Nonfinancial Disclosure Mandates and Private Lending

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Abstract

Utilizing the staggered implementation of environmental and social (E&S) disclosure mandates in 31 countries spanning from 2000 to 2017, we discover that lenders charge (approximately 18 basis points) less on bank loans and stipulate less restricted loan contract terms when the borrower's country is subject to E&S information disclosure mandates. The negative relationship between E&S disclosure mandates and bank loan costs is more pronounced among loan facilities with pre-existing bank lending relationships or when borrowers face greater market attention. Further analysis shows that better country-level information environments strengthen this negative impact of E&S disclosure mandates. Our study suggests that non-financial ESG disclosure not only mitigates information asymmetries in private lending but also significantly reduces the cost of capital worldwide.

Keywords: ESG disclosure; private lending; environmental and social disclosure; bank lending relationship; information environment

JEL classification: G18; G21; G32; G38; M14; M48; Q56

1. Introduction

There has been a tremendous increase in environmental and social (E&S) disclosure regulation initiatives around the world over the past decades. This trend is projected to proceed through the next years. For instance, in the decade before 2024, environmental, social and governance (ESG) regulations increased by 155% according to the ESG Book, a commercial data management firm.[1] The scale and scope of these regulations have not only significantly increased the supply of E&S information but also improved transparency and quality through more disclosure of E&S activities. On the demand side, the growing discourse and concerns surrounding global warming and climate risks have prompted investors to seek greater environmental and social responsibility from companies. However, there has been an ongoing debate over the years about whether E&S-related information, being non-financial in nature, has any impact on financial markets. Some argue that E&S disclosure has a minimal impact on financial markets because this non-financial information is irrelevant to a firm's core operations and is hard to interpret due to a lack of standardized reporting frameworks. On the other hand, in theory, E&S information can influence firm value by reducing information asymmetry and altering the firm's competitive environment, supply chains, and operations. Moreover, E&S disclosure reflects firms' E&S activities and influences investors' non-monetary returns and investment decisions.

Despite the growing emphasis on E&S matters and emerging interest in the relation between corporate E&S disclosures and firm investment (e.g., Bae et al., 2024; Gibbons, 2023; Jiang et al., 2023; Wang, 2023), empirical evidence regarding the impact of mandatory E&S disclosures on the cost of capital remains under explored and

[1] https://sustainability-news.net/policy-and-regulation/2024-guide-to-esg-regulation/

limited to cost of equity (e.g. Chava, 2014; El Ghoul et al., 2011; Plumlee et al., 2015). However, evidence on cost of equity may not directly apply to cost of debts due to the different payoff structures. In this study, we fill this research gap by investigating the impact of E&S regulation adoption on the cost of debts from evidence in global bank loan markets.

Corporates' credit conditions are the key factors that inform lenders' decisions. Lenders will therefore generally consider two main questions, 1) whether the information available on the borrower is biased, and 2) how to effectively utilize this information to accurately assess the corporation's true creditworthiness. First, in the contracting process, lenders will incorporate any costs that are related to alleviating the information asymmetry. The literature shows that E&S disclosure helps alleviate the information asymmetry between the investor and corporates and reduce cost of equity (e.g. El Ghoul et al., 2011). Since the newly disclosed E&S information from corporates is also available to debt investors, it may likewise have an impact on the loan market as well. Second, the E&S information is associated with borrowers' investment and efficiency (Allman & Won, 2021; Chava, 2014; El Ghoul et al., 2011; Gibbons, 2023), which may also contain information about the future financial performance of a company. In particular, lenders can better access E&S-related risk that may affect borrowers' ability to make the repayment timely. In addition, after the contracting of loans, lenders dedicate significantly to monitoring the loan to reduce the moral hazard. With reduced information asymmetry after the more stringent disclosure regulations, borrowers may benefit from loosened terms and lower costs in bank loan borrowing. Collectively, if the newly disclosed E&S information resulting from the mandates helps to reduce information friction between lenders and borrowers given this information contains useful information about borrowers' future financial performance, borrowers'

loan contracts should be responsive to the mandatory E&S disclosure mandates. Therefore, we hypothesize that mandatory E&S regulations affect borrowers' cost of private debt.

We investigate the effect of mandatory E&S information disclosure in the bank loan markets because lenders become emerging consumers of the new non-financial information due to more ESG regulations for banks operating across the world. For example, all large companies, including banks in the EU, will need to provide sustainability reporting under the European Sustainability Reporting Standards (ESRS) by the end of 2024.[2] Similarly, the Financial Conduct Authority (FCA) is introducing a new Sustainability Disclosure Requirements regime in 2024 for UK banks.[3] Arguably, borrowers' E&S information is one of the foremost drivers of effective actions needed to navigate the rapid growth in ESG regulations.[4] However, integrating environmental and social factors into loan pricing has been a long-standing challenge for bank lenders and become an urgent task for banks in many countries recently. For example, the European Central Bank expects European banks to update their loan pricing framework by the end of 2024 so that climate-related and environmental risks can be reflected in banks' credit risk appetite and business strategy.[5] One key factor that constrains the loan pricing components from being sensitive to climate-related and environmental risk is non-financial information disclosure. Although banks become more obligated to collect, monitor and assess new information to guide their decisions, information disclosure and quality were limited previously. With increased E&S information available from borrowers, lenders will be foreseeably inevitable to take actions to refine their pricing

[2] https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en#legislation
[3] https://www.fca.org.uk/publications/policy-statements/ps23-16-sustainability-disclosure-requirements-investment-labels
[4] More E&S information is desirable when investor care more about ESG (Xue, 2023).
[5] https://kpmg.com/xx/en/our-insights/ecb-office/climate-related-and-environmental-risks-in-loan-pricing.html

framework to reflect E&S-related risks in line with regulatory expectations. Critically understanding how the mandatory E&S information disclosure requirements interact with the financial markets is therefore crucial, particularly, for corporations seeking to optimize their financing decisions.

Our study focuses on 31 countries' adoption of E&S disclosure regulations, which are implemented by governments, financial market regulators, and stock exchanges gradually on a country basis. These interventions bring significant changes that not only expand corporates' E&S information available to market participants but also enhance corporates' awareness of E&S considerations in their investment and financing decisions (Gibbons, 2023). Using a sample of 22,401 bank loan facilities issued between 2000 and 2017, we apply a staggered difference-in-difference (DID) approach to investigate whether E&S information disclosure mandates have an impact on bank loan costs. Our sample covers corporate borrowers from 50 countries, among which 31 countries introduced E&S mandates, and 19 countries serve as control countries. Our findings indicate that loan interest spreads decrease following the implementation of E&S regulations, suggesting that E&S disclosures lower the cost of debt. To address endogeneity concerns, we apply propensity score matching, resulting in a matched sample of 5,381 loan facilities from 1,159 unique borrowers. Our findings remain robust across various specifications, alternative fixed effects, alternative matching methods, entropy balancing, and additional control variables. On average, firms in countries with E&S disclosure regulations experience about 18 basis points reduction in their loan interest spread, compared to that of borrowers in countries without such regulations or before the regulations were implemented. Our main results address the significant implications of enhancing environmental and social disclosure through regulations for corporate borrowing from banks.

Our findings are further corroborated by the effect of E&S information disclosure regulations on loosening non-price terms of loan contracts. Our analysis reveals that after the enactment of the E&S disclosure mandates, borrowers secure larger loan facilities with longer maturity. Lenders also become less inclined to require collateral in loan agreements after the introduction of these regulations. In addition, we also observe an increase in new borrower-lender relationships post-adoption of the E&S disclosure requirements. Viewed collectively, our empirical findings support the notion that the incremental information provided by borrowing firms through E&S disclosures reduces information asymmetries between borrowers and lenders, leading to lower loan spreads and more favorable loan terms.

Further analysis shows that the negative relation between E&S information disclosure and loan costs is stronger for firms that are more exposed to the capital market risk prior to loan issuance. This finding addresses the importance of investor attention in capital markets. We also find no evidence that the effect of E&S disclosure mandates is driven by pressure from banks due to their own ESG disclosure requirements, which indicates that E&S information contains useful information about the borrower's creditworthiness. Moreover, we observe a more pronounced association between E&S disclosure mandates and loan interest spread when the lenders have existing lending relationships with borrowers. This finding suggests that the incremental E&S information due to interventions is more useful for lenders who have less information asymmetries with borrowers already.

In addition, our international sample provides a useful setting to explore how the institutional environment affects the mechanisms through which E&S information influences loan prices. Specifically, we test our main hypothesis on sub-samples based

on common measures of institutional characteristics, namely corporate governance, information environment, transparency and trust, and national ethics levels. Our results indicate that the impact of E&S information on lowering loan costs is more pronounced in countries with stronger corporate governance, a more robust information environment, higher levels of transparency and trust, and elevated national ethical standards.

Our study contributes to at least three areas of research. First, we enhance the literature on the consequences of mandatory ESG disclosure regulations by demonstrating its positive impact on the debt market. Chen et al., (2018) suggest that CSR reporting mandates in China are associated with increased firms expenditure and reduced profitability. Downar et al., (2021) find that firms' carbon emission is reduced following the carbon disclosure mandates. More recent studies focus more on the mandatory ESG information disclosure interacts with the capital market, following a comprehensive literature review by Christensen et al., (2021). For example, a theoretical paper by Jiang et al., (2023) illustrates that when ESG disclosure are mandatory, managers are more likely to select optimal projects, enhancing investment efficiency. Krueger et al., (2024) demonstrate that following the implementation of global ESG disclosure regulations, the information environment has improved which shows a beneficial effect on the capital market. Joining this growing body of literature, we provide evidence of the real effect of mandatory disclosure on the international loan market.

Second, we contribute to research on private lending by highlighting the role of non-financial information disclosure in lenders' decision-making processes. The existing literature focuses on how E&S disclosure mandates have material effects on

the cost of equity (Chava, 2014; El Ghoul et al., 2011; Plumlee et al., 2015; Truong et al., 2024), financing, investment decision (Bae et al., 2024; Gibbons, 2023; Ho et al., 2024). However, how E&S information affects debt financing is scarcely investigated. Previous bank loan studies have suggested how information risk affects bank lending and the role of high-quality firm-level information in reducing the information asymmetries between borrowers and lender (Graham et al., 2008; Qian et al., 2015). For example, banks charge lower spread in loans and require fewer restrictive covenants to adopters of International Financial Reporting Standards (Kim et al., 2011). More firm-level media coverage and positive sentiment are shown to reduce the cost of bank borrowing (Bushman et al., 2016; Jia et al., 2023). We extend this literature by showing the transparency and quality of non-financial information having crucial financial consequences in bank lending. Others investigate the question from the perspective of lenders. While Wang, (2023) highlights that ESG disclosure regulations exhibit transmission effects across bank lending networks, our study documents a more direct impact of E&S disclosure regulations from the borrowers' perspective.

Finally, our study advances the literature on international accounting by providing evidence that differences in non-financial disclosure regulations across countries contribute to variations in financial market frictions (Beyer et al., 2010; Christensen et al., 2017; Dhaliwal et al., 2011; Francis et al., 2008; Grewal et al., 2019). In addition, more broadly, we contribute to the extensive literature on how information disclosure interacts with the capital market (Chen et al., 2015; Healy & Palepu, 2001; Leuz & Wysocki, 2016; Verrecchia, 2001).

The remainder of our paper is organized as follows. Section 2 presents hypotheses development. Section 3 introduces the empirical method, including the data and sample

construction. Section 4 discusses our empirical findings. Section 5 conducts subsample analyses. Section 6 concludes the paper.

2. Hypotheses development

In this section, we formulate our hypotheses development on the effects of mandatory ESG disclosure on the cost of bank loans for borrowing firms.

It is argued that E&S disclosure has little impact on the financial market for two main reasons: (1) from the accounting perspective, as long as all material information relevant to a firm's operations is disclosed, additional E&S information is considered peripheral and irrelevant to the firm's core operational performance; (2) E&S information lacks comparability due to the absence of standardized reporting frameworks, preventing such information from being fully integrated into the investment decision-making process. Based on these views, we have our null hypothesis:

H0: Mandatory E&S regulations do not affect borrowers' cost of private debt.

However, contrary to the null hypothesis, recent empirical studies suggest that investors' behavior and the financial market are affected by mandatory ESG disclosure regulations. For instance, Bolton & Kacperczyk (2021) document a carbon premium, indicating that firms with more carbon emission levels exhibit higher adjusted stock returns and argue that investors care about the risk associated with carbon emissions. Similarly, Gibbons (2023) shows that the adoption of E&S regulations influences both investment and financing activities. Krueger et al. (2024) find increased stock liquidity in countries with E&S regulations. These findings collectively indicate that ESG regulations can shape market behavior, influencing investor sentiment and corporate

finance activities across various domains.

Moreover, theory suggests that E&S information is relevant to investors from both the "value" and "values" perspectives. The "value" theory indicates that ESG disclosure, albeit non-financial, reduces information asymmetry and affects both the expected return and expected risk of the firm. From the "values" perspective, investors such as mutual funds and banks are "ESG-conscious" and have preferences on investees' ESG activities. ESG information reflects firms' ESG activity and affects investors' non-monetary returns and their investment decisions.

From the "value" perspective, E&S disclosure may cast negative effects on firm value via various channels. For example, it reveals information to competitors that may negatively affect firms' competitiveness. The disclosure of E&S activities to the public and authorities could pressure firms to make operational changes. Recent empirical studies provide supportive findings. Christensen et al. (2017) examine the effect of the mandatory disclosure of mine-safety records in financial statements for SEC-registered mine owners and find improved safety but reduced productivity for treated mines. Such an effect is associated with stock market reactions and mutual fund holdings. Focusing on mandatory disclosure of corporate social responsibility information in China, Chen et al. (2018) find that firms subject to the mandate experience a decrease in profitability after the mandate.[6] We have our first alternative hypothesis:

H1a: Mandatory E&S regulations increase borrowers' cost of private borrowing.

On the other hand, mandatory E&S disclosure is also expected to positively affect firm's debt financing as it reduces information asymmetry between firms and investors

[6] Downar et al., (2021) find that the carbon disclosure mandate in the UK effectively reduces firm emissions without affecting their profit margins.

(Krueger et al., 2024). Information asymmetry plays a crucial role in financing and investment decision-making, bank loans being no exception. Ivashina (2009) documents that information asymmetry between the lead bank and other lending banks is associated with higher loan spread. Sufi (2007) finds that information asymmetry between the borrower and the lender affects the syndicate structure and lender member composition.

The tightness of loan contracting is fundamentally determined by the credit condition of a borrower. Therefore, ex-ante financial performance should be the primary consideration of lenders when they lend funds to borrowers. One of the key conclusions from Gibbons (2023) is that firms mandated to disclose E&S information attract more long-term-oriented institutional investors and invest in more value-increasing projects. Institutional investors play an important role in corporate governance efficiency and in turn determine the corporate investment decisions and performance (e.g. Gillan & Starks, 2000). In addition, the literature also suggests that long-term institutional investors are associated with less tight loan contracting and lower loan interest rates spread (Kim et al., 2019). Therefore, the mandatory E&S information disclosure can potentially increase the ex-ante credit condition of the borrowers.

Moreover, the "values" theory suggests that investors such as banks are "ESG-conscious" and have preferences on investees' ESG activities. Such preferences are often based on non-financial motives and may be developed either internally or externally. For example, Houston & Shan (2022) find that banks demonstrate ESG responsibility: banks are more likely to establish borrower-lender relationships with companies whose ESG profiles are similar to the banks', and subsequently cast positive

effects on the borrowers' ESG performance. Similarly, Wang (2023) finds that U.S. borrowers are exposed to E&S disclosure regulations of the lending banks' home countries and improve their E&S performance following the mandate. The ESG transmission between banks and borrowing companies is reciprocal. For example, Huang et al., (2024) document "ESG washing" activities in bank's loan decision-making process: banks with poor ESG performance offer preferable terms for borrowing companies with strong ESG performance. Given the banks' need for ESG-related information on the borrowing companies, any information asymmetry in ESG activities would induce friction in the bank loan market and increase the cost of searching for suitable investees and the cost of monitoring ESG activities of borrowing companies. We conjecture that such costs will be incorporated into the cost of debt.

Based on both the above views, we formulate our second alternative hypothesis as the following:

H1b: Mandatory E&S regulations reduce borrowers' cost of private borrowing.

3. Empirical method

3.1. Data and sample selection

We obtain information on E&S disclosure mandates from Carrots & Sticks Report (Gibbons, 2023; Krueger et al., 2024), which includes ESG disclosure regulations and requirements issued by governments, regulators, and exchanges.[7] Since we focus on the effect of non-financial information on bank loans, we do not include regulations related to corporate governance policies as these regulations may have material information

[7] These excludes regulations specific to an industry or geography or those that only apply to state-run firms.

about the firm's financial status.

Our loan facility data is from Thomson-Reuters LPC DealScan database. Dealscan is a widely used resource for bank loan study which contains rich information about a loan's interest spread, lenders, borrower, maturity, size, collateral, covenants, type, purposes, and so on. We merge facility information with the borrower's financial information in Compustat Global and North America via GVKEY, using the DealScan-Compustat linking file (Chava & Roberts, 2008).

For sample construction, all relevant data must be non-missing for outcome and control variables at the facility level. We exclude treated firms that undergo at least one E&S disclosure regulation with fewer than three facility observations before the regulation, and control firms that are never treated by an E&S disclosure regulation with fewer than ten total observations. We also exclude firms operating in the financial and utility sectors. Our initial full sample contains 22,401 facility observations from 50 economies during 2000-2017, among which 31 are subject to mandatory E&S disclosure regulations. In Appendix I, we present a list of these 31 mandatory regulations utilized in our sample.

To alleviate potential bias in sample selection, we then use Propensity Scoring Matching (PSM) method to match the treated economies' facility observations to non-treated facility observations in the United States[8]. After PSM, we obtain a panel of 5,381 facilities covering 1,159 firms for our main tests. The sample distributions by economy and year are presented in Table 1. Panel A shows that the full sample covers 50 economies including 31 treatment economies, which have enacted a mandatory E&S disclosure regulation. Countries/regions subject to E&S disclosure regulations shocks

[8] Details of PSM can be found in section 4.2.

are highlighted in bold, with the mandate year in brackets. Among the non-treated economies, the United States is the most prominent contributor to the full sample (i.e. 17,333 US observations out of 22,401 all observations). Following that, Canada has relatively more observations (i.e. 661 observations) than other countries. In panel B, we also present the distribution of the number of observations by year, both before and after PSM to samples. Details of the matching procedure are described in Section 4.2 and the propensity score matching results is presented in Table 4. The number of observations is relatively lower in 2017 due to the end of subscription to databases when we collected our data.

[Insert Table 1 here]

Other data used in our empirical analysis includes analyst coverage from I/B/E/S, countries' GDP growth rates and inflation from the World Bank, and media news sentiment from RavenPack News Analytics. Institutional environmental measures are from Bushman et al. (2004), Kaufmann & Bellver (2005), Djankov et al. (2008), La Porta et al. (1998) and the World Values Survey.

3.2. Key variables

The primary variable of interest in this study is *ES*, an indicator variable equal to one if the borrowing firm's headquarter country has adopted a mandatory E&S disclosure regulation and zero otherwise. For example, the UK adopted the Climate Change Act in 2008, and *ES* for all borrowing firms headquartered in the UK equals one for years 2008-2017, and zero for years 2000-2007.

The main dependent variable is the interest rate spread of the loan facility (*Spread*), calculated as the natural logarithm of the sum of the interest rate spread of the facility

in basis points over LIBOR and any annual fees paid for each dollar drawn down to the bank group (i.e., all-in-drawn spread).

For controls, we include a set of variables measuring borrower- and facility-level characteristics that predetermine bank loan spread. Specifically, these variables include the following: *ROA*, defined as operating income after depreciation divided by total assets. *IC*, defined as operating income after depreciation divided by interest expense. *Lev*, defined as total liabilities divided by total assets. *Size*, defined as the natural logarithm of total assets. *Z-Score*, which is Altman's (1968) Z-score. MB, defined as market value of equity divided by the book value of equity. *Loss*, a dummy variable equal to 1 if *ROA* is negative, and 0 otherwise. *Revolver*, a dummy variable equal to 1 if the loan is a revolving line of credit, and 0 otherwise. *TermloanB*, a dummy variable equal to 1 if the loan type is Term Loan B or below (C, D, E, or F), and 0 otherwise. *Return*, defined as borrower's cumulative market-adjusted return over 180 days before the loan issuance date. *NegRtn* a dummy variable equal to 1 if *Return* is negative, and 0 otherwise. *Public*, a dummy variable equal to 1 if the borrower remains publicly listed after the most recent loan issuance, and 0 otherwise. We also include the inflation rate (*Inflation*) and GDP growth rate (*GDPGrowth*) for controlling macroeconomic variations across economies. Appendix I provides a list of variable definitions.

[Insert Table 2 here]

Table 2 presents the summary statistics of the main variables used in this study. Panel A and Panel B present the statistics for full sample and matched sample, respectively. The mean value of the main dependent variable, *Spread*, is 4.997 in our full sample and 4.864 in the matched sample. Equivalently, *Spread* shows an average value of bank loan interest rate spread of 147.96 and 129.5 for matched sample,

respectively. The mean of our primary variable of interest, *ES*, is 0.436, indicating that 43.6% of observations fall in the post-mandate period. The statistics for control variables in Panel A and those in Panel B are closely assembled. In general, the summary statistics of the control variables are similar to those commonly used in literature (e.g. Gao & Jang, 2021; Yang, 2024).

4. Empirical findings

4.1. Preliminary results

We start our empirical work by doing preliminary tests on the effect of mandatory E&S disclosure on loan interest spread. Specifically, we estimate the following staggered difference-in-differences (DID) model:

$$Spread_{it} = \beta_0 + \beta_1 ES_{i,t-1} + \delta\, Controls_{i,t-1} + Purpose\ FE + Firm\ FE + Year\ FE + \varepsilon_{it}. \quad (1)$$

The dependent variable $Spread_{it}$ is the bank loan interest rate spread of borrower *i* in year *t.* The key independent variable $ES_{i,t-1}$ is an indicator variable equal to one if borrower *i* is operated in a country that adopted a mandatory environmental or social law in year *t-1*. All control variables in equation (1) are measured in year *t-1*. We also include facility purpose fixed effects, borrower firm fixed effects and year fixed effects for controlling unobserved heterogeneity that may affect the cost of borrowing. ε is the error term.

We first check the time effect of the events. We run Equation (1) by replacing $ES_{i,t-1}$ with six dummies indicating relative years around the enactment of the E&S regulation. Event year -1 is excluded to allow the effects to be measured relative to

this benchmark year, while years that are three or more years prior to ($t \leqslant -3$) or after ($t \geqslant +3$) the enactment of the E&S regulation are consolidated into groups. Figure 1 plots the coefficient estimates for each event-time year together with 99% confidence intervals. We find that loan interest rate spread is reduced after the enactment of E&S regulations.

[Insert Figure 1 here]

We then estimate equation (1) in a full sample of 21,680 facilities and the results are in column (1) of Table 3. The coefficient estimate of *ES* is significantly negative, suggesting that the bank loan borrowing rate decreases after the borrowing firm's country adopts E&S disclosure regulation. Economically, the loan interest spread decreases by 6.3% (i.e., $e^{-0.065}$-1) after the enactment of E&S disclosure regulation. In column (2), we additionally include industry-year fixed effects to replace year fixed effects which can further control for time-variant factors at the industry level. The results remain similar. In column (3), we add the lender fixed effects and replace the borrowing firm's fixed effects with the borrower's industry fixed effects. In column (4), we replace the borrower's industry and year fixed effects with industry-year fixed effects. The coefficient estimates on *ES* remain similar and statistically significant. In columns (5) and (6), we exclude observations from North America (the US and Canada) to alleviate concerns about potential sampling issues as the observations of these two countries contribute to 80% of the whole sample. Overall, all columns show significant and consistent results that indicate a reduction in loan spread after mandatory E&S disclosure regulations.

[Insert Table 3 here]

4.2. Propensity score matching

We then adopt a propensity scoring matching (PSM) approach in our main specifications to mitigate the concern that the treatment from E&S regulations is not random. We begin our PSM analysis by predicting the likelihood of the firm being treated by E&S disclosure regulations using the following probit model:

$$Treated_{it} = \beta_0 + \beta_1 ES_{i,t-1} + \delta X_{i,t-1} + Purpose\ FE + Industry\ FE + Year\ FE + \varepsilon_{it}, \quad (2)$$

where the dependent variable *Treated* is an indicator variable that equals to one if a facility is borrowed by a borrower whose home country has adopted E&S disclosure regulation, and zero otherwise. The control variables in equation (2) are *ROA, IC, Lev, Size, Z-Score, MB, Loss, Revolver, TermloanB, Return, NegRtn,* and *Public*. We also include facility purpose fixed effect, 2-digit SIC code industry fixed effect, and year fixed effect to control for unobserved heterogeneity.

The PSM is performed using a caliper of 0.01 and nearest-1-neighbor matching without replacement. Table 4 Panel A presents the results of the estimated coefficients of equation (2). Panel B presents the means of the covariates of treated borrowers' facilities and their matched borrowers' facilities. The last column in Panel B presents the *t*-test statistics of the differences in the means of the covariates between treated and non-treated observations. After the PSM, we find that the treated sample and matched sample are balanced based on the results shown in Table 4.

[Insert Table 4 here]

We then estimate equation (l) using the above matched sample. We report the PSM-DID results for the effects of mandatory E&S disclosure regulation in column (1)

of Table 5. The coefficient estimate on ES_{t-1} is negative and statistically significant at 99% significance level. The economic magnitude is also substantial that the loan interest spread decreased 12.5% (i.e., $e^{-0.133}$-1) after the enactment of E&S disclosure regulation, which is approximately 18.4 basis points. In columns (2)-(4), we use alternative sets fixed effects in our regression for robustness that are the same as Table 3. Specifically, in column (2), we additionally include industry-year fixed effects to replace year fixed effects which can further control for time-variant factors at the industry level. The coefficient of estimate on ES_{t-1} remains negative and statistically significant at 99% significance level. The loan interest spread decreased 13.2% (i.e., $e^{-0.142}$-1) after the enactment of E&S disclosure regulation, which is approximately 19.6 basis points. In column (3), we add the lender fixed effects and replace the borrowing firm's fixed effects with the borrower's industry fixed effects. In column (4), we replace the borrower's industry fixed effects and year fixed effects with industry-year fixed effects. The coefficients of estimates on *ES* remain negative and statistically significant at 95% significant level. Turning to the control variables, the coefficient estimates are similar to those in Table 3 and are generally consistent with previous research (e.g. Bushman et al., 2016). Collectively, Table 5 shows consistent results using the PSM sample, indicating reduced loan spread after the adoption of E&S disclosure mandates.

[Insert Table 5 here]

4.3. Robustness checks

Our baseline results could be subject to challenges in identification. In Table 6, we conduct a battery of robustness checks and tests to address the concerns in this section.

[Insert Table 6 here]

In Panel A, we use an alternative PSM method that restricts our control group to US facilities. Specifically, we exclude all countries never treated by E&S disclosure regulations except the US before conducting the PSM matching. The US is not subject to any E&S disclosure regulations in our sample and there are 17,333 US observations out of 22,401 observations. Benefiting from such sufficient observations of US facilities as the control group, we successfully matched the majority of treated facilities, yielding 4,918 observations in our matched sample using this PSM restriction. The coefficient estimates on *ES* in column (1) is significantly negative, and results from other specifications using alternative fixed effects in columns (2)-(4) are similar.

Panel B further addresses the abovementioned selection bias by examining the main regression after applying the Entropy Balancing approach, which has demonstrated several superiorities in the literature to PSM in the context of causal inference. Different from PSM which relies on balanced covariates by matching similar observations, the Entropy Balancing approach directly optimizes the weights assigned to observation in the sample to achieve a perfect balance on the means, variances, and potentially higher moments of the covariates between treated and control groups. The ability of Entropy Balancing in using all the information in the sample leads to better statistical efficiency and more precise estimates of treatment effects. Also, not relying on specific models such as logit model in PSM, the Entropy Balancing approach suffers less from misspecification. Our results estimated using this more robust method to PSM show consistent results as our baseline model.

Panel C incorporates R&D intensity, tangibility, debt rating, analyst coverage and news sentiment as additional control variables and repeats the analyses in Table 5. Panel C allows us to further control for other firm characteristics that may reflect borrowing

firms' credit conditions (e.g. Jia et al., 2023). *RD* is constructed by dividing the total research and development expense by total assets and we replace missing research and development by 0. *PPE* is the total PPE divided by total assets. *SP_rating* indicates whether the borrower has a senior debt rating from major rating agencies, which equals 1 if yes, and 0 otherwise. *Analyst* is also a dummy variable that equals 1 if there is at least one analyst following the borrower in the month before the loan issuance, and 0 otherwise. *Sentiment* is the average of the CSS of news articles published about a borrower over 180 days prior to the loan issuance date. The CSS ranges from -1 to 1, with a positive (negative) score indicating positive (negative) sentiment and a score of 0 indicating neutral sentiment. We find the results remain unchanged.

In Panel D, to further address the potential endogenous nature of E&S information disclosure mandates, we run additional DID by looking at the EU directive in 2014. The adoption of "Directive 2014/95/EU" (the Directive)[9] on the disclosure of non-financial and diversity information set the EU on a clear course towards greater business transparency and accountability on social and environmental issues. We construct the variable *Post_Directive*, which is a dummy variable equal to 1 if a country has adopted the Directive, and 0 otherwise. We use the following specification to test the effect of the Directive on loan spread as a robustness of our main results.

$$Spread_{it} = \beta_0 + \beta_1 Post\_Directive_{i,t-1} + \delta\ Controls_{i,t-1} + Purpose\ FE + Firm\ FE + \varepsilon_{it} \quad (3)$$

where β_1 is the coefficient of interest. Purpose-, firm- and year-fixed effects are also included. ε is the error term. In column 1, we used the whole sample before PSM. In column (2) the sample is restricted to US borrowers and EU borrowers for robustness

[9] https://www.legislation.gov.uk/eudr/2014/95

check. For columns (3) and (4), the samples are PSM matched whole sample and US-EU sample, respectively. The results show that after the introduction of NFRD, the loan interest is further decreased as expected, which reinforces our main findings.

4.4. E&S mandatory disclosure and loan contract design

To further investigate the effect of E&S information disclosure mandates on bank lending, we examine the non-price terms of loan contracts in this section. We replace the dependent variable, *Spread*, in equation (1) with *Amount*, *Maturity*, *Collateral*, and *Covenant* to estimate the coefficient of *ES*. These variables measure the bank loan size, months to maturity of the loan, the number of covenants and whether the facility is secured. Detailed variable definitions are in Appendix II. The results are presented in Table 7.

[Insert Table 7 here]

In columns (1) – (4), the results show that after the enactment of the E&S information disclosure mandates, borrowers obtain larger-sized loans with longer maturities. The association between *ES* and *Amount*, and the association between *ES* and *Maturity* are both statistically and economically significant. Specifically, in columns (1) and (2), the main variable *ES* has coefficients that are positive and significant at the 99% significance level, when we use alternative fixed effects. The average loan size increased by 18.4% (26.9%) after the implementation of E&S disclosure regulations. In columns (3) and (4), the main variable *ES* shows positive coefficients which are significant at the 95% significance level. The average loan maturity increased by 3.7 months and 4.8 months after the implementation of E&S disclosure regulations as indicated in columns (3) and (4), respectively.

In columns (5) and (6), we employ a logit regression model using purpose, industry and year fixed effect, and purpose and industry-year fixed effect, respectively. We find that mandatory E&S disclosure regulations reduce the requirement for collateral in loan contracts. Specifically, the odds of lenders requiring collateral are lower when mandatory E&S disclosure is implemented as shown in columns (5) and (6). The findings suggest that more E&S information reduces bank loan lenders' concerns about the borrower's credit risk, allowing the lenders to offer less restrictive contract terms. We do not find significant results in columns (7) and (8), where we examine the effect of *ES* on *Covenant*. This is not surprising since covenants serve a very important role in monitoring the borrower to avoid moral hazard. Therefore, even though the ex-ante information asymmetries are likely to be reduced after E&S, the lenders still have incentives to monitor the borrowers after the contracting of loans.

In columns (9) and (10), we test whether mandatory E&S disclosure regulation helps to establish new borrower-lender relationships. If the E&S information disclosure mandates help to reduce the information asymmetries between the borrowers and the lenders, the borrowers should attract more lenders that have limited information about the borrowers previously and therefore, the possibility of establishing new borrower-lender relationships is expected to be higher (Sufi, 2007). We construct a new relationship lending measure, *New lender-borrower dummy*, which is a dummy variable equal to 1 if the lead bank has syndicated 50% or more of the dollar volume of the borrower's loans for the first time over the five years preceding the current loan's issuance, and 0 otherwise. Control variables are the same as our main variables. Additionally, we include another control *Outstanding* following the literature (e.g., Bushman et al., 2016), which is a dummy variable equal to 1 if the borrower has outstanding loans at the time of the current loan's issuance, and 0 otherwise. We regress

New lender-borrower dummy on these variables using a logit model with purpose, industry and year fixed effect, and purpose and industry-year fixed effect, in columns (9) and (10) respectively. The results are significantly positive which confirms our conjectures, i.e., E&S information disclosure mandates increase the possibility of new borrower-lender relationship establishment. This finding supports our main hypothesis.

5. Sub-sample analysis

So far, we have examined and confirmed our hypothesis that the bank loan interest rate is effectively lowered after the adoption of E&S disclosure regulations in the borrower's country. In this section, we conduct sub-sample analyses to examine various heterogeneities related to both the supply and demand sides, as well as country-level institutional characteristics.

5.1. Borrower's market exposure

While E&S information supplements financial information and reduces information asymmetry in bank lending, the effect should be corroborated by the efficiency of E&S information dissemination. As investors and other stakeholders are more serious about the E&S issues, the effect of E&S information should be more obvious for borrowers with more market exposure. To validate this conjecture, we divide our main sample into groups based on media sentiment and market capitalization, our two proxies for market exposure, and estimate equation (1) for the sub-samples.

[Insert Table 8 here]

Panel A of Table 8 presents the results. We find that the coefficient estimates on *ES* are significantly negative in columns (1) and (2), where the borrowing firms have positive media news sentiment, or above-median market capitalization. The results are

consistent with our conjecture that market exposure corroborates the effect of E&S disclosure on bank lending.

5.2. Bank motivation and the impact of relationship lending

One of the concerns for our main results is that when the lenders' operating country adopts mandatory E&S disclosure regulation, their preference for borrowers' E&S disclosure changes. If so, the effect of E&S information disclosure mandates may stem from lenders' preference change instead of the borrowers' incremental information disclosure. In column (1) of Panel B, Table 8, we include in our sample loan contracts where the lender operates in countries with mandatory E&S disclosure regulations, whereas in column (2) we exclude these contracts from the sample. If our main results stem from banks' preferences, we should observe different results across the columns. We find the coefficient estimates on *ES* to be significantly negative in both columns. In columns (3) and (4), we replace the dependent variable with *New lender-borrower dummy* and repeat the tests in columns (1) and (2). We find the coefficient estimates to be positive and significant in both columns. The results in Panel B, Table 8 indicate that our main results are not driven by banks' preferences and pressures after the adoption of the E&S mandates.

In Panel C of Table 8, we examine if the effect of E&S disclosure mandates on loan spread is different for existing and newly-established borrower-lender relationships. Specifically, we estimate equation (1) for newly-established borrower-lender relationship in column (1) and existing relationships in column (2), respectively. We find the coefficient estimate on *ES* to be negative in both columns, but statistically significant in column (2) only. In columns (3) and (4), we conduct analysis at the participant bank-loan contract level. In column (3), we include only newly established

participant bank-borrower relationships, whereas in column (4) we focus on existing participant bank-borrower relationships. The coefficient estimate on *ES* is positive in column (3) and significantly negative in column (4). The results suggest that the negative relationship between the implementation of E&S disclosure regulations is more pronounced for loans involving borrowers and lenders with established prior lending relationships. This finding suggests that the incremented E&S information may be processed or incorporated in the pricing framework only by lenders who possess an existing and supervisory level of knowledge about the borrowers.

5.3. Institutional environment

To what extent does the mandatory E&S information disclosure affect the loan cost should be related to variant country-level institutional environments. In this section, we examine the impact of various country-level corporate governance, information environment and cultural dimensions on the effects of E&S disclosure.

[Insert Table 9 here]

5.3.1 Corporate governance

We first examine the influence of corporate governance strength at the country level. The legal and political institutions of a country play a crucial role in shaping banks' capacity and incentives to evaluate borrowers effectively and provide financing. Strong institutional frameworks can enhance banks' ability to screen borrowers accurately, while weak institutions may limit their effectiveness and willingness to extend credit. As the building blocks of efficiency, corporate governance strength may encourage lenders to provide funds to borrowers whose information is more intensively and transparently disclosed due to regulation. We believe the effect of E&S disclosure

regulations is more pronounced in the countries that have stronger country-level corporate governance. Our first proxy for corporate governance is whether the borrower is headquartered in a common law country. Common law countries are considered of higher level of corporate governance, as the package of laws is most protective of shareholders compared to civil law countries (La Porta et al., 1998). Our second proxy for corporate governance is *Governance disclosure* from Bushman et al. (2004). The last variable is the Anti-self-dealing index, defined as the average of ex-ante and ex-post private control of self-dealing (Djankov et al., 2008). Our results are reported in Panel A of Table 9. The coefficients of *ES* are significantly negative in columns (1), (3) and (5), where the corporate governance environment is better, and insignificant in columns (2), (4) and (6), where the borrowers are from countries with lower corporate governance levels. The results confirm our conjecture that borrowers in well-governed countries experience a greater reduction in bank loan costs following the implementation of E&S disclosure mandates.

5.3.2 Information environment

The effectiveness of E&S disclosure in reducing information asymmetry depends on the efficiency of a country's financial information environment. A well-developed information environment enhances the availability and dissemination of primary E&S information, enabling lenders to make more informed lending decisions. Our information environment measures are from Bushman et al. (2004). *Analyst* is the number of analysts following the largest 30 companies in each country in 1996. *Audit* is a variable indicating the percentage of firms in the country audited by the Big 5 accounting firms. These two variables capture country-level private information acquisition (Bushman et al., 2004). We employ the average rank of the countries' media development (*Media*) to proxy for information dissemination. Higher values of *Analyst*,

Audit, and *Media* indicate a better corporate information environment. Panel B of Table 9 presents our results. We find the coefficients of *ES* to be significantly negative in columns (1), (3) and (5) where borrowers' countries are associated with better private information acquisition and dissemination.

5.3.3 Transparency and trust

Transparency and reliability of the information are also crucial for lenders in addition to obtaining timely and accurate information about the borrowers. Therefore, we conjecture that the effect of E&S disclosure regulations on reducing loan interest spread is more pronounced in countries where information is more transparent and trustful. For information transparency measures, we adopt the political transparency score and institutional transparency score from Kaufmann & Bellver (2005). Higher scores suggest better information transparency. In addition to the information quality, we conjecture that the trust of information should play a role in the E&S information and loan cost relationships. We measure social trust as the percentage of respondents in a country answering "Yes" to the question "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?" from World Values Survey (Brockman et al., 2020; Levine et al., 2018). The results are presented in Panel C of Table 9, where we can find the effect of E&S information disclosure mandates on loan spread is stronger in countries with higher political transparency, institutional transparency and social trust level.

5.3.4 National ethics levels

Lastly, we examine national ethics levels constructed by Kaufmann (2004) in Panel D of Table 9. The National Ethics Index encompasses multiple aspects of corporate and public sector ethics and governance, serving as an alternative proxy for

a country's institutional environment. Specific indices include the Corporate Ethics Index and the Public Sector Ethics Index. Higher values of these indices indicate higher levels of ethics. The results are shown in Panel D, Table 9 and suggest that the effect of E&S information disclosure mandates is stronger in the countries that have better national ethics scores. The results are largely consistent with previous findings and align with our expectations.

6. Conclusion

This study examines how mandatory non-financial disclosure can have an impact on the bank loan contract design. We find that the bank loan interest spread significantly decreased for firms subject to E&S information disclosure regulations. Also, after the implementation of these regulations, we observe less restrictive bank loan terms and more newly established lending relationships between borrowers and lenders. Our main finding indicates that E&S information provides incremental information that can reduce the information asymmetries between lenders and borrowers. We document that these effects are primarily due to improved transparency and quality of E&S information from borrowers following the implementation of disclosure regulations, rather than the lender's own E&S disclosure pressure. We further document that the effect of mandatory E&S disclosure is stronger in countries with better jurisdiction-level institutional environment, specifically corporate governance environment, information environment, transparency, and trust to information. Our results are consistent using alternative institutional environment proxies measured by the national ethics index. Our study offers a comprehensive investigation into the interactions between E&S regulation and the capital market, which has important implications. For example, policymakers can re-estimate the regulations that further help to reduce

market friction. Firms can optimize their financing and investment decisions based on the changing regulatory environment. Lenders can refine their pricing framework to further benefit from the increased scope and intensity of information.

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Figure 1

Figure 1 plots the median coefficient estimates of *Spread*, along with 99% confidence intervals, both before and after the implementation of mandatory E&S disclosure regulations in the 31 affected economies. We run the Equation (1) by replacing $ES_{i,t-1}$ with six dummies indicating the relative year around the enactment of the E&S regulation. Event year -1 is excluded to allow the effects to be measured relative to this benchmark year, while years that are three or more years prior to ($t \leqslant -3$) or after ($t \geqslant +3$) the enactment of the E&S regulation are consolidated into groups.

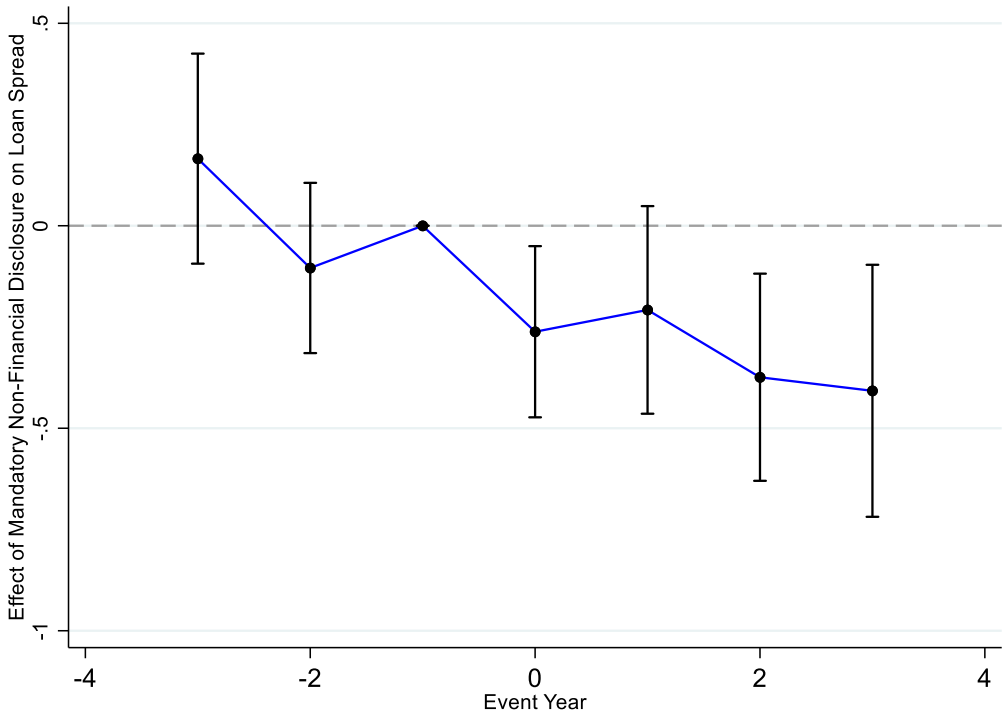

Table 1. Sample composition

This table presents the sample composition. Panel A presents the number of observations by country/region during 2000-2017 for the full sample. Countries/regions subject to E&S disclosure regulations shocks are highlighted in bold, with the mandate year in brackets. Panel B presents the sample composition by year for both the full sample and the matched sample. Details of the matching procedure are described in Section 4.2 and the propensity score matching results are presented in Table 4.

Panel A. Number of observations by country/region

Country/region	Number of observations	Country/region	Number of observations
Argentina	25	**Japan (2005)**	188
Australia (2001)	254	**Korea (2012)**	12
Austria	14	Luxembourg	86
Belgium (2017)	71	Macau	23
Bermuda	19	**Malaysia (2007)**	5
Brazil	76	Mauritius	11
Canada (2004)	661	**Mexico (2012)**	76
Cayman Islands	7	Monaco	5
Chile (2015)	37	**Netherlands (2006)**	205
China (2008)	67	New Zealand	5
Cyprus	13	**Norway (2013)**	58
Czech Republic	3	**Philippines (2009)**	24
Denmark (2001)	25	Poland	23
Egypt	11	**Portugal (2006)**	28
Finland (2006)	49	**Russia (2014)**	69
France (2001)	415	**Singapore (2012)**	87
Germany (2005)	371	**South Africa (2010)**	47
Greece	31	**Spain (2002)**	201
Hong Kong (2014)	109	**Sweden (2005)**	99
Hungary (2004)	14	Switzerland	176
India (2003)	102	Taiwan	210
Indonesia (2012)	11	**Thailand (2014)**	2
Ireland	75	**Turkey (2003)**	21
Israel (2009)	16	United States	17,333
Italy (2007)	98	**United Kingdom (2008)**	833
		Total	22,401

Panel B. Number of observations by year

Year	Full sample	Matched sample
2000	544	94

2001	1,226	172
2002	1,209	206
2003	1,191	218
2004	1,637	312
2005	1,701	365
2006	1,516	355
2007	1,563	377
2008	1,011	286
2009	731	209
2010	1,148	315
2011	1,597	440
2012	1,305	368
2013	1,546	432
2014	1,530	452
2015	1,408	388
2016	1,224	310
2017	314	82
Total	22,401	5,381

Table 2. Summary statistics

This table presents the summary statistics of the variables used in this study. Panel A and Panel B present the statistics for the full sample and matched sample, respectively. The unit of observation is at the facility level, comprising 5,381 facilities from 1,159 unique borrowers. Variable definitions are provided in Appendix II.

	N	Mean	St. Dev	P25	Median	P75
Panel A: Full sample						
Spread	22,401	4.997	0.842	4.605	5.165	5.617
ROA	22,401	0.084	0.071	0.049	0.080	0.119
IC	22,401	15.173	41.987	2.209	4.661	10.957
Lev	22,401	0.597	0.189	0.474	0.601	0.719
Size	22,401	8.100	1.973	6.739	7.981	9.364
Zscore	22,401	3.064	2.418	1.528	2.539	3.887
MB	22,401	2.946	3.570	1.299	2.066	3.404
Loss	22,401	0.069	0.253	0.000	0.000	0.000
Revolver	22,401	0.548	0.498	0.000	1.000	1.000
TermloanB	22,401	0.100	0.300	0.000	0.000	0.000
Return	22,401	0.076	0.319	-0.073	0.073	0.220
NegRtn	22,401	0.364	0.481	0.000	0.000	1.000
Public	22,401	0.637	0.481	0.000	1.000	1.000
Inflation	22,401	0.095	0.004	0.093	0.096	0.099
GDPGrowth	22,401	0.075	0.014	0.072	0.075	0.085
Panel B: Matched sample						
Spread	5,381	4.864	0.934	4.317	5.011	5.521
ES	5,381	0.436	0.496	0.000	0.000	1.000
ROA	5,381	0.079	0.059	0.046	0.074	0.108
IC	5,381	10.558	29.279	2.210	4.215	8.880
Lev	5,381	0.617	0.163	0.512	0.619	0.726
Size	5,381	9.091	1.815	7.850	9.098	10.253
Zscore	5,381	2.474	1.896	1.269	2.090	3.155
MB	5,381	2.660	3.004	1.213	1.967	3.143
Loss	5,381	0.050	0.218	0.000	0.000	0.000
Revolver	5,381	0.485	0.500	0.000	0.000	1.000
TermloanB	5,381	0.087	0.281	0.000	0.000	0.000
Return	5,381	0.045	0.287	-0.081	0.056	0.186
NegRtn	5,381	0.388	0.487	0.000	0.000	1.000
Public	5,381	0.616	0.486	0.000	1.000	1.000
Inflation	5,381	0.095	0.005	0.093	0.095	0.099
GDPGrowth	5,381	0.073	0.016	0.067	0.075	0.083

Table 3. Mandatory E&S disclosure regulations and loan spread

This table reports the results on the effect of mandatory E&S disclosure regulations on loan spread. The dependent variable is the loan spread (*Spread*). For the economies that with mandatory E&S disclosure regulations, *ES* is a dummy variable equal to one for years after mandatory E&S disclosure becomes effective and zero otherwise. For economies that are without mandatory E&S disclosure regulations, *ES* equals zero. The sample covers 2000 to 2017 period. Columns 1-4 present results for the full sample, whereas columns 5 and 6 exclude observations from the US and Canada for sample bias concerns. Industry dummies are based on 2-digit Standard Industrial Classification (SIC) codes. Variable definitions are provided in Appendix II. *t*-values based on robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

	(1)	(2)	(3)	(4)	(5)	(6)
ES	-0.065**	-0.087***	-0.081***	-0.096***	-0.092**	-0.09*
	(-2.284)	(-2.973)	(-4.597)	(-5.095)	(-2.244)	(-1.664)
ROA	-1.471***	-1.532***	-1.563***	-1.621***	-1.738***	-2.285***
	(-13.348)	(-12.737)	(-17.906)	(-17.396)	(-5.351)	(-5.315)
IC	0.000**	0.000**	0.000*	0.000*	0.001	0.000
	(2.105)	(2.035)	(1.93)	(1.937)	(1.198)	(.469)
Lev	0.551***	0.554***	0.532***	0.527***	1.132***	0.917***
	(11.822)	(11.155)	(16.313)	(15.348)	(6.643)	(4.385)
Size	-0.112***	-0.118***	-0.166***	-0.168***	-0.099***	-0.162***
	(-10.602)	(-10.377)	(-47.524)	(-46.325)	(-2.805)	(-3.671)
ZScore	-0.015***	-0.014***	-0.023***	-0.023***	0.007	-0.009
	(-3.67)	(-3.379)	(-8.127)	(-7.874)	(0.619)	(-0.507)
MB	-0.003**	-0.001	-0.009***	-0.009***	-0.019***	-0.021**
	(-2.109)	(-0.896)	(-6.63)	(-6.045)	(-3.308)	(-2.516)
Loss	0.038*	0.034	0.015	0.017	-0.035	-0.108
	(1.655)	(1.407)	(0.738)	(0.815)	(-0.522)	(-1.352)
Revolver	-0.077***	-0.074***	-0.069***	-0.061***	-0.127***	-0.107***
	(-9.246)	(-9.033)	(-7.355)	(-6.444)	(-6.376)	(-5.462)
TermloanB	0.271***	0.256***	0.424***	0.409***	0.235***	0.202***
	(20.577)	(19.513)	(32.708)	(30.695)	(5.562)	(4.899)
Return	-0.016	-0.022	0.023	0.023	-0.145***	-0.108*
	(-0.885)	(-1.165)	(1.35)	(1.233)	(-2.841)	(-1.66)
NegRtn	0.022**	0.025**	0.035***	0.038***	-0.074**	-0.063
	(1.968)	(2.134)	(3.115)	(3.185)	(-2.33)	(-1.612)
Public	-0.499***	-0.504***	-0.149***	-0.149***	-0.461***	-0.504***
	(-23.417)	(-23.077)	(-17.853)	(-17.15)	(-8.365)	(-8.048)
Inflation	-7.588***	-7.016***	-21.059***	-22.122***	1.897	4.448
	(-3.304)	(-2.831)	(-12.832)	(-12.679)	(0.53)	(0.937)
GDPGrowth	-3.107***	-3.694***	1.568**	1.253*	-1.949*	-2.115
	(-4.408)	(-4.844)	(2.459)	(1.881)	(-1.727)	(-1.446)
Observations	21,680	21,610	20,845	20,769	4,173	4,059
Adj R^2	0.728	0.742	0.606	0.619	0.74	0.773
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	No	Yes	Yes

Year FE	Yes	No	Yes	No	Yes	No
Lender FE	No	No	Yes	Yes	No	No
Industry FE	No	No	Yes	No	No	No
Industry-year FE	No	Yes	No	Yes	No	Yes

Table 4. Propensity score matching

This table reports the results of our propensity score matching. Panel A presents the estimated coefficients of Equation (2), predicting the likelihood of firms being treated by E&S disclosure regulation. The dependent variable, *Treated*, is an indicator variable that equals to one if a facility is borrowed by a borrower who has been treated by an E&S disclosure regulation in our observation period, and zero if a facility is borrowed by borrower from non-treated countries. Panel B presents the means of the covariates of non-US borrowers' facilities and their matched US borrowers' facilities. The last column in Panel B presents the t-test statistics of the differences in the means of the covariates between treated and non-treated observations. Industry dummies are based on 2-digit Standard Industrial

Panel A: The likelihood of being treated by E&S disclosure regulation – Probit model	
Dependent variable	*Treated*
ROA	-1.306***
	(-4.892)
IC	0.000
	(-0.61)
Lev	-0.36***
	(-3.793)
Size	0.213***
	(30.827)
ZScore	-0.042***
	(-4.347)
MB	0.006
	(1.479)
Loss	-0.247***
	(-4.096)
Revolver	-0.169***
	(-6.679)
TermloanB	-0.368***
	(-8.593)
Return	-0.084
	(-1.609)
NegRtn	0.06*
	(1.857)
Public	0.122***
	(5.044)
Industry, Year, and Purpose FE	Yes
Observations	22050
Pseudo R^2	0.242

Panel B: Characteristics for treated and control group			
	Treated	Control	Mean-Diff.
ROA	0.078	0.076	0.002
IC	10.843	11.239	-0.396
Lev	0.625	0.624	0.001
Size	8.738	8.685	0.053
Zscore	2.531	2.533	-0.002
MB	2.757	2.763	-0.006
Loss	0.060	0.063	-0.003

Revolver	0.493	0.479	0.015
TermloanB	0.101	0.105	-0.004
Return	0.054	0.050	0.004
NegRtn	0.387	0.392	-0.005
Public	0.624	0.615	0.009
Propensity Score	0.303	0.305	-0.002

Table 5. PSM-DID - mandatory E&S disclosure on loan spread

This table reports coefficient estimates from regressing *Spread* on *ES* (mandatory E&S disclosure dummy), and various firm-, facility-, and country-specific controls (i.e., Equation (1)). The matched sample is consistent of 4918 observations that cover 2000 to 2017 period. Industry dummies are based on 2-digit Standard Industrial Classification (SIC) codes. Variable definitions are provided in Appendix II. *t*-values based on robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

	(1)	(2)	(3)	(4)
ES	-0.133***	-0.142***	-0.054**	-0.074**
	(-3.595)	(-3.238)	(-2.226)	(-2.573)
ROA	-1.547***	-1.744***	-1.668***	-1.671***
	(-5.453)	(-4.716)	(-7.655)	(-6.275)
IC	0.001	0.000	0.000	0.000
	(1.281)	(0.692)	(0.259)	(-0.222)
Lev	0.573***	0.478***	0.505***	0.56***
	(4.413)	(3.226)	(6.288)	(6.055)
Size	-0.165***	-0.158***	-0.166***	-0.169***
	(-5.782)	(-4.654)	(-20.921)	(-19.512)
ZScore	-0.038***	-0.034***	-0.03***	-0.034***
	(-3.4)	(-2.67)	(-4.004)	(-3.645)
MB	-0.006	-0.008	-0.011***	-0.011***
	(-1.553)	(-1.581)	(-3.171)	(-2.805)
Loss	0.079	0.102	0.056	0.086
	(1.355)	(1.403)	(1.066)	(1.399)
Revolver	-0.06***	-0.059***	-0.083***	-0.075***
	(-3.247)	(-3.03)	(-4.016)	(-3.314)
TermloanB	0.258***	0.22***	0.419***	0.373***
	(8.103)	(6.833)	(13.887)	(11.451)
Return	-0.084*	-0.093*	0.032	0.011
	(-1.791)	(-1.66)	(0.674)	(0.203)
NegRtn	-0.01	-0.016	0.051*	0.046
	(-0.362)	(-0.518)	(1.867)	(1.464)
Public	-0.567***	-0.594***	-0.219***	-0.22***
	(-11.978)	(-11.72)	(-10.503)	(-9.328)
Inflation	-3.264	-5.377	-22.287***	-24.885***
	(-1.002)	(-1.33)	(-8.853)	(-8.213)
GDPGrowth	-2.6**	-3.496**	2.774***	1.694
	(-2.157)	(-2.543)	(2.612)	(1.361)
Observations	5381	5226	5068	4885
Adj R^2	0.732	0.749	0.592	0.603
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	No
Year FE	Yes	No	Yes	No
Lender FE	No	No	Yes	Yes
Industry FE	No	No	Yes	No
Industry-year FE	No	Yes	No	Yes

Table 6. Robustness

This table reports various robustness tests results of our main regression. In Panel A, we use an alternative PSM method to run our DID specification. Specifically, in our matching, the dependent variable is an indicator variable that equals to one if a facility is borrowed by a non-US borrower who has been treated by an E&S disclosure regulation in our observation period, and zero if a facility is borrowed by a US borrower. Panel B examines the main regression after applying Entropy Balancing. Panel C incorporates additional control variables, regressing them according to Equation (1) and using the matched sample described in Table 5. In Panel D, we run additional DID by only looking at EU observations. NFRD is a dummy variable equal to 1 if a country is in adoption of Directive 2014/95/EU on the disclosure of non-financial and diversity information, and 0 otherwise. Industry dummies are based on 2-digit Standard Industrial Classification (SIC) codes. Variable definitions are provided in Appendix II. *t*-values based on robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

Panel A: Alternative PSM				
	(1)	(2)	(3)	(4)
ES	-0.173***	-0.175***	-0.089***	-0.107***
	(-4.463)	(-3.805)	(-3.584)	(-3.606)
Observations	4918	4720	4746	4544
Adj R^2	0.74	0.758	0.598	0.614
Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	No
Year FE	Yes	No	Yes	No
Lender FE	No	No	Yes	Yes
Industry FE	No	No	Yes	No
Industry-year FE	No	Yes	No	Yes
Panel B: Entropy balancing				
	(1)	(2)	(3)	(4)
ES	-0.232***	-0.189***	-0.09***	-0.088***
	(-6.049)	(-5.326)	(-3.998)	(-3.758)
Observations	20784	20713	20103	20026
Adj R^2	0.738	0.771	0.626	0.671
Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	No
Year FE	Yes	No	Yes	No
Lender FE	No	No	Yes	Yes
Industry FE	No	No	Yes	No
Industry-year FE	No	Yes	No	Yes
Panel C: Additional controls				
	(1)	(2)	(3)	(4)
ES	-0.135***	-0.142***	-0.061**	-0.071**
	(-3.624)	(-3.234)	(-2.417)	(-2.367)
RD	0.279	0.052	-1.074***	-0.833*
	(0.592)	(0.09)	(-2.702)	(-1.854)
PPE	-0.38**	-0.466**	-0.095*	-0.086
	(-2.473)	(-2.395)	(-1.696)	(-1.299)
Analyst	-0.058	-0.053	-0.065***	-0.064**
	(-1.092)	(-0.854)	(-2.958)	(-2.528)
SP_rating	-0.148**	-0.086	0.024	0.049*
	(-2.421)	(-1.213)	(1.038)	(1.799)

Sentiment	-0.774***	-0.634**	-1.098***	-1.32***
	(-3.494)	(-2.279)	(-4.853)	(-5.001)
Observations	4918	4720	4746	4544
Adj R^2	0.744	0.76	0.601	0.617
Other Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	No
Year FE	No	No	Yes	No
Lender FE	No	No	Yes	Yes
Industry FE	No	No	Yes	No
Industry-year FE	Yes	Yes	No	Yes
After PSM	Yes	Yes	Yes	Yes
Panel D: Additional DID				
	(1)	(2)	(3)	(4)
EUcountry	-0.375***	-0.189*	-0.344**	-0.469***
	(-3.387)	(-1.650)	(-2.418)	(-3.102)
NFRD	-0.085***	-0.108***	-0.067	-0.059
	(-5.497)	(-6.931)	(-1.639)	(-1.058)
*EUcountry *NFRD*	-0.696***	-0.527***	-0.649***	-0.786***
	(-5.285)	(-4.267)	(-4.183)	(-4.736)
Observations	6784	5510	1631	1084
Adj R^2	0.727	0.749	0.750	0.775
Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
After PSM	No	No	Yes	Yes

Table 7. Mandatory E&S disclosure on other loan characteristics

This table reports test results of mandatory E&S disclosure on other loan characteristics. We use the matched sample described in Table 5. In column (1) - (8), we replace the dependent variable, *Spread*, in Equation (1) with *Amount*, *Maturity*, *Collateral*, and *Covenant* to estimate the coefficient of *ES*. In column (1) - (8), we test whether mandatory E&S disclosure regulation is associated with new borrower-lender relationships. Industry dummies are based on 2-digit Standard Industrial Classification (SIC) codes. We run our regression using a logit model in columns (6) - (10). Variable definitions are provided in the Appendix. *t*-values based on robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable	Amount		Maturity		Collateral		Covenant		New lender-borrower dummy	
ES	0.169***	0.238***	3.566**	4.276**	-0.295**	-0.412***	0.026	-0.044	0.312***	0.208**
	(2.584)	(3.147)	(2.076)	(2.25)	(-2.534)	(-2.654)	(0.565)	(-0.86)	(4.007)	(2.237)
ROA	1.268**	0.907	22.317**	22.203*	-8.105***	-10.646***	-0.43	-0.095	0.878	1.682
	(2.361)	(1.471)	(2.146)	(1.683)	(-6.083)	(-5.896)	(-0.926)	(-0.169)	(1.061)	(1.642)
IC	0	0.002**	-0.05***	-0.033*	0.004**	0.005**	0.001	0.002*	0.001	0.001
	(0.027)	(2.112)	(-3.312)	(-1.802)	(2.433)	(2.538)	(1.337)	(1.757)	(0.463)	(0.281)
Lev	-0.019	0.376	-6.246	-3.874	1.16***	1.27**	-0.045	0.004	-0.049	0.039
	(-0.077)	(1.321)	(-1.224)	(-0.674)	(2.704)	(2.205)	(-0.189)	(.016)	(-0.164)	(0.109)
Size	0.281***	0.21	-1.024	-0.25	-0.568***	-0.682***	-0.021	0.03	-0.003	-0.000
	(2.909)	(1.561)	(-0.879)	(-0.179)	(-15.014)	(-13.236)	(-0.5)	(0.611)	(-0.135)	(-0.009)
ZScore	0.022	0.013	0.01	0.225	-0.08*	-0.109**	-0.026	-0.046**	-0.022	-0.019
	(1.045)	(0.579)	(0.021)	(0.39)	(-1.861)	(-2.031)	(-1.456)	(-2.001)	(-0.699)	(-0.480)
MB	0.004	-0.002	0.192	0.281	-0.001	0.003	-0.005	0.001	-0.004	-0.008
	(0.447)	(-0.236)	(0.996)	(1.22)	(-0.068)	(0.124)	(-0.549)	(0.048)	(-0.302)	(-0.498)
Loss	-0.01	0.012	-3.876*	-4.55*	-0.029	-0.059	-0.081	-0.064	-0.002	-0.076
	(-0.092)	(0.092)	(-1.828)	(-1.735)	(-0.108)	(-0.168)	(-0.947)	(-0.593)	(-0.010)	(-0.322)
Revolver	0.046	-0.029	8.234***	8.019***	-0.128	-0.11	0.025	0.028	-0.070	-0.105
	(1.366)	(-0.826)	(10.932)	(9.597)	(-1.21)	(-0.842)	(1.016)	(1.114)	(-0.904)	(-1.173)
TermloanB	0.423***	0.404***	19.743***	18.826***	3.661***	4.046***	0.186***	0.167***	-0.338**	-0.276*
	(6.118)	(5.666)	(15.875)	(13.487)	(8.68)	(7.583)	(3.092)	(2.954)	(-2.461)	(-1.731)
Return	-0.013	-0.038	2.045	1.5	0.459*	0.752**	-0.06	-0.041	-0.068	-0.119
	(-0.159)	(-0.393)	(1.185)	(0.731)	(1.947)	(2.275)	(-0.749)	(-0.447)	(-0.396)	(-0.558)
NegRtn	-0.009	-0.022	1.058	0.669	0.529***	0.797***	-0.023	0.034	0.112	0.168
	(-0.184)	(-0.407)	(1.011)	(0.556)	(3.726)	(4.29)	(-0.614)	(0.788)	(1.114)	(1.359)
Public	1.372***	1.433***	-2.202	-2.684	-0.881***	-1.01***	0.183***	0.14**	-0.036	-0.093

	(16.383)	(16.096)	(-1.122)	(-1.342)	(-8.071)	(-7.178)	(3.376)	(2.454)	(-0.473)	(-1.020)
Inflation	-0.469	-7.749	197.677	164.745	19.197	28.011	-14.564***	-16.48***	-21.629**	-27.898**
	(-0.075)	(-1.044)	(1.377)	(0.986)	(1.454)	(1.366)	(-3.106)	(-2.943)	(-2.324)	(-2.443)
GDPGrowth	0.971	0.452	53.951	105.693*	19.36***	17.431**	-1.576	-2.103	-18.124***	-22.982***
	(0.477)	(.194)	(1.091)	(1.923)	(3.784)	(2.547)	(-1.038)	(-1.231)	(-4.506)	(-5.116)
Spread									0.027	0.019
									(0.487)	(0.290)
Outstanding									-2.341***	-2.626***
									(-13.704)	(-12.932)
Observations	5381	5226	5381	5226	3127	2407	5381	5226	5175	4297
Adj/Pesudo R^2	0.628	0.644	0.387	0.428	0.373	0.42	0.544	0.594	0.153	0.209
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
Industry FE	No	No	No	No	Yes	No	No	No	Yes	No
Year FE	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Industry-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
After PSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8. Cross-sectional tests

This table reports the results of the effect of exposure to market, bank motivation, and relationship lending on loan spread. Industry dummies are based on 2-digit Standard Industrial Classification (SIC) codes. Panel A testes the effect of firm exposure to market on the relationship between mandatory E&S regulation on loan interest spread. We measure borrower's exposure to market by media sentiment (*Sentiment*), and firm size (*MCap*). Panel B examines the effect of the bank's mandatory ESG disclosure on loan spread and relationship lending. Panel C investigates the impact of the existing relationship lending on the relationship between mandatory E&S regulation on loan interest spread. Variable definitions are provided in Appendix II. *t*-values based on robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

Panel A: Firm exposure to market

	(1)	(2)	(3)	(4)
	Investor sentiment		Market capitalization	
Group	Positive	Negative	Above median	Below median
Dependent variable	Spread		Spread	
ES	-0.235***	-0.082	-0.152***	-0.026
	(-4.830)	(-0.775)	(-2.898)	(-0.484)
Observations	1520	2898	2729	2100
Adj R^2	0.749	0.782	0.722	0.763
Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Lender FE	No	No	No	No
Industry FE	No	No	No	No
Year FE	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	Yes	Yes

Panel B: The effect of bank mandatory ESG disclosure on loan spread and relationship lending

	(1)	(2)	(3)	(4)
Group	Bank subject to mandates	Bank NOT subject to mandates	Bank subject to mandates	Bank NOT subject to mandates
Dependent variable	Spread		New lead bank-borrower dummy	
ES	-0.231**	-0.119**	0.454**	0.504***
	(-2.400)	(-2.391)	(2.071)	(4.093)
Spread			-0.225	0.067
			(-1.229)	(0.891)
Outstanding			-3.311***	-2.471***
			(-4.200)	(-11.324)
Observations	1384	3670	932	3071
Adj/Pesudo R^2	0.777	0.744	0.203	0.172
Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	No
Industry FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	Yes	Yes

Panel C. Newly established vs. existing lender-borrower relationship

	(1)	(2)	(3)	(4)
	Lead bank-borrower relationship		Participant bank-borrower relationship	
Group	New	Existing	New	Existing
Dependent variable	Spread		Spread	

ES	-0.084	-0.153**	0.012	-0.068**
	(-0.954)	(-2.182)	(0.625)	(-2.530)
Observations	1304	2401	18843	11372
Adj R^2	0.798	0.764	0.870	0.865
Controls	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	No	No

Table 9. Institutional environment

This table reports the results of the impact of institutional environments on the relationship between mandatory E&S disclosure regulation and loan spread. Panel A tests the role of corporate governance environment (i.e. measured by *Common Law*, *Governance* and *Antiself*). Panel B tests the role of information environment (i.e. measured by *Analyst, Audit*, and *Media*). Panel C tests the role of transparency and trust (i.e. measured by *PTSco*, *ITSco* and *Trust*). Panel D reports the results of the impact of nation ethics (i.e., Corporate Legal Corruption Component, Corporate Ethics Index and Public Sector Ethics Index) on the relationship between mandatory E&S disclosure regulation and loan spread. Industry dummies are based on 2-digit Standard Industrial Classification (SIC) codes. Variable definitions are provided in Appendix II. *t*-values based on robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

Panel A. Corporate governance environment

	(1)	(2)	(3)	(4)	(5)	(6)
	Law system		Governance disclosure		Anti-self-dealing index	
Group	Common law	Civil law	High	Low	High	Low
ES	-0.103*	-0.070	-0.157***	-0.055	-0.121**	-0.007
	(-1.811)	(-0.902)	(-2.635)	(-0.551)	(-2.277)	(-0.105)
Observations	1532	1613	1613	1539	1609	1670
Adj R^2	0.815	0.756	0.809	0.757	0.811	0.755
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Information environment

	(1)	(2)	(3)	(4)	(5)	(6)
	Analyst		Audit		Media	
Group	High	Low	High	Low	High	Low
ES	-0.182***	0.046	-0.192***	0.273	**-0.163****	-0.095
	(-3.120)	(0.522)	(-3.744)	(1.498)	**(-2.351)**	(-1.076)
Observations	1850	1298	2482	657	1987	1074
Adj R^2	0.820	0.757	0.802	0.738	0.809	0.751
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	Yes	Yes	Yes	Yes

Panel C. Transparency and trust

	(1)	(2)	(3)	(4)	(5)	(6)
	Political transparency		Institutional transparency		Social trust	
Group	High	Low	High	Low	High	Low
ES	-0.177***	-0.057	-0.091*	-0.042	-0.365***	0.050
	(-2.928)	(-0.671)	(-1.713)	(-0.586)	(-3.153)	(0.845)
Observations	2119	1154	1535	1745	1187	2287
Adj R^2	0.812	0.718	0.824	0.736	0.778	0.808
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	Yes	Yes	Yes	Yes

Panel D. National ethics indices

	(1)	(2)	(3)	(4)
	Corporate Ethics Index		Public Sector Ethics Index	
	High	Low	Spread	Spread
ES	-0.239***	0.067	-0.216***	0.096
	(-3.730)	(0.810)	(-3.880)	(1.134)
Observations	1528	1743	1608	1663
Adj R^2	0.831	0.738	0.836	0.736
Purpose FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
After PSM	Yes	Yes	Yes	Yes

Appendix I. E&S Disclosure Rule Changes

provides an overview of the mandatory Environmental and Social (E&S) disclosure instruments adopted globally between 2001 and 2015. The data and descriptions are sourced from the Carrots & Sticks Report. The 'Type' column classifies each regulation as Environmental (E), Social (S), or a combination of both (E&S). The 'Issuer' column indicates whether the regulation was introduced by a legislature (Law), a regulatory body (Reg), or through a stock exchange listing requirement (LR).

Country	Regulation Name	Year	Type	Short Description	Issuer
Australia	Corporations Act, Section 299	2001	E	Report detailing performance on significant environmental regulations	Law
Belgium	Social Balance Sheet	2003	S	Annual report on the status of employees	Law
Canada	TSX Timely Disclosure Policy	2004	E&S	Requires immediate disclosure of material E&S issues	LR
Chile	Norma de Carácter General No. 386	2015	S	Annual workforce gender diversity report	Reg
Chile	Norma de Carácter General No. 385	2015	E&S	Annual disclosure of ESG practices	Reg
China	SSE Guidelines: Environmental Information Disclosure	2008	E	Report on environmental policies and employee health and safety	LR
China	Green Securities Policy	2008	E	Disclosure of environmental record	Law
China	Environmental Information Disclosure Act	2008	E	Disclosure of environmental information by corporations. Reports of companies that breach pollution levels or have serious incidents	Law
Denmark	The Danish Financial Statements Act	2001	E	Requires annual reporting of material environmental aspects	Law
Finland	General Guidelines for Recording, Accounting, and Disclosing of Environmental Issues	2006	E	Requires disclosure of environmental issues as part of financial statements (2001/453/EU)	Reg
France	Law No 2001-397	2001	S	Annual workforce gender diversity report	Law
France	New Economic Regs Act (NRE)	2001	E&S	Requires annual disclosure of social and environmental policies	Law
Germany	Bilanzrechtsreformgesetz	2005	E&S	Requires that non-financial indicators including internal sustainability indicators be published in the annual report	Law
Hong Kong	The New Companies Ordinance	2014	E&S	Annual report on environmental policies and performance, compliance with relevant laws, and relations with stakeholders.	LR
Hungary	Accounting Act, Act C, Section 95	2004	E&S	Requires limited non-financial reporting as part of annual report(2003/51/EC).	Law
India	SEBI Committee on Corporate Governance	2003	E&S	Mandates a quarterly corporate governance report with information about various stakeholders	Reg
Indonesia	KEP-431/BL/2012	2012	E&S	Requires annual reporting on environmental, labor, and social practices	Reg

Israel	Securities Law Regs	2009	E	Requires listed companies to report on environmental policies	Law
Italy	Legislative Decree No 32/2007	2007	E&S	Requires disclosure of material E&S issues (2003/51/EC).	Law
Japan	Mandatory GHG Accounting System	2005	E	Mandates reporting of greenhouse gas emissions	Law
Japan	Law Concerning the Promotion of Business Activities with Environmental Consideration	2005	E	Requires an annual environmental report	Law
Korea	Environmental Information Disclosure Policy	2012	E	Requires disclosure of environmental information validated by government	Law
Korea	Green Posting System	2012	E	Requires that firms report GHG emissions and energy use	Reg
Malaysia	CSR Framework, Listing Reqs	2007	E&S	Requires listed companies to report on CSR activities, or lack thereof	LR
Mexico	National Emissions Register (RENE)	2012	E	Mandatory emissions measurement and report to a central database	Law
Netherlands	Dutch Civil Code	2006	E&S	Requires disclosure of material social and environmental issues as part of financial statements (2003/51/EC).	Law
Norway	Act Amending the Norwegian Accounting Act	2013	E&S	Large companies must report policies for human and labor rights, as well as social and environmental issues	Law
Philippines	Corporate Social Responsibility Act	2009	E&S	Requires annual reporting of CSR activities.	Law
Portugal	Law 19/2006 on Access to Environmental Information	2006	E	Broadens public access to environmental information (2003/4/EC)	Law
Russia	Reg. No. 454-P on the Disclosure of Information by Issuers of Securities.	2014	E&S	Requires all issuers to disclose their use of energy resources and corporate governance measures	Reg
Singapore	Revised Code of Corporate Governance	2012	E&S	Sets out that the responsibility of the board of directors includes the consideration of environmental and social risks to the company	LR
South Africa	Johannesburg Stock Exchange (JSE) Listing Req.	2010	E&S	Requires that annual reports of listed firms include ESG policies	LR
Spain	ICAC Resolution	2002	E&S	Requires reporting of environmental assets, provisions, investments, and expenses in annual financial reports	Reg
Sweden	Annual Accounts Act, Amendments	2005	E&S	Requires disclosure of E&S issues (2003/51/EC).	Law
Thailand	Rules, Conditions, and Procedures for Disclosure Regarding Financial and Non-financial Information of Securities Issuers	2014	E&S	Requires annual CSR disclosure	Reg
Turkey	Labour Law No. 4857	2003	S	Mandates reporting of workplace safety and discrimination based on handicaps	Law
UK	Climate Change Act (GHG Reporting)	2008	E	Requires the reporting of GHG emissions in the company report	Law

Appendix II. Variable definitions

Variable	Definition	Data source
Spread	The natural logarithm of the sum of the interest rate spread of the loan facility in basis points over LIBOR and any annual fees paid for each dollar drawn down to the bank group (i.e., all-in-drawn spread).	*DealScan*
ES	A dummy variable equal to one if a borrower is operated in a country that adopted a mandatory environmental or social law in the prior year. Once a country has adopted such a law, the variable remains equal to one. Otherwise, the variable equals zero.	*Carrots & Sticks Report*
ROA	Operating income after depreciation divided by total assets.	*Compustat*
IC	Operating income after depreciation divided by interest expense.	*Compustat*
Lev	Total liabilities divided by total assets.	*Compustat*
Size	The natural logarithm of total assets.	*Compustat*
Zscore	Altman's (1968) Z-score.	*Compustat*
MB	The market value of equity divided by the book value of equity.	*Compustat*
Loss	A dummy variable equal to 1 if *ROA* is negative, and 0 otherwise.	*Compustat*
Revolver	A dummy variable equal to 1 if the loan is a revolving line of credit, and 0 otherwise.	*DealScan*
TermloanB	A dummy variable equal to 1 if the loan type is Term Loan B or below (C, D, E, or F), and 0 otherwise.	*DealScan*
Return	The borrower's cumulative market-adjusted return over the 180 days before the loan issuance date.	*Compustat*
NegRtn	A dummy variable equal to 1 if Return is negative, and 0 otherwise.	*Compustat*
Public	A dummy variable equal to 1 if the borrower remains publicly listed after the most recent loan issuance, and 0 otherwise.	*DealScan*
Inflation	Inflation rate.	*World Bank*
GDPGrowth	GDP growth rate.	*World Bank*
RD	Total research and development expense divided by total assets. We replace missing research and development by 0.	*Compustat*
PPE	Total PPE divided by total assets.	*Compustat*

Analyst	A dummy variable equal to 1 if there is at least one analyst following the borrower in the month before the loan issuance, and 0 otherwise.	*I/B/E/S*
SP_rating	A dummy variable equal to 1 if the borrower has a senior debt rating from major rating agencies, and 0 otherwise.	*Compustat*
Sentiment	The average of the CSS of news articles published about a borrower over the 180 days prior to the loan issuance date. The CSS ranges from -1 to 1, with a positive (negative) score indicating positive (negative) sentiment and a score of 0 indicating neutral sentiment.	*RavenPack*
MCap	Outstanding shares times stock price.	*Compustat*
ROE	Net income divided by total equity.	*Compustat*
Amount	The natural logarithm of the loan amount in USD.	*DealScan*
Maturity	The number of months to maturity.	*DealScan*
Covenant	The number of financial covenants of the loan.	*DealScan*
Collateral	A dummy variable equal to 1 if the loan is secured, and 0 otherwise.	*DealScan*
Outstanding	A dummy variable equal to 1 if the borrower has outstanding loans at the time of the current loan's issuance, and 0 otherwise.	*DealScan*
New lender-borrower dummy	A dummy variable equal to 1 if the lead bank has syndicated 50% or more of the dollar volume of the borrower's loans for the first time over the five years preceding the current loan's issuance, and 0 otherwise.	*DealScan*
NFRD	A dummy variable equal to 1 in the period after the enaction of Directive 2014/95/EU on the disclosure of non-financial and diversity information in 2014, and 0 otherwise.	*The European Union*
EUcountry	A dummy variable equal to 1 if a borrower is headquartered in an EU country, and 0 otherwise.	*The European Union*
Bank Mandatory ESG disclosure	A dummy variable equal to one if a lender parent bank is operated in a country that adopted a mandatory environmental or social law in the prior year. Once a country has adopted such a law, the variable remains equal to one. Otherwise, the variable equals zero.	*Carrots & Sticks Report*
Common Law	A dummy variable equal to 1 if a borrower is headquartered in a common law country, and 0 otherwise.	*La Porta et al. (1998)*
Governance disclosure	Average ranking of the answers to the following questions: B2a (range of shareholdings), B2b (major shareholders), Ce (management information), Cf (list of board members and their affiliations), Cg (remuneration of directors & officers), and Ch (shares owned by directors & employees).	*Bushman et al. (2004)*

Anti-self-dealing index	Anti-self-dealing index. Average of ex-ante and ex-post private control of self-dealing.	*Djankov et al. (2008)*
Analyst	Number of analysts following the largest 30 companies in each country in 1996.	*Bushman et al. (2004)*
Audit	Variable indicating the percentage of firms in the country audited by the Big 5 accounting firms. AUDIT equals 1, 2, 3 or 4 if the percentage ranges between [0,25%], (25%,50%], (50%, 75%] and (75%, 100%], respectively.	*Bushman et al. (2004)*
Media	Average rank of the countries' media development (print and television) between 1993 and 1995.	*Bushman et al. (2004)*
PTSco	Political transparency score	*Kaufmann and Bellver (2005)*
ITSco	Institutional transparency score	*Kaufmann and Bellver (2005)*
Trust	The percentage of respondents in a country answering "Yes" to the question "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?"	*World Values Survey*
Corporate Ethics Index	The percentage of firms in the country that give satisfactory rating (above 5) to the questions on index calculated as the average of the percentage of firms' Corporate Illegal Corruption Component and the Corporate Legal Corruption Component.	*Kaufmann (2004)*
Public Sector Ethics Index	The percentage of firms in the country that give satisfactory ratings (above 5) to the questions on honesty of politicians, government favoritism in procurement, diversion of public funds, trust in postal office and the average of bribe frequencies for permits, utilities and taxes.	*Kaufmann (2004)*