

# Climate Change-Related Regulatory Risks and Bank Lending\*



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*JEL codes: G21, Q51, Q58*

*Keywords: climate change, transition risk, credit allocation, Paris Agreement*

*We analyze the effect of climate change-related regulatory risks on banks' credit allocation. Our evidence suggests that effects crucially depend firms' exposure to regulatory risks as well as on the existing regulatory environment in borrowers' region. Following an increase in global salience of regulatory risks, banks allocate more credit to US firms that are likely to be negatively impacted by regulatory intervention. Conversely, in Europe, banks lend more to firms that could benefit from it. This divergence can be linked to the less stringent regulatory environment in the United States compared to Europe. We investigate the role of banks' behaviour in supporting or hindering the transition but do not find evidence that the increase in lending to negatively exposed US firms is directed at firms that have a higher likelihood to green their business model. In Europe, however, credit supply appears to facilitate the transition.*

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\*This paper was prepared by the authors under the Lamfalussy Fellowship Programme sponsored by the ECB. Any views expressed are only those of the authors and do not necessarily represent the views of the ECB or the Eurosystem.

## The role of banks in the transition toward a greener economy

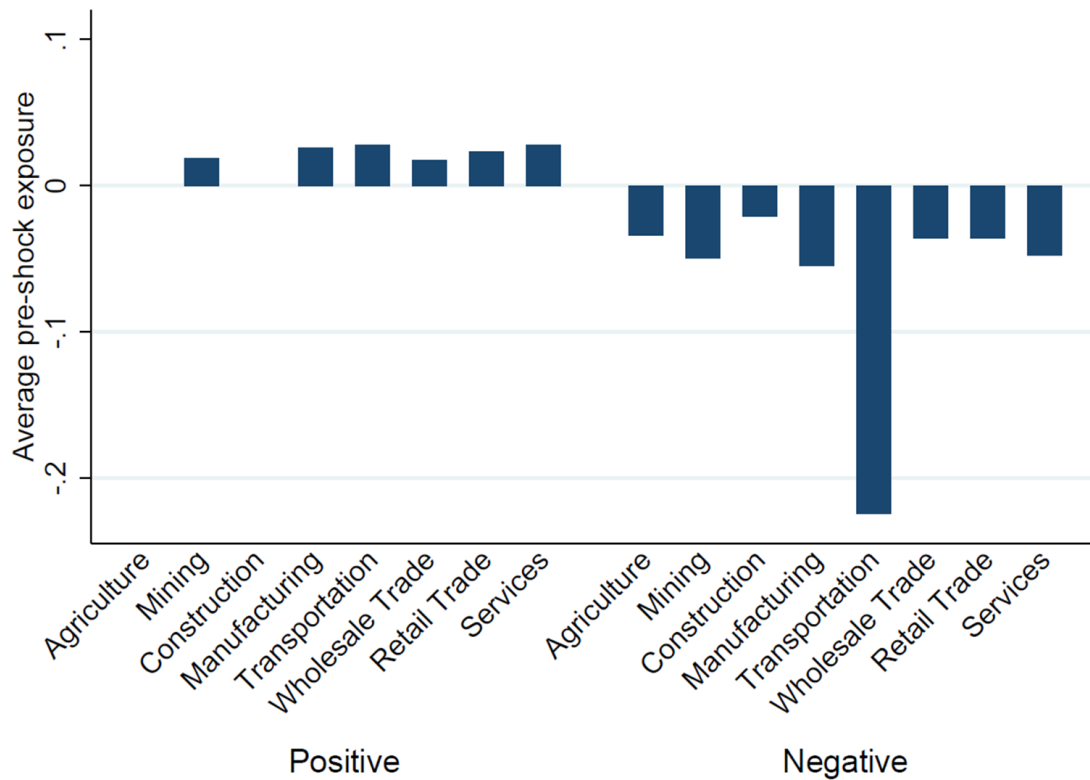
Climate change poses a substantial threat to the global economy and makes transitioning toward a more sustainable and greener future a first-order challenge. Overcoming this challenge relies heavily on the introduction of regulation to align short-term profit-maximizing decisions of firms with long-term interests of society. Hence, firms face regulatory risks related to climate change. While some can be negatively impacted by the introduction of regulation - for example due to increasing operating and input costs - others may benefit - for instance due to subsidies. Firms' exposure to these risks may influence lending patterns. Understanding how banks respond to these risks is of great importance as banks can play a central role in not only setting the incentives for a green transformation but also in providing the necessary funding to achieve it (UNEP, 2011). Hence, this work (Mueller & Sfrappini, 2022) sheds light on the current role that banks' behavior plays in the transition toward a greener economy.

We analyze whether and how banks take firms' exposure to regulatory risks related to climate change into account in their lending decisions. Our empirical design centers around the 2015 Paris Agreement as a shock that raises banks' awareness about the regulatory risks that firms face. The Paris Summit marks the first comprehensive agreement at a global level to coordinate actions to tackle climate change. We argue that this event has raised public awareness of transition risks and may have shifted banks' prevailing perceptions of these risks (Bolton & Kacperczyk, 2021; Degryse et al., 2021; Krueger et al., 2020; Kruse et al., 2020). For our analysis, we rely on detailed, worldwide syndicated loan data between 2010 and 2019 enriched with a firm-level measure of regulatory risks related to climate change from Sautner et al. (2022). The granularity of this measure allows distinguishing between lending to firms that could benefit from regulatory invention and to those that are likely to be negatively affected by the introduction of regulation.

### The distribution of firms' regulatory risks related to climate change

Figure 1 illustrates a few key stylized facts about the distribution of regulatory risks by displaying firms' average pre-Paris exposure at one-digit industry level separately for the group of positively and negatively exposed firms. We define negatively exposed firms as companies that consider themselves to be negatively impacted by the introduction of climate change regulation as it can negatively influence operating costs, earnings, and cash flows as well loss probabilities (Huang et al., 2018; Nguyen, 2018; Seltzer et al., 2020). Meanwhile, certain firms consider themselves to benefit from the introduction of regulation as these policies might, for example, correct relative cost disadvantages of greener business models, by either providing subsidies to greener technologies or increasing the operating costs of more polluting competitors (Holburn, 2012). We refer to these firms as positively exposed firms.

Figure 1 highlights that the degree to which firms consider themselves to be positively affected is much lower than the extent to which firms stand to lose from future regulation. This is not surprising given the form that future regulation related to climate change is likely to take. On the one hand, when comparing negatively exposed firms across industries, it is in particular transportation, manufacturing, and mining that face high negative regulatory risks. On the other hand, positively exposed firms in manufacturing and services exhibit the largest potential to benefit from regulation. Thus, within industry variation is significant, as we observe positively, negatively and non-exposed firms within each industry (except for agriculture and construction).

**Figure 1: Industry distribution of firms' exposure**

Note: This figure shows the distribution of firms' ex-ante exposure averaged at the 1-digit industry level separately for negatively and positively exposed firms. Non-exposed firms are not included.

## How does banks' lending to positively and negatively exposed firms change after the Paris Agreement?

Our results uncover large heterogeneity in lending patterns depending on firms' exposure as well as the regulatory environment in which the firm is located. The stringency of existing regulation in the region the firm is located in can be an indicator for banks of the financial risks that these firms face due to their exposures. Before the Paris Agreement, the regulatory environment in the United States was, according to environmental policy indicators, less stringent than in Europe. This results in different lending patterns.

We find that banks lend more to US firms that are likely to lose from new environmental policies. While, when lending to European firms, banks lend more to firms that are likely to benefit from future regulation.

The divergence of these results across the two regions in our analysis is perhaps unsurprising considering also developments in the regulatory environments surrounding the Paris Agreement. Although the United States was very active in facilitating the Paris Agreement, 2016 was an election year making imminent policy efforts unlikely. The subsequent period was dominated by the presidency of Donald Trump, who signaled and actively pursued a deregulating agenda with respect to environmental policy. Conversely, the European Union, in particular, was seen to have quickly finalized legislative processes ratifying the Agreement and was expected to meet 2030 climate targets in 2016 (Dröge, 2016).

## Banks' own exposure and other heterogeneity

Bank characteristics could play a significant role in determining changes in credit supply after the Paris Agreement. In particular, banks are themselves, albeit indirectly, exposed to regulatory risks related to climate change via their loan portfolios. This may lead them to face different and opposing incentives when allocating credit. Negatively exposed banks might prefer to adjust lending to diversify their exposure away from negatively exposed firms. However, Degryse et al. (2020) show evidence of banks' incentives to protect the value of their legacy positions, which could lead to protective behavior toward negatively exposed incumbent clients. We find evidence of the latter in Europe, where the more negatively exposed the bank is the more it increases its credit supply toward negatively exposed firms.

Banks' preferences for sustainable lending could also play a role in this setting. We employ an indicator for banks' public commitment to lend sustainably and look at membership in the UNEP FI<sup>1</sup> to investigate whether banks' ex-ante preferences lead to different credit supply decisions (Degryse et al., 2021). We find that existing preferences for sustainable lending play only a marginal role in Europe, where UNEP members increased credit supply relatively more than non-members to positively exposed firms.

## Policy implications

There has been considerable discussion during the COP26 meeting in Glasgow in November 2021 and in regulatory circles in the last few years around whether and how to regulate financial market participants in order to facilitate a transition to a more sustainable economy. This research can provide some indicative evidence of how banks' behavior interacts with the need to transition toward a greener economy by taking a closer look at the type of firms toward which credit is directed. Increasing credit supply to negatively exposed firms could be interpreted as hindering the transition, if this lending is not directed toward supporting firms in their transition toward a more sustainable business model.

We link bank's credit allocation to firms' ex-ante likelihood to transition, proxied by the degree of negative exposure, investments in research and development as well as capital expenditures, and green patenting. In the United States, we find no evidence that the shift in credit toward negatively exposed firms is directed toward those that have a higher likelihood of achieving the transition. In Europe, changes in lending patterns after the Paris Agreement supported the transition but banks' own negative exposure appears to have been a hindering factor.

This paper has important policy implications, as it provides insights into the scope of banking regulation in fostering the transition toward a greener economy. A solid empirical understanding of the present serves as the basis for the exploration of possible future policies. Our research evaluates how banks alter their lending behavior to take transition risks into account on their own accord highlighting aspects wherein regulatory action is needed. We show the importance of the stringency of the existing regulatory environment in determining how banks engage in the transition. ■

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<sup>1</sup> United Nations Environment Programme Finance Initiative. The data is hand-collected from the official website: <http://www.unep.org/members/> (accessed on July 20, 2021)

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