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Global Bank Lending under Climate Policy

Asli Demirguc-Kunt, Alvaro Pedraza, Fredy Pulga, and Claudia Ruiz-Ortega

Abstract

What is the response of bank foreign subsidiaries to climate policy in their host countries? We find that global banks with high environmental performance increase their presence in countries after local authorities strengthen their climate-related actions. Through their foreign subsidiaries, these banks expand their credit by 4.6 percent following an increase in one-standard deviation of the host country climate policy index. Importantly, we do not find evidence that banks with low environmental scores exit in response to climate initiatives. Our findings show that strengthening climate policy might be a win-win strategy for policymakers—in addition to addressing carbon emission reduction, climate-related initiatives also appear to attract foreign capital from lenders with strong preferences for green assets.

KEYWORDS
Global banks, climate change, environmental performance

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Asli Demirguc-Kunt
Center for Global Development (Non-Resident Fellow); ademirguckunt@gmail.com

Alvaro Pedraza
World Bank; apedrazamorales@worldbank.org

Fredy Pulga
Universidad de la Sabana; fredy.pulga@unisabana.edu.co

Claudia Ruiz-Ortega
World Bank; cruizortega@worldbank.org (corresponding author)

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CENTER FOR GLOBAL DEVELOPMENT
2055 L Street, NW Fifth Floor
Washington, DC 20036

1 Abbey Gardens
Great College Street
London
SW1P 3SE

www.cgdev.org

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1. Introduction

A central objective of climate policy is the reduction of carbon emissions, either by promoting renewable energies and increasing energy efficiency across sectors, or by imposing restrictions on activities contributing to greenhouse gas (GHG) emissions. However, heterogeneity in the stringency of climate policy among governments can lead to a reallocation of factors across countries, altering the effectiveness of policy actions. On the one hand, multinational firms might shift production to countries with weaker environmental standards to circumvent costly regulations (Hanna, 2010; Chung, 2014; Cai et al., 2016). Alternatively, fiscal support for green technologies and other government policies that promote the transition to a less-carbon intensive economy might attract foreign capital; strong climate policies might be appealing to multinationals with more efficient and cleaner technologies than their domestic counterparts (Brucal et al., 2017). In this context, banks, the largest source of external finance for most firms, can play a major role. By adjusting their lending, banks may undermine efforts to combat climate change if they move capital towards firms operating in countries with weaker climate standards, a regulatory arbitrage to circumvent climate policies (Houston & Lin, 2012; Benincasa et al., 2021). Conversely, banks may support climate strategies if they expand their lending into countries implementing climate policies by financing innovation and greener activities. Understanding if the financial sector, and in particular banks, act as a conduit in the implementation of climate policies remains an open question.

In this paper, we examine how global banks—those operating physical branches and subsidiaries in foreign countries—adjust their credit following changes in climate policy. These financial institutions typically expand abroad to follow their international clients and to seek new profit opportunities in host countries. They represent a large share of the banking sector in the countries where they operate,[1] and move global liquidity into or away from local economies with important real effects (Bruno & Hauswald, 2014; Giannetti & Ongena, 2012; Poelhekke, 2015). We identify adjustments in the credit supply of global banks in two ways. First, we exploit the cross-section of banks operating in a given country-year and compare changes in the lending of foreign banks to those of their domestic peers as climate policy strengthens. Second, we exploit variation in the lending of a global bank at a given period across countries. More precisely, using data on foreign bank subsidiaries, we analyze if banks operating in multiple countries change their credit in jurisdictions that advance their climate agenda. To the best of our knowledge, this is the first paper that analyzes the lending response of foreign bank subsidiaries to domestic policies tackling climate change.

We find that after authorities in the host country strengthen their climate-related actions, there is a marginal increase in the lending portfolio of banks. This small average effect masks some important heterogeneity in the cross section. In particular, subsidiaries of global banks with the highest scores in environmental performance respond to host-country climate policy by increasing their total

1 In 2013, foreign banks accounted for 43 and 36 percent of the total banking assets in developing and high-income countries respectively (Claessens & Van Horen, 2015).

credit in that market–credit grows by 4.6% following an increase in one-standard deviation of the country climate policy index. Consistent with this finding, total bank employment at that location increases. Importantly, we do not find any evidence that global banks with low environmental scores exit countries implementing climate policies. That is, there is no evidence that their total credit shrinks in their host countries nor that the banks reduce their labor force in those locations. Similarly, domestic banks, regardless of their environmental score are mostly irresponsive to climate actions by local authorities. Our findings suggest that after the implementation of climate policy, foreign banks with preferences towards green assets tend to increase their lending in that country, leading to a net increase in foreign capital.

We use the Climate Policy component of the Climate Change Performance Index as the measure of the strength of policy actions in 58 countries. Published annually since 2007 by Germanwatch e.V., the Climate Policy is a survey of over 500 climate and energy experts from civil societies assessing the resolve of policymakers to address climate change. For instance, the survey aims to capture whether (and to what extent) a country's authorities are taking concrete actions to reduce GHG emissions and to promote renewable energies (Burck et al., 2022).[2] The Climate Policy measure (CPM) has a key advantage for our analysis. Rather than capturing outcomes in a country, such as actual GHG emission reduction which might take time to materialize, the CPM is indicative of the experts' perception of new policies, and the implementation of previous policy frameworks. Hence, the CPM can have considerable variation within a country and over time.

We combine the Climate Policy measure with Fitch Fundamentals, a comprehensive dataset reporting the balance sheets of most commercial banks operating in each country. We obtain the Environmental scores of publicly listed banks (E-scores) from the ESG components available in Refinitiv. We assign to all the subsidiaries of a global bank the same score as the parent institution. With this data, we examine differences across banks in their lending adjustments following changes in the climate policy of a given country. More precisely, we investigate differences between global vs. domestic banks, and across banks with varying environmental performance.

One concern about a naïve model where credit growth is regressed on a climate policy index, is that there can be country level characteristics correlated with both the climate policy and with bank lending. For instance, an improvement in economic conditions can lead to both the introduction of new climate initiatives and to an increase in bank lending, especially from global banks. To mitigate such concerns, we include country level characteristics that are known to correlate with bank credit, such as local economic conditions and characteristics of the legal environment (De Haas & Van Lelyveld, 2010). Further, we saturate our model with country-year fixed effects to control for unobserved time-varying factors in each country that might affect the overall supply of credit.

2 Some of these policies include tax incentives for renewable energy, support for technology innovation, initiatives that induce climate resilience. The CP also aims to capture strategies to reduce forest degradation and other protections to ecosystem biodiversity, and national peat land protection.

Our identification effectively compares, within a country, the response across banks. We interpret the finding that only global banks with high environmental scores increase their lending after the introduction of climate policies as evidence of a green-preference channel.

Using the sample of global banks, we present an alternative empirical exercise where we compare the credit growth across foreign subsidiaries of the same bank. In this exercise, we control for a series of home-host country pair characteristics that are associated with foreign bank credit (e.g., geographic, and cultural proximity as in Mian, 2006), and include parent bank-year fixed effects. Here, we are comparing for a global bank and year, whether there are shifts in the credit supply across countries. We confirm our finding that global banks with high E-scores increase their credit in host countries that strengthen their climate policy. At the same time, we do not find any evidence that global banks with low environmental performance reduce their supply of credit to countries strengthening their climate actions.

Another concern with our empirical exercise is that rather than measuring banks' preferences for green assets, the environmental score could be capturing other underlying characteristics unrelated to climate objectives. Moreover, because foreign banks are particularly sensitive to the legal environment in the host country (Quian & Strahan, 2007), if climate policies signal an improvement in the institutional framework, banks with high environmental standards might increase their credit for reasons not linked to climate actions. We address these issues in two ways. First, we show that the environmental score is indeed correlated with variables that are related to green outcomes. For instance, we show that global banks headquartered in countries with higher GHG emissions tend to have lower environmental scores, even after controlling for a wide battery of bank observable characteristics. Second, we examine the role of corporate governance on the banks' response to climate actions, since these might be related to risk taking and to the legal features of the host country (Anginer et al., 2018). We classify banks by their Refinitiv Governance score and estimate horse-race regression models with both the environmental and governance scores. Our estimates on the credit growth of banks with high environmental standards are mostly unchanged, but importantly, corporate governance does not seem to be driving the banks' response to climate policies. Overall, these findings provide credence to our interpretation that global banks with strong preferences for green assets expand their lending in countries that strengthen their climate policies.

Our paper contributes to a growing literature on climate change and finance.[3] For example, it has been well documented that investors ask for a premium to hold assets from firms with high exposure to climate-change risks (Atanasova & Schwartz, 2019; Delis et al., 2019; Bolton & Kacperczyk, 2021). However, the literature on the implications of climate policies on bank lending has been rather scant. Reghezza et al. (2022) show that bank reallocate lending away from polluting firms after the Paris Agreement and Miguel et al. (2022) show that banks limit their supply of credit to climate-change exposed firms after the introduction of new capital requirements in Brazil.

3 See Giglio et al., (2021) for a review of this literature.

Closely related to our analysis, Benincasa et al. (2021) find that global banks react to higher climate policy stringency in their home country by increasing their cross-border lending through greater participation in syndicated loans. Contrary to our results, these authors document banks' behavior in the syndicated loan market that is consistent with a regulatory arbitrage channel—whereby banks from countries with strict regulations engage in cross-border activities in jurisdictions with weaker regulations.[4] Rather than looking at the syndicated loan market, which is mainly concentrated in the largest corporations in a country, our work focuses on bank lending by subsidiaries of international banks, and their response to climate policy in their host country. Since foreign subsidiaries represent a large share of the lending portfolio of global banks (Cetorelli & Goldberg, 2012), it is important to understand how credit responds to climate mitigation strategies in this context. Additionaly, because subsidiaries are regulated by the authorities at the host country and rely on local retail funding, they might behave similar to domestic banks (Aldasoro et al., 2022). Finally, strong climate policies are not neccesarily restrictive of bank activity. For instance, tax incentives for renewable energy and fiscal support for technology innovation might encourage lenders to direct funding to these sectors rather than drive away capital.

In a recent paper, Kacperczyk & Peydró (2022) use syndicated loans to show that after a bank announces its commitment to carbon neutrality, it decreases (increases) its lending to firms with more (less) scope-1 emissions.[5] The authors interpret the reallocation of credit towards activities with low GHG emissions as evidence of banks' preferences toward green assets. Our findings are complementary and shed novel light on a key aspect of the green preference channel. Specifically, we show that global banks with high environmental performance increase their exposure to countries that strenghten their climate policy actions. Our results suggest that climate policy might be a win-win strategy for policymakers by directly reducing carbon emissions and also attracting capital from global lenders with strong preferences for green assets.

Our paper is also related to the growing literature that examines the exposure of financial institutions to climate change through two different risk drivers: the physical impact of climate change and the policy risk of the transition to a less carbon-intensive economy–through the exposure to firms with business models not aligned with a low-carbon setting (Krueger et al., 2020; Seltzer et al., 2020; BIS, 2021; Duniz et al., 2021). Since regulations to fight climate change could erode the value of banks' credit exposure or the corresponding collateral, supervisory authorities have introduced prudential regulation to account for the impact of climate-related risks. The combination of green policies (e.g., those that promote renewable energies, increase in energy efficiency, and reduce greenhouse gas emissions) with prudential measures implies that banks operate in a complex regulatory framework with substantial trade-offs. We contribute to this literature by providing

4 There is evidence that banks circumvent tight restrictions on lending activity and more capital requirements by transferring funds to markets with fewer regulations. See for example, Houston & Lin (2012), Ongena et al. (2013), Aiyar et al. (2014), and Karolyi & Taboada (2015).

5 Direct GHG emissions that occur from sources that are controlled or owned by the firm.

evidence on how global banks take actions to increment or reduce their presence in countries with more stringent climate policies.

2. Data

To examine whether foreign banks' subsidiaries adjust their lending portfolio in response to climate policies of their host countries, we combine data on: (i) climate policy stringency, (ii) banks' balance sheets and environmental standards, and (iii) host and home country characteristics. In this section, we provide detailed description of the sample construction and main variables for the analysis.

Climate policy. Published annually since 2007, the Climate Change Performance Index (CCPI) tracks countries' efforts to combat climate change. As an independent monitoring tool, it aims to enhance transparency in international climate politics and enables comparison of climate protection efforts and progress made by individual countries. A module within the CCPI is the Climate Policy measure (CPM), an annual survey among energy policy experts from non-governmental organizations, universities and think tanks within the countries that are evaluated, rating the climate-related measures from their governments. The policies evaluated include initiatives to promote renewable energies, the increase in energy efficiency and other measures to reduce greenhouse gas emissions.[6] Within each policy area, experts evaluate both the strength and the level of implementation of the respective policy framework, and rank countries within a range of 0 (the lowest score) to 20 (the highest score). In line with the Paris Agreement, experts also evaluate the ambition level and the efforts of each country to reduce national emissions, the so-called Nationally Determined Contributions (NDCs). Our sample includes 58 countries with information on the CPM between 2007 and 2020.[7]

During our sample period, the average CPM for both developed and developing countries is around 10, but since this measure captures government attitudes towards climate actions, there is large variation across countries and even within each country over time (Panels A and B of Figure 1). In 2007 for instance, while the climate policy component scores of developed countries in North America were close to zero, countries in Europe had an average score of about 14. Also, the increase in the climate policy score for North America between 2007 and 2016 was followed by a large contraction, reflecting the exit of the U.S. from the Paris Agreement.

6 Besides the climate policy component, other categories in the index are the GHG emissions, renewable energy, and energy use. Since the methodology of these categories was modified in 2017, we exclusively focus on the climate policy component, which allows us to compare the progress of countries in terms of climate policy regulation from 2007 to 2020.

7 Of the 58 countries in the CCPI dataset, only three do not have information for the entire 2007–2020 period. These countries are Chile, which was added to the CCPI in 2020, and Iceland and Singapore, whose data is available until 2017.

Bank-level data. We obtain banks' yearly financial statements from *Fitch Fundamentals*. The dataset covers both private and publicly traded financial institutions operating across 200 countries and comprises a full set of balance sheet, profitability, and employment information. We restrict the data to banks operating in the 58 countries for which the CCPI is collected and exclude financial institutions with no information on their total assets, common equity, and gross loans. We complement the bank-level data with Factset Revere Geographic Revenue (GeoRev). GeoRev provides annual information of listed companies' revenue by country, which we use to identify global banks and their subsidiaries. For each country and year in the Fitch dataset, we find global banks and their subsidiaries by merging banks by their names in GeoRev. We define global banks as banks that: 1) operate in the same country of their headquarters but report at least 1 percent of their revenue generated in a different country; 2) operate in a different country as their headquarters' country. Of the 502 banks matched in GeoRev and Fitch, we identify 173 that derived at least 1 percent of their total revenue from their international operations across the 58 countries in our sample. For example, according to GeoRev, Banco Santander, domiciled in Spain, generated 24% of its total revenue from Brazil, 17% from the United States, 11% from the United Kingdom, 8% from Mexico, and 5% from Chile during 2020. Of the 173 cross-border banks in the sample, 122 report revenues in subsidiaries located in developed countries, compared to 99 in developing countries.

For the group of publicly traded banks in the sample, we use the Environmental score (E-*score*) from the ESG component reported in Refinitiv. This score is benchmarked by industry and captures the relative performance of each company based on their own corporate records. For the environmental pillar, it measures three main themes: emission, innovation, and resource use. Overall, the score captures the percentile ranking of a company relative to its peers, whether it committed to environmental standards such as reduction of CO2 emissions, protection of biodiversity and capital measure capacity to reduce environmental costs, and capability to promote sustainability. The environmental scores are available for 211 banks. Among these, 90 are domestic banks and 121 are global banks. Due to the bounded nature of this measure, we use a logistic transformation, $ENV = ln\left(\frac{E_{score}}{1-E_{score}}\right)$. For the transformed variable, the median bank has an environmental score of 1.11, and banks at the 25th and 75th percentiles reporting scores of −0.36 and 2.08, respectively.

Country-level data. In some specifications, we exploit variation on the lending of global banks across their subsidiaries. We include in our dataset information on the economic development of countries where global banks operate (i.e., lagged log GDP per capita) as well as geographical and cultural closeness between the countries of operation and origin of global banks (i.e., distance between countries and whether home and host countries share common language), as these characteristics have an important role on cross-border lending (Qian and Strahan, 2007; Giannetti and Yafeh, 2012).

The complete summary statistics of our data are displayed in Table 1, with the variable definitions listed in Appendix Table A1. Our final sample is restricted to countries with available CPM data

and for banks with E-scores.[8] In Panel A, we report the statistics at the country-year level. Of the countries in our sample, 39 percent are developing economies (see Appendix Table A2 for country list). In our final sample, the median country has 5 publicly listed banks, and there are 3 banks operating in countries at the 25th percentile, and 11 banks in countries at the 75th percentile.

Panel B of Table 1 presents the summary statistics calculated at the bank-year level in our sample, where subsidiaries of global banks are counted as separate entities, and their information is captured at the country of operation. Banks in our sample have on average 8.5 billion dollars in assets, 4.2 billion in deposits, and yearly credit growth of 9 percent. The number of banks' employees is also growing over time, although at a smaller pace than credit, at 2 percent per year. In terms of geographical penetration, the average bank operates in 7 countries where climate policy data is collected (between 1 and 11 countries for the 25th and 75th percentile).

In Figure 2 we document the differences between listed domestic and global banks in the sample along four observable characteristics. As shown, banks with presence in foreign markets have higher environmental scores but tend to be smaller than banks with only domestic focus. Among listed banks, the distribution of the equity to asset ratio and yearly portfolio growth seems to be similar between these two groups.

3. Methodology

Our objective is to measure whether subsidiaries of global banks expand or contract their lending in response to climate policies at the host country. Furthermore, we examine if changes in the climate policy rating have differential effects on the credit supply of foreign bank subsidiaries relative to domestic banks. To do so, we estimate the following bank-country equation:

$$\Delta \log Y_{b,c,t} = \alpha_0 + \alpha_1 CPM_{c,t-1} * GLOBAL_{b,c,t} + \alpha_2 GLOBAL_{b,c,t} + \alpha_3 X_{b,c,t-1} + \alpha_{c,t} + u_{b,c,t} \quad (1)$$

The dependent variable is credit growth, $\Delta \log Y_{b,c,t}$; the change in the logarithm of the value of loans of each bank b operating in country c between years t–1 and t. GLOBAL is a dummy variable equal to one if bank b is a subsidiary of a foreign bank on year t and zero otherwise. The climate policy measure, $CPM_{c,t-1}$, captures the strength of the climate actions in the host country of the subsidiary. The key parameter of interest in (1) is the estimated coefficient on $CPM_{c,t-1} * GLOBAL_{b,c,t}$, denoted by α_1. We control for bank-level characteristics, $X_{b,c,t-1}$, which include bank size (log of total assets and log of total deposits) and bank's common equity ratio (common equity over total assets). Equation (1) includes country-year fixed effects to control for time-varying factors in each country that might affect the overall supply of credit. Our strategy effectively compares, within a country, the response in total credit from domestic and global banks to changes in climate policy. We estimate robust

8 While our focus is on global banks, constraining the sample to lenders with reported E-scores largely reduces the sample of domestic banks. In robustness exercises, we compare the behavior of foreign banks to the universe of domestic banks in each country (16,373 in total) and confirm our findings.

standard errors by double clustering at the bank-year level to account for serial correlation between each lender over time.

While equation (1) is useful to compare the behavior of domestic vs. foreign banks, there might be confounding factors that affect the supply of cross-border lending. For instance, economic conditions in the home country of the foreign bank and other market conditions in the countries where the global bank operates could affect the supply of credit in each host country. If the credit growth of a subsidiary is managed by the corporate headquarters (De Haas & Van Lelyveld, 2010), conditional on home and host country conditions, the relative growth of the lending portfolio across locations (i.e., each host country) should be a good proxy for the targets set by the global bank. In other words, our dependent variable is expected to capture how global banks manage their subsidiaries and distribute credit.

As an alternative specification, we study the behavior within a global bank in the countries it operates. To be precise, we estimate the following equation for the group of global banks in the sample:

$$\Delta \log Y_{b,c,t} = \alpha_0 + \alpha_1 CPM_{c,t-1} + \alpha_2 HOST_{b,t} + \alpha_3 X_{b,c,t-1} + \alpha_{b,t} + u_{b,c,t} \quad (2)$$

where $HOST_{b,t}$ are country-level controls that have been shown to affect cross-border credit supply (De Haas & Van Lelyveld, 2010; Karolyi & Toboada, 2015). These include cultural shared aspects between lenders and borrowers (common spoken language), geographic distance between the headquarters and the subsidiary, and the host country's demographic and macroeconomic characteristics. The key aspect in equation (2) is that we control for bank-year fixed effects. In this setting, we are effectively comparing for a global bank and year, whether there are shifts in the credit supply in response to changes in the climate policy stringency of host countries.

4. Results

4.1 Foreign bank subsidiaries vs. domestic banks

We first estimate the basic model, Equation (1), in which the credit growth of a bank depends on the lagged climate policy measure in a country, controlling for bank and country characteristics. The estimates are displayed in Columns (1) and (2) of Table 2. The coefficient for the CPM variable, which captures the average response across banks, suggests that banks in our sample increase their credit after the introduction of climate-related actions, that is, after the country's authorities strengthen their climate policy. The magnitude of the coefficient implies that the average bank expands its credit by 1.12% following an increase of 1-standard deviation of the CPM (0.25 × 4.47 = 1.12). Notably, the coefficient for the interaction between climate policy and the global bank dummy is indistinguishable from zero. Hence, we cannot reject the null hypothesis that the average credit growth of global and domestic banks is the same after climate policy strengthens.

It is possible that the aggregate results are masking important heterogenous behavior in the cross section. For example, if banks base their credit decision on their preferences for green assets (Kacperczyk & Peydró, 2022), their reaction to government-sponsored green initiatives might be more pronounced. We explore this channel by further classifying banks by their environmental performance and study whether the response to climate policy depends on the bank's ex-ante environmental score. To be precise, we examine how banks with better/worse environmental scores adjust their lending portfolio in response to climate policy stringency, using the logistic transformation of the Refinitiv E-score, $ENV_{b,t-1}$. Banks with high environmental scores include those with established climate-related strategies and those that show strong commitment to higher environmental standards. With this strategy we aim to compare if there are any differences in credit allocation depending on the banks' environmental policies. We estimate the following equation:

$$\begin{aligned}\Delta \log Y_{b,c,t} = {} & \alpha_0 + \alpha_1 ENV_{b,t-1} + \alpha_2 ENV_{b,t-1} * CPM_{c,t-1} + \alpha_3 GLOBAL_{b,c,t} + \alpha_4 ENV_{b,t-1} * GLOBAL_{b,c,t} \\ & + \alpha_5 CPM_{c,t-1} * GLOBAL_{b,c,t} + \alpha_6 ENV_{b,t-1} * GLOBAL_{b,c,t} * CPM_{c,t-1} + \beta X_{b,c,t-1} + \alpha_{c,t} + u_{b,c,t}\end{aligned} \tag{3}$$

The set of controls are the same as those introduced in equation (1). In particular, we estimate equation (3) with country-year fixed effects to control for time-varying factors in each country. Effectively, we are comparing within a host country and a year, the response in total credit between domestic and global banks, and by environmental performance (Columns 3 and 4). We find that the response to changes in climate policy is concentrated among global banks, and more specifically, among those with high environmental standards. The positive and statistically significant coefficient for the triple interaction, ENV * GLOBAL * CPM, indicates that these banks increase their credit after the host country strengthens its climate policy. The magnitude of the coefficient in column (4) implies that a global bank with E-score in the 75th percentile of the distribution expands its credit by 2.38% more than a bank in the 25th percentile. Domestic banks, on the other hand, do not appear to change their lending volumes following climate initiatives from local authorities.

In Figure 2, we show that the distribution of environmental scores is different between domestic and foreign banks, with the latter mostly skewed towards higher scores. These differences might emerge from low coverage or even variations in the scoring methodology for banks with exclusive domestic focus. To deal with this issue, we replace the variable ENV by a dummy variable equal to 1 if a domestic (global) bank has an environmental score above the *50th*-percentile of the distribution of domestic (global) banks in year *t*–1 and zero otherwise; that is, we condition the distribution of E-scores separately for domestic and global banks. The results, presented in columns (5) and (6), confirm our main finding: The response to changes in climate policy is largely driven by the actions of banks with high environmental standards. The magnitude of the coefficient for the triple interaction ENV * GLOBAL * CPM (column (6)), implies that global banks with E-scores above the median substantially expand their credit by 4.6% in response to a 1-standard deviation increase in the CPM of the host country (1.03 × 4.47 = 4.6).

As an alternative measure for banks' expansion in a market, we examine whether banks grow their staff in a particular country. That is, we replace the dependent variable in models (1) and (3) by a bank's employment growth, $\Delta \log L_{b,c,t}$, which is the change in the logarithm of the number of employees for each bank per year. The results, presented in Table 3, further support the view that global banks with high environmental standards increase their focus in countries with strong climate policies. In particular, estimates in column 6 indicate that the expansion of bank staff in response to changes in a country's climate policy is exclusive of global banks with high E-scores. More concretely, global banks with E-scores above the median grow their employment in 4% for each 1-standard deviation increase in the CPM of a country.

Throughout the paper, we benchmark the response of global banks relative to domestic banks operating in the same country. One limitation to our analysis is that by focusing on banks with environmental scores, the number of domestic banks is largely reduced in the final sample. As a robustness test, we examine the changes in credit and employment growth without excluding domestic banks, regardless of the availability of environmental performance data. In this exercise, we compare the behavior of global banks with high and low environmental performance relative to the universe of domestic banks operating in each country. The results show that domestic banks do not alter their lending volume or employment in response to climate policies introduced by local authorities (Appendix Table A3). In contrast, global banks with high E-scores respond the strengthening of climate policies, captured by increases in the CPM, by expanding their presence in these markets.

Figure 3 summarizes our findings. Each panel plots the estimated difference (and associated confidence interval) of credit and employment growth across banks in response to a 1-standard deviation increase in the CPM. The figure compares three groups of banks: (i) global banks with E-scores above vs. below the median, (ii) global banks above the median E-score vs. the universe of domestic banks, and (iii) global banks below the median E-score vs. all domestic banks. Across all panels, the evidence suggests that the strengthening of climate policies in a country, rather than driving capital away, is attracting foreign lenders with preferences for green assets.

4.2 Within global banks

So far, we compared how total credit growth differs between foreign and domestic banks when climate policy stringency changes in a given country. Although we interpret our coefficient of interest as the effect of the host country's climate policy stringency on foreign bank subsidiaries relative to domestic banks, a bank's willingness to grant credit through its subsidiaries may be affected by other aspects, such as markets' characteristics where the bank is operating or economic conditions in its home country. To further rule out potentially confounding factors, we examine the results from the angle of the global bank. Specifically, we estimate equation (2) where we control for bank-year fixed effects. In this setting, we are effectively comparing for a global bank and year, whether there are shifts in the credit supply in response to changes in the climate

policy actions of host countries. In addition, we also control for country-level aspects that have been shown to affect cross-border credit supply (De Haas & Van Lelyveld, 2010; Karolyi & Toboada, 2015): (i) cultural shared aspects between lenders and borrowers (common spoken language), (ii) geographic distance between the headquarters and the subsidiary, and (iii) the host country's demographic and macroeconomic characteristics.

Results for equation (2) are presented in Table 4. The estimated coefficient, α_1 in column (1), while positive is not statistically significant. That is, we cannot reject the null hypothesis that on average, global banks keep their lending portfolios constant following changes in climate policy. In columns (2) and (3), we explore the heterogenous response of global banks with different environmental standards by including the interactions of the E-score with $ENV_{b,t-1}$. We further confirm the result that only banks with high environmental scores react to climate measures, by increasing their supply of credit precisely in countries where local authorities are strengthening their green agenda. Estimates in column 3 indicate that for a global bank in the median of the environmental score distribution, an increase of 1-standard deviation in the CPM in a host country results in a credit expansion of 0.7% ([−0.313 + 0.291 * 1.61] * 4.47 = 0.7) and up to 1.6% for a bank in the 75th percentile of the distribution. Importantly, we do not find evidence that international banks with low environmental scores reduce their credit supply in host countries where authorities are strengthening their climate-related policies. We further confirm our findings when we estimate the growth in bank employment—global banks increase their labor force in subsidiaries where authorities improve their climate actions (Columns 4 to 6 in Table 4).

5. Alternative channels and robustness tests

In our analysis, we assume that the environmental factor reported by Refinitiv captures the corporate policies of banks related with environmental concerns and climate-change. If this is the case, the E-score should be a good proxy for the preference over green assets, and in fact, a large number of academic papers have used this measure under the same assumption. However, a major concern with our empirical exercise is that the environmental score, in addition to measuring green preferences, could be capturing other underlying characteristics unrelated to climate objectives. For example, risk preferences, or preferences over legal frameworks. To take a closer look at this issue, we consider a host of regressions in which the dependent variable is the environmental performance of banks, measured by the one-year ahead logistic transformation of the E-score. The regressors include a battery of bank observable characteristics, such as size and geographical focus. Because the corporate governance factor in the ESG measure is often correlated with the E-score, we include the G-score as a regressor.

The results are presented in Table 5 (columns 1–3). Larger banks with global focus tend to have higher E-scores. As expected, the environmental performance of a bank is highly correlated with the previous-year governance score. In columns (2) and (3) we include the per capita GHG emissions

of the country where the bank is headquartered. As shown, banks from countries with higher GHG emissions tend to have lower environmental scores. On the contrary, when we estimate a similar model where the dependent variable is the one-year ahead logistic transformation of the G-score, GHG emissions are not related to corporate governance (columns 4–6). In this case, only bank size and whether a bank is global are correlated with corporate governance policies of the bank. The evidence thus suggests that the E-scores indeed capture specific properties that relate to green aspects of banks.

Given the relationship between governance and environmental performance, we examine the role of the G-score on banks' response to climate actions. Since foreign banks are sensitive to the legal environment in the host country (Quian & Strahan, 2007), and if climate policies are used as a signal of an improvement in the institutional framework, banks classified with high environmental standards might increase their credit for reasons not linked to climate actions. To the extent that the corporate governance of a bank is related to its risk taking and to its preferences for legal features of the host country (Anginer et al., 2018), we could differentiate whether climate policies affect credit growth through green preferences or through other institutional conditions. To do this, we include in equation (3) the governance score and its interactions with the climate policy measure and the global bank dummy. We then estimate horse-race regression models (Table 6). Our estimates on the expansion of credit and employment of global banks with high environmental standards are mostly unchanged. In addition, the corporate governance factor does not seem to be driving the banks' response to climate policies. Overall, these findings are in line with our interpretation that global banks with strong preferences for green assets expand their lending in countries that strengthen their climate policies.

Finally, we explore other potential effects from climate policies on bank lending. For instance, fiscal support for green technology innovations might encourage risk taking among firms and lenders. At the same time, climate policies might ease the funding conditions for banks, especially those with higher environmental standards. To take a closer look at these issues, we examine if climate-related actions by domestic authorities are associated with changes in the risk profile of bank loans and to total bank deposits. More precisely, we estimate equation (3) using three separate dependent variables: the yearly percentage change in (i) loan loss provisions, (ii) the share of non-performing loans, and (iii) deposits (results in Table A4). Our evidence indicates that while global banks with high E-scores expand their presence in countries following an increase in the CPM, their provisions and share of non-performing loans remain constant. We also find that deposits remain mostly unchanged after climate policy actions, even among global bank subsidiaries with high environmental performance. Overall, the reallocation of credit towards jurisdictions with stronger climate policy does not appear to arise as a mechanical result from greater available funds, through increased deposits. Rather, our evidence is mostly consistent with the view that banks with high environmental standards respond to climate policy actions by increasing their lending in that

location. Such credit expansion, in turn, does not appear to yield riskier loan portfolios for banks since nonperforming loans and loan loss provisions remain unchanged.

6. Conclusions

This paper studies a growing yet understudied aspect of global banking, namely, the response from foreign banks to climate change policy actions. We ask whether global banks adjust their credit growth in foreign subsidiaries when regulatory authorities of host countries strengthen their climate policies. Using a sample of 120 global banks and an index of climate policy in 58 countries between 2007 and 2020, we find that the response to policy measures is largely driven by the 'green profile' of banks. Subsidiaries of foreign banks with high environmental standards (i.e., those with highest scores in emission, innovation, and resource use), increase their credit and overall presence following the implementation of climate-related actions in host countries. Importantly, 'brown' banks, those with low environmental scores, are mostly irresponsive to the host country climate policy.

In the paper, we do not distinguish between types of climate policies. For example, we cannot analyze whether policies target technology subsidies, carbon pricing, or the introduction of performance standards. Instead, we capture the strength of the overall policy framework in a country through the Germanwatch e.V. climate policy measure. Future work in this area should focus on the response from banks to different climate change policies. In addition, there may be important credit reallocation across sectors and firms that is omitted in our analysis. The extent to which banks adjust their portfolios along these dimensions might have important implications for the effectiveness of climate mitigation strategies. Also, while the link between international institutions and local environmental performance remains a controversial issue, there is evidence that foreign corporations transfer environmentally friendly technologies and practices to their foreign owned plants (Brucal et al., 2017). It is possible that complementarities between green lending from global banks and green foreign direct investment might further amplify the impact of climate policies. Whether such complementarities are present, and the extent of their role, remain open questions.

In conclusion, the paper has important policy implications. Our results highlight a selection mechanism whereby government commitments to address climate change also attract foreign banks with strong preferences for green assets, rather than spur capital flight. Therefore, climate policies appear to be a win-win strategy for policymakers, improving the environment by directly addressing carbon emission reduction, and also for attracting foreign finance.

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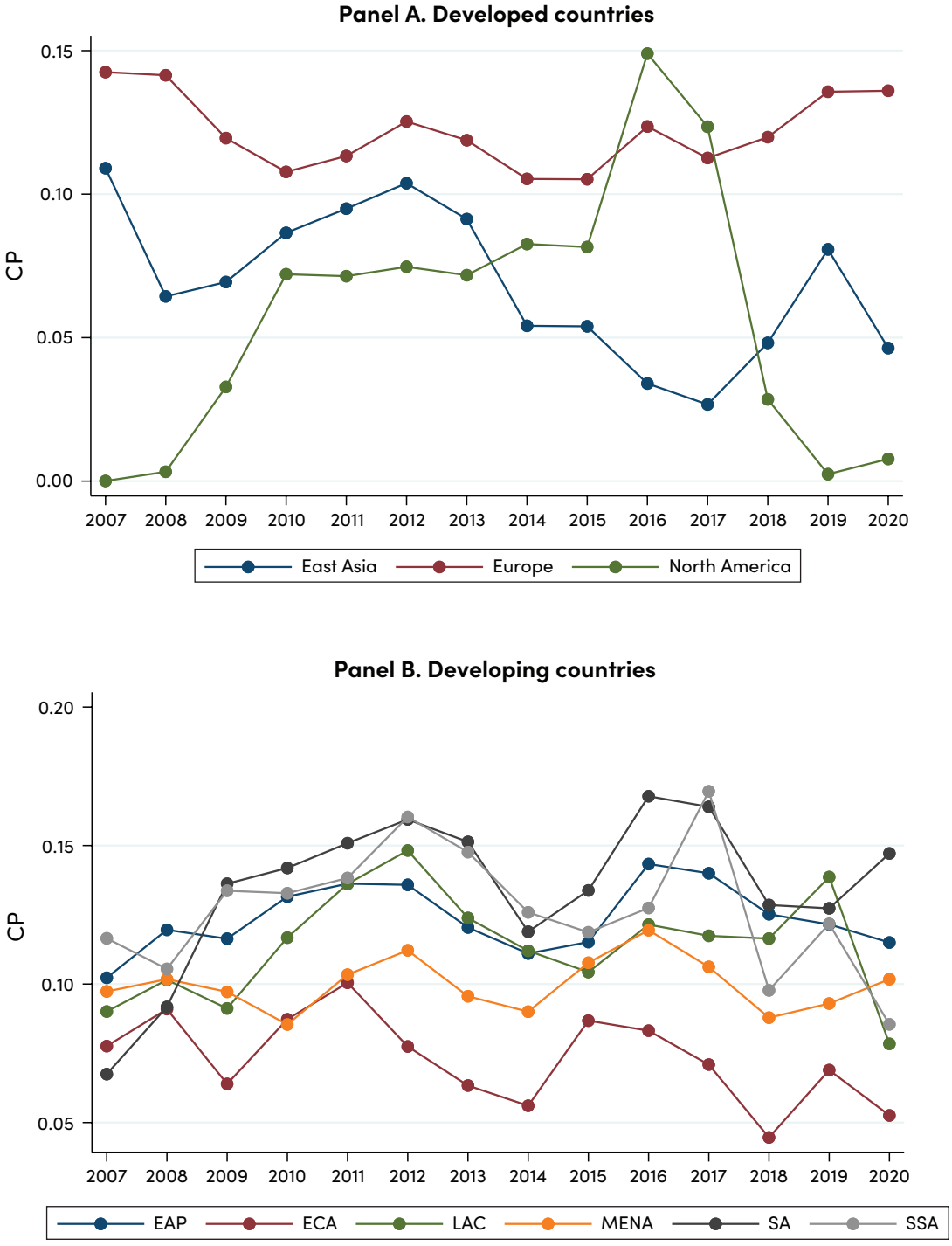
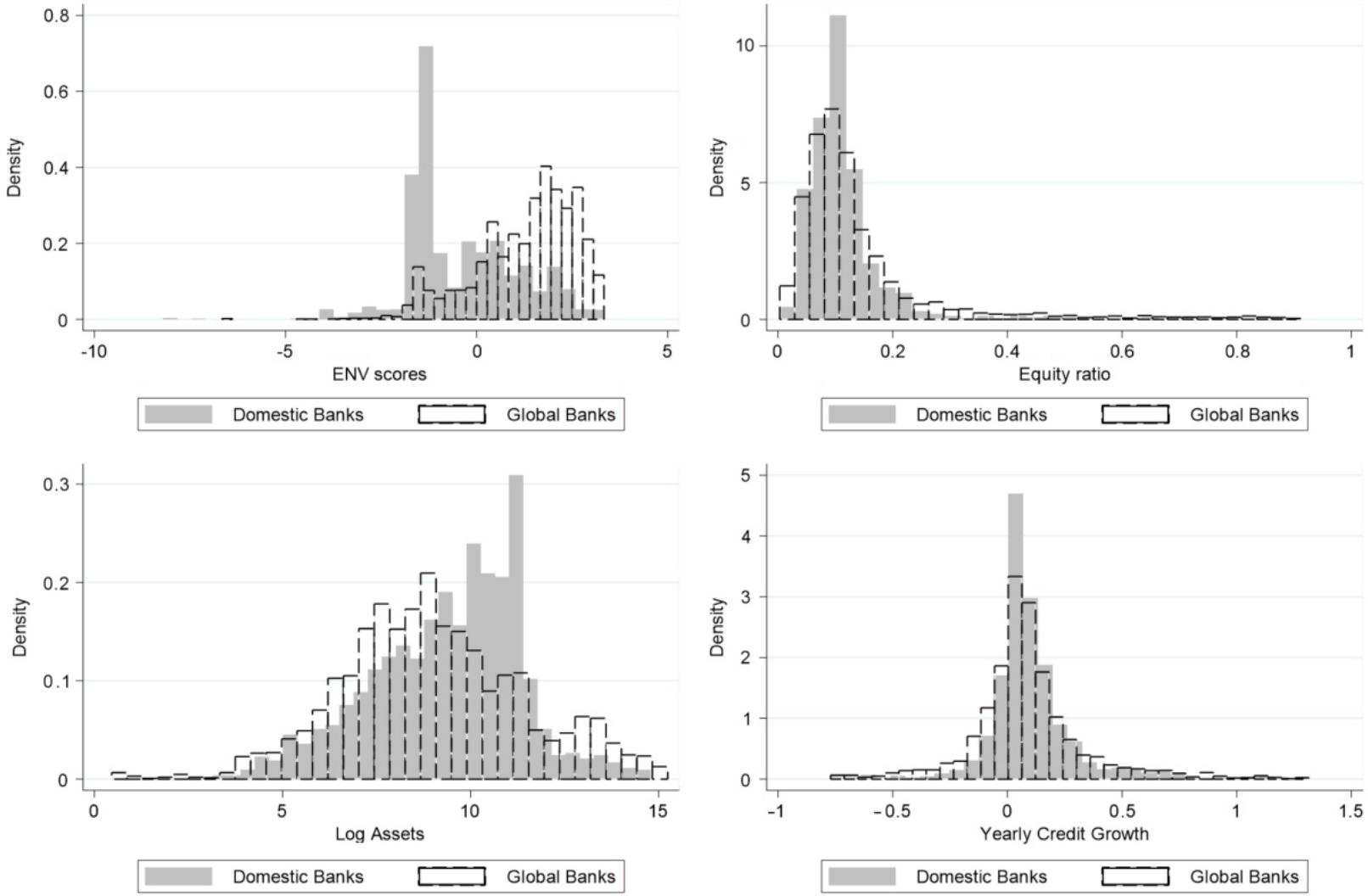
Figures and tables

FIGURE 1. Climate policy measure (CPM) by regions



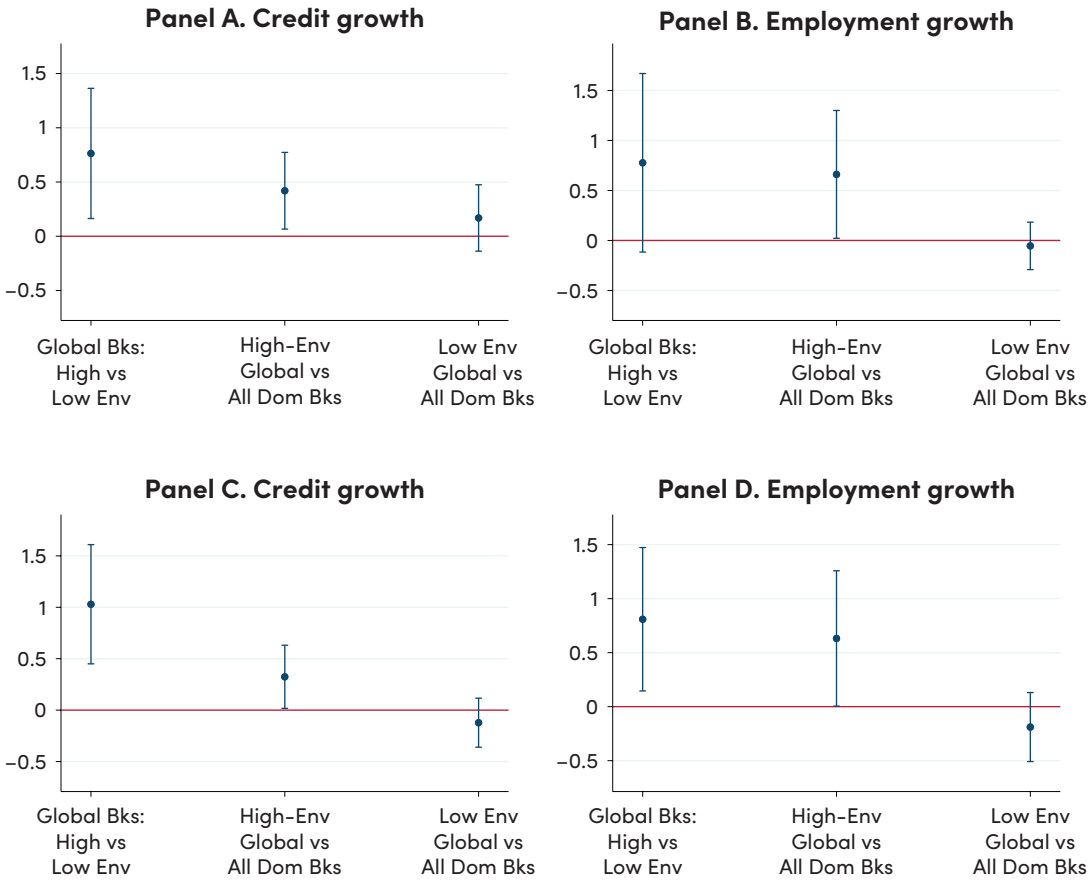
Notes: The figure reports the yearly average values of the CPM across the three regions of the 35 developed countries (Panel A) and the six regions of the 23 developing countries (Panel B) for which data is collected.

FIGURE 2. Characteristics of global vs. domestic banks



Notes: The figure reports the distribution of banks in our sample along four observable characteristics (i.e., environmental score, size, equity to asset ratio, and yearly credit growth) sorted by banks' geographical focus.

FIGURE 3. Marginal effects: 1-standard deviation increase in the climate policy measure



Notes: The panels plot the point estimates and confidence intervals of the difference in credit and employment growth between: (i) global banks with E-scores above and below the median, (ii) global banks with E-scores above the median vs. all domestic banks, and (iii) global banks with E-scores below the median vs. all domestic banks. Estimates in Panels A and B control for fixed effects at the country and year level. Estimates in Panels C and D control for fixed effects at the country and year level.

TABLE 1. Summary statistics

	Mean	p50	p25	p75	SD	# Obs.
Panel A. Country-Year Data						
$Developing_{c}$	0.39	0.00	0.00	1.00	0.49	694
$CPM_{c,t}$	9.99	10.18	7.17	12.86	4.14	694
$Number\ of\ banks_{c,t}$	8.45	5.00	3.00	11.00	9.69	694
$Number\ of\ global\ banks_{c,t}$	6.25	4.00	2.00	8.00	5.62	694
$Population\ growth_{c,t}$	0.67	0.63	0.08	1.27	0.90	694
$GDP\ per\ capita_{c,t}$	9.84	9.92	9.15	10.71	1.02	694
$Exchange\ rate_{c,t}$	0.99	1.00	0.93	1.05	0.10	692
$Unemployment\ rate_{c,t}$	7.47	6.47	4.82	8.96	4.23	694
$GHG\ per\ capita_{c,t}$	7.75	6.74	4.60	9.54	4.39	694
Panel B. Bank-Year Data						
$Credit\ Growth_{b,c,t}$	0.09	0.06	−0.01	0.16	0.24	5,449
$Employment\ Growth_{b,c,t}$	0.02	0.00	−0.04	0.05	0.29	3,012
$CPM_{c,t}$	9.82	9.98	6.92	12.86	4.47	5,863
$ENV_{b,t}$	0.81	1.11	−0.36	2.08	1.57	5,863
$ENV_{b,t}$ (Global banks)	1.26	1.61	0.46	2.27	1.34	4,339
$GOV_{b,t}$	0.57	0.71	−0.19	1.46	1.22	4,852
$Equity\ ratio_{b,c,t}$	0.14	0.10	0.07	0.14	0.13	5,744
$Assets_{b,c,t}$	9.05	8.99	7.48	10.63	2.35	5,838
$Deposits_{b,c,t}$	8.34	8.50	6.71	10.25	2.77	5,516
$NPL\ Growth_{b,c,t}$	0.00	0.00	0.00	0.00	0.02	4,132
$Provisions\ Growth_{b,c,t}$	0.00	0.00	0.00	0.00	0.02	4,267
$Deposits\ Growth_{b,c,t}$	0.11	0.07	0.00	0.17	0.28	5,229
$GLOBAL_{b,c,t}$	0.74	1.00	0.00	1.00	0.44	5,863
$Number\ of\ countries_{b,c,t}$	7.00	4.00	1.00	11.00	6.92	5,863
$Language_{b,c}$	0.49	0.00	0.00	1.00	0.50	5725
$Distance_{b,c}$	5.13	7.00	0.00	8.83	4.03	5725
$DEVELOPING\ (home\ country)_{b,c,t}$	0.28	0.00	0.00	1.00	0.45	5,863

Notes: The table displays the summary statistics of the dataset at the country-year level (Panel A) and at the bank-year level (Panel B). The sample is restricted to countries for which CPM data is collected banks with environmental scores. See Table A1 in the Appendix for variable definitions.

TABLE 2. Credit growth response to movements in climate policy

			Continuous $ENV_{b,t-1}$		Discrete $ENV_{b,t-1}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$CPM_{c,t-1}$	0.253*		0.178		0.356***	
	[0.131]		[0.176]		[0.110]	
$ENV_{b,t-1}$			0.001	0.013	0.025	0.039
			[0.009]	[0.012]	[0.023]	[0.036]
$ENV_{b,t-1}$ * $CPM_{c,t-1}$			−0.087	−0.154	−0.315	−0.426
			[0.084]	[0.099]	[0.191]	[0.290]
$GLOBAL_{b,c,t}$	−0.021	0	−0.009	0.011	0.006	0.044
	[0.017]	[0.028]	[0.022]	[0.031]	[0.017]	[0.038]
$ENV_{b,t-1}$ * $GLOBAL_{b,c,t}$			−0.023*	−0.031**	−0.065*	−0.095**
			[0.013]	[0.013]	[0.034]	[0.038]
$CPM_{c,t-1}$ * $GLOBAL_{b,c,t}$	−0.002	−0.302	−0.14	−0.42	−0.340*	−0.777**
	[0.140]	[0.251]	[0.169]	[0.245]	[0.173]	[0.299]
$ENV_{b,t-1}$ * $GLOBAL_{b,c,t}$ * $CPM_{c,t-1}$			0.249*	0.310**	0.763**	1.030***
			[0.129]	[0.126]	[0.337]	[0.325]
Constant	0.8	0.228	0.789	0.234	0.759	0.23
	[0.522]	[0.200]	[0.512]	[0.196]	[0.519]	[0.197]
Observations	4,806	4,749	4,806	4,749	4,806	4,749
R-squared	0.271	0.402	0.272	0.403	0.272	0.404
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year FE		Yes		Yes		Yes

Notes: The table reports OLS estimates of regressions at the bank-year level summarized in equation 1 for the sample of countries for which CPM data is collected, and the sample of banks with environmental scores. The dependent variable corresponds to the yearly credit growth of a bank in a country. The variable $ENV_{b,t-1}$ is the logistic transformation of the environmental score of bank b in year *t*–1. Columns 1, 4 and 5 restrict the sample to domestic banks. Columns 2, 6 and 7 restrict the sample to global banks. Columns 3, 8 and 9 pool domestic and global banks together. Controls at the country-year level include the change in exchange rate, GHG emissions per capita, lagged log GDP per capita, lagged log population growth, and lagged log unemployment rate. Other bank controls include the assets, deposits and equity ratios of banks, all in logs and lagged one year. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.

TABLE 3. Bank employment growth response to movements in climate policy

			Continuous $ENV_{b,t-1}$		Discrete $ENV_{b,t-1}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$CPM_{c,t-1}$	0.338		0.3		0.296	
	[0.280]		[0.332]		[0.246]	
$ENV_{b,t-1}$			0.007	0.003	0.011	−0.005
			[0.016]	[0.016]	[0.043]	[0.039]
$ENV_{b,t-1}$ * $CPM_{c,t-1}$			0.085	0.072	−0.041	0.194
			[0.245]	[0.132]	[0.424]	[0.350]
$GLOBAL_{b,c,t}$	0.016	0.026	0.074**	0.079	0.064*	0.084**
	[0.030]	[0.025]	[0.031]	[0.046]	[0.032]	[0.033]
$ENV_{b,t-1}$ * $GLOBAL_{b,c,t}$			−0.036*	−0.029	−0.087**	−0.098**
			[0.019]	[0.022]	[0.032]	[0.042]
$CPM_{c,t-1}$ * $GLOBAL_{b,c,t}$	−0.05	−0.076	−0.642	−0.659	−0.503	−0.555
	[0.366]	[0.305]	[0.393]	[0.402]	[0.310]	[0.344]
$ENV_{b,t-1}$ * $GLOBAL_{b,c,t}$ * $CPM_{c,t-1}$			0.368	0.360**	0.937	0.965**
			[0.301]	[0.157]	[0.530]	[0.373]
Constant	−0.002	0.129	−0.185	0.147	−0.21	0.112
	[1.052]	[0.354]	[1.091]	[0.350]	[1.099]	[0.347]
Observations	2,728	2,607	2,728	2,607	2,728	2,607
R-squared	0.161	0.374	0.164	0.376	0.163	0.376
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year FE		Yes		Yes		Yes

Notes: The table reports OLS estimates of regressions at the bank-year level summarized in equation 1 for the sample of countries for which CPM data is collected, and the sample of banks with environmental scores. The dependent variable corresponds to the yearly employment growth of a bank in a country. The variable $ENV_{b,t-1}$ is the logistic transformation of the environmental score of bank b in year *t*–1. Columns 1, 4 and 5 restrict the sample to domestic banks. Columns 2, 6 and 7 restrict the sample to global banks. Columns 3, 8 and 9 pool domestic and global banks together. Controls at the country-year level include the change in exchange rate, GHG emissions per capita, lagged log GDP per capita, lagged log population growth, and lagged log unemployment rate. Other bank controls include the assets, deposits and equity ratios of banks, all in logs and lagged one year. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.

TABLE 4. Growth of global banks across subsidiaries

	(1)	(2)	(3)	(4)	(5)	(6)
	Credit Growth			Employment Growth		
$CPM_{c,t-1}$	0.154	−0.268	−0.313	0.412	−0.184	−0.26
	[0.211]	[0.272]	[0.280]	[0.285]	[0.257]	[0.308]
$ENV_{b,t-1}$ * $CPM_{c,t-1}$		0.270*	0.291*		0.343*	0.381*
		[0.138]	[0.141]		[0.166]	[0.185]
GDP per $capita_{c,t-1}$	−0.056	−0.053	−0.059	0.066	0.069	0.065
	[0.068]	[0.066]	[0.066]	[0.064]	[0.064]	[0.065]
Exchange $rate_{c,t-1}$	−0.262**	−0.261**	−0.260**	−0.041	−0.05	−0.055
	[0.109]	[0.108]	[0.109]	[0.149]	[0.153]	[0.159]
$Assets_{b,c,t-1}$	0.017**	0.017**	0.017**	0.016	0.016	0.016
	[0.007]	[0.007]	[0.007]	[0.025]	[0.025]	[0.025]
Equity $ratio_{b,c,t-1}$	0.412***	0.415***	0.414***	0.118	0.13	0.13
	[0.084]	[0.084]	[0.096]	[0.075]	[0.085]	[0.095]
Population $growth_{c,t-1}$	0.03	0.031	0.031	0.038	0.04	0.043
	[0.025]	[0.024]	[0.024]	[0.034]	[0.035]	[0.037]
Unemployment $rate_{c,t-1}$	−0.003	−0.002	−0.002	−0.003	−0.001	−0.001
	[0.005]	[0.005]	[0.005]	[0.006]	[0.006]	[0.006]
$Deposits_{b,c,t-1}$	−0.012	−0.012	−0.013*	−0.021	−0.022	−0.023
	[0.007]	[0.007]	[0.007]	[0.027]	[0.027]	[0.028]
GHG per $capita_{c,t-1}$	−0.011	−0.011	−0.012	0.003	0.003	0.003
	[0.012]	[0.012]	[0.012]	[0.008]	[0.008]	[0.008]
$Language_{b,c}$			−0.012			0.015
			[0.020]			[0.052]
$Distance_{b,c}$			−0.003			0
			[0.003]			[0.008]
Constant	0.855	0.823	0.909	−0.666	−0.691	−0.64
	[0.668]	[0.656]	[0.668]	[0.765]	[0.764]	[0.749]
Observations	2,692	2,692	2,660	1,357	1,357	1,331
R-squared	0.307	0.309	0.307	0.324	0.325	0.326
Bank-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Ctry of Origin-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table reports OLS estimates of regressions at the bank-year level summarized in equation 2 for the sample of global banks operating in countries for which CPM data is collected. In columns 1 to 3, the dependent variable corresponds to the yearly credit growth of a global bank in a country. In columns 4 to 6, the dependent variable corresponds to the yearly growth of employment of a global bank in a country. The variable $ENV_{b,t-1}$ is the logistic transformation of the environmental score of bank b in year *t*–1. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.

TABLE 5. Correlates of environmental and governance scores

	(1)	(2)	(3)	(4)	(5)	(6)
	ENV Scores			GOV Scores		
$Assets_{b,c,t-1}$	0.081*	0.068	0.066	0.067**	0.081**	0.081**
	[0.041]	[0.043]	[0.044]	[0.028]	[0.032]	[0.033]
$Equity\ ratio_{b,c,t-1}$	1.685**	1.789**	1.702*	1.881**	2.220***	2.319***
	[0.727]	[0.786]	[0.787]	[0.633]	[0.685]	[0.719]
$GOV_{b,t-1}$	0.392***	0.408***	0.410***			
	[0.059]	[0.060]	[0.060]			
$GLOBAL_{b,c,t}$	1.855***	1.637***	1.631***	0.581***	0.726***	0.743***
	[0.208]	[0.219]	[0.220]	[0.167]	[0.179]	[0.181]
$Number\ of\ countries_{b,c,t-1}$	0.032**	0.030*	0.030*	0.026	0.021	0.024
	[0.013]	[0.014]	[0.015]	[0.015]	[0.017]	[0.017]
DEVELOPING (home country)$_{b,c,t}$	0.542**	0.532	0.554	−0.016	0.371	0.355
	[0.239]	[0.413]	[0.420]	[0.173]	[0.353]	[0.351]
$GLOBAL_{b,c,t}$ * DEVELOPING (home country)$_{b,c,t}$	−1.558***	−1.280***	−1.298***	−0.577**	−0.725**	−0.740**
	[0.285]	[0.297]	[0.296]	[0.220]	[0.247]	[0.249]
$CPM_{c,t-1}$ (home country)		0	−0.016		−0.004	0.01
		[0.015]	[0.017]		[0.011]	[0.020]
GHG per capita$_{c,t-1}$ (home country)		−0.061***	−0.059***		0.027	0.027
		[0.018]	[0.018]		[0.016]	[0.016]
GDP per capita$_{c,t-1}$ (home country)		0.263	0.206		0.083	0.014
		[0.166]	[0.180]		[0.169]	[0.188]
$CPM_{c,t-1}$ (host countries)			2.15			−1.783
			[1.682]			[1.965]
GDP per capita$_{c,t-1}$ (host countries)			0.066			0.062
			[0.108]			[0.100]
Constant	−1.892***	−3.705*	−3.827*	−0.916**	−2.326	−2.239
	[0.482]	[1.763]	[1.781]	[0.311]	[1.762]	[1.753]
Observations	1,966	1,769	1,769	2,217	1,993	1,993
R-squared	0.456	0.468	0.469	0.112	0.14	0.142
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table reports OLS estimates of regressions at the bank-year level for the sample of banks with environmental and governance scores operating in countries for which CPM data is collected. The dependent variable corresponds to a bank's yearly logistic transformation of the environmental (columns 1–3) and governance (columns 4–8) score. For global banks operating in multiple countries, host country variables are calculated as the weighted average of such variables, where the weights correspond to the share of total assets of the bank in each host country at a given year. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.

TABLE 6. Horse race

	Continuous ENV and GOV Scores		Discrete ENV and GOV Scores	
	(1)	(2)	(3)	(4)
	Credit Growth	Employment Growth	Credit Growth	Employment Growth
$ENV_{b,t-1}$	0.024*	−0.003	0.054	0.006
	[0.012]	[0.015]	[0.032]	[0.037]
$ENV_{b,t-1} * CPM_{c,t-1}$	−0.179	0.01	−0.412	−0.085
	[0.127]	[0.158]	[0.314]	[0.367]
$GLOBAL_{b,c,t}$	0.031	0.083	0.079	0.090*
	[0.038]	[0.050]	[0.045]	[0.045]
$ENV_{b,t-1} * GLOBAL_{b,c,t}$	−0.03	−0.023	−0.079*	−0.1
	[0.017]	[0.031]	[0.040]	[0.059]
$CPM_{c,t-1} * GLOBAL_{b,c,t}$	−0.648*	−0.676	−1.033**	−0.609
	[0.307]	[0.511]	[0.372]	[0.530]
$ENV_{b,t-1} * GLOBAL_{b,c,t} * CPM_{c,t-1}$	0.296*	0.340*	0.812*	1.112**
	[0.153]	[0.183]	[0.417]	[0.439]
$GOV_{b,t-1}$	0.005	0.019	0.008	−0.002
	[0.011]	[0.031]	[0.024]	[0.043]
$GOV_{b,t-1} * CPM_{c,t-1}$	−0.119	−0.144	−0.065	0.147
	[0.139]	[0.258]	[0.371]	[0.477]
$GOV_{b,t-1} * GLOBAL_{b,c,t}$	−0.012	−0.046	−0.04	−0.031
	[0.010]	[0.027]	[0.030]	[0.034]
$GOV_{b,t-1} * GLOBAL_{b,c,t} * CPM_{c,t-1}$	0.131	0.174	0.282	−0.057
	[0.136]	[0.141]	[0.389]	[0.223]
Constant	0.035	0.151	0.034	0.2
	[0.251]	[0.464]	[0.246]	[0.458]
Observations	3,936	2,396	3,936	2,396
R-squared	0.4	0.387	0.4	0.386
Bank FE	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes

Notes: The table reports OLS estimates of regressions at the bank-year level for the sample of countries for which CPM data is collected, and the sample of banks with environmental scores. In columns 1 and 3, the dependent variable corresponds to the yearly credit growth of a bank in a country. In columns 2 and 4, the dependent variable corresponds to the yearly employment growth of a bank in a country. In columns 1 and 2, the variables $ENV_{b,t-1}$ and $GOV_{b,t-1}$ correspond to the logistic transformations of the environmental and governance scores of bank *b* in year *t*–1. In columns 3 and 4, the variables $ENV_{b,t-1}$ and $GOV_{b,t-1}$ correspond to indicator variables that equal one if the domestic (global) bank *b* has a score above the median of domestic (global) banks in year *t*–1 and zero otherwise. Controls at the bank-country-year level include the assets, deposits and equity ratios of banks, all in logs and lagged one year. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.

Appendix tables

TABLE A1. Variable definition

Panel A. Country-Year Data	
$Developing_{c}$	Indicator variable equal to 1 if country *c* is a developing country and zero otherwise.
$CPM_{c,t}$	Climate policy component of the Climate Policy Component of country *c* in year *t*, scaled by 100, with values ranging from 0 to 0.2.
$Number\ of\ banks_{c,t}$	Number of banks of country *c* in year *t*.
$Number\ of\ global\ banks_{c,t}$	Number of global banks of country *c* in year *t*.
$Population\ growth_{c,t}$	Yearly population growth of country *c* in year *t*.
$GDP\ per\ capita_{c,t}$	GDP per capita (in USD logs) of country *c* in year *t*.
$Exchange\ rate_{c,t}$	Yearly percentage change of the USD exchange rate of country *c* in year *t*.
$Unemployment\ rate_{c,t}$	Unemployment rate of country *c* in year *t*.
$GHG\ per\ capita_{c,t}$	GHG emissions over population of country *c* in year *t*.
Panel B. Bank-Year Data	
$Credit\ Growth_{b,c,t}$	Percentage change of the gross total loans of bank b in country c in year *t*.
$Employment\ Growth_{b,c,t}$	Percentage change of the number of staff of bank b in country c in year *t*.
$CPM_{c,t}$	Climate policy component of the Climate Policy Component of country *c* in year *t*, scaled by 100, with values ranging from 0 to 0.2.
$ENV_{b,t}$	Environmental scores of bank *b* in year *t*, measured as the log transformation of the score.
$GOV_{b,t}$	Governance scores of bank *b* in year *t*, measured as the log transformation of the score.
$Equity\ ratio_{b,c,t}$	Common equity over total assets of bank b in country c and year *t*.
$Assets_{b,c,t}$	Total assets (in million USD logs) of bank *b* in country *c* and year *t*.
$Deposits_{b,c,t}$	Total deposits (in million USD logs) of bank *b* in country *c* and year *t*.
$NPL\ Growth_{b,c,t}$	Yearly percentage change of the non-performing loans of bank *b* in country *c* and year *t*.
$Provisions\ Growth_{b,c,t}$	Yearly percentage change of the provisioning rate of bank *b* in country *c* and year *t*.
$Deposits\ Growth_{b,c,t}$	Yearly percentage change of the deposits of bank *b* in country *c* and year *t*.
$GLOBAL_{b,c,t}$	Indicator variable that equals one if bank *b* operating in country *c* at year *t* is classified as global (based on the matching of Fitch data with GeoRev data).
$Number\ of\ countries_{b,c,t}$	Number of countries of operation of global bank *b* in year *t*.
$Language_{b,c}$	Indicator variable that equals one if the country of origin of global bank *b* and the country of operations *c* is the same, zero otherwise.
$Distance_{b,c}$	Geographic distance (in log km) between the country of origin of global bank *b* and the country of operations *c*.
$DEVELOPING\ (home\ country)_{b,c,t}$	Indicator variable that equals one if bank *b* in country *c* at year *t* is headquartered in a developing country.

TABLE A2. Countries with CCPI data

Developed Countries	Developing Countries
Australia	Algeria
Austria	Argentina
Belgium	Belarus
Canada	Brazil
Croatia	Bulgaria
Cyprus	Chile
Czechia	China
Denmark	Egypt
Estonia	India
Finland	Indonesia
France	Iran
Germany	Kazakhstan
Greece	Malaysia
Hungary	Malta
Iceland	Mexico
Ireland	Morocco
Italy	Romania
Japan	Russia
Latvia	Saudi Arabia
Lithuania	South Africa
Luxembourg	Thailand
Netherlands	Turkey
New Zealand	Ukraine
Norway	
Poland	
Portugal	
Singapore	
Slovakia	
Slovenia	
South Korea	
Spain	
Sweden	
Switzerland	
United Kingdom	
United States	

Notes: Only three countries do not have information for the entire 2007–2020 period. These countries are Chile, which was added to the CCPI in 2020, and Iceland and Singapore, whose data is available until 2017.

TABLE A3. Bank Lending response to movements in climate policy (including all domestic banks in Fitch)

	Credit Growth			Employment Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
$CPM_{c,t-1}$	0.03	0.029		−0.042	−0.043	
	[0.053]	[0.053]		[0.024]	[0.024]	
$GLOBAL_{b,c,t}$	−0.055***			−0.011		
	[0.018]			[0.026]		
$CPM_{c,t-1}$ * $GLOBAL_{b,c,t}$	0.289			0.304		
	[0.165]			[0.187]		
$GLOBAL\text{-}LowENV_{b,c,t}$		−0.041**	−0.006		0.024	0.042
		[0.016]	[0.014]		[0.025]	[0.025]
$GLOBAL\text{-}HighENV_{b,c,t}$		−0.075**	−0.052**		−0.038	−0.03
		[0.030]	[0.018]		[0.038]	[0.040]
$GLOBAL\text{-}LowENV_{b,c,t}$ * $CPM_{c,t-1}$		0.168	−0.122		−0.054	−0.189
		[0.172]	[0.134]		[0.132]	[0.178]
$GLOBAL\text{-}HighENV_{b,c,t}$ * $CPM_{c,t-1}$		0.419*	0.324*		0.661*	0.631*
		[0.198]	[0.172]		[0.356]	[0.349]
Constant	0.364	0.362	0.693***	0.316	0.3	0.408***
	[0.368]	[0.368]	[0.093]	[0.183]	[0.186]	[0.076]
Observations	174,973	174,973	174,971	134,377	134,377	134,341
R-squared	0.284	0.284	0.318	0.153	0.153	0.167
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year FE			Yes			Yes
F-test (pval)		0.118	0.013		0.0805	0.0477

Notes: The table reports OLS estimates of regressions at the bank-year level for the sample of countries for which CPM data is collected. The sample includes all domestic banks in Fitch and global banks with environmental scores. The dependent variable corresponds to the yearly credit growth of a bank in a country. The dependent variables correspond to the yearly credit (columns 1–3) and employment (columns 4–6) growth of a bank in a country. The indicator variable GLOBAL-LowENV (GLOBAL-HighENV) equals one for global banks with environmental scores in year t–1 below (above) the median environmental score. Controls at the country-year level include the change in exchange rate, GHG emissions per capita, lagged log GDP per capita, lagged log population growth, and lagged log unemployment rate. Other bank controls include the assets, deposits and equity ratios of banks, all in logs and lagged one year. F-test (pval) report the p-values of an F-test comparing if $GLOBAL\text{-}LowENV_{b,c,t}$ * $CPM_{c,t-1}$ = $GLOBAL\text{-}LowENV_{b,c,t}$ * $CPM_{c,t-1}$. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.

TABLE A4. Alternative mechanisms behind movements in climate policy

	(1)	(2)	(3)	(4)	(5)	(6)
	Provisions Growth		NPL Growth		Deposits Growth	
$CPM_{c,t-1}$	−0.038*		−0.032*		0.111	
	[0.018]		[0.015]		[0.191]	
$ENV_{b,t-1}$	0	0	0	−0.001	0.015	0.025**
	[0.001]	[0.001]	[0.001]	[0.001]	[0.010]	[0.011]
$ENV_{b,t-1} * CPM_{c,t-1}$	−0.001	−0.005	0.01	0.013	−0.098	−0.133
	[0.008]	[0.008]	[0.009]	[0.008]	[0.115]	[0.137]
$GLOBAL_{b,c,t}$	0.001	0.002	0.001	−0.001	0.001	−0.007
	[0.002]	[0.002]	[0.002]	[0.002]	[0.024]	[0.028]
$ENV_{b,t-1} * GLOBAL_{b,c,t}$	−0.001	−0.001	−0.001	0.001	−0.005	−0.018
	[0.001]	[0.001]	[0.001]	[0.001]	[0.014]	[0.016]
$CPM_{c,t-1} * GLOBAL_{b,c,t}$	0.015	0.007	0.004	0.005	0.115	0.26
	[0.019]	[0.019]	[0.014]	[0.015]	[0.202]	[0.270]
$ENV_{b,t-1} * GLOBAL_{b,c,t} * CPM_{c,t-1}$	0.01	0.012	0.003	−0.011	0.072	0.104
	[0.012]	[0.012]	[0.011]	[0.009]	[0.171]	[0.177]
Constant	−0.043	−0.023	−0.107	−0.034	2.674***	0.418
	[0.061]	[0.019]	[0.062]	[0.019]	[0.510]	[0.302]
Observations	3,828	3,765	3,723	3,617	4,827	4,771
R-squared	0.102	0.33	0.19	0.478	0.276	0.412
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year FE		Yes		Yes		Yes

Notes: The table reports OLS estimates of regressions at the bank-year level summarized in equation 1 for the sample of countries for which CPM data is collected, and the sample of banks with environmental scores. The dependent variables correspond to the yearly growth of loan loss provisioning (columns 1 and 2), of NPLs (columns 3 and 4) and of deposits (columns 3 and 6) of a bank in a country. The variable $ENV_{b,t-1}$ is the logistic transformation of the environmental score of bank b in year *t*–1. Controls at the country-year level include the change in exchange rate, GHG emissions per capita, lagged log GDP per capita, lagged log population growth, and lagged log unemployment rate. Other bank controls include the assets, deposits and equity ratios of banks, all in logs and lagged one year. Standard errors are reported in brackets and are doubled clustered at the bank and year levels. *, **, *** denote significance at the 10, 5 and 1 percent levels. Detailed variable definitions are provided in Table A1 in the Appendix.