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

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ABSTRACT:

Using a credit registry of European banks' new loan issuance and content analysis on their environmental disclosures, we show that banks that discuss the environment more extensively extend a higher volume of credit to borrowers in brown industries. These results are robust even after controlling for banks' climate risk discussions and cannot be attributed to the financing of borrowers' transition towards greener technologies. Examining the mechanisms behind the strategic disclosure choices, we highlight that banks are hesitant to sever ties with existing brown borrowers, particularly when those borrowers exhibit financial underperformance or banks have low capital adequacy.
Keywords: financial institutions, sustainability reporting, strategic disclosure, credit exposure, zombie lending

JEL classification: G11, G15, G21

1. Introduction

Many large European banks celebrate themselves as pioneers in embracing environmental values and engaging in climate-sensitive initiatives (e.g., European Central Bank [ECB] 2022). Following a global trend of exponential growth in sustainability disclosures (e.g., Christensen et al. 2021), banks have expanded their reporting practices to emphasize their stewardship for achieving climate goals. Yet, over the past few years, policymakers and industry commentators have raised concerns about whether banks strategically select to disclose favorable information over their environmental actions and impact (e.g., ECB 2023; Standard and Poor's 2023).[1] Discussions about regulating environmental disclosures are heated on both sides of the Atlantic (ECB 2022; Security and Exchange Commission [SEC] 2022).

We contribute to this debate by examining whether banks' environmental disclosures reflect their lending choices. European regulators have repeatedly stressed the potentially important role of banks in financing green projects and guiding the transition to a carbon-neutral economy (e.g., European Commission [EC] 2019; UN Environment Programme Finance Initiative [UNEP-FI] 2022). Climate-conscious institutional investors have also pressured banks to reduce the financing of brown industries and align their lending activities with the goals of the Paris Climate Agreement (The Institutional Investors Group on Climate Change [IIGCC] 2021). Both stakeholder groups have called for greater transparency of banks' climate governance, strategy, and impact.

We show that environmental disclosures do not reflect lending decisions, suggesting that banks emphasize sustainability performance on several other dimensions of their business to cover up continued lending to brown sectors. Thus, banks are likely to strategically report positive sustainability actions and withhold information about negative ones, potentially

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[1] For instance, BNP Paribas, HSBC, and Deutsche Bank have been facing litigations and fines over misleading environmental disclosures (https://www.environmental-finance.com/assets/files/magazines/ef-winter-2020.pdf).

misleading investors, customers, and regulators. This evidence lends empirical support to the rising concerns over the completeness and reliability of banks' environmental disclosures.

Our empirical analysis relies on a credit registry recently launched by the European System of Central Banks, AnaCredit (AC). AC covers granular information on new loan issuance and credit exposures by euro area banks and detailed data on borrowers' characteristics. We collect information on the environmental disclosures of the systemic banks in the euro area using banks' investor reports and a dictionary of environment-related keywords, which we develop with the aim of capturing banks' claims on their sustainability policies. We validate our proxy for the volume of banks' environmentally themed disclosures by showing that it is positively associated with a country's social attention towards sustainability topics (e.g., Ioannou and Serafeim, 2012; Christensen et al. 2022) and the bank's reputation as captured by environmental score ratings and disclosure ratings (e.g., Serafeim 2014; Christensen et al. 2022). Environmental disclosures also reflect banks' market activities, such as green bond issuance. Furthermore, even though more extensive environmental disclosures are associated with larger past exposures to brown industries, they tend to have positive sentiment. Taken together, this evidence suggests that our measure effectively captures the extent to which a bank stresses environmental goals in its communication to investors and its environmental sustainability profile.

Having established the relevance of our proxy for environmental disclosures, we explore whether it also reflect banks' lending activities, which being opaque may not dent the bank's reputation with stakeholders. We proxy for borrower's brownness using industry- and firm-level greenhouse gas (GHG) emissions as well as a newly developed proxy for the greenness and brownness of borrowers' operations based on their business descriptions. This approach allows us to examine loan issuance to small, less visible borrowers (i.e., when focusing on industry-level GHG emissions as well as on our textual analysis proxy), but also to document

that our conclusions continue to hold when using more granular proxies for brownness available for large borrowers.

We find that banks that portray their activities as more sustainable extend more credit to borrowers in brown industries and borrowers with higher emissions in general. This pattern is most pronounced for smaller borrowers, indicating that going beyond the largest borrowers and focusing on the whole bank loan portfolios is crucial to evaluate the environmental impact of banks' lending decisions. We further show that the disconnect between banks' environmental disclosures and brown lending is not offset by a greater lending activity in green industries, further supporting that disclosures exaggerate banks' environmental stewardship.

All our estimates are obtained controlling for 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 et al., 2018; Degryse et al., 2019), which allow us to identify the credit supply of banks that emphasize the sustainability of their lending policies. 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.

One possibility is that banks with extensive environmental disclosures lend to borrowers in brown industries to facilitate their transition to greener technologies. To this end, we develop several empirical tests to examine the transition financing channel. First, 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. Second, we exploit the fact that green transition is typically capital-intensive and requires large amounts of credit. However, 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 transition lending is unlikely to drive our findings. Third, existing literature has

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documented that young new entrants are more likely to innovate and disrupt old technologies (e.g., Aghion et al., 2016). We thus examine whether high-environmental-disclosure banks are more likely to lend to young firms in brown industries. Instead, we find that high environmental reporters extend disproportionately less credit to young firms in brown industries, indicating that they unlikely to fund borrowers' the adoption of greener technologies. Finally, we reach a similar conclusion when we identify borrowers with well-defined plans to reduce their carbon emissions through the Science Based Target Initiative (SBTi). Specifically, we compare lending to similarly sized brown firms with and without science-based emission targets to focus on a sample of borrowers with similar dependence on bank credit and find no evidence that firms with clearly defined plans to reduce carbon emissions obtain more funding from banks with more extensive environmental disclosures. Our results indicate that these banks are unlikely to engage in transition lending. We also find no evidence that past environmental disclosures predict a decrease in lending to brown industries.

Interestingly, even though banks with more extensive environmental disclosures do not exhibit a lower propensity to issue brown loans, they are less likely to start new relationships with brown borrowers. Instead, banks with extensive environmental disclosures tend to extend more loans to brown borrowers with which they have stronger relationships, as measured by the proportion of outstanding loans they extended in the past. In addition, these banks tend to fund borrowers in brown industries, especially if they are less profitable, have low productivity, and lower interest coverage ratio. The discrepancies between actual lending decisions and the environmental profiles banks aim to project thus appear to be accentuated by banks' propensity to continue lending to financially unhealthy brown borrowers. These borrowers have typically fewer financing alternatives. Thus, terminating the relationships would force banks to not only realize credit losses but also to explain their exposures to brown industries, suggesting that relationships with zombie firms hinder banks' efforts to reduce their environmental impact.

Consistent with this hypothesis, we find that the discrepancies between environmental disclosures and the environmental impact of lending decisions are particularly pronounced for banks with low capitalizations, that is, the banks that have particularly strong incentives to engage in zombie lending (Peek and Rosengren, 2005; Giannetti and Simonov, 2013). Overall, these findings suggest that bank relationships and previous exposures limit the role that banks can play in financing the climate transition. In this respect, our findings are consistent with De Haas and Popov (2023) and Degryse et al. (2023), who show that debt financing can slow the transition to a greener economy.

Finally, we show that large banks, which arguably are under greater pressure by stakeholders to legitimize their operations and lending choices, are particularly inclined to boost their environmental profiles, even if they provide large amounts of credit to borrowers in brown industries. Mandatory sustainability reporting and the use of an external auditor do not appear to influence the relation between environmental-themed disclosures and brown lending, potentially because climate disclosures are not easily verifiable or standardized to be effectively audited or regulated.

Our paper makes several important contributions to the literature. First, we contribute to a flourishing literature on the environmental practices and decarbonization process in the banking sector. While European banks have overwhelmingly adopted climate-related goals following the Paris agreement (Reghezza et al., 2022), the evidence on whether banks can develop a credible reputation for greener lending policies is mixed. For instance, Basu et al. (2022) find no association between banks' social score rating and mortgage issuance in poor localities in the U.S., while Houston and Shan (2022) show that banks with high ESG ratings are more likely to engage in syndicated loans with borrowers of similar ESG risk. Similarly, Kacperczyk and Peydro (2022) and Degryse et al. (2023) show that banks that become members of initiatives, such as the SBTi and the United Nations Environment Programme

Finance Initiative, extend more syndicated loans to greener borrowers at lower prices. However, Laeven and Popov (2023) find that banks extend more syndicated loans in fossil and fuel industries after the adoption of carbon taxes in their domestic country. To the best of our knowledge, we are the first to explore banks' environmental disclosures and their association with their lending practices. In addition, existing literature mostly relies on large exposures or syndicated loans, 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 opaque and therefore less likely to affect banks' reputation.

Second, we add to prior research on the accuracy of sustainability disclosures. Environmental performance is multidimensional, and managers have incentives to selectively disclose positive information on companies' environmental performance to decrease their funding costs (Shin 2003; Lyon and Maxwell, 2011). Existing studies offer mixed evidence on the accuracy of sustainability disclosures primarily due to reliance on small samples and the empirical challenges in capturing sustainable investments for nonfinancial corporations (e.g., Cho and Patten 2007; Cho et al. 2012; Hummel and Schlick 2016; Marquis et al. 2016; Khan et al. 2016; Grewal et al. 2019; Huang and Lu 2022; Baker et al., 2022). Taking advantage of banks' granular loan-level reporting in a credit registry, we can observe lending to brown and green borrowers and find that it does not reflect banks' environmental disclosures.

Lastly, although firms increasingly integrate sustainability goals in their business models (e.g., Hart and Zingales 2017; Rajan et al. 2022; Serafeim 2022), recent studies show that firms often exaggerate over their sustainability credentials. Most notably, Kim and Yoon (2022), Gibson et al. (2022) and Raghunandan and Rajgopal (2022) find that funds with an ESG mandate fail to make sustainable investment choices. We contribute to this research by providing novel insights from the banking sector. Our results also imply that the ESG rating shortcomings highlighted in previous literature (e.g., Dhaliwal et al., 2012; Berg et al. 2021;

Serafeim and Yoon, 2022a; Serafeim and Yoon, 2022b; Christensen et al., 2022) can be at least partially attributed to their reliance on firms' inadequate and unsubstantiated disclosures.

2. Data Sources and Main Variables

2.1. Bank lending policies

We focus on loans to corporate borrowers issued by large banks in the Eurozone. Our data collection starts from 115 banking groups, which for their size are considered systemically important and are subject to the Single Supervisory Mechanism (SSM). We eliminate nine banks with headquarters in the USA and Canada, for which the lending activities described in the investor reports primarily concern non-European borrowers and are not covered in our credit register.[2] We retain European banks with headquarters outside the Eurozone (e.g., Barclays, HSBC, UBS), because a significant proportion of their loan portfolio pertains to Eurozone borrowers and is extended by subsidiaries included in the Eurozone credit registries. We further exclude two nonbank systemic lenders (Volkswagen Bank and Renault Crédit International); two banks solely catering to private clients and mortgage borrowers (Precision Capital and CRH, respectively); and one financial holding of a systemic bank (Raiffeisenbankengruppe OÖ Verbund). Our final sample includes 101 systemic banking groups. Considering all their subsidiaries, we have a total of 553 banks.

For each subsidiary, we obtain loan-level data from AnaCredit (AC), a credit register launched 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). An important advantage of AC over national banks' credit

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[2] These banks include: The Bank of New York Mellon (identified as systemic in Belgium), Goldman Sachs Europe (Germany), J.P. Morgan (Germany and Luxemburg), Morgan Stanley (Germany), State Street (Germany), Bank of America (Ireland), Citibank (Ireland) and RBC (Luxemburg).

data repositories is the harmonization of loan-level information across different countries. All banks report any loan provided to firms if the exposure to the borrower exceeds EUR 25,000.

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, where 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.[3] Our measure of new loans to a borrower includes all facilities a bank (subsidiary) has granted to a borrower during a year with the exception of credit lines, because drawn credit lines reflect the borrower's demand as well as the supply of credit. Appendix A provides detailed all variable definitions.

2.2 Green and brown borrowers

We rely on three alternative specifications of green and brown borrowers that trade off firm coverage and granularity of information on the technology and emissions of a specific borrower.

First, to have the largest possible coverage, we proxy for the environmental impact of banks' lending decisions using greenhouse gas (GHG) emissions data at the industry (NACE 2)-country-year level, retrieved from Eurostat over the 2014-2020 period. We standardize emissions using the industry's value added in that country and year to account for the fact that industry size differs 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. Based on this methodology, examples of

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[3] To mitigate the concern that extending the sample's time-series 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.II).

brown industries include Crop and animal production, hunting and related service activities; Manufacture of coke and refined petroleum products; Electricity, gas, steam, and air conditioning supply; Land transport and transport via pipelines; Air travel, etc. Examples of green industries include Manufacture of electrical equipment; Wholesale trade, except of motor vehicles and motorcycles; Real estate activities; Legal and accounting activities; Architectural and engineering activities, technical testing, and analysis; Advertising and market research; Human health activities, etc.

In our primary analyses, we focus on whether banks' environmental disclosures reflect their lending activity in brown industries, since this association can arguably more objectively indicate greenwashing. However, in supplemental tests, we show that our conclusions are invariant when we consider loans to green industries.

Second, to mitigate concerns that heterogeneity in pollution intensity across firms within a sector affects our results, we also obtain firm-level GHG emissions from Urgentem. The Urgentem Carbon Dataset covers the full spectrum of Scope 1, 2 and 3 emissions reported by more than 6,000 global companies at a consolidated level. 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. We thus use as an alternative proxy for a borrower's "brownness" the intensity ratio of Scope 1 and 2 GHG emissions to its total revenues.

Finally, since we are able to obtain emissions only for 574 very large borrowers through Urgentem, we retrieve companies' business descriptions for a total of 150,105 public and private companies in AC from S&P Capital IQ. We perform textual analysis of business descriptions using the EU taxonomy for sustainable activity to create a dictionary for brown and green firms. Specifically, we list in Appendix B.3 the words related to brown and green

activities which we obtain from the EU taxonomy. We define a business as brown (green) if a brown (green) word occurs in the firm's business description without being accompanied by a green (brown) word. We employ the resulting borrower classification in our tests to complement industry and borrower level GHG emissions.

2.3 Banks sustainability reporting

We construct our proxy for environmental disclosures from the investor reports of the banking groups in our sample. Investor reports commonly discuss firms' environmental activities, including sustainability, financial and nonfinancial information.[4] Absent a central repository of European firms' reports, similar to EDGAR in the US, we retrieve investor 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, which includes a large report directory of international firms. Despite our best efforts, our sample does not include documents that cannot be downloaded from banks' websites (or that are not covered by the Corporate Register). We posit that this restriction likely biases us against constructing a relevant proxy for banks' environmental disclosures that can be further validated. Further, the majority of the reports are written in English, which facilitates the consistency of the textual analysis procedures and dictionary selection. We exclude 88 reports that are provided only in the language of the bank's country of incorporation to avoid challenges arising from translating the dictionary used in the textual analysis.

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[4] Sustainability reports are usually separate from annual reports and are used by firms to communicate their environmental, social and governance activities. Sustainability reports 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), further providing information on firms' sustainability initiatives. 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 ("triple-bottom line").

Moreover, while banks' reports are mostly prepared at the parent level and are informative about the activities of the whole banking group, many of the systemic financial institutions in our sample are bank subsidiaries. We collect reports at the parent level when subsidiary reporting is unavailable and use a bank's consolidated disclosures on environmental strategies for its subsidiaries.

Panel A of Table 1 includes descriptive statistics of the reports used in the textual analysis. Our final sample of documents includes 623 annual reports, 273 sustainability reports, 57 integrated reports, and 61 nonfinancial reports. In 220 filings, the sustainability report was included as part of a bank's annual report. 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 to construct our proxy for banks' environmental disclosures.

2.4. Textual analysis and the environmental disclosure variable

To capture the extent to which banks claim to embrace environmental sustainability goals in their disclosures, we develop our own dictionary tailored to the banking context, as is considered best practice in textual analysis (Li, 2010). 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.[5]

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[5] 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/.

Our dictionary of environment-related keywords in bank reports 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"), 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").[6] The full list of environmental keywords is reported in Appendix B.1. Examples of banks' disclosures of their environmental activities are provided in Appendix C.

We reduce all keywords to their stems before performing the textual analysis of banks' documents. 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"). The mean value of *Environmental disclosures* is about 1.12% (Panel B of Table 1) and is small by construction because banks use disclosures to report about many topics including financial performance. In addition, we count the keywords in our dictionary without considering specific words in the text around these keywords.[7] Figure 1 shows that the volume of environmental disclosures increases by about 27% over our sample period, in line with firms increasing focus on climate topics (Ioannou and Serafeim, 2012; Rouen et al., 2022).

Figure 2 reports the words that banks most frequently employ in sentences with at least one environmental disclosure keyword. Banks commonly discuss their climate footprint in conjunction with their "finance" activities and "loan" decisions to portray their active contribution to a sustainable economy.

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[6] 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).

[7] This approach has been widely adopted in prior studies employing textual analysis (e.g., Matsumoto et al., 2011; Brochet et al., 2015; Bozanic et al., 2018; Campbell et al., 2019).

Occasionally, banks discuss different aspects of their environmental activities, for instance, emphasizing their direct emissions or their asset management activities. Our objective is to explore whether banks' claims of sustainability performance with respect to any of their activities are associated with greener lending policies, or if rather banks use sustainability performance in one dimension to cover their brown credit exposures. Based on such a definition of greenwashing, which is widely used by both academics (e.g, Lyon and Maxwell 2011) and practitioners (Hales 2021), we test whether by selectively disclosing positive environmental information on any of their activities, banks aim to project an image of environmental stewardship, which is not reflected in their lending activities.

We note that banks may discuss the environment in connection to their economic exposures to climate "risk". In these cases, as illustrated by the disclosures of Commerzbank in Appendix C, banks, which were not obliged to disclose these risks in the Eurozone during our sample period, typically discuss their policies aiming to decrease the exposures.[8]

To address concerns that banks may simply inform investors about their financial exposure to climate risk, instead of emphasizing their environmental stewardship, we consider that disclosures aiming to portray a bank as environmentally conscious are likely to have positive sentiment. We thus construct a measure of sentiment of the environmental disclosures following by Hassan, Hollander, Van Lent, and Tahoun (2019). Specifically, we condition on proximity of our environmental vocabulary words to positive and negative words, identified from Loughran and McDonald's (2011) dictionary of words related to sentiment in financial texts. Our proxy for the sentiment of environmental disclosures is then defined as:

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[8] The SSM published guidelines on the disclosure of climate-related and environmental risks only in November 2020, that is, when our sample period ends.
https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-relatedandenvironmentalrisks~58213f6564.en.pdf

$$Sentiment_{i,t} = \frac{\sum_b^{B_{i,t}}\{I[b \in E] \times \sum_{c=b-10}^{b+10} S(c)\}}{B_{i,t}},$$

where E is the set of words in our environmental dictionary; $B_{i,t}$ is the total number of words in the investor and sustainability reports of firm *i* during year *t*; and *S(c)* is a function that assigns a value of +1 if word c is associated with positive sentiment and a value of -1 if word c is associated with negative sentiment; *S(c)* takes value zero otherwise. $\sum_{c=b-10}^{b+10} S(c)$ calculates the net sentiment among the ten words surrounding any word in our environmental vocabulary.

Panel A of Figure 3 shows that banks with more extensive environmental disclosures tend to discuss environmental issues with positive sentiment, indicating that our keywords are unlikely to capture the financial risks arising from climate change and rather proxy for the extent to which banks stress their environmental stewardship.

Besides using the sentiment of the environmental disclosures, in the empirical analysis, we also perform a robustness check defining the proxy for environmental disclosures without environmental keywords mentioned in conjunction to risk and stress tests. We introduce this alternative proxy in the empirical analysis.

3. Validation of the Environmental Disclosure Proxy

To evaluate whether our environmental disclosure proxy captures how a bank portrays its environmental stewardship to investors, we examine its association with countries' social norms and banks' financial performance, environmental ratings, and green bond issuance. Since disclosures are often consolidated, we perform this analysis at the banking group level.

First, prior studies show that national ideologies and social values are related to the disclosure of ESG-related information (e.g., Ioannou and Serafeim, 2012; Christensen et al., 2021). Building on this work, we expect that banks domiciled in countries with stronger public

attention towards sustainability topics will be pressured to commit to more extensive environmental disclosures.

To test our predictions, we employ data from the European Social Survey to capture societal pressure in the countries of the sample banks' headquarters. Specifically, we define a proxy for country-level *Activism* as the percentage of respondents that claim that they would boycott a product, take part in lawful public demonstrations, sign petitions, and post political comments online. We also define a proxy for interest in environmental and social issues in a given country based on the percentage of people responding that it is important: i) to care for the environment; ii) to behave properly; iii) that people are treated equally and have equal opportunities (*Socioeconomic beliefs*) during a year. In addition, using the World Bank ESG data, we define an indicator variable for whether a bank's headquarters country is classified as high environmental risk using ESG country scores (*High Env risk country*), conjecturing that attention to environmental issues is higher in these countries.[9] In column 1 of Table 2, consistent with our expectations, we find that banks in countries with greater social activism and environmental risk exposures are more likely to provide extensive environmental disclosures.

Second, we conjecture that our proxy for environmental disclosures will be positively associated with banks' voluntary adoption of sustainability reporting standards. We thus consider whether a bank prepares its sustainability disclosures under the Global Reporting Initiative Standards (*GRI standards*) and whether a bank has adopted integrated reporting (*Integrated reporting*).[10] We control for several proxies for size and financial performance, including the natural logarithm of total assets (*Total assets*), the ratio of Tier 1 capital to total

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[9] Details on the variable construction are included in Appendix D.
[10] GRI standards offer modular, detailed guidelines that help firms standardize their measurement and disclosure of performance metrics with respect to material sustainability topics. GRI is an international independent organization, and its sustainability reporting standards have been widely adopted by more than 10,000 companies in 100 countries.

assets (*Tier 1 capital*), and the ratio of operating income to gross loans (*ROA*). We also control for a bank's financial vulnerability using the ratio of total debt to total assets (*Leverage*). Data on banks' financial performance are obtained from FINREP.

In column 2 of Table 2, our environmental disclosure proxy is positively associated with the likelihood of GRI sustainability reporting. In addition, while there is weak evidence of a link between our disclosure measure and banks' financial performance, *Tier 1 capital and Total Assets* (*ROA* and *Leverage*) are positively related to *Environmental disclosures* in two (three) out of six specifications, suggesting that if anything, more visible and reputable banks disclose a larger volume of environmental-related information as documented in previous literature (e.g., Serafeim, 2014).

Third, prior studies have documented the association between the volume of firms' sustainability disclosures and ESG ratings (e.g., Basu et al., 2022; Christensen et al., 2022). Such an association would be particularly important in our context because it would confirm that a bank's environmental disclosures are associated with its reputation for environmental stewardship. We thus posit that environmental disclosures should be positively related to environmental scores provided by reputable rating agencies, such as MSCI (*MSCI Env score*) and Sustainalytics (*Sustainalytics Env score*). Related, our proxy should be further associated with the environmental disclosure score by Bloomberg that captures the availability of climate-related information by firms (*Bloomberg Env score*). The mean MSCI and Sustainalytics environmental scores of the sample banks are 5.3 and 59.4, respectively; the mean Bloomberg environmental disclosure score is 41.5. These values are higher than the mean respective scores reported in other studies (e.g., Berg et al., 2022; Christensen et al., 2022), consistent with the size and reputation of the systemic banks of our sample. In Table 2 (columns 3-5), we document a positive and statistically significant association between *Environmental disclosures* and all three measures of banks' environmental ratings capturing bank reputation. Importantly, this

finding reaffirms our argument that the sample banks disclose disclose favorable information about their environmental activities and sustainability strategies.

We further validate this argument by investigating the association between our disclosure proxy and the likelihood of a bank being included in the list of the 100 most sustainable firms, globally assessed by Corporate Knights (*ESG Corporate Knights*). We find a positive association between *Environmental disclosures* and banks' sustainability reputation (column 6), collectively suggesting that our measure also captures sustainability activities that banks report to their investors.

Last, we investigate the association between *Environmental disclosures* and banks' involvement in green bond issuance as underwriters. We measure green bond issuance as the ratio of annual green bond volume a bank underwrites to bank's total assets (*Green bond issuance*). Data on green bond issuance are obtained from Bloomberg. We document a positive relationship between *Environmental disclosures* and *Green bond issuance* (column 7), suggesting that our proxy for environmental disclosures is associated with environmental stewardship when highly visible activities in public debt markets are involved.

Collectively, these findings validate our environmental disclosure proxy and are consistent with banks disclosing favorable information about their environmental sustainability and strategies to investors.

Panel B of Figure 3 provides some further evidence on why some banks have more extensive environmental disclosures. We conjecture that banks that were traditionally specialized in brown industries may be more pressured to disclose their environmental strategies. We thus relate the extent of the environmental disclosures to the emissions of the banks' borrowers. We correlate our environmental disclosures proxy with the proportion of loans that a bank has extended to brown industries in the past. It is evident that banks with more extensive environmental disclosures have a larger proportion of outstanding loans to brown industries.

While this is suggestive of greenwashing, in what follows we explore whether high environmental reporters 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 with more extensive environmental disclosures issue greener loans. On the one hand, banks may use public reports to communicate their environmental strategies and build a reputation with stakeholders. In this case, we would expect a negative association between environmental disclosures and new loans to brown industries. On the other hand, banks may only report positive sustainability actions that are most visible and withhold negative information on their most opaque activities to enhance their public image. As Panel B of Figure 3 suggests, banks holding a significant brown loan portfolio may even overemphasize their environmental strategy of transitioning to green sectors and provide a portrayal of environmental stewardship to appease investors. In this case, we expect no significant relationship, or even a positive association, between environmental reporting and banks' supply of credit to brown industries.

We use AC data on new loan issuance to focus on changes in the composition of banks' loan portfolios. We estimate the following empirical 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, $Loan\ amount_{f,b,i,c,t}$:

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

$$+\beta_2 High\ Environmental\ Reporter_{b,t} + \gamma \mathbf{X_{b,t}} + \delta_{i,c,t} + \mu_b + \epsilon_{f,b,i,c,t} \quad (1)$$

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 disclosures indeed engage in greener lending practices.[11]

The vector μ_b denotes bank (subsidiary) fixed effects and the matrix $\mathbf{X}_{b,t}$ includes time-varying bank controls. While in some specifications, we control for bank's size, leverage, profitability, and tier 1 capital, 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. 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 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 greenwashing 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.

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

4.2 Main findings

Table 3 reports the main findings. Panel A shows that banks classified as high environmental reporters grant more credit to borrowers in brown industries. In terms of economic magnitudes, the estimate in column 5 suggests that high environmental reporters extend 3.6% 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 greener lending practices. 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 interpreted to depend on 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 absorb bank level shocks.

4.3 Environmental stewardship or climate risk?

Collectively, the findings in Table 3 are suggestive of greenwashing, but concerns may arise regarding what our proxy for high environmental reporters captures. Specifically, extensive environmental disclosures could discuss the banks' financial exposure to brown industries and the consequent risk. In this respect, the banks' environmental disclosures may not portray environmental consciousness and sustainability.

Our validation tests suggest that this is unlikely, because banks with more extensive disclosures have a better reputation for their environmental stewardship than other banks. However, we perform two robustness checks to mitigate this concern. First, we redefine the *High environmental reporter* dummy excluding from the count any words that are in our in our original environmental dictionary but recur within 10 words (after excluding any stopwords)

from terms that are likely to be related to discussions of climate risk, which include, among others, "risk", "threat", "hazard", "exposure", "stress", "scenario", "regulate", "legislate" (as detailed in Appendix B). Panel A of Table IA.V in the Internet Appendix shows that our results are invariant.

We also consider that banks whose environmental disclosures have a positive slant are the least likely to warn their investors and stakeholders about the financial risks arising from their exposures to brown industries. Panel B of Table IA.V defines high environmental reporters as those whose disclosures have sentiment in the top quintile during a year. The results are qualitatively similar to those in Panel A of Table 3. While we lose significance in columns 3 and 4, it is comforting that the most conservative specifications in which we consider how different banks extend credit to the same borrowers remain statistically and economically significant.

4.4. The timing of environmental disclosures and lending decisions

We also consider that environmental disclosures could discuss future actions banks will take to enhance their environmental profiles. In this respect, environmental disclosures should be reflected only in future 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. Panel A of Table IA.IV in the Internet Appendix reports results for the three-year lag of the *High environmental reporter* dummy.[12] The estimates mirror those in Panel A of Table 3.[13]

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[12] For this test, we perform the textual analysis of banks' reports starting from 2011 in order not to lose observations.

[13] In the same spirit Panel B of Table IA.IV presents the robustness analysis using the one-year lag and the one-year lead variable of the *High environmental reporter* dummy. Consistently with the previous findings, the estimates reveal that banks with more extensive environmental disclosures extend more credit to borrowers in brown industries.

We reach the same conclusions in Panel B of Table IA.IV, in which we exclude from the definition of the *High environmental reporter* dummy any words in our environmental dictionary that are within 10 words (after excluding any stopwords) from terms that are likely to be related to future plans about lending policies, such as "commit", "plan", "target", or "future".

4.5 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 our empirical approach allows us to include small private companies in the analyses, we do not capture differences between borrowers within the same industry. For this reason, we employ the volume of a borrower's annual Scope 1 and 2 GHG emissions, standardized by total revenues.

Table 4 summarizes the results. Despite that sample size dramatically decreases since granular emission data are available only for large firms, 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 borrower's GHG emissions is associated with an approximately 30% 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, these estimates suggest that banks with more extensive environmental disclosures, if anything, grant more credit to polluting borrowers. 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.

4.6 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 one of the bank relationships of a firm 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.

We report the results on the extensive margin of banks' lending in Table 5. In Panel A, we examine the initiation of new lending relationships. Overall, high environmental reporters are less likely to establish new relationships with brown borrowers. Our results are statistically significant in two out of five specifications: Specifically, when we control for a bank's propensity to establish new credit relationships in a given year (with interactions of bank and year fixed effects) and borrower demand (either using interactions of industry, country, and year fixed effects or interactions of firm and time fixed effects), high environmental reporters appear to be less likely to initiate credit relationships with firms in brown industries.[14] Thus, as far new relationships are concerned, banks with more extensive environmental disclosures appear to be reducing their brown lending.

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[14] In Appendix Table IA.VI, we do not observe any differential propensity for high environmental reporters to start relationships with borrowers in green industries. We find some evidence that high environmental reporters are less likely to terminate relationships with borrowers in green industries.

In Panel B, we investigate whether high environmental reporters are more likely to terminate existing credit relationships with brown borrowers. In columns 2 and 3, we document that banks with extensive environmental disclosures are less likely to terminate relationships with borrowers in brown industries. While this result remains statistically significant in column 4 when we include interactions of firm and time fixed effects to isolate the effect of borrowers with multiple relationships, it becomes statistically insignificant in column 5 when we include additional interactions of bank and year fixed effects. Overall, banks with extensive environmental disclosures appear less likely to terminate relationships with brown borrowers especially when they do not rely on other lenders.

The evidence on relationships initiations and terminations suggests that credit relationships limit banks' ability to reduce the environmental impact of their portfolios. Banks' reluctance to terminate existing credit relationships with brown borrowers potentially attenuates the effect of the fewer new relationships in brown sectors on the overall greenness of banks' portfolios. As a result, banks with higher environmental disclosures may end up extending more credit to borrowers in brown industries than other banks.

4.7 Changes in bank level credit exposures to brown industries

So far, we have shown that while banks do not reduce the size of the loans to firms in polluting industries, banks that emphasize the environment in their public reports partially adjust their portfolios on the extensive margin by not establishing new relationships with firms in brown industries.

To evaluate how banks' exposures to brown borrowers change, we aggregate observations at the bank-industry-country-year level and estimate an ordinary least squares (OLS) model where the dependent variable is a bank's b share of outstanding credit to industry i in country

c during year t out of all bank b new loans during that year, $Credit\ share_{b,i,c,t}$. We estimate the following equation:

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

$$(2)$$

Table 6 reports the results. The lower probability of establishing relationships with brown borrowers has limited effects on the overall greenness of a bank's loan portfolio. In the aggregate, high environmental reporters appear to extend more new loans to brown industries. This appears to be the case even when we control for bank-specific shocks, by including interactions of bank and year fixed effects, indicating that the composition of the bank loan portfolios 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 of country and year fixed effects. Furthermore, in Table IA.VIII, we show that if anything, banks with more extensive environmental disclosures issue a lower proportion of loans to green borrowers.

Overall, these results support the conclusion that, banks on average make unsubstantiated claims about their climate agenda, i.e., environmental statements that do not reflect their lending strategies across brown and green sectors.

4.8 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 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. 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 extended by high environmental reporters to borrowers in brown industries does not differ from that of other banks. Thus, high environmental reporters do not appear to use loan maturity to monitor brown borrowers and spur change.

Overall, the contractual features of the loans reveal no reluctance of high environmental reporters to fund borrowers in brown industries and are consistent with our previous findings. We next investigate why banks make environmental disclosures that do not appear to 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 lending policies of banks with more extensive environmental disclosures may not indicate greenwashing if banks lend to borrowers in brown industries to fund their transition to technologies with lower emissions. In a relatively short time series, it is hard to evaluate this conjecture ex post by testing whether brown borrowers that obtain loans from banks with more extensive environmental disclosures end up decreasing their emissions.[15] However, we can use the insight that switching to greener technologies requires high investment and R&D. If high environmental reporters finance the transition to greener technologies, we expect that their brown borrowers are more likely to engage in R&D or have high capital expenditures.

To test our prediction, 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 define indicator variables for whether a borrower ranks in the top quartile of the respective variables' distribution across the firms in the same industry (NACE 2) and year. We augment Model (1) with the respective indicator variables (*Proxy*) and the interactions *High env. reporter* x *Proxy* and *High env. reporter* x *Brown* x *Proxy*. The variable of interest is the triple interaction between high environmental reporter, borrower brownness, and the proxy for transition financing.

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.

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[15] In Appendix Table IA.VII, we test whether firms that obtain more loans from high environmental reporters subsequently lower their emissions. Given that we observe emissions for few firms and that our time series is short, this test has low power. However, it does not support the conjecture that firms that receive credit from borrowers in brown industries subsequently decrease their carbon emissions.

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 any firms that are five-year old or less as young. In columns 5 and 6, we find that high environmental reporters extend less credit to young firms in brown industries, indicating that they are unlikely to fund borrowers' transition to greener technologies.

Second, we exploit SBTi data. Some companies commit to targets to reduce their greenhouse gas emissions by adhering to the SBTi. We obtain the list of companies that become signatories of the SBTi in different years from the SBTi website. We match the list with AnaCredit and consider a firm to have committed to decrease its carbon emissions if the firm has adhered to the SBTi in the past or does so within the next year.[16] Since firms that adhere to the SBTi are large, to focus on firms that exhibit similar dependence on bank credit, we restrict the control sample to similarly sized-companies in the same NACE-2 industry. As in our previous test, our coefficient of interest is on the triple interaction between high environmental reporter, borrower brownness, and the dummy identifying borrowers that are SBTi signatories. The results in columns 7 and 8 are consistent with our earlier findings: We do not find any evidence that banks with more extensive environmental disclosures attempt to favor the transition to greener technologies of borrowers in brown industries by extending more credit to firms with clearly defined emission targets.

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

Last, but only least, we take advantage of borrowers' business descriptions, which we are able to obtain for 150,248 borrowers in AC. While we classify most firms as neither brown nor green, 5.5% (4.1%) are brown (green) for a total of 8248 (6112) brown (green) firms. This classification allows us to exclude the firms in brown industries that are more likely to have adopted green technologies. In columns 9 and 10, we test whether high environmental reporters lend more to brown firms defined based on their business descriptions. We continue to find that brown firms obtain more credit from high environmental reporters, even though the coefficient of interest is not statistically significant in column 10 when we consider loans by different banks to the same firm.[17]

5.2 Relationship strength and loan opacity

Our results in Section 4.6 suggest that the discrepancies between banks' environmental disclosures and lending policies emerge because banks are reluctant to discontinue established credit relationships with brown borrowers. Columns 1 and 2 of Table 9 provide further support to 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 consequence for the bank itself, as the borrower could experience distress and the bank is the highly exposed to the borrower. Consistent with the idea that the bank internalizes the negative effect of not extending liquidity to these borrowers, we find that the coefficient on the triple interaction term between *Brown, High Environmental Reporter*, and *Exposure* is positive and significant in column 1. The coefficient is positive but statistically

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[17] In Table IA.IX we find no evidence that high environmental reporters lend more to firms with green business descriptions.

insignificant in column 2, indicating that we lose power when we concentrate on borrowers that receive loans from multiple banks during a year. This suggest that high-environmental-reporting banks extend loans especially to brown borrowers with which they entertain exclusive relationships.

Columns 3 and 4 consider borrower size. They highlight that high environmental reporters extend more loans to small borrowers in brown industries. Because loans to small borrowers are the most opaque part of a bank's assets, incomplete disclosures that omit their discussions are less likely to come to the attention of the bank's investors and other stakeholders and to have negative reputational effects. This finding helps to explain why studies that rely on the syndicated loan market tend to find that bank commitments to decrease emissions by adhering to initiatives such as the SBTi are associated with less brown syndicated loans (e.g., Peydro and Kacperczyk, 2022). These commitments are of course different and have more concrete objectives than environmental disclosures. While banks that adhere to these initiatives may behave differently from high environmental reporters, we note that syndicated loans are easily observable by investors and regulators and may consequently have large reputational costs.

In addition, small firms may have particularly hard time accessing alternative sources of funding increasing the probability that the bank's decision to interrupt the relationship or extend less credit would result in distress. Fears of borrowers' distress that would force banks to recognize their losses and to disclose and discuss their exposures to brown industries may in turn increase the banks' propensities to extend loans to these borrowers.

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

We explore whether the desire to avoid borrower distress can help explain the disconnect between environmental disclosures and bank lending. If borrowers in brown industries are unprofitable and lack alternative financing options, banks may prefer to renew their loans to

keep the borrowers alive and to avoid realizing losses on their balance sheets (Peek and Rosengren 2005; Giannetti and Simonov 2013; Acharya et al. 2021). This practice is commonly referred to as zombie lending (e.g., Acharya et al 2021). We test whether high environmental reporters' zombie lending may drive the continued financing of brown industries.

We employ several proxies to define low-quality borrowers: (i) an indicator variable for whether a borrower's ROA (net income to total assets) ranks in the bottom quartile of the variable's distribution within the same industry (NACE 2); (ii) an indicator variable for whether a borrower's productivity (sales per employee) ranks in the bottom quartile of the variable's distribution within the same industry (NACE 2); and (iii) 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 augment Model (1) with the respective indicator variables (*Proxy*) and the interactions *High env. reporter* x *Proxy* and *High env. reporter* x *Brown* x *Proxy*. The variable of interest is the triple interaction between high environmental reporter, borrower brownness, and the proxy for low-quality borrower.

Table 9 reports the results of these tests. We find that the high environmental reporters are more likely to extend credit to brown sectors when borrowers have low profitability (columns 5 and 6), low productivity (columns 7 and 8), and low interest coverage ratio (columns 9 and 10) even though the estimates are not statistically significant at conventional levels in two specifications. This evidence is consistent with the interpretation that high environmental reporters renew loans to obsolete brown borrowers to avoid realizing credit losses. Not only are these low-quality brown borrowers the least likely to have the operational and financial capacity to transition to greener technologies, but they are also more likely to experience financial distress if their bank relationships are terminated. These low-quality borrowers are

less likely to have access to alternative source of funding. Thus, terminating the relationship would force the bank to recognize the losses as well as to discuss and explain the exposure to brown industries.

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 indeed extend larger loans to borrowers in brown industries, which fully supports our conjecture that zombie lending helps to explain the low informativeness of banks' environmental disclosures.

Overall, these findings suggest that relationships with low-quality brown borrowers help to 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

We also examine whether a bank's visibility proxied by its size (total assets) can enhance the credibility of environmental disclosures. It appears that large banks with more extensive environmental disclosures extend more credit to borrowers in brown industries (column 2 of Table 10). This evidence suggests that large banks having higher visibility may be more subject to institutional pressures to integrate climate goals in their strategy, and thus, may overemphasize their environmental stewardship without changing their lending policies. It also indicates that the credibility of environmental disclosures and the extent to which these are reflected in the banks' loan portfolios may be particularly hard to verify for market participants.

The rest of Table 10 supports this conjecture. We examine whether the association between environmental reporting and banks' lending activities in brown industries is influenced by

factors that could attenuate banks' propensity to include unsubstantiated claims in their environmental disclosures, such as whether sustainability reporting is mandatory in a bank's headquarters country and whether lending incurs following the Paris Agreement on Climate Change. We expect that mandatory reporting and the new agreement raise regulatory and public awareness towards climate-related issues and possibly scrutiny of banks' environmental disclosures. Moreover, using a public accounting firm to audit banks' environmental claims could also improve disclosure accuracy and verifiability.

In Table 10, using the introduction of sustainability reporting rules at the country-year level defined in Krueger et al. (2021), we find no evidence that mandatory reporting can mitigate the opportunistic use of environmental disclosures (column 3). Similarly, although the volume of environmental disclosures increases post-Paris Agreement (Figure 1), we document that the content of such disclosures fails to qualitatively capture underlying lending practices (column 4). 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 2017, 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 (column 5), in line with recent studies suggesting that auditors have limited expertise and experience in evaluating sustainability disclosures (Aobdia and Yoon, 2022). Collectively, these results are consistent with the view that environmental disclosures are inherently hard to compare and standardize and thus cannot be easily regulated or verified by auditors. Therefore, banks can boost their environmental profiles by performing selective environmental disclosures, and for instance stressing their involvement in the issuance of green bonds and the financing of a few green projects, while large chunks of their loan portfolios continue to consist of credit to brown industries.

6. Conclusions

In response to the rising institutional pressures towards the green economy transition, banks have substantially increased the volume of sustainability reporting to inform stakeholders over their environmental goals and initiatives. However, many industry commentators raise concerns regarding the extent to which these disclosures include unsubstantiated claims of banks' sustainability strategies and potentially serve as publicity tools.[18]

Studying how banks' environmental disclosures reflect their lending policies, we contribute to this ongoing debate. We show that features of banks' business models, such as relationship lending, hinder the effective transition to a green lending strategy and are accentuated by zombie lending and banks' aversion to recognize losses. In addition, lack of granular data likely exacerbates the problem, as we show that the environmental disclosures reflect banks' underwriting activities in the more transparent bond market but not their lending policies.

Our results support concerns about the lack of transparent and consistent sustainability disclosures (ECB 2022) and indicate that efforts to increase the comparability and transparency of sustainable financing products (e.g., Reg. 2020/852; Reg. 2019/2088) should be extended to banks.

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[18] In a recent survey of various business sectors by the EC and national consumer protection authorities, forty-two percent of firms' green claims are found to be deceptive and misleading. European Commission, "Screening of websites for 'greenwashing': half of green claims lack evidence", January 28 2021 (https://ec.europa.eu/commission/presscorner/detail/en/ip_21_269).

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Figure 1. Environmental Disclosures over Time

The figure plots the mean *Environmental disclosure* in our sample over time. In percent.
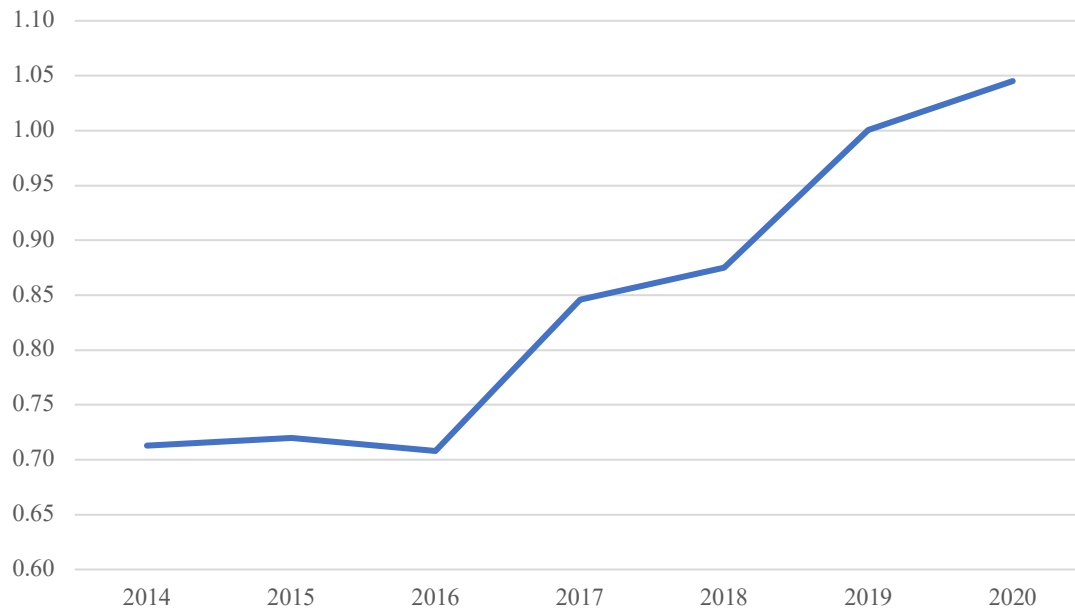
Figure 2. Word Cloud of Environmental Disclosure Content

The figure presents the cloud of words identified in sentences with at least one environmental disclosure keyword of our dictionary in banks' reports over the 2014-2020 period. Terms are assigned a font size proportional to their frequency in the corpus of reports.

Figure 3. Environmental Disclosures, Sentiment and Banks' Exposure to Brown Industries

Panel A shows the bin scatter plot depicting the relationship between the baseline measure of banks' environmental disclosures and our measure of the environmental disclosures' sentiment. Panel B illustrates 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 of the bank's environmental exposure. Both scatter plots present averages for the data sorted into 20 bins based on environmental sentiment (Panel A) and exposure to brown firms (Panel B).

Panel A.
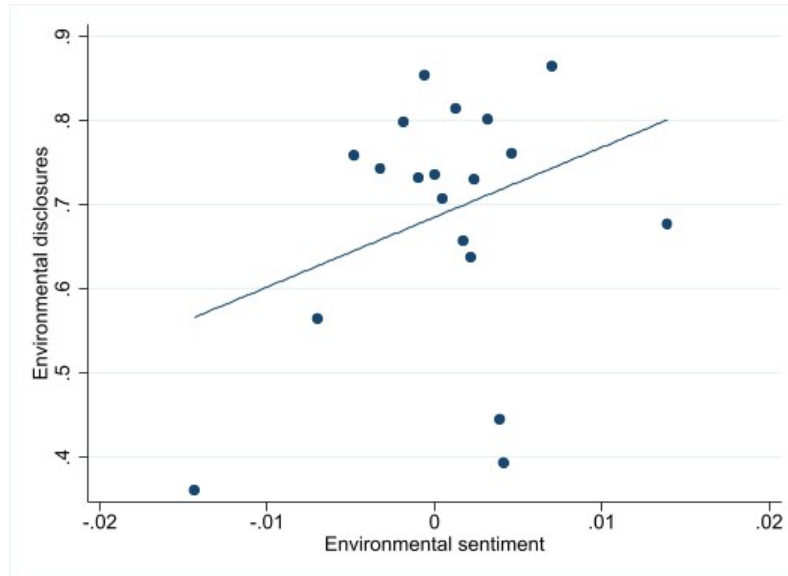
Panel B.
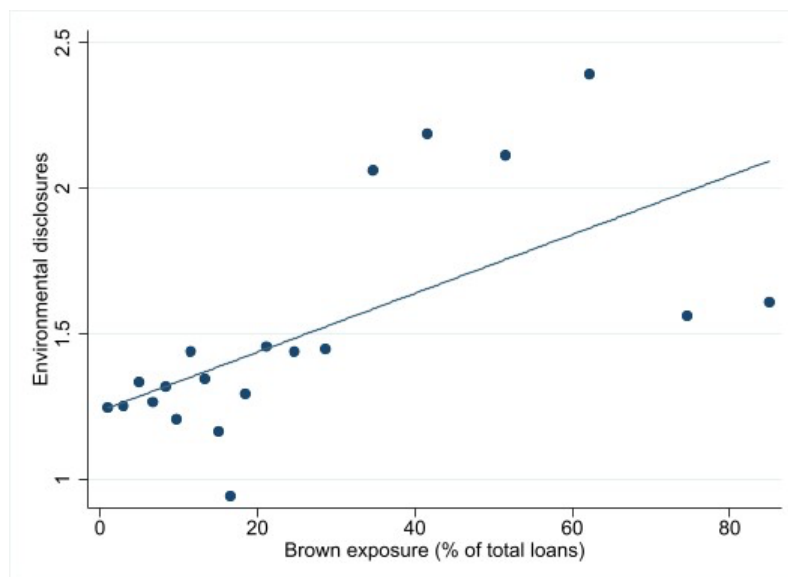
Figure 4. Banks' Environmental Disclosures and New Loans to Brown Industries

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. Vertical lines denote a 95% confidence interval. Standard errors are reported in parentheses, corrected for heteroskedasticity and clustered at the bank level.
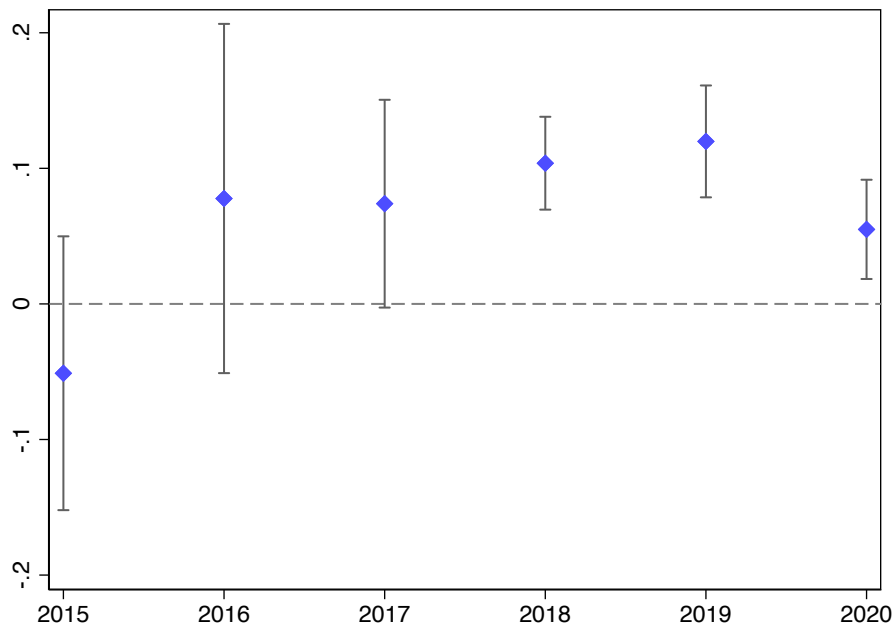
Table 1. Descriptive Statistics

The table reports descriptive statistics. Panel A reports the number of documents used to estimate the proxy for banks' environmental disclosures. Panel B reports the summary statistics for the variables pertaining to the validation tests of the banks' environmental disclosure proxy. Panel C reports the descriptive statistics for the analysis of banks' lending policies. The values of 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 (%)	3,365	1.124	0.890	0.558	0.749	1.317
GRI standards	3,365	0.402	0.490	0.000	0.000	1.000
Integrated reporting	3,365	0.405	0.491	0.000	0.000	1.000
Bloomberg Env score	1,307	41.521	11.321	38.393	44.643	48.214
ESG Corporate Knights	3,365	0.055	0.229	0.000	0.000	0.000
Green bond issuance	3,365	0.008	0.067	0.000	0.000	0.001
MSCI Env score	1,862	5.254	2.327	3.400	5.696	7.067
Sustainalytics Env score	2,909	59.363	15.569	51.713	59.111	70.563
Leverage	3,365	0.928	0.025	0.911	0.924	0.949
ROA	3,365	0.029	0.015	0.021	0.028	0.034
Total assets	3,365	25.798	1.371	24.629	25.568	27.183
Tier 1 capital	3,365	0.152	0.066	0.122	0.151	0.195
Activism	2,724	0.211	0.068	0.176	0.197	0.277
Socioeconomic beliefs	2,724	0.654	0.055	0.623	0.646	0.672
High Env risk country	2,724	0.287	0.453	0.000	0.000	1.000

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	0.09	0.29	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

Table 2. Validation Tests

The table reports the results of the analyses on the relation between banks' environmental disclosures and financial and environmental performance. Across all specifications, the dependent variable is *Environmental disclosures*, defined as the percentage of the ratio of environmental-related keywords to total number of words (excluding stop-words). All other variables are defined in Appendix A. The values of the continuous variables are winsorized at 1% and 99%. Country and year fixed effects are included but not tabulated. OLS regressions are used to estimate the models, with standard errors reported in parentheses. Standard errors are corrected for heteroskedasticity and clustered at the country (specification 1) or bank (specifications 2-7) level. ∗∗∗, ∗∗ and ∗ denote significance at the 1%, 5% and 10% (two-sided) levels, respectively.

	Environmental disclosures						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Activism	3.680***						
	(0.498)						
Socioeconomic beliefs	0.016						
	(0.401)						
High Env risk country	0.353**						
	(0.130)						
GRI standards		0.185***	0.162***	0.114*	0.136**	0.186***	0.178***
		(0.052)	(0.060)	(0.068)	(0.062)	(0.053)	(0.052)
Integrated reporting		0.242*	0.048	0.148	0.043	0.261**	0.213*
		(0.126)	(0.103)	(0.124)	(0.083)	(0.126)	(0.128)
Leverage		2.414	4.493***	4.049**	3.212**	2.477	2.357
		(1.532)	(1.565)	(1.982)	(1.584)	(1.503)	(1.472)
ROA		2.101*	1.187	1.584	-2.122	2.069*	2.160*
		(1.114)	(1.649)	(2.696)	(1.448)	(1.076)	(1.130)
Total assets		0.051*	0.023	0.004	-0.023	0.042	0.060**
		(0.029)	(0.031)	(0.031)	(0.030)	(0.028)	(0.030)
Tier 1 capital		1.139	2.529***	2.569***	1.081	1.202	1.184
		(1.031)	(0.746)	(0.735)	(1.021)	(1.029)	(1.021)
MSCI Env score			0.033*				
			(0.018)				
Sustainalytics Env score				0.004*			
				(0.003)			
Bloomberg Env score					0.012***		
					(0.003)		
ESG Corporate Knights						0.242***	
						(0.085)	
Green bond issuance							0.570***
							(0.165)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	Yes	Yes	Yes	Yes
S.E. Cluster	Country	Bank	Bank	Bank	Bank	Bank	Bank
Obs.	471	660	487	452	365	660	660
R²	0.23	0.44	0.46	0.44	0.43	0.45	0.45

Table 3. Banks' Environmental Disclosures 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. 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	-0.112**	-0.0843**		-0.0451	
	(0.0488)	(0.0367)		(0.0400)	
Brown	-0.212***				
	(0.0257)				
High env. reporter x Brown	0.128***	0.0558	0.0744***	0.0388*	0.0363*
	(0.0411)	(0.0375)	(0.0223)	(0.0220)	(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	2,822,338	3,740,323	3,740,250	828,689	828,074
R²	0.705	0.200	0.207	0.792	0.797

Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0785[*]	-0.0647[*]		-0.0268	
	(0.0443)	(0.0331)		(0.0340)	
Green	-0.0614				
	(0.0459)				
High env. reporter x Green	-0.0697	-0.0493	-0.0196	-0.0463	-0.0172
	(0.0571)	(0.0324)	(0.0247)	(0.0484)	(0.0436)
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
R²	0.704	0.200	0.207	0.792	0.797

Table 4. Measuring Borrower Level Emissions

The table reports the results of the tests on the association between banks' environmental disclosures and the volume of new loans to brown borrowers. 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 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.

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High envir. reporter	-0.0704	-0.0347		-0.0774	
	(0.0945)	(0.138)		(0.123)	
GHG emissions	-0.195*	0.0422	0.0355		
	(0.103)	(0.0299)	(0.0316)		
High envir. reporter x GHG emissions	-0.217	0.290**	0.305**	0.0495	0.0393
	(0.213)	(0.135)	(0.134)	(0.128)	(0.125)
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	0.540	0.577	0.790	0.807

Table 5. The Extensive Margin of Bank Lending and Environmental Disclosures

The table reports the results of the tests on 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	0.122	0.0928		0.129	
	(0.0903)	(0.0822)		(0.0967)	
Brown	-0.000316				
	(0.0123)				
High env. reporter x Brown	0.00712	0.00857	-0.0219**	0.00866	-0.0337**
	(0.0186)	(0.0123)	(0.00862)	(0.0219)	(0.0151)
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	-	-
Bank-Time FE	No	No	Yes	No	Yes
Firm-Time FE	No	No	No	Yes	Yes
N	340,664	344,817	344,669	339288	339,050
R^2	0.0694	0.0266	0.0652	0.0890	0.142

Panel B. Relationship Termination

	Exit				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.00624	-0.0273		-0.0537**	
	(0.00526)	(0.0230)		(0.0241)	
Brown	0.00124				
	(0.00217)				
High env. reporter x Brown	-0.00844**	-0.0235**	-0.00743***	-0.0131*	-0.00747
	(0.00420)	(0.0116)	(0.00278)	(0.00723)	(0.00942)
Bank controls	Yes	Yes	Yes	Yes	-
Bank FE	Yes	Yes	-	Yes	-
Firm FE	Yes	No	No	-	-
Time FE	Yes	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-
Bank-Time FE	No	No	Yes	No	Yes
N	506,186	913,794	913,766	222,283	222,143
R^2	0.469	0.0700	0.0752	0.504	0.509

Table 6. Bank-level Change of Financing to Brown Industries

The table reports the results of the tests on the association between banks' environmental disclosures and the change in credit exposures to brown industries. The analyses are at the bank-industry-country-year level. In Columns (1)-(3), the dependent variable is the natural logarithm of the volume of new loans extended by a bank to all borrowers in NACE-2 industry i in country c in year t (*Loan amount*). In Columns (4)-(6), the dependent variable is the ratio of a bank's annual loan volume to a NACE-2 industry i in country c in year t, deflated by the total value of loans issued over a year (*Credit share*). *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			Credit share		
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter	-0.0993	-0.144**		-0.00103	-0.000372	
	(0.0754)	(0.0559)		(0.00116)	(0.00131)	
Brown	-0.159***	-0.104**	-0.109**	-0.00311***	-0.000704	-0.00129
	(0.0291)	(0.0432)	(0.0439)	(0.000866)	(0.00138)	(0.00131)
High env. reporter x Brown	0.160**	0.257***	0.267***	0.0140***	0.0114***	0.00936***
	(0.0639)	(0.0698)	(0.0704)	(0.00341)	(0.00355)	(0.00353)
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
R²	0.577	0.592	0.614	0.346	0.353	0.349

Table 7. Loan Contractual Features

The table reports the results of the tests on 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	-0.00149	-0.000395		0.000377	
	(0.000924)	(0.000844)		(0.000527)	
Brown	0.00176***				
	(0.000679)				
High env. reporter x Brown	0.000962	-0.0000283	-0.000323	-0.000133	-0.000206
	(0.000926)	(0.000404)	(0.000409)	(0.000474)	(0.000524)
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

Panel B. Loan Maturity

	Loan maturity				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.170*	-0.0795**		-0.0422	
	(0.101)	(0.0376)		(0.0444)	
Brown	-0.165***				
	(0.0337)				
High env. reporter x Brown	0.125	0.0388	0.0366*	0.0478	0.0162
	(0.0764)	(0.0384)	(0.0204)	(0.0316)	(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	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

Table 8. Environmental Disclosures and the Funding of Transition to Greener Technologies

The table reports the results of the tests on 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. In columns (1) and (2), we use a 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), *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 columns (1)-(8), *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 Targets		Business Description	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
High env. reporter x Brown	0.0734*** (0.0211)	0.0442* (0.0245)	0.0533** (0.0219)	0.0354 (0.0310)	0.104*** (0.0395)	0.0450 (0.0616)	-0.0160 (0.0740)	0.126*** (0.0451)		
High env. reporter x Proxy	0.167 (0.314)	0.240 (0.162)	0.0487 (0.0484)	0.00494 (0.0152)	0.187*** (0.0344)	0.0279 (0.0271)	0.756** (0.300)	0.165 (0.407)		
High env. reporter x Brown x Proxy	-0.480 (0.624)	-0.590*** (0.210)	0.0625 (0.0464)	0.0368 (0.0547)	-0.0953 (0.0685)	-0.0928** (0.0391)	-0.794 (0.796)	0.600 (1.027)		
Brown business									0.165** (0.0308)	
High env. reporter x Brown business									0.310** (0.0536)	0.0235 (0.0681)
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	2,375,561	697,341	453,020	151,116	248,321	81,696
R²	0.208	0.792	0.210	0.791	0.224	0.793	0.299	0.801	0.345	0.825

Table 9. The Environmental Impact of Bank Relationships and Zombie Lending

The table examines why high environmental reporter lend to brown borrowers using several proxies for borrower quality and ability to access other sources of funding. Columns (1) and (2) present the *Exposure* proxy that denotes the share of credit a firm *f* receives from bank *b* as a share of the firm's total bank credit outstanding at *t-1*. Columns (3) and (4) we 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 dummy variable *ROA* that takes the value of 1 if the firm's return on assets ranks in the bottom quartile of firms in the same industry (NACE-2) and the same year, and 0 otherwise. Columns (7) and (8) present the estimates using a dummy variable that takes the value of 1 if the firm's sales to employee ratio in the bottom quartile of firms in the same industry (NACE-2) and the same year, and 0 otherwise. Columns (9) and (10) 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*). A 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 a 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		Low ROA		Low Sales to Employee		Low Interest Coverage Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
High env. reporter x Brown	0.00617	0.0421*	0.118***	0.0630**	0.0545***	0.0394**	0.0321*	0.0298*	0.0571***	0.0176
	(0.0162)	(0.0234)	(0.0324)	(0.0274)	(0.0146)	(0.0178)	(0.0166)	(0.0181)	(0.0166)	(0.0187)
High env. reporter x Proxy	0.0707***	0.168***	-0.0691	-0.0129	0.0547***	0.0276*	0.0342***	0.0336**	0.0318***	-0.00372
	(0.0105)	(0.0235)	(0.0858)	(0.0791)	(0.00949)	(0.0156)	(0.0106)	(0.0153)	(0.0101)	(0.0128)
High env. reporter x Brown x Proxy	0.199***	0.0502	-0.219***	-0.0389	0.0545**	0.0107	0.124***	0.0772*	0.0311	0.0615*
	(0.0212)	(0.0531)	(0.0646)	(0.0503)	(0.0234)	(0.0392)	(0.0277)	(0.0416)	(0.0271)	(0.0354)
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	1,626,362	408,934	2,218,763	683,941	2,003,216	666,516	1,642,281	635,608	1,797,927	658,817
R^2	0.194	0.797	0.410	0.792	0.202	0.791	0.218	0.788	0.195	0.790

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 column (1), *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 variable's distribution. In column (2), *Large bank* is an indicator variable of whether a bank's total assets rank in the top quartile of the variable's distribution. In column (3), *Mandatory sustainability reporting* is an indicator variable of whether a loan was originated in a country that mandated sustainability reporting in year t. In column (4), *Post Paris agreement* is an indicator variable of whether a loan was issued post 2017. In column (5), *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.

Factor:	Loan amount				
	Low Tier 1 capital	Large bank	Mandatory sustain. reporting	Post Paris agreement	Audited sustain. report
	(1)	(2)	(3)	(4)	(5)
High env. reporter x Brown	0.0134	-0.105*	0.0989*	-0.0336	0.0293
	(0.0163)	(0.0623)	(0.0597)	(0.0584)	(0.0206)
High env. reporter x Brown x Factor	0.0582**	0.142**	-0.0616	0.0737	-0.00619
	(0.0254)	(0.0619)	(0.0613)	(0.0600)	(0.0280)
Bank-Time FE	Yes	Yes	Yes	Yes	Yes
Firm-Time FE	Yes	Yes	Yes	Yes	Yes
N	828,074	828,070	828,074	828,074	828,074
R^2	0.797	0.797	0.797	0.797	0.797

Appendix A. Variable Definitions

Variables	Variable definitions
Bank disclosure characteristics	
Environmental disclosures	The ratio of environmental-related keywords to total number of words (excluding stop-words). The wordcount is estimated across bank's annual and sustainability reports.
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.
Country ESG characteristics	
Activism	The mean value of the percentage of people boycotting a product (bctprd), protesting in a lawful public demonstration (pbldmn), signing a petition (sgnptit) and posting a political comment online (pstplonl) within a bank's HQ country-year. Data are derived from the European Social Survey. For country-years with missing data, the most recent value was used.
Socioeconomic beliefs	The mean value of the percentage of people suggesting that it is important: i) to care for the environment (impenv<=2); ii) to behave properly (ipbhprp<=2); iii) that people are treated equally and have equal opportunities (ipeqopt<=2) within a bank's HQ country-year. Data are derived from the European Social Survey. For country-years with missing data, the most recent value was used.

	Binary variable equal to one if a bank's HQ country is classified as high Environmental risk using World Bank's ESG country scores, zero otherwise. Details on the methodology of classifying a country as high Environmental risk are included in the Appendix D.
High Env risk country	

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.
Loan Interest Rate	Annualized interest rate 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 1 if the firm belongs to a NACE-2 industry for which the ratio of greenhouse gas (GHG) emissions to gross value added ranks in the top quintile of all industries in a respective reporting country during year *t*, and 0 otherwise.
Green	Binary variable that takes the value of 1 if the firm belongs to a NACE-2 industry for which the ratio of GHG emissions to gross value added ranks in the bottom quintile of all industries in a respective reporting country during year *t*, and 0 otherwise.
GHG emissions	The borrower's pollution intensity measured as the sum of Scope 1 and 2 GHG emissions as a share of 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.3.

Firm characteristics (Orbis)

R&D	Firm's ratio of R&D to total assets.

Investment	Firm's ratio of a change in fixed assets to total assets
ROA	Firm's return on assets. (Net income divided by total assets)
Sales to employee	The natural logarithm of the firm's sales divided by the number of employees.
Leverage	Firms' total debt to total assets

Appendix B. Dictionaries

B.1 Environmental-related Keywords.

agriculture	energy	paper
air quality	energy star	petrol
air travel	equator	pfc
animal	farmer	photovoltaic
asbesto	fish	plastic
automobile	forest	pollute
automotive	fracking	recycle
biodiversity	fuel	renewables
building	glass	sea
building certific	gmo	sf6
business travel	grabbing	silicium
car	green	solar
carbon	habitat	sox
cement	heat	soy
certified building	hfc	steel
ch4	hydro	sugar
chemicals	land	sulphuric
circular	laughing gas	temperature
climate	leed	transport
co2	metal	tree
coal	methane	uranium
commut	mines	vehicle
coral	mining	waste
corporate travel	mountain	water
diesel	n2o	weather
drill	natural gas	wind
ecosystem	natural resource	wood
electric	nuclear	
emission	ocean	
endangered	oil	

B.2 Climate risk related keywords

risk	exposure	stress
threat	regulate	
hazard	legislate	
danger	impact	
challenge	monitor	
concern	oversee	
costs	control	
disrupt	scenario	

B.3 Business description keywords

Panel A. Brown

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

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
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	

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.

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

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

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

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

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

Appendix D. Constructing the *High Env risk country* Variable

The steps to construct the proxy for *High Env risk country* are described as follows:

1. We retrieve country-year environmental indicators using the World Bank's ESG Data Draft dataset:
   https://datacatalog.worldbank.org/dataset/environment-social-and-governance-data
2. We focus on the following indicators that are relevant and mostly populated across our sample European countries:

A. Natural resource depletion (NY.ADJ.DRES.GN.ZS)
B. CO2 emissions (EN.ATM.CO2E.PC)
C. Methane emissions (EN.ATM.METH.PC)
D. Nitrous oxide emissions (EN.ATM.NOXE.PC)
E. PM2.5 air pollution (EN.ATM.PM25.MC.M3)
F. Terrestrial and marine protected areas (ER.PTD.TOTL.ZS)
G. Renewable energy consumption (EG.FEC.RNEW.ZS)

3. Within the sample countries, we rank by year individual Environmental indices (A-G) in quintiles.
4. We estimate mean Environmental quintile ranks (*Environmental quintile rank_negative*: for indices A- E, and *Environmental quintile rank_positive*, for indices F-G, separately, since the former indicate a negative climate footprint whereas the latter a positive one)
5. Lastly, we create the binary variable *High Env risk country* which equals one if the *Environmental quintile rank_negative* takes the values of 4 or 5, or the *Environmental quintile rank_positive* takes the values of 1 or 2, zero otherwise.

Internet Appendix.

Supplementary Findings

Table IA.I Spearman Correlation Matrix of the Variables in the Validation Tests

	Obs.= 367	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	*Environmental disclosures*	1.000										
(2)	*GRI standards*	0.175***	1.000									
(3)	*Integrated reporting*	0.071	0.012	1.000								
(4)	*Bloomberg Env score*	0.310***	0.004	0.171***	1.000							
(5)	*ESG Corporate Knights*	0.170***	0.002	-0.028	0.201***	1.000						
(6)	*Green bond issuance*	0.227***	0.151***	0.107**	0.259***	0.329***	1.000					
(7)	*MSCI Env score*	0.259***	0.141***	0.309***	0.223***	0.238***	0.443***	1.000				
(8)	*Sustainalytics Env score*	0.279***	0.173***	0.226***	0.407***	0.313***	0.471***	0.460***	1.000			
(9)	*Leverage*	-0.094*	-0.155***	0.201***	-0.024	0.023	0.017	0.294***	0.114**	1.000		
(10)	*ROA*	0.039	-0.017	-0.107**	0.247***	-0.017	-0.052	-0.125**	0.060	-0.374***	1.000	
(11)	*Total assets*	-0.079	-0.125**	0.163***	0.165***	0.098*	-0.008	0.273***	0.098*	0.455***	0.059	1.000
(12)	*Tier 1 capital*	0.268***	0.210***	-0.018	-0.042	0.077	0.146***	0.149***	0.136**	-0.187***	0.130**	-0.327***

Table IA.II. New Loans Analysis. Robustness using Post 2018 Period

The table reports the results of a robustness test of the baseline analyses in Table 3 using a shorter time window (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	-0.139**	-0.136***		-0.0307	
	(0.0628)	(0.0426)		(0.0386)	
Brown	-0.0504***				
	(0.0179)				
High env. reporter x Brown	0.0151	0.0756***	0.0914***	0.0356*	0.0401*
	(0.0329)	(0.0247)	(0.0232)	(0.0190)	(0.0232)
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

Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.129*	-0.126***		-0.0214	
	(0.0672)	(0.0486)		(0.0423)	
Green	-0.0234				
	(0.0473)				
High env. reporter x Green	-0.0344	-0.00539	-0.0194	-0.0182	-0.0195
	(0.0385)	(0.0321)	(0.0328)	(0.0459)	(0.0486)
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

Table IA.III. New Loans Analysis. 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 environmental-related keywords to total number of words (excluding stop-words). 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	-0.0518***	-0.0878***		-0.0843***	
	(0.00402)	(0.00376)		(0.00624)	
Brown	-0.184***				
	(0.00641)				
Environmental disclosures x Brown	0.0242***	0.0504***	0.0557***	0.0181*	0.0125
	(0.00601)	(0.00800)	(0.00832)	(0.0107)	(0.0108)
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
R²	0.705	0.200	0.207	0.792	0.797

Panel B. Green industries

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
Environmental disclosures	-0.0632	-0.0774**		-0.0750	
	(0.0431)	(0.0354)		(0.0488)	
Green	-0.0845*				
	(0.0451)				
Environmental disclosures x Green	0.0248	-0.0183	-0.0148	-0.0184	-0.000820
	(0.0216)	(0.0217)	(0.0174)	(0.0217)	(0.0155)
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

Table IA.IV Robustness: High Environmental Reporters using Lagged Disclosures or Controlling for Disclosure Horizon

The table reports the results of a robustness test of the Baseline analyses in Panel A of Table 3 using alternative proxied 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 take the baseline definition of the *High environmental reporter* dummy and exclude any words that are in our environmental dictionary but are within 10 words (after excluding any stopwords) from terms that are likely to be related to future plans about lending policies, such as "commit", "plan", "target", or "future". In Panel C, 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 (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: Robustness using Lagged Environmental Disclosures

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter (t-3)	-0.146**	-0.165***		-0.111**	
	(0.0687)	(0.0634)		(0.0538)	
Brown	-0.0523***				
	(0.0181)				
High env. reporter (t-3) x Brown	0.0336	0.0875***	0.0831***	0.0761***	0.0635***
	(0.0518)	(0.0164)	(0.0167)	(0.0213)	(0.0242)
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

Panel B: Robustness excluding Environmental Keywords associated with Future Plans

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.106***	-0.0774		-0.0383	
	(0.0401)	(0.0571)		(0.0394)	
Brown	-0.210***				
	(0.0262)				
High env. reporter x Brown	0.128***	0.0449	0.0760***	0.0548**	0.0597***
	(0.0455)	(0.0541)	(0.0263)	(0.0254)	(0.0223)
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	2,785,056	3,699,515	3,699,445	806,427	805,832
R^2	0.706	0.201	0.208	0.794	0.798

Panel C: Robustness excluding Leads and Lags of Environmental Disclosures

	Loan Amount					
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter (t-1) x Brown	0.0536**	0.0374				
	(0.0207)	(0.0298)				
High env. reporter (t) x Brown			0.0744***	0.0363*		
			(0.0223)	(0.0217)		
High env. reporter (t+1) x Brown					0.0797**	0.0600***
					(0.0320)	(0.0175)
Industry-Country-Time FE	Yes	-	Yes	-	Yes	-
Firm-Time FE	No	Yes	No	Yes	No	Yes
Bank-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	3,390,994	786,615	3,740,250	828,074	2,623,380	534,600
R^2	0.196	0.794	0.207	0.797	0.211	0.802

Table IA.V Robustness: High Environmental Reporters excluding Discussion of Climate Risk or using Positive Sentiment of the Environmental Disclosures

The table reports the results of a robustness test of the Baseline analyses in Panel A of Table 3 using alternative proxied for high environmental reporters. In Panel A, we take the baseline definition of *High environmental reporter* dummy and exclude any words that are in our environmental dictionary but are within 10 words (after excluding any stopwords) from terms that are likely to be related to in the discussion of climate risk, which include, among others, "risk", "threat", "hazard", "exposure", "stress", "scenario", "regulate", "legislate". In Panel B, we report the results in which high environmental reporters are defined based on environmental disclosures with more positive sentiment. 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 for their sentiment 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: Robustness excluding Environmental Keywords associated with the Discussion of Climate Risk

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0720**	-0.0728**		-0.0222	
	(0.0315)	(0.0323)		(0.0283)	
Brown	-0.212***				
	(0.0261)				
High env. reporter x Brown	0.122***	0.0609	0.0832***	0.0425*	0.0434**
	(0.0396)	(0.0409)	(0.0238)	(0.0222)	(0.0207)
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	2,785,056	3,699,515	3,699,445	806,427	805,832
R^2	0.706	0.201	0.208	0.794	0.798

Panel B: Robustness using Positive Sentiment of the Environmental Disclosures

	Loan Amount				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.0503	0.0516		-0.0138	
	(0.0643)	(0.0411)		(0.0498)	
Brown	-0.193***				
	(0.0310)				
High env. reporter x Brown	0.0806*	0.0431	0.0426	0.0802***	0.0802***
	(0.0450)	(0.0304)	(0.0324)	(0.0226)	(0.0246)
Bank controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	No	Yes	No
Firm FE	Yes	No	No	No	No
Time FE	Yes	No	No	No	No
Industry-Country-Time FE	No	Yes	Yes	No	No
Firm-Time FE	No	No	No	Yes	Yes
Bank-Time FE	No	No	Yes	No	Yes
N	2,262,821	3,065,744	3,065,668	590,776	590,412
R^2	0.704	0.219	0.226	0.800	0.805

Table IA.VI. The Extensive Margin of Bank Lending and Environmental Disclosures: Green Industries

The table reports the results of the tests on 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, *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	0.116	0.0893		0.122	
	(0.0856)	(0.0779)		(0.0921)	
Green	-0.0436				
	(0.0351)				
High env. reporter x Green	0.0249	0.0151	0.00433	0.0253	0.00485
	(0.0279)	(0.0250)	(0.0119)	(0.0291)	(0.0138)
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	-	-
Bank-Time FE	No	No	Yes	No	Yes
Firm-Time FE	No	No	No	Yes	Yes
N	340,664	344,817	344,669	339,288	339,050
R^2	0.0695	0.0266	0.0652	0.0891	0.142

Panel B. Relationship Termination

	Exit				
	(1)	(2)	(3)	(4)	(5)
High env. reporter	-0.00522	-0.0284		-0.0535**	
	(0.00681)	(0.0236)		(0.0256)	
Green	0.00308				
	(0.00506)				
High env. reporter x Green	-0.00615	-0.00630*	-0.00418**	-0.00750	-0.00250
	(0.00509)	(0.00372)	(0.00185)	(0.00712)	(0.00397)
Bank controls	Yes	Yes	Yes	Yes	-
Bank FE	Yes	Yes	-	Yes	-
Firm FE	Yes	No	No	-	-
Time FE	Yes	-	-	-	-
Industry-Country-Time FE	No	Yes	Yes	-	-
Bank-Time FE	No	No	Yes	No	Yes
N	506,186	913,794	913,766	222,283	222,143
R^2	0.469	0.0700	0.0752	0.504	0.509

Table IA.VII. Firm-Level Analysis of Exposure to High Environmental Reporters and Subsequent GHG Emissions

The table tests whether firms that receive loans from high environmental reporters ex post 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	4.747	3.776	6.358	8.116	3.287	0.282
	(19.72)	(12.35)	(25.21)	(14.88)	(37.36)	(10.03)
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

Table IA.VIII. Bank-level Change of Financing to Green Industries

The table reports the results of the tests on the association between banks' environmental disclosures and the change in credit exposures to green industries. The analyses are at the bank-industry-country-year level. In Columns (1)-(3), the dependent variable is the natural logarithm of the volume of new loans extended by a bank to all borrowers in the same NACE-2 industry i in country c in year t (*Loan amount*). In Columns (4)-(6), the dependent variable is the ratio of a bank's annual loan volume to a NACE-2 industry i in country c in year t, deflated by the total value of loans issued over a year (*Credit share*). *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.

	Loan amount			Credit share		
	(1)	(2)	(3)	(4)	(5)	(6)
High env. reporter	-0.0678	-0.103*		0.00236**	0.00253*	
	(0.0778)	(0.0578)		(0.00113)	(0.00134)	
Green	-0.0726***	-0.0733**	-0.0780***	-0.00000086	0.000293	0.000185
	(0.0276)	(0.0292)	(0.0295)	(0.000780)	(0.000814)	(0.000784)
High env. reporter x Green	-0.0233	-0.0206	-0.0185	-0.00479***	-0.00480***	-0.00421**
	(0.0472)	(0.0459)	(0.0462)	(0.00173)	(0.00174)	(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	0.577	0.592	0.614	0.346	0.353	0.349

Table IA.IX. High Environmental Reporters 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	-0.0809	-0.0664		-0.0540	
	(0.0643)	(0.0596)		(0.0656)	
Green Business		0.514***	0.511***		
		(0.0465)	(0.0456)		
High env. reporter x Green Business	0.128	0.0746	0.0806	0.147	0.149
	(0.0616)	(0.117)	(0.119)	(0.0795)	(0.0803)
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	145,882	248,422	248,321	81,858	81,696
R^2	0.809	0.344	0.349	0.822	0.825