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Journal

Federal Reserve Bank of San Francisco Working Paper Series, 2024(23)

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Publication Date

2024-07-30

DOI

10.24148/wp2024-23

Industrial Composition of Syndicated Loans and Banks' Climate Commitments*

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August 12, 2024

Abstract

In the past two decades, a number of banks joined global initiatives aimed to mitigate climate change by "greening" their asset portfolios. We study whether banks that made such commitments have a different emission exposure of their portfolios of syndicated loans than banks that did not. We rely on loan-level information with global coverage combined with country-industry information on emissions. We find that all banks have reduced their loan-emission exposures over the last 8 years. However, we do not find differences between banks that did and those that did not signal their sustainability goals, with the exception of early signers of Principles of Responsible Investments (PRI), who already had lower exposure to emissions through their syndicated lending. In addition, banks that signed PRI shortened the maturity of the loans extended to highly-emitting industries but only temporarily. Thus, we conclude that banks reduced their exposure to climate transition risks on average, but voluntary climate commitments did not contribute to syndicated loan reallocation away from highly-emitting sectors.

JEL classification codes: G21, F21, Q54 **Keywords**: climate, sustainable finance, green finance, bank lending, syndicated loans

*We benefited from comments of seminar participants at the ECB and BIS Mexico. The views expressed in this paper are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of San Francisco or the Federal Reserve System.

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1 Introduction

In 2006 Kofi Annan launched the United Nation's initiative of Principles for Responsible Investment (PRI) designed to draw the attention of financial institutions to sustainable development goals. The climate sustainability goal is one among them. However, it was not until 2015 Mark Carney's speech on the "tragedy of horizons" that financial regulators started to include climate-related risks into their discussions of financial stability. The establishment of the Task Force on Climate-related Financial Disclosure (TCFD) by the Financial Stability Board, then chaired by Carney, followed suit. In 2017 the Network for Greening Financial System was launched as a coalition of a handful of central banks. Finally, in 2019, the Principles for Responsible Banking (PRB) were launched. The idea was that by accounting for climate-related risks, financial institutions would move money away from high-emission sectors, therefore "greening" their portfolio and, therefore, disincentivizing investment into technologies with high emissions. As Hartzmark and Shue (2022) clearly demonstrated, however, this strategy might be counter-productive — facing higher cost of borrowing, firms are likely to reduce their investment in greening their technologies. Many banks have signed the PRI, TCFD, and PRB agreements, all of which require a measure of the greenhouse gas (GHG) emissions embedded in the assets of financial institutions and the limits on such exposure. At the same time, the NGFS encouraged regulators to price climate risks appropriately. Have these efforts led to substantial divestment of financial institutions from sectors that require funds for green investments? We provide an answer to this question for the global syndicated loan market.

Recent empirical literature made some headway in assessing the effect of portfolio greening initiatives on financial capital allocation. Looking at the bank-firm pairs, Kacperczyk and Peydró (2022) find that banks that have made climate commitments reallocate their funding from firms with high to firms with low direct emissions (Scope 1). Since low-emission firms are likely to be in the industries that do not innovate in green technologies space, these dynamics can be counterproductive to climate goals. In fact, Kacperczyk and Peydró (2022) show that high-emission firms do reduce their investments and do not improve their emission efficiency when their funding is reduced. These findings are corroborated by the analysis in Reghezza et al. (2022); Mueller and Sfrappini (2022) who find that after Paris Accord in 2015 European banks reduced their lending to European firms with high emissions. There is also evidence that climate risks are reflected in loan pricing (Degryse et al., 2023; Ehlers et al., 2022; Hrazdil et al., 2020), although the evidence is mixed on whether there is a difference between banks that made climate commitments and the ones that did not. This analysis shows that bank appear to "green" their loan portfolios by reducing their exposure to highly-emitting firms, which may be of concern. In this paper, we take a broader view on the question and ask whether there is evidence that green commitments made by banks lead to a reduction of credit to highly-emitting *industries*, which would be of greater concern since these are industries in which investment in green technologies is the most needed.

Our goal is to take the broadest view possible on the question of how green commitments might

have affected the industry composition of bank lending. To do so, we focus on the syndicated loan market, for which global bank lending information is available at the loan level. We aggregate these data to the global ultimate owner (GUO) of the lender, since climate commitments are made at the headquarter level, focusing on 64 GUOs that account for a substantial share of syndicated loans globally. Given our focus on the industrial composition of bank lending, we are not limited by the self-reported firm-level emission data. Instead, we rely on World Input-Output Database environmental accounts to measure country-industry emissions. We match each borrower to a relevant country and industry to classify or aggregate loans by emissions. We conduct our analysis at bank-borrower country level as well as at the loan level. Since most findings point to changes in bank behavior only occurring after the Paris Accord, we limit our sample to 2015-2022.

We ask the following questions: Did banks that signed climate commitments reduce their lending to high-emission sectors? Alternatively, were banks already less exposed to high emitters more likely to sign climate commitments? We distinguish between these two possibilities by comparing the distribution of emission intensity of the syndicated loan portfolios across banks and within banks over time. We also distinguish between banks that made commitments before the Paris Accord and those who did so more recently. We find that all banks, regardless of their commitments (or lack of), reduced their lending to firms in highly-emitting sectors during our sample period. Banks that made commitments earlier were already lending less to highly emitting sectors, and we find no effect of climate commitments.

Another margin of adjustment for banks would be changes to the maturity structure of their loans. The risk of lending to highly-emitting sectors could increase with possible climate mitigation policies going forward. One way to reduce this risk is to shorten the maturity of loans extended to high emitters.[1] Thus, we also test whether climate commitments, which explicitly require acknowledgment and measurement of climate risks, led to shorter maturity of loans to firms in highly-emitting sectors. This would also be counter-productive because long-term investments are needed to fund green transition in these sectors. We do find a temporary shortening of maturities in new loans to high emitters following the signing of PRI.

Our paper contributes to the strand of literature on syndicated loans and emissions data. Prior work has focused on the degree to which climate risk is priced into loans (Hrazdil et al., 2020; Ehlers et al., 2022; Mueller and Sfrappini, 2022; Degryse et al., 2023). While there is evidence for a "carbon premium" in loans given since the Paris Agreement of 2015, the effect of climate regulatory risk depends on several factors including firm exposure and location (Mueller and Sfrappini, 2022). Additionally, "green" banks–both *de facto* and as signaled via climate agreements–do not seem to price carbon differently than non-green banks across all firms, but instead only to similar "green" firms (Ehlers et al., 2022; Degryse et al., 2023). In addition, Ho and Wong (2023) find that climate transition risk has been increasingly priced into syndicated loans to emissions-intensive sectors in emerging markets since the signing of the Paris agreement.

[1] Using firm-level data, Ivanov et al. (2023) find that higher-emitting firms face shorter loan maturities.

Our work also closely relates to the broader literature on climate risk in other financial markets. Work on equity returns has shown that there is a greenium, or asset risk premium associated with greenness and transparency factor that is priced into investments, though the premium may be muted for a period of time during transition (Alessi et al., 2021; Zhang, 2023). This carbon premium is present for firms across the world, with higher short-term premiums in countries with more economic development, and is found to dependent on both emissions levels and percent changes in emissions (Bolton and Kacperczyk, 2023). Similarly, there is existing literature on carbon pricing in fixed-income bonds. Corporate and municipal bonds are similarly priced with a climate risk premium, affecting both bond credit ratings and yield spreads (Baker et al., 2022; Acharya et al., 2022; Seltzer et al., 2022; Goldsmith-Pinkham et al., 2023). The literature has also explored the relationship between sovereign debt and physical climate risk; natural disasters and anomalies can increase the risk of default and impact government's borrowing conditions (Mallucci, 2022; Diarra and Jaber, 2022; Phan and Schwartzman, 2023).

Since we do not find substantial divestment of banks that made climate commitments from highly emitting industries, and only find a limited decline in maturities of loans to firms in these industries, we can conclude that there is little evidence of counterproductive effect of these UN, NGFS, and TCFD initiatives. The next question to be addresses is whether firms implement other principles outlined in PRI and PRB that require direct influence over the green activities of borrowers. This has recently been addressed in recent papers specifically documenting the effect of climate agreements on bank and borrower practices. Hasan et al. (2023) identify improved environmental performance among client firms of TCFD-member lenders as compared to control firms. Houston and Shan (2021) similarly show that lenders' ESG scores can influence borrower ESG scores. The limitation of our data with industry-level emissions is that we cannot observe whether banks reallocate their loans to greener firms within a given sector, albeit the literature has found evidence that of some within-industry reallocation.[2] Moreover, we cannot assess whether bank borrowers are greening their technologies. We leave this analysis to future work.

We begin our presentation with details on green commitments in Section 2, describe the data in Section 3, and report our empirical approach and findings in 4. The last section concludes.

2 Institutional context

We consider a set of three climate commitments, designed to support the sharing of climate-related disclosures and promote sustainable frameworks for banking and investing. The first of these

[2]For example, Polo et al. (2023) show that banks charge higher interest rates to higher-emitting firms, with banks that have publicly committed to decarbonization efforts charging higher climate risk premiums. Ding et al. (2023) find that firms with higher emissions receive less new bank loans and see reduced term structures in those that they do receive. Ye (2023) shows that bank divestment from high-emission firms stifles green innovation among these firms while promoting green innovation among the lower-emission firms that subsequently receive increased lending from these banks. Newton et al. (2022) show how ESG ratings mediate lender-borrower matching, with higher ESG-rated banks being more likely to give loans to higher ESG-rated firms.

commitments is that of the United Nations' Principles for Responsible Investing (PRI). Established in 2006 with just over 70 signatories, PRI promotes the incorporation of Environmental, Social, and Corporate Governance (ESG) responsibility factors into investment decisions. There are nearly 4000 total signatories and over 700 asset owner signatories that regularly provide PRI-outlined disclosures. PRI signatories commit to the adoption and implementation of six main principles. According to the principles, ESG issues are to be incorporated into investment analysis and decision-making processes. They are also to be incorporated into ownership policies and practices. Signatories are to seek appropriate disclosure by the entities in which they invest. Signatories are to promote acceptance and implementation of the principles within the investment industry. Signatories are to work together to enhance the effectiveness of principle implementation. Lastly, activities and progress towards principle implementation are to be reported by all signatories.

Established in 2015 by the Financial Stability Board, the Task Force on Climate-related Financial Disclosure (TCFD) is designed to provide recommendations for voluntary climate-related disclosures that are comparable and widely adoptable across sectors. With more than 4,000 supporters, the TCFD established eleven main recommendations aimed to increase climate-related financial risk exposure transparency in four areas: governance, strategy, risk management, and metrics and targets. Specifically, it poses the following recommendations. For governance, it recommends that organizations disclose the organization's oversight and role, such as that of boards and management, in assessing and managing climate-related risks and opportunities. For strategy, it recommends that organizations disclose the actual and potential impacts of climate-related matters. This includes describing the risks and opportunities identified over short, medium, and long term, as well as the impact on businesses, strategy, and financial planning. Such strategy should include a description of resilience to different climate-related scenarios. For risk management, it recommends organizations disclose how climate-related risks and identified, assessed, and managed. Disclosures include specific processes and how these processes are integrated into overall risk management. For metrics and targets, it recommends that organizations report scope 1, 2, and 3 (if appropriate) greenhouse gas emissions and performance against targets, in line with strategy and risk management process.

Similarly, the United Nations' Principles for Responsible Banking (PRB) was created in 2019 to provide a framework for sustainable finance alignment and disclosure in accordance with the United Nations' Sustainable Development Goals and the 2015 Paris Climate Agreement. There are more than 300 signatories, covering approximately fifty percent of global assets. PRB signatories commit to the adoption and implementation of six principles. They are to align business strategy to frameworks such as the Sustainable Development Goals, the Paris Climate Agreement, and other national/regional goals. Targets are to be set and published with the aim of continuously increasing positive impact and reducing negative impact on, and managing risk to, people and the environment. Signatories are to work with clients and customers to encourage sustainable practices and activities and consult with relevant stakeholders to achieve societal sustainability goals. The principles are to be implemented through effective governance and responsible banking. Lastly, signatories are to be transparent and accountable about performance.

3 Data

Our data come from three main sources: LSEG Loan Connector DealScan database of syndicated loans, available at the loan level with information on loan characteristics, the composition of loan syndicate, and limited information about borrowers; World Input-Output Database (WIOD) which in its environmental accounts provides emissions by country-industry pair; and online resources for banks' climate commitments.

3.1 Syndicated loans

We use data on syndicated loans from LSEG Loan Connector DealScan dataset. This dataset contains comprehensive information on the universe of all loans from the global syndicated loan market as contained in Dealscan. First, we pull all observations available in the Dealscan data set from January 2015 to November 2022. The raw data contains 685,465 observations. We then limit our data to 64 of the largest parent banks available, as defined by their share in the global syndicated loan market. We aggregated all affiliates to global ultimate owner level for these 64 banks, relying on bank names matched with the parent. Once this filtering is done, our dataset contains 387,643 observations. Table A.1 provides a list of banks in the sample.

The unit of observation is a loan facility. Dealscan provides information on each loan including size, maturity, and other contract details, including facility and deal amounts and active dates. For each observation, we also have information on the lenders and borrowers. In addition to loan amounts, we use industrial classification of the borrower, using SIC classification from Dealscan to match borrower's industry to the WIOD classification.

3.2 Emissions measurement

We measure environmental performance for each bank by matching borrowers to industry and country level Scope 1 emissions. Scope 1 emissions are defined as those greenhouse gas emissions created directly by sources owned and operated by a given organization. Our emissions data comes from the World Input Output Database WIOD16 Climate Dataset. The original dataset provides information on total Scope 1 emissions and gross output for 32 countries with differing year and industry coverage, containing in total 49 different industries from 2005 to 2016.

Country-industry coverage varies by year, so we use industry-level carbon dioxide emissions for the year 2014 to standardize our measure of emissions for 30 countries and up to 49 industries. We scale emissions by gross output of the given industry in a given country in the same year. Because the distribution of emissions to output ratio is very skewed, we project it on the 0-100 scale by computing percentiles of this measure for each country-industry in the overall distribution. High values of the resulting index correspond to high emissions.

For our sample of loan facilities, we use each borrower's 4-digit SIC code to match observations to

our constructed measure of environmental performance. We are unable to match all observations in our loan dataset due to missing SIC codes. Our final dataset contains 269,412 loan-facility observations with emissions indices. Figure A.1 plots the distribution of both emissions to gross output ratios and our emissions index.

We conduct some analysis at the loan level, but we also compute the emission intensity of each banks' portfolio in a given country in a given year. To do so, we construct a weighted average of emissions index for all new loans in which a bank participated in a given year with a borrower located in a given country. We use loan amounts as weights.

3.3 Climate Commitments

We include three different climate commitments in our analysis: the Task Force on Climate-Related Financial Disclosures (TCFD), Principles for Responsible Investment (PRI), and Principles for Responsible Banking (PRB). For each of these individual initiatives, we obtain a list of each participating bank's signing month and year from the official agreement websites. We merge these signatory records into our loan sample at the bank-date level. Because bank names can be written differently across databases, we use a manual string-matching process to ensure that the bank names defined in our loan sample are appropriately attributed to corresponding signatories. Table!A.1 reports the signing dates by agreement for all banks in our sample.

For our robustness tests, we also use data on banks' climate commitment rating from LSEG Eikon ESG Score database, which provides Environmental Pillar Score time series for most banks in our sample.

4 Empirical analysis

To summarize our data, Figure A.1 presents density plots of emission intensity of bank portfolios by year, for those who are ever signatories to a given agreement versus those who never signed that agreement. This basic time decomposition of portfolio greenness by signatory shows some differences in median emissions percentile, although no major deviations in greenness are apparent in any one group.

Turning to our statistical analysis, we present our empirical methodology first, followed by the results and the robustness tests.

4.1 Empirical specification

To investigate whether climate commitments impact the relative emissions exposure of signatory banks' portfolios as compared to non-signatories, we estimate the following baseline regressions at

either bank-country-year or at the loan level:

$$E_{bct} = \boldsymbol{\alpha} + \beta_1 S_{bt} + \beta_2 t + \beta_3 (S_{bt} * t) + \varepsilon_{bct}, \tag{1}$$

$$E_{lbt} = \boldsymbol{\alpha} + \beta_1 S_{bt} + \beta_2 t + \beta_3 (S_{bt} * t) + \varepsilon_{lbt}. \tag{2}$$

The dependent variable E_{bct} is the emission exposure of the portfolio of the loans issued in year t with participation of bank b and borrower located in country c, computed as weighted average of the emission index of all loans originated by syndicates with participation of bank b to borrowers in country c in year t using loan amount as weight. The dependent variable E_{lbct} is simply the emission index of loan l with participation of bank b to any borrower in country c in year t. S_{bt} indicates whether bank b has already signed a given climate commitment in year t. t is a year-time trend, with 2015 serving as year zero. $\boldsymbol{\alpha}$ is a varied set of fixed effects that may include just a constant, a bank b fixed effect, a borrower country c fixed effect, or both b and c fixed effects.

The coefficient β_1 captures a change in the level of the emissions' exposure of bank b following the signing of a climate commitment, β_2 captures any secular trends that are unrelated to climate commitments, while β_3 captures potential changes in the trend of emissions' exposure following the signing of the commitment. If green commitments lead to banks reducing loan origination to highly emitting industries, we expect $\beta_1 < 0$ or $\beta_3 < 0$ or both.

Our second test is whether the maturity of the loan to sectors with high emissions is affected by the signing of climate commitments. We conduct this analysis at the loan level:

$$\begin{aligned} MtM_{lbt} &= \boldsymbol{\alpha} + \beta_1 S_{bt} + \beta_2 t + \beta_3 (S_{bt} * t) + \beta_4 E_{lbt} && (3) \\ &+ \gamma_1 (E_{lbt} * t) + \gamma_2 (E_{lbt} * S_{bt}) + \gamma_3 (E_{lbt} * S_{bt} * t) + \varepsilon_{lbt}, && (4) \end{aligned}$$

where MtM_{lbt} is the maturity, in months, of loan l. The coefficients of interest are γ_2 which indicates the differential effect of signing climate commitments on average maturity of loans to highly emitting sectors and γ_3 which indicates a change in trend in maturities of loans issued to highly emitting sectors following the signing of climate commitments, relative to the trends in maturities of loans to non-emitting industries and to banks that did not sign commitments. If green commitments lead to banks reducing maturity of their loans to highly-emitting sectors to reduce their transition risk, we expect $\gamma_2 < 0$ or $\gamma_3 < 0$ or both.

4.2 Effects on industry composition of loans

We report our main results separately for PRI, TCFD, and PRB in Tables 1-3, respectively. For each of the three climate commitments, we estimate equation (1), at the bank-borrower country-year level, with different sets of fixed effects. Column (1) of each table provides estimates without bank or borrower country fixed effects, which means the coefficients are identified by variation

across banks, across borrower countries, and over time. Column(2) includes bank fixed effects, which means coefficients are identified by variation across borrowing countries and over time, but not across banks. Column (3) includes borrower country fixed effects, which means the coefficients are identified by variation across banks and over time. Finally, column (4) includes both bank and country fixed effects, which means identification comes from variation over time for a given bank and for a given borrower country.[3]

For PRI signing effect (Tables 1) we find that signatories tend to lend less than non-signatories to highly-emitting sectors $\beta_1 < 0$. However, the coefficient becomes small and not statistically significant when we include bank fixed effects, which implies that there is time-invariant difference between banks that signed PRI at some point and those banks that never did. To further investigate this difference, we limit the sample to banks that signed PRI after 2015 (the beginning of our sample), thus excluding the 17 banks that signed it before the beginning of our sample. The results are reported in Table 4, which confirms that the coefficient in the full sample was driven by lower exposure to high emitters among banks that signed PRI prior to 2015. In both specifications, we find a downward trend in emission exposure of syndicated loans, which is less precisely estimated when we include country fixed effects. This trend is not affected by the signing of PRI. Thus, these regressions show that, at least after the Paris Accord, there was no reduction in lending to highly emitting sector as a result of an increasing number of banks signing PRI.

Tables 2 and 3 repeat the main analysis for TCFD and PRB signing. Since both TCFD and PRB initiatives were introduced after 2015 no banks have signed these initiatives prior to the beginning of our sample. We continue to find a trend towards reducing exposure to hightly-emitting sectors, but no effect of signing on either level or trend of the emission exposure.

Next, we estimate our baseline regression at the loan-level, as shown in equation (2), for each of the three climate commitments. The results are reported in Tables 5- 8. We find that the results are similar to those found at the bank-country-year aggregate level, although the secular trend is less precisely estimated.

To summarize, we find no significant level or trend effects of signing PRI, TCFD, or PRB. To illustrate the effects, we conduct F-tests of the combination of level and trends effects for our main specifications with both country and bank fixed effects (column (4)) in Tables 1-3. The results are shown in Figure 2 with the sum of coefficients for each year combined with the 95 percent confidence interval. We can see that throughout, there is no significant effect of signing climate commitments on the country-industry composition of loans with respect to their emission exposure.

4.3 Effects on maturity

We have shown that there is no support for the hypothesis that the signing of climate commitments led banks to reduce their participation in loan origination for highly-emitting sectors. Changing

[3]These are not bank-country pair fixed effects.

loan composition, however, is not the only way to mitigate transition risk. Since a large portion of the transition risk comes from potential climate mitigation and decarbonization policies, it might be reasonable to expect that these policy changes will not materialize in the immediate future. Thus, one may reduce exposure to transition risks by shortening the maturity of the loans to high emitters. We test this hypothesis at the loan level, estimating the regression in equation (3). Results are reported in Tables 9-12.

We find that PRI signatories tend to participate in loans with longer maturities on average, whether or not we limit the sample to those who did not sign PRI prior to 2015. We do observe that after signing PRI banks have a slightly shorter maturity of the loans to highly emitting industries. In terms of magnitudes, maturity is about 2.5 month shorter for the highest emitting industry compared to the median if we rely on the coefficients in Table 9. The effect is larger, 8 months, for the same comparison if we exclude banks that signed PRI prior to 2015 (Table 10), but in that sample there is an offsetting effect of the trend, rendering the total effect insignificant after 5 years.

Turning to Tables 11-12, we do not find similar patterns. There is no significant change in either level or trend in maturity of lending to high-emission industries after subscribing to TCFD nor PRB.

4.4 Robustness tests

We have attempted various ways to improve the precision of our results and test other measures. Overall, regardless of methodology or measures used we are unable to find evidence of banks reducing their lending to highly emitting sectors as a result of signing green commitments.

4.4.1 Main specification

Considering potential changes to lending practices due to COVID, we next consider only the sample of loans that originated before 2020. We estimate our main specification at the loan-level for each commitment only using loans from 2015-2019. We find no significant climate agreement effects on emissions percentile. The results are reported in Tables A.2-A.4.

We also consider alternative levels of aggregation, clustering of standard errors, and fixed effects combinations, as well as various lag structures. These modifications do not alter our results qualitatively.

We were concerned that climate commitments might not be reflective of actual greenness of the banks. To control for this heterogeneity, we included as a control variable, the Environmental Pillar of the ESG index we obtained for each bank in each year from LSEG Loan Connector.[4] Our main

[4]ESG Scores measure companies' ESG performance based on reported data in the public domain across three pillars and 10 different ESG topics. The environmental pillar pertains firms' resource use, emissions and innovation. The pillar weights are normalised to percentages ranging between 0 and 100. LSEG Loan Connector provides further

conclusions hold and no major climate commitment effect is present.

4.4.2 Alternative commitment and outcome variables

We considered two alternative measures of commitment in addition to PRI, TCFD, and PRB signing. Namely, the Environmental Pillar of the ESG index (described above) and the signing of the Equator principles.[5] We found no significant effects on the loan composition.

We also considered the Environmental Pillar of the ESG index as an outcome variable and found no effect of the signing of PRI, TCFD, or PRB on this measure of environmental performance. The results are reported in Tables A.5-A.7.

4.4.3 Alternative specifications

In addition to our main specification, we construct an event-study specification. We do so to account for the fact that the "treatment" of banks signing a climate agreement is staggered over many years. Thus, the event-study design allows us to measure the climate commitment effect relative to the signing period, against non-signers. The time to treatment is measured at the year-quarter interval.

We estimate the event-study specification for both emissions-percentile and months-to-maturity outcomes. For emissions percentile, we plot the coefficient on the time of treatment variable. Only for PRI there is a significant deviation from zero in post-treatment periods, with the delay of about 8 quarters. For month-to-maturity, we run an interacted model with time to treatment and emissions percentile. We plot the interacted term. In the case of months to maturity, there is no noticeable significant effect post-signing. These results are reported in Figures A.3 and A.4, respectively.

We also estimate a logit regression model using our emissions percentile outcome variable. In particular, we re-estimate equation 2 in a logit set-up with the dependent variable being 1 if the loan is at or above the 90^{th} percentile of emissions. There are no significant commitment effects of PRB and PRI, however TCFD has a negative level effect, which is offset, to a large extent, by a positive trend effect. The results are reported in Tables A.8-A.10 and in Figure A.2.

Lastly, we apply quantile regressions to our baseline specification at the 25^{th}, 50^{th}, and 75^{th} percentiles. In this specification, as in the benchmark, there are significant time trend effects, but no climate commitment differences.

details on the index.

[5]The Equator Principles (EPs) are intended to serve as a common baseline and risk management framework for financial institutions to identify, assess and manage environmental and social risks when financing Projects. The Equator Principles apply globally, to all industry sectors and to five financial products: project finance advisory services, project finance, project-related corporate loans, bridge loans, and project-related refinance, and project-related acquisition finance. Equator Principles Financial Institutions implement the 10 Equator Principles through their internal environmental and social risk management policies, procedures and standards.

5 Conclusion

We present a number of empirical tests evaluating the effect of banks signing green commitments on the industrial composition of their syndicated lending and the maturity of their loans across sectors. We found no effects of signing green commitments on loan composition, indicating that there is no evidence for the concern about counterproductive effects of such commitments — at least in the syndicated loan markets. Banks that promise to green their portfolios do not seem to significantly reduce the share of loan to highly emitting sectors any more than banks that did not sign such commitments. While there is an overall trend towards less lending to high emitters, this trend is not explained by the PRI, TCFD, or PRB initiatives.

We find limited evidence that banks that sign PRI attempt to address their exposure to transition risk by shortening maturities of loans to highly emitting sectors. However, this effect is relatively small in magnitude and is only temporary.

Overall, we conclude that green commitments of banks do not lead to relocation of syndicated lending from more to less emitting sectors and therefore, at least in the context of the syndicated loan market. Therefore, the concerns raised by Hartzmark and Shue (2022) have not materialized in the context of the global syndicated loan market. It is possible that banks green their portfolios by relocating funds toward more climate-friendly firms *within* industries, which is in fact consistent with green transition. Some studies have already demonstrated these effects, as discussed before. Unfortunately, our data are not granular enough to also estimate these effects.

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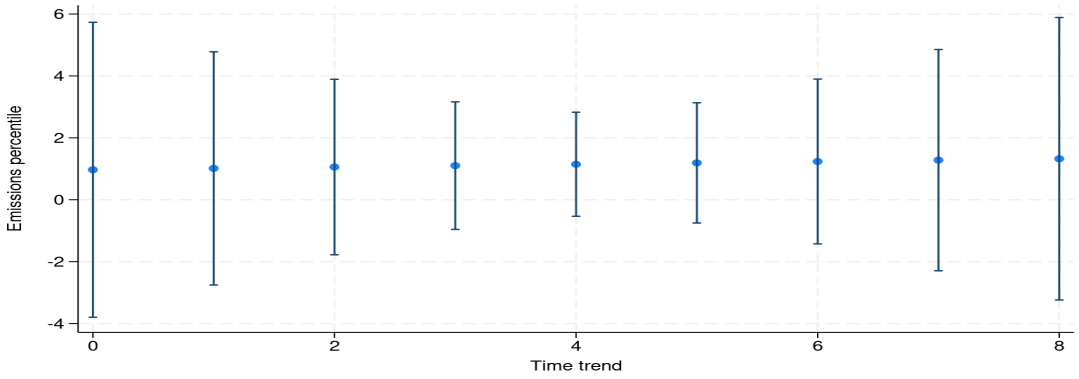
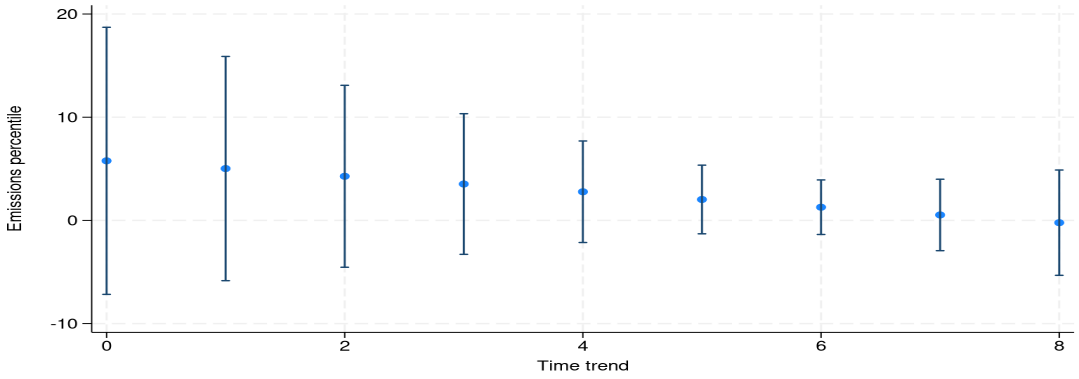
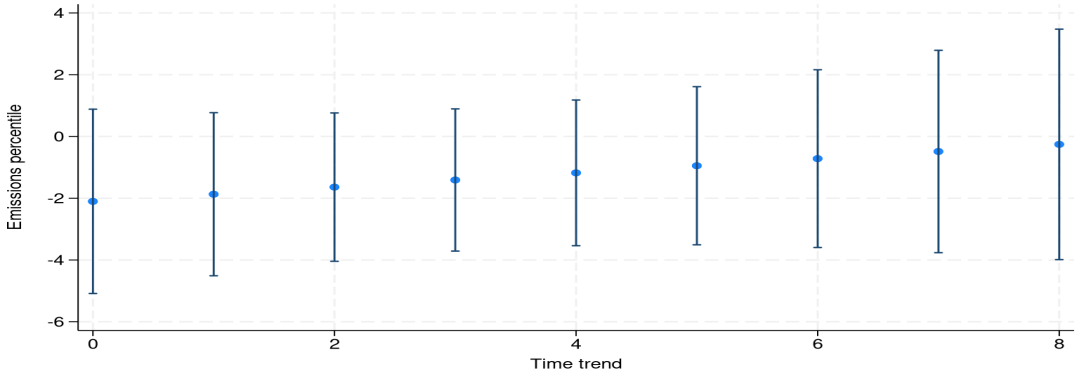
Figure 1: Joint effect on level and trend of emission exposure (F-test)



(a) TCFD



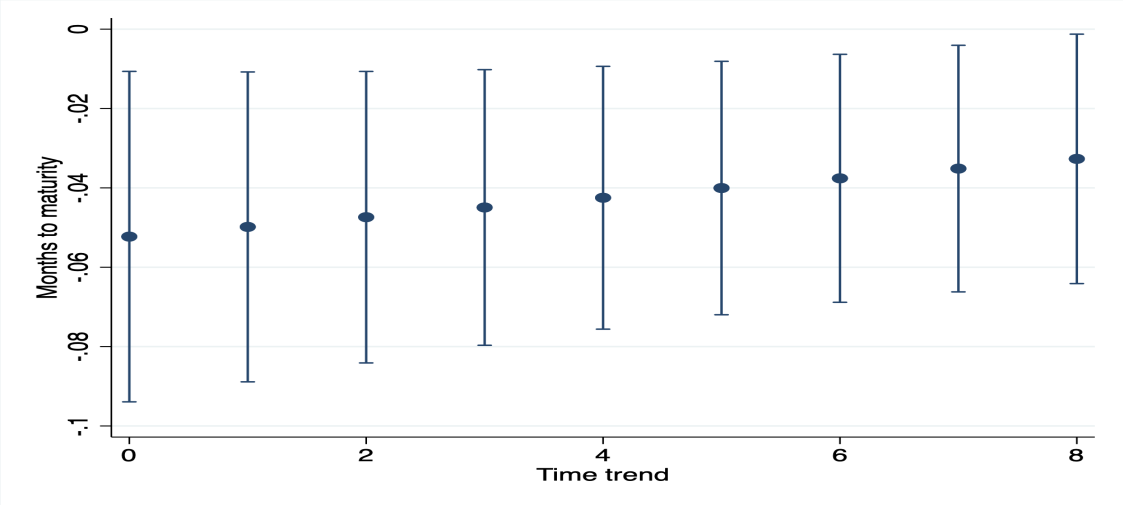
(b) PRB



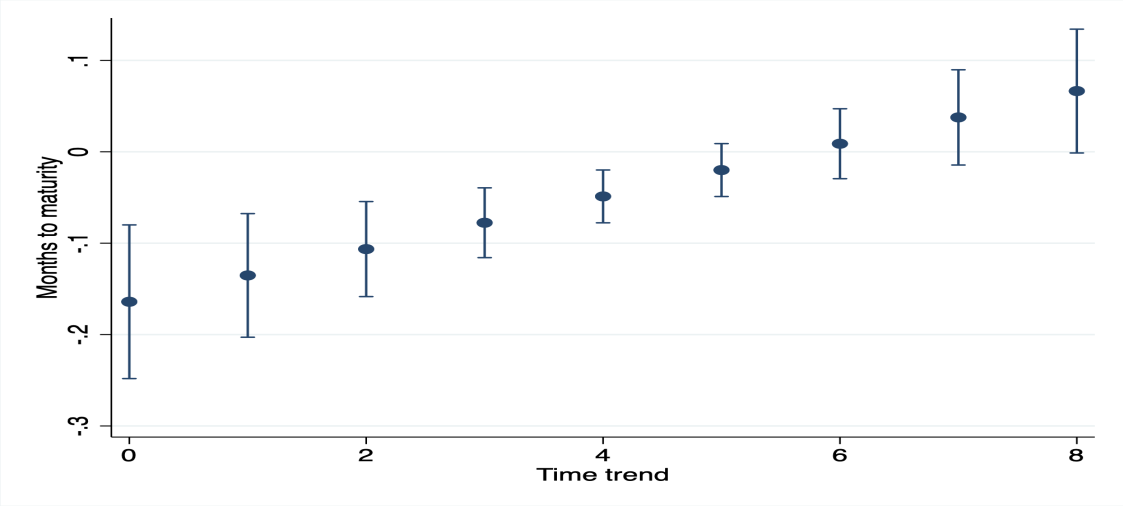
(c) PRI

Note: Charts correspond to column (4) specifications in Tables 1-3 with bank and country fixed effects. The dots are the sum of coefficients on level and trend effect of signing climate agreement. The lines represent 95% confidence intervals.

Figure 2: Joint effect on level and trend of maturity (F-tests)



(a) PRI: Full sample



(b) PRI: Excluding early signers

Charts correspond to column (4) specifications in Tables 9 and 10 with bank and country fixed effects. The dots are the sum of coefficients on level and trend effect of signing climate agreement. The lines represent 95% confidence intervals.

Table 1: Main Results: PRI

Emissions exposure	(1)	(2)	(3)	(4)
Signatory	-3.166*	-1.221	-4.438*	-2.101
	(1.243)	(1.531)	(1.697)	(1.457)
Time trend	-0.660**	-0.454*	-0.621	-0.446
	(0.210)	(0.218)	(0.557)	(0.569)
Sig. x year	0.371	-0.0006	0.591	0.231
	(0.296)	(0.262)	(0.309)	(0.295)
Observations	5854	5843	5854	5843
R^2	0.004	0.059	0.251	0.287
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Dependent variable is a bank-country-year weighted average emission index. See equation (1) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 2: Main Results: TCFD

Emissions exposure	(1)	(2)	(3)	(4)
Signatory	0.769	-0.383	1.314	0.969
	(1.693)	(1.393)	(2.353)	(2.326)
Time trend	-1.187***	-0.557*	-0.818	-0.539
	(0.233)	(0.234)	(0.570)	(0.509)
Sig. x year	0.623	0.127	0.278	0.0445
	(0.378)	(0.316)	(0.523)	(0.531)
Observations	5854	5843	5854	5843
R^2	0.005	0.059	0.250	0.287
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Dependent variable is a bank-country-year weighted average emission index. See equation (1) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 3: Main Results: PRB

Emissions exposure	(1)	(2)	(3)	(4)
Signatory	5.428	3.616	7.627	5.773
	(3.935)	(2.626)	(6.596)	(6.318)
Time trend	-0.605**	-0.577**	-0.513	-0.501
	(0.192)	(0.173)	(0.493)	(0.542)
Sig. x year	-0.770	-0.466	-1.065	-0.749
	(0.684)	(0.503)	(1.070)	(1.040)
Observations	5854	5843	5854	5843
R^2	0.003	0.059	0.249	0.288
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Dependent variable is a bank-country-year weighted average emission index. See equation (1) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 4: Main Results: PRI, Recent Signatories

Emissions exposure	(1)	(2)	(3)	(4)
Signatory	0.376	0.0695	-2.128	-2.223
	(2.775)	(2.402)	(2.231)	(2.101)
Time trend	-0.660**	-0.457*	-0.638	-0.462
	(0.211)	(0.219)	(0.557)	(0.570)
Sig. x year	0.0330	-0.228	0.509	0.263
	(0.545)	(0.422)	(0.460)	(0.412)
Observations	3705	3701	3705	3701
R^2	0.003	0.061	0.242	0.279
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Recent signatories defined as those banks signing on or after January 2015. Dependent variable is a bank-country-year weighted average emission index. See equation (1) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 5: Loan Level Results: PRI

Emissions exposure	(1)	(2)	(3)	(4)
Signatory	-1.934***	0.757	-1.308	0.818
	(0.217)	(0.928)	(1.075)	(0.632)
Time trend	-0.337***	-0.382	-0.371	-0.370
	(0.0387)	(0.364)	(0.346)	(0.323)
Sig. x year	0.0702	-0.0119	0.120	-0.0107
	(0.0538)	(0.194)	(0.137)	(0.119)
Observations	269412	269406	269412	269406
R^2	0.001	0.019	0.026	0.043
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Dependent variable is a loan-level emission index of the borrower's country and industry. See equation (2) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses . * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 6: Loan Level Results: PRI, Recent Signatories

Emissions index	(1)	(2)	(3)	(4)
Signatory	-6.436***	-1.445	-6.295***	-1.522
	(0.495)	(2.475)	(1.557)	(1.683)
Time trend	-0.337***	-0.377	-0.387	-0.358
	(0.0385)	(0.366)	(0.338)	(0.321)
Sig. x year	1.007***	0.393	1.187**	0.417
	(0.102)	(0.387)	(0.347)	(0.304)
Observations	161655	161654	161655	161654
R^2	0.002	0.021	0.031	0.047
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Recent signatories defined as those banks signing on or after January 2015. Dependent variable is a loan-level emission index of the borrower's country and industry. See equation (2) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses . * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 7: Loan Level Results: TCFD

Emissions index	(1)	(2)	(3)	(4)
Signatory	-1.377***	-1.427	-1.663	-1.687
	(0.330)	(1.639)	(1.304)	(1.394)
Time trend	-0.420***	-0.267	-0.255	-0.282
	(0.0395)	(0.320)	(0.382)	(0.247)
Sig. x year	0.291***	0.0971	0.156	0.174
	(0.0717)	(0.409)	(0.242)	(0.254)
Observations	269412	269406	269412	269406
R^2	0.001	0.019	0.026	0.044
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Dependent variable is a loan-level emission index of the borrower's country and industry. See equation (2) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 8: Loan Level Results: PRB

Emissions index	(1)	(2)	(3)	(4)
Signatory	9.092***	8.368	9.862*	8.658
	(1.005)	(5.227)	(4.565)	(4.474)
Time trend	-0.505***	-0.416	-0.516	-0.402
	(0.0327)	(0.282)	(0.278)	(0.253)
Sig. x year	(0.170)	-1.274	-1.297	-1.320
	(0.170)	(0.865)	(0.780)	(0.774)
Observations	269412	269406	269412	269406
R^2	0.001	0.019	0.027	0.044
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Dependent variable is a loan-level emission index of the borrower's country and industry. See equation (2) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses . * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 9: Effects on Maturity: PRI

Months to Maturity	(1)	(2)	(3)	(4)
Signatory	3.390**	2.581	2.784**	2.576
	(0.990)	(1.488)	(0.994)	(1.801)
Time trend	0.203	0.363	0.285	0.358*
	(0.383)	(0.334)	(0.181)	(0.148)
Sig. x year	0.408	0.0330	0.271	0.0535
	(0.237)	(0.218)	(0.332)	(0.398)
Emissions index	0.0703	0.0693	0.0843	0.0829
	(0.0648)	(0.0584)	(0.0605)	(0.0543)
Emissions x year	0.00989	0.00892	0.00719	0.00704
	(0.00773)	(0.00643)	(0.00788)	(0.00792)
Emissions x sig.	-0.0466*	-0.0549***	-0.0488	-0.0523*
	(0.0180)	(0.0135)	(0.0240)	(0.0203)
Emissions x. sig. x year	0.000917	0.00206	0.00211	0.00245
	(0.00332)	(0.00142)	(0.00298)	(0.00198)
Observations	262252	262246	262252	262246
R^2	0.011	0.044	0.071	0.088
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

Note: Dependent variable is maturity of the loan. See equation (3) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 10: Effect on Maturity: PRI, Recent Signatories

Months to Maturity	(1)	(2)	(3)	(4)
Signatory	7.492**	5.879	9.390***	6.210*
	(2.437)	(3.253)	(1.533)	(2.762)
Time trend	0.203	0.367	0.333	0.385
	(0.383)	(0.331)	(0.246)	(0.191)
Sig. x year	-0.330	-0.808	-1.038*	-0.878
	(0.558)	(0.590)	(0.432)	(0.570)
Emissions percentile	0.0703	0.0694	0.0883	0.0870
	(0.0648)	(0.0584)	(0.0627)	(0.0562)
Emissions x year	0.00989	0.00890	0.00639	0.00637
	(0.00773)	(0.00638)	(0.00819)	(0.00855)
Emissions x sig.	-0.138**	-0.155**	-0.164***	-0.164***
	(0.0403)	(0.0460)	(0.0417)	(0.0410)
Emissions x. sig. x year	0.0225*	0.0256**	0.0298**	0.0288**
	(0.00901)	(0.00752)	(0.0105)	(0.00862)
Observations	157622	157621	157622	157621
R^2	0.014	0.055	0.082	0.101
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

Note: Recent signatories defined as those banks signing on or after January 2015. Dependent variable is maturity of the loan. See equation (3) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

Table 11: Effect on Maturity: TCFD

Months to Maturity	(1)	(2)	(3)	(4)
Signatory	-3.610*	-3.246*	-2.794*	-2.690
	(1.463)	(1.264)	(1.092)	(1.425)
Time trend	0.370	0.198	0.522	0.289*
	(0.297)	(0.235)	(0.296)	(0.129)
Sig. x year	0.790*	0.818*	0.448	0.628
	(0.305)	(0.300)	(0.402)	(0.398)
Emissions percentile	0.0482	0.0443	0.0642	0.0616
	(0.0602)	(0.0529)	(0.0547)	(0.0478)
Emissions x year	0.00739	0.00706	0.00437	0.00425
	(0.00659)	(0.00474)	(0.00653)	(0.00634)
Emissions x sig.	0.0265	0.0293	0.0105	0.0129
	(0.0302)	(0.0258)	(0.0244)	(0.0228)
Emissions x. sig. x year	-0.00205	-0.00269	0.00166	0.00142
	(0.00639)	(0.00519)	(0.00216)	(0.00157)
Observations	262252	262246	262252	262246
R^2	0.010	0.044	0.070	0.087
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

Note:Dependent variable is maturity of the loan. See equation (3) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

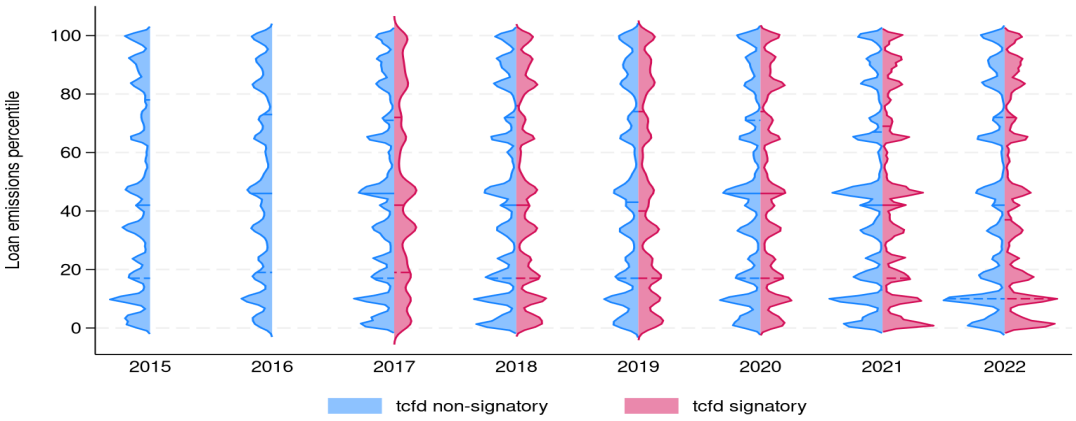
Table 12: Effect on Maturity: PRB

Months to Maturity	(1)	(2)	(3)	(4)
Signatory	-9.846	-10.81	-9.324	-9.863
	(6.842)	(6.600)	(6.998)	(5.811)
Time trend	0.111	0.402	0.354	0.440
	(0.412)	(0.364)	(0.253)	(0.243)
Sig. x year	2.365	1.850	1.828*	1.647*
	(1.169)	(0.990)	(0.866)	(0.674)
Emissions percentile	0.0528	0.0504	0.0687	0.0667
	(0.0635)	(0.0565)	(0.0632)	(0.0562)
Emissions x year	0.00569	0.00491	0.00235	0.00248
	(0.00612)	(0.00526)	(0.00551)	(0.00596)
Emissions x sig.	0.116	0.0964	0.0627	0.0504
	(0.194)	(0.181)	(0.144)	(0.123)
Emissions x. sig. x year	-0.0136	-0.00966	-0.00259	-0.000768
	(0.0267)	(0.0240)	(0.0146)	(0.0120)
Observations	262252	262246	262252	262246
R^2	0.012	0.044	0.071	0.088
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

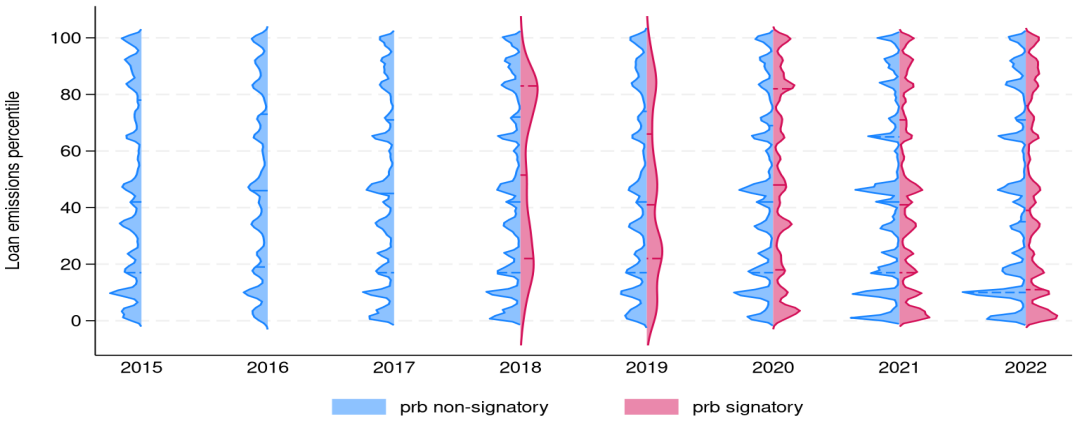
Note: Dependent variable is maturity of the loan. See equation (3) for the exact specification. Fixed effects as indicated. Robust standard errors clustered at the same level as fixed effects as well as on industry are in parentheses. * indicates significance at 10% level, ** at 5% level, and *** at 1% level.

A Appendix

Figure A.1: Density plot of emissions, by signatory status and year



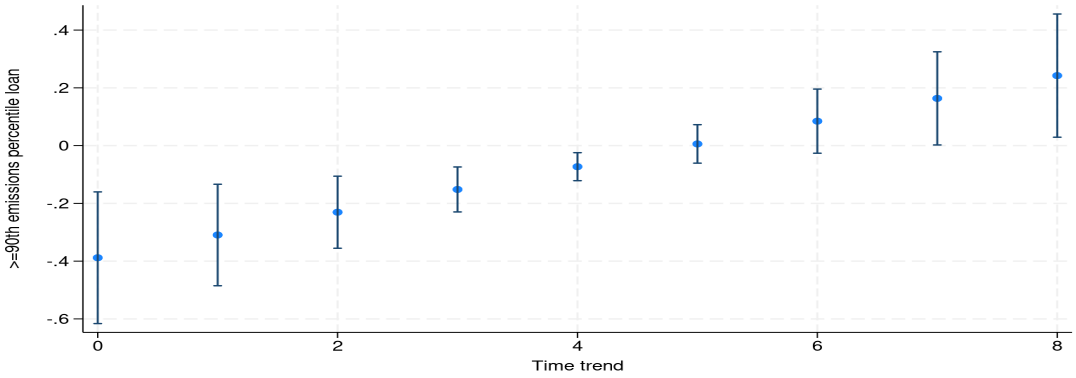
(b) TCFD



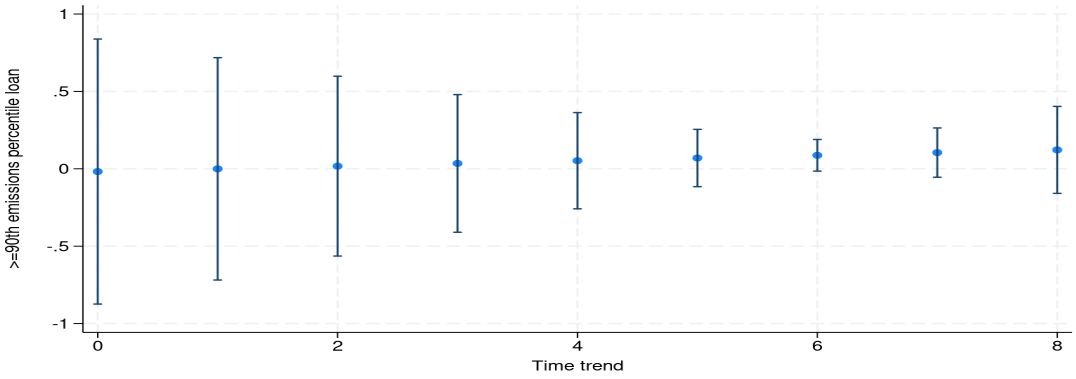
(c) PRB

(a) PRI

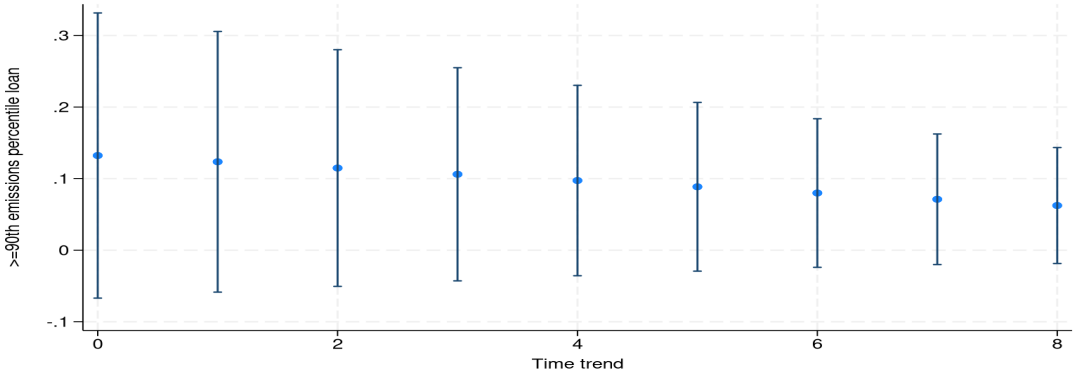
Figure A.2: Joint effect on level and trend of 90th percentile emission logit regression (F-test)



(a) TCFD

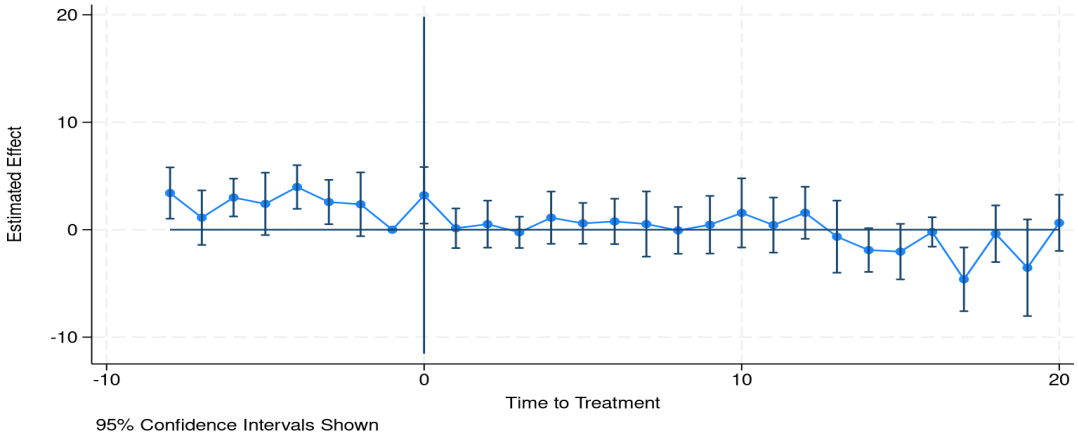


(b) PRB

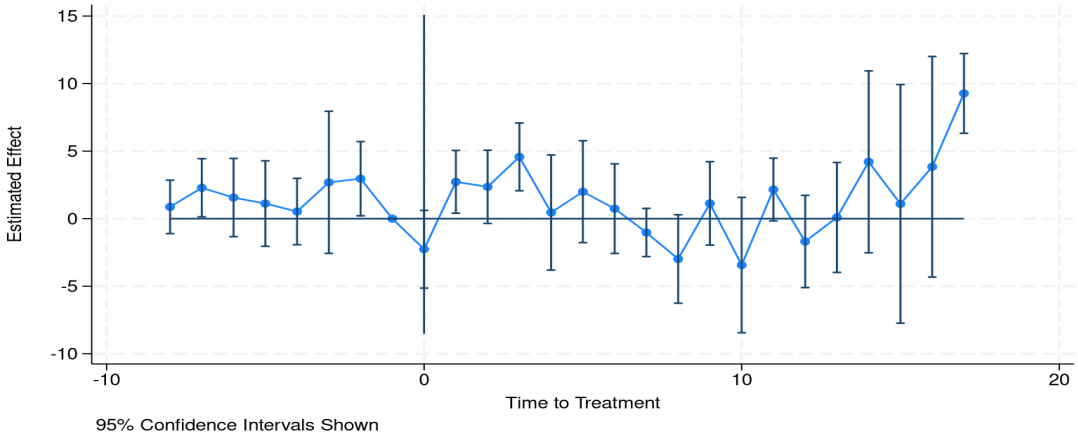


(c) PRI

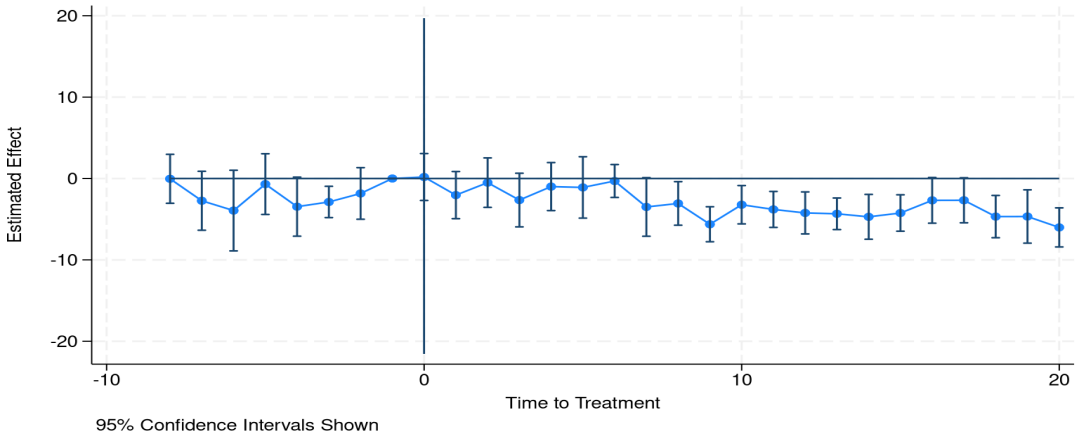
Figure A.3: Event study, emissions percentile



(a) TCFD

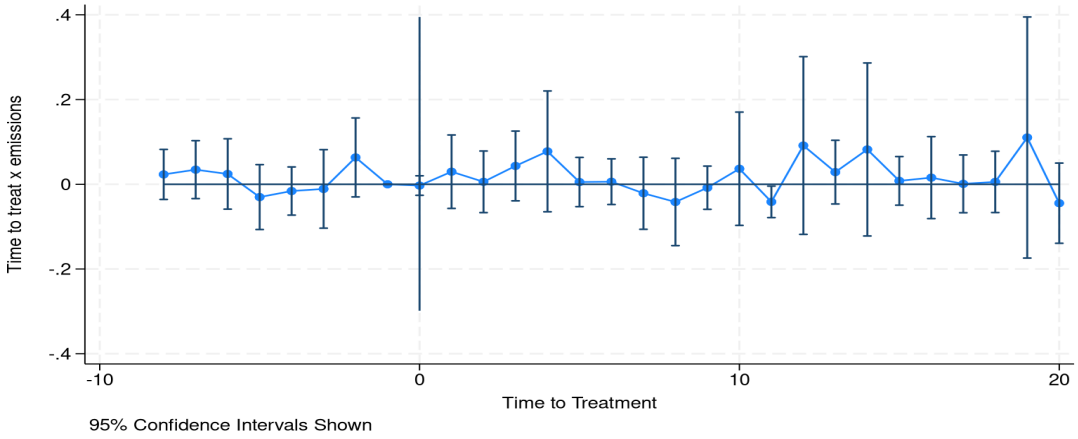


(b) PRB

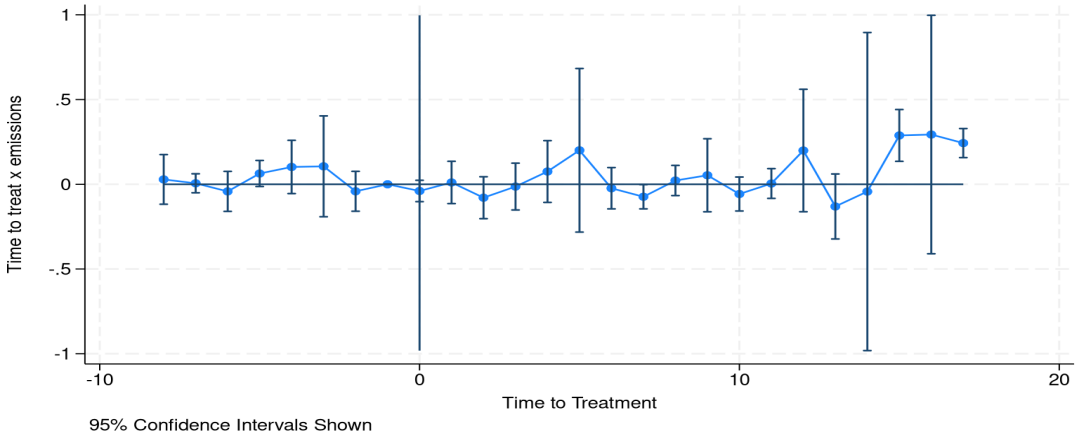


(c) PRI

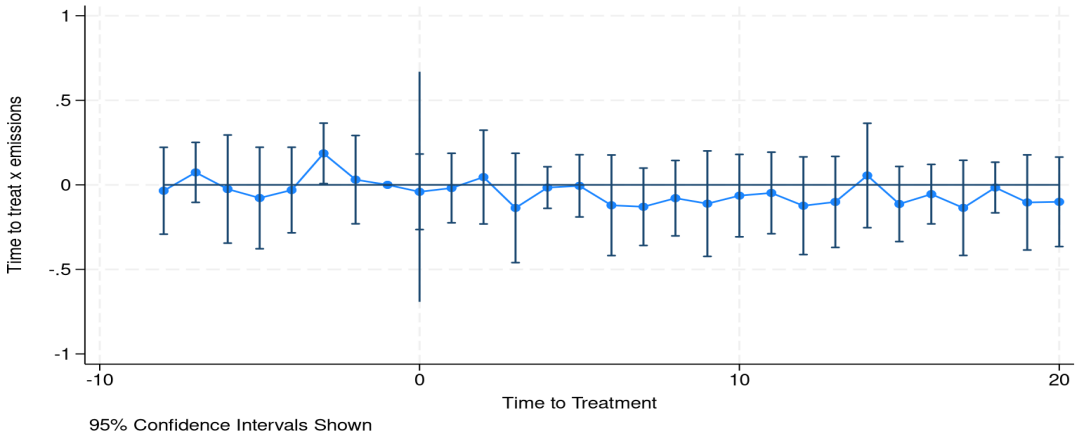
Figure A.4: Event study, months to maturity, interacted model



(a) TCFD



(b) PRB



(c) PRI

Table A.1: Green commitment dates

Bank Name	**PRI Signing Date**	**TCFD Signing Date**	**PRB Signing Date**
	(1)	(2)	(3)
ABN AMRO	2012m3	2017m11	2019m9
ANZ			2019m9
BBVA	2021m8	2017m12	2019m9
BMO Capital Markets	2019m12	2017m12	2021m1
BNP Paribas	2012m9	2017m6	2022m12
BOfA	2014m11	2017m6	
Bank of China	2019m12	2021m2	2021m7
Barclays	2016m4	2017m6	2019m9
BayernLB		2020m11	2021m8
CIBC World Markets		2018m3	
CM-CIC			2019m11
CaixaBank	2016m5	2017m12	2019m9
China Construction		2021m5	
Citi		2017m6	2019m9
Citizens Financial			
Commerzbank Group	2020m9	2020m9	2019m9
Commonwealth Bank		2018m3	2019m10
Credit Agricole	2010m3	2017m12	2019m9
Credit Suisse	2014m1	2017m11	2019m9
DBS		2017m12	
DNB Markets	2006m10	2017m6	2019m9
Danske Bank	2010m2	2018m9	2019m9
Deutsche Bank	2012m5	2018m9	2019m9
Fifth Third Securities		2020m9	
First Abu Dhabi		2019m12	2021m10
Goldman Sachs	2011m12	2018m9	2021m3
HSBC	2006m6	2017m6	
ICBC			
ING		2017m6	2019m9
Intesa Sanpaolo		2018m10	2019m9
Jefferies LLC			
KeyBanc Capital			
LBBW	2009m10		2018m9
Lloyds Banking		2017m12	2019m9
MUFG	2006m4		2019m9
Macquarie	2015m8	2019m4	
Mediobanca	2019m9	2022m3	2021m5
Mizuho	2006m9		2019m9
Morgan Stanley	2013m10	2017m6	
NatWest Markets			2019m9
National Australia Bank	2019m2	2017m10	2019m9
Natixis	2019m8	2021m2	2019m9
Nomura	2011m3		2020m5
Nordea	2007m1	2018m12	2019m9
OCBC		2019m11	
PNC Bank			
RBC Capital	2015m8	2020m6	
Rabobank	2022m7	2017m10	2022m12
SEB		2018m5	
SG Corporate		2021m9	
ScotiaBank		2018m2	
Standard Chartered Bank		2017m6	2019m9
Sumitomo Mitsui	2019m1	2017m12	2019m9
TD Securities			
Truist Financial			
UBS	2009m4	2017m6	2019m9
UOB		2019m11	
US Bancorp			
UniCredit		2020m1	2019m10
Wells Fargo		2019m11	
Westpac		2017m12	2019m9

Table A.2: Loan level results, pre-COVID: PRI

Emissions percentile	(1)	(2)	(3)	(4)
Signatory	-2.078***	-0.593	-2.196	-0.681
	(0.392)	(0.848)	(1.454)	(0.580)
Time trend	-0.873***	-1.458**	-0.998	-1.575*
	(0.178)	(0.456)	(0.727)	(0.592)
Sig. x year	0.574**	1.053**	0.717	1.176*
	(0.182)	(0.341)	(0.524)	(0.438)
Observations	154611	154606	154611	154606
R^2	0.001	0.017	0.030	0.049
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

Note: Unit of observation is loan facility for a lender bank to borrower country in a given year.

Table A.3: Loan level results, pre-COVID: TCFD

Emissions percentile	(1)	(2)	(3)	(4)
Signatory	-1.647***	-1.541	-1.759	-1.712
	(0.359)	(1.842)	(1.693)	(1.734)
Time trend	-0.684***	-0.250	-0.608	-0.206
	(0.119)	(0.473)	(0.602)	(0.490)
Sig. x year	0.455***	0.0348	0.432	0.0538
	(0.134)	(0.711)	(0.669)	(0.564)
Observations	171833	171828	171833	171828
R^2	0.001	0.022	0.030	0.049
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

Note: Unit of observation is loan facility for a lender bank to borrower country in a given year.

Table A.4: Loan level results, pre-COVID: PRB

Emissions percentile	(1)	(2)	(3)	(4)
Signatory	6.816***	7.553	6.879	7.650
	(1.058)	(4.928)	(4.324)	(4.246)
Time trend	-0.648***	-0.649	-0.636	-0.655
	(0.0860)	(0.338)	(0.617)	(0.565)
Sig. x year	-0.878***	-0.977	-0.859	-0.978
	(0.195)	(0.933)	(0.929)	(0.877)
Observations	125919	125914	125919	125914
R^2	0.001	0.018	0.033	0.049
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes
Industry FE	No	No	No	Yes

Note: Unit of observation is loan facility for a lender bank to borrower country in a given year.

Table A.5: Main Results, E score: PRI

E score	(1)	(2)	(3)	(4)
Signatory	15.36***	2.444	14.70***	2.524
	(1.620)	(3.233)	(0.974)	(3.158)
Time trend	-0.0781	0.477	-0.0897	0.475
	(0.140)	(0.367)	(0.0560)	(0.360)
Sig. x year	-2.188***	-0.662	-2.123***	-0.665
	(0.374)	(0.461)	(0.198)	(0.455)
Observations	4905	4897	4905	4897
R^2	0.023	0.867	0.037	0.868
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Unit of observation is average E score for a lender bank to borrower country in a given year.

Table A.6: Main Results, E score: TCFD

E score	(1)	(2)	(3)	(4)
Signatory	-3.055	-6.800*	-2.983*	-6.841*
	(1.669)	(2.587)	(1.237)	(2.550)
Time trend	-0.911***	0.236	-0.884***	0.228
	(0.144)	(0.388)	(0.129)	(0.384)
Sig. x year	2.104***	1.452*	2.050***	1.466*
	(0.344)	(0.621)	(0.238)	(0.617)
Observations	5650	5642	5650	5642
R^2	0.025	0.867	0.037	0.868
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Unit of observation is average E score for a lender bank to borrower country in a given year.

Table A.7: Main Results, E score: PRB

E score	(1)	(2)	(3)	(4)
Signatory	-7.261	-10.89	-6.326	-10.95
	(4.533)	(6.153)	(3.745)	(6.087)
Time trend	-0.478***	0.185	-0.453***	0.174
	(0.142)	(0.302)	(0.0741)	(0.297)
Sig. x year	1.889*	2.449	1.696**	2.467
	(0.778)	(1.252)	(0.581)	(1.246)
Observations	5320	5312	5320	5312
R^2	0.005	0.871	0.017	0.871
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Unit of observation is average E score for a lender bank to borrower country in a given year.

Table A.8: Logit regression, emissions percentile: PRI

I(>= 90th percentile emissions)	(1)	(2)	(3)	(4)
Signatory	0.0323	0.109	0.115	0.132
	(0.0204)	(0.0665)	(0.0990)	(0.102)
Time trend	-0.0188***	-0.0196	-0.0227*	-0.0166
	(0.00371)	(0.0143)	(0.00998)	(0.0150)
Sig. x year	-0.00504	0.00255	-0.00417	-0.00873
	(0.00515)	(0.00743)	(0.0169)	(0.00940)
Observations	269412	268738	269369	268695
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Unit of observation is loan facility for a lender bank to borrower country in a given year. Industry clustering added.

Table A.9: Probability of lending to high emitting sectors: TCFD

I(>= 90th percentile emissions)	(1)	(2)	(3)	(4)
Signatory	-0.293***	-0.330***	-0.364***	-0.388***
	(0.0326)	(0.0945)	(0.0589)	(0.116)
Time trend	-0.0240***	-0.0284**	-0.0308*	-0.0330***
	(0.00376)	(0.0101)	(0.0138)	(0.00885)
Sig. x year	0.0497***	0.0687**	0.0677***	0.0788**
	(0.00700)	(0.0241)	(0.0178)	(0.0275)
Observations	269412	268738	269369	268695
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Unit of observation is loan facility for a lender bank to borrower country in a given year. Industry clustering added.

Table A.10: Logit regression, emissions percentile: PRB

I(>= 90th percentile emissions)	(1)	(2)	(3)	(4)
Signatory	0.0265	0.204	-0.0502	-0.0178
	(0.0961)	(0.532)	(0.154)	(0.437)
Time trend	-0.0289***	-0.0430***	-0.0305**	-0.0270*
	(0.00316)	(0.00840)	(0.0108)	(0.0109)
Sig. x year	0.00911	0.0169	0.0223	0.0175
	(0.0163)	(0.0760)	(0.0276)	(0.0709)
Observations	269412	268738	269369	268695
Bank FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Note: Unit of observation is loan facility for a lender bank to borrower country in a given year. Industry clustering added.