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 on climate change as signed in 2015, its 195 signatories have



1 Introduction

Much of the academic literature correctly focuses on the complexity of integrating climate into financial-stability monitoring. Bolton *et al* (2020), in a major contribution ('The green transition: Central banking and financial stability in the age of climate change'), stated that this integration is *challenging because of the radical uncertainty associated with a physical, social and economic phenomenon that is constantly changing and involves complex dynamics and chain reactions*. Put simply, there are too many variables to deal with. Within their mandates, banking supervisors also find it difficult to make trade-offs between shorter- and longer-term financial stability objectives. Former Bank of Canada and Bank of England governor Mark Carney wrote in 2016 that *rapid and ambitious measures may be the most desirable from the point of view of climate mitigation, but not necessarily from the perspective of financial stability over a short-term horizon* (Carney, 2016).

This uncertainty has held back central banks from acting more decisively on climate. However, such limitations are all predicated on a treatment of climate as exogenous, an external variable that must have to be dealt with at some point. This Policy Brief proposes an alternative and more limited analytical approach: taking the complexity of climate as a risk out of the equation and instead focusing more narrowly on the legally-mandated certainty of the climate transition. Central banks could take a macro approach towards the management of



To serve this 'real economy' transition, banks⁵ will have to get better at two things. First, they need to get better at financing the new green economy. This is hard. Banks' risk models make low-carbon financing opportunities more expensive because of the newness and uncertainty related to the green economy. Moreover, data from the European Banking Author-



path towards the Paris net-zero objective will result in the least amount of financial instability

(SBTi, 2024)⁸. The open-source Paris Agreement Capital Transition Assessment (PACTA) methodology enables supervisor authorities to evaluate whether corporations are transitioning to net-zero carbon production. The technological (mis)alignments from PACTA can be aggregated to present a net alignment rate for each bank (ECB, 2024).

In the EU, the Corporate Sustainability Reporting Directive (CSRD, 2022/2464/EU) requires companies, including banks, to disclose absolute values for financed emissions and to set targets. The first disclosures will be in 2025 for the financial year 2024. However, many banks are expected to use the allowed phase-in period to delay full target-setting, and may for the time-being use a mix of partial portfolio disclosures and relative targets instead. Moreover, financial sector-specific guidance is still some years away. The result is that complete and accurate information to measure climate transition as a financial-stability issue is still some years away.

Given the importance to financial stability, there is a strong argument for central banks to take a greater role in requiring banks to internally and disclose external metrics and targets related to financed emissions. There is also more work to do to clarify the treatment of financed emission in certain circumstances. For example, central banks should have a view on how they will adjust baselines and targets in the event of a merger, acquisition or disposal of certain books of business.

4.2 Management

Of course, government regulation and taxation, such as carbon taxes, are the first best responses to the need to cut emissions. In this context, Tirole (2023) argued that *the central bank can act as a 'climate-change fighter of last resort'*. Following from their financial-stability mandate, the question for central banks (as policymakers) is what they should do to minimise financial instability when policymakers have determined a clear outcome (net-zero).

The main macroprudential instrument to date has been climate risk stress tests. While climate risk stress tests are a useful tool to make potential financial losses in the financial system transparent, they do not in themselves reduce financed emissions. Moreover, current climate stress tests give a false sense of security by underestimating the size of climate shocks and the impact of climate shocks on the financial system (ignoring feedback loops) (Reinders *et al*, 2023).

Another recent prudential instrument is the development of bank transition plans, as required by the latest amendments to the EU Capital Requirements Directive (CRD, 2013/36/EU). Banks should assess and embed forward-looking climate (and other environmental, social and governance) risk considerations in their strategies, policies and risk-management processes through transition planning, for the short-, medium- and long-term time horizons (Article 76 of the amended CRD). Banks should demonstrate their overall resilience to net-zero climate risks. Smoleška and Van 't Klooster (2022) argued that bank transition plans are a hybrid instrument half-way between risk management (internal to banks) and guided transition from supervisors. The ECB, as banking supervisor of the euro-area banks, could implement a guided transition by requiring banks to include annual reductions in financed carbon emissions in their prospective transition plans, on the basis that supervisors (including the ECB) will be entitled to assess the robustness of banks' transition plans under Article 87a(4) of the amended CRD⁹.

There is a need for further policy tools that require banks (and other financial institutions) to reduce financed emissions in line with the Paris goal. The preferred instrument of many macroprudential policymakers is the imposition of systemic risk buffers. ECB/ESRB (2023)

⁸ C. 15, Article 3, <https://ghgprotocol.org/sites/default/files/2022-12/Chapter15.pdf>.

⁹ Article 104(1)(c) CRD, "shall restrict or limit the business, including with regard to the acceptance of deposits, operations or network of institutions or to request the divestment of activities that pose excessive risks to the soundness of an institution."

proposed a systemic risk buffer (called concentration charges) for climate-related concentration risk. If and when carbon-intensive exposures exceed a concentration threshold, the systemic risk buffer kicks in, as greater concentrations are associated with larger bank losses.

The main challenge is to set the appropriate size of the systemic risk buffer. First, estimates of the impact on aggregate credit growth of a one percentage point increase in capital requirements vary from a one to ten percentage-point decrease in credit growth (ECB/ESRB, 2023). This large variance in expected impact makes it difficult to calibrate the exact size of the systemic risk buffer.

Second, policymakers tend to set capital buffers at the lower level, making them less effective. A case in point is the countercyclical capital buffer, implemented after the global financial crisis, which is not regarded as sufficiently substantial to be able to counter the credit cycle when activated.

Third, the buffer has to be large enough to tilt the balance from carbon-intensive to low-carbon loans (Oehmke and Opp, 2023). In the current outlook, with energy shortages and high interest rates, fossil-related loans are more profitable than loans for renewable-energy projects, which need high upfront investment at currently high interest rates. So, just like the countercyclical capital buffer, a systemic risk buffer for climate concentrations is likely to have limited effect, unless it is set at a variable and sufficiently high level (which is unlikely to happen for political-economic reasons).

An alternative to buffers (which are basically pricing tools) is to cap financed carbon emissions by means of a large exposure rule limit (Schoenmaker and Van Tilburg, 2016). Such a hard budget constraint would directly 'limit' the amount of financed carbon emissions in an effective way. As Kornai (1986) noted, *the softer the budget constraint, the weaker the compulsion to adjust demand to relative prices ... demand management works only if it is associated with sufficiently hard budget constraints. This is one of the important relationships between macro- and microeconomics*. Hard budget constraints overcome the first-mover disadvantage problem by creating a level playing field for all banks and better price signals for financed emissions.

Given the limitations of buffers, we explore the possibility of applying bank-specific macro limits for financed emissions, starting with a baseline and applied for assets to 2050. Bank-specific means a limit based on a bank's absolute financed emissions, taking into consideration the actual portfolio baseline at a certain date. Macro means that the aim of the limit is to reduce financed emissions in the wider financial system. Within the constraints of such hard limits, a price for financed emissions will emerge. This will help banks steer towards Paris-aligned loan and investment portfolios that limit bank-specific and systemic losses resulting from the climate transition. Limits beat buffers on execution, even if they require central banks to align more with policymakers in order to implement and enforce.

5 Calibrating the guided transition

There is no reason why central banks couldn't immediately require better measurement of climate transition risks. While there may be work to do to develop standards for financed-emissions accounting, existing methodologies and industry-led initiatives are sufficiently well advanced to allow for quick implementation. Quality of disclosures should improve rapidly over time as financed-emissions accounting will fall under assurance by auditors. Nevertheless, central banks should be mindful of banks seeking to game the system. Existing supervisor instruments could be deployed to close loopholes. Efforts to improve measurement would seem a low-cost, no-regret priority for all the central banks in the 195 jurisdictions that have signed the Paris Agreement.

The proposal for a guided transition to manage and enforce a hard limit on financed

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emissions requires urgent work for it to be developed and operationalised. The case for more active management of the transition is currently most obvious for jurisdictions that have net-zero commitments enshrined in law. In those jurisdictions, central banks can follow the stated aims of policymakers and extrapolate from their financial-stability mandates. In other jurisdictions, there is still a case to be made for guided transition, but in the absence of a legal mandate, the case will depend on a better understanding of climate as a risk. Regardless of the legal status quo, central banks are advised to better understand how a guided-transition instrument could have to be implemented in case an event-driven acceleration needs to take place. Our recommendations include:

5.1 Design of the guided-transition instrument

Hard limits on financed carbon emissions to reach net-zero in 2050 could be designed top-down from a system perspective. As indicated in Figure 2, the starting point is the amount of today's financed emissions as a percentage of bank capital. This prudential limit should be tightened to achieve absolute emission reductions of four percentage points per year, relative to the base year 2025¹⁰. Given this tightening, banks have an incentive to lend to companies that adapt to greener business models as they will contribute to reduced financed emissions (Schoenmaker and Schramade, 2022). Lending to companies that do not adapt will be hard to come by as these companies will never contribute to reduced financed emissions. The aim should be to achieve timely reductions, not to punish high-carbon companies that are on a credible and timely path to reduce their carbon emissions.

The aim of the prudential limit should be to steer the climate transition in an even-handed way to net-zero by 2050, over time and across banks¹¹. All banks, no matter what their baseline of financed emissions, will have to set annual steps towards net-zero. Under the auspices of the European Systemic Risk Board (ESRB), limits could be set for all regulated financial entities: pension funds, insurance companies and investment funds. The result of the limit will need to be a decline in finance to companies that are unable to adapt and thus to prevent climate-transition losses to the financial system.

5.2 Clarification of the legal basis

We have argued that central bank action to guide the climate transition stems from the central banks' financial-stability mandates. The imposition of a four percentage-point annual reduction in financed emissions will nevertheless result in some market upheaval. It is important to understand this as part of a process of internalising the Paris goal in the steadiest way possible: upheaval now to avoid greater financial instability later.

In the EU, the new bank transition plans under the amended CRD provide a good legal base. The ECB, as banking supervisor of the euro-area banks, could implement the guided transition by requiring banks to include annual reductions in financed carbon emissions in their prospective transition plans, as supervisors (including the ECB) will be entitled to assess the robustness of banks' transition plans under the new Article 87a(4) of the amended CRD¹². EBA draft guidelines (EBA, 2024) provide some guidance to the financial sector on the contents of these transition plans, but will require future clarifications on time horizons and treatment of financed emissions.

10 100% of the 2025 baseline (2025 = 100%) in 2025, 96% in 2026, 92% in 2027, and 80% in 2050.

11 The 4% annual reduction in financed emissions is relative to the 2025 baseline (2025 = 100%). This implies a 4.4% annual reduction in absolute emissions (4.4% = 4% × 1.1).

12 The EBA draft guidelines (EBA, 2024) require banks to include annual reductions in financed carbon emissions in their prospective transition plans, as supervisors (including the ECB) will be entitled to assess the robustness of banks' transition plans under the new Article 87a(4) of the amended CRD.

5.3 Mitigation of global leakages

Although the transition to net-zero will need to happen globally, it is important to mitigate leakage of emissions financed by EU financial institutions to foreign financial institutions, and to minimise opportunities for arbitrage between supervisor jurisdictions. This is perhaps the greatest challenge. The instrument may well be successful at improving the Paris-alignment of European banks' portfolios, but will fail at improving alignment of the real economy if corporations finance their high-emitting activities elsewhere. Solutions could include making the prudential limit location-based, just like the counter-cyclical capital buffer. Non-EU institutions operating in the EU would then also fall under the prudential limit. To prevent international leakage, these prudential limits would have to be implemented at global level through the Financial Stability Board (FSB) and the G20¹³.

Operationalising the framework will require a formidable effort, but should not be impossible. The infrastructure to deal with climate issues is much stronger now than it was a decade ago. At the international level, FSB, G20 and annual UNFCCC conferences are opportunities to clarify international treaty requirements and to overcome collective action problems. Knowledge networks such as the Network for Greening the Financial System (NGFS), the European Systemic Risk Board and the Glasgow Financial Alliance for Net Zero (GFANZ) can be mobilised to expand on our recommendations.

6 Conclusions

To many professionals working on sustainability at banks and the companies they finance, it feels like an enormous amount of effort has been undertaken in the decade since the Paris Agreement. From stress-testing to disclosure, from changes in governance to development of green-finance offerings, much has been achieved. Yet, globally, financed emissions have not come down. Leading jurisdictions, including the EU, are still following the 'too late, too sudden' path. Difficult decisions are being postponed, which will result in a more disorderly transition as 2050 approaches. Sceptical readers may think that 2050 is far away and that 'something' will be sorted out to avoid crisis. Perhaps the Paris objectives will be relaxed or their non-compliance will go unenforced. Alternatively, the planet may be saved by some yet-to-be-invented miracle technology.

But this can hardly be the basis for a supervisor framework. It is time to tip the default around and, until we are told otherwise, treat the Paris net-zero commitment as the will of policymakers. Financial stability must be managed accordingly, with a guided transition.

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