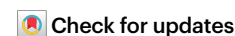


# Model-based financial regulation challenges for the net-zero transition

Matteo Gasparini, Matthew Ives, Ben Carr, Sophie Fry & Eric Beinhocker



Current model-based financial regulations favour carbon-intensive investments. This is likely to disincentivize banks from investing in new low-carbon assets, impairing the transition to net zero. Financial regulators and policymakers should consider how this bias may impact financial system stability and broader societal objectives.

BASED ON M. Gasparini et al. *Nature Climate Change*  
<https://doi.org/10.1038/s41558-024-01972-w> (2024).

## The policy problem

As the urgency for climate action increases, financial regulators, supervisors and central banks are facing growing calls to bring financial regulations in line with a transition to net-zero carbon emissions. Various proposals have been made in the literature, such as green quantitative easing, direct central bank financing, lending quotas, including environmental, social and governance (ESG) factors in asset eligibility criteria, and differentiated prudential regulation. Financial regulators and supervisors are currently holding back on these proposals. However, the existing structure of some global financial regulations may inadvertently favour investments in carbon-intensive activities. This could negatively impact the speed of the transition to net-zero carbon emissions and increase the exposure of the financial system to climate-related risks in the long term.

## The findings

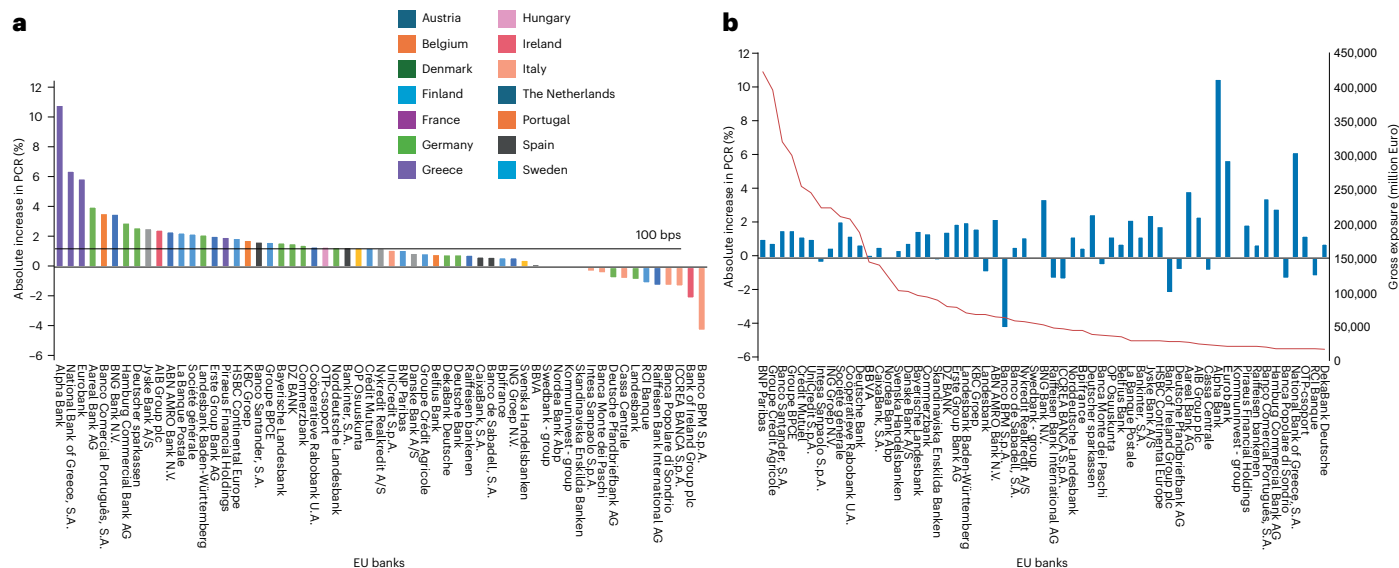
We find that under the current regulations, if 59 of the largest banks in the European Union (EU) were to divest from high-carbon sectors and reinvest in other activities, they would record, on average, losses equivalent to about 15% of their previous 5 years' profits. We show that this is due to the increase in loan loss provisions required to cover the higher estimated risk of low-carbon-intensity activities, compared with high-carbon-intensity activities. We show that the average estimate of risk (expressed in terms of the ratio between loan loss reserves and outstanding loans) among EU banks is lower for carbon-intensive activities as opposed to low-carbon activities (1.8% and 3.4%, respectively, in 2021). This is likely to be due to the backward-looking structure of model-based risk estimates that fails to adequately incorporate recent policy changes, the declining costs of low-carbon technologies and other ongoing factors. We argue that this creates disincentives for banks to invest in new low-carbon assets and exposes them to future risks from high-carbon assets.

## The study

We analyse EU banks' portfolios and associated accounting requirements (IFRS9) using data from the European Banking Authority. Specifically, we focus on the accounting rules of banks that rely on model-based risk assessments, similar to other financial regulations such as capital requirements. We classify investments into high-carbon and low-carbon emission intensity, leveraging the Climate Policy Relevant Sectors (CPRS) classification, and test the robustness of our findings with various classifications. We first investigate the relationship between the accounting requirements' model-based risk estimates and the classification of high- or low-carbon intensity. We then use the accounting relationship between model-based risk estimates, loan loss provisions and profits to assess the potential losses emerging from an active investment strategy to shift from high- to low-carbon-intensity activities by banks. Finally, we provide evidence across various risk models of a negative correlation between risk estimates and emission intensity and analyse the possible financial drivers of such differences.

## Recommendations for policy

- The current structure of some existing model-based financial regulations implicitly favours investment in carbon-intensive activities, working against broader government and societal objectives of transitioning to net-zero carbon emissions.
- Structured as they are, such financial regulations may exacerbate climate-related risks in the financial system, thereby working against one of the primary objectives of financial supervisors, which is to preserve financial stability.
- Legislators and governmental agencies should be aware that this implicit bias may lead to a misalignment between the financial system's allocation of capital and the use of fiscal and other policy tools by governments to crowd-in private capital to finance the energy transition, thus undermining the effectiveness of those policies.
- Financial supervisors, regulators and international standard-setting bodies (for example, the International Sustainability Standards Board and the Financial Stability Board) should consider addressing these issues within the existing standards and regulatory framework, including using more forward-looking risk assessments, such as scenario analysis, and other macroprudential tools.



**Fig. 1 | Change in provision coverage ratio for the 59 largest European banks.** **a**, Absolute percentage increase in the provision coverage ratio (PCR) following a divestment from high-carbon assets and corresponding reinvestment in low-carbon assets, maintaining a constant level of outstanding loans by bank. Colours represent the country of the banks' headquarters. The increase in the PCR represents the difference between the PCR required for low-carbon assets

as opposed to high-carbon assets for each bank in our sample. Horizontal line represents average in basis points (bps). **b**, Absolute percentage increase in PCR (blue bars) ranked by gross loan exposure (red line), from largest (left) to smallest (right). Figure adapted with permission from M. Gasparini et al. *Nat. Clim. Change* <https://doi.org/10.1038/s41558-024-01972-w> (2024), Springer Nature Ltd.

Matteo Gasparini <sup>1,2</sup>, Matthew Ives <sup>1,2</sup>, Ben Carr <sup>3,4</sup>, Sophie Fry <sup>5</sup> & Eric Beinhocker <sup>2,5</sup>

<sup>1</sup>Smith School of Enterprise and the Environment, University of Oxford, Oxford, UK. <sup>2</sup>Institute for New Economic Thinking, University of Oxford, Oxford, UK. <sup>3</sup>Grantham Research Institute, London School of Economics, London, UK. <sup>4</sup>Bloomberg L.P., Enterprise Products, London, UK. <sup>5</sup>Blavatnik School of Government, University of Oxford, Oxford, UK.

✉ e-mail: [Matteo.gasparini@ouce.ox.ac.uk](mailto:Matteo.gasparini@ouce.ox.ac.uk)

Published online: 2 April 2024

## Further reading

- Battiston, S., Mandel, A., Monasterolo, I., Schütze, F. & Visentin, G. A climate stress-test of the financial system. *Nat. Clim. Change* **7**, 283–288 (2017).

**This paper provides an assessment of the direct and indirect exposure of the financial system to the financial risk emerging from climate policies.**

- Campiglio, E. et al. Climate change challenges for central banks and financial regulators. *Nat. Clim. Change* **8**, 462–468 (2018).

**This paper provides a review of the possible tools that could be utilized by financial regulators and supervisors for fostering the green transition.**

- Lamperti, F., Bosetti, V., Roventini, A. & Tavoni, M. The public costs of climate-induced financial instability. *Nat. Clim. Change* **9**, 829–833 (2019).

**This paper shows that climate change could induce a higher frequency of banking crises.**

- Semieniuk, G. et al. Stranded fossil-fuel assets translate to major losses for investors in advanced economies. *Nat. Clim. Change* **12**, 532–538 (2022).

**The authors provide an assessment of the possible financial losses associated with fossil fuels' stranded assets.**

## Acknowledgements

The project has received no external funding. We thank P. Tufano (Harvard Business School), C. Hepburn (University of Oxford), J. Stock (Harvard University) and R. Barker (University of Oxford, ISSB) for their feedback on this research. We thank the discussants and participants at the EAERE conference and various people at the European Central Bank (ECB), the International Sustainability Standards Board (ISSB) and the International Monetary Fund (IMF) for their feedback on this research.

## Competing interests

The authors declare no competing interests.