Firm ESG Reputation Risk and Debt Choice

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04 Oct 2022

Abstract

Using a novel sample covering 3,783 U.S. public firms from 2007 to 2020, we study how firm-level Environmental, Social, and Governance (ESG) reputation risk affects its debt choice. We find that firms with higher ESG reputation risk borrow less from banks than from markets, potentially to avoid bank monitoring and scrutiny. The Social and Governance components, in particular, matter. Furthermore, firms suffering higher numbers of negative ESG reputation shocks are less likely to continue to rely on bank credit, especially for firms with relatively lower adverse selection costs. Overall, our study presents solid empirical evidence on the interplay between borrower ESG reputation risk and debt financing.

1. Introduction

A firm's credibility in environmental, social, and corporate governance (ESG) factors has become increasingly important. By fostering long-term relationships with key corporate stakeholders, adoption of effective ESG practices enhance the firm's financial performance and competitive advantage (Donaldson and Preston, 1995; Hillman and Keim, 2001; Hoepner et al., 2016). Conversely, poor ESG performance is associated with higher credit risk (Jiraporn et al., 2014), legal risk (Schiller 2018; Hong et al., 2019), and downside risk (Hoepner et al., 2018). Due to the increasing willingness of financial institutions to consider ESG factors when deciding whether or not to extend credit, firms with poor ESG reputations are increasingly subject to wider lending spreads and more stringent requirements. Prior literature shows evidence that ESG-related concerns are linked to the loan spread, with higher ESG risk associated with higher loan spreads (Chava, 2014; Hauptmann, 2017). Having lenders that are committed as responsible banks strengthens the positive relationship between ESG risk and loan spread (Degryse et al., 2021). ESG-related risk is also reflected in bond spreads. Seltzer et al., (2020), for example, examined the relationship between climate regulatory risk and corporate bond contracting and found that firms with poor environmental profiles suffer higher yield spreads, especially if they are located in states with stricter environmental legislation. More recently, Amiraslani et al., (2022) find that firms with better environmental and social performance benefit from lower bond spreads and longer debt maturities. Although prior studies have widely discussed the relation between ESG-related risks and loan or bond contracting separately, there is limited research to directly study the choice between public bonds and bank loans in a firm's marginal financing decision.

In this paper, we use the RepRisk Index (RRI) to measure firms' risk exposures related to ESG issues (see Section 3.1 for the rationale) and provide strong evidence that a higher RRI is positively associated with less reliance on bank loans and greater dependence on public

bonds.[1] Our conceptual framework is built on the theoretical literature, which posits that bank loan financing offers substantial advantages over public debt in terms of monitoring efficiency, access to private information, and the ability to establish long-term lending relationships (Diamond,1984; Fama, 1985; Boyd and Prescott, 1986; Berlin and Loyes, 1988;). This literature suggest that banks are more efficient and effective monitors than arm's-length investors. As a result, firms with a high degree of information asymmetry prefer to issue public debt over borrowing from banks.

We conduct our empirical analysis on a sample of 71,341 firm-year-quarter observations covering 3,783 U.S. public firms from 2007 to 2020 and find strong evidence that a higher RRI is positively associated with less reliance on bank loans and greater dependence on public bonds. Specifically, a one-standard-deviation increase in the ESG risk exposure reduces the ratio of bank debt to total debt by 2.97 pp while increasing the ratio of public debt to total debt by 1.63 pp. Further, we break down the RRI into components based on the number of incidents with the respective "E," "S," or "G" issues. We show that the S and G components have a greater influence on firms' debt choices than the E component.

Focusing on specific debt instruments, we find that firms with higher ESG risk exposure borrow less on term loans than revolvers. This is because term loans are typically used to finance long-term projects with longer maturities and greater credit risk and are normally imposed with stricter financial covenants and higher monitoring requirements (Angbazo et al., 1998; Harjoto et al., 2006, Newton, 2020). As a result, firms with higher ESG risk exposure avoid stringent scrutiny by reducing their reliance on term loans. Further, firms with a high ESG risk exposure rely more on senior bonds than subordinated bonds since subordinate bonds are subject to a high level of market discipline.

To address the potential issue of endogeneity between company ESG risk exposure and

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[1] We discuss RepRisk data in more detail in section 3.2.

debt structure, we use "*High Religious*" and "*Canada Border*" as two instrumental variables for the ESG reputation risk. "*High Religious*" is a dummy variable that equals one if the ratio of religious adherents in the state, where a firm's headquarters is located, is higher than 50%. Stronger social morality and corporate social responsibility (CSR) are positively correlated with higher levels of religious adherence (Angelidis and Ibrahim, 2004; Hilary and Hui, 2009; Deng et al., 2013; Callen and Fang, 2015). We anticipate that local religious adherence is negatively correlated with a firm's ESG risk exposure but unlikely to correlate with a firm's financing outcomes. The second instrument, "*Canada Border*", is a dummy variable that equals one if a firm's headquarter is in a state that borders Canada, and a value of zero otherwise. Putnam (2001) demonstrates that the extent of slavery in the nineteenth century is directly connected to the level of local social capital. The closer to the Canadian border a state is, the sooner it will become a free state, and consequently, it will have greater social capital. We anticipate that firms situated in states bordering Canada have less exposure to ESG risks and higher ESG performance. Since the proximity to the Canadian border is unlikely to correspond to the financing outcomes of businesses, the result with instrumental variables further confirms that firms with higher exposure to ESG risks rely less on bank loans.

Our results contribute to the literature in several ways. To begin, whereas prior corporate finance theories and accounting theories have generated a large body of empirical studies on the relationship between ESG issues and loan contracting or bond contracting (Goss and Roberts, 2011; Chava, 2014；Degryse, 2021; Amiraslani, 2022), there is little research comparing different attitude towards ESG issues in the banking area versus the public bond area. We fill this gap by directly investigating how ESG reputation risk impacts firms' financing choices. We show that firms with higher ESG reputation risk significantly reduce their reliance on bank debt, especially on term loans with stringent monitoring requirements, and increase their reliance on public bond debt.

Second, our study contributes to the literature on bank monitoring (e.g., Diamond, 1984; Rajan, 1992; Bolton, 2000; Park, 2000), lending relationships (e.g., Chernenko et al., 2019; Prilmeier, 2019; Houston and Shan, 2021) and debt choice (e.g., Lin et al., 2013; Boubaker et al., 2018; Li et al., 2019) by revealing how firms shift their financing choice from banks to the public bond market in order to avoid bank monitoring. Firms with higher ESG-related risks (e.g., unemployment risk) have incentives to hoard negative news to maintain a better image and hence avoid borrowing from banks to prevent their misbehaviours from being detected (Ji and Tian, 2016; Ben-Nasr, 2019). Further, Houston and Shan (2019) show that borrowers switch their lenders after experiencing ESG reputation shocks in response to the potential disruption of their lending relationships. Our results suggest that the incentive to avoid bank monitoring and the concern of disrupted lending relationships are two plausible mechanisms underlying firms' decreased dependence on bank loans when exposed to high ESG reputation risk.

Finally, our evidence adds to the ongoing debate on how ESG risk influences firms' debt contracts and how financing decisions may help firms move towards more sustainable growth (Degryse, et al., 2021; Delis et al., 2021; Houston et al., 2021). In a recent paper closest to ours, Beyene et al. (2021) examine the potentially different roles of market- versus bank-based credit in the allocation of resources to fossil fuel. They do so by investigating fossil fuel firms' costs of corporate bonds versus syndicated bank loan financing, and the consequent composition of these two debt types along with these fossil fuel firms' risk of seeing part of their assets stranding. In contrast with our findings, they show that bank financing has not declined, on average, in response to stronger climate legislation and that stranded assets risk has become increasingly concentrated in a few significant exposures existing on the balance sheets of several very large banks. While the majority of banks may be progressively avoiding ESG risk, extremely large banks appear to shelter behind their too-big-to-strand status and/or

may aim to delay the stranding of fossil fuel reserves by "working the political system", an approach which may become easier, for a while, following events in 2022. The significance of different types of debt in shaping enterprises' sustainable transformation remains unknown, as does the extent to which debt finance may be used to address concerns about sustainable development. In this paper, our aim is to shed light on whether high ESG reputation risk increases or reduces firms' reliance on bank debt and the mechanisms behind this choice. We believe this paper could help us better understand the role of ESG reputation risk in different debt markets and the establishment of a sustainable financial system.

The remainder of the paper proceeds as follows. We discuss the sample construction process and variable definitions in Section 2. Section 3 presents the empirical results on ESG risk and debt choices. Section 4 provides different robust checks. We conclude the paper in Section 5.

2. Hypothesis Development

Banks can acquire a constant flow of information from their borrowers, as financial intermediaries. The comparative cost advantages in information production enable them to undertake superior debt-related monitoring (Diamond 1984, 1991). Conversely, diffused public debt ownership and the associated free-rider problem reduce bondholders' incentives to engage in costly information production and monitoring. Since banks are able to monitor borrowers efficiently and detect firms' misbehaviours easily through strict monitoring compared with public debtholders (Ben-Nasr, 2019), either to avoid expensive debt financing or to prevent misbehaviours from being detected, firms with high ESG risk exposure (particularly those not easily detected) have strong incentives to hide their misbehaviours by avoiding the reliance on bank loans, especially in an environment where mandated ESG disclosure legislation does not exist (Krueger et al., 2021). This incentive to hide may influence

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a firm's financing direction. Firms with higher ESG-related risks (e.g., unemployment risk) have incentives to hoard negative news to maintain a better image and they avoid borrowing from banks so as to prevent their misbehaviours from being detected (Ji and Tian, 2016; Ben-Nasr, 2019). Lin and Paravisini (2011) suggest that banks that have suffered reputation loss may subsequently increase their monitoring efforts in order to re-establish their reputations. Borrowers would intentionally switch from bank loans to public bonds to avoid stricter monitoring following an upsurging negative reputation incidents. Taken together, we derive the following hypothesis on firm ESG reputation risk and debt choice:

Hypothesis 1: Firms with higher ESG risk exposure rely less on bank loans to avoid stringent covenants and tight monitoring imposed by banks. ("Avoid Bank Monitoring Hypothesis").

Firms' debt choices are also related to the supply side. The availability of bank loans directly impacts a firm's capital structure. The contraction in the supply of bank loans increases firms' reliance on the public bond market (Leary, 2009). Lending to borrowers who have received adverse media coverage is likewise a negative shock to banks. Banks are necessarily concerned that lending to borrowers with poor ESG reputations may harm their own reputations, resulting in depositor base volatility (Houston et al., 2021) and outflow of deposits (Homanen, 2018). Therefore, bankers exposed to such reputation shocks may be hesitant to finance borrowers with poor ESG reputations. We should expect that those risks affect the likelihood of loan repayment and the persistence of the existing lending relationship. In contrast, diffuse ownership, arm's length monitoring, and collective action problems associated with public debt can lead to low credit standards and less stringent ESG risk screening. Concerned about the disruption of bank lending relationships and the loss in credit availability, firms with unfavourable ESG-related reputations may choose public bonds as their primary debt type to

minimise the uncertainty of an unexpected withdrawal from the lending relationship.

Lin and Paravisini (2011) demonstrate that reputation shock has a substantial effect on the supply of loans from banks linked to fraudulent borrowers, with an example where the supply of loans dropped by over 25% during the two years following such a shock. Banks, especially those linked to borrowers with negative ESG incidents, have an incentive to cut credits with poor ESG performance borrowers in order to avoid scandals and protect their reputations and social capital. Houston and Shan (2019) show that borrowers switch their lenders after experiencing ESG reputation shocks, in response to the potential disruption of their lending relationship. Taken together, we derive the following hypothesis on firm ESG reputation risk and the probability that a firm switches debt choices.

Hypothesis 2: Higher firm ESG reputation risk is positively associated with the likelihood of switching from bank debt to public debt ("Disrupted Lending Relationship Hypothesis").

3. Data

3.1 Sample Construction

To investigate the impact of a firm's ESG risk on its choice between bank loan and public debt, we construct a dataset on ESG risk, controls, and debt structures for U.S. public firms over the period 2007-2020. We obtain debt structure data from S&P Capital IQ, which provides data on corporate debt structure for public debt and private debt from 2002 onwards (Colla et al. 2013; Choi et al., 2018). Our paper follows recent literature (e.g., Boubakri, et al., 2019; Li et al., 2019) in using debt structure from Capital IQ instead of investigating debt choice by acquiring loan deals and public bond deals from Dealscan and SDC databases.[2] This

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[2] Prior literature (e.g., Denis and Mihov 2003; Morellec, et al., 2015) investigates the choice of financing by acquiring bond issuance data from Fixed Income Securities Database (FISD) or SDC database and acquiring loan

is because the Dealscan database only provides syndicated loan data, which do not cover all of a firm's loan transactions. Also, due to the missing observations, the SDC database is unable to provide the most comprehensive public bond data. We extract ESG reputation risk data from RepRisk. The RepRisk database provides a monthly unbroken time-series ESG rating and coverage on ESG news incidents, which spans the start of 2007 to the end of 2020. Houston and Shan, (2019) compare different ESG databases and find that the ESG data from RepRisk database provide unparalleled granularity. It employs a monthly, continuous ESG rating ranging from 0 to 100, while the KLD and Eikon database both provide annual ESG ratings with many missing observations. Second, RepRisk provides event-based data that evaluate the outcomes of ESG activities. Compared with self-reported ESG databases (Bloomberg, Refinitiv Eikon, and MSCI), RepRisk is less susceptible to greenwashing biases and the manipulation of self-disclosure. Third, monthly ESG data provided by RepRisk database can be aggregated to quarterly ESG data, which is more suited for matching with the quarterly level debt structure provided by S&P Capital IQ in order to better evaluate the impact of ESG risk changes on firms' debt structures. Last but not least, to the best of our knowledge, RepRisk is the only database that systematically identifies and assesses material ESG risks by analysing information from external sources. Different from other ESG data providers, RepRisk aims to provide firm-level ESG risk exposure, instead of ESG performance rating. Our paper uses the RRI to measure firms' risk exposure related to ESG issues.[3] The RRI calculation is based on the reach of information sources, the frequency, the timing of ESG risk incidents, and the content of risk incidents. It ranges from 0 (lowest) to 100 (highest). The higher the RRI, the

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issuance from DealScan database. More recently, an increasing number of studies have started to investigate the debt choice directly with the availability of debt structure data.

[3] RepRisk relies on AI and machine learning technologies to search and screen 28 ESG issues related to risk incidents, on a daily basis, from over 100,000 public sources and stakeholders in 23 languages. These sources range from international to the regional, national, and local levels. More detailed information on the 28 ESG issues and the calculation process of either RRI or RRR are available at https://www.reprisk.com/news-research/resources/methodology.

higher the risk exposure. The RRI increases in proportion to the severity, reach, and novelty of the incident, and it decays if there is no new risk incident that happened for a given day. In addition, we use the RepRisk Rating (RRR) to measure firms' ESG performance, which is calculated based on the RRI and the Country-Sector ESG risk. It ranges from AAA (highest) to D (lowest); the higher the RRR denotes better ESG performance and lower ESG risk exposure.

We obtain firms' financial information from Compustat for the most recent fiscal quarter that ended before the period end date of the debt structure. We exclude all financial firms (SIC Code 6000-6999) and observations with missing firms' financial statement information at the end of the quarter before the current period end date of the debt structure. The final sample contains 71,341 firm-year-quarter observations and 3,783 U.S. public firms from 2007 to 2020.

In addition to the firm-year-quarter level debt structure sample, we construct the new debt issuance sample of loans and bonds with corresponding deal characteristics as well as firm characteristics and ESG data. Our sample of bank loans is obtained from the Refinitiv Eikon and WRDS-Thomson Reuters DealScan LPC for 2007-2019. The bank loan coverage at Refinitiv Eikon is provided by Refinitiv Loan Pricing Corporation (LPC), which consists of detailed information on bank loans made to public firms. We obtain detailed information on public bonds issued by U.S public companies from Refinitiv Eikon and collect the reference firms' financial characteristics from Compustat for the most recent fiscal quarter ending prior to the loan start date (bond start date). We match the borrower and / or borrower's parent name to Compustat following Chava and Roberts (2008). The current DealScan-Compustat only includes matches at the end of 2017. Following Newton et al. (2020), we extend the present version of the link table until the end of 2019. Again, we exclude all financial firms (SIC Code 6000-6999) and all observations with missing firms' financial statement information at the end

of the quarter prior to the current loan (current bond). In the final sample, we have 14,383 loan facilities and 5,569 public bonds. To merge the ESG data from the RepRisk database (this database only provides the private ID of RepRisk and ISIN), we construct a link table of ISIN and GVKEY through Capital IQ and manually check the link table. This Dealscan-SDC combined sample is applied to investigate whether the ESG risk is priced in bond contract terms and loan contract terms and the robust check of new debt issuance.[4]

3.2 Overview of sample

Table 1 presents summary statistics for the main variables of the full sample. To reduce the effects of outliers, we winsorize all of our continuous variables at 1% and 99% levels. Panel A presents the summary statistics for the firm-quarter level sample. The mean value for the percentage of *Bank Debt* financing is 39%, and the mean value for the percentage of *Public Debt* financing is 49% in our full sample. The mean value for bank debt financing in the subsample of high RRI businesses is 30%, which is lower than the mean value for bank debt financing (48 percent) in the subsample of low RRI enterprises. Firms with a high RRI are more likely to use public debt financing than firms with a low RRI, with an average of 58% vs 40% for low RRI firms. These preliminary findings are consistent with our primary hypothesis that higher ESG risk reduces firms' reliance on bank debt. In addition, in the whole sample, the average firm size is 7.71, the mean value of firm leverage ratio is 0.345, the mean value of Tobin's Q is 1.803, and about 50% of firms have debt rating. The statistics of those control variables are consistent with previous literature (e.g., Lin et al., 2013; Boubaker et al., 2017, 2018; Choi et al., 2018; Li et al., 2019; Chen et al., 2020). Panel B reports the summary statistics of the loan facility level sample. The average All-in-Spread Drawn (AISD) of the bank loans in our full sample is 227.773 basis points, and the average AISD of the bank loans

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[4] We include the results of loan pricing and bond pricing, and the robust check of new debt issuance in the online Appendix.

for firms with high RRI is 210.515 basis points, which is lower than bank loan spreads for low RRI (245.613 basis points). Panel B shows that the average spread of public bonds for firms with high RRI is lower than the average spread for firms with low RRI (186.039 basis points vs. 299.81 basis points). To further test our hypothesis, we explore the impact of RRI on loan spreads and bond spreads, respectively, after controlling firm characteristics, loan information, bond information and fixed effects in OA 5. The results of OA 5 confirm that the RRI is positively associated with loan spreads and bond spreads, respectively, which are consistent with previous literature (e.g., Hauptmann, 2017; Seltzer et al., 2021).

< INSERT TABLE 1 HERE >

Table 2 presents the correlation matrix of the main variables in our empirical analysis and all of the correlation coefficients are statistically significant at the 1% level. It shows that *RRI* is negatively linked to *Bank Debt*, and positively related to *Public Debt*, which provides univariate evidence that firms with higher ESG risk exposure tend to use less bank debt over public debt. We also find that *RRR* is positively related to *Bank debt* and negatively related to *Public Debt*, which provides univariate evidence that firms with higher ESG ratings rely more on bank debt than public debt.

< INSERT TABLE 2 HERE >

4. Empirical Results

4.1 Investigate the "Avoid Bank Monitoring Hypothesis"

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While Table 2 demonstrates a negative association between firms' ESG risk exposure and reliance on bank debt, we are unable to alleviate the concern that company debt structure is connected with other firm characteristics relevant to firms' ESG risk exposure. In this section, we conduct a multivariate analysis to better gauge the effect of a firm's ESG risk exposure on its debt choices. We primarily estimate the following models:

$$Debt\ Choice_{i,t} = \alpha_1 RRI_{i,t-1} + \beta_t X_{it-1} + \upsilon_t + \eta_i + \epsilon_{i,t} \qquad (1)$$

Where the dependent variable is the debt choice measures, capturing a firm's reliance on bank debt or bond debt. It is proxied by either $Bank\ Debt_{i,t}$ or $Public\ Debt_{i,t}$. $Bank\ Debt_{i,t}$ measures the proportion of bank debt in a firm's total debt and $Bond\ Debt_{i,t}$ measures the proportion of public debt in a firm's total debt. Our main interest is the size, sign and statistical significance of the coefficients $RRI_{i,t-1}$, which captures the firm's ESG risk exposure at the end of the quarter prior to the period end date of debt structure. X_{it-1} is a set of control variables that may influence the choice of debt. All of the independent variables are lagged by one quarter. In addition, we include year-quarter, industry-fixed effects in our model to account for potential changes in the reliance on a particular type of debt through time and among industries.

Table 3 reports the baseline regression results of Equation (1). Standard errors are clustered at the industry level and are heteroskedasticity-robust. Column (1) of Table 3 shows a negative and statistically significant relationship between a firm's ESG risk exposure and the proportion of bank debt in a firm's debt structure. Column (3) of Table 3 indicates a positive and statistically significant relationship between a firm's ESG risk exposure and a firm's reliance on public debt. The results are consistent and robust when we include year-quarter fixed effects and industry fixed effects in Columns (4) to (6). Based on the estimates from

Columns (4) and Column (6) of Table 3, a one-standard-deviation increase in the ESG risk exposure reduces the ratio of bank debt to total debt by 2.97 pp and increases the ratio of public debt to total debt by 1.63 pp. In addition, although the increase of ESG risk exposure reduces the reliance on bank debt, we cannot pin down whether the total debt goes down followed by reducing bank debt. Therefore, we further investigate the impact of ESG risk on firms' total debt. We demonstrate that ESG risk exposure has no effect on overall debt. With an increase in ESG risk exposure, the drop in bank debt is compensated for by an increase in public debt. We include control variables on firm-specific characteristics to isolate other potential effects on the firm's debt choice. In line with previous literature (e.g., Houston and James, 1996; Denis and Mihov, 2003; Lin et al., 2013; Boubaker et al., 2017, 2018), we show that larger firms, those with a greater Tobin's Q, those with a higher leverage ratio and higher cash ratio depend less on bank loans and more on public debt. Additionally, firms' profitability is positively correlated with a higher dependence on bank debt and less reliance on public debt. Overall, these results indicate that the relationship between ESG risk exposure and debt choice is consistent with the hypothesis that firms with higher ESG risk exposure choose public bonds to avoid scrutiny and insulate themselves from bank monitoring.

While our results from Table 3 show that ESG risk is negatively associated with the reliance on bank debt and positively associated with the dependence on public debt, we still lack information on which component of ESG risk is driving a firm's less reliance on bank debt. Therefore, we split RRI into three components (E, S, and G), which represent environmental risk exposure, social risk exposure, and governance risk exposure, respectively. We first estimate the impact of each component of ESG risk exposure on debt structure separately, then we put "E", "S" and "G" into the same specification to alleviate the potential impact of the interplay among each component and increase the reliability of our estimations. Our findings

suggest that firms' less reliance on bank debt is mainly driven by "S" and "G" rather than "E".[5] The results are robust even when we include the three components into one specification (Columns (4) and (8) in Table 4). Debt holders, as external financiers, are unable to efficiently detect firms' misconduct and irresponsible behaviours caused by social and governance risks. Due to this severe information asymmetry between firms and debt holders, firms that face significant social and governance risks avoid borrowing from banks to conceal their misconduct from bank monitoring. These results are consistent with the previous literature that firms with poor social or governance performance have strong incentives to hide their behaviours. For example, Ben-Nasr (2019) shows that firms with higher unemployment risk tend to rely on public bonds to avoid banks' monitoring of misconduct. Also, Lin et al., (2013) demonstrate that large shareholders with excess control rights have incentives to extract the private benefits of control, and they choose public bonds as a way of avoiding bank monitoring. Taken together, the results of Table 4 further support our findings that ESG risk exposure, particularly "S" and "G" risk exposure, motivates corporations to borrow less from banks in order to escape scrutiny and avoid bank supervision.

< INSERT TABLE 3 HERE >

< INSERT TABLE 4 HERE >

To further explore what issues of ESG risk exposure drives firms' financing choices, we follow Houston and Shan (2019) and construct a proxy of borrowers' risk exposure to the

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[5] Although the coefficient of the "E" component is significant in Model (1) of Table 4, it becomes insignificant when we control the other two components at the same time, implying that the impact of the "E" component is probably correlated with "S" and "G".

specific issues: [6]

$$RRI_{j,t-1} = RRI_{t-1} * (\# of\ News\ Associated\ with\ Issue\ j\ at\ t-1)/$$
$$(Total\ \# of\ News\ Associated\ with\ All\ Issues\ at\ t-1) \qquad (2)$$

Table 5 reports the estimation results. We find that firms more exposed to "S" and "G" issues significantly reduce their reliance on bank loans. These results are consistent with the findings in Table 4. Specifically, we find 1) animal mistreatment; 2) human rights abuse; 3) social discrimination; 4) forced labor; 5) child labor; 6) freedom of association; 7) discrimination in employment; 8) poor employment conditions; 9) executive compensation; 10) misleading communication; 11) tax evasion; 12) tax optimisation; 13) anti-competitive; 14) controversial products; 15) health and environmental; 16) national legislation; 17) supply chain are main issues driving firms' less reliance on bank loans. Overall, compared with environmental issues, social issues and governance issues are the main factors driving firms to avoid bank monitoring.

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The "Avoid Bank Monitoring Hypothesis" suggests that firms with higher ESG risk exposure borrow more from public debt and less from bank loans. S&P Capital IQ classifies total debt into seven mutually exclusive debt types, enabling us to investigate the impact of ESG risk exposure on the composition of debt structure. Colla et al., (2013) use the classification of debt from the S&P Capital IQ database and find that about two-thirds of enterprises rely on senior bonds and notes, one-fifth on subordinated bonds and notes, and

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[6] RepRisk database provides company negative news related to 28 different issues spanning across E, S and G.

about 5% on commercial paper. If the bank monitoring avoidance hypothesis dominates, firms with higher ESG risk exposure would borrow less on term loans than revolvers. This is because term loans are typically used to finance long-term projects with longer maturities and greater credit risk and are normally imposed with stricter financial covenants and higher monitoring requirements (Angbazo et al., 1998; Harjoto et al., 2006, Newton, 2020). As a result, firms with higher ESG risk exposure take action to avoid stringent scrutiny by reducing the reliance on term loans. In Table 6, we report the regression results of the impact of ESG risk on different components of the debt structure. The results in Columns (1) and (2) of Table 6 indicate that as RRI increases, bank loans reduce mostly owing to a decline in the proportion of term loans. The decline in term loans is more pronounced than the decline in revolvers, further supporting our "Avoid Bank Monitoring Hypothesis". In addition, firms with higher ESG risk exposure are closely associated with higher credit risk and legal risk. Sironi (2003) and Pop (2009) find that subordinated debt spreads are sensitive to the financial conditions and risk profiles of bank issuers, as reflected in traditional credit ratings. The senior bond is secured by assets and other collateral of the firm and senior bond investors can acquire priority in terms of repayment when the firm faces bankruptcy and liquidation. Therefore, as a relatively safe investment, bond investors would prefer to hold safer senior bonds rather than subordinated bonds issued by firms with high ESG risk exposure, and we can expect that the growth in public debt with increased ESG risk exposure (RRI) would rely more on senior bonds and notes. We report the impact of ESG risk exposure on the instruments of bond debt in Columns (3), (4) and (5). There is a statistically substantial correlation between ESG risk and the reliance on senior debt, with no statistically significant change in subordinated bonds and notes. Overall, the results confirm our hypothesis that firms with significant ESG risk rely more on senior bonds and notes for longer timelines, as well as commercial paper for short timelines, rather than term loans to avoid strict monitoring from banks.

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4.2. Investigate the "Disrupted Lending Relationship Hypothesis"

As described previously, we argue that firms with higher ESG risk exposure rely less on bank loans to avoid stringent covenants and tight monitoring imposed by banks. In an extended analysis, we retrieve the number of exogenous ESG-related incidents for a firm in each quarter and examine the impact of exogenous negative ESG news on firms' debt choices. Using the exogenous ESG-related incidents can alleviate concerns of omitted variable bias since the media reporting timing relative to the firms' debt expiration date is arguably quasi-exogenous and unlikely to be related to the corporate insider factors. RepRisk database collects and screens ESG-related risk incidents from over 100,000 public sources and shareholders. Each risk incident is analysed according to the severity (harness) of the risk incident or criticism, the information source's reach, and the issues' novelty.

 Since reputation shock from borrowers would make it harder for banks to extend their business in the future (Homanen, 2018) and lead to the outflow of deposits (Houston et al., 2021). Banks, especially those exposed to reputation shocks have a strong incentive to shrink their loan supply to firms with more ESG risk incidents and interrupt their existing lending relationship (Houston and Shan, 2019). Consequently, the shrinking of loan supply is reflected in borrowers' debt structures. Conversely, banks suffer reputation shocks from their borrowers, who normally increase monitoring efforts to re-establish their reputation (Lin and Paravisini, 2011). Therefore, the emergence of negative news prompts the borrower further to avoid stricter monitoring from banks. If the disrupted lending relationship and stronger monitoring avoidance incentive jointly drive our results, the number of ESG-related incidents will

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significantly reduce the likelihood of borrowing new bank loans. [7] Thus, we employ the ESG-related incidents as exogenous reputation shocks to investigate the likelihood of issuing new debt. We anticipate that the likelihood of issuing bank loans will decline promptly in the current quarter, following a prior quarter increase in the number of ESG-related incidents. To examine this hypothesis, we estimate the following model:

$$New\ Debt\ issuance_{i,t} = \alpha_1 Nr\_News_{i,t-1} + \beta_t X_{it-1} + \upsilon_t + \eta_i + \epsilon_{i,t} \qquad (3)$$

Where the dependent variable $New\ Debt\ issuance_{i,t}$ is a dummy variable that equals one if the change in outstanding bank debt at quarter t and at quarter t-1 is positive, and zero otherwise; $or\ New\ Bond\ issuance_{i,t}$, a dummy variable that equals one if the change in outstanding public debt at quarter t and at quarter t-1 is positive, and zero otherwise. X_{it-1} is a vector of control variables specified under Eq. (1). We also control the year-quarter fixed effects and industry fixed effects. All independent variables are lagged one period.

We report our regression results in Table 7. Column (1) of Panel A shows negative and statistically significant relations between the likelihood of issuing new bank debt and the number of negative ESG news events. Furthermore, a positive association exists between the likelihood of issuing public bonds and the number of unfavourable ESG news events (Column (2) of Panel A). The results are robust and consistent in the sample of firms that issues either bonds and loans (Columns (1) and (2) of Panel B).

Houston and Shan (2019) demonstrate that the quantity of unfavourable ESG news is adversely and statistically substantially associated with the chance of maintaining the same lead arrangers, implying that reputation shocks may cause firms to switch lenders. The channels of "Disrupted Lending Relationship" naturally raise the question of whether firms

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[7] We also use the sample from DealScan and SDC as a robustness check and report the results in Appendix OA 4. The results are robust and consistent.

who have received more negative ESG-related news then shift away from bank debt and towards public debt in reaction to the possibility of sudden termination of the lending relationship and severe bank monitoring. Since switching lenders is costly for borrowers (Petersen and Rajan, 1994), this may not be an optimal choice for some firms. Firms that have suffered ESG reputation shocks would switch to receiving funding from the public market instead of banks. We estimate the following model to investigate the impact of negative news shock on the probability of switching debt choices,

$$\Pr\left(Same_{i,t}\right) = \phi\left(\alpha_1 Nr\_News_{i,t-1} + \beta_t X_{it-1} + v_t + \eta_i + \epsilon_{i,t}\right) \tag{4}$$

In the logit model Eq. (4), $\phi(.)$ denotes the cumulative distribution function (CDF) of the probability that a firm switches debt choice. $Same_{i,t}$ is a dummy variable that equals one if the new loan issuance happens both at the quarter t and at the quarter t-1. $Nr\_News_{i,t-1}$ is the main explanatory variable that measures the amount of negative news coverage on firm i at quarter t-1. X_{it-1} is the vector of borrower's characteristics consistent with the control variables in Eq. (1). We also include year-quarter fixed effects and industry fixed effects. Standard errors are clustered at the firm level.

We conduct an analysis based on two subsamples. First, we estimate Eq. (4) based on the subsample of firms that issue either bonds or loans or both. Column (3) of Panel A in Table 7 reports that the coefficient estimates of $Nr\_News_{i,t-1}$ is negatively associated with the likelihood of retaining the same loan issuance, indicating that firms with more negative ESG news coverage at quarter t-1 are less likely to continue borrowing via bank loans at quarter t. Furthermore, firms with a greater amount of negative ESG news coverage are more likely to keep borrowing from the public bond market. This is most likely since firms issue public debt to eliminate the risk of unforeseen funding interruptions and avoid severer monitoring from banks. Additionally, to account for the influence of firms that issue both loans and bonds on

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our results, we undertake an analysis using a subsample of firms that issue either loans or bonds (Panel B). The estimation findings are consistent with those in Panel A.

Our findings suggest that the frequency of negative ESG-related news coverage acts as an exogenous reputation shock, lowering the likelihood of borrowing bank debt and increasing the likelihood of switching from bank debt to public debt. Overall, our findings support our "Bank Monitoring Avoidance" hypothesis and the "Disrupted Lending Relationship" hypothesis.

< INSERT TABLE 7 HERE >

4.3. Instrumented ESG risk

Although we employ lagged dependent variables in all of our regressions to minimise concerns about reverse causality, this may not entirely eliminate the question of endogeneity between company ESG risk exposure and debt structure. To further address these endogeneity issues, we preform 2SLS regression analyses using *High Religious* and *Canada Border* as our instrumental variables for the ESG risk. *High Religious* is a dummy variable that equals one if the ratio of religious adherents in the state where a firm's headquarters located is higher than 50%. A higher level of religious adherence is positively associated with stronger social morality (Hilary and Hui, 2009; Callen and Fang, 2015) and attitude towards CSR (Angelidis and Ibrahim,2004, Deng et al., 2013). We could anticipate that local religious adherence is negatively correlated with a firm's ESG risk exposure but unlikely to correlate with a firm's financing outcomes.

Canada Border is a dummy variable that equals one if the firm's headquarters is located in the state that borders Canada and zero otherwise. Putnam (2001) shows that local social capital is closely related to the depth of slavery in the nineteenth century. The slavery system

destroys local social solidary and social norms. The states closer to the Canadian border are then considered to have more social capital. Using the distance to the Canadian border as the instrumental variable for CSR is used in several studies (e.g., Hasan et al., 2017; Gupta, 2018; Cornett, 2021). In this paper, we use the dummy variable *Canada Border* as our second instrumental variable for ESG risk. We expect that firms located in the states bordering Canada have lower ESG risk exposure and better ESG performance. Importantly, the distance to the Canadian border is unlikely to be correlated with firms' financing outcomes.[8]

Column (1) of Table 8 presents results from the first-stage regression. The dependent variable is *RRI,* and the independent variables include the two instrumental variables and other control variables. Coefficients on instrumental variables are both negative and statistically significant, which is consistent with our expectation that the firm's ESG risk is negatively associated with their headquarters' distances to Canadian border and local religions level. The F-statistic is highly significant, confirming the relevance of our instrumental variable. In the second stage, the coefficient on *RRI* is statistically significant and negatively related to the bank debt and positively associated with public debt. This result with instrumental variables further confirms that firms with higher exposure to ESG risks rely less on bank loans.

< INSERT TABLE 8 HERE >

5. *Robustness checks*

This section provides several robustness checks for our main results. To conserve space, we provide the tables in the Online Appendix.

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[8] The estimation results of 2SLS are robust to using continuous variables. As a further robustness check we use the ratio of religious adherents in the state where the firm's headquarters is located (measured by the number of religious adherents divided by the state's population), and the distance to the Canadian border measured by the natural logarithm of the distance from the firm's headquarters to the Canadian border. The results are available upon to request.

5.1 Testing for the potential importance of omitted variables

One remaining concern could be that the decline in bank debt subjected to the increase in ESG risk exposure is spuriously correlated with important unobservable omitted variables. In OA Table 2, we assess how big the selection of unobserved variables would have to be in order to explain our estimated coefficients in the main results. We perform the coefficient stability test proposed by Oster (2019). We follow the implementation recommendation of Oster and set the maximum R2 explained by the variable of interest, observed control variables and unobserved variables to 1.3 times the R2 from the corresponding model. Table OA 2 reports the additional importance ("δ") needed on the unobserved variables to "explain away" the result. The larger δ, the more strongly omitted variable concerns are mitigated. We show that the effect of ESG risk exposure could be expected to be zero only if omitted variables were almost (1.222) as important for the bank debt ratio as the included control variables. In addition, we investigate whether the impact of each ESG issue on the decline of bank debt is driven by the omitted variables. Our results show that each calculated "δ" on the coefficient of interest obtained is significantly higher than 1, indicating our main results are unlikely to be affected by the omitted variables.

5.2 Loan, bond spread and maturity comparison and ESG risk

Another potential concern with our results is whether the impact of ESG risk on debt financing is driven by the cost of debt. If ESG risk is priced in the loan spread but not in the bond spread, the borrower with high ESG risk exposure would have a strong incentive to borrow from the public bond market and to save the ESG risk premium in the loan market. The literature shows evidence that ESG risks are priced in the loan spread. Firms with higher ESG risk or poor ESG reputation are associated with higher loan spreads (e.g., Chava, 2014; Hauptmann, 2017). More recently, although Seltzer et al., (2020) found a positive relationship

between climate regulatory risks and bond yield spreads, we lack comprehensive evidence on whether ESG risk is priced in bond contracts. Hence, we investigate the impact of ESG risk exposure on loan contracts and bond contracts, respectively, based on the sample from DealScan and SDC. Our estimation results are reported in Table OA3. Higher ESG risk exposure is positively associated with higher loan spreads and negatively associated with shorter loan maturity. These results are consistent with existing studies (e.g., Chava, 2014; Hauptmann, 2017; Newton et al., 2022). In addition, we find ESG risks are also priced in bond spreads and maturities. Higher ESG risk exposure results from higher bond yield spreads and shorter bond maturities, which are also consistent with Amiraslani et al., (2022). Overall, our results confirm that firms with higher ESG risk exposure raise more funding from the market, which is not driven by the different ESG risk premiums in the different debt markets.

5.3 ESG risk and Debt New Issuance (based on the sample from DealScan and SDC)

A further potential concern with our main results is that the current measurements using the increase in the outstanding debt to measure debt new issuance may not reflect the actual activity. Specifically, if a firm retires and issues debt simultaneously, it may face no change (or even a negative change) in the debt balance. In this situation, our results may suffer misclassification problems. To alleviate the concern about the problems, an alternative proxy to measure the new debt issuance is using the debt issuance data based on the sample from DealScan and SDC. However, this method also suffers from selection bias problems since DealScan provides syndicated loan data but non-syndicated loan data are not included. In addition, the SDC database does not provide the most comprehensive bond issuance data for firms. Therefore, we employ the increase in the outstanding debt to proxy new debt issuance. In addition, we re-estimate our results from the combined sample of DealScan and SDC as our robustness check. Table OA4 reports the robustness check, and we find the results are robust and consistent with our results in Table 7. Overall, the selection of sample and new debt

issuance proxy does not impact our estimation results.

5.4 Whether results driven by the loan supply?

Prior studies find the shrinkage in loan supply may push public firms to borrow more from the public bond market (e.g., Goel and Zemel, 2018; Fernández et al., 2018). If the loan supply is an important factor affecting firms' debt financing, one concern arising naturally is whether the loan supply drives our results. To alleviate this concern, we obtain the U.S loan supply data on commercial and industrial loans and present the regression results with an additional control variable of the commercial and industrial loans (*Loan_Supply*) to identify the effect of loan supply on debt choice.[9] In Table OA5, we find the coefficients of *RRI* are still robust and consistent with the estimation results in Table 3. In addition, we find a positive relationship between loan supply and the reliance on bank debt and a negative relationship between loan supply and the reliance on public debt, yet statistically insignificant. The loan supply increase also contributes to the firm's total debt. Our results confirm that the fundamental changes in loan supply do not drive the impact of ESG risk on debt financing.

5.5 Whether the results are more pronounced with less asymmetric information?

Firms are relatively more willing to share their exclusive information with a small group of lenders than with dispersed bondholders (Bhattacharya and Chisea, 1995). This superior access to private information for banks could help reduce the adverse selection costs faced by borrowers and consequently relates to the debt choice of firms. Therefore, firms with greater monitoring needs, i.e., those with higher levels of asymmetric information and severe agency problems, would borrow privately from banks, while firms with lower monitoring

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[9] We obtain all U.S. commercial banks' commercial and industrial loans from the website of Federal Reserve Bank of St. Louis https://fred.stlouisfed.org/series/BUSLOANS.

needs would borrow more from the public bond market (Houton and James, 1996; Denis and Mihov, 2003, Bharath et al., 2008; Florou and Kosi, 2015; Tan et al., 2020). Institutional investors possess superior screening and monitoring abilities to alleviate information asymmetry (Boone and White, 2015, Fisch and Momtaz, 2020). Hence, firms with high institutional ownership have fewer adverse costs and have fewer requirements for bank monitoring. In addition, Dyck et al., (2019) and Chen et al., (2020) show that institutional investors have increasingly incorporated CSR into their investment decisions and apply greater efforts to monitor and influence their portfolio firms' CSR policies. If this information asymmetry channel exists, we anticipate that the firm's reliance on public bonds would be more pronounced when firms have high institutional ownership. With the increase in institutional ownership, firms are more likely to rely on public debt to avoid stronger dual monitoring from banks and institutional investors after ESG reputation shocks. As such, we construct an interaction term *Ln_Nr_News*Inst_high*, which indicates whether the level of institutional ownership drives the impact of ESG reputation shock on debt financing. The results reported in Table OA6 show that firms with less asymmetric information (higher institutional ownership) are more likely to issue new public bonds and less likely to borrow new loans from banks after suffering reputation shocks.

5.6 Alternative proxies and fixed effects

Finally, we apply the RepRisk Rating (RRR) to measure firms' ESG performance. It ranges from AAA (highest) to D (lowest). The higher the RRR denotes better ESG performance and lowers ESG risk exposure. In addition, from Columns (1) to (6) of Table OA7, we control firm fixed effects to replace industry fixed effects and report our estimation results. We find that RRR is positively related to the proportion of bank debt and negatively related to the proportion of public debt (Columns 3 and 4). RRI is still negatively associated with bank debt and positively associated with the percentage of bank debt, and positively associated with the

percentage of public debt (Columns 1 and 2), which are consistent with the results in Table 3. Hence, either replacing the ESG risk proxy or replacing industry-fixed effects with firm fixed effects does not change the robustness of the results.

6. Conclusion

This paper closes a gap in the literature by demonstrating that firms with a high ESG reputation risk depend less on bank loans and more on public bonds. We provide robust evidence that firms with high ESG reputation risk rely less on bank loans in order to avoid bank monitoring and scrutiny. Furthermore, we find that, with the increasing number of ESG negative shocks, firms switch their bank debt to the public bond market, potentially in response to the following severe bank monitoring and disrupted lending relationships from lenders. This switching is more pronounced for firms with less asymmetric information than firms with higher asymmetric information. We believe our work demonstrates a novel channel in which firms' ESG reputation risk can profoundly affect their financing choices.

Financial markets and intermediaries play a pivotal role in allocating resources for investment in the economy. The literature has long discussed the comparative advantages of the bank-based versus capital market-based financing on effective funding allocation. Banks' comparative advantage stems from their ability to collect private information about borrowers through their lending relationships. Due to their comparative cost advantages in information production, banks are able to conduct improved debt-related monitoring. Conversely, diffused public debt ownership and the resulting free-rider problem limit bondholders' incentives to invest in time-consuming monitoring. Our results suggest that with the increase on ESG risk exposure, firms avoid borrowing from banks and switch to the public bond market, implying that banks probably are more successful at shaping and monitoring borrowers' ESG performances. In this context, our research has significant policy implications by

demonstrating the critical role of financial intermediaries in attaining sustainable development goals.

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Table 1: Summary Statistics

This table presents summary statistics for our sample firms over the 2007-2019 period. We split our sample into two subsamples based on the median value of *RRI*. In Panel A, *Bank Debt* is the percentage of bank debt scaled by the total amount of debt. *Public Debt* is the percentage of public bond debt scaled by the total amount of debt. *RRI* is the firm's quarterly reputational exposure to ESG risk. *RRR* is the firm's quarterly level ESG rating. Other variable definitions are listed in Appendix OA1. Panel B and Panel C present the summary statistics for our bond level sample and our loan facility-level sample, respectively. All variables are winsorized at the 1% and 99% levels.

Sample:	All Observations			High RRI Observations			Low RRI Observations		
Variable:	Observations	Mean	S.D.	Observations	Mean	S.D.	Observations	Mean	S.D.
Panel A: Firm Level Data									
Bank Debt (%)	71,341	0.390	0.387	35,818	0.305	0.350	35,523	0.476	0.404
Public Debt (%)	71,341	0.494	0.399	35,818	0.583	0.376	35,523	0.403	0.402
Other (%)	71,341	0.116	0.248	35,818	0.111	0.230	35,523	0.121	0.265
RRI	71,341	10.446	12.911	35,818	20.770	10.855	35,523	0.036	0.212
RRR	71,341	8.106	1.560	35,818	7.276	1.667	35,523	8.943	0.833
Firm Size	71,341	7.711	2.182	35,818	8.691	1.881	35,523	6.720	2.011
Firm Leverage	71,341	0.345	0.460	35,818	0.339	0.352	35,523	0.351	0.548
Tobin's Q	71,341	1.803	3.069	35,818	1.603	1.871	35,523	2.007	3.912
PPE Ratio	71,341	0.320	0.261	35,818	0.335	0.253	35,523	0.304	0.267
Debt Rating Indicator	71,341	0.503	0.500	35,818	0.653	0.476	35,523	0.352	0.478
Firm Profit	71,341	0.019	0.093	35,818	0.027	0.055	35,523	0.011	0.119
Cash Ratio	71,341	0.107	0.125	35,818	0.094	0.100	35,523	0.120	0.145
Panel B: Loan Level Data									
Loan Spreads (bps)	11,970	227.773	145.218	5516	210.515	150.327	6,454	245.613	150.852
Loan Maturity	14,383	3.838	0.629	7,181	3.761	0.706	7,202	3.916	0.529
Panel C: Bond Level Data									
Bond Spreads (bps)	5,260	236.691	185.595	2,918	186.039	158.799	2,342	299.801	204.049
Bond Maturity	5,569	4.684	0.714	3,138	4.700	0.800	2,431	4.664	0.564

Table 2: Correlation Matrix

This table presents the correlation matrix for the main variables in our sample. *Bank Debt* is the percentage of bank debt scaled by the total amount of debt. *Public Debt* is the percentage of public bond debt scaled by the total amount of debt. *RRI* is the firm's quarterly reputational exposure to ESG risks. *RRR* is the firm's quarterly ESG rating. Other variable definitions are listed in Appendix OA1. We can see that *RRI* is negatively associated with bank debt and positively associated with public debt. All variables are winsorized at the 1% and 99% levels. * denotes statistical signifcance at the 5% level.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(8)	(9)	(11)	(12)	(13)
(1) Bank Debt	1										
(2) Public Debt	-0.801*	1									
(3) RRI	-0.249*	0.236*	1								
(4) RRR	0.154*	-0.133*	-0.708*	1							
(5) Firm Size	-0.295*	0.328*	0.538*	-0.449*	1						
(6) Tobin's Q	-0.030*	0.009	-0.061*	0.059*	-0.286*	1					
(8) Firm Leverage	-0.024*	0.094*	-0.035*	0.048*	-0.164*	0.268*	1				
(9) PPE Ratio	-0.012*	0.026*	0.048*	-0.074*	0.066*	-0.126*	0.047*	1			
(11) Debt Rating Indicator	-0.368*	0.457*	0.329*	-0.200*	0.557*	-0.135*	0.050*	0.049*	1		
(12) Firm Profit	-0.002	0.013*	0.089*	-0.074*	0.350*	-0.291*	-0.204*	0.058*	0.153*	1	
(13) Cash Ratio	-0.060*	-0.047*	-0.100*	0.063*	-0.300*	0.232*	-0.007	-0.293*	-0.213*	-0.200*	1

Table 3: Debt structure and ESG risk

This table presents our baseline results regarding the impact of ESG risk on debt structure. The dependent variable, *Bank Debt,* is the percentage of bank debt scaled by the total amount of debt. *Public Debt* is the percentage of public bond debt scaled by the total amount of debt. Columns (1) to (3) report regression results of *Bank Debt, Public Debt* and *Total Debt* on ESG risk (*RRI*), respectively. Columns (4) to (6) also report regression results of *Bank Debt* and *Public Debt* on *RRI*, respectively. We include year quarter fixed effects and industry fixed effects from Coulmns (4) to (6). The independent variables are lagged one period. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level and are reported in parentheses.

Dependent Variable:	Bank Debt (%)	Public Debt (%)	Total Debt	Bank Debt (%)	Public Debt (%)	Total Debt
	(1)	(2)	(3)	(4)	(5)	(6)
RRI	-0.231***	0.117***	0.020	-0.242***	0.127***	0.234
	(0.04)	(0.04)	(0.21)	(0.04)	(0.05)	(0.20)
Firm Size	-0.033***	0.032***	1.072***	-0.031***	0.035***	1.040***
	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.03)
Tobin's Q	-1.074***	0.907***	-0.083	-1.058***	0.895***	0.007
	(0.21)	(0.20)	(1.03)	(0.20)	(0.20)	(0.95)
Firm Leverage	-0.002	0.058**	1.348***	-0.004	0.071**	1.296***
	(0.02)	(0.03)	(0.25)	(0.02)	(0.03)	(0.22)
PPE Ratio	-0.074***	0.046*	0.342***	-0.025	-0.021	0.607***
	(0.02)	(0.02)	(0.08)	(0.03)	(0.03)	(0.14)
Debt Rating Indicator	-0.224***	0.298***	0.309***	-0.222***	0.276***	0.319***
	(0.01)	(0.02)	(0.07)	(0.02)	(0.02)	(0.07)
Firm Profit	0.243***	-0.263***	-0.827***	0.212***	-0.233***	-0.758***
	(0.07)	(0.06)	(0.25)	(0.06)	(0.06)	(0.24)
Cash Ratio	-0.514***	0.237***	-0.995***	-0.473***	0.198***	-0.903***
	(0.05)	(0.05)	(0.23)	(0.05)	(0.05)	(0.24)
Year-Quarter FE	No	No	No	Yes	Yes	Yes
Industry FE	No	No	No	Yes	Yes	Yes
Obs.	62,586	62,586	62,586	62,586	62,586	62,586
Adj. R2	0.194	0.241	0.779	0.220	0.278	0.792

Table 4: The impact of each component of ESG risk on Debt choice

This table shows the impact of each component of ESG risk on debt choice. The dependent variable, *Bank Debt* is the percentage of bank debt scaled by the total amount of debt. *Public Debt* is the percentage of public bond debt scaled by the total amount of debt. We split ESG risk into three components:" E", "S", and "G". Our results show that firms' debt choice is driven by Social, Governance factors rather than the Environmental factor. The independent variables are lagged one period. Column (4) and Column (8) report the estimation results of specification including "E", "S" and "G" together. The coefficient of "E" is significant in the sepcification (1), but it becomes insignificant in the specification (4). "S" and "G" remain significant in all specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level and are reported in parentheses.

Dependent Variable:	Bank Debt (%)				Public Debt (%)			
	（1）	（2）	（3）	（4）	（5）	（6）	（7）	（8）
RRI_E	-0.265*** (0.10)			-0.153 (0.10)	0.068 (0.11)			0.003 (0.11)
RRI_S		-0.334*** (0.06)		-0.300*** (0.06)		0.178** (0.07)		0.174*** (0.07)
RRI_G			-0.237*** (0.06)	-0.233*** (0.06)			0.156** (0.07)	0.152** (0.07)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	62,586	62,586	62,586	62,586	62,586	62,586	62,586	62,586
Adj.R2	0.217	0.218	0.217	0.220	0.277	0.278	0.277	0.278

Table 5: The impact of borrower's RRI related to 28 issues on debt structure

This table reports the OLS regreession of the impact of borrower's RRI related to 28 issues on debt structure. The abbreviation of the specific issues are: *rri_cc*: Climatee change, *rri_lp*: Local pollution, *rri_iol*: Impacts on communities, *rri_oaw*: Overuse and wasting, *rri_wi*: Waste Issues, *rri_am*: Animal mistreatment, *rri_hra*: Human rights abuses, *rri_ioc*: Impacts on communities, *rri_lpi*: Local participation, *rri_sd*: Social discrimination, *rri_fl*: Forced labor, *rri_cl*: Child labor, *rri_foa*: Freedom of association, *rri_die*: Discrrimination in employment, *rri_oh*: Occupational health and safety, *rri_pec*: Poor employment conditions, *rri_cbe*: Corruption, *rri_ec*: Executive compensation, *rri_mc*: Misleading communication, *rri_fd*: Fraud, *rri_te*: Tax evasion, *rri_to*: Tax optimation, *rri_ap*: Anti-competitive, *rri_cp*: Controversial products, *rri_phe*: Health and Environmental, *rri_voi*: Violation of international standards, *rri_von*: National legislation, and *rri_sci*: Supply chain. The 28 issues related RRI are lagged one period. The dependent variable is *Bank debt* (%). Year-quarter and Industry FE are included. The Industry classificattion is based on Fama-French 48 industry classification. Standard errors are clustered at the firm level. standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Environemental Issues	(1)	(2)	(3)	(4)	(5)	(6)	
	rri_cc	rri_lp	rri_iol	rri_oaw	rri_wi	rri_am	
Bank Debt (%)	-0.005	-0.000	0.001	-0.006	0.008	-0.033***	
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	

Panel B: Community Issues	(1)	(2)	(3)	(4)			
	rri_hra	rri_ioc	rri_lpi	rri_sd			
Bank Debt (%)	-0.009***	0.001	0.008	-0.027**			
	(0.00)	(0.00)	(0.01)	(0.01)			

Panel C: Employee Issues	(1)	(2)	(3)	(4)	(5)	(6)	
	rri_fl	rri_cl	rri_foa	rri_die	rri_oh	rri_pec	
Bank Debt (%)	-0.021***	-0.023***	-0.017***	-0.029***	-0.005	-0.010***	
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	

Panel D: Governance Issues	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	rri_cbe	rri_ec	rri_mc	rri_fd	rri_te	rri_to	rri_ap
Bank Debt (%)	-0.001	-0.060***	-0.022***	-0.003	-0.028***	-0.035***	-0.008**
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)

Panel E:Cross-Cutting Issues	(1)	(2)	(3)	(4)	(5)		
	rri_cp	rri_phe	rri_voi	rri_von	rri_sci		
Bank Debt (%)	-0.014***	-0.005**	-0.011	-0.003*	-0.012***		
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)		

Table 6: ESG risk, Bank monitoring, Debt instruments

This table shows the OLS regression results for the impact of ESG risk on different types of debt and which types of debt are more sensitive to the ESG risk. Specifically, we split bank debt into term loans and revolvers and split bond debt into three components (senior bonds and notes, subordinated bonds and notes, and commercial paper) by following Colla et al., (2013). All of the independent variables are lagged one period. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level and are reported in parentheses.

Dependent Variable:	Bank Debt (%)		Bond Debt (%)		
	Term Loan (%) (1)	Revolvers (%) (2)	Senior Bonds and Notes (%) (3)	Subordinated Bonds and Notes (%) (4)	Commercial Paper (%) (5)
RRI	-0.187***	-0.055**	0.104**	-0.011	0.034***
	(0.03)	(0.02)	(0.05)	(0.01)	(0.01)
Controls	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Obs.	62,586	62,586	62,586	62,586	62,586
Adj. R2	0.093	0.179	0.262	0.054	0.083

Table 7: Negative news, debt issuance and debt switching

This table reports the Logit regression of the number of the borrower's negative reputation news on the likelihood of initiating new loans and new bonds(Coumns(1) and (2)). In addition, this table reports the Logit regression of the number of the borrower's negative reputation news on the likelihood of switching debt choices(Columns(3) and (4)). *Ln_Nr_News* is the number of negative ESG news coverage at quarter t-1. Detailed variable definitions are available in the OA1. All regressions control for industry and year quarter fixed effects. The dependent variables and independent variables are lagged one period. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level, and t-statistics are reported in parentheses.

Dependent Variable:	Sample of firms that issues either bonds or loans, or both			
	New Loan Issuance	New Bond Issuance	Same Loan Issuance	Same Bond Issuance
	(1)	(2)	(3)	(4)
Ln_Nr_News	-8.475***	4.917***	-11.992***	6.894*
	(2.01)	(1.25)	(3.19)	(3.77)
Controls	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Obs.	62,586	62,586	62,408	62,260
Pseudo R2	0.037	0.040	0.053	0.046
Dependent Variable:	Sample of firms that issues either bonds or loans			
	New Loan Issuance	New Bond Issuance	Same Loan Issuance	Same Bond Issuance
	(1)	(2)	(3)	(4)
Ln_Nr_News	-8.863***	6.471***	-10.798***	8.526**
	(2.28)	(1.42)	(3.26)	(3.89)
Controls	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Obs.	48,639	48,639	48,565	48,447
Pseudo R2	0.044	0.052	0.051	0.051

Table 8: 2SLS

The table shows the results from 2SLS estimations using an instrumental variable approach. The dependent variable is *RRI* in the first stage. *RRI* is instrumented by the dummy variables *Canada Border* and *High Religious* in the second stage. Year-quarter and Industry FE are included. Industry classificattion are based on Fama-French 48 industry classification. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level, and t-statistics are reported in parentheses.

Dependent Variable:	1st Stage	2nd Stage	
	RRI	Bank Debt (%)	Bond Debt (%)
	(1)	(3)	(4)
Variables of Interest			
RRI		-0.016***	0.036***
		(0.003)	(0.004)
Instrumental Variables			
Canada Border	-0.542***		
	(0.15)		
High Religious	-1.729***		
	(0.16)		
Cragg-Donald Wald F-stat	60.361		
(Stock-Yogo weak ID test critical value)	(19.93)		
Controls	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Obs.	71,341	71,341	71,341

Online Appendix for "Firm ESG Reputation Risk and Debt Choice"

OA1: Variable definition and data source

This table presents the description of all the key variables in our sample, together with their data sources.

Variable	Definition	Source
Public Debt (%)	Ratio of public bonds to total debt. Public bonds represent the sum of senior bonds and notes, subordinated bonds and notes, and commercial paper. Total debt is the sum of term loans, revolving credit, senior bonds and notes, subordinated bonds and notes, commercial paper, capital leases, and other debt.	Capital IQ
Bank Debt (%)	Ratio of bank loans to total debt. Bank loans is the sum of revolving credit and term loans. Total debt is the sum of term loans, revolving credit, senior bonds and notes, subordinated bonds and notes, commercial paper, capital leases, and other debt.	Capital IQ
RRI	Company's quarterly reputational exposure to ESG risks.	RepRisk
RRR	Company's quarterly ESG rating	RepRisk
Ln_Nr_News	Natural logarithm of one plus the total number of negative ESG issues, as reported in the media.	RepRisk
Firm Size	The natural logarithm of the borrower's total assets	Compustat
Firm Leverage	The ratio of borrower's total book debt to total assets.	Compustat
Tobin's Q	The ratio of market value of total assets to book value of total assets.	Compustat
PPE Ratio	The amount of property, plant, and equipment scaled by total assets.	Compustat
Debt Rating Indicator	An indicator that equals one if the borrower is rated by S&P long-term credit rating, and zero otherwise	Compustat and Capital IQ
Firm Profit	Operating income before depreciation scaled by total assets	Compustat
Cash Ratio	Cash and equivalents divided by total assets	Compustat
New Loan Issuance	An indicator that equals one if the difference between the outstanding of bank debt at quarter t and at quarter t-1 is positive, and zero otherwise.	Capital IQ
New Bond Issuance	An indicator that equals one if the difference between the outstanding of public debt at quarter t and at quarter t-1 is positive, and zero otherwise.	Capital IQ
Same Loan Issuance	An indicator that equals one if the borrower has both new loan issuance at quarter t and quarter t-1, and zero otherwise.	Capital IQ
Same Bond Issuance	An indicator that equals one if the borrower has both new bond issuance at quarter t and quarter t-1, and zero otherwise.	Capital IQ

OA2: Testing for the potential importance of omitted variables

The table reports the results of the potential importance of omitted variables following Oster (2019). We repot the (absolute value) of δ needed to "explain away" the result, that is , to imply a zero coefficient on the variable of interest. In these analyses, we follow recommendations of Oster (2019) to set the maximum R2 explained by the variable of interest, observed control variables，and unobseerved variables to 1.3 times the R2 from the corresponding specification. *** p<0.01, ** p<0.05, * p<0.1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Main results	Table 3 Model(1)	Table 3 Model(4)					
	δ	δ					
	1.298	1.222					
Panel B: Environmental issues	Table 5 (rri_cc)	Table 5 (rri_lp)	Table 5 (rri_iol)	Table 5 (rri_oaw)	Table 5 (rri_wi)	Table 5 (rri_am)	
	δ	δ	δ	δ	δ	δ	
	4.587	4.474	4.223	2.851	5.207	6.150	
Panel C: Community Issues	Table 5 (rri_hra)	Table 5 (rri_ioc)	Table 5 (rri_lpi)	Table 5 (rri_sd)			
	δ	δ	δ	δ			
	5.302	4.262	3.366	4.204			
Panel D: Employee Issues	Table 5 (rri_fl)	Table 5 (rri_cl)	Table 5 (rri_foa)	Table 5 (rri_die)	Table 5 (rri_oh)	Table 5 (rri_pec)	
	δ	δ	δ	δ	δ	δ	
	5.221	5.597	5.230	4.727	5.345	6.232	
Panel E: Governance Issues	Table 5 (rri_cbe)	Table 5 (rri_ec)	Table 5 (rri_mc)	Table 5 (rri_fd)	Table 5 (rri_te)	Table 5 (rri_to)	Table 5 (rri_ap)
	δ	δ	δ	δ	δ	δ	δ
	7.749	3.954	4.201	8.797	4.324	6.595	5.931
Panel F: Cross-Cutting Issues	Table 5 (rri_cp)	Table 5 (rri_phe)	Table 5 (rri_voi)	Table 5 (rri_von)	Table 5 (rri_sci)		
	δ	δ	δ	δ	δ		
	5.945	6.691	2.873	3.521	5.828		

OA3: Loan, bond spread and maturity comparison and ESG risk

This table represents the impact of ESG risk on loan spreads and bond spreads. This table is designed to alleviate the concern that whether firms' financing choice is affected by the pricing of ESG risk in the two markets. *Loan Spread* is the basis point spread over LIBOR plus the facility fee. *Bond Spread* is the difference between the yield on the bond and a treasury bond with the corresponding maturity. *Loan Maturity* is the natural log of the maturity of the loan facility in months. *Bond Maturity* is the natural log of the maturity of bonds in months. The results show that ESG risk exposure (measured by *RRI*) is priced in either loan contract terms or bond contract terms. Firms with higher ESG risk face higher loan spread, shorter loan maturity, higher bond spreads, and shorter bond maturity. Control variables include firm characteristics, loan characteristics or bond characteristics. All regressions control for industry and year quarter fixed effects. The independent variables are lagged one period. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level, and t-statistics are reported in parentheses.

Sample	All Loan Facilities		All Bond Facilities	
Dependent Variable:	Loan spread	Loan Maturity	Bond spread	Bond Maturity
RRI	46.57**	-0.280**	108.09***	-0.278**
	(16.23)	(-2.40)	(21.43)	(0.10)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Obs.	11,310	13,711	4,932	4,954
Adj. R2	0.414	0.148	0.653	0.039

OA4: Robustness Check:ESG risk and Debt New Issuance (based on the sample from DealScan and SDC)

This table reports the Logit regression of the number of the borrower's negative reputation news and ESG risk exposure on the likelihood of initiating new loans and new bonds, respectively. Different with the restimation results in Table 7 and Table 9. This results are estimated based on the samole from DealScan and SDC. All independet variables are lagged one period. We include year-quarter and Industry FE. The Industry classificattion is based on Fama-French 48 industry classification. Standard errors are clustered at the firm level. standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	New Loan Issuance	New Bond Issuance	New Loan Issuance	New Bond Issuance
	(1)	(2)	(3)	(4)
RRI	-0.505***	0.526**		
	(0.19)	(0.26)		
Ln_Nr_News			-4.519*	8.537***
			(2.58)	(3.17)
Controls	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Obs.	62,537	62,537	62,537	62,537
Pseudo R2	0.066	0.083	0.066	0.083

OA5: Robust Check: Whether results driven by the loan supply?

This table reports the regression results with an additional control variables (*Loan supply*). *Loan supply* is monthly all commercial and industrial loans from all commercial banks. All specifications include industry fixed effects and year-quarter fixed effects. Standard errrors are clustered by firm and aree reported in parentheses. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10%

Dependent Variable:	Bank Debt (%)	Public Debt (%)	Total Debt
	(1)	(2)	(3)
RRI	-0.242***	0.127***	0.234
	(0.04)	(0.05)	(0.20)
Loan supply	0.284	-0.144	4.870***
	(0.42)	(0.43)	(1.30)
Controls	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Obs.	62,586	62,586	62,586
Adj. R2	0.699	0.699	0.741

OA6: Robust Check:Whether results driven by institutional ownership?

This table presents whether our regressions results are driven by institional ownership. Ins_high is a dummy variable that takes one if the percentage of ownership hold by institutional investos is higher than mean value of the instituional ownership, and zero otherwise.. *Ln_Nr_News* is the number of negative ESG news coverage at quarter t-1. The interaction term *Ln_Nr_News*Inst_high* indicates whether the impact of ESG negative news coverage on debt issuance is more pronounced with the increase on institutional ownership. All regressions control for industry and year quarter fixed effects. The independent variables are lagged one period. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level, and t-statistics are reported in parentheses.

Panel A:	Sample of firms that issue either bonds or loans, or both	
Dependent Variable:	New Loan Issuance	New Bond Issuance
	(1)	**(2)**
Ln_Nr_News*Inst_high	-7.128*	7.558**
	(3.81)	(3.46)
Ln_Nr_News	-0.835	-8.850***
	(3.10)	(2.96)
Inst_high	-0.122***	0.007
	(0.05)	(0.06)
Controls	Yes	Yes
Year-Quarter FE	Yes	Yes
Firm FE	Yes	Yes
Obs.	50,725	50,725
Adj. R2	0.042	0.055

Panel B:	Sample of firms that issue either bonds or loans	
Dependent Variable:	New Loan Issuance	New Bond Issuance
	(1)	**(2)**
Ln_Nr_News*Inst_high	-9.479**	7.393*
	(4.32)	(3.97)
Ln_Nr_News	-0.612	-7.535**
	(3.49)	(3.45)
Inst_high	-0.160***	-0.049
	(0.05)	(0.07)
Controls	Yes	Yes
Year-Quarter FE	Yes	Yes
Firm FE	Yes	Yes
Obs.	39,298	39,298
Adj. R2	0.048	0.072

OA7: Robust Check: Different ESG proxies and different fixed effects

This table reports regression estimates based on different ESG proxies and different fixed effects. The dependent variable, Bank Debt, is the percentage of bank debt scaled by the total amount of debt. Public Debt is the percentage of public bond debt scaled by the total amount of debt. We control firm fixed effects to replace the industry fixed effects in Table 3. Columns (1) and (3) report regression results of Bank Debt and Public Debt on ESG risk (RRI), respectively. Columns (2) and (4) report regression results of Bank Debt and Public Debt on ESG rating (RRR), respectively. Columns (5) and (6) report regression results of Total Debt on RRI and RRR, respectively. The independent variables are lagged one period. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are robust and clustered at the firm level and are reported in parentheses.

Dependent Variable:	Bank Debt (%)		Public Debt (%)		Total Debt	
	(1)	(2)	(3)	(4)	(5)	(6)
RRI	-0.066***		0.058**		0.096	
	(0.02)		(0.02)		(0.07)	
RRR		1.003***		-0.608**		-1.336
		(0.26)		(0.26)		(0.85)
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	62,540	62,540	62,540	62,540	62,540	62,540
Adj. R2	0.699	0.699	0.741	0.741	0.939	0.939