

“Glossy Green” Banks: The Disconnect Between Environmental Disclosures and Lending Activities

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ABSTRACT:

Using confidential information on banks’ portfolios, we show that banks that emphasize the sustainability of their lending policies in their disclosures do not exhibit a reduced environmental impact and, if anything, they extend a higher volume of credit to brown borrowers, without charging higher interest rates, shortening debt maturity, or requiring more collateral. These results cannot be attributed to the financing of borrowers’ transition towards greener technologies. Examining the mechanisms behind the strategic disclosure choices reveals that banks extend credit to existing brown borrowers, especially those who are financially underperforming.

Keywords: financial institutions, sustainability reporting, strategic disclosure, zombie lending, ChatGPT

JEL classification: M41, G11, G15

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1. Introduction

Addressing the challenge of climate change necessitates substantial investments in technologies designed to mitigate greenhouse gas (GHG) emissions. Given their role as primary financiers of investments globally, banks can play a pivotal role in this endeavor. To effectively channel capital toward environmentally sustainable initiatives, however, it is crucial that investors and other stakeholders can discern which banks have environmentally conscious credit policies. In this context, transparency becomes critical (Christensen, Hail, and Leuz, 2021). Responding to rising stakeholder demand for sustainability-themed disclosures, banks have expanded their reporting on environmental commitments and climate-sensitive lending practices (e.g., KPMG, 2023). Yet, there are ongoing concerns that banks may strategically disclose information in a manner that emphasizes favorable aspects of their environmental actions, potentially masking the true scope and impact of their environmental activities. Paraphrasing the United Nations Organization’s concerns about strategic disclosures, banks could be misleading the public to believe that they are doing more to protect the environment, promoting false solutions to the climate crisis that distract from concrete and credible actions.¹

We contribute to this debate by examining whether banks’ environmental disclosures reflect their lending choices. On the one hand, concerns about potential market penalties (e.g., Akyildirim, Corbet, Ongena, and Oxley, 2024) may deter banks from engaging in strategic disclosure. Hence, we would expect banks that emphasize climate-conscious lending practices in their reporting to extend less credit to brown firms—those with a significant negative environmental impact— and more credit to green firms than other banks. On the other hand, due to the opacity of loan portfolios, which limits investor scrutiny, banks may face low reputational risks from overstating the sustainability of their lending practices. Moreover, banks have incentives to present their credit activities as more climate-friendly, as prior research suggests that sustainability-focused disclosures yield numerous benefits, such as increased stock liquidity (e.g., Dhaliwal, Li, Tsang, and Yang, 2011; Gibbons, 2023; Krueger, Sautner, Tang, and Zhong, 2024), higher environmental, social, and governance (ESG) ratings (e.g., Christensen,

¹ <https://www.un.org/en/climatechange/science/climate-issues/greenwashing>

Serafeim, and Sikochi, 2022), and the ability to attract talented employees (e.g., deHaan, Li, and Zhou, 2023). Therefore, banks may select to overemphasize their loan portfolio decarbonization strategies, while not changing their overall lending policies and extending a larger amount of credit to brown borrowers than banks that put less emphasis on environmental disclosures.

To address our research question, we employ AnaCredit (AC), a credit registry accessible within the European System of Central Banks. AC offers loan-level coverage of virtually all bank–firm relationships in the euro area, with detailed information on credit exposures and loans (above EUR 25,000), contract terms, and borrower characteristics. This granularity allows us to investigate banks’ strategic disclosures by disentangling credit supply from demand, capturing within-bank heterogeneity in lending to brown versus green firms, examining the extensive margin of lending relationships, and linking loans to borrower-level environmental outcomes. Importantly, AC’s coverage allows us to examine the full scope of banks’ credit activities, including smaller and more opaque borrowers that represent the largest share of loan portfolios but are typically excluded from syndicated loan datasets and are generally unobservable to investors. Further, our focus on euro area banks is motivated by the significant regulatory and investor pressure that these institutions face to finance the transition to a carbon-neutral economy (European Commission, 2019; The Institutional Investors Group on Climate Change, 2021).

Moreover, we rely on the rapidly expanding literature on the use of artificial intelligence (AI) and large language models (LLMs) for financial text analysis (e.g., Lopez-Lira and Tang, 2023). Specifically, we use ChatGPT to extract information on whether a bank is discussing the sustainability of its lending policies in annual and sustainability reports.² To validate our textual proxy, we show that banks that portray themselves as environmentally conscious are typically larger, better capitalized, have higher environmental ratings, and are more likely to have adopted sustainability reporting standards or climate initiatives.

We show that banks whose reports emphasize the sustainability of their lending policies are not only no more likely to issue new loans to firms in green industries than other banks, but they also extend

² In the Internet Appendix, Section D, we present robustness using an alternative dictionary-based text analysis and report consistent findings.

more credit to firms in highly polluting sectors. Specifically, banks with environmental disclosures in the top quintile extend about 10% more credit to borrowers in brown industries in comparison to other banks. Consequently, when we aggregate the effects at the bank level, we find that these banks extend a 23% higher share of new loans to brown industries and a 11% lower share to green industries compared to the average industry credit share of the sample banks.³ We also find no evidence that banks that emphasize the sustainability of their lending policies attempt to discipline brown borrowers by charging higher loan rates, extending loans with shorter maturity, or requiring collateral.

Importantly, our results hold when we control for credit demand by including either interactions of firm and time fixed effects (Khwaja and Mian, 2008) or interactions of industry, country, and time fixed effects (Degryse, De Jonghe, Jakovljević, Mulier, and Schepens, 2019). We control for banks' ability to expand their balance sheets, either by using a combination of bank fixed effects and bank time-varying financial performance characteristics, or by interactions of bank and time fixed effects. We further capture banks' propensity to lend to specific borrowers by including interactions of bank and firm fixed effects.

Moreover, while a large proportion of GHG emissions originates from very few industries, and industry classification provides a comprehensive first classification of brown loans, it may fail to capture important within-industry heterogeneities. For this reason, we further rely on two borrower-level proxies for environmental impact. First, we employ borrower-level GHG emissions from the Urgentem Carbon database. Second, using content analysis of borrowers' business descriptions from S&P Capital IQ, we evaluate borrowers' product greenness, which indicates the extent to which their product portfolio includes environmentally beneficial solutions that can contribute to the transition toward a net-zero economy. Since business descriptions are available for publicly listed and private firms, one advantage of this methodology is that we can measure borrower level greenness across a larger portion of a bank's loan portfolio. We classify borrowers as brown if their products have adverse environmental impacts. We continue to find a disconnect between banks' disclosures regarding lending policy sustainability and their underlying credit activities. Our conclusions continue to hold when

³ The average industry credit share of the sample banks is 3%.

focusing on more verifiable disclosure content or when comparing banks' discussions of specific environmentally sensitive activities with their actual lending to borrowers engaged in these activities.

We consider several mechanisms for why banks that emphasize the sustainability of their lending policies lend to borrowers in brown industries. One possibility is that these banks aim to facilitate their borrowers' transition to greener technologies. We find no evidence that firms in brown industries that receive credit from high-environmental-disclosure banks invest in R&D or fixed assets more than other firms in their industries, suggesting that these firms are unlikely to be investing in new (greener) technologies. Similarly, high-environmental-disclosure banks do not extend more credit to young firms in brown industries, which should be more likely to innovate and disrupt old technologies (e.g., Aghion, Dechezlepretre, Hemous, Martin, and Van Reenen, 2016), or to firms in brown industries that focus more on green product offerings based on their business descriptions. Finally, we find no evidence that firms committed to reduce carbon emissions through the Science Based Target initiative (SBTi) obtain more funding from banks with more extensive environmental disclosures. In addition, we do not find that firms that receive loans from high environmental reporters are more likely to join the SBTi or decrease GHG emissions over a three-year period post loan issuance. If anything, these firms exhibit less investment in fixed assets and conduct less R&D than their peers over the same period. Taken together, while banks' sustainability lending agendas are inherently long-term and potentially designed to yield results over time, our findings suggest that high-environmental-disclosure banks are not undertaking meaningful short-term measures to advance these goals.

It appears instead that banks' prior credit exposures constrain their role in financing the climate transition (see Degryse, Roukny, and Tielens, 2022 for a similar argument). Banks that emphasize the sustainability of their lending practices are no more likely to cut ties with existing brown borrowers. Moreover, these banks tend to fund borrowers in brown industries with higher leverage and lower interest rate coverage, who respectively obtain 10% and nearly 20% more credit than the average borrower. Thus, banks' strategic disclosures of their credit activities appear to be driven by their incentives to continue lending to financially unhealthy brown borrowers, who typically have fewer financing alternatives and will likely experience financial distress if their bank relationships were severed.

We further explore whether the disconnect between environmental disclosures and lending policies is more likely to arise when reputational costs are lower. We show that this disconnect is particularly pronounced in loans to small firms, which are more difficult for investors to observe and monitor. Specifically, we find that lending to large brown borrowers by high environmental reporters is about 12% lower relative to credit extended by these banks to other borrowers. Our results thus suggest that it is essential to look beyond the largest borrowers and to consider the full scope of banks' credit activities to accurately evaluate the relationship between sustainability disclosures and the environmental impact of their lending decisions.

Overall, our findings suggest that banks' environmental disclosures can provide a misleading picture of the greenness of their portfolios, supporting concerns that banks that trumpet their environmental stewardship struggle to reduce their brown exposures.⁴ Banks appear to have weak incentives to change their lending policies because this could negatively affect their outstanding loans (Degryse et al., 2022).

Our paper makes several contributions to the literature. First, we contribute to the rapidly expanding literature that investigates the prevalence of unsubstantiated sustainability claims by financial institutions. Most notably, Gibson, Glossner, Krueger, Matos, and Steffen (2022), Raghunandan and Rajgopal (2022), and Kim and Yoon (2023) show that funds with an ESG mandate fail to make sustainable investment choices. Compared to banks, mutual funds face stronger marketing incentives to increase their assets under management and engage in strategic disclosure behavior. However, while banks face higher regulatory costs, their less transparent loan portfolios may enable more subtle forms of strategic disclosure. Thus, we extend the findings of prior research to the banking sector, highlighting distinct mechanisms—such as asset opacity and client relationships—driving strategic environmental disclosures. Basu, Vitanza, Wang, and Zhu (2022) find no association between banks' social score ratings and mortgage issuance in poor localities. Our study leverages richer loan-level data with tighter identification and offers novel evidence from the euro area, where regulatory pressures and institutional

⁴ To exemplify, “Canada’s RBC Struggles to Go Green While Financing Oil,” Bloomberg, April 3, 2024.

incentives are stronger than for U.S. banks or mutual funds. These distinctions allow us to contribute new insights into the credibility of banks' environmental disclosures.

In addition, recent studies provide evidence of strategic disclosures related to diversity and inclusion (Baker, Larcker, McClure, Saraph, and Watts, 2024) and equal employment opportunities (EEO-1) for nonfinancial corporations (Bourveau, Flam, and Le, 2023). We contribute to this strand of the literature, which suggests that firms augment their sustainability disclosures to symbolically comply with stakeholder pressure for sustainability actions (e.g., Marquis, Toffel, and Zhou, 2016; Bothello, Ioannou, Porumb, and Zengin-Karaibrahimoglu, 2023), by exploring virtually the entirety of banks' asset side. Further, we identify important economic mechanisms that are likely to influence banks' strategic disclosure choices. Our study thus extends the growing literature on the reliability of sustainability disclosures (Christensen et al., 2021).

Concerns of strategic disclosure are particularly pronounced for banks that announce commitments to reduce exposures or exit from specific industries, such as coal or mining (Green and Vallée, 2023; Haushalter, Henry, and Iliev, 2023; Sastry, Verner, and Marquez-Ibanez, 2024). Given that public commitments typically require significant time to generate measurable outcomes and achieve an effective transition toward green practices, our paper adopts a different perspective. It highlights that banks' environmental disclosures to external stakeholders, which—as we show—largely pertain to current rather than future actions, do not align with their lending policies. Our results thus support regulatory concerns that investors may select banks based on the emphasis that they put on the sustainability of their lending policies in specific industries, despite the increasing brownness of their portfolios (ECB [European Central Bank], 2022; 2023). Related, existing literature mostly relies on large exposures in specific industries (Green and Vallée, 2023) or syndicated loans (e.g., Kacperczyk and Peydro, 2022; Degryse et al., 2023), which are more visible and potentially less susceptible to unsubstantiated claims. We consider changes in the banks' entire loan portfolios, including loans to smaller borrowers, which comprise the bulk of banks' portfolios but are opaque and, therefore, less likely to be scrutinized and affect a bank's reputation.

2. Data Sources and Main Variables

To evaluate whether a bank's environmental disclosures reflect its lending policies, we must examine the bank's loan portfolio and the sustainability of its borrowers, along with the bank's efforts to establish a reputation for environmental sustainability through its disclosures. Below, we outline our data. Appendix A provides detailed variable definitions.

2.1. Bank lending activities

We consider 101 systemically important banking groups subject to the Single Supervisory Mechanism (SSM), which include 553 banking subsidiaries headquartered in the Eurozone. For each subsidiary, we obtain loan-level data from AC, a credit register initiated by the European System of Central Banks in 2018. Specifically, AC covers borrower characteristics (e.g., industry, location), loan terms (e.g., amount, maturity, interest rate, issuance date), performance (e.g., delinquency), and the bank's credit exposure to the borrower. All banks report any loan to non-financial corporations that exceeds EUR 25,000. The data granularity allows us to capture any changes in lending policies through the *flow* of banks' credit over time.

A key advantage of using AC is that it provides loan-level information covering virtually all credit exposures in the euro area, including to unlisted and small firms that are typically unobserved by investors. In contrast, market participants typically rely on banks' aggregated and self-reported disclosures, which lack borrower-level granularity and may omit much of the credit portfolio. This difference in information sets highlights why our analysis can reveal discrepancies between banks' disclosures and their lending policies that a typical market participant cannot easily identify.

Specifically, in our empirical analysis, we consider new loans to borrowers in the Eurozone issued between 2014 and 2020. Since the median loan maturity is approximately four years (see Table 1, Panel B; maturity is reported in days), extending our sample's time-series to include loans issued after 2014 allows us to capture most of the banks' lending activity during this period.⁵ Our definition of new loans to a borrower includes all facilities a bank (subsidiary) has granted to the borrower during a year, with

⁵ To mitigate the concern that this research design choice influences our primary findings, we replicate the analyses by focusing on loans issued over the 2018-2020 period, i.e., after the initiation of banks' monthly reporting to AC. Our results are robust (see Internet Appendix Table IA.4).

the exception of credit lines, because the use of approved credit lines reflects the borrower's demand rather than the supply of credit. Last, we obtain data on banks' financial performance from the supervisory financial reporting (FINREP) dataset.

2.2 Green and brown borrowers

We rely on three alternative proxies for green and brown borrowers that trade off firm coverage with data granularity. First, to obtain the largest possible coverage, we use GHG emissions at the industry (NACE-2)-country-year level, retrieved from Eurostat over the 2014–2020 period. We standardize emissions using the industry's annual value added in a country to account for differences in industry size across countries. We classify industries as brown (green) if they rank in the upper (bottom) quintile for GHG emissions relative to the industry's value added in a given year. Based on this methodology, examples of brown industries include Manufacture of coke and refined petroleum products; Electricity, gas, steam, and air conditioning supply; Land transport and transport via pipelines; Air travel. Green industries consist of Wholesale trade, except of motor vehicles and motorcycles; Legal and accounting activities; Advertising and market research, among others. Not only does this classification allow us to include all AC borrowers in our analyses, but it also reflects that the largest carbon damages occur in energy-intensive industries (Greenstone, Leuz, and Breuer, 2023).

Second, we acknowledge the limitation that an industry-based definition of environmental impact may fail to capture substantial variation among firms within the same sector in terms of the adoption of more sustainable operations or environmentally beneficial products and services. To mitigate this concern, we obtain firm-level GHG emissions from Urgentem Carbon Dataset. Urgentem covers the full spectrum of Scope 1, 2, and 3 emissions for more than 6,000 companies worldwide. Scope 1 and 2 emissions are produced by a firm directly through its activities and by purchasing electricity and energy, respectively. They can be measured much more objectively than Scope 3 emissions, which are an estimate of the emissions of a firm's suppliers. For this reason, we proxy for a borrower's brownness using the ratio of the sum of its Scope 1 and 2 emissions to its total revenues.

Finally, we assess whether a borrower's product portfolio includes environmentally friendly solutions that contribute to the transition toward a net-zero economy. To do this, we retrieve business descriptions for a total of 150,105 borrowers in AC from S&P Capital IQ. We perform textual analysis

of business descriptions using the E.U. taxonomy for sustainable activities to create a dictionary for brown and green activities (Appendix IA.A).⁶ We classify borrowers in three groups: those with environmentally friendly products or services (“green”); those whose products are environmentally harmful (“brown”); and those whose business profiles indicate a relatively less material climate footprint. One important advantage of this approach is that our borrower classification covers both public and private companies, providing broader coverage than the emissions-based classification. We identify 5.5% of firms as brown (8,248 firms) and 4.1% as green (6,112 firms).

2.3 Banks’ environmental disclosures

We retrieve annual and sustainability reports for the 2014–2020 period from banks’ websites at the time of the data collection process (February–May 2021). We obtain any missing banks’ reports from the Corporate Register.⁷ We collectively process 1,397 reports, including 623 annual reports, 273 sustainability reports, 57 integrated reports, 61 nonfinancial reports, and 383 other sustainability-related reports (e.g., climate change reports, reports on GHG emissions, responsible investment reports) (Table IA.1). Examples of banks’ discussions of environmental-related issues are provided in Appendix IA.B.

Following a growing number of papers that use natural language processing to categorize text (e.g., Lopez-Lira and Tang, 2023), we rely on OpenAI’s ChatGPT 3.5 to evaluate the extent to which banks’ reports emphasize the sustainability of their lending policies.⁸ Open AI’s ChatGPT is a large language model that has been trained on millions of books and articles and has demonstrated a strong capability of analyzing the context of complex and nuanced language across various domains of knowledge.

⁶ We develop this classification in the context of Capital IQ business descriptions. To exemplify, although “pollution” or “oil spill” may commonly refer to adverse environmental impact, when used in business descriptions, these terms refer to firms’ activities of mitigating environmental damage rather than actively polluting.

⁷ We collect reports at the parent level when subsidiary reporting is unavailable and use a bank’s consolidated disclosures on environmental strategies because reports are mostly prepared at the banking group level. Sustainability reports are usually separate from annual reports but can also be filed as part of annual reports. Nonfinancial reports include disclosures of firms’ nonfinancial performance (e.g., innovation, brand value). Finally, using integrated reporting, firms (banks in our context) produce one report (instead of many standalone reports) where they communicate to investors value creation through financial, environmental and social capital.

⁸ An earlier version of this paper was circulated using a dictionary-based methodology to capture the emphasis on the sustainability of banks’ environmental disclosures. We report our dictionary and results in Internet Appendix, Section D (Table IA.11). The conclusions are similar to those we obtain using LLMs.

Since ChatGPT has a total limit of 4,096 tokens or around 3,000 words for input and output combined, we split banks' reports into paragraphs and use the following prompt to evaluate whether a bank is discussing the sustainability of its lending policies:

“Pretend you are an investor. The following text is an excerpt from a bank’s annual report: <...>

Based on this text only, please answer the following question. Are the bank’s lending policies environmentally sustainable? There are three choices: “YES”, “NO”, or “UNKNOWN” if the text contains no relevant information.”

We read the explanations that ChatGPT provides with its answer to evaluate the effectiveness of the algorithm and our prompt. We find encouraging that we retrieve the answer “UNKNOWN” for text that “lacks specific details regarding the bank’s lending policies and their overall environmental sustainability” and “YES” when “the excerpt emphasizes the integration of non-financial aspects” and “a proactive approach by the bank towards addressing environmental risks and aligning its practices with principles of sustainable finance”. A detailed example of this process is in Internet Appendix IA.C.⁹

Finally, we define *Environmental disclosures* as the ratio of the number of words in the paragraphs for which we obtain a “YES” classification to the total number of words in the bank’s reports during that year. While our proxy partly relies on disclosure length, our prompt filters out immaterial environmental statements and non-substantive content. Unlike prior studies that broadly capture the length of environmental disclosures, we focus on text directly related to banks’ credit decisions, excluding symbolic or superficial initiatives—such as improvements in corporate office energy efficiency (e.g., LEED-certified lighting) or reductions in employee travel emissions—that are unrelated to lending policies. This approach enhances the relevance of our disclosure metric and can be directly benchmarked against banks’ credit allocation to brown versus green firms, whereas non-lending environmental disclosures (e.g., related to their asset management division or internal operations) do not offer a natural link to lending decisions.

⁹ We focus on environmental disclosures because they are more standardized, policy-relevant, and measurable than social disclosures, which remain difficult to measure in a large sample of firms across countries.

The mean value of *Environmental disclosures* is approximately 4.5% (Panel A of Table 1) and is small by construction, as banks' annual reports cover a wide range of topics, predominantly focusing on financial performance. Figure 1 shows that the volume of banks' claims about the sustainability of their lending policies increased by over 100% over our sample period, in line with firms increasing focus on climate topics (e.g., Ioannou and Serafeim, 2012; Rouen, Sachdeva, and Yoon, 2022).

2.4 The Contents of Banks' Environmental Disclosures

Since banks' environmental disclosures are multidimensional, we evaluate the attributes of banks' discussions about the environmental sustainability of their lending policies considering the following dimensions: (1) disclosure topics; (2) temporality; (3) tone; (4) quantitative content; and (5) explicit commitments and urgency for improvement. To achieve this, we complement our AI approach with a rigorous, human-coded procedure. We recruited, trained, and supervised 75 undergraduate economics students, who reviewed and classified paragraphs on banks' environmentally related lending policies using a structured questionnaire (included in Section B of the Internet Appendix). Following extensive pilot testing, each paragraph was independently coded by two raters, with discrepancies resolved by a third.

Table 1, Panel C summarizes the results. Banks present their environmental sustainability of their lending policies in broadly similar ways. First, high environmental reporters are marginally more likely to disclose hard information, such as quantitative targets or explicit commitments (e.g., participation in the Science Based Target Initiative, Equator Principles, etc.). However, these differences are not statistically significant, confirming broader concerns in the literature about the credibility and verifiability of such commitments.

Second, banks' disclosures of lending policies place substantial weight on current actions, reinforcing a perception that they are actively pursuing efforts to green their loan portfolios, while disclosures focused solely on future lending initiatives remain relatively uncommon. These patterns are also evident in the disclosure examples presented in Appendix IA.B and partially alleviate concerns about unverifiable forward-looking claims commonly associated with symbolic disclosures. Third, most environmental disclosures maintain a neutral tone, and high environmental reporters tend to make credit-related sustainability statements that are just as positive as those of other banks. The low

frequency of negative-tone discussions suggests that banks are generally reluctant to highlight weaknesses in their environmental lending policies. Similarly, references to aspects of lending practices that require improvement are uncommon. Fourth, as shown in Figure 2, discussions of credit assessment criteria are dominated by energy use and GHG emissions. We do not observe a significant difference in the credit assessment criteria discussed by banks, even though high environmental reporters address GHG emissions and energy topics significantly more frequently.

Taken together, these findings suggest that key features of credit-related environmental disclosures do not vary significantly across banks. Common salient features, such as temporality, tone, or hard data, offer little guidance for external stakeholders in distinguishing between genuine and strategic disclosure behavior. Overall, these findings reinforce our methodological choice of focusing on credit-related environmental disclosure length, as it aligns with similar proxies in prior literature (e.g., Abraham et al., 2024) and with the concerns raised by policymakers regarding the inverse correlation between the credibility of these disclosures and their length. For instance, Frank Elderson, the Vice-Chair of the ECB Supervisory Board, stated in a webinar held by the European Banking Institute in November 2020: *“Banks are trying to compensate for the poor quality of their disclosures by issuing a great volume of information around green topics. We end up with a lot of white noise and no real substance.”*

3. Which Banks Discuss the Sustainability of their Lending Policies?

Before proceeding with our primary analysis, we validate our textual proxy by examining the characteristics of banks that emphasize the sustainability of their lending policies. Table 2 reports the results. Consistent with the view that the adoption of sustainability reporting standards enhances the availability of sustainability-related information, we find that the *Environmental disclosures* measure is positively associated with the likelihood of a bank preparing sustainability reports in accordance with the Global Reporting Initiative (GRI) standards or issuing an integrated report, even though the coefficients are not always statistically significant at conventional levels.

Larger banks, as measured by *Total assets*, appear to emphasize the sustainability of their lending policies more, likely reflecting the greater pressure from institutional investors and regulators to disclose such information. Additionally, banks with more extensive environmental disclosures tend to

be better capitalized, suggesting that strong financial performance allows banks to focus on sustainability objectives. In column 2, we find that banks committed to reducing emissions through the SBTi have more extensive environmental disclosures, further supporting the link between our *Environmental disclosures* measure and a bank's reputation for environmental sustainability and commitment to climate goals.

We further corroborate this interpretation by documenting that banks emphasizing the sustainability of their lending policies tend to have higher environmental rating scores. Specifically, the *Environmental disclosures* proxy is positively associated with a bank's MSCI and Sustainalytics environmental rating scores (*MSCI Env score* and *Sustainalytics Env score* in columns 3 and 4, respectively). In column 5, we find that our proxy is also related to the Bloomberg, environmental disclosure score, which captures the availability of climate-related information (*Bloomberg Env score*). This result is consistent with prior studies that have documented an association between the volume of firms' sustainability disclosures and ESG ratings (e.g., Basu et al., 2022; Christensen et al., 2022) and helps explain why banks emphasize the sustainability of their lending policies. Related, in column 6, our textual proxy is positively associated with the likelihood of a bank being included in the list of the 100 most sustainable firms globally, as assessed by Corporate Knights. These findings suggest that emphasizing the sustainability of lending policies enhances a bank's reputation.

Last, we document that banks with more extensive environmental disclosures underwrite more green bonds, as measured by the ratio of annual green bond volume a bank underwrites, obtained from Bloomberg, to the bank's total assets (column 7). Thus, banks that portray their lending practices as sustainable are particularly involved in green lending when highly visible activities in public debt markets are involved. This finding resonates with evidence from the syndicated loan market (Kacperczyk and Peydro, 2022; Green and Vallée, 2023; Degryse et al., 2023).

In Figure 3, we exploit cross-sectional differences between banks to gain a first insight into the characteristics of the portfolios of banks with extensive environmental disclosures. Banks that emphasize the sustainability of their lending policies appear to have a larger proportion of outstanding loans to brown industries. This finding suggests that banks specializing in brown industries are

pressured to disclose their environmental strategies and plans to decarbonize.¹⁰ In what follows, we explore whether these banks indeed change the composition of their loan portfolios.

4. Environmental Disclosures and Bank Lending Policies

4.1 Methodology

We examine whether banks that emphasize the sustainability of their lending policies decrease lending to brown borrowers more than other banks. On the one hand, banks may use investor reports to communicate their environmental strategies and build a reputation with stakeholders. In this case, we would anticipate a negative (positive) association between environmental disclosures and new loans to brown (green) industries. On the other hand, banks may strategically report on the sustainability of their lending policies while withholding information about their ongoing relationships with brown borrowers. Given that loan decisions are largely opaque and difficult to verify and question by external stakeholders, such behavior could enhance a bank's public image, as the positive correlation between environmental disclosures and environmental ratings suggests. However, we would expect no significant relationship or even a positive association between environmental reporting and banks' supply of credit to brown industries.

We use AC data on new loan issuance to focus on changes in the composition of banks' loan portfolios. Since banks that emphasize the sustainability of their lending policies have larger exposure to brown industries, this allows us to capture whether these banks adjust their loan portfolios in a way that is consistent with their environmental claims.

We estimate the following ordinary least squares (OLS) model where the dependent variable is the logarithm of the new loans' amount, issued by bank b during year t to firm f in industry i and in country c , *Loan amount* $_{f,b,i,c,t}$:

¹⁰ Table IA.2 shows that these banks indeed benefit from emphasizing the sustainability of their lending policies. Not only are more extensive discussions about the sustainability of a bank's lending policies associated with subsequent improvements of the bank's environmental rating, but the effect is much larger for banks with a larger proportion of outstanding loans to brown industries.

$$\begin{aligned} \text{Loan amount}_{f,b,i,c,t} = & \alpha + \beta_1(\text{Brown}_{i,c,t} \times \text{High Environmental Reporter}_{b,t}) \\ & + \beta_2 \text{High Environmental Reporter}_{b,t} + \gamma \mathbf{X}_{b,t} + \delta_{i,c,t} + \mu_b + \epsilon_{f,b,i,c,t} \quad (1) \end{aligned}$$

The variable of interest is the interaction term $\text{Brown}_{i,c,t} \times \text{High Environmental Reporter}_{b,t}$. $\text{High Environmental Reporter}_{b,t}$ is an indicator variable of whether bank b 's environmental disclosures rank in the upper quintile of the variable's distribution during year t , and $\text{Brown}_{i,c,t}$ is an indicator variable of whether the ratio of carbon emissions to gross value added of industry i in country c ranks in the upper quintile of the variable's distribution across all industries of a country during year t . We expect that $\beta_1 < 0$ if banks with more extensive environmental disclosures indeed engage in greener lending practices.¹¹

The vector μ_b denotes bank (subsidiary) fixed effects and the matrix $\mathbf{X}_{b,t}$ includes time-varying bank controls. While in some specifications, we control for bank's size, leverage, profitability, and tier 1 capital ratio, in other specifications, we include interactions of bank subsidiary and time fixed effects, thus controlling non-parametrically for time-varying bank characteristics and shocks affecting the overall bank's supply of credit. Specifically, we consider fixed effects at the bank subsidiary level, even though sustainability policies and disclosures are typically decided at the parent level, because different subsidiaries of a bank often experience different funding and demand shocks.

We further saturate the equation with different sets of fixed effects to control for shocks to the demand for credit, which is crucial because the demand for credit of borrowers in brown industries could decrease over time due to regulations and external pressure that also drive banks' increased environmental disclosures. Specifically, following Degryse et al. (2019), our specifications include interactions of industry, country, and year fixed effects ($\delta_{i,c,t}$), which allows us to identify the supply of credit if demand shocks affect firms based on industry and location. In alternative specifications, we include interactions of firm and time fixed effects and identify the supply of credit from firms with multiple relationships (Khawaja and Mian, 2008). The high-dimensional fixed effects also ensure that

¹¹ While the specifications in which we discretize our proxies for environmental disclosures are easier to interpret, in Table IA.5, we substitute the *High environmental reporter* dummy with the continuous version of the *Environmental disclosure* variable and show that our conclusions are invariant.

our results are not driven by differences in country specialization or national supervisory and enforcement measures, which may potentially affect bank disclosures and reporting practices.

Thus, the coefficient β_1 captures the extent to which banks that emphasize the sustainability of their lending policies grant credit to high-emission borrowers in comparison to other banks, after controlling for the borrowers' demand for credit. Consequently, our tests capture cross-sectional variation that is informative for assessing whether investors who select a bank based on its environmental disclosures indeed invest in a bank that extends less new credit to brown borrowers. Banks that specialize in brown industries could nevertheless green their loan portfolios by decreasing the credit they grant to brown borrowers relative to their past lending behavior. This consideration is particularly important given our earlier finding that banks emphasizing the sustainability of their lending policies tend to specialize in brown industries. To capture this time-series variation, we include interactions of bank and borrower fixed effects in some of our specifications and, controlling for credit demand, we test whether high environmental reporters become less inclined to satisfy brown borrowers' credit demand relative to their past behavior.¹²

4.2 Main findings

Table 3 reports the main findings. Panel A shows that banks classified as high environmental reporters grant more credit to borrowers in brown industries. In terms of economic magnitudes, the estimate in column 5 suggests that high environmental reporters extend 3.3% more credit to firms in brown industries compared to other banks. High environmental reporters could still green their credit portfolios by reducing credit to brown borrowers relative to their past lending. To capture this time-series variation, we include bank×firm fixed effects in column 6. The insignificant coefficient on the interaction between brown borrower and high environmental reporter suggests that these banks do not adjust their lending policies.

¹² Panel A of Table IA.3 shows that the brown borrowers of banks that emphasize the sustainability of their lending policies are generally larger in terms of total assets, have higher leverage, and tend to be older firms relative to these banks' other borrowers. Importantly, in Panel B, we do not find significant differences in the characteristics of the brown borrowers of high environmental reporting banks relative to other banks, as evidenced by the statistically insignificant coefficients on most interaction terms between *High env reporter* and borrower characteristics. Specifically, while brown borrowers of high environmental reporting banks tend to be more mature firms (based on their age and investment intensity), they do not significantly differ in other important aspects, such as size, profitability or leverage.

In Panel B, we consider loans to borrowers in green industries. We find no evidence that emphasizing the environment in public reporting is associated with more new credit to green firms. Thus, banks do not appear to compensate their brown loans by lending to firms in green industries.

Importantly, the results in Table 3 cannot be driven by the fact that brown industries experience positive demand shocks in some countries or that some banks are able to expand their credit supply to a larger extent because the interactions of industry, country and year fixed effects or firm and year fixed effects absorb shocks to credit demand, while the interaction of bank and year fixed effects absorbs bank level shocks.¹³

4.3 Alternative proxies for brown borrowers

An important concern with our interpretation of the empirical evidence is that we measure borrowers' emissions at the industry (NACE-2)-country-year level. Although this approach allows us to include small private companies in the analyses, we do not capture differences between borrowers within the same industry. We try to mitigate this concern by employing two borrower-based measures of greenness.

We first use a borrower's annual Scope 1 and 2 GHG emissions, standardized by total revenues. Panel A of Table 4 summarizes the results. Sample size dramatically decreases because GHG emission data are available only for large firms. Notwithstanding this, we continue to find that banks with extensive environmental disclosures extend more credit to borrowers with higher emissions, when controlling for credit demand using interactions of country, industry, and year fixed effects (columns 2 and 3). Specifically, a one-standard-deviation increase in the intensity of a borrower's GHG emissions is associated with almost 20% higher lending by high environmental reporters compared to other banks. We do not observe any statistically significant differences in lending to borrowers with high emissions between banks with extensive environmental disclosures and other banks in the other specifications, although these estimates are likely attributed to low cross-sectional variation when focusing on

¹³ To evaluate whether our results are driven by environmental disclosures referring to future lending policies, Table IA.6, Panel A reports the results for the three-year lag of the *High environmental reporter* dummy, while Panel B presents the robustness analysis using the one-year lag and the one-year lead variable of the *High environmental reporter* dummy. For this test, we use banks' reports starting from 2012 in order not to lose observations. The results mirror those in Table 3. We would also like to note that only about 3% of the paragraphs on banks' sustainability lending policies solely refer to forward-looking actions (Table 1, Panel C).

borrowers with multiple lending relationships. At best, these results suggest that banks' environmental credit-related disclosures are unrelated to their underlying lending choices.

We reach similar conclusions in Panel B, where we use our classification of brown borrowers based on business descriptions, which allows us to go beyond the largest firms in our sample. In columns 2 and 3, where we absorb credit demand using the interaction of industry, country and time fixed effects, we find that borrowers in brown industries obtain more new credit from banks that emphasize the sustainability of their lending policies. Our conclusions are robust when examining borrowers with green business descriptions (Table IA.7). Thus, environmental disclosures are far from being associated with greener, or less brown, lending policies or any efforts to reduce exposures to brown industries.

4.4 Alternative proxies for environmental disclosures

Furthermore, we assess the robustness of our baseline results using a stricter measure of disclosure. Specifically, we redefine high-environmental-reporting banks excluding statements that lack quantitative information or are purely forward-looking, as such statements are not easily verifiable and more likely to mislead investors. As shown in Table 5, Panel A, our findings are robust: banks that allocate more disclosure space to the sustainability of their lending policies continue to extend more new credit to brown borrowers, even when focusing only on more verifiable statements.

We also consider the possibility that environmental disclosures may reflect a greater focus on funding green projects (renewables) within the energy sector, which may not be fully captured by our broader analysis of brown industries and lending sustainability. To explore this, we construct a bank-level indicator for whether a bank explicitly mentions funding renewable energy in its disclosures and test whether these banks lend more to borrowers engaged in renewable energy activities, as identified through their business descriptions. In Panel B, Columns 1-2, we show that, controlling for differences in credit demand, high environmental reporters do not allocate more credit to renewable energy borrowers than other banks. Columns 3-6 present similar tests examining loans to borrowers in the recycling and waste management, or coal and oil and gas business, and banks that emphasize lending to these industries. Again, we find no evidence that banks highlighting these environmentally sensitive industries are differently inclined to supply credit to such borrowers.

4.5 The extensive margin of bank lending

We have so far focused on all newly issued bank loans to both new and existing clients. However, banks that aim to achieve greener loan portfolios may avoid starting new relationships with brown borrowers and even terminate existing relationships with borrowers in brown industries. We examine the extensive margin of banks' lending activities using Model (1) and the following dependent variables: (i) an indicator variable for whether a bank-firm relationship did not exist in year $t-1$ and is established in year t (*Entry*); (ii) an indicator variable for whether a loan is not renewed and the bank-firm relationship from period $t-1$ ceases to exist in period t (*Exit*). All other model specifications are similar to Table 3.

Table 6 reports the results. Panel A examines the initiation of new lending relationships, while Panel B considers relationship terminations. Overall, high environmental reporters appear as likely as other banks to terminate relationships with brown borrowers. Thus, banks that emphasize lending sustainability do not appear to discipline borrowers by divesting. However, in columns 5 and 6 of Panel A, high-environmental reporters appear less likely to start relationships with brown borrowers. Furthermore, in Appendix Table IA.8, we observe that high environmental reporters are more likely to start relationships with borrowers in green industries, suggesting that at least when starting new relationships, they may be greening their portfolios.

4.6 Bank level credit exposures to brown industries

In the previous sections, we have shown that although banks that overemphasize the sustainability of lending policies in their reporting do not reduce credit to firms in polluting industries, they partially adjust their portfolios on the extensive margin by establishing new relationships with firms in green industries. To evaluate banks' exposures to brown (and green) borrowers, we aggregate observations at the bank-industry-country-year level and estimate an OLS model where the dependent variable is a bank's b share of new credit to industry i in country c during year t out of all bank b 's new loans during that year, *Credit share* $_{b,i,c,t}$. We estimate the following equation:

$$\begin{aligned} \text{Credit share}_{b,i,c,t} = & \alpha + \beta_1(\text{Brown}_{i,c,t} \times \text{High Environmental Reporter}_{b,t}) \\ & + \beta_2 \text{High Environmental Reporter}_{b,t} + \gamma \mathbf{X}_{b,t} + \delta_{i,t} + \nu_{c,t} + \mu_b + \epsilon_{b,i,c,t} \end{aligned} \quad (2)$$

Table 7 reports the results. We find that the greater (lower) propensity to establish relationships with green (brown) borrowers has limited effects on the overall greenness of high environmental reporters' loan portfolios. In the aggregate, these banks appear to extend more credit to brown industries and less credit to green industries. This is the case even when we control for bank-specific shocks by including the interaction of bank and year fixed effects, indicating that the composition of the bank loan portfolio varies in a way that is not congruent with the bank's environmental disclosures. The estimates are also robust when we control for the demand shocks experienced by banks' clients, including interactions of industry and year fixed effects and country and year fixed effects. Overall, these results support regulatory concerns that banks' environmental disclosures can be misleading.

4.7 Environmental disclosures and loan contractual features

While banks with more extensive environmental disclosures extend larger amounts of credit to brown borrowers, they could use contractual features to discipline them (Choy et al., 2024; Dai et al., 2025). For instance, banks could provide loans at higher interest rates to brown borrowers. This would not only increase the borrowers' cost of capital and hamper their ability to invest, but it would also be a sign of high environmental reporters' reluctance to lend to borrowers in brown industries.

In Panel A of Table 8, we find no evidence that high environmental reporters extend loans with higher interest rates to borrowers in brown industries. If anything, in column 3, borrowers in brown industries appear to pay lower interest rates on loans from banks that emphasize the sustainability of their lending policies. Interestingly, though, in column 1, where the coefficient on the brown industry dummy is not absorbed by the fixed effects, we find that borrowers in brown industries pay higher interest rates, suggesting that borrowers in industries with high emissions indeed face transitions risks, which banks on average price when they issue new loans.

High environmental reporters could increase the monitoring intensity of brown borrowers to accelerate their transition. While monitoring intensity is not observable, we attempt to infer it from contractual features. Short maturity allows banks to exercise control, as they can threaten firms with non-renewal of loans if environmental targets are not met. In Panel B, we find that, on average, loans to brown borrowers have shorter maturities, consistent with the notion that these borrowers are riskier and that banks exercise control by imposing short-maturity (column 1). However, loans extended by

high environmental reporters to borrowers in brown industries have longer maturities, a result that does not persist across alternative specifications. Thus, high environmental reporters do not appear to use loan maturity to monitor brown borrowers. Last, collateralized lenders should also have stronger incentives to monitor (Rajan and Winton, 1995). However, as shown in Panel C, brown borrowers are no more likely to receive collateralized credit, nor do we observe differences between high environmental reporters and other banks.

Overall, loan contractual features suggest that high environmental reporters are no more likely to closely monitor brown borrowers than other banks. This conclusion is further supported by evidence of a slightly higher default probability of brown borrowers of high environmental reporting banks over a three-year horizon post loan issuance (Table IA.9). Thus, this evidence reinforces our interpretation that high environmental reporters are more inclined than other banks to fund borrowers in brown industries. In what follows, we explore the motives for this behavior.

5. Why Do Banks with Extensive Environmental Disclosures Lend to Brown Borrowers?

5.1 Funding the transition to greener technologies in brown industries

Banks with extensive environmental disclosures could lend to brown borrowers to fund their transition to lower-emission technologies. To evaluate this conjecture is challenging because the changes in emissions associated with the green transition may occur only in the long term and well after the end of our sample. Nevertheless, we take several steps to evaluate whether the clients of high environmental reporters are adapting their investment policies in response to the evolving climate crisis at a faster pace than other firms.

First, we consider that transitioning to greener technologies requires significant investments in fixed assets and R&D. Thus, if high environmental reporters fund the transition to greener technologies, their brown borrowers should have higher R&D and capital expenditures than other firms in their industry. To test this, we obtain data from Orbis and construct the following borrower-year level variables: (i) R&D to total assets; (ii) change in fixed assets to total assets. We then define indicator variables for whether a borrower ranks in the top quartile of the respective variables' distribution within the same

industry (NACE-2) and year. We augment Model (1) with the respective indicator variables (*Proxy*) and all the lower-order interaction terms:

$$\begin{aligned}
\text{Loan amount}_{f,b,i,c,t} = & \alpha + \beta_1(\text{Brown}_{i,c,t} \times \text{High Environmental Reporter}_{b,t}) \\
& + \beta_2 \text{High Environmental Reporter}_{b,t} \\
& + \beta_3(\text{Brown}_{i,c,t} \times \text{High Environmental Reporter}_{b,t} \times \text{Proxy}_{f,t}) \\
& + \beta_4(\text{High Environmental Reporter}_{b,t} \times \text{Proxy}_{f,t}) \\
& + \beta_5(\text{Brown}_{i,c,t} \times \text{Proxy}_{f,t}) + \beta_6 \text{Proxy}_{f,t} + \gamma \mathbf{X}_{b,t} + \delta_{i,c,t} + \mu_b + \epsilon_{f,b,i,c,t} \quad (3)
\end{aligned}$$

The independent variable of interest is the triple interaction term between high environmental reporter, borrower brownness, and the proxy for transition financing (i.e., coefficient β_3).

In Table 9, we find no evidence that high environmental reporters are more likely to support transition financing when we consider firms with high capital expenditures (columns 3 and 4). If anything, high environmental reporters are less likely to lend to firms in brown industries that have larger R&D expenditures, as indicated by the negative and statistically significant coefficient of the triple interaction variable in column 2.

Second, a limitation of using financial data is that we cannot distinguish between green and brown investment and we may have low power to identify the borrowers that invest in transition technologies. We thus introduce several additional proxies. We rely on existing studies that highlight that firms in brown industries that are more likely to innovate and disrupt old technologies are typically young new entrants (e.g., Aghion et al., 2016). We thus test whether *High Environmental Reporter* banks lend more to young firms in brown industries. We define firms that are five-year old or less as young. In columns 5 and 6, we find that high environmental reporters do not extend more credit to young firms in brown industries, suggesting that they are unlikely to fund the transition to greener technologies.

Next, firms often commit to green transition by setting GHG emission targets through the SBTi framework. We obtain the list of signatory firms from the SBTi's website and match it with AC borrowers. We evaluate whether high environmental reporters lend to firms that have already adhered to the SBTi at the time of the loan's origination or within the following year. Given that SBTi signatories are typically large firms, we restrict the control sample to similarly sized borrowers within the same

NACE-2 industry, i.e., those that exhibit similar dependence on bank credit. The results in columns 7 and 8 are consistent with our earlier conclusions: banks with more extensive environmental disclosures are no more likely to extend credit to firms with established emission reduction targets.

We further leverage our product greenness textual proxy to investigate whether banks that emphasize the sustainability of their lending policies extend credit to borrowers with a green business focus in traditionally brown industries, for instance, firms specializing in renewable energy within the broader energy sector. In columns 9 and 10, we find no evidence that high environmental reporters extend more credit to green firms in brown industries.

Third, we acknowledge that transition lending is likely to yield impact over a longer time horizon or may concern firms that are only at the initial stages of their environmental transition. Thus, we test whether brown borrowers who obtain loans from banks with more extensive environmental disclosures reduce their emissions at a faster pace than other firms up to three years after loan origination. In Table IA.10, Panel A, we find no evidence supporting the hypothesis. We complement this finding by showing that firms granted loans from high environmental reporting banks are no more likely to pledge to reduce future emissions through the SBTi over the same period (Panel B). We further document that borrowers do not increase capital expenditures and R&D over a three-year horizon after receiving loans from banks that emphasize the sustainability of their lending policies (Panels C and D). If anything, we find some evidence that these borrowers invest less in fixed assets and conduct less R&D than their peers. Thus, while sustainability lending agendas are inherently long-term, within our sample period, we find no evidence that banks with extensive environmental disclosures are undertaking more short-term measures to advance these goals than other banks.

5.2 Relationship strength and loan opacity

Since banks that emphasize the sustainability of their lending policies appear to have larger exposures to brown industries, the discrepancies between banks' environmental disclosures and lending policies may emerge because banks are reluctant to discontinue established credit relationships with brown borrowers. Columns 1 and 2 of Table 10 support this conjecture. We test whether high environmental reporters extend more credit to borrowers in brown industries if they have extended a larger proportion of the borrower's outstanding loans in the past. This variable that we label *Exposure*

not only captures how close the relationship of a bank with a given borrower is, but also that a refusal to extend a loan could have negative consequences for the bank itself, as the borrower may experience distress. Consistent with the idea that the bank internalizes the negative effect of not extending liquidity to these borrowers, we find that the coefficient on the triple interaction term between *Brown, High Environmental Reporter*, and *Exposure* is positive and significant in columns 1 and 2.

Columns 3 and 4 examine the role of borrower size. In Column 3, we find that when accounting for borrowers with single banking relationships—a subsample neglected in Column 4 — banks with high environmental disclosures extend more loans to small borrowers within brown industries. Since loans to small borrowers represent the most opaque portion of a bank’s assets, incomplete disclosures that omit these discussions are less likely to attract the attention of investors and other stakeholders, thus alleviating potential reputational risks. This finding may also explain why studies focusing on syndicated loans show that bank commitments to reducing emissions are associated with greener lending practices (e.g., Peydro and Kacperczyk, 2022). We find that banks that are SBTi signatories also overclaim their sustainability lending practices, suggesting that differences in findings across studies likely stem from the fact that syndicated loans are more easily observed by investors and regulators, thereby carrying higher reputational costs. Moreover, small firms often face significant challenges in accessing alternative sources of funding, which increases the probability that a bank’s decision to sever the relationship or reduce credit would result in financial distress. Concerns about distress, which could compel banks to recognize losses and disclose their exposures to brown industries, may further incentivize banks to continue extending credit to these borrowers.

5.3 Lending to low-quality firms and the brownness of banks’ portfolios

We further examine whether banks’ motivation to avoid borrower distress can help explain the disconnect between their environmental disclosures and lending practices. When borrowers in brown industries are unprofitable and lack alternative sources of financing, banks may choose to renew their loans to keep these borrowers afloat and avoid recognizing losses on their balance sheets (Peek and Rosengren, 2005; Acharya et al., 2022). This behavior, often referred to as zombie lending, may drive the continued financing of brown industries by banks that highlight their climate-conscious lending

policies. We test whether zombie lending among high environmental reporters contributes to the ongoing support for environmentally harmful firms.

We employ two proxies to define low-credit-quality borrowers: (i) an indicator variable for whether a borrower's leverage ranks in the top quartile of the variable's distribution within the same industry (NACE-2); (ii) an indicator variable for whether a borrower's interest coverage ratio (EBIT to interest expense) ranks in the bottom quartile of the variable's distribution within the same industry (NACE-2). We estimate Model (3) with the respective indicator variables (*Proxy*). The variable of interest is the triple interaction between high environmental reporter, borrower brownness, and the proxies for low-credit-quality borrower.

Table 10 reports the results of these tests. We find that banks that emphasize the sustainability of their lending policies are more likely to extend new loans to borrowers in brown industries with high leverage (columns 5 and 6) and low interest coverage ratio (columns 7 and 8), even though the estimates are statistically significant at conventional levels only in the most restrictive specifications in which we include interactions of firms and time fixed effects. This evidence is consistent with the interpretation that high environmental reporters renew loans to brown borrowers that would otherwise experience financial distress. Not only are these brown borrowers less likely to have access to alternative funding sources, but they also lack the operational and financial capacity to transition to greener technologies.

If zombie lending indeed drives our findings, banks with low capitalizations should exhibit a more pronounced disconnect between environmental disclosures and lending policies (e.g., Peek and Rosengren, 2005). In column 1 of Table 11, we find that high environmental reporters with low capitalization extend larger loans to borrowers in brown industries, even though the coefficient on the triple interaction term loses statistical significance once we include bank x time fixed effects. These findings suggest that relationships with low-credit-quality brown borrowers may further explain why high environmental reporters engage in strategic environmental disclosure.

Collectively, these results highlight the trade-offs banks face between the benefits and potential costs of strategic environmental disclosure. Banks are more likely to engage in such practices when the potential benefits are greater, for instance, by diverting investors' attention away from their brown exposures when those exposures are substantial. Conversely, banks are less likely to engage in strategic

disclosure when their lending involves larger, and therefore more transparent firms, for which the reputational costs of such disclosures are likely higher.

5.4 Cross-sectional differences in institutional and bank-specific characteristics

Lastly, we examine whether large banks, which are subject to more scrutiny by regulators, may be less inclined to engage in strategic disclosure. It appears that large banks with more extensive environmental disclosures extend more credit to borrowers in brown industries (columns 3 and 4 of Table 11). This evidence suggests that larger institutions with higher visibility and stronger investor pressure potentially face higher benefits from strategic disclosure and are more likely to engage in it. Overall, this finding confirms that the credibility of environmental disclosures and the extent to which these are reflected in the banks' loan portfolios is particularly difficult for regulators and market participants to verify.

The rest of Table 11 supports this conjecture. Using the introduction of sustainability reporting rules at the country-year level defined in Krueger et al. (2024), we find no evidence that mandatory reporting can mitigate the opportunistic use of environmental disclosures (columns 5 and 6). This evidence further stresses the importance of examining banks' entire loan portfolio allocations when evaluating the effectiveness of sustainability reporting regulation in motivating banks to adopt more sustainable lending practices. For instance, focusing on syndicated loans, Wang (2023) shows that foreign banks subject to ESG disclosure regulations incentivize U.S. borrowers to enhance their sustainability performance and terminate relationships with borrowers exhibiting weak sustainability practices. However, our findings suggest that this effect does not necessarily enhance the credibility of lengthier disclosures for banks within a country, nor does it generalize to small, opaque credit exposures to domestic borrowers, which constitute the bulk of a bank's portfolio. Thus, these results highlight the need for further research in this area.¹⁴

¹⁴Wang (2023) shows that mandatory ESG disclosures in the lender's country improved the behavior of borrowers in the syndicated loan market. Wang (2023) is silent about environmental disclosure contents. Furthermore, we focus on the universe of commercial loans in Europe, including smaller and more opaque borrowers. Strategic disclosure effects are more pronounced in this segment, where credit relationships are less visible to the market. In untabulated tests, we find no evidence that mandatory sustainability reporting affects credit issuance by high environmental reporting banks, even when focusing on very large borrowers. This suggests that the presumed benefits of such mandates may not be broadly generalizable.

Similarly, although the volume of environmental disclosures increases post-Paris Agreement (Figure 1), the content of such disclosures continues to be unrelated to underlying lending practices (columns 7 and 8), and if anything, banks' tendency to emphasize the sustainability of their lending practices while lending to brown industries becomes more pronounced. In fact, in Figure IA.1, where we show the dynamics of the propensity of high environmental reporters to lend to borrowers in brown industries, the estimate on our interaction term of interest starts to be statistically significant in 2018, that is, the year after the Paris agreement, when pressure for environmental stewardship increased.

Finally, we show that the use of an external auditor does not significantly enhance the credibility of sustainability disclosures (columns 9 and 10), consistent with recent studies suggesting that auditors have limited expertise in evaluating sustainability disclosures (Aobdia and Yoon, 2025).

Collectively, these results suggest that banks enhance their sustainability profiles through extensive environmental disclosures, while significant portions of their loan portfolios continue to consist of brown borrowers.

6. Conclusions

In response to rising institutional pressures, banks have substantially increased the volume of sustainability reporting to inform stakeholders about their environmental goals and initiatives to improve the sustainability of their lending policies. However, concerns regarding the extent to which environmental disclosures include unsubstantiated claims and serve as mere publicity tools are widespread. We contribute to this debate by examining the relationship between banks' claims about the sustainability of their lending policies and their actual credit decisions. We show that features of banks' loan portfolio, such as specialization in brown industries, relationship lending and exposure to brown "zombie" borrowers, help explain the heterogeneity in strategic disclosure practices and hinder the effective transition to a green lending strategy. In addition, the opacity of banks' portfolios exacerbates the problem, as banks' claims are hard to verify and dispute.

An interesting avenue for future research is to explore the conditions under which investor base, market competition, and institutional context increase banks' reputational costs, thereby decreasing the disconnect between their environmental disclosures and lending policies. Moreover, while the window

of our study provides insight into short-run dynamics, it may be too narrow to capture longer-term shifts in borrowers' climate footprints and lending policies, which could be the focus of future work. Our findings should thus be viewed as documenting the absence of short-run improvements rather than as ruling out longer-horizon effects. Finally, we do not observe covenants, ESG-specific clauses, or ongoing discussions between banks and brown borrowers regarding environmental issues. Future work exploiting these features in relation to banks' environmental reputation would be valuable.

Subject to the above caveats, our results support concerns about the lack of transparent and comparable sustainability disclosures (ECB, 2022), which amplifies investor processing costs of assessing whether environmental claims are reflected in actual lending practices. Even salient disclosure features—such as hard data or temporality—are insufficient to distinguish strategic disclosure behavior. Standardization through regulatory mandates could help by requiring banks to disclose portfolio-linked, comparable metrics, such as financed emissions (level and changes, disaggregated by industry), taxonomy-based portfolio ratios (Green Asset Ratio [GAR] or Banking Book Taxonomy Alignment Ratio [BTAR]), and new credit flow metrics by borrower greenness. Supervisory and reporting frameworks (e.g., EBA Pillar 3 templates, ISSB IFRS S2 financed-emissions requirements) are already moving in this direction, which may enhance the transparency, comparability, and credibility of disclosures.

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Figure 1. Banks' Emphasis on the Sustainability of Lending Policies over Time

The figure plots the mean Environmental disclosures in our sample over time. Environmental disclosures is defined as the number of words in paragraphs that emphasize the sustainability of a bank's lending policies in its investor reports in a year relative to the total number of words in the investor reports during that year. In percent.

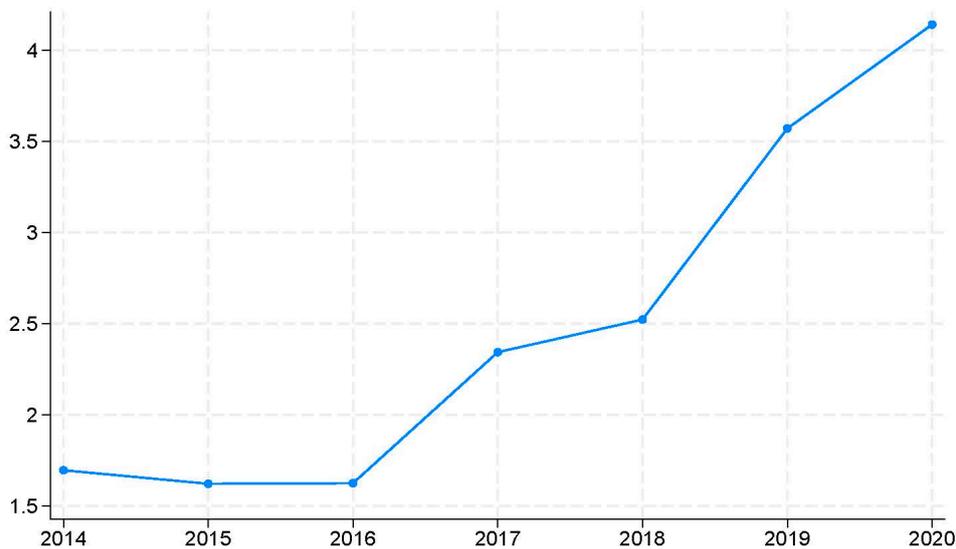


Figure 2. Keywords in Environmental Lending Disclosures

The figure shows a word cloud of the most frequent environmentally sensitive industries and credit evaluation parameters that banks discuss in paragraphs related to their environmental lending policies in annual and sustainability reports from 2014 to 2020. Terms are displayed with font sizes proportional to their frequency.

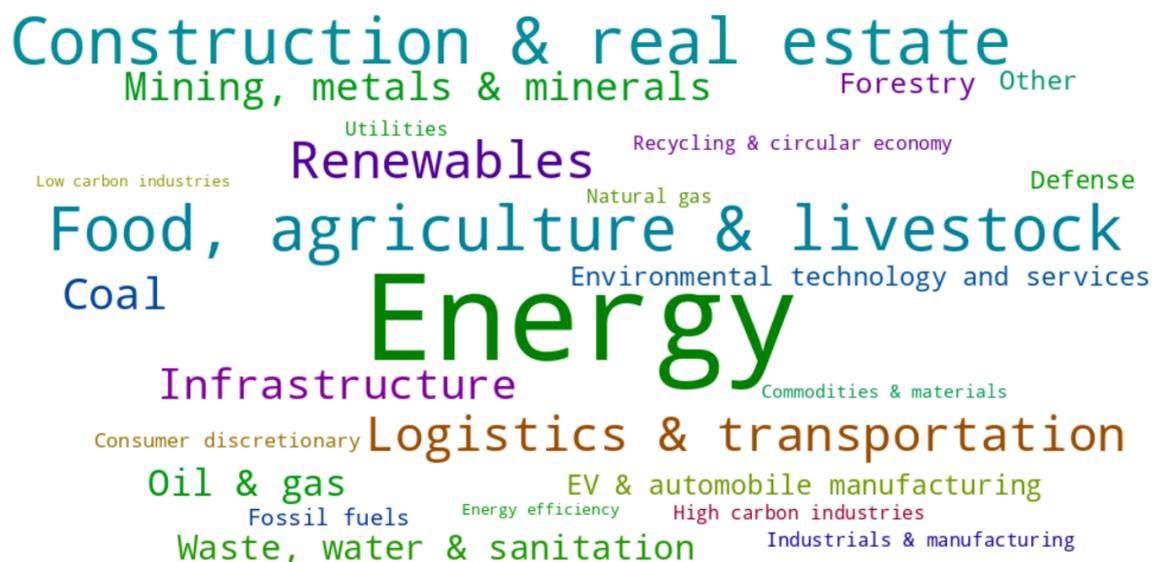


Figure 3. Banks' Emphasis on the Sustainability of Lending Policies and Exposure to Brown Industries

The figure shows a bin scatter plot depicting the relationship between banks' *Environmental Disclosures* and their ex-ante exposure to brown borrowers. The scatter plot presents averages for the data sorted into 20 bins based on the banks' exposure to brown firms.

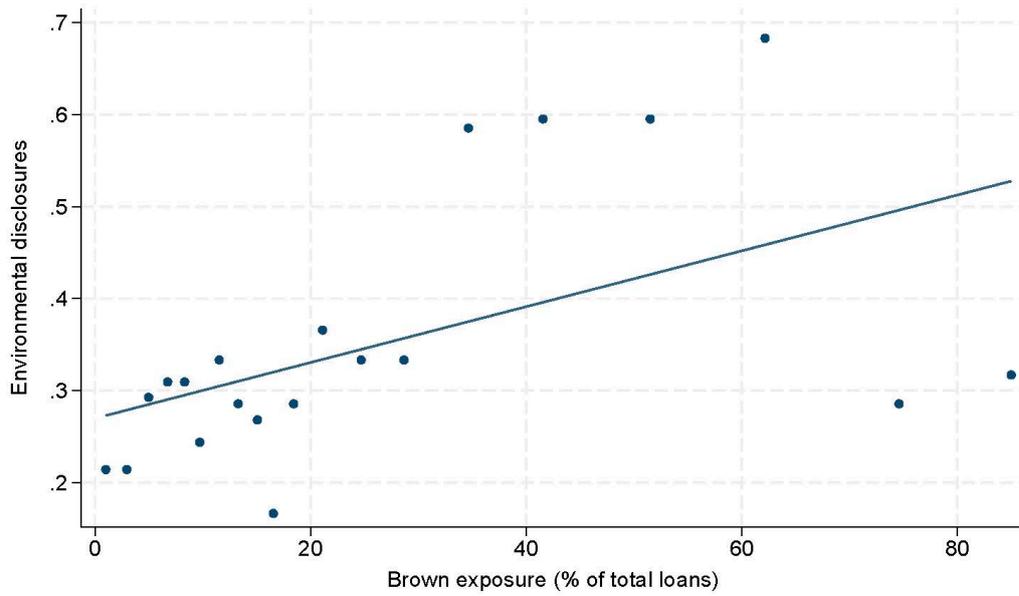


Table 1. Descriptive Statistics

The table reports descriptive statistics for the analysis of banks' characteristics (Panel A) and banks' lending policies (Panel B). Panel C reports descriptive statistics for the environmental disclosure characteristics identified through a paragraph-level classification by trained research assistants based on a questionnaire-guided review of sustainability-related lending disclosures across banks. The last column reports the *t*-statistic for the difference in means between high environmental reporters and other banks ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Appendix A.

Panel A. Summary statistics of banks' characteristics

	Obs.	Mean	S.D.	Q1	Median	Q3
Environmental disclosures (%)	2,889	4.478	3.621	1.823	3.303	6.905
GRI standards	2,889	0.403	0.490	0.000	0.000	1.000
Integrated reporting	2,889	0.414	0.4912	0.000	0.000	1.000
Bloomberg Env score	1,121	42.086	10.520	39.286	44.643	47.321
ESG Corporate Knights	2,889	0.063	0.243	0.000	0.000	0.000
Green bond issuance	2,889	0.007	0.062	0.000	0.000	0.001
MSCI Env score	1,630	5.273	2.300	3.400	5.900	7.100
Sustainalytics Env score	2,476	60.921	15.196	54.726	59.167	71.435
Leverage	2,889	0.926	0.025	0.911	0.923	0.948
ROA	2,889	0.031	0.014	0.022	0.028	0.037
Total assets	2,889	25.855	1.358	25.059	25.568	27.202
Tier 1 capital	2,889	0.166	0.058	0.137	0.155	0.196
SBTI dummy	2,889	0.118	0.323	0.000	0.000	0.000

Panel B. Summary statistics of loan-level data

	Obs.	Mean	S.D.	Q1	Median	Q3
Loan Amount	3,740,323	11.005	1.519	10.126	10.820	11.900
Loan Maturity	3,712,480	1,588.401	1,213.133	574.000	1642.092	2,100.000
High env. reporter	3,740,323	0.153	0.360	0.000	0.000	0.000
Brown	3,740,323	0.162	0.368	0.000	0.000	0.000
Leverage	3,740,323	0.908	0.030	0.890	0.914	0.932
ROA	3,740,323	0.033	0.011	0.026	0.033	0.037
Total assets	3,740,323	25.132	1.612	23.875	24.971	26.715
Tier 1 capital	3,740,323	0.178	0.038	0.154	0.170	0.199
GHG emissions (Urgentem)	3,765	109.683	181.829	19.958	32.570	78.910
Brown business	1,180,889	0.053	0.223	0.000	0.000	0.000
Green business	1,180,889	0.019	0.137	0.000	0.000	0.000

Panel C. Summary statistics of the manually classified environmental disclosure content

	Full sample			High environmental reporter			Other banks			Mean diff.
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	
Total Report Word Count	183,300	163,237	110,252	147,921	130,182	102,405	190,648	168,547	110,522	-42.727***
Sustainable Lending Word Count	3,122	1,609	4,234	6,796	5,064	6,142	2,628	1,301	3,642	4,167***
Environmental commitments	0.273	0.220	0.273	0.298	0.279	0.199	0.269	0.202	0.283	0.029
Quantitative disclosures	0.426	0.429	0.293	0.449	0.492	0.213	0.422	0.403	0.303	0.027
Disclosure of Credit Assessment Topic:										
GHG emissions	0.210	0.137	0.238	0.304	0.251	0.231	0.196	0.105	0.236	0.109***
Energy	0.368	0.335	0.286	0.390	0.363	0.204	0.365	0.324	0.297	0.025
Ecology	0.177	0.100	0.225	0.171	0.123	0.186	0.177	0.099	0.230	-0.007
Air/Water/Waste	0.106	0.039	0.169	0.116	0.084	0.140	0.105	0.023	0.173	0.011
Disclosure Temporality:										
Past/present time horizon	0.972	1.000	0.091	0.974	0.993	0.046	0.971	1.000	0.096	0.003
Forward-looking horizon	0.028	0.000	0.091	0.026	0.007	0.046	0.029	0.000	0.096	-0.003
Disclosures on the urgency of environmental performance improvement	0.034	0.000	0.095	0.038	0.000	0.078	0.033	0.000	0.097	0.005
Disclosure Tone:										
Positive	0.301	0.206	0.309	0.302	0.230	0.268	0.300	0.202	0.315	0.002
Neutral	0.697	0.793	0.310	0.695	0.770	0.269	0.697	0.796	0.315	-0.002
Negative	0.001	0.000	0.005	0.001	0.000	0.004	0.001	0.000	0.006	0.000

Table 2. Banks' Characteristics and Emphasis on the Sustainability of Lending Policies

The table examines the relation between banks' *Environmental Disclosures* and their financial and environmental performance. All variables are defined in Appendix A. Fixed effects are included as indicated but not tabulated. Standard errors are corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Environmental disclosures						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GRI standards	0.0084*** (0.00304)	0.0098*** (0.00292)	0.00548 (0.00382)	0.00388 (0.0037)	0.00332 (0.00409)	0.0083*** (0.00284)	0.00647** (0.00301)
Integrated reporting	0.0142* (0.00742)	0.0111 (0.00775)	0.00628 (0.00729)	0.0140 (0.0087)	0.00311 (0.00757)	0.0146** (0.00715)	0.0112 (0.00761)
Leverage	-0.0252 (0.0633)	-0.0268 (0.0617)	0.0378 (0.0698)	-0.0352 (0.0808)	0.132* (0.0788)	-0.00585 (0.0628)	-0.00370 (0.0640)
ROA	0.0312 (0.0532)	0.0342 (0.0513)	0.0794 (0.104)	0.0562 (0.152)	0.0198 (0.104)	0.0416 (0.0504)	0.0611 (0.0527)
Total assets	0.005*** (0.00163)	0.0045*** (0.00154)	0.00343* (0.00202)	0.00296 (0.0019)	0.00131 (0.00201)	0.0044*** (0.00123)	0.0063*** (0.00157)
Tier 1 capital	0.0674** (0.0271)	0.0657*** (0.0247)	0.119*** (0.0406)	0.0680 (0.0431)	0.119*** (0.0401)	0.0656** (0.0268)	0.0649** (0.0256)
SBTi signatory		0.0160** (0.00728)					
MSCI Env score			0.002*** (0.00068)				
Sustainalytics Env score				0.0003*** (0.0001)			
Bloomberg Env score					0.0005*** (0.00014)		
ESG Corporate Knights						0.0243** (0.0109)	
Green bond issuance							0.0415*** (0.00827)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	622	622	462	457	359	622	622
R ²	0.285	0.309	0.260	0.245	0.268	0.328	0.327

Table 3. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries

The table examines the association between banks' credit-related environmental disclosures and the volume of new loans extended to individual borrowers (*Loan amount*). In Panel A (B), *Brown (Green)* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top (bottom) quintile of the ratio's distribution across all industries in the firm's country during a year. *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. Fixed effects and bank controls are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Brown industries</i>						
High env. reporter	-0.0712 (0.0577)	-0.0935* (0.0555)		-0.0507 (0.0434)		
Brown	-0.221*** (0.0266)					
High env. reporter x Brown	0.160*** (0.0349)	0.110*** (0.0233)	0.0783*** (0.0209)	0.0494** (0.0207)	0.0331* (0.0196)	0.0128 (0.0208)
N	2,822,338	3,740,323	3,740,250	828,689	828,074	432,886
R ²	0.705	0.200	0.207	0.792	0.797	0.917
<i>Panel B. Green industries</i>						
High env. reporter	-0.0420 (0.0675)	-0.0695 (0.0557)		-0.0390 (0.0450)		
Green	-0.0580 (0.0456)					
High env. reporter x Green	-0.0242 (0.0346)	-0.0280 (0.0201)	-0.00883 (0.0179)	-0.0126 (0.0251)	0.00169 (0.0240)	-0.0267 (0.0212)
N	2,822,338	3,740,323	3,740,250	828,689	828,074	432,886
R ²	0.705	0.200	0.207	0.792	0.797	0.917
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes

Table 4. Alternative Proxies for Brown Borrowers

The table examines the association between banks' credit-related environmental disclosures and the volume of new loans extended to individual borrowers (*Loan amount*) using alternative proxies for brown borrowers. In Panel A, brownness is defined using borrower-level GHG emissions defined as the ratio of the sum of Scope 1 and 2 GHG emissions to total revenues during a year. In Panel B, *Brown business* denotes an indicator variable constructed by performing textual analysis of business descriptions of public and private companies from S&P Capital IQ. *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. Fixed effects and bank controls are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Borrower-level GHG emissions</i>						
High env. reporter	-0.193 (0.148)	-0.336** (0.157)		-0.216 (0.133)		
GHG	-0.00129** (0.000598)	0.000742** (0.000368)	0.000929** (0.000387)			
High env. reporter x GHG	0.0000882 (0.000557)	0.00118** (0.000559)	0.00106* (0.000609)	0.000459 (0.000542)	0.000403 (0.000579)	0.000653 (0.001158)
N	3,765	3,637	3,454	2,989	2,786	1,153
R ²	0.652	0.542	0.579	0.790	0.807	0.920
<i>Panel B. Brown business description</i>						
High env. reporter	-0.0194 (0.0309)	-0.0427 (0.0639)		-0.0288 (0.0445)		
Brown business		0.245*** (0.0323)	0.244*** (0.0321)			
High env. reporter x Brown business	-0.00488 (0.0232)	0.189** (0.0924)	0.191** (0.0904)	0.0269 (0.0406)	0.0211 (0.0406)	-0.0500 (0.0348)
N	926,883	1,180,106	1,179,910	311,548	310,951	82,644
R ²	0.729	0.254	0.263	0.806	0.811	0.922
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	Yes	Yes

Table 5. Alternative Proxies for Environmental Disclosures

The table examines the association between banks' credit-related environmental disclosures and the volume of new loans extended to individual borrowers (*Loan amount*) using alternative proxies for environmental disclosures. In Panel A, *Environmental disclosures* is measured only on paragraphs with environmental lending disclosures that include either (i) numerical information, or (ii) information pertaining to past or current actions. *High environmental reporter, verifiable* is an indicator variable of whether a bank's more verifiable content of environmental disclosures ranks in the top quintile of the variable's distribution during a year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. In Panel B, we compare whether the volume of credit that a bank extends to borrowers with business descriptions that include investments in renewables (*Renewables*) or recycling and waste management (*Recycling and Waste*) or oil and gas and coal (*Oil & Gas and Coal*) map to the probability that the bank discusses these environmentally sensitive activities in its credit-related sustainability disclosures. Borrower business activities are identified by performing textual analysis of business descriptions of public and private companies from S&P Capital IQ. In both panels, fixed effects are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

<i>Panel A. Environmental disclosures, verifiable</i>						
	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter, verifiable	0.0854 (0.141)	0.0422 (0.0727)		0.103*** (0.0306)		
Brown	-0.212*** (0.0250)					
High env. reporter, verifiable x Brown	0.121*** (0.0359)	0.115*** (0.0232)	0.0791*** (0.0247)	0.0579** (0.0234)	0.0377 (0.0236)	0.00215 (0.0220)
N	2,822,338	3,740,323	3,740,250	828,689	828,074	432,886
R ²	0.705	0.200	0.207	0.792	0.797	0.917
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	Yes	Yes
<i>Panel B. Emphasis on environmentally sensitive sectors and lending to borrowers with related business activities</i>						
	Loan Amount					
	Renewables		Recycling and Waste		Oil & Gas and Coal	
	(1)	(2)	(3)	(4)	(5)	(6)
Bank topic disclosure dummy x Borrower business	0.0263 (0.0660)	0.0397 (0.0995)	-0.0283 (0.0725)	-0.0628 (0.0682)	0.00919 (0.0369)	0.0251 (0.0473)
N	310,951	157,622	310,951	157,622	310,951	157,622
R ²	0.811	0.925	0.811	0.925	0.811	0.925
Firm-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm FE	No	Yes	No	Yes	No	Yes

Table 6. The Extensive Margin of Bank Lending and Emphasis on the Sustainability of Lending Policies

The table examines the extensive margin of banks' credit decisions. In Panel A, the dependent variable *Entry* is a binary variable equal to one if a bank-firm relationship that did not exist in year $t-1$ is established in year t , and zero for any relationship that existed in year $t-1$. In Panel B, the dependent variable *Exit* is defined as one if the loan is not renewed and the bank-firm relationship from period $t-1$ ceases to exist in period t , and zero otherwise. In both Panels, *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year. *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. Fixed effects and bank controls are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

<i>Panel A. New relationships</i>						
	Entry					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter	0.0452** (0.0219)	0.0381 (0.0244)		0.0401** (0.0173)		
Brown	-0.00080 (0.0106)					
High env. reporter x Brown	-0.0125 (0.0205)	-0.00408 (0.00763)	-0.00629 (0.00585)	-0.00291 (0.00840)	-0.0105* (0.00579)	-0.0219*** (0.00691)
N	2,080,303	2,804,073	2,804,052	1,408,479	1,408,397	996,592
R ²	0.391	0.0921	0.103	0.425	0.434	0.742
<i>Panel B. Relationship termination</i>						
	Exit					
High env. reporter	-0.0143 (0.0284)	0.00788 (0.0213)		-0.00774 (0.0114)		
Brown	-0.00110 (0.00793)					
High env. reporter x Brown	-0.00107 (0.00664)	0.00469 (0.00964)	0.00678 (0.00919)	0.00125 (0.00622)	0.00141 (0.00617)	0.0126 (0.0090)
N	1,191,339	1,719,707	1,719,695	919,101	919,040	552,656
R ²	0.363	0.0453	0.0535	0.451	0.456	0.690
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes

Table 7. Bank-level Financing to Brown and Green Industries

The table examines the association between banks' credit-related environmental disclosures and their credit exposures across industries (*Credit share*). The analyses are at the bank-industry-country-year level. *Brown (Green)* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top (bottom) quintile of the ratio's distribution across all industries in the firm's country during a year. *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. Fixed effects and bank controls are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Credit share					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. Reporter	-0.0022* (0.00125)	-0.0007 (0.00160)		0.0008 (0.00118)	0.0019 (0.00158)	
Brown	-0.0028*** (0.000876)	-0.0003 (0.00140)	-0.0009 (0.00133)			
High env. reporter x Brown	0.0115*** (0.00328)	0.0090*** (0.00336)	0.0070** (0.00336)			
Green				-0.0001 (0.00079)	0.0002 (0.00082)	0.00004 (0.00078)
High env. reporter x Green				-0.00396** (0.00171)	-0.0040** (0.00172)	-0.0033** (0.00164)
N	93,963	93,959	93,874	93,963	93,959	93,874
R ²	0.346	0.353	0.349	0.346	0.353	0.349
Bank controls	Yes	Yes	-	Yes	Yes	-
Bank FE	Yes	Yes	-	Yes	Yes	-
Industry FE	Yes	-	-	Yes	-	-
Time FE	Yes	-	-	Yes	-	-
Country FE	Yes	-	-	Yes	-	-
Country-Time FE	No	Yes	Yes	No	Yes	Yes
Industry-Time FE	No	Yes	Yes	No	Yes	Yes
Bank-Time FE	No	No	Yes	No	No	Yes

Table 8. Loan Contractual Features

The table examines the association between banks' credit-related environmental disclosures and loan contract terms (*Interest Rate* [Panel A], *Loan maturity* [Panel B], *Loan collateral* [Panel C]). As a firm may have multiple loans granted by the same bank in a year, *Interest Rate* and *Loan maturity* are computed as the weighted average of the loans' interest rates and maturities, respectively, at the bank-firm-year level using loan sizes as weights. *Loan collateral* is an indicator variable of whether at least one loan from a bank to a borrower in a given year is collateralized. *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year, and *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. Fixed effects and bank controls are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

<i>Panel A. Interest rate</i>						
	Interest rate					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter	0.000959 (0.000945)	-0.00107 (0.000746)		-0.00104** (0.000437)		
Brown	0.00166** (0.000669)					
High env. reporter x Brown	0.000972 (0.000726)	-0.000318 (0.000378)	-0.00070** (0.000334)	-0.000441 (0.000446)	-0.000450 (0.000441)	-0.00008 (0.000285)
N	671,120	1,201,352	1,201,282	359,679	359,427	148,161
R ²	0.721	0.378	0.392	0.737	0.741	0.935
<i>Panel B. Loan maturity</i>						
	Loan maturity					
High env. reporter	0.0398 (0.0741)	0.0389 (0.0320)		0.0500 (0.0327)		
Brown	-0.170*** (0.0344)					
High env. reporter x Brown	0.112* (0.0627)	0.0223 (0.0238)	-0.0168 (0.0176)	0.000923 (0.0260)	-0.0201 (0.0208)	0.0262 (0.0246)
N	2,810,878	3,712,480	3,712,407	824,777	824,165	431,828
R ²	0.519	0.250	0.268	0.656	0.665	0.845
<i>Panel C. Loan collateral</i>						
	Loan collateral					
High env. reporter	0.00251 (0.0314)	-0.00130 (0.0155)		0.0148 (0.0146)		
Brown	-0.0166 (0.0104)					
High env. reporter x Brown	0.00325 (0.0177)	0.0153 (0.0241)	0.00954 (0.0173)	-0.000016 (0.0163)	-0.00110 (0.00859)	-0.0183*** (0.0060)
N	2,822,338	3,740,323	3,740,250	828,689	828,074	432,886
R ²	0.621	0.273	0.291	0.669	0.680	0.872
Bank controls	Yes	Yes	-	Yes	-	-
Loan controls	Yes	Yes	Yes	Yes	Yes	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes

Table 9. Banks' Emphasis on the Sustainability of Lending Policies and the Funding of Transition to Greener Technologies

The table examines whether the association between banks' credit-related environmental disclosures and the volume of new loans to brown borrowers is explained by banks' financing the transition to greener technologies. In columns 1 and 2, we use an indicator variable of whether a borrower's ratio of R&D to total assets ranks in the top quartile of the variable's distribution across the firms in the same NACE-2 industry over a year. In columns 3 and 4, we use an indicator variable of whether a firm's ratio of change in fixed assets to total assets ranks in the top quartile of firms in the same industry (NACE-2) over a year. In columns 5 and 6, we use an indicator variable of whether a firm's age is less than five years. In columns 7 and 8, we compare lending to firms with emissions reductions targets or commitments with the SBTi and with firms of the same size and same industry (NACE-2) without SBTi commitments. In columns 9 and 10, *Green business* denotes an indicator variable constructed by performing textual analysis of business descriptions of public and private companies from S&P Capital IQ. *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year, and *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Fixed effects are included as indicated in the table but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

Proxy:	Loan Amount									
	R&D		Investment		Young Firm		SBTi		Green Business	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
High env. reporter x Brown	0.0713*** (0.0173)	0.0384* (0.0220)	0.0715*** (0.0189)	0.0346 (0.0247)	0.0645*** (0.0190)	0.0430* (0.0236)	-0.0478 (0.0685)	0.0337 (0.0324)	0.0614* (0.0369)	0.0274 (0.0254)
High env. reporter x Proxy	0.161 (0.265)	0.211 (0.141)	0.0274 (0.0603)	-0.0145 (0.0169)	0.0867 (0.0793)	0.0458 (0.0284)	1.001*** (0.348)	0.481** (0.228)	0.154 (0.178)	0.0608 (0.0520)
High env. reporter x Brown x Proxy	-0.509 (0.522)	-0.487** (0.229)	-0.00095 (0.0506)	0.0257 (0.0272)	0.0387 (0.0617)	-0.0452 (0.0443)	-1.492** (0.671)	-0.395 (0.636)	0.0694 (0.187)	0.0623 (0.0622)
Industry-Country-Time FE	Yes	-	Yes	-	Yes	-	Yes	-	Yes	-
Firm-Time FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,218,763	683,941	2,084,272	667,548	2,291,896	687,031	395,068	122,212	1,151,259	308,230
R ²	0.208	0.792	0.210	0.791	0.215	0.792	0.314	0.816	0.255	0.810

Table 10. The Environmental Impact of Bank Relationships and Zombie Lending

The table examines why banks that emphasize the sustainability of their lending policies lend to brown borrowers using several proxies for borrower quality and ability to access other sources of funding. Columns 1 and 2 present the *Exposure* proxy that denotes the share of credit a firm f receives from bank b as a share of the firm's total bank credit outstanding at $t-1$. Columns 3 and 4 use an indicator variable of whether a firm's total assets rank in the top quartile of firms in the same year. Columns 5 and 6 use a dummy variable, *High Leverage*, that takes the value of 1 if the firm's leverage ranks in the bottom quartile of firms in the same industry (NACE-2) and the same year, and 0 otherwise. Columns 7 and 8 report the estimates using a dummy variable that takes the value of 1 if the interest coverage ratio ranks in the bottom quartile of firms in the same industry (NACE-2) and the same year, and 0 otherwise. *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year, and *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Fixed effects are included as indicated in the table but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

Proxy:	Loan Amount							
	Exposure		Large Firms		High Leverage		Low Interest Coverage Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High env. reporter x Brown	0.0105 (0.0462)	0.0246 (0.0233)	0.0767** (0.0313)	0.0346* (0.0184)	0.0838*** (0.0263)	0.000759 (0.0284)	0.0838*** (0.0263)	0.000759 (0.0284)
High env. reporter x Proxy	0.0160 (0.0791)	0.0875 (0.0971)	-0.0987 (0.0854)	-0.0204 (0.0563)	0.0140 (0.0610)	0.0756*** (0.0288)	0.0845 (0.120)	0.0175 (0.0169)
High env. reporter x Brown x Proxy	0.181*** (0.0657)	0.108** (0.0487)	-0.118* (0.0713)	0.00458 (0.0284)	0.0297 (0.0681)	0.117*** (0.0372)	0.0298 (0.103)	0.176*** (0.0551)
Industry-Country-Time FE	Yes	-	Yes	-	Yes	-	Yes	-
Firm-Time FE	No	Yes	No	Yes	No	Yes	No	Yes
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,626,362	408,934	2,218,763	683,941	1,859,253	625,353	1,797,872	658,799
R ²	0.194	0.797	0.410	0.792	0.222	0.792	0.195	0.790

Table 11. Cross-sectional Differences in Institutional and Bank-specific Characteristics

The table examines whether the association between banks' credit-related environmental disclosures and new loans extended to brown borrowers is influenced by institutional and bank characteristics. In columns 1 and 2, *Low Tier 1 capital* is an indicator variable of whether a bank's tier 1 capital adequacy ratio ranks in the bottom quartile of the distribution. In columns 3 and 4, *Large bank* is an indicator variable of whether a bank's total assets rank in the top quartile of the distribution. In columns 5 and 6, *Mandatory sustainability reporting* is an indicator variable of whether a loan was originated in a country that mandated sustainability reporting in year t . In columns 7 and 8, *Post Paris agreement* is an indicator variable of whether a loan was issued post 2016. In columns 9 and 10, *Audited sustainability report* is an indicator variable of whether a borrower's sustainability report is audited by an external reviewer or auditor. *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year, and *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Fixed effects are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

Factor:	Loan amount									
	Low Tier 1 capital		Large bank		Mandatory sustain. reporting		Post Paris agreement		Audited sustain. report	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
High env. reporter x Brown	0.0412** (0.0189)	0.0214 (0.0290)	-0.0487 (0.0565)	-0.168** (0.0837)	0.107 (0.0985)	0.0744 (0.0873)	-0.0447 (0.0660)	0.132 (0.0953)	0.0816*** (0.0312)	0.0257 (0.0236)
High env. reporter x Brown x Factor	0.0807** (0.0399)	0.0215 (0.0340)	0.136** (0.0543)	0.205** (0.0840)	-0.0265 (0.101)	-0.0379 (0.0888)	0.129* (0.0731)	-0.101 (0.0947)	-0.0146 (0.0425)	-0.00180 (0.0546)
Industry-Country-Time FE	Yes	-	Yes	-	Yes	-	Yes	-	Yes	-
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Time FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
N	3,740,250	828,074	3,740,250	828,070	3,740,250	828,070	3,740,250	828,070	3,740,250	828,070
R ²	0.207	0.797	0.207	0.797	0.207	0.797	0.207	0.797	0.207	0.797

Appendix A. Variable Definitions

Variables	Variable definitions
Bank disclosure characteristics	
<i>Environmental disclosures</i>	The ratio of number words in paragraphs that emphasize the sustainability of a bank's lending policies in its reports during a year relative to the total number of words in the bank's reports during that year.
<i>SBTi</i>	Binary variable equal to one if a bank has joined the signatories of the Science Based Targets initiative, zero otherwise.
<i>GRI standards</i>	Binary variable equal to one if a bank prepares the sustainability reporting under the Global Reporting Initiative Standards, zero otherwise.
<i>Integrated reporting</i>	Binary variable equal to one if a bank issues an Integrated Report, zero otherwise.
Manually classified environmental disclosure content	
	The textual variables below are measured as the ratio of the number of words in the relevant "yes" (or "positive", "negative", "neutral") answers in the questionnaire (Section B of Internet Appendix) to total number of words in paragraphs with credit-related sustainability disclosures:
<i>Environmental commitments</i>	Answer "yes" to question "Does the text mention any commitments?"
<i>Quantitative disclosures</i>	Answer "yes" to question "Does the report contain quantitative information that are related to sustainability?"
<i>GHG emissions topic</i>	Answer "yes" to question "Does the paragraph mention greenhouse gas (GHG), emissions or CO2?"
<i>Energy topic</i>	Answer "yes" to question "Does the paragraph mention energy management?"
<i>Ecology topic</i>	Answer "yes" to question "Does the paragraph mention ecological impact, biodiversity, deforestation or related topics?"
<i>Air/Water/Waste topic</i>	Answer "yes" to question "Does the paragraph mention topics related to air quality, water, toxins substances and waste?"
<i>Past/present time disclosure horizon</i>	Answer "yes" to question "Does the paragraph refer to past or present initiatives?"
<i>Forward-looking disclosure horizon</i>	Answer "yes" to question "Does the paragraph refer to future initiatives, targets or opportunities?"
<i>Disclosures on the urgency of environmental performance improvement</i>	Answer "yes" to question "Does the paragraph mention any weaknesses in the sustainability of its lending policies?"
<i>Positive disclosure tone</i>	Answer "positive" to question "What is the tone of the paragraph?"
<i>Neutral disclosure tone</i>	Answer "neutral" to question "What is the tone of the paragraph?"
<i>Negative disclosure tone</i>	Answer "negative" to question "What is the tone of the paragraph?"
Bank sustainability performance	
<i>Bloomberg Env score</i>	Bank's Environmental disclosure score provided by Bloomberg.
<i>ESG Corporate Knights</i>	Binary variable equal to one if a bank is included in ESG Corporate Knights' short-list of top ESG performers, zero otherwise.
<i>Green bond issuance</i>	The ratio of the annual green bond volume a bank underwrites to bank's total assets. Green bond issuance volume is obtained by Bloomberg.

<i>MSCI Env score</i>	Bank's environmental pillar score provided by MSCI.
<i>Sustainalytics Env score</i>	Bank's mean environmental score provided by Sustainalytics. Environmental score is the mean of (e1.1 +e1.2 +e1.3 +e1.4 +e1.5 +e1.6 +e1.7 +e1.7.0 +e1.8 +e1.9 +e1.10 +e1.11 +e1.12 +e2.1 +e2.2 +e2.3 +e3.1.10 +e3.1.11 +e3.1.15). We focus on these sustainability indices, for which sample banks have less than 50 percent missing variable values.
Bank financial performance	
<i>Leverage</i>	Total debt to total assets.
<i>ROA</i>	Operating income to gross loans.
<i>Total assets</i>	The natural logarithm of total assets (in Euro).
<i>Tier 1 capital</i>	Tier 1 capital to total assets.
AnaCredit loan variables	
<i>Loan Amount</i>	The natural logarithm of the amount of new loans granted by a bank to a given borrower during a year. We consider the following type of facilities: loans other than overdrafts, convenience credit, extended credit, credit card credit, revolving credit other than credit card credit, reverse repurchase agreements, trade receivables and financial leases.
<i>Loan Interest Rate</i>	Annualized interest rate on a new loan offered by a bank to a given borrower during a year. As a firm may have multiple loans granted by the same bank in a year, <i>Loan Interest Rate</i> is computed as the weighted average of the loan interest rates at the bank-firm-time level using loan sizes as weights.
<i>Loan Maturity</i>	The natural logarithm of the original maturity of new loans extended by a bank to a given borrower during a year. As a firm may have multiple loans granted by the same bank in a year, <i>Loan Maturity</i> is computed as the weighted average of the loan maturity at the bank-firm-time level using loan sizes as weights.
<i>Exposure</i>	A share of credit a firm <i>f</i> receives from bank <i>b</i> as a share of the firm's total bank credit outstanding.
Brown / Green industries and firms	
<i>Brown (Green)</i>	Binary variable that takes the value of one if a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top (bottom) quintile of the ratio's distribution across all industries in the firm's country during a year, zero otherwise.
<i>GHG emissions</i>	The ratio of the sum of Scope 1 and 2 GHG emissions to total revenues (tons of CO ₂ emissions per \$million of revenue). Source: Urgentem.
<i>Brown (Green) business</i>	Binary variable constructed by performing textual analysis of business descriptions of public and private companies from S&P Capital IQ. We define a business as brown (green) if a brown (green) word occurs in the firm's business description without a green (brown) word. Brown and green words are listed in Appendix IA.A.
Firm characteristics (Orbis)	
<i>R&D</i>	Firm's ratio of R&D to total assets.
<i>Investment</i>	Firm's ratio of change in fixed assets to total assets.
<i>Interest coverage ratio</i>	Firm's EBIT to interest expense.
<i>Leverage</i>	Firm's total debt to total assets.

Internet Appendix

A. Additional Appendices

Appendix IA.A. Business description keywords

Panel A. Brown industries keywords

airlines	drilling	mining
airplane	fracking	nitric acid
air transport	fuel	oil
aluminum	gas	paraffin
ammonia	grabbing	petrochemical
asbestos	hydrocarbon	petrol
aviation	hydrochlorin	plastics
cement	iron	polymer
chemical products	kerosene	refine
chemicals	lng	silicium
chlorin	logging	soda ash
coal	lpg	steel
copaper	lubricant	sulfide
diesel	metal fabrication	sulphide
diesel	methanol	sulphuric
drill	mines	

Panel B. Green industries keywords

AIR QUALITY	bioliquid	solar	forest management
air filter(-ration)	biopower	static var	forest land
air quality	bioremediation	superconduct	forest protection
biodiesel	capacitor	thermal	forest regeneration
biolng	charging point	thermodynamic	maritime safety
biolpg	charging station	thermoelectric	natural forest
biomethane	clean energy	thermostat	oil cleanup
carbon dioxide	cogenerate(-ion)	trigenerate(ion)	oil removal
contaminate(-ion)	condensing boiler	ultrasonic humidifier	oil spill
decommision	distributed generate	uranium	organic
degas	electricity storage	voltage regulation	protected area
electric bus	energy audit	CIRCULARITY	rainforest
electric car	energy certified(-cation)	biowaste	reforestation
electric mobility	energy conservation	circular	regenerative farm
electric transport	energy consumption	circularity	seeding
electric vehicle	energy diagnosis	demineral	tropical forest
electromobil	energy efficient(-cy)	desalination	wildlife
emission	energy monitor	drinking water	GENERAL
e-mobil	energy optimum(-ization)	material recovery	climate
fuel consumption	energy recovery	potabilization	drone imaging
fuel inspection	energy saving	rainwater	energy performance

fuel repair	energy storage	recycling	environmental impact
gas capture	energy transition	waste consulting	environment protection
heat pump	energy yield	waste recovery	environmental data
hybrid car	flywheel	waste removal	environmental inspection
hybrid vehicle	fuel cell	waste reuse	environmental management
hybrid vessel	heat recovery	waste solution	environmental monitor
hydrogen	hydraulic	wastewater system	environmental policy
low carbon	hydro	water collection	environmental protection
methane leakage	insulate(-ion)	water consulting	environmental regulation
nitrogen	led	water filter(-ration)	environmental research
nox	lighting control	water purification	environmental risk
rail transport	low power	water quality	environmental safety
railway	marine energy	water remediation	environmental solution
ENERGY	nuclear	water reuse	environmental technology
MANAGEMENT	ocean energy	water safety	green
alternative energy	photovoltaic	water scarcity	natural science
alternative fuel	proofing	water treatment	pollutant
battery(-ies)	renewable	BIODIVERSITY	pollution
bioclimatic	retrofit	ecology	sustainability
bioenergy	sealing	ecosystem	sustainable
biofuel	smart energy	endangered	
biogas			

Appendix IA.B. Examples of Banks' Disclosures on Environmental Issues

In this section, we list some examples from banks' annual filings to illustrate how our dictionary captures disclosures on environmental activities.

ING Group (Annual Report 2020)

ING's power generation portfolio continues to outperform the market and both the International Energy Agency's sustainable development scenario (SDS) and the OECD scenario. In the 12 months measured in the Terra report, **ING reduced its direct exposure to coal-fired power plants by 43 percent (in line with our commitment to reduce it to close to zero by the end of 2025) and increased financing for renewable energy generation by €1.19 billion.** Other sectors face more challenges, such as the residential mortgage sector. There we encounter a shortage of accurate data to measure progress and a general lack of homeowner action. (...) (One of the targets) is our aim **to reduce financing to upstream oil and gas by 19 percent by 2040 from 2019 levels.** We'll align this portfolio both by decreasing exposure and **engaging with clients to help them shift to low-carbon technology.** The measurement is based on three indicators: **emission** intensity, an absolute reduction in financing and a relative transition of the financing mix from high-**carbon** to low-**carbon** and **renewable** energy. This target is also aligned with the SDS scenario, which is not static. If more or quicker action is needed and this scenario is adjusted, our target will adjust accordingly.

Credit Agricole (2020 Annual Report, pg. 61-62)

Propose a range of green offers for the climate transition of Corporate and individual customers

LCL's climate transition offers:

"Sustainable City – **Green** Mobility" consumer loans are designed to finance the purchase of new or used **vehicles** (including pre-financing of the environmentally friendly **car** grant) that produce few or no **polluting emissions**. Loan amounts vary between €3,000 and €75,000, which makes it possible to purchase to a wide range of **vehicles**.

"Impact financing": for its SME and mid-cap customers, LCL structures and arranges "Impact Financing" ("**Green** Loans" and "Sustainability- Linked Loans"), which are loans or credits whose margin is indexed to ESG performance criteria specific to the company being financed. This offer allows our customers to align their CSR strategy with their financing and, if they achieve their targets, to benefit from a subsidised rate (...) The LCL SmartBusiness programme is designed to support business customers (SMEs, mid-caps, key accounts) with major changes, in particular by promoting the **energy** transition with Greenflex, providing advice on **energy** transition, environmental and societal issues, joining forces with Voltalia through electricity contracts (CPPA), which bring added value to the heart of our customers' business, and with Global **Climate** Initiatives to measure and reduce the environmental footprint. (...)

Farmers also play an essential role in preserving **biodiversity**. Birds and insects in **agricultural** environments, especially pollinators, are key indicators of agro-ecosystem health and are essential for **agricultural** production and food security. As the leading banker to farmers and **foresters**, the Crédit Agricole Group supports farmers in these initiatives and works to preserve and develop **forest** areas in France and abroad, since 80% of the earth's **biodiversity** is found in forests.

Commerzbank (2019)- GRI Report (pg. 53-54):

The integration of non-financial aspects into the Bank's **risk management processes** is hugely important for sustainable finance. These include risks resulting from **climate change**. They form part of the overall risk management and in future will be anchored even more firmly in the risk strategy under "Commerzbank 5.0". Credit risk management already incorporates climate issues in country and sector analyses and in risk assessment. Physical risks include rising sea levels and flooding for the real estate sector, along with crop failures in agriculture or low water levels in rivers, with implications for the transport and chemical industries. Transition risks such as changes in energy policy are also taken into account in the analysis.

Lending decisions for companies and institutional customers are therefore based not only on an individual risk assessment but also – where relevant – on the extent to which they involve climate risks and on the level of resistance to them. If a customer is exposed to a higher probability of physical climate risk, a scenario analysis is carried out and the resilience to climate-related phenomena tested.

In implementing the "Commerzbank 5.0" strategy, we are currently developing a methodology for embedding sustainability considerations in the future management of Commerzbank AG's loan portfolio. **The initial focus is on the CO2 emissions associated with our business activities.** The CO2 intensity of the bank's loan portfolio is to be reduced through individual target values and measures. These include the **promotion of emission-reducing technologies and the active management of financing in CO2-intensive industries.**

By contrast, environmental and social risks arising from our core business are assessed in Commerzbank AG's Reputational Risk Management department. The Bank has adopted a clear position on controversial issues such as weapons, environmentally harmful energy sources and speculative trading in basic foodstuffs. Our process for managing these risks is described in detail in the framework for handling environmental and social risks in the core business, which is published online. The framework also includes all industry-specific requirements, for example relating to mining, energy, oil and gas. Exclusion criteria were defined for particularly critical products, transactions or business relationships. These include projects related to fracking or tar sands, but also the Group-wide decision not to finance new coal (...)

Appendix IA.C. ChatGPT prompt and Examples of Answers

Example 1

Pretend you are an investor. The following text is an excerpt from a bank's annual report: "*Farmers also play an essential role in preserving **biodiversity**. Birds and insects in **agricultural** environments, especially pollinators, are key indicators of agro-ecosystem health and are essential for **agricultural** production and food security. As the leading banker to farmers and **foresters**, the Crédit Agricole Group supports farmers in these initiatives and works to preserve and develop **forest** areas in France and abroad, since 80% of the earth's **biodiversity** is found in forests.*"

Based on this text only, please answer the following question. Are the bank's lending policies environmentally sustainable? There are three choices: "YES", "NO", or "UNKNOWN" if the text contains no relevant information. Then elaborate with a short sentence on the next line.

UNKNOWN

The provided text emphasizes the Crédit Agricole Group's support for farmers and efforts to preserve biodiversity. However, it lacks specific details regarding the bank's lending policies and their overall environmental sustainability.

Example 2

Pretend you are an investor. The following text is an excerpt from a bank's annual report: "*ING's power generation portfolio continues to outperform the market and both the International Energy Agency's sustainable development scenario (SDS) and the OECD scenario. In the 12 months measured in the Terra report, ING reduced its direct exposure to coal-fired power plants by 43 percent (in line with our commitment to reduce it to close to zero by the end of 2025) and increased financing for renewable energy generation by €1.19 billion. Other sectors face more challenges, such as the residential mortgage sector. There we encounter a shortage of accurate data to measure progress and a general lack of homeowner action. (...) (One of the targets) is our aim to reduce financing to upstream oil and gas by 19 percent by 2040 from 2019 levels. We'll align this portfolio both by decreasing exposure and engaging with clients to help them shift to low-carbon technology. The measurement is based on three indicators: emission intensity, an absolute reduction in financing and a relative transition of the financing mix from high-carbon to low-carbon and renewable energy. This target is also aligned with the SDS scenario, which is not static. If more or quicker action is needed and this scenario is adjusted, our target will adjust accordingly.*"

Based on this text only, please answer the following question. Are the bank's lending policies environmentally sustainable? There are three choices: "YES", "NO", or "UNKNOWN" if the text contains no relevant information. Then elaborate with a short sentence on the next line.

YES

The text highlights ING's commitment to reducing exposure to coal-fired power plants, increasing financing for renewable energy, and setting specific targets for reducing financing to upstream oil and gas. These actions align with environmental sustainability goals and suggest a proactive approach towards responsible lending policies.

B. Questionnaire for Textual Classification

INSTRUCTIONS FOR TEXT ANALYSIS		
<p>1. Scope of Analysis:</p> <ul style="list-style-type: none"> When answering the questions, focus exclusively on the <u>sustainability of bank lending policies</u>. <p>2. What to Look For:</p> <ul style="list-style-type: none"> Lending policies directly tied to environmental sustainability, brown/green industries, specific topics (listed below), green loans, ESG-linked financing, or policies to reduce environmental harm through lending practices. <p>3. Feedback and Comments:</p> <ul style="list-style-type: none"> If you encounter ambiguity or require clarification, note your feedback, questions, or concerns in the designated section. These will be addressed during the regular RA meetings. <p>Key Reminders:</p> <ul style="list-style-type: none"> Always refer back to the guidelines to ensure uniformity across all classifications. Use critical thinking to distinguish between relevant and irrelevant ESG contexts. This approach will help maintain precision and clarity in the analysis of bank environmental disclosures. 		
Paragraph identifiers		
ID	Unique paragraph number	These columns identify the paragraphs from the disclosures.
Year	Year of the report	
Paragraph Text	Text of the report	Do not overwrite information in these columns.
Industry information		
Industry name	If the paragraph discusses lending to specific industries, list all mentioned industries.	
Quantitative information		
Commitments	Does the text mention any commitments? (Yes/No)	Examples of commitments: <ul style="list-style-type: none"> Science Based Target Initiative (SBTi) Equator Principles Task Force on Climate-related Financial Disclosures (TCFD) Net Zero Asset Managers Initiative (NZAM) Principles for Responsible Banking (PRB)
Quantitative information	Does the report contain quantitative information that are related to sustainability? (Yes/No)	Focus on numbers, percentages, euro amounts and other quantitative information. Do not include years.

Credit Assessment Criteria		
GHG	Does the paragraph mention greenhouse gas (GHG), emissions or CO2? (Yes/No)	
Energy management	Does the paragraph mention energy management? (Yes/No)	
Ecological impact, biodiversity, deforestation	Does the paragraph mention ecological impact, biodiversity, deforestation or related topics? (Yes/No)	
Air quality, water, toxins substances and waste	Does the paragraph mention topics related to air quality, water, toxins substances and waste? (Yes/No)	
Time horizon		
Past and Present	Does the paragraph refer to past or present initiatives? (Yes/No)	Code as Yes if the paragraph refers to any historical and present / closing year initiatives.
Future	Does the paragraph refer to future initiatives, targets or opportunities? (Yes/No)	Code as Yes if the paragraph refers to any near or distant future initiatives, targets or opportunities.
Years	List all years that the paragraph mentions. If no years are provided leave the cell empty.	
Additional information		
Room for improvement discussions	Does the paragraph mention any weaknesses in the sustainability of its lending policies? (Yes/No)	Code as Yes only if the paragraph talks about weaknesses in sustainability of lending policies. Code as No if general weaknesses of lending policies or general sustainability issues unrelated to lending.
Tone	What is the tone of the paragraph? (Positive/Neutral/Negative)	To determine the tone of the paragraph, consider the following guidelines: Positive Tone: <ul style="list-style-type: none"> The paragraph highlights achievements, progress, or

		<p>improvements in sustainability practices.</p> <ul style="list-style-type: none"> • Language reflects optimism, growth, or success. • Example: “The bank reduced its carbon footprint by 20% and achieved a 100% renewable energy target in its operations.” <p>Neutral Tone:</p> <ul style="list-style-type: none"> • The paragraph provides factual, balanced information without expressing strong positive or negative sentiment. • Describes policies or initiatives without explicit evaluation. • Example: “The bank launched a new policy to assess the environmental impact of its lending practices.” <p>Negative Tone:</p> <ul style="list-style-type: none"> • The paragraph discusses failures, weaknesses, or areas needing significant improvement in sustainability. • Language reflects concern, criticism, or setbacks.
Notes	Feel free to add any other notes, if needed	List your questions, and comments. We will address them during our regular RA meetings.

C. Supplementary Figures and Tables

Figure IA.1. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Brown Industries

The figure presents the coefficients of time-varying estimates of the association between banks' credit-related environmental disclosures and the volume of new loans to borrowers in brown industries for each year, as described by Model 1. The dependent variable is the natural logarithm of the amount of new loans extended by a bank to a given borrower during a year (*Loan amount*). *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year. *High environmental reporter* is an indicator variable of whether a bank's environmental disclosures rank in the top quintile of the variable's distribution during a year. We plot the coefficient on the interaction term between these two variables estimated year by year. Vertical lines denote a 95% confidence interval. Standard errors are corrected for heteroskedasticity and clustered at the bank level.

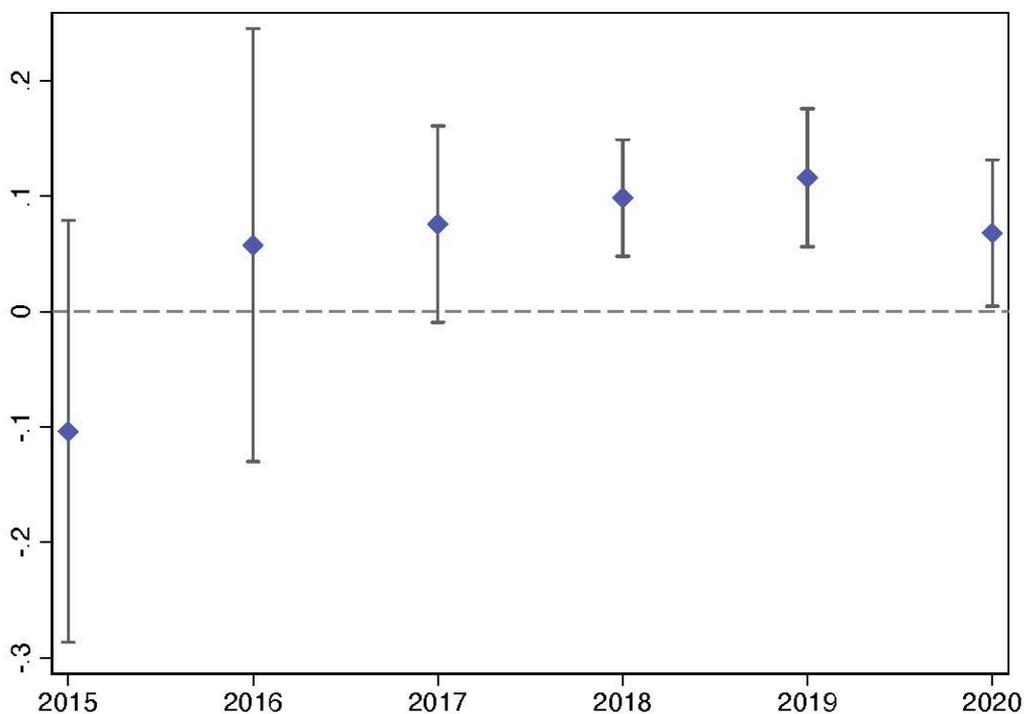


Table IA.1. Banks' Reports by Year

The table reports the number of documents used to construct banks' *Environmental Disclosures*.

Report type	Number of reports	Mean total wordcount	Mean environmental wordcount
Annual report	623	81,584	700
Integrated report	57	28,257	414
Nonfinancial report	61	17,411	466
Other	383	3,895	199
Sustainability report	273	17,199	509
Total	1,397	42,760	503

Table IA.2. Benefits of Banks' Emphasis on the Sustainability of Lending Policies

The table examines the relation between banks' *Environmental Disclosures* and subsequent changes in MSCI environmental risk score. The dependent variable, $\Delta(\text{MSCI Env Score})$, is annual change in MSCI environmental risk score from year $t-1$ to t . *Environmental disclosures* is the ratio of words in paragraphs emphasizing a bank's sustainable lending policies to the total words. *High Brown Exposure* is an indicator variable of bank credit exposure to brown industries ranks in the top quintile of the distribution across all bank during a year. Fixed effects are included as indicated but not tabulated. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. Standard errors are corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	$\Delta(\text{MSCI Env score})_{t-1, t}$		
	(1)	(2)	(3)
Environmental disclosures _{t-1}	1.122* (0.661)	0.782 (0.727)	2.759* (1.600)
High Brown Exposure _{t-1}	-0.147* (0.0850)	-0.142 (0.0888)	-0.187 (0.127)
Environmental disclosures _{t-1} x High Brown Exposure _{t-1}	5.638** (2.310)	5.897** (2.420)	6.336* (3.473)
Bank Controls	No	Yes	Yes
Time FE	Yes	Yes	Yes
Bank FE	No	No	Yes
N	353	353	351
R ²	0.0348	0.0412	0.152

Table IA.3. Characteristics of Brown Borrowers of Sustainability-Focused Banks

The table examines the characteristics of brown borrowers compared to the other borrowers of high-environmental reporters (Panel A) and whether the features of brown borrowers differ for those granted a loan by bank that emphasize the sustainability of their lending policy in comparison to those that are clients of other banks (Panel B). Borrower characteristics include *Total Assets*, *Leverage*, *R&D*, *Investment*, *Age* (the natural logarithm of a borrower's years since incorporation), *ROA* (operating income to total assets), *SBTi* (an indicator variable of whether a borrower has adopted the SBTi). *Brown* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of the ratio's distribution across all industries in the firm's country during a year. The analysis is at the borrower-time level. In Panel B, *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. We further control for *Existing relationship*, defined as an indicator variable for whether the lender has previously extended credit to the borrower. The analysis is at the bank-firm-time level. Fixed effects are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

<i>Panel A: Brown borrower characteristics</i>		
	Brown	
	(1)	(2)
Total Assets	0.0141*** (0.000494)	0.0141*** (0.000495)
Leverage	0.0510*** (0.00326)	0.0510*** (0.00326)
R&D	-0.0156 (0.0192)	-0.0144 (0.0192)
Investment	-0.000115 (0.00172)	-0.000113 (0.00172)
Age	0.00975*** (0.000918)	0.00974*** (0.000918)
ROA	0.00582 (0.00632)	0.00579 (0.00632)
SBTi		-0.0820 (0.0515)
Time FE	Yes	Yes
Country FE	Yes	Yes
N	320,807	320,807
R ²	0.0760	0.0760

Panel B: Brown borrower characteristics and sustainability-focused banks

	Brown	
	(1)	(2)
High env. reporter	0.00730 (0.0593)	0.0228 (0.0612)
Total Assets	0.0174*** (0.00112)	0.0180*** (0.00111)
High env. reporter x Total Assets	-0.00302 (0.00409)	-0.00405 (0.00370)
Leverage	0.0403***	0.0381***

	(0.00518)	(0.00441)
High env. reporter x Leverage	0.00225 (0.0133)	0.00663 (0.0102)
R&D	-0.0245*** (0.00816)	-0.0197** (0.00795)
High env. reporter x R&D	0.00202 (0.00708)	0.00220 (0.00769)
Investment	0.0139*** (0.00249)	0.0134*** (0.00245)
High env. reporter x Investment	-0.0134** (0.00593)	-0.0125** (0.00518)
Age	0.00279** (0.00110)	0.00281*** (0.00104)
High env. reporter x Age	0.00668* (0.00398)	0.00676* (0.00377)
ROA	0.0277*** (0.0103)	0.0211** (0.0105)
High env. reporter x ROA	-0.0442 (0.0305)	-0.0369 (0.0300)
SBTi	-0.0731 (0.0521)	-0.0680 (0.0517)
High env. reporter x SBTi	-0.0236 (0.0655)	-0.0289 (0.0648)
Existing relationship	0.0122*** (0.00217)	0.0108*** (0.00198)
High env. reporter x Existing relationship	0.0179 (0.0117)	0.0172 (0.0115)
Time FE	Yes	Yes
Country FE	Yes	Yes
Bank FE	No	Yes
N	1,732,815	1,732,796
R ²	0.0610	0.0670

Table IA.4. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries, using loans issued post-2018

The table examines the robustness of the baseline analyses in Table 3 considering only loans originated post 2018. All other specifications are the same to those in Table 3. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Brown industries</i>						
High env. reporter	-0.0304 (0.134)	-0.0867 (0.0786)		-0.0448 (0.0471)		
Brown	-0.0497*** (0.0182)					
High env. reporter x Brown	0.00809 (0.0234)	0.101*** (0.0213)	0.0847*** (0.0243)	0.0275 (0.0197)	0.0311 (0.0217)	0.0177 (0.0253)
N	1,614,428	2,483,590	2,483,549	669,713	669,496	329,547
R ²	0.761	0.183	0.187	0.781	0.785	0.922
<i>Panel B. Green industries</i>						
High env. reporter	-0.0268 (0.140)	-0.0649 (0.0816)		-0.0380 (0.0485)		
Green	-0.0181 (0.0474)					
High env. reporter x Green	-0.00402 (0.0317)	-0.0205 (0.0241)	0.00239 (0.0171)	-0.00774 (0.0321)	0.00491 (0.0279)	-0.0240 (0.0260)
N	1,614,428	2,483,590	2,483,549	669,713	669,496	329,547
R ²	0.761	0.183	0.187	0.781	0.785	0.922
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes

Table IA.5. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries, using the continuous variable *Environmental disclosures*

The table examines the robustness of the baseline analyses in Table 3 using the continuous variable *Environmental disclosures*. All other specifications are the same to those in Table 3. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Brown industries</i>						
Environmental disclosures	1.215 (0.813)	0.286 (0.551)		0.179 (0.834)		
Brown	-0.162*** (0.0373)					
Environmental disclosures x Brown	-0.941 (0.793)	0.948*** (0.309)	0.687** (0.318)	0.185 (0.276)	0.0698 (0.228)	0.00373 (0.252)
N	2,822,338	3,740,323	3,740,250	828,689	828,074	432,886
R ²	0.705	0.200	0.207	0.792	0.797	0.917
<i>Panel B: Green industries</i>						
Environmental disclosures	1.173 (0.809)	0.476 (0.516)		0.349 (0.789)		
Green	-0.0835* (0.0481)					
Environmental disclosures x Green	0.498 (0.362)	-0.369 (0.278)	-0.187 (0.242)	-0.546 (0.344)	-0.308 (0.374)	-0.544 (0.376)
N	2,822,338	3,740,323	3,740,250	828,689	828,074	432,886
R ²	0.705	0.200	0.207	0.792	0.797	0.917
Bank controls	Yes	Yes	-	Yes	-	
Bank FE	Yes	Yes	-	Yes	-	
Firm FE	Yes	No	No	-	-	
Time FE	Yes	-	-	-	-	
Industry-Country-Time FE	No	Yes	Yes	-	-	
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes

Table IA.6. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries, using Lagged and Future Disclosures

The table examines the robustness of the baseline analyses in Panel A of Table 3 using alternative proxies for high environmental reporters. In Panel A, we define the *High environmental reporter* dummy using the three-year lag of the environmental disclosures. In Panel B, we report the estimates using one year lead and lag of the environmental disclosures. All other specifications are similar to those in Table 3. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

Panel A: Lag of Environmental Disclosures

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter (t-3)	-0.163 (0.148)	-0.150*** (0.0329)		-0.201*** (0.0394)		
Brown		-0.0534*** (0.0197)				
High env. reporter (t-3) x Brown	0.0360 (0.0227)	0.0905*** (0.0231)	0.0691*** (0.0221)	0.0250 (0.0214)	0.0250 (0.0230)	-0.0234 (0.0297)
Bank controls	Yes	Yes	-	Yes	-	
Bank FE	Yes	Yes	-	Yes	-	
Firm FE	Yes	No	No	-	-	
Time FE	Yes	-	-	-	-	
Industry-Country-Time FE	No	Yes	Yes	-	-	
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes
N	1,552,512	2,386,642	2,386,627	636,756	636,539	311,841
R ²	0.761	0.179	0.183	0.780	0.783	0.922

Panel B: Leads and Lags of Environmental Disclosures

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter (t-1) x Brown	0.0796*** (0.0212)	0.0309* (0.0186)				
High env. reporter (t) x Brown			0.0783*** (0.0209)	0.0331* (0.0196)		
High env. reporter (t+1) x Brown					0.0790*** (0.0196)	0.0342 (0.0278)
Industry-Country-Time FE	Yes	-	Yes	-	Yes	-
Firm-Time FE	No	Yes	No	Yes	No	Yes
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3,390,994	786,615	3,740,250	828,074	2,623,380	534,600
R ²	0.196	0.794	0.207	0.797	0.211	0.802

Table IA.7. Banks' Emphasis on the Sustainability of Lending Policies and Firms with Green Business Descriptions

The table examines the robustness of the baseline analyses in Panel B of Table 4 focusing on the greenness of borrowers' business activities, defined as an indicator variable constructed by performing textual analysis of business descriptions of public and private companies from S&P Capital IQ (*Green business*). All other specifications are the same to those in Panel B of Table 4. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter	-0.0216 (0.0308)	-0.0386 (0.0639)		-0.0297 (0.0447)		
Green business		0.816*** (0.0444)	0.810*** (0.0447)			
High env. reporter x Green business	0.0648 (0.0338)	0.158 (0.148)	0.168 (0.147)	0.0618 (0.0471)	0.0715 (0.0478)	0.0063 (0.0597)
N	926,883	1,180,106	1,179,910	311,548	310,951	82,644
R ²	0.729	0.257	0.266	0.806	0.811	0.922
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	Yes	Yes

Table IA.8. The Extensive Margin of Bank Lending and Emphasis on the Sustainability of Lending Policies: Green Industries

The table examines the robustness of the extensive margin of banks' credit decisions considering green industries. All other specifications are the same to those in Table 6. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

<i>Panel A. New relationships</i>						
	Entry					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter	0.0348 (0.0212)	0.0328 (0.0231)		0.0338** (0.0159)		
Green	0.0166 (0.0207)					
High env. reporter x Green	0.0199* (0.0101)	0.0125 (0.00865)	0.00895* (0.00497)	0.0159 (0.00975)	0.0119** (0.00461)	0.0218*** (0.0059)
N	2,080,303	2,804,073	2,804,052	1,408,479	1,408,397	996,592
R ²	0.391	0.0921	0.103	0.425	0.434	0.742
<i>Panel B. Relationship termination</i>						
	Exit					
High env. reporter	-0.0121 (0.0295)	0.0103 (0.0219)		-0.00582 (0.0118)		
Green	-0.0310** (0.0136)					
High env. reporter x Green	-0.00886 (0.00618)	-0.00624 (0.00392)	-0.00305 (0.00305)	-0.00628* (0.00370)	-0.00459 (0.00318)	-0.0018 (0.0095)
N	1,191,339	1,719,707	1,719,695	919,101	919,040	552,656
R ²	0.363	0.0453	0.0535	0.451	0.456	0.690
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes

Table IA.9. Banks' Emphasis on the Sustainability of Lending Policies, New Loans to Green and Brown Industries, and Subsequent Borrower Default

The table examines loan default status over the three-year horizon post issuance (*Default*) for borrowers in brown and green industries and by banks that emphasize the sustainability of their lending policies. The dependent variable is an indicator of whether the newly issued loan is in default in years t+1, t+2 and t+3 after the issuance. In Panel A (B), *Brown (Green)* is an indicator variable of whether a firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top (bottom) quintile of the ratio's distribution across all industries in the firm's country during a year. *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. Fixed effects and bank controls are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Default (t+1)		Default (t+2)		Default (t+3)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Brown borrowers</i>						
High env. reporter x Brown	-0.00331 (0.00622)	-0.00187 (0.00368)	0.00103 (0.00754)	-0.00185 (0.00638)	0.00459** (0.00205)	0.00721** (0.00339)
N	1,061,659	186,674	970,831	139,678	920,293	97,108
R ²	0.135	0.760	0.117	0.820	0.109	0.852
<i>Panel B: Green borrowers</i>						
High env. reporter x Green	0.00223 (0.00402)	0.00492** (0.00190)	-0.0066** (0.00274)	0.00108 (0.00389)	-0.0071** (0.00285)	-0.000824 (0.00316)
N	1,061,659	186,674	970,831	139,678	920,293	97,108
R ²	0.135	0.760	0.117	0.820	0.109	0.852
Industry-Country-Time FE	Yes	-	Yes	-	Yes	-
Firm-Time FE	No	Yes	No	Yes	No	Yes
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes

Table IA.10. Firm's Exposure to Banks that Emphasize the Sustainability of their Lending Policies and Subsequent GHG Climate Efforts

The table examines whether borrowers that receive loans from high environmental reporters subsequently reduce their GHG emissions obtained from Urgentem data (Panel A), adopt SBTi (Panel B), increase their investments in fixed assets (Panel C) and in R&D (Panel D). Columns (1) and (2) estimate the effect on the outcome variables in year $t+1$. The following columns report the effects for subsequent years from $t+2$ until $t+3$. *High env. reporter exposure* denotes the share of credit a firm receives from high-environmental-disclosure banks as a share to total bank credit in year t . Fixed effects are included as indicated but not tabulated. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the firm level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

<i>Panel A. GHG emissions</i>						
	GHG emissions (t+1)		GHG emissions (t+2)		GHG emissions (t+3)	
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter exposure	9.501 (19.29)	0.261 (9.412)	7.964 (18.28)	11.09 (12.13)	11.39 (19.55)	-5.842 (13.73)
N	1,428	1,134	1,412	1,121	1067	816
R ²	0.382	0.938	0.387	0.926	0.378	0.922
<i>Panel B. SBTi</i>						
	SBTi (t+1)		SBTi (t+2)		SBTi (t+3)	
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter exposure	-0.0000087 (0.0000461)	0.0000153 (0.0000484)	-0.0000091 (0.0000579)	0.0000261 (0.0000704)	0.0000676 (0.0000630)	-0.0000810 (0.0000795)
N	362,483	291,348	368,023	295,600	293,337	218,994
R ²	0.0191	0.505	0.0607	0.530	0.0558	0.484
<i>Panel C. Fixed asset investments</i>						
	Investment (t+1)		Investment (t+2)		Investment (t+3)	
	(1)	(2)	(3)	(1)	(2)	(3)
High env. reporter exposure	-0.00106** (0.000443)	-0.00180** (0.000804)	-0.000680* (0.000402)	-0.000410 (0.000728)	-0.000222 (0.000447)	0.000374 (0.000831)
N	1,230,672	786,013	1,297,797	850,776	958,426	580,028
R ²	0.0318	0.463	0.0258	0.448	0.0232	0.467
<i>Panel D. R&D investments</i>						
	R&D (t+1)		R&D (t+2)		R&D (t+3)	
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter exposure	-0.00025** (0.000113)	0.0000404 (0.0000523)	-0.000130* (0.0000682)	-0.0000523 (0.0000498)	0.000130 (0.000103)	-0.0000118 (0.0000183)
N	1,323,310	881,299	1,303,345	881,039	935,835	577,227
R ²	0.150	0.931	0.145	0.890	0.176	0.994
Industry-Country-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes

D. Supplementary Analysis Using Dictionary-Based Text Analysis

In this section, we present results using an alternative textual analysis methodology that relies on the dictionary approach. Following Li (2010), we develop a dictionary tailored to capture environmental reporting choices within the banking context. We therefore read 50 documents to determine repeating patterns in the words and phrases that banks commonly use to communicate their environmental activities. We further rely on the definitions of relevant sustainability topics included in RepRisk—a database containing media coverage of firms’ sustainability risks—and in the Materiality Map developed by SASB.¹⁵

Our dictionary of environmental-information-related keywords includes non-directional words and phrases related to energy use and waste management (e.g., “oil”, “renewables”, “natural gas”, “coal”, “nuclear”, “paper”), emissions (e.g., “CO2”, “carbon”, “emission”, “laughing gas”), biodiversity (e.g., “biodiversity”, “forest”, “coral”), activities commonly consider to affect pollution (e.g., “car”, “building certificate”, “pollute”, “waste”, “fracking”, “grabbing”), or that may have negative ecological consequences (“gmo”).¹⁶ We reduce all keywords to their stems before performing the textual analysis of banks’ documents. The full list of environmental keywords is reported in Table IA.VII.

Similarly to the baseline analysis using ChatGTP, we define *Environmental disclosures* as the ratio of environmental-information-related keywords in a bank’s documents reported over a year to the total number of words in these documents (excluding stop-words, such as “and,” “a,” and “by”).

Table IA.11 summarized the results findings using the alternative dictionary-based text analysis. The reported findings are consistent with the baseline results reported in Table 3. Specifically, in Panel A, across all specifications, we show that banks classified as high environmental reporters grant more credit to borrowers in brown industries. In Panel B, we consider loans to borrowers in green industries. We find no evidence that emphasizing the environment in public reporting is associated with greener lending practices.

¹⁵ SASB offers detailed guidelines on important sustainability topics that firms across different sectors are expected to disclose in their investor reports: <https://www.sasb.org/standards/materiality-map/>.

¹⁶ We exclude the keyword “environmental” as vaguely describing underlying indicators of banks’ specific environmental activities, and thus, potentially biasing our analysis in favor of finding evidence consistent with banks’ unsubstantiated claims. Our dictionary is similar to the ones employed in prior studies that examine attributes of firms’ environmental disclosures (e.g., Chou and Kimbrough, 2020; Baz et al., 2021).

Appendix IA.D. Environmental-related keywords

(1)	agriculture	(31)	energy	(61)	paper
(2)	air quality	(32)	energy star	(62)	petrol
(3)	air travel	(33)	equator	(63)	pfc
(4)	animal	(34)	farmer	(64)	photovoltaic
(5)	asbesto	(35)	fish	(65)	plastic
(6)	automobile	(36)	forest	(66)	pollute
(7)	automotive	(37)	fracking	(67)	recycle
(8)	biodiversity	(38)	fuel	(68)	renewables
(9)	building	(39)	glass	(69)	sea
(10)	building certificate	(40)	gmo	(70)	sf6
(11)	business travel	(41)	grabbing	(71)	silicium
(12)	car	(42)	green	(72)	solar
(13)	carbon	(43)	habitat	(73)	sox
(14)	Manufacture of other non-metallic products	(44)	heat	(74)	soy
(15)	certified building	(45)	hfc	(75)	sugar
(16)	ch4	(46)	hydro	(76)	sulphuric
(17)	chemicals	(47)	land	(77)	temperature
(18)	circular	(48)	laughing gas	(78)	transport
(19)	climate	(49)	leed	(79)	tree
(20)	co2	(50)	metal	(80)	uranium
(21)	coal	(51)	methane	(81)	vehicle
(22)	commute	(52)	mines	(82)	waste
(23)	coral	(53)	mining	(83)	water
(24)	corporate travel	(54)	mountain	(84)	weather
(25)	diesel	(55)	n2o	(85)	wind
(26)	drill	(56)	natural gas	(86)	wood
(27)	ecosystem	(57)	natural resource		
(28)	electric	(58)	nuclear		
(29)	emission	(59)	ocean		
(30)	endangered	(60)	oil		

Table IA.11. Banks' Emphasis on Sustainability and New Loans to Green and Brown Industries, using Dictionary-Based Text Analysis

The table examines the association between banks' environmental disclosures and the volume of new loans extended to individual borrowers (*Loan amount*). *High environmental reporter* is an indicator variable of whether a bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution during a year. The variable is constructed as the ratio of environmental-information-related keywords in a bank's reports over a year to the total number of words in these reports using the dictionary-based approach described above. All other specifications are the same to those in Table 3. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level. ***, ** and * denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Brown industries</i>						
High env. reporter	-0.0740 (0.0582)	-0.0968*** (0.0300)		-0.0177 (0.0173)		
Brown	-0.186*** (0.0323)					
High env. reporter x Brown	0.129** (0.0510)	0.0878** (0.0372)	0.0978*** (0.0282)	0.0715** (0.0321)	0.0538* (0.0284)	0.00374 (0.0194)
N	2,231,059	3,058,259	3,058,180	636,717	636,085	432,886
R ²	0.712	0.206	0.213	0.799	0.803	0.917
<i>Panel B. Green industries</i>						
High env. reporter	-0.0409 (0.0609)	-0.0855** (0.0356)		-0.00326 (0.0245)		
Green	-0.0282 (0.0285)					
High env. reporter x Green	-0.0674 (0.0512)	-0.00839 (0.0445)	-0.00487 (0.0341)	-0.0239 (0.0701)	-0.0121 (0.0601)	0.00051 (0.0286)
N	2,231,059	3,058,259	3,058,180	636,717	636,085	432,886
R ²	0.712	0.206	0.213	0.799	0.803	0.917
Bank controls	Yes	Yes	-	Yes	-	-
Bank FE	Yes	Yes	-	Yes	-	-
Firm FE	Yes	No	No	-	-	-
Time FE	Yes	-	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-	-
Firm-Time FE	No	No	No	Yes	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes	Yes
Bank-Firm FE	No	No	No	No	No	Yes