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'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 or shortening debt maturity. 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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ABSTRACT:

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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 (e.g., Edmans, 2023). In this context, transparency becomes critical (Christensen, Hail, and Leuz, 2021; Starks, 2023). 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, in the absence of strategic disclosure, we expect that banks that emphasize climate-focused lending practices in their reporting will extend less credit to brown firms — those with a significant negative environmental impact — and more credit to green firms, which engage in environmentally sustainable practices. Therefore, banks that prominently feature their environmental lending policies in their reporting may be making genuine efforts to enhance their sustainability impact. On the other hand, due to the opacity of loan portfolios that limits investor scrutiny, banks face lower reputational risks from

[1] https://www.un.org/en/climatechange/science/climate-issues/greenwashing

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overclaiming 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, 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 and the decrease of their exposures to few high-polluting firms, while not changing their overall lending policies or even increasing the amount of credit they supply to brown industries.

To address our research question, we employ a novel credit registry by the European System of Central Banks, Anacredit (AC). AC provides granular information on new loan issuance and credit exposures by euro area banks and detailed data on firm characteristics. Our focus on euro area banks is further motivated by the significant regulatory and investor mandates these institutions face to finance the transition to a carbon-neutral economy (e.g., 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; Jha, Qian, Weber, and Yang, 2023; Hansen and Kazinnik, 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

[2] In Online Appendix B, we present robustness using an alternative dictionary-based text analysis and report consistent findings.

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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 less likely to issue new loans to firms in green industries, but they also appear to extend more credit to firms in highly polluting sectors. Consequently, when we aggregate the effects at the bank level, we find that these banks extend a higher share of new loans to brown industries and a lower share to green industries in comparison to other banks. We also do not observe that banks that emphasize the sustainability of their lending policies attempt to discipline brown borrowers through higher loan rates or shorter loan maturity. Thus, banks appear to strategically disclose positive sustainability actions and withhold information about negative ones.

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 (Acharya, Eisert, Eufinger, and Hirsch, 2018; Degryse, De Jonghe, Jakovljević, Mulier, and Schepens, 2019). We also control for banks' ability to expand their balance sheets either using a combination of bank fixed effects and bank time-varying financial performance characteristics, or interactions of bank and time 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 can also mask 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 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

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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 as brown borrowers whose products have adverse environmental impacts. We continue to find evidence that banks that emphasize the sustainability of their lending policies extend more credit to brown borrowers, without lending more to green firms. Our findings indicate that banks' claims of environmentally friendly credit practices are not associated with their underlying lending choices, which is also indicative of strategic disclosures.

These patterns are particularly pronounced for loans to small firms, which are inherently harder to observe and more difficult for investors to monitor. Our results thus suggest that it is essential to look beyond the largest borrowers — such as those in the syndicated loan market or those with available carbon emission data (e.g., Kacperczyk and Peydro, 2022; Green and Vallée, 2023; Degryse, Goncharenko, Theunisz, and Vadasz, 2023; Wang, 2023) — and to focus on banks' entire loan portfolios to accurately evaluate the relationship between sustainability disclosures and the environmental impact of their lending decisions.

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 transition to greener technologies. However, we do not find that brown borrowers that receive more credit from high environmental reporters decrease their GHG emission intensities in the next three years. In addition, 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

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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. Taken together, our results indicate that banks that emphasize the sustainability of their lending policies are unlikely to engage in transition lending.

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, especially if they have high leverage and lower interest rate coverage. Thus, banks' strategic disclosures of their credit activities appear to be driven by their incentives to continue lending to financially unhealthy brown borrowers that typically have fewer financing alternatives and will likely experience financial distress if their bank relationships were severed.

Overall, our findings indicate that banks' environmental disclosures can provide a misleading picture of the greenness of their portfolios and support concerns that banks that trumpet their environmental stewardship struggle to decrease their brown exposures.[3] Banks appear to have weak incentives to change their lending policies because this could negatively affect their outstanding loans (Degryse et al., 2022) and thus debt financing slows the transition to a greener economy (De Haas and Popov, 2023).

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

[3] To exemplify, "Canada's RBC Struggles to Go Green While Financing Oil," Bloomberg, April 3, 2024.

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mandate fail to make sustainable investment choices. Basu, Vitanza, Wang, and Zhu (2022) find no association between banks' social score rating and mortgage issuance in poor localities. In addition, using a cross-industry context, recent studies provide evidence of strategic disclosures pertaining to diversity and inclusion (Baker, Larcker, McClure, Saraph, and Watts, 2024) and equal employment opportunities (EEO-1) information for federal contractors (Bourveau, Flam, and Le, 2023). We add to these studies by analyzing credit-related content of banks' annual and sustainability reports and document a disconnect between disclosures and underlying lending decisions. We therefore contribute to studies suggesting that firms augment their sustainability disclosures to symbolically comply with stakeholders' pressures for sustainability actions (e.g., Marquis, Toffel, and Zhou, 2016; Bothello, Ioannou, Porumb, and Zengin-Karaibrahimoglu, 2023). Further, we identify important economic mechanisms that are likely to influence banks' strategic disclosure choices. Our study thus extends the literature on the drivers of firms' greenwashing activities (see Christensen et al. (2021) for a detailed literature review).

Concerns of greenwashing 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). While evidence on the credibility of these commitments is mixed, regulators have voiced concerns that banks strategically disclose the lower exposure to selected and narrow parts of their loan portfolio, while they could be extending an increasing amount of new credit to brown borrowers (ECB, 2022; 2023). We identify greenwashing beyond banks' narrow claims, thus addressing regulators' concerns that lenders cherry-pick which exposures to discuss, without providing investors a holistic view of their portfolios. Our results highlight that it is important to go beyond the narrow industry commitments that banks announce and support regulatory concerns that investors may select banks based on the emphasis that they

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put on the sustainability of their lending policies in specific industries, despite the increasing brownness of their portfolios. Related, existing literature mostly relies on large exposures or syndicated loans (e.g., Kacperczyk and Peydro, 2022; Degryse et al., 2023), which are more visible and potentially less subject to greenwashing. We consider changes in the banks' entire loan portfolios, including loans to smaller borrowers, which are the bulk of banks' portfolios but are opaque and, therefore, less likely to be scrutinized and affect a bank's reputation.

Lastly, our results also suggest that the ESG rating shortcomings highlighted in previous literature (e.g., Dhaliwal, Radhakrishnan, Tsang, and Yang, 2012; Berg, Kölbel, and Rigobon, 2021; Serafeim and Yoon, 2022; Christensen et al., 2022) can be at least partially attributed to rating agencies' reliance on inadequate firm disclosures.

2. Data Sources and Main Variables

To evaluate whether bank environmental disclosures reflect their lending policies, we need to observe a bank's loan portfolio and the sustainability of its borrowers as well as the banks' attempts to build a reputation for environmental sustainability through their disclosures. Below we describe our data and proxies.

2.1. Bank lending policies

We consider 101 systemically important banking groups subject to the Single Supervisory Mechanism (SSM), which include 553 banking subsidiaries in total. For each subsidiary, we obtain loan-level data from AC, a credit register initiated by the European System of Central Banks in 2018 that offers confidential information on commercial loans outstanding. Specifically, AC covers borrower characteristics (e.g., industry, location), loan terms (e.g., amount, maturity, interest rate, issuance date), and 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.

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The data granularity in AC allows us to capture any changes in lending policies through the *flow* of banks' credit over time. Specifically, in our empirical analysis, we consider loans that are newly issued over the 2014–2020 period. Since the median loan maturity is approximately four years (see Table 1, Panel C; maturity is reported in days), extending our sample's time-series to include loans issued post 2014 allows us to capture most of the banks' lending activity during this period.[4] Our definition of new loans to a borrower includes all facilities a bank (subsidiary) has granted to the borrower during a year with 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 have 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 as brown (green) industries that rank in the upper (bottom) quintile for GHG emissions relative to the industry's value added in a given year. Based on this methodology, Manufacture of coke and refined petroleum products; Electricity, gas, steam, and air conditioning supply; Land transport and transport via pipelines; Air travel are examples of brown industries. Green industries include Wholesale trade, except of motor vehicles and motorcycles; Legal and accounting activities; Architectural and engineering activities, technical testing, and analysis; Advertising and market research, etc. Not only does this classification allow us to include all AC borrowers in

[4] 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.I).

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our analyses, but it also reflects that the largest carbon damages occur in energy-intensive industries (Greenstone, Leuz, and Breuer, 2023).[5]

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 or 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 that 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 EU taxonomy for sustainable activities to create a dictionary for brown and green activities (Appendix B).[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

[5] Greenstone et al. (2023) show that the top-four energy-intensive industries account for 89% of the total carbon damages worldwide.

[6] We note that 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.

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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] Panel A of Table 1 describes our final sample, which includes 623 annual reports, 273 sustainability reports, 57 integrated reports, and 61 nonfinancial reports. We further collect other less lengthy and more tailored disclosures (383 documents) that banks commonly use to communicate their sustainability efforts and performance (e.g., sustainability facts and figures, climate change report, report on greenhouse gas emissions, impact report, responsible investments report). These filings may be disclosed together with or instead of a sustainability report. Collectively, we process 1,397 documents. Examples of banks' discussions of environmental-related issues are provided in Appendix C.

Following a growing number of papers that use natural language processing and ChatGPT in particular — to categorize text (e.g., Lopez-Lira and Tang, 2023; Jha et al., 2023; Hansen and Kazinnik, 2023), we rely on OpenAI's ChatGPT 3.5 to evaluate the extent to which banks' investor 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 remarkable capability of deciphering and categorizing the context of complex and nuanced language in various domains of knowledge.

[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 firms' annual reports. In many European countries, sustainability reporting is mandatory. Nonfinancial reports include disclosures of firms' nonfinancial performance (e.g., innovation, brand value). Finally, using integrated reporting, firms produce one report (instead of many standalone reports) where they communicate to investors value creation though financial, environmental and social capital.

[8] An earlier version of this paper was circulated using a dictionary-based methodology to capture the emphasis on sustainability in banks' environmental disclosures. We report our dictionary and results in Internet Appendix B. The conclusions are equivalent to those we obtain using LLMs and that we report in the paper.

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Since ChatGPT has a total limit of 4,096 tokens or around 3,000 words for input and output combined, we split banks' reports in 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". We provide a more detailed example of this process in Appendix D.

Having classified all paragraphs of a bank's reports during a year, 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. The mean value of *Environmental disclosures* is about 4.5% (Panel B of Table 1) and is small by construction because banks' annual reports cover many topics and predominantly 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).

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

Before proceeding with our primary analyses, we validate our textual proxy by examining the characteristics of banks that emphasize the sustainability of their lending policies in their reports. The results of these validation tests are reported in Table 2. Consistent with the view that the adoption of sustainability reporting standards enhances the availability of sustainability-related information, we find that *Environmental disclosures* 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 (the coefficient on *Integrated reporting* is only statistically significant at the 10% level in column 1).

Larger banks appear to stress more the sustainability of their lending policies, 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 (e.g., Serafeim, 2014). In column 2, we find that banks committed to reduce 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, we show that the *Environmental disclosures* proxy is positively associated with a bank's environmental rating score by MSCI and Sustainalytics (*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 environmental disclosure score by Bloomberg, which captures the availability of climate-related information by firms (*Bloomberg Env score*). This result is consistent with prior studies that have documented the association between the volume of

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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 related to 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 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 2, we exploit cross-sectional differences between banks to gain a first insight on 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 presumably suggests that banks specialized in brown industries are pressured to disclose their environmental strategies and plans to decarbonize. In what follows, we explore whether these banks indeed change the composition of their loan portfolios by focusing on new loan issuance.

4. Environmental Disclosures and Bank Lending Policies

4.1 Methodology

We study whether banks that emphasize the sustainability of their lending policies indeed issue greener loans. 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 expect

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a negative (positive) association between environmental disclosures and new loans to brown (green) industries. On the other hand, banks may selectively report sustainability credit initiatives, future plans, or a decrease in exposures to selected brown borrowers, while withholding information on their continued relationships with the bulk of their brown clients. Since loan decisions are mostly opaque, thus, hard to be verified and questioned by outside stakeholders, such behavior could enhance a bank's public image, as the positive association between environmental disclosures and environmental ratings demonstrates, even though there is no significant relationship, or 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. We estimate the following ordinary least squares (OLS) model where the dependent variable is the logarithm of new loans' amount, issued by bank b during year t to firm f in industry i and in country c, $Loan\ amount_{f,b,i,c,t}$:

$$Loan\ amount_{f,b,i,c,t} = \alpha + \beta_1(Brown_{i,c,t} \times High\ Environmental\ Reporter_{b,t})$$
$$+\beta_2 High\ Environmental\ Reporter_{b,t} + \gamma \mathbf{X}_{\boldsymbol{b,t}} + \delta_{\boldsymbol{i,c,t}} + \mu_b + \epsilon_{f,b,i,c,t} \qquad (1)$$

The variable of interest is the interaction term $Brown_{i,c,t} \times High\ Environmental\ Reporter_{b,t}$. $High\ Environmental\ Reporter_{b,t}$ 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 $Brown_{i,c,t}$ is an indicator variable of whether the ratio of carbon emissions to gross value added of industry i in country c ranks is 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

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disclosures indeed engage in greener lending practices.[9] Appendix A provides detailed variable definitions.

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. Specifically, following Acharya et al. (2018) and Degryse et al. (2019), our specifications include interactions of country, industry, and year fixed effects ($\delta_{i,c,t}$), which allow 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 (Khwaja and Mian, 2008). The high-dimensional fixed effects also ensure that 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' credit decisions are associated with borrowers' emissions after controlling for the borrowers' demand for credit.

4.2 Main findings

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

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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. 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 loans 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.

We also consider that environmental disclosures could discuss future changes in lending policies to green and brown industries. In this respect, environmental disclosures should be reflected only in future, not current, lending policies. We thus use lags of the *High environmental reporter* dummy to test whether banks that previously stressed the environment subsequently adopt greener lending policies. Table IA.III in the Internet Appendix reports the results for the three-year lag of the *High environmental reporter* dummy.[10] The estimates mirror those in Panel A of Table 3.[11]

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

[10] For this test, we use banks' reports starting from 2012 in order not to lose observations.

[11] To evaluate whether bank disclosures are backward-looking, Panel B of Table IA.III presents the robustness analysis using the one-year lag and the one-year lead variable of the *High environmental reporter* dummy. Consistent with the previous findings, the estimates reveal that banks with more extensive environmental disclosures extend more credit to borrowers in brown industries.

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allows us to include small private companies in the analyses, we do not capture differences between borrowers within the same industry and country. 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, an increase by one standard deviation in the intensity of a borrower's GHG emissions is associated with an approximately 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 the statistically insignificant estimates on β_1 in columns 4 and 5 are likely attributed to low cross-sectional variation when focusing on borrowers with multiple lending relationships. At best, these estimates suggest that banks' environmental credit-related disclosures are unrelated to their underlying lending choices, and, if anything, it appears that they grant more credit to polluting borrowers.

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 interaction of industry, country and time fixed effects, we observe that borrowers in brown industries obtain more new loans from banks that emphasize the sustainability of their lending policies. Thus, high environmental disclosures are far from being associated with greener, or less brown, lending policies or any attempts to reduce exposures to brown industries.

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4.4 The extensive margin of bank lending

We have so far focused on all the newly issued bank loans to both new and existing clients. However, banks that aim to achieve greener loan portfolios may avoid starting relationships with brown borrowers and even terminate 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 and control variables are similar to Table 3.

Table 5 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 start or terminate relationships with brown borrowers. If anything, the negative and statistically significant coefficient in column 5 of Panel A suggests that high environmental reporters are less likely to terminate lending relationship with borrowers in brown industries compared to other banks. Thus, banks that emphasize the sustainability of their lending policies do not appear to discipline borrowers by divesting.

In Appendix Table IA.V, we observe that high environmental reporters are more likely to start relationships with borrowers in green industries suggesting that at least in this dimension they may be greening their portfolios.

4.5 Changes in bank level credit exposures to brown industries

In the previous sections, we show 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.

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To evaluate how banks' exposures to brown (and green) borrowers change, 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:

$$Credit\ share_{b,i,c,t} = \alpha + \beta_1(Brown_{i,c,t} \times High\ Environmental\ Reporter_{b,t})$$
$$+ \beta_2 High\ Environmental\ Reporter_{b,t} + \gamma \mathbf{X}_{\boldsymbol{b,t}} + \delta_{\boldsymbol{i},t} + \nu_{c,t} + \mu_b + \epsilon_{b,i,c,t} \quad (2)$$

Table 6 reports the results. We find that the greater propensity in establishing relationships with green borrowers has limited effects on the overall greenness of high-environmental-reporters' loan portfolio. 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 and are at best narrowly focused on selected portions of their loan portfolios that comply with climate goals.

4.6 Environmental disclosures and loan contractual features

While banks with more extensive environmental disclosures extend larger amount of credit to brown borrowers, they could use contractual features to discipline them. For instance, banks could provide loans at higher interest rates to brown borrowers. This would not only increase

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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 7, we test whether high environmental reporters extend loans with higher interest rates to borrowers in brown industries. We find no evidence that this is the case. Borrowers in brown industries do not pay higher interest rates for loans from banks with extensive environmental disclosures. If anything, in column 3, where we absorb credit demand by including interactions of industry, country and time fixed effects and control for bank shocks using bank and time fixed effects, 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.

We also test whether banks with more extensive environmental disclosures extend loans with shorter maturity to borrowers in brown industries. Short maturity allows lenders to exercise control, as banks can threaten firms not to renew the loans if environmental or other targets are not met. In Panel B of Table 7, we test whether high environmental reporters extend loans with shorter maturity to borrowers in brown industries, using Model (1) and a dependent variable defined as the natural logarithm of number of days till maturity (*Loan Maturity*). We find that on average, the maturity of loans to brown borrowers is shorter, consistent with the idea that these borrowers are riskier and banks exercise control by extending short maturity loans (column 1). But if anything, the loans extended by high environmental reporters to borrowers in brown industries have longer maturity. Thus, high environmental reporters do not appear to use loan maturity to monitor brown borrowers.

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Overall, the contractual features of the loans reveal no reluctance of banks that emphasize the sustainability of their lending policies to fund borrowers in brown industries and are consistent with our previous findings. We next investigate why banks make environmental disclosures that do not reflect their lending policies.

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

5.1 Funding the transition to greener technologies in brown industries

The disconnect between banks' environmental disclosures and their lending policies does not necessarily indicate greenwashing if these banks finance the transition of brown borrowers to lower-emission technologies. We start evaluating this conjecture by testing whether brown borrowers that obtain loans from banks with more extensive environmental disclosures subsequently reduce their emissions. In Appendix Table IA.V, we find no evidence supporting the hypothesis. Given that we observe emissions for a few firms and that our time series is short, this test has low power.

To provide further evidence, we consider that transitioning to greener technologies typically 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 and (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:

$$Loan\ amount_{f,b,i,c,t} = \alpha + \beta_1(Brown_{i,c,t} \times High\ Environmental\ Reporter_{b,t}) + \beta_2 High\ Environmental\ Reporter_{b,t}$$

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$$+ \beta_3(Brown_{i,c,t} \times High\ Environmental\ Reporter_{b,t} \times Proxy_{f,t})$$

$$+ \beta_4(High\ Environmental\ Reporter_{b,t} \times Proxy_{f,t})$$

$$+ \beta_5(Brown_{i,c,t} \times Proxy_{f,t}) + \beta_6 Proxy_{f,t} + \gamma \mathbf{X}_{\boldsymbol{b,t}} + \delta_{\boldsymbol{i,c,t}} + \mu_b + \epsilon_{f,b,i,c,t} \quad (3)$$

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 8, 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.

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. First, 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, indicating that they are unlikely to fund the transition to greener technologies.

Next, we draw on data from the SBTi. Several firms commit to reducing their GHG emissions by setting targets through the SBTi framework. We obtain the list of signatory firms from the SBTi website and match it with AC borrowers. A firm is considered to have committed to reducing its carbon emissions if it adhered to the SBTi before the loan's

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origination or within the following year.[12] 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.

Last, we leverage our product greenness textual proxy to further investigate whether banks that emphasize the sustainability of their lending policies extend credit to green borrowers 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.

In sum, we find no support for the hypothesis that banks that emphasize the sustainability of their lending policies fund the transition of brown industries to greener technologies.

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 9 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 such a bank's refusal to extend a loan could have negative consequences for the bank itself, as the borrower could experience distress. Consistent with the idea that the bank internalizes the negative effect of not extending liquidity to these borrowers,

[12] Our results are robust if we consider a firm's SBTi commitments at any point in time to define a time-invariant indicator variable.

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we find that the coefficient on the triple interaction term between *Brown, High Environmental Reporter*, and *Exposure* is positive and significant both 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 opt to renew their loans to keep these borrowers afloat and avoid recognizing losses on their balance sheets (Peek and Rosengren, 2005; Giannetti and Simonov, 2013; Acharya et al., 2022). This behavior, often referred to as zombie lending (e.g., Acharya et al., 2022), may drive

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the continued financing of brown industries by banks that emphasize their environmental lending policies. We test whether zombie lending practices among high environmental reporters are contributing to the ongoing support for environmentally harmful firms.

We employ several 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-quality borrower.

Table 9 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 helps to explain greenwashing, banks with low capitalizations should exhibit an even larger disconnect between environmental disclosures and lending policies (e.g., Peek and Rosengren, 2005; Giannetti and Simonov, 2013). In column 1 of Table 10, we find that high environmental reporters with low capitalizations extend larger loans to borrowers in brown industries, even though the coefficient on the triple interaction term loses statistical significance once we include interactions of bank and time fixed effects.

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Overall, these findings suggest that relationships with low-credit-quality brown borrowers can help explain why high environmental reporters hide their brown exposures and overstate their environmental objectives at the detriment of the long-term carbon footprint of their loan portfolios.

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

Last, we examine whether large banks having higher visibility may be more subject to institutional pressures to integrate climate goals in their strategy. It appears that large banks with more extensive environmental disclosures extend more credit to borrowers in brown industries (columns 3 and 4 of Table 10). Since large banks tend to be more visible and scrutinized, this evidence suggests that the credibility of environmental disclosures and the extent to which these are reflected in the banks' loan portfolios is particularly hard to verify for market participants.

The rest of Table 10 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 banks subject to ESG disclosure regulations incentivize 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 generalize to small opaque credit exposures, for which banks have more leeway to mask unsustainable lending decisions. Thus, further research in this area is required.

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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 4, 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 materially enhance the credibility of the sustainability disclosures (columns 9 and 10), in line with recent studies suggesting that auditors have limited expertise in evaluating sustainability disclosures (Aobdia and Yoon, 2022).

Collectively, these results suggest that banks boost their environmental profiles through selective environmental disclosures, stressing the financing of a few green projects or the reduction in credit to a few selected brown borrowers, while large chunks of their loan portfolios continue to consist of credit to brown industries.

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 how banks' claims about the sustainability of their lending policies are related to their lending decisions. We show that features of banks' business models, such as relationship lending, hinder the effective transition to a green lending

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strategy and are potentially accentuated by zombie lending and banks' specialization in brown industries. In addition, the opacity of banks' portfolios exacerbates the problem, as banks' claims are hard to verify and dispute.

Our results support concerns about the lack of transparent and consistent sustainability disclosures (ECB, 2022) and indicate that regulating the contents of the disclosures may be necessary to increase their informativeness. The recent EU Corporate Sustainability Reporting Directive (2022/2464), which aims to standardize the content of sustainability disclosures, harbors the promise of enhancing their substantive content while mitigating the prevalence of greenwashing practices.

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References

Acharya, V. V., T. Eisert, C. Eufinger, and C. Hirsch. 2018. Real Effects of the Sovereign Debt Crisis in Europe: Evidence from Syndicated Loans. *Review of Financial Studies* 31: 2855–2896.

Acharya, V. V., M. Crosignani, T. Eisert, and S. Steffen. 2022. Zombie Lending: Theoretical, International, and Historical Perspectives. *Annual Review of Financial Economics* 14: 21–38.

Aghion, P., A. Dechezlepretre, D. Hemous, R. Martin, and J. Van Reenen. 2016. Carbon Taxes, Path Dependency, and Directed Technical Change: Evidence from the Auto Industry. *Journal of Political Economy* 124: 1–51.

Aobdia, D., and A. Yoon. 2022. Do Auditors Understand the Implications of ESG Issues for their Audits? Evidence from Financially Material Negative ESG Incidents. *Working paper*.

Baker, A.C., D. F. Larcker, C. G. McClure, D. Saraph, and E.M. Watts. 2024. Diversity Washing. *Journal of Accounting Research forthcoming.*

Basu, S., J. Vitanza, W. Wang, and X. Zhu. 2022. Walking the Walk? Bank ESG Disclosures and Home Mortgage Lending. *Review of Accounting Studies* 27: 779–821.

Berg, F., J. Kölbel, and R. Rigobon. 2021. Aggregate Confusion: The Divergence of ESG Ratings. *Review of Finance* 26 (6): 1315–1344.

Bothello, J., I. Ioannou, V.A. Porumb, and Y. Zengin-Karaibrahimoglu. 2023. CSR decoupling within business groups and the risk of perceived greenwashing. *Strategic Management Journal* 44 (13): 3217–3251.

Bourveau, T., R. W. Flam, and A. Le. 2023. Behind the EEO Curtain. *Working paper.*

Christensen, H. B., L. Hail, and C. Leuz. 2021. Mandatory CSR and Sustainability Reporting: Economic Analysis and Literature Review. *Review of Accounting Studies* 26: 1176–1248.

Christensen, D., G. Serafeim, and A. Sikochi. 2022. Why Is Corporate Virtue in the Eye of the Beholder? The Case of ESG Ratings. *The Accounting Review* 97 (1): 147–175.

Degryse, H., O. De Jonghe, S. Jakovljević, K. Mulier, and G. Schepens. 2019. Identifying credit supply shocks with bank-firm data: Methods and applications. *Journal of Financial Intermediation* 40: 1–15.

Electronic copy available at: https://ssrn.com/abstract=4424081

Degryse, H., Goncharenko, R., Theunisz, C., and T. Vadasz. 2023. When Green Meets Green. *Journal of Corporate Finance* 78: 102355.

Degryse, H., T. Roukny, and J. Tielens. 2022. Asset Overhang and Technological Change. *Working Paper.*

De Haas, R., and A. Popov. 2023. Finance and Carbon Emissions. *The Economic Journal*, Volume 133: 637–668.

Dhaliwal, D.S., O.Z. Li, A. Tsang, and Y.G. Yang. 2011. Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The initiation of Corporate Social Responsibility Reporting. *The Accounting Review* 86 (1): 59–100.

Dhaliwal, D.S., S. Radhakrishnan, A. Tsang, and Y.G. Yang. 2012. Nonfinancial Disclosure and Analyst Forecast Accuracy: International Evidence on Corporate Social Responsibility Disclosure. *The Accounting Review* 87 (3): 723–759.

deHaan, E., N. Li, and F.S. Zhou. 2023. Financial Reporting and Employee Job Search the rise of disclosure practices that emphasize environmental stewardship. *Journal of Accounting Research* 61 (2): 571–617.

Edmans, A. 2023. Applying Economics – Not Gut Feel – To ESG, *Financial Analyst Journal*, *forthcoming*.

European Central Bank. 2022. Supervisory Assessment of Institutions' Climate-Related and Environmental Risks Disclosures. https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.ECB_Report_on_climate_and_environmental_disclosures_202203~4ae33f2a70.en.pdf.

European Central Bank. 2023. The Importance of Being Transparent. https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.theimportanceofbeingtransparent042023~1f0f816b85.en.pdf

European Commission. 2019. Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on Sustainability-Related Disclosures in the Financial Services Sector PE/87/2019/REV/1. http://data.europa.eu/eli/reg/2019/2088/oj.

Giannetti, M., and A. Simonov. 2013. On the Real Effects of Bank Bailouts: Micro Evidence from Japan. *American Economic Journal: Macroeconomics* 5: 135–67.

Electronic copy available at: https://ssrn.com/abstract=4424081

Gibbons, B. 2023. The Financially Material Effects of Mandatory Nonfinancial Disclosure. *Journal of Accounting Research, forthcoming*.

Gibson, R., S. Glossner, P. Krueger, P. Matos, and T. Steffen. 2022. Responsible Institutional Investing Around the World. *Review of Finance* 26 (6): 1389–1432.

Green, D., and B. Vallée. 2023. Measurement and Effects of Bank Exit Policies. *Working paper.*

Greenstone, M., C. Leuz, and P. Breuer. 2023. Mandatory Disclosure Would Reveal Corporate Carbon Damages: Accurate Reporting Is Critical For Markets and Climate Policies. *Science* 381 (6660): 837–840.

Hansen, A. L., and S. Kazinnik. 2023. Can ChatGPT decipher Fedspeak?. *Working Paper*.

Haushalter, D., J.J. Henry, and P. Iliev. 2023. Can Banks Save Mountains? *Review of Corporate Finance Studies* 12(4):761–91.

Ioannou, I., and G. Serafeim. 2012. What drives corporate social performance? The role of national-level institutions. *Journal of International Business Studies* 43 (9): 834–864.

Jha, M., J. Qian, M. Weber, and B. Yang. 2024. ChatGPT and Corporate Policies. *Working Paper*.

Kacperczyk, M. T., and J.-L. Peydro. 2022. Carbon Emissions and the Bank-Lending Channel. *Working Paper*.

Khwaja, A. I., and A. Mian. 2008. Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market. *American Economic Review* 98 (4): 1413–1442.

Kim, S., and A. Yoon. 2023. Analyzing Active Fund Managers' Commitment to ESG: Evidence from the United Nations Principles for Responsible Investment. *Management Science* 69 (2): 723–1322.

KPMG. 2023. Counting on it: Sustainability reporting in financial services. June 2023.

Krueger, P., Z. Sautner, D. Y. Tang, and R. Zhong. 2024. The Effects of Mandatory ESG Disclosure Around the World. *Journal of Accounting Research*, *forthcoming.*

Li, F., 2010. Textual analysis of corporate disclosures: A survey of the literature. *Journal of Accounting Literature* 29: 143–165.

Electronic copy available at: https://ssrn.com/abstract=4424081

Lopez-Lira, A., and Y. Tang. 2023. Can ChatGPT Forecast Stock Price Movements? Return Predictability and Large Language Models. *Working Paper.*

Marquis, C., M. W. Toffel, and Y. Zhou. 2016. Scrutiny, norms, and selective disclosure: A global study of greenwashing. *Organization Science* 27 (2): 483–504.

Peek, J., and E. S. Rosengren, 2005. Unnatural selection: Perverse Incentives and the Allocation of Credit in Japan. *American Economic Review* 95: 1144–1166.

Raghunandan, A., and S. Rajgopal. 2022. Do ESG funds make stakeholder-friendly investments? *Review of Accounting Studies* 27: 822–863.

Rouen, E., K. Sachdeva, and A. Yoon. 2022. The Evolution of ESG Reports and the Role of Voluntary Standards. *Working Paper.*

Sastry, P., E. Verner, and D. Marques-Ibanez. 2024. Business as Usual: Bank Climate Commitments, Lending, and Engagement. *ECB Working Paper No. 2024/2921*.

Serafeim, G. December 2014. Turning a Profit While Doing Good: Aligning Sustainability with Corporate Performance. Governance Studies, The Initiative on 21st Century Capitalism, No. 19, Brookings Institution.

Serafeim, G., and A. Yoon. 2022. Stock Price Reactions to ESG News: The Role of ESG Ratings And Disagreement. *Review of Accounting Studies* 28: 1–31.

Starks, L. T. 2023. Presidential address: sustainable finance and ESG issues – value versus values. *Journal of Finance* 78: 1837–1872.

The Institutional Investor Group on Climate Change, 2021. Aligning the Banking Sector with the Goals of the Paris Agreement. https://www.localpensionspartnership.org.uk/Portals/0/Documents/Responsible%20Investment/IIGCC%202021%2002%20Banks.pdf.

Wang, L. L. 2023. Transmission Effects of ESG Disclosure Regulations Through Bank Lending Networks. *Journal of Accounting Research* 61 (3): 935–978.

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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.

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Figure 2. Banks' Emphasis on the Sustainability of Lending Policies and Exposure to Brown Industries

The figure shows the bin scatter plot depicting the relationship between banks' *Environmental Disclosures* and their ex-ante exposure to brown borrowers. It displays a bin scatter plot for the lagged share of the bank's lending to brown borrowers as a proportion of total credit outstanding (Brown exposure) and the continuous variable bank's *Environmental Disclosures*. Both scatter plots present averages for the data sorted into 20 bins based the exposure to brown firms.

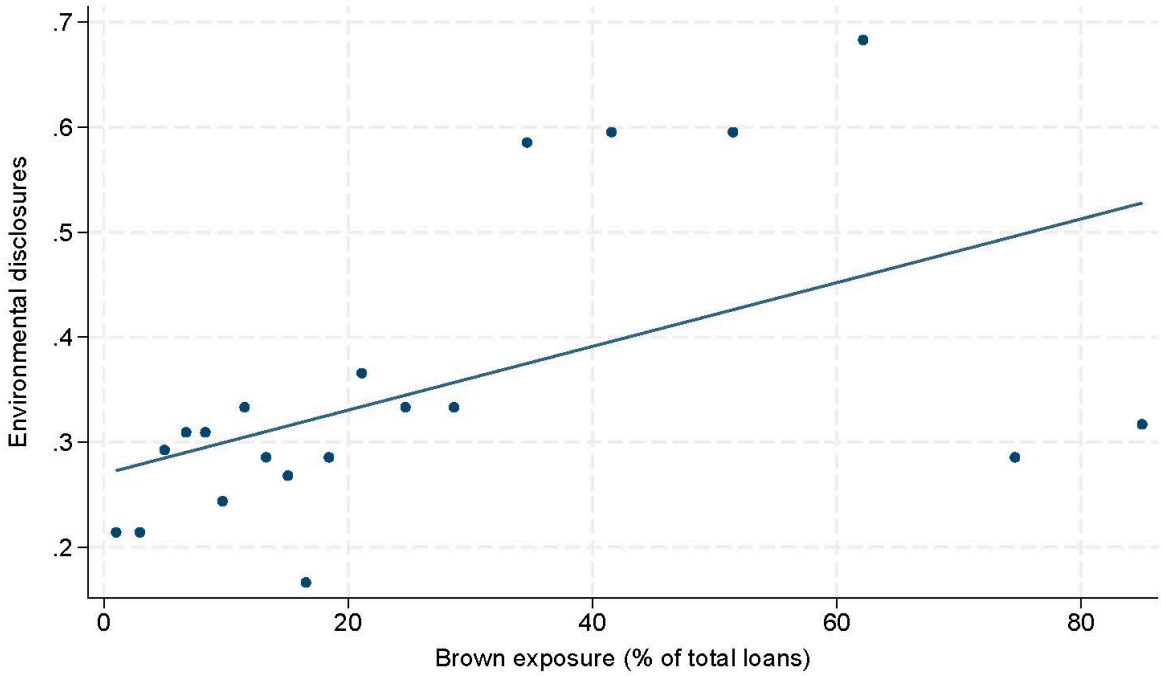

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Figure 3. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Brown Industries

The figure presents the coefficients of time-varying estimates of the association between banks' 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.

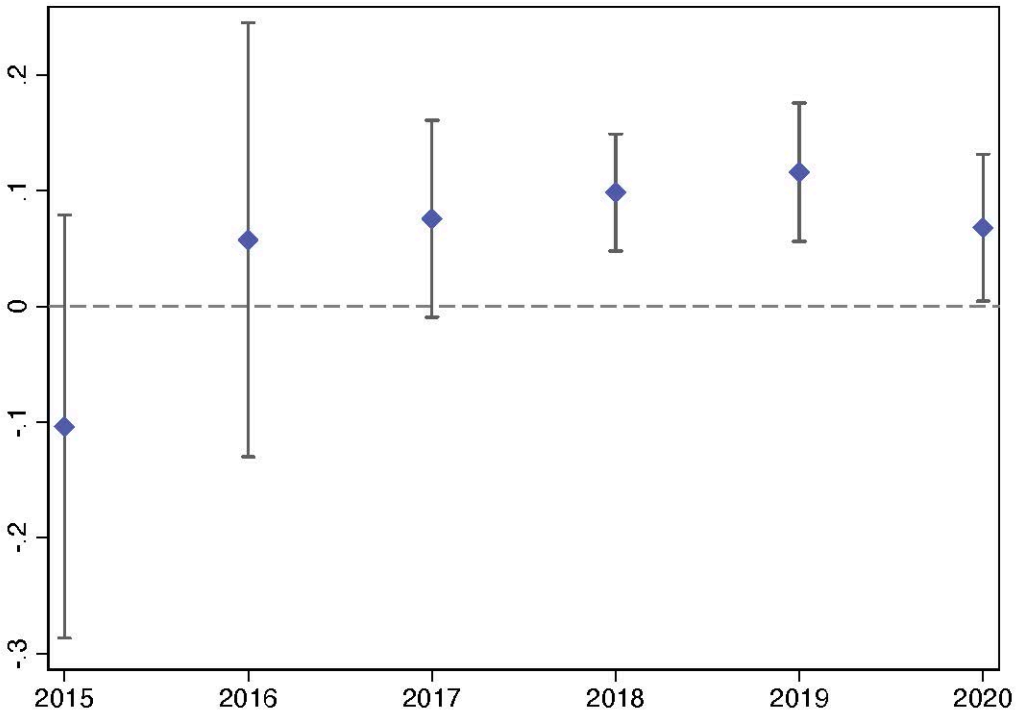

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Table 1. Descriptive Statistics

The table reports descriptive statistics. Panel A reports the number of documents used to construct banks' *Environmental Disclosures*. Panel B reports the summary statistics for the variables pertaining to the bank level analysis in Table 2. Panel C reports the descriptive statistics for the analysis of banks' lending policies. Continuous variables are winsorized at 1% and 99%. Variables are defined in Appendix A.

Panel A. Banks' reports by year

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**

Panel B. 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	0	0

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Panel C. Summary statistics of loan-level data

	Obs.	Mean	S.D.	Q1	Median	Q3
Loan Amount	3,740,323	11.00	1.52	10.13	10.82	11.90
Loan Maturity	3,712,480	1588	1213	574	1642	2100
High env. reporter	3,740,323	0.15	0.36	0	0	0
Brown	3,740,323	0.16	0.87	0	0	0
Leverage	3,740,323	0.91	0.03	0.89	0.91	0.93
ROA	3,740,323	0.03	0.01	0.02	0.03	0.04
Total assets	3,740,323	25.13	1.61	23.88	24.97	26.7
Tier 1 capital	3,740,323	0.18	0.04	0.15	0.17	0.20
GHG emissions (Urgentem)	3,765	109.68	181.83	19.96	32.57	78.9
Brown business	1,180,889	0.05	0.22	0	0	0
Green business	1,180,889	0.02	0.14	0	0	0

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

The table explores the relation between banks' *Environmental Disclosures* and their financial and environmental performance. The dependent variable is *Environmental disclosures*. All variables are defined in Appendix A. Continuous variables are winsorized at 1% and 99%. OLS regressions are used to estimate the models. 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***	0.0098***	0.00548	0.00388	0.00332	0.0083***	0.00647**
	(0.00304)	(0.00292)	(0.00382)	(0.0037)	(0.00409)	(0.00284)	(0.00301)
Integrated reporting	0.0142*	0.0111	0.00628	0.0140	0.00311	0.0146**	0.0112
	(0.00742)	(0.00775)	(0.00729)	(0.0087)	(0.00757)	(0.00715)	(0.00761)
Leverage	-0.0252	-0.0268	0.0378	-0.0352	0.132*	-0.00585	-0.00370
	(0.0633)	(0.0617)	(0.0698)	(0.0808)	(0.0788)	(0.0628)	(0.0640)
ROA	0.0312	0.0342	0.0794	0.0562	0.0198	0.0416	0.0611
	(0.0532)	(0.0513)	(0.104)	(0.152)	(0.104)	(0.0504)	(0.0527)
Total assets	0.005***	0.0045***	0.00343*	0.00296	0.00131	0.0044***	0.0063***
	(0.00163)	(0.00154)	(0.00202)	(0.0019)	(0.00201)	(0.00123)	(0.00157)
Tier 1 capital	0.0674**	0.0657***	0.119***	0.0680	0.119***	0.0656**	0.0649**
	(0.0271)	(0.0247)	(0.0406)	(0.0431)	(0.0401)	(0.0268)	(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

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

The table reports the results of the tests on the association between banks' environmental disclosures and the volume of new loans to borrowers in different industries during a year, as described by Model (1). In all specifications, 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*). 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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. Brown Industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0712	-0.0935*		-0.0507	
	(0.0577)	(0.0555)		(0.0434)	
Brown	-0.221***				
	(0.0266)				
High env. reporter x Brown	0.160***	0.110***	0.0783***	0.0494**	0.0331*
	(0.0349)	(0.0233)	(0.0209)	(0.0207)	(0.0196)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,822,338	3,740,323	3,740,250	828,689	828,074
R^2	0.705	0.200	0.207	0.792	0.797

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Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0420	-0.0695		-0.0390	
	(0.0675)	(0.0557)		(0.0450)	
Green	-0.0580				
	(0.0456)				
High env. reporter x Green	-0.0242	-0.0280	-0.00883	-0.0126	0.00169
	(0.0346)	(0.0201)	(0.0179)	(0.0251)	(0.0240)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,822,338	3,740,323	3,740,250	828,689	828,074
R^2	0.704	0.200	0.207	0.792	0.797

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Table 4. Alternative proxies for brown borrowers

The table explores the association between banks' environmental disclosures and the volume of new loans to borrowers using alternative proxies for brown borrowers. In Panel A, brownness is defined using borrower-level emissions based on Urgentem data during a year. *GHG emissions* denotes the borrower's pollution intensity estimated as the ratio of the sum of Scope 1 and 2 GHG emissions to total revenues. In Panel, *Brown business* denotes an indicator variable constructed by performing textual analysis of business descriptions of public and private companies from S&P Capital IQ. In all specifications, 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*). *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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. Borrower-level GHG emissions

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.193	-0.336**		-0.216	
	(0.148)	(0.157)		(0.133)	
GHG	-0.00129**	0.000742**	0.000929**		
	(0.000598)	(0.000368)	(0.000387)		
High env. reporter x GHG	0.0000882	0.00118**	0.00106*	0.000459	0.000403
	(0.000557)	(0.000559)	(0.000609)	(0.000542)	(0.000579)
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
Bank-Time FE	No	No	Yes	No	Yes
N	3,765	3,637	3,454	2,989	2,786
R^2	0.652	0.542	0.579	0.790	0.807

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Panel B. Brown business description

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0194	-0.0427		-0.0288	
	(0.0309)	(0.0639)		(0.0445)	
Brown business		0.245***	0.244***		
		(0.0323)	(0.0321)		
High env. reporter x Brown business	-0.00488	0.189**	0.191**	0.0269	0.0211
	(0.0232)	(0.0924)	(0.0904)	(0.0406)	(0.0406)
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
Bank-Time FE	No	No	Yes	No	Yes
N	926,883	1,180,106	1,179,910	311,548	3109,51
R^2	0.729	0.254	0.263	0.806	0.811

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Table 5. The Extensive Margin of Bank Lending and Emphasis on the Sustainability of Lending Policies

The table explores 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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. New Relationships

	Entry				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	0.0452**	0.0381		0.0401**	
	(0.0219)	(0.0244)		(0.0173)	
Brown	-0.000804				
	(0.0106)				
High env. reporter x Brown	-0.0125	-0.00408	-0.00629	-0.00291	-0.0105*
	(0.0205)	(0.00763)	(0.00585)	(0.00840)	(0.00579)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,080,303	2,804,073	2,804,052	1,408,479	1,408,397
R2	0.391	0.0921	0.103	0.425	0.434

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Panel B. Relationship Termination

	Exit				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0143	0.00788		-0.00774	
	(0.0284)	(0.0213)		(0.0114)	
Brown	-0.00110				
	(0.00793)				
High env. reporter x Brown	-0.00107	0.00469	0.00678	0.00125	0.00141
	(0.00664)	(0.00964)	(0.00919)	(0.00622)	(0.00617)
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
Bank-Time FE	No	No	Yes	No	Yes
N	1,191,339	1,719,707	1,719,695	919,101	919,040
R^2	0.363	0.0453	0.0535	0.451	0.456

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Table 6. Bank-level Financing to Brown and Green Industries

The table explores the association between banks' environmental disclosures and their credit exposures to brown industries, as described by Model (2). The analyses are at the bank-industry-country-year level. The dependent variable is the ratio of a bank's annual new loan volume to a NACE-2 industry *i* in country *c* in year *t*, divided by the total value of new loans issued by the bank over a year (*Credit share*). *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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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*	-0.0007		0.0008	0.0019	
	(0.00125)	(0.00160)		(0.00118)	(0.00158)	
Brown	-0.0028***	-0.0003	-0.0009			
	(0.000876)	(0.00140)	(0.00133)			
High env. reporter x Brown	0.0115***	0.0090***	0.0070**			
	(0.00328)	(0.00336)	(0.00336)			
Green				-0.0001	0.0002	0.00004
				(0.00079)	(0.00082)	(0.00078)
High env. reporter x Green				-0.00396**	-0.0040**	-0.0033**
				(0.00171)	(0.00172)	(0.00164)
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
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

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Table 7. Loan Contractual Features

The table explores the association between banks' environmental disclosures and loan contractual features. In Panel A, the dependent variable is the agreed annualized interest rate offered by a bank to a given borrower during a year (*Interest Rate*). In Panel B, the dependent variable is the natural logarithm of the original maturity of new loans extended by a bank to a given borrower during a year (*Loan maturity*). 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 rate and maturity, respectively, at the bank-firm-time level using loan sizes as weights. *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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. Interest Rate

	Interest rate				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	0.000959	-0.00107		-0.00104**	
	(0.000945)	(0.000746)		(0.000437)	
Brown	0.00166**				
	(0.000669)				
High env. reporter x Brown	0.000972	-0.000318	-0.000704**	-0.000441	-0.000450
	(0.000726)	(0.000378)	(0.000334)	(0.000446)	(0.000441)
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
Bank-Time FE	No	No	Yes	No	Yes
N	671,120	1,201,352	1,201,282	359,679	359,427
R^z	0.721	0.378	0.392	0.737	0.741

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Panel B. Loan Maturity

	Loan maturity				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	0.0398	0.0389		0.0500	
	(0.0741)	(0.0320)		(0.0327)	
Brown	-0.170***				
	(0.0344)				
High env. reporter x Brown	0.112*	0.0223	-0.0168	0.000923	-0.0201
	(0.0627)	(0.0238)	(0.0176)	(0.0260)	(0.0208)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,810,878	3,712,480	3,712,407	824,777	824,165
R^2	0.519	0.250	0.268	0.656	0.665

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Table 8. Banks' Emphasis on the Sustainability of Lending Policies and the Funding of Transition to Greener Technologies

The table explores whether the association between banks' environmental disclosures and the volume of new loans to brown borrowers is explained by banks' financing the transition to greener technologies as described by Model (3). 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. All variables are defined in Appendix A. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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									
Proxy:	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***	0.0384*	0.0715***	0.0346	0.0645***	0.0430*	-0.0478	0.0337	0.0614*	0.0274
	(0.0173)	(0.0220)	(0.0189)	(0.0247)	(0.0190)	(0.0236)	(0.0685)	(0.0324)	(0.0369)	(0.0254)
High env. reporter x Proxy	0.161	0.211	0.0274	-0.0145	0.0867	0.0458	1.001***	0.481**	0.154	0.0608
	(0.265)	(0.141)	(0.0603)	(0.0169)	(0.0793)	(0.0284)	(0.348)	(0.228)	(0.178)	(0.0520)
High env. reporter x Brown x Proxy	-0.509	-0.487**	-0.00095	0.0257	0.0387	-0.0452	-1.492**	-0.395	0.0694	0.0623
	(0.522)	(0.229)	(0.0506)	(0.0272)	(0.0617)	(0.0443)	(0.671)	(0.636)	(0.187)	(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

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Table 9. 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, as described by Model (3). 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. In all specifications, 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*). The dummy variable *Brown* takes the value of 1 if the firm belongs to the NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the top quintile of all industries in the respective reporting country during year *t*, and 0 otherwise. *High environmental reporter* is a dummy variable that takes value equal to 1 if bank's *Environmental Disclosures* rank in the top quintile of the variable's distribution in year *t*, and 0 otherwise. Fixed effects are included as indicated in the table, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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							
Proxy:	Exposure		Large Firms		High Leverage		Low Interest Coverage Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High env. reporter x Brown	0.0105	0.0246	0.0767**	0.0346*	0.0838***	0.000759	0.0838***	0.000759
	(0.0462)	(0.0233)	(0.0313)	(0.0184)	(0.0263)	(0.0284)	(0.0263)	(0.0284)
High env. reporter x Proxy	0.0160	0.0875	-0.0987	-0.0204	0.0140	0.0756***	0.0845	0.0175
	(0.0791)	(0.0971)	(0.0854)	(0.0563)	(0.0610)	(0.0288)	(0.120)	(0.0169)
High env. reporter x Brown x Proxy	0.181***	0.108**	-0.118*	0.00458	0.0297	0.117***	0.0298	0.176***
	(0.0657)	(0.0487)	(0.0713)	(0.0284)	(0.0681)	(0.0372)	(0.103)	(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

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Table 10. Cross-sectional Differences in Institutional and Bank-specific Characteristics

We test whether the association between banks' environmental disclosures and lending to borrowers in green industries 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. In all specifications, 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. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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									
Factor:	Low Tier 1capital		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**	0.0214	-0.0487	-0.168**	0.107	0.0744	-0.0447	0.132	0.0816***	0.0257
	(0.0189)	(0.0290)	(0.0565)	(0.0837)	(0.0985)	(0.0873)	(0.0660)	(0.0953)	(0.0312)	(0.0236)
High env. reporter x Brown x Factor	0.0807**	0.0215	0.136**	0.205**	-0.0265	-0.0379	0.129*	-0.101	-0.0146	-0.00180
	(0.0399)	(0.0340)	(0.0543)	(0.0840)	(0.101)	(0.0888)	(0.0731)	(0.0947)	(0.0425)	(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

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Appendix A. Variable Definitions

Variables	Variable definitions
Bank disclosure characteristics	
Environmental disclosures	The ratio of number words in paragraphs that emphasize the sustainability of a bank's lending policies in its investor reports during a year relative to the total number of words in the bank's investor reports during that year.
SBTi	Binary variable equal to one if a bank has joined the signatories of the Science Based Targets initiative, zero otherwise.
GRI standards	Binary variable equal to one if a bank prepares the sustainability reporting under the Global Reporting Initiative Standards, zero otherwise.
Integrated reporting	Binary variable equal to one if a bank issues an Integrated Report, zero otherwise.
Bank sustainability performance	
Bloomberg Env score	Bank's Environmental disclosure score provided by Bloomberg.
ESG Corporate Knights	Binary variable equal to one if a bank is included in ESG Corporate Knights' short-list of top ESG performers, zero otherwise.
Green bond issuance	The ratio of the annual green bond volume a bank underwrites to bank's total assets. Green bond issuance volume is obtained by Bloomberg.
MSCI Env score	Bank's environmental pillar score provided by MSCI.
Sustainalytics Env score	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	
Leverage	Total debt to total assets.
ROA	Operating income to gross loans.
Total assets	The natural logarithm of total assets (in Euro).
Tier 1 capital	Tier 1 capital to total assets.
AnaCredit loan variables	
Loan Amount	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.

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Loan Interest Rate	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, *Loan Interest Rate* is computed as the weighted average of the loan interest rates at the bank-firm-time level using loan sizes as weights.
Loan Maturity	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, *Loan Maturity* is computed as the weighted average of the loan maturity at the bank-firm-time level using loan sizes as weights.
Exposure	A share of credit a firm *f* receives from bank *b* as a share of the firm's total bank credit outstanding.
Brown / Green industries and firms	
Brown	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 quintile of the ratio's distribution across all industries in the firm's country during a year, zero otherwise.
Green	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 bottom quintile of the ratio's distribution across all industries in the firm's country during a year, zero otherwise.
GHG emissions	The borrower's pollution intensity measured as the ratio of the sum of Scope 1 and 2 GHG emissions to total revenues. Source: Urgentem.
Brown (Green) business	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 B.
Firm characteristics (Orbis)	
R&D	Firm's ratio of R&D to total assets.
Investment	Firm's ratio of change in fixed assets to total assets.
Interest coverage ratio	Firm's EBIT to interest expense.
Leverage	Firms' total debt to total assets.

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Appendix B. Dictionaries

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
asbesto	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 spil
decommision	distributed generate	uranium	organic
degas	electricity storage	voltage regulation	protected area
electric bus	energy audit	**CIRCULARITY**	rainforest
electric car	energy certified(-cation)	biowaste	reforestration
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

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fuel consumption	energy recovery	potabilization	drone imaging
fuel inspection	energy saving	rainwater	energy perfomance
fuel repair	energy storage	recycling	enviromental 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 MANAGEMENT	nuclear	water reuse	environmental technology
alternative energy	ocean energy	water safety	green
alternative fuel	photovoltaic	water scarcity	natural science
battery(-ies)	proofing	water treatment	pollutant
bioclimatic	renewable	**BIODIVERSITY**	pollution
bioenergy	retrofit	ecology	sustainability
biofuel	sealing	ecosystem	sustainable
biogas	smart energy	endangered	

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Appendix C. Example 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.

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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 (…)

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Appendix D. Examples of ChatGPT prompt.

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.

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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.

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Internet Appendix.

A. Supplementary Tables

Table IA.I. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries-Robustness using Post 2018 Period

The table reports the results of a robustness test of the baseline analyses in Table 3 considering only loans originated post 2018. In all specifications, 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*). 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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. Brown Industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0304	-0.0867		-0.0448	
	(0.134)	(0.0786)		(0.0471)	
Brown	-0.0497***				
	(0.0182)				
High env. reporter x Brown	0.00809	0.101***	0.0847***	0.0275	0.0311
	(0.0234)	(0.0213)	(0.0243)	(0.0197)	(0.0217)
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
Bank-Time FE	No	No	Yes	No	Yes
N	1,614,428	2,483,590	2,483,549	669,713	669,496
R^2	0.761	0.183	0.187	0.781	0.785

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Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0268	-0.0649		-0.0380	
	(0.140)	(0.0816)		(0.0485)	
Green	-0.0181				
	(0.0474)				
High env. reporter x Green	-0.00402	-0.0205	0.00239	-0.00774	0.00491
	(0.0317)	(0.0241)	(0.0171)	(0.0321)	(0.0279)
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
Bank-Time FE	No	No	Yes	No	Yes
N	1,614,428	2,483,590	2,483,549	669,713	669,496
R^2	0.761	0.183	0.187	0.781	0.785

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Table IA.II. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries-Robustness using Environmental Disclosures as a Continuous Variable

The table reports the results of a robustness test of the baseline analyses in Table 3 using a continuous version of the *Environmental disclosures* variable. In all specifications, 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*). 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. *Environmental disclosures* variable is defined as the percentage of the ratio of the number of words in paragraphs that we classify as emphasizing the sustainability of a banks lending policies during a year to the total number of words in the bank's investor reports during that year. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. Brown Industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
Environmental disclosures	1.215	0.286		0.179	
	(0.813)	(0.551)		(0.834)	
Brown	-0.162***				
	(0.0373)				
Environmental disclosures x Brown	-0.941	0.948***	0.687**	0.185	0.0698
	(0.793)	(0.309)	(0.318)	(0.276)	(0.228)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,822,338	3,740,323	3,740,250	828,689	828,074
R^2	0.705	0.200	0.207	0.792	0.797

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Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
Environmental disclosures	1.173	0.476		0.349	
	(0.809)	(0.516)		(0.789)	
Green	-0.0835*				
	(0.0481)				
Environmental disclosures x Green	0.498	-0.369	-0.187	-0.546	-0.308
	(0.362)	(0.278)	(0.242)	(0.344)	(0.374)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,822,338	3,740,323	3,740,250	828,689	828,074
R^2	0.705	0.200	0.207	0.792	0.797

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Table IA.III. Robustness: Using Lagged and Future Disclosures

The table reports the results of a robustness test 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. In all specifications, 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. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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: Robustness using Lagged Environmental Disclosures

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

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Panel B: Robustness with Leads and Lags of Environmental Disclosures

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter (t-1) x Brown	0.0796***	0.0309*				
	(0.0212)	(0.0186)				
High env. reporter (t) x Brown			0.0783***	0.0331*		
			(0.0209)	(0.0196)		
High env. reporter (t+1) x Brown					0.0790***	0.0342
					(0.0196)	(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

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

The table reports the results of the tests on the extensive margin of banks' credit decisions considering green industries. 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, *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 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*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. New Relationships

	Entry				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	0.0348	0.0328		0.0338**	
	(0.0212)	(0.0231)		(0.0159)	
Green	0.0166				
	(0.0207)				
High env. reporter x Green	0.0199*	0.0125	0.00895*	0.0159	0.0119**
	(0.0101)	(0.00865)	(0.00497)	(0.00975)	(0.00461)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,080,303	2,804,073	2,804,052	1,408,479	1,408,397
R2	0.391	0.0921	0.103	0.425	0.434

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Panel B. Relationship Termination

	Exit				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0121	0.0103		-0.00582	
	(0.0295)	(0.0219)		(0.0118)	
Green	-0.0310**				
	(0.0136)				
High env. reporter x Green	-0.00886	-0.00624	-0.00305	-0.00628*	-0.00459
	(0.00618)	(0.00392)	(0.00305)	(0.00370)	(0.00318)
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
Bank-Time FE	No	No	Yes	No	Yes
N	1,191,339	1,719,707	1,719,695	919,101	919,040
R^2	0.363	0.0453	0.0535	0.451	0.456

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

The table tests whether firms that receive loans from high environmental reporters subsequently reduce their GHG emissions obtained from Urgentem data. The dependent variable is the borrower's pollution intensity estimated as the ratio of the sum of Scope 1 and 2 GHG emissions to total revenues. Columns (1) and (2) estimate the effect on GHG in year *t+1*. Columns (3)-(4) and (5)-(6) report the effects for subsequent year *t+2* and *t+3,* respectively. *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. OLS regressions are used to estimate the models. 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.

	GHG emissions (t+1)		GHG emissions (t+2)		GHG emissions (t+3)	
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter exposure	10.88	7.242	13.52	7.624	9.345	0.165
	(15.44)	(7.653)	(17.81)	(9.407)	(23.26)	(8.039)
Industry-Country-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
N	1105	837	827	558	557	271
R^2	0.335	0.934	0.325	0.930	0.348	0.962

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

We test whether high environmental reporters lend more to green firms defined based on their business descriptions. *Green 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. In all specifications, 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*). All variables are defined in Appendix A. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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)
High env. reporter	-0.0216	-0.0386		-0.0297	
	(0.0308)	(0.0639)		(0.0447)	
Green Business		0.816***	0.810***		
		(0.0444)	(0.0447)		
High env. reporter x Green Business	0.0648	0.158	0.168	0.0618	0.0715
	(0.0338)	(0.148)	(0.147)	(0.0471)	(0.0478)
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
Bank-Time FE	No	No	Yes	No	Yes
N	926,883	1,180,106	1,179,910	311,548	310,951
R^2	0.729	0.257	0.266	0.806	0.811

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B. 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.[13]

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").[14] 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.VIII 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.

[13] 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/.

[14] 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' greenwashing. 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).

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Appendix IA.VII 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		

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Table IA.VIII. Banks' Emphasis on the Sustainability of Lending Policies and New Loans to Green and Brown Industries: Robustness using Dictionary-Based Text Analysis

The table reports the results of the tests on the association between banks' environmental disclosures and the volume of new loans to borrowers in different industries during a year, as described by Model (1). In all specifications, 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*). 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. The variable is constructed 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 using the dictionary-based approach. Bank controls include *Total assets*, *Leverage*, *ROA*, and *Tier 1 Capital*. All variables are defined in Appendix A. Fixed effects and bank controls are included as indicated, but not tabulated. Dash (-) symbol refers to the fact that the controls/fixed effects are not applicable as they are nested in different (higher-order) fixed effects. OLS regressions are used to estimate the models. 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. Brown Industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0740	-0.0968***		-0.0177	
	(0.0582)	(0.0300)		(0.0173)	
Brown	-0.186***				
	(0.0323)				
High env. reporter x Brown	0.129**	0.0878**	0.0978***	0.0715**	0.0538*
	(0.0510)	(0.0372)	(0.0282)	(0.0321)	(0.0284)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,231,059	3,058,259	3,058,180	636,717	636,085
R^2	0.712	0.206	0.213	0.799	0.803

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Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0409	-0.0855**		-0.00326	
	(0.0609)	(0.0356)		(0.0245)	
Green	-0.0282				
	(0.0285)				
High env. reporter x Green	-0.0674	-0.00839	-0.00487	-0.0239	-0.0121
	(0.0512)	(0.0445)	(0.0341)	(0.0701)	(0.0601)
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
Bank-Time FE	No	No	Yes	No	Yes
N	2,231,059	3,058,259	3,058,180	636,717	636,085
R^2	0.712	0.206	0.213	0.799	0.803

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