

The low-carbon transition, climate commitments and firm credit risk*



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The transition to a net-zero economy exposes firms to climate-related financial risks that can increase their credit risk. To explore this relationship, we construct a novel dataset including firms' greenhouse gas emissions over time alongside information on their climate disclosure practices and forward-looking emission reduction targets. We then assess how such climate-related metrics influence both firms' credit ratings and their market-implied distance-to-default. We find that high emissions tend to be associated with higher credit risk. But disclosing climate data and setting a forward-looking target to cut emissions both mitigate this effect, with the impact of climate commitments being somewhat stronger for more ambitious targets. We also show that after the Paris agreement, firms most exposed to transition risk saw their ratings deteriorate by more, with the effect being larger for European than for US firms, probably reflecting differential expectations around climate policy. In this policy brief, we also highlight the implications of these results for corporate climate disclosures and the treatment of transition risk faced by the financial sector.

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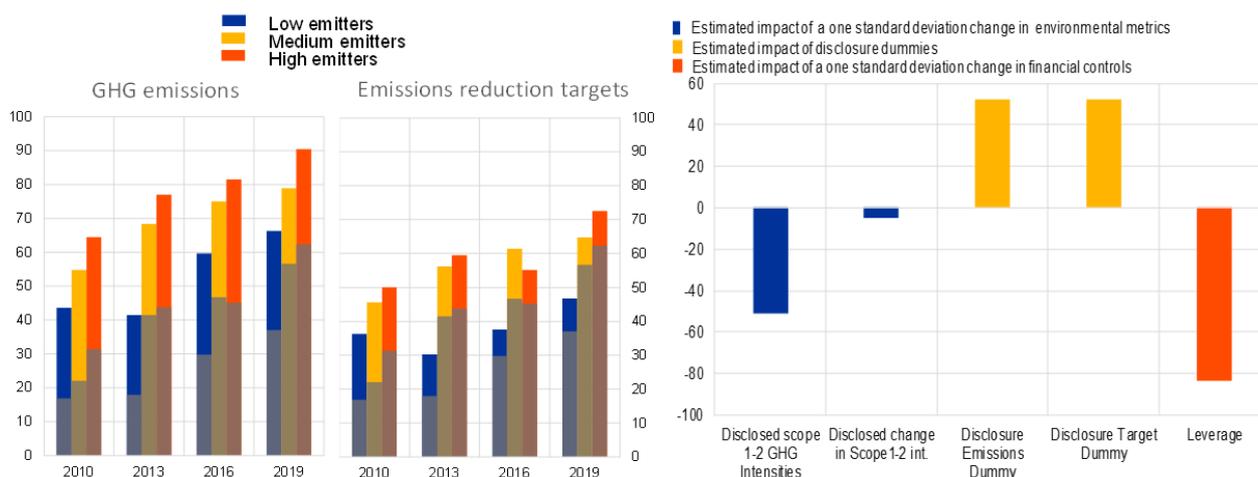
Climate change is one of the biggest challenges of our time. It is essential that every firm in the economy substantially reduces its greenhouse gas emissions in the coming years. Firms that fail to do so will fail the planet. But they may also endanger their own medium-term survival. In particular, firms which do not adapt sufficiently may be left with stranded assets such as unusable coal mines, or remain exposed to heavily carbon-intensive technologies that may eventually attract punitive taxation given the growing appetite of governments to introduce tougher policies to catalyse the transition to a low-carbon economy. Such firms may also see an increase in their financing costs if they face changing market sentiment and growing investor pressure.

The transition to a net zero economy therefore exposes firms to climate-related financial risks that may affect their credit risk. In a recent [research paper](#) (Carbone et al, 2022), we show that climate-related transition risk appears to be reflected to some extent in the credit ratings and market-implied distance-to-default of non-financial corporate firms. In particular, greenhouse gas emissions, the act of disclosing climate-related data, and commitments to reduce emissions all appear to play an emerging yet important role in influencing a firm’s credit risk. Credit ratings and the market-implied distance-to-default are credit risk metrics that are extensively used by financial institutions and central banks to assess the credit risk related to their exposures. For this reason, better and more harmonised firm-level climate data would improve the ability of credit rating agencies, financial institutions, investors and central banks to assess climate transition-related credit risk of their portfolios, while also reducing the likelihood that financial markets misprice carbon transition risk.

Firms are increasingly disclosing environmental indicators related to the low-carbon transition. Among listed European and US non-financial corporations, the share of firms disclosing emissions and making emission reduction commitments has increased substantially over time (**Figure 1, left**). Furthermore, over the past decade, reported emissions have been increasingly subject to some form of auditing, assurance, or verification. High emitting firms appear to be the ones consistently disclosing the most, probably because they are exposed to higher scrutiny.

Figure 1 Disclosure of GHG emission data by type of emitter (left panel) and estimated impact of transition risk on credit ratings (right panel)

Notes: Left panel: Percentage of listed firms disclosing GHG emissions and setting GHG emission reduction targets; shaded areas indicate disclosures in reports subject to audit or assurance; right panel: Y-axis: Percentages of credit rating notch. X-axis: selected factors affecting credit ratings.



Sources: Refinitiv, Urgentem, S&P, Moody’s, and ECB calculations.

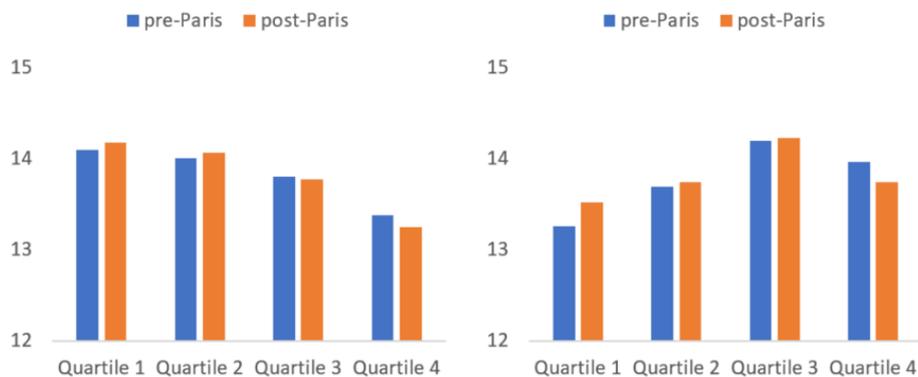
To assess empirically whether and how firms' credit risk relates to their climate-related transition risk, we develop a novel firm-level dataset which augments data on firms' GHG emissions over time with information on climate disclosure practices and forward-looking emission reduction targets. We therefore obtain a rich picture of firms' climate-related transition risk alongside their strategies to manage such risk, though there are naturally some limitations related to the reliability and comparability of these metrics. The data cover approximately 560 European and US listed non-financial firms observed over the period 2010 – 2019. Our empirical approach exploits panel regressions and difference-in-differences analysis, and controls for other common factors unrelated to climate change which may influence a firm's credit risk.

We find that firms with high current emissions and high emission intensities (i.e. emissions relative to revenues) exhibit higher credit risk. In particular, there is a positive relationship between emissions resulting from a firm's own operations (Scope 1) and credit risk estimates, as measured by both credit ratings and the market-implied distance-to-default. This relationship holds true for the credit risk of both firms which are already close to default as well as for all other firms, although firms with high-yield credit ratings exhibit a stronger sensitivity. The magnitude of the effect is, on average, comparable to that of traditional determinants of credit risk, such as leverage (Figure 1, right).

Governments' low-carbon transition policies appear to affect the link between transition risk and credit ratings. In contrast to the US, European countries have had a stronger low-carbon transition policy over recent years, including via the EU Emissions Trading System, a carbon market operational since 2005. By using the 2015 Paris Agreement as a shock that increases climate-related regulatory risks faced by firms without changing their environmental profiles, a difference-in-differences analysis shows that credit rating agencies assess transition risk differently for European and US firms that are otherwise broadly comparable. In particular, the average credit ratings of high polluting European firms, whether identified by emission levels or intensities, have fallen since 2015 (quartile 4 in Figure 2). In addition, the ratings of the most polluting firms in Europe worsened relative to those of US peers following the Paris Agreement.

Figure 2 Average credit rating of European firms before and after the Paris Agreement in 2015

Notes: Y-axis: Alphanumeric rating grade following the mapping of the rating scale to ordinal values ranging from 1 to 21, such that a higher ordinal value indicates a better rating. Panel A: X-axis: Quartile of Scope 1 GHG emission intensity. Panel B: X-axis: Quartile of Scope 1 GHG emission level. Quartile 1 (4) corresponds to the lowest (highest) Scope 1 GHG emission intensity / level.



Sources: Refinitiv, Urgentem, S&P, Moody's, and ECB calculations.

Disclosing emissions, setting emission reduction targets and achieving reductions in emissions can mitigate the impact of high levels of emissions on credit risk estimates (Figure 1, right). The act of disclosing emissions may signal that the firm is aware of its transition risk. And committing to an emission reduction target or achieving actual reductions in emissions may indicate that a firm has a strategy to manage its transition risk. We find that disclosing emissions and setting an emission-reduction target are both associated with lower credit risk under both measures, even after controlling for the strength of a firm's governance. We also find some evidence that achieving reductions in emissions is associated with better credit ratings, even if it does not appear to influence market-implied credit risk. And our results on forward-looking commitments are somewhat stronger for more ambitious targets, both in terms of the percentage reduction in emissions targeted and the targeted speed of reduction. Although the credibility of forward-looking emission reduction targets may be questionable, we also find some evidence that firms making such commitments do actually decrease their carbon footprint by more than other firms.

Enhancing the coverage, quality and comparability of disclosure of GHG emissions and emission reduction strategies would facilitate better assessment and pricing of firm-level climate risk. In this regard, the climate change-related disclosure standards proposed under the European Union's Corporate Sustainability Reporting Directive are a key step and should be implemented in a timely manner. More generally, it is important to pursue wider international efforts to introduce mandatory and standardized reporting and disclosure standards with an audit requirement across further jurisdictions, and if possible at the global level. Our results also call for ambition in setting such standards, especially around forward-looking targets and strategies, including on the content and milestones of transition plans.

Our findings are also relevant for the regulatory framework for banks and insurance companies. Under capital adequacy regulations, risk weights to reflect credit risk are either determined based on external ratings provided by credit rating agencies under the Standardised Approach or internal ratings under the Internal Ratings-Based (IRB) Approach. While credit ratings appear to reflect transition risk considerations for large corporates to some extent, the extent to which IRB risk weights based on internal models reflect climate-related transition risk is less clear. Our results therefore highlight the importance of assessing whether the climate-related transition risk faced by firms is adequately and consistently reflected in prudential and supervisory standards.

Greater consistency and transparency in credit rating agencies' incorporation of climate-related risks is also important. Credit ratings play a crucial role across the financial system, including in relation to the Standardised Approach for computing risk weights. Therefore, it is important to understand whether credit ratings appropriately reflect transition risk. This needs to be supported by the adoption of systematic and transparent disclosure practices by credit rating agencies in relation to how they reflect climate change risks in their methodologies and assess their relevance and materiality.

Finally, our results have potential implications for the way central banks approach climate-related transition risk in their monetary and non-monetary policy operations. In particular, they highlight how climate change and the carbon transition will affect the value and the risk profile of the assets held on central bank balance sheets. Partly with these considerations in mind, several central banks have started to take action. For example, the ECB has recently announced the inclusion of disclosure requirements for private sector assets as a new eligibility criterion or as a basis for a differentiated treatment for collateral and asset purchases.² This type of measure can both promote more consistent disclosure practices in the market and allow the valuation

² See https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708_1~f104919225.en.html.

and risk control frameworks used by central banks to better reflect firm-level transition risk. The ECB also plans to adjust the framework guiding the allocation of corporate bond purchases to incorporate climate change criteria, in line with its mandate, including a focus on the alignment of issuers with the goals of the Paris agreement. And the Bank of England has set out details of how it will green its corporate bond purchase scheme, placing particular emphasis on realised reductions in emissions, disclosure practices and emissions reduction targets when assessing the climate performance of firms.³ Our findings are supportive of such approaches. In particular, they highlight the importance of central banks focussing on firms' disclosures and forward-looking targets and strategies, alongside how well they are doing in actually cutting their emissions, when considering their monetary and non-monetary policy portfolios. ■

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³ See <https://www.bankofengland.co.uk/markets/greening-the-corporate-bond-purchase-scheme>.

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