review of Financial Studies* 22, 4821–4847.

Boone, A.L., Ivanov, V.I., 2012. Bankruptcy spillover effects on strategic alliance partners. *Journal of Financial Economics* 103, 551–569.

Bouwman, C., 2011. Corporate governance propagation through overlapping directors. *Review of Financial Studies* 24, 2358–2394.

Brochet, S., Srinivasan, S., 2014. Accountability of independent directors: Evidence from firms subject to securities litigation. *Journal of Financial Economics* 111, 430–449.

Brown, J.L., 2011. The spread of aggressive corporate tax reporting: A detailed examination of the corporate-owned life insurance shelter. *The Accounting Review* 86, 23–57.

Brown, A.B., Dai, J., Zur, E., 2019. Too busy or well-connected? Evidence from a shock to multiple directorships. *The Accounting Review* 94 (2): 83–104.

Cai, Y., Dhaliwal, D.S., Kim, Y., Pan, C., 2014. Board interlocks and the diffusion of disclosure policy. *Review of Accounting Studies* 19, 1086–1119.

Cai, J., Garner, J.L., Walkling, R.A., 2009. Electing directors. *Journal of Finance* 64 (5), 2389–2421.

Chiu, P.-C., Teoh, S.H., Tian, F., 2013. Board interlocks and earnings management contagion. *The Accounting Review* 88, 915–944.

Cowen, A.P., Marcel, J.J., 2011. Damaged goods: Board decisions to dismiss reputationally compromised directors. *Academy of Management Journal* 54, 509–527.

Dennis, S., Nandy, D., Sharpe, I., 2000. The determinants of contract terms in bank revolving credit agreements. *The Journal of Financial and Quantitative Analysis* 35, 87–110.

Dou, Y., 2017. Leaving before bad times: Does the labor market penalize preemptive director resignations? *Journal of Accounting and Economics* 63 (2), 161–178.

Eckbo, B., Thorburn, K., Wang, W., 2016. How costly is corporate bankruptcy for the CEO? *Journal of Financial Economics* 121 (1), 210–229.

Fahlenbrach, R., Low, A., Stulz, R., 2017. Do independent director departures predict future bad events?" *Review of Financial Studies* 30, 2313–2358.

Falato, A., Kadyrzhanova, D., Lel, U., 2014. Distracted directors: Does board busyness hurt shareholder value? *Journal of Financial Economics* 113, 404–426.

Fama, E.F., Jensen, M., 1983. Separation of ownership and control. *Journal of Law and Economics* 26, 301–325.

Ferris, S., Jagannathan, M., Pritchard, A., 2003. Too busy to mind the business? monitoring by directors with multiple board appointments. *Journal of Finance* 58, 1087–1111.

Fich, E.M., Shivdasani, A., 2006. Are busy boards effective monitors? *Journal of Finance* 61, 689–724.

Fich, E.M., Shivdasani, A., 2007. Financial fraud, director reputation, and shareholder wealth. *Journal of Financial Economics* 86, 306–336.

Field, L., Lowry, M., Mkrtchyan, A., 2013. Are busy boards detrimental? *Journal of Financial Economics* 109, 63–82.

Fields, L.P., Fraser, D.R., Subrahmanyam, A., 2012. Board quality and the cost of debt capital: The case of bank loans. *Journal of Banking & Finance* 36, 1536–1547.

Foroughi, P., Marcus, A., Nguyen, V., Tehranian, H., 2021. Peer effects in corporate governance practices: Evidence from universal demand laws. *Review of Financial Studies*, forthcoming.

Francis, J.R., Pinnuck, M., Watanabe, O., 2014. Auditor style and financial statement comparability. *The Accounting Review* 89, 605–633.

Gilson, S.C., 1989. Management turnover and financial distress. *Journal of Financial Economics* 25, 241–262.

Gilson, S.C., 1990. Bankruptcy, boards, banks, and blockholders: Evidence on changes in corporate ownership and control when firms default. *Journal of Financial Economics* 27, 355–387.

Giroud, X., 2013. Proximity and investment: Evidence from plant-level data. *Quarterly Journal of Economics* 128, 861–915.

Gow, I.D., Wahid, A.S., Yu, G., 2018. Managing reputation: Evidence from biographies of corporate directors. *Journal of Accounting and Economics* 66, 448–469.

Graham, J.R., Li, S., Qiu, J., 2008. Corporate misreporting and bank loan contracting. *Journal of Financial Economics* 89 (1), 44–61.

Hertzel, M.G., Li, Z., Officer, M.S., Rodgers, K., 2008. Inter-firm linkages and the wealth effects of financial distress along the supply chain, *Journal of Financial Economics* 87, 374–387.

Hertzel, M.G., Officer, M.S., 2012. Industry contagion in loan spreads. *Journal of Financial Economics* 103, 493–506.

Houston, J.F., Jiang, L., Lin, C., Ma, Y., 2014. Political connections and the cost of bank loans. *Journal of Accounting Research* 52, 193–243.

Houston, J.F., Lin, C., Zhu, Z., 2016. The financial implications of supply chain changes. *Management Science* 62, 2520–2542.

Huang, H., Lobo, G., Wang, C., Zhou, J., 2018. Do banks price independent directors' attention? *Journal of Financial Quantitative Analysis* 53, 1755–1780.

Ivashina, V., 2009. Asymmetric information effects on loan spreads. *Journal of Financial Economics* 92, 300–319.

Jensen, M., 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance* 48, 831–880.

Jiang, W., Wan, H., Zhao, S., 2016. Reputation concerns of independent directors: Evidence from individual director voting. *Review of Financial Studies* 29, 655–696.

Jorion, P., Zhang, G., 2007. Good and bad credit contagion: Evidence from credit default swaps. *Journal of Financial Economics* 84, 860–881.

Jorion, P., Zhang, G., 2009. Credit contagion from counterparty risk. *Journal of Finance* 64, 2053–2087.

Kim, J.-B., Song, B.Y., Zhang, L., 2011. Internal control weakness and bank loan contracting: Evidence from SOX Section 404 disclosures. *The Accounting Review* 86 (4), 1157–1188.

Kothari, S.P., Ramanna, K., Skinner, D.J., 2010. Implications for GAAP from an analysis of positive research in accounting. *Journal of Accounting and Economics* 50, 246–286.

Lang, L., Stulz, R., 1992. Contagion and competitive intra-industry effects of bankruptcy announcements, *Journal of Financial Economics* 32, 45–60.

Levit, D., Malenko, N., 2016. The labor market for directors and externalities in corporate governance. *Journal of Finance* 71, 775–808.

Lin, Z., Song, B.Y., Tian, Z., 2016. Does director-level reputation matter? Evidence from bank loan contracting. *Journal of Banking and Finance* 70, 160–176.

Masulis, R.W., Mobbs, S., 2014. Independent director incentives: Where do talented directors spend their limited time and energy? *Journal of Financial Economics* 111, 406–429.

Masulis, R.W., Mobbs, S., 2017. Independent director reputation incentives: The supply of monitoring services. Working paper, SSRN.

Reppenhagen, D.A., 2010. Contagion of accounting methods evidence from stock option expensing. *Review of Accounting Studies* 15, 629–657.

Sisli-Ciamarra, E., 2012. Monitoring by affiliated bankers on board of directors: Evidence from corporate financing outcomes. *Financial Management* 41, 665–702.

Srinivasan, S., 2005. Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. *Journal of Accounting Research* 43, 291–334.

Stain, L.C.D., Zhao, H., 2019. Independent executive directors: How distraction affects their advisory and monitoring roles. *Journal of Corporate Finance* 56, 199–223.

Wooldridge, J.M., 2002. *Econometric analysis of cross section and panel data*. MIT Press, Cambridge, MA.

Zhang, S., 2021. Directors' career concerns: Evidence from proxy contests and board interlocks. *Journal of Financial Economics* 140, 894–915.

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 1 Summary statistics

This table reports summary statistics for the main variables in the empirical tests. The variable *Treat* is a dummy variable that equals one if a loan is taken out by a firm after a board-interlocked peer filed bankruptcy, and zero otherwise; *MidIndBankrupt* is a dummy variable that equals one if a loan is taken out in the middle of an industry bankruptcy wave, and zero otherwise; *LocalBankrupt* is a dummy variable that equals one if a loan is taken out within one year after a firm located within a 50-km radius surrounding the borrower filed bankruptcy, and zero otherwise; *Loan Spread* is the all in drawn spread, measured as the amount the borrower pays in bps over the LIBOR or the LIBOR equivalent (prime-based spreads are converted into LIBOR-equivalent spreads) for each dollar drawn down; *Log(Loan Spread)* is defined as the natural logarithm of *Loan Spread*; *Loan Maturity* is the number of months between the loan initiation date and the maturity date; *Log(Loan Maturity)* is defined as the natural logarithm of *Loan Maturity*; *Loan size* is the loan amount, measured in millions of dollars; *Log(Loan Size)* is defined as the natural logarithm of *Loan Size*; *Secured* is an indicator variable equal to one if a loan facility is secured by collateral, and zero otherwise; *NumLender* is the number of lenders involved in a loan; *Log(NumLender)* is defined as the natural logarithm of *NumLender*; *Relationship Lender* is an indicator variable equal to one if the lead arranger of the loan is the lead arranger of a different loan for the same borrower in the three years prior to the loan origination date, and zero otherwise; *Performance pricing* is an indicator variable equal to one if a loan involves a performance pricing feature, and zero otherwise; *Refinancing* is an indicator variable equal to one if the loan is refinancing a previous loan, and zero otherwise; *Base Prime* is an indicator variable equal to one if the base rate for the loan is the prime rate rather than the LIBOR, and zero otherwise; *Size* is the natural logarithm of total assets; *MB* is the market value of equity plus the book value of debt, divided by total assets; *Leverage* is the ratio of long-term debt to total assets; *Operating CF* is the ratio of operating cash flow to the average of the beginning and ending total assets; *Tangibility* is the ratio of property, plant, and equipment to total assets; *CF Volatility* is the standard deviation of quarterly cash flows from operations over the 16 fiscal quarters prior to the loan initiation year, scaled by total debt; *Return volatility* is the standard deviation of the raw returns to the borrower firm's common stock over the window of 252 trading days ending the day prior to the loan origination date; *Z-score* is the modified Altman (1968) Z-score, calculated as (1.2*working capital + 1.4*retained earnings + 3.3*EBIT + 0.999*sales)/total assets; *Credit spread* is measured as the difference between the AAA and BAA corporate bond yields (data from the Federal Reserve Board of Governors); and *Term spread* is measured as the difference between the 10- and two-year Treasury yields (data from the Federal Reserve Board of Governors).

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Variables	Obs	Mean	Std	Q1	Median	Q3
Treat	19,461	0.0812	0.2731	0	0	0
MidIndBankrupt	19,461	0.044	0.206	0	0	0
LocalBankrupt	19,461	0.373	0.484	0	0	1
Loan Spread	19,461	194.673	136.901	100	175	250
Log(Loan Spread)	19,461	5.004	0.794	4.605	5.165	5.521
Loan Maturity (in month)	19,461	49.757	22.768	36	60	60
Log(Loan Maturity)	19,461	3.74	0.664	3.584	4.094	4.094
Loan Size ($m)	19,461	470.226	652.265	100	235	525
Log(Loan Size)	19,461	19.156	1.408	18.421	19.275	20.079
Secured	19,461	0.493	0.5	0	0	1
NumLender	19,461	9.146	7.632	3	7	12
Log(NumLender)	19,461	1.842	0.929	1.099	1.946	2.485
Relationship Lender	19,461	0.485	0.5	0	0	1
Performance Pricing	19,461	0.433	0.496	0	0	1
Refinancing	19,461	0.682	0.466	0	1	1
Base Prime	19,461	0.513	0.5	0	1	1
Size	19,461	7.658	1.582	6.562	7.591	8.753
MB	19,461	3.063	4.793	1.398	2.245	3.761
Leverage	19,461	0.306	0.212	0.158	0.286	0.419
Operating CF	19,461	0.098	0.081	0.055	0.092	0.138
Tangibility	19,461	0.314	0.235	0.119	0.251	0.473
CF Volatility	19,461	0.109	0.103	0.049	0.08	0.131
Return Volatility	19,461	0.027	0.016	0.017	0.023	0.031
Z-score	19,461	3.513	3.1	1.685	2.837	4.376
Credit Spread	19,461	0.942	0.29	0.77	0.89	1.05
Term Spread	19,461	1.125	0.933	0.22	1.2	1.96

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 2 Pearson correlation matrix

This table reports the Pearson correlation matrix for the main variables. All variables are as defined in Table 1. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Treat	1																		
(2) MidIndBankrupt	0.009	1																	
(3) LocalBankrupt	0.032***	0.04***	1																
(4) Log(Loan Spread)	-0.121***	0.025***	0.022***	1															
(5) Log(Loan Maturity)	-0.043***	-0.05***	-0.064***	0.252***	1														
(6) Log(Loan Size)	0.106***	0.041***	-0.046***	-0.305***	0.057***	1													
(7) Secured	-0.093***	-0.02***	-0.011	0.536***	0.259***	-0.203***	1												
(8) Log(NumLender)	0.081***	0.029***	-0.016**	-0.245***	0.11***	0.571***	-0.158***	1											
(9) Relationship Lender	0.017**	0.015**	-0.02***	-0.108***	-0.031***	0.228***	-0.071***	0.211***	1										
(10) Performance Pricing	0.023***	-0.027***	0.009	-0.157***	0.049***	0.06***	0.038***	0.225***	-0.064***	1									
(11) Refinancing	0.037***	0.007	0.024***	-0.038***	0.101***	0.169***	0.095***	0.233***	0.15***	0.218***	1								
(12) Base Prime	0.011	-0.001	0.024***	-0.031***	-0.035***	-0.083***	0.194***	0.065***	-0.101***	0.67***	0.22***	1							
(13) Size	0.176***	0.085***	0.008	-0.273***	-0.054***	0.636***	-0.297***	0.438***	0.211***	-0.117***	0.036***	-0.274***	1						
(14) MB	0.011	-0.056***	-0.006	-0.117***	-0.02***	0.044***	-0.07***	0.019***	0.035***	0.002	-0.031***	-0.027***	0.018**	1					
(15) Leverage	-0.033***	0.066***	0.009	0.215***	0.083***	0.135***	0.162***	0.123***	0.127***	-0.099***	0.088***	-0.081***	0.197***	-0.067***	1				
(16) Operating CF	0.03***	-0.019***	-0.015**	-0.219***	0.028***	0.089***	-0.162***	0.07***	-0.014**	0.061***	0.009	-0.018***	-0.011	0.212***	-0.19***	1			
(17) Tangibility	-0.028***	0.163***	-0.057***	-0.063***	-0.031***	0.104***	-0.062***	0.067***	0.039***	0	0.019***	-0.004	0.174***	-0.082***	0.207***	0.101***	1		
(18) CF Volatility	-0.019***	-0.018**	0.021***	-0.028***	-0.026***	-0.221***	-0.007	-0.21***	-0.153***	0.032***	-0.082***	0.087***	-0.36***	0.064***	-0.501***	0.275***	-0.114***	1	
(19) Return Volatility	-0.027***	-0.086***	-0.012	-0.193***	-0.021***	-0.149***	-0.103***	-0.135***	-0.118***	0.07***	-0.103***	0.069***	-0.3***	0.26***	-0.537***	0.414***	-0.237***	0.604***	1
(20) Z-score	-0.082***	0.104***	0.089***	0.352***	-0.143***	-0.314***	0.264***	-0.247***	-0.125***	-0.037***	-0.025***	0.158***	-0.333***	-0.1***	0.115***	-0.251***	0.003	0.04***	-0.076***

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 3 Bankruptcy contagion effect via overlapping directors on loan spreads

This table reports the regression results of the effect of a director's reputation loss on loan spreads. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*. All the other variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)	(2)	(3)	(4)
Treat	**0.103****	**0.095****	**0.102*****	**0.101*****
	(2.429)	**(2.446)**	**(3.108)**	**(3.131)**
MidIndBankrupt		0.016	0.041*	0.041*
		(0.570)	(1.853)	(1.799)
LocalBankrupt		0.028**	0.026**	0.025**
		(2.120)	(2.369)	(2.304)
Size		-0.130***	-0.036**	-0.037**
		(-8.460)	(-2.413)	(-2.506)
MB		-0.000	0.001	0.001
		(-0.085)	(1.138)	(1.135)
Leverage		0.251***	0.212***	0.215***
		(3.848)	(3.804)	(3.931)
Operating CF		-0.693***	-0.496***	-0.500***
		(-7.733)	(-6.054)	(-6.182)
Tangibility		-0.165*	-0.162*	-0.159*
		(-1.764)	(-1.906)	(-1.874)
CF Volatility		0.164	0.085	0.085
		(1.453)	(0.933)	(0.929)
Return Volatility		7.581***	5.976***	5.849***
		(7.686)	(7.958)	(8.070)
Z-score		-0.025***	-0.020***	-0.020***
		(-6.243)	(-5.388)	(-5.419)
Log(Loan Maturity)			0.095***	0.096***
			(6.163)	(6.270)
Log(Loan Size)			-0.102***	-0.101***
			(-9.324)	(-9.340)
Secured			0.351***	0.351***
			(11.708)	(11.628)
Log(NumLender)			-0.044***	-0.044***
			(-4.335)	(-4.288)
Relationship Lender			-0.042**	-0.041**
			(-2.755)	(-2.705)
Performance Pricing			-0.089***	-0.089***
			(-5.633)	(-5.657)
Refinancing			-0.082***	-0.082***

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

			(-7.335)	(-7.343)
Base Prime			0.017	0.016
			(0.945)	(0.917)
Credit spread				0.060
				(1.134)
Term spread				0.066***
				(2.883)
Intercept	4.996***	5.894***	6.842***	6.708***
	(1,640.682)	(42.697)	(31.308)	(30.045)
Loan type	No	No	Yes	Yes
Loan purpose	No	No	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
N	19,461	19,461	19,461	19,461
R^2	0.649	0.675	0.753	0.753

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 4 Tests of the director distraction hypothesis

This table examines whether a firm's bankruptcy contagion effect on loan spreads via the overlapping directors is driven by their distraction away from interlocked borrowers. Columns (1) captures this distraction, based on whether the overlapping director is a busy director. Column (2) captures the distraction based on whether the overlapping director loses a directorship following the bankruptcy filing. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*. The variable *Treat_Busy* equals one if a loan is initiated by the borrowing firm that shares a busy director with a bankrupt firm in the period following the bankruptcy filing, and zero otherwise; *Treat_Nobusy* equals one if a loan is initiated by a borrowing firm that is interlocked with the bankrupt firm, but not via a busy director, in the period following the bankruptcy filing, and zero otherwise; *Treat_Loss* equals one if a loan is initiated in the post-bankruptcy period by an interlocked firm whose overlapping director loses a directorship at the bankrupt firm or other firm following the bankruptcy filing, and zero otherwise; and *Treat_Noloss* equals one if a loan is initiated in the post-bankruptcy period by an interlocked firm whose overlapping director does not lose a directorship following the bankruptcy filing, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)	(2)
Treat_Busy	0.101*	
	(2.059)	
Treat_Nobusy	0.101**	
	(2.482)	
Treat_Loss		0.113**
		(2.284)
Treat_Noloss		0.091**
		(2.079)
Control variables	Yes	Yes
Loan type	Yes	Yes
Loan purpose	Yes	Yes
Firm effects	Yes	Yes
Year effects	Yes	Yes
N	19,461	19,461
R^2	0.753	0.753
F-value for Diff between Treat_Busy(Loss) and Treat_Nobusy(Noloss)	0.00	0.11

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 5 Dynamic tests

This table reports the regression results of the dynamic tests. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*; *Treat_Prioryr3* is a dummy variable that equals one if a loan is taken out by a firm during the third year before its board-interlocked peer filed bankruptcy, and zero otherwise; *Treat_Prioryr2* is a dummy variable that equals one if a loan is taken out by a firm during the second year before its board-interlocked peer filed bankruptcy, and zero otherwise; *Treat_Prioryr1* is a dummy variable that equals one if a loan is taken out by a firm during the first year before its board-interlocked peer filed bankruptcy, and zero otherwise; *Treat_Postyr1* is a dummy variable that equals one if a loan is taken out by a firm during the first year since its board-interlocked peer filed bankruptcy, and zero otherwise; *Treat_Postyr2* is a dummy variable that equals one if a loan is taken out by a firm during the second year since its board-interlocked peer filed bankruptcy, and zero otherwise; *Treat_Postyr3* is a dummy variable that equals one if a loan is taken out by a firm during the third year since its board-interlocked peer filed bankruptcy, and zero otherwise; and *Treat_Postyr3+* is a dummy variable that equals one if a loan is taken out by a firm after the third year since its board-interlocked peer filed bankruptcy, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)
Treat_Prioryr3	0.021
	(0.358)
Treat_Prioryr2	-0.028
	(-0.597)
Treat_Prioryr1	0.018
	(0.317)
Treat_Postyr1	0.157***
	(3.623)
Treat_Postyr2	0.129**
	(2.182)
Treat_Postyr3	0.106*
	(1.971)
Treat_Postyr3+	0.075
	(1.494)
Control variables	Yes
Loan type	Yes
Loan purpose	Yes
Firm effects	Yes
Year effects	Yes
N	19,461
R^2	0.754

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 6 Falsification tests

This table reports the regression results of the falsification tests. Column (1) uses a group of pseudo-interlocked borrowers that share directors with bankrupt firms, but only before bankruptcy filings. Column (2) reports the results by dividing the pseudo-interlocked borrowers into two subgroups, depending on whether the overlapping director left the bankrupt firm prior to the bankruptcy filing. Column (3) uses a group of pseudo-interlocked borrowers that are not director interlocked with the bankrupt firms, but with firms that shared directors with the bankrupt firms when the bankruptcies were filed. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*; *Pseudo Treat* is a dummy variable that equals one if a loan was taken out by a pseudo-interlocked firm during the period after a firm filed bankruptcy, and zero otherwise; *Pseudo Treat_Leftbk* equals one for loans initiated by previously interlocked firms, which ceased to be connected with the bankrupt firms because the overlapping directors left the bankrupt firms before the bankruptcy filing, during the five-year period after bankruptcy filings, and zero otherwise; and *Pseudo Treat_Other* equals one for loans initiated by previously interlocked firms, which ceased to be connected with bankrupt firms, but not because the overlapping directors left the bankrupt firms before the bankruptcy filing, during the five-year period after bankruptcy filings, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All the other variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)	(2)	(3)
Pseudo Treat	0.043		0.003
	(1.060)		(0.089)
Pseudo Treat_Leftbk		0.052	
		(0.862)	
Pseudo Treat_Other		0.026	
		(0.569)	
MidIndBankrupt	0.038	0.038	0.032
	(1.397)	(1.396)	(1.020)
LocalBankrupt	0.036***	0.036***	0.028***
	(3.431)	(3.416)	(2.905)
Control variables	Yes	Yes	Yes
Loan type	No	No	No
Loan purpose	No	No	No
Firm effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
N	18,486	18,486	17,767
R^2	0.755	0.755	0.760

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 7 Director positions and the effect of director reputation loss on loan spreads

This table examines whether the effect of a director's reputation loss on loan spreads varies with the director's board position. Columns (1) and (2) report the results for director positions in bankrupt firms and their counterpart interlocked borrowers, respectively. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*; *Treat_CEOChair* is a dummy variable that equals one if the reputation-compromised director serves as the CEO or board chair, and zero otherwise; and *Treat_NCEOChair* is a dummy variable that equals one if the reputation-compromised director does not serve as the CEO or board chair, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) Position in bankrupt firms	(2) Position in interlocked firms
Treat_CEOChair	0.164***	0.180***
	(3.488)	(3.507)
Treat_NCEOChair	0.069*	0.072*
	(1.757)	(1.844)
Control variables	Yes	Yes
Loan type	Yes	Yes
Loan purpose	Yes	Yes
Firm effects	Yes	Yes
Year effects	Yes	Yes
N	19,461	19,461
R^2	0.753	0.753
F-value for Diff between Treat_CEOChair and Treat_NCEOChair	2.99*	3.09*

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 8 Director influence and the effect of director reputation loss on loan spreads

This table examines whether the effect of a director's reputation loss on loan spreads varies with the director's influence over the board. Panel A captures the director's influence based on tenure. Columns (1) and (2) report the results for director tenure in bankrupt firms and their counterpart interlocked borrowers, respectively. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*; *Treat_LTenure* is a dummy variable that equals one if the reputation-compromised director has a tenure longer than the sample median until the bankruptcy filing year, and zero otherwise; and *Treat_STenure* is a dummy variable that equals one if the reputation-compromised director has a tenure no longer than the sample median until the bankruptcy filing year, and zero otherwise. Panel B captures a director influence based on board size. The variable *Treat_SBoard* is a dummy variable that equals one if the firm's board size is smaller than the sample median in the bankruptcy filing year, and zero otherwise, and *Treat_LBoard* is a dummy variable that equals one if the firm's board size is no smaller than the sample median in the bankruptcy filing year, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Director influence based on tenure

Variables	(1) Tenure in bankrupt firms	(2) Tenure in interlocked firms
Treat_LTenure	0.128***	0.133**
	(2.823)	(2.810)
Treat_STenure	0.066	0.069
	(1.510)	(1.447)
Control variables	Yes	Yes
Loan type	Yes	Yes
Loan purpose	Yes	Yes
Firm effects	Yes	Yes
Year effects	Yes	Yes
N	19,461	19,461
R^2	0.753	0.753

Panel B: Director influence based on board size

Variables	(1) Board size in bankrupt firms	(2) Board size in interlocked firms
Treat_SBoard	0.116***	0.114***
	(4.213)	(3.232)
Treat_LBoard	0.082	0.081
	(1.379)	(1.385)
Control variables	Yes	Yes
Loan type	Yes	Yes
Loan purpose	Yes	Yes
Firm effects	Yes	Yes
Year effects	Yes	Yes
N	19,461	19,461
R^2	0.753	0.753

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 9 Board quality and the effect of a director's reputation loss on loan spreads

This table examines whether the effect of a director's reputation loss on loan spreads varies with the board's quality. Column (1) captures board quality based on the board's independence (the number of independent directors divided by board size), Column (2) captures board quality based on board diversity (the number of female directors divided by board size), and Column (3) captures board quality based on the presence of bank-affiliated directors. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*; *Treat_HQBoard* is a dummy variable that equals one if a loan is initiated by an interlocked firm with a higher-quality board in the period following the bankruptcy filing, and zero otherwise; and *Treat_LQBoard* is a dummy variable that equals one if a loan is initiated by the interlocked firm with a lower-quality board in the period following the bankruptcy filing, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) Board independence	(2) Board diversity	(3) Bank-affiliated director
Treat_HQBoard	0.066*	0.064**	0.065
	(1.994)	(2.292)	(1.317)
Treat_LQBoard	0.128***	0.134***	0.130***
	(3.318)	(3.031)	(3.285)
Control variables	Yes	Yes	Yes
Loan type	Yes	Yes	Yes
Loan purpose	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
N	19,461	19,461	19,461
R^2	0.753	0.753	0.753
F-value for Diff between Treat_HQBoard and Treat_LQBoard	2.98*	2.99*	1.08

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 10 Director turnover and the effect of director reputation loss on loan spreads

This table reports the regression results from the tests by splitting the post-event period into two subperiods, based on whether reputation-compromised directors leave interlocked borrowers. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*; *Treat_NoDepart* is a dummy variable that equals one if a loan is taken out by a firm during the period after its board-interlocked peer filed bankruptcy and before the reputation-comprised director leaves the borrower, and zero otherwise; and *Treat_Depart* is a dummy variable that equals one if a loan is taken out by a firm during the period after the reputation-comprised director leaves the borrower, and zero otherwise. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)
Treat_NoDepart	0.148***
	(4.464)
Treat_Depart	0.074*
	(1.940)
Control variables	Yes
Loan type	Yes
Loan purpose	Yes
Firm effects	Yes
Year effects	Yes
N	19,461
R^2	0.753
F-value for Diff between Treat_NoDepart and Treat_Depart	4.84**

This is the pre-published version published in Journal of Corporate Finance,
available online at: http://dx.doi.org/10.1016/j.jcorpfin.2021.102097.

Table 11 Robustness tests

This table reports the results from robustness tests. Column (1) reports the results estimating the three-equation structural models. Column (2) reports the results using a propensity score–matched sample. Column (3) reports the results excluding interlocked borrowers that share an auditor with the bankrupt firms. Column (4) reports the results excluding interlocked borrowers operating in the same one-digit SIC code industry as their bankrupt peers. Column (5) reports the results further controlling for state–year and industry–year fixed effects. The dependent variable is *Log(Loan Spread)*, defined as the natural logarithm of *Loan Spread*, and *Default Spread* is defined as the difference between the yields on Moody's seasoned corporate bonds with a BAA rating and 10-year US government bonds. Each regression includes a separate intercept and the same set of control variables as in Table 3. All control variables are as defined in Table 1. Beneath each coefficient estimate is its robust *t*-value with clustering by firm and year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) Three-equation structural models	(2) Propensity score–matched sample	(3) Excluding pairs sharing the same auditor	(4) Excluding pairs belonging to the same industry	(5) State–year and industry–year fixed effects
Treat	0.075***	0.050**	0.088**	0.123***	0.095***
	(4.004)	(2.112)	(2.226)	(3.580)	(3.074)
Default Spread	0.075***				
	(4.840)				
Control variables	Yes	Yes	Yes	Yes	Yes
Loan type	Yes	Yes	Yes	Yes	Yes
Loan purpose	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	No
State–year effects					Yes
Industry–year effects					Yes
N	19,332	5,707	18,817	18,636	19,461
R^2	0.191	0.806	0.747	0.753	0.801