GREENING BANKING SECTOR: CENTRAL BANKS' RESPONSES

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Abstract

Climate change poses a significant threat to both society and the global economy, with the potential to undermine global financial stability, including the banking system. Despite the urgent need for climate action, capital flows toward climate solutions have been largely inadequate. This calls for financial regulatory intervention as an urgent response to redirect capital flow toward climate actions, thereby, strengthening the financial system's resilience to withstand "climate-related financial risks." Financial regulators, including central banks, have undertaken various structural reforms to protect the financial system from these disruptions. This paper examines how the central banks' responses to "climate-related financial risks" protect the financial system while aligning with national efforts to achieve a green economic transition.

Introduction

Excessive human intervention through unsustainable industrial and agricultural practices without accounting for negative externalities has imposed extensive costs on the entire society. Economists and scientists now acknowledge that climate change represents a substantial economic and societal risk. It is not only the economy that is exposed to these dangers of climate change, but also the financial sector that is becoming increasingly vulnerable. Historical evidence on the correlation between the financial sector and climate change has been weak. However, in the last decade, the relationship has intensified. The growing frequency and intensity of climate-induced extreme weather events, such as storms, floods and droughts, have led to mounting business losses and strained financial assets. Such events affect the financial performance of corporations, resulting in non-performing loans and adversely affect bank liquidity and solvency.

The economic losses are already evident. The insured losses were $140 billion in 2017 due to natural calamities, compared to a 30-year inflation-adjusted average of $80 billion (Carney, 2019). Insured losses were $125 billion in 2023 and further increased to $146 billion in 2024 (Swiss Re Institute, 2025). While these risks are expected to affect multiple firms, sectors and geographies in a highly correlated manner, developing economies would be particularly vulnerable due to higher exposure and lower adaptive ability. With this background, it is important for the financial sector to integrate climate change in business practices and support Governments' initiatives to mobilise capital for climate actions, both climate mitigation and adaptation. While climate mitigation can limit global warming, subsequently lessening the intensity and frequency of natural disasters, climate adaptation can make the economy resilient to these climate change-induced extreme weather events.

Since banks are one of the most vital institutions in the financial system, they have a crucial role in these green transition efforts, particularly in a banking-

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driven economy. A growing number of central banks and regulators around the world are becoming aware of their role and potential mandate in addressing climate change and environmental risks faced by the banking and financial sector. Discussions and debates on Climate change in banking, popularly known as "green banking", have picked up after the Paris Agreement in 2015 and intensified after COVID-19. Since COVID-19, several central banks have gone ahead and incorporated 'climate change' in their policies, regulations, operations and supervisory practices. Green Banking across the global financial system has gained traction due to altruism, increasing familiarity of climate change as a risk and opportunity among bankers, investors, regulatory pressures and Government policies (Gaba, R., & Sharma, D., 2025; Rakshitha, J., & Chaya, R., 2023). Banks are lending to support green assets, including renewable energy and clean transportation; and companies are engaged in reducing carbon emissions. Some banks also declared to bring down the Greenhouse Gas (GHG) intensity of their loan books over time and reach net-zero by a specific time frame (Di Maio, C., et al. 2023). Banks also voluntarily follow global disclosure standards such as the International Sustainability Standards Board Disclosure framework (formerly TCFD) to disclose their sustainability practices. Besides, banks are also identifying, measuring and managing climate risks by quantitative and qualitative methodologies, including heat mapping, scenario analysis and stress testing. They integrate climate risks and opportunities throughout their lending operations and risk management. Commercial banks and universal banks also support green companies in raising debt and equity capital from public and private markets and underwriting green bonds. Although commercial banks are taking measures to green their banks, these have not been enough to mobilise the necessary capital for climate actions (Newell, P. 2024) and make the banking system resilient to climate change risk (Chalabi Jabado, F., & Ziane, Y. 2024). Here, central banks can nudge banks to incorporate climate change in their business practices, including decision making on loan disbursement and risk management, to protect the banking system from this material risk, while supporting efforts on green transition.

Internalising both the costs of climate change and the benefits of climate action remains a major challenge. Climate change is now described as the greatest market failure the world has seen. As carbon pricing is expected to remain low for the next several years, a sharp and rapid increase in carbon prices could trigger sudden massive financial losses, sometimes referred to as a 'Climate Minsky moment'. Hence, this risk warrants the need to address the market failures by designing financial policies and regulations that reward green investment. Hence, central banks must play a crucial role in this transition.

Objectives

Climate change is increasingly becoming a mandate of central banks, from the perspective of financial stability and supporting the Government's measures to climate action. Climate change risk can potentially harm financial stability, although not immediately, but it is critical that central banks pay adequate attention to this material threat. Climate change risk may derail central banks' monetary policy objectives, therefore, central banks should closely monitor and take necessary interventions. The objective of the paper is to bring climate change into the banking regulation and the monetary policy discussion while supporting the Government's mandate for a green transition.

Methodology

This study is a comprehensive secondary study to map the range of measures central banks have undertaken-or are currently exploring responses to

climate change. In addition, this study encompassed peer-reviewed academic literature and grey literature on the operations and governance of central banks concerning climate change. This study brings insights from the working papers and policy reports from leading research institutions and international organisations such as the International Monetary Fund (IMF), Bank for International Settlements (BIS) and Asian Development Bank (ADB).

Central Banks' Response to Climate Change

Climate-related financial risk is a potential threat to the stability of the financial system and can complicate efforts to control inflation and maintain price stability. Besides, central banks also play a developmental role in supporting national policy objectives, including green transition goals. As capital mobilisation for green transition is much lower than the requirement, there is a need to bridge the financing gap. The conventional and unconventional tools can be used to address climate-related financial issues and help accelerate the flow of capital into green sectors. This paper focuses on the responses initiated or considered by central banks and banking supervisors or proposed by academicians, think tanks and international institutions to address climate change risks while supporting their country's broader green transition efforts.

Differential Capital Adequacy

The fundamental premise of banking regulation, as per the Bank for International Settlements (BIS)/ Basel Accord, is based on ensuring adequate capital against unexpected losses and appropriately pricing expected losses. Ignoring climate change risks, already recognised as a material risk, violates this principle in banking regulation and can result in higher lending rates or constrained capital allocation for green investments. The credit rating agencies or banks should have factored in climate risk in their risk assessment exercises. Lowering the risk weight of the green sector can reduce the lending rate and stimulate capital flow to the sector, while increasing the risk weight to carbon-intensive businesses would decrease transition in the banking sector.

Global institutions and some central banks suggest reevaluating current risk weights based on the risks presented by climate change. For example, studies suggested green loans have a lower Non-Performing Loans (NPL) ratio compared to conventional loans in China (Choi, J., et al. 2020). The Asian Development Bank (ADB) Institute working series paper suggests that in the long run, green factors are likely to lower long-term credit risks. Central banks in the European Union and China are considering risk weights for green lending while increasing them for carbon-intensive projects.

Embed Climate Risk into Supervisory Review Frameworks

All risks that could impact capital adequacy, including climate change risks, that might emerge suddenly or evolve gradually, directly or indirectly affecting the banks' loan portfolio to be taken into account. Climate-related and environmental risks are drivers of traditional prudential risk categories. The central banks are, thus, instructed financial institutions to embed climate risk assessments into their supervisory review frameworks, particularly Pillar II reviews, so that longer-term considerations are adequately integrated into risk management processes.

Financial supervisors in Australia, China, Japan and Malaysia have considered material environmental and social risks and asses the implications of these risks on the financial system stability. In the European Union, there are specific capital requirements for banks to incorporate a macro-prudential buffer for systemic environment and social risks.

Interest Rate Subvention for Green Lending

Subsidised financing has long been a regulatory tool for central banks to direct credit towards underserved groups, such as lower-income groups and Micro, Small and Medium Enterprises (MSMEs), as well as sectors of national importance. Given the pace of innovation and evolving business models required to tackle climate change, industries and firms that can potentially contribute towards green development and low-carbon transition are perceived as high-risk. Interest subsidies for green lending may, to a certain degree, compensate lenders for these higher risks and encourage more investment in green projects. Central banks of India, China and Bangladesh are supporting green projects through interest rate subsidies for some specific green technologies. Concessional capital for the renewable energy sector is one of the key drivers of the rapid adoption of the technology in China. Currently, in some countries, interest rate subvention are only for small-scale projects in the green sector, but this may be expanded to provide the financial support for large-scale projects as well to support their respective Governments' green transition.

Mandatory Lending

Credit quotas have long been used by central banks of some countries to channel credit flows to underprivileged sectors of the economy, as these sectors are not able to access capital from mainstream financiers like banks. As funding green sectors is essential from the perspective of social-economic development, it can be considered a priority sector for lending. Additional green credit quotas could be carved out from the existing priority sector to give an impetus to sustainable lending. Indonesia, for instance, has a system in place with a focus on its national energy security plan, while Bangladesh has implemented a mandatory 5% green lending credit quota for banks (Hossain, 2023).

Collateral Policy

Collateral policies may have an impact on the asset preferences of commercial banks. The tools such as screening, haircuts and preferential treatment to promote climate-friendly investments can be used. The European Central Bank (ECB) has integrated climate change into developing its collateral framework to support green sectors (Li, R. 2024).

Increasing Climate Risk Disclosure

Asymmetric information between borrowers and investors makes the market inefficient in assessing risks and opportunities accurately. As the companies (borrowers) do not disclose climate change risks and opportunities adequately, it is difficult for the market to respond to these risks appropriately. Misleading disclosure could lead to failure in the financial market. Current ongoing initiatives to address these asymmetric information issues could have multiple benefits: they help financial intermediaries map their climate change risks and opportunities; address the asymmetric information barriers between corporations and financiers/investors; and help the financial policy regulators assess the climate-related risks in the financial system. Several countries have undertaken regulatory measures that make it mandatory for corporations to disclose risks related to climate change. For instance, South Africa mandates climate change performance disclosures for listed companies, while in Bangladesh, banks are required to publish independent green annual reports, following the Global Reporting Initiative (GRI). The Reserve Bank of India (RBI) has issued a draft guideline on 'Disclosure framework on Climate-related financial risks, 2024' for its regulated entities.

There are regulations only for top publicly listed companies to disclose climate change and sustainability, private companies, other companies are exempted from this. Disclosure by all borrowers

will facilitate banks in pricing the loan and managing risks appropriately. Here, lenders can act as advisors to these small and medium-sized companies to follow the best practices concerning climate change for the interests of both borrowers and lenders.

Use of Monetary Policy Tools

Central banks are exploring how to use monetary tools to lower the cost of credit and promote credit flows to green sectors (Schnabel, I. 2021). Monetary policies can decrease the Statutory Liquidity Ratio (SLR) and Cash Reserve Ratio (CRR) for green projects, while determining the repo rate, reverse repo, bank rate and open-based financed-emission intensity of commercial banks. Such measures could decrease the cost of lending to green projects while supporting central banks' broader economic objectives.

Decreased credit costs for clean energy and energy efficiency could reduce reliance on imported fuels and energy requirements of countries relying on other countries for their energy needs. This step can reduce inflation volatility as transportation costs, attributed to higher fuel prices, are a key factor that increases inflation. Lower reliance on imported fossil fuels can help central banks better manage the foreign exchange market. Investment in climate-smart agriculture can mitigate the risk of hyperinflation of food prices caused by extreme weather events. Encouraging credit to climate-resilient crops, water harvesting and solar-powered cold storage projects can indirectly support central banks' mandate to control inflation.

Stress Testing

Conventional measurement of risk could be adapted to assess climate-related financial risk, as the analysis of climate-related impacts is not fundamentally different from standard scenario analysis. Since the 2008 global financial crisis, the term "stress testing" has generally been used to qualify a comprehensive and firm-wide scenario analysis. Most backwards-looking risk assessments and models are not suited to properly assess climate risks, as they fail to assess the non-linearity and deep uncertainty of climate scenarios and distributions, including extreme weather events. A climate risk stress test is an important tool to address these challenges, as it can quantify the potential impact of severe but plausible climate scenarios in the absence of historical data. Central banks have established national guidelines, though not mandatory, for climate risk integration, including stress testing.

Incorporating Climate Change Risk in Risk Management

Climate change is a material financial risk that could potentially destabilise the financial system, including banks and institutional investors. The financial institutions to assess climate risk exposure in their portfolios. Financial regulators in the United Kingdom (UK), South Africa, Bangladesh and Vietnam have taken steps in this direction. The Bank of England has launched a resilience review of the UK's financial system. Bangladesh mandates Ecological and Social Risk Management (ESRM) guidelines, which financial institutions mandatorily follow to assess the environmental and social risk impact for project finance.

The regulators may ensure to have an accurate database and modelling capability to identify climate change risk, particularly physical risks such as heat waves and floods. Usually, risk management is based on historical data, which does not capture climate change risks appropriately. The RBI has developed the "Reserve Bank Climate Risk Information System (RB-CRIS)", which can address these climate data gaps and help banks improve their climate risk management.

Moral Suasion and Forward Guidance

Central banks also use moral suasion by making rhetorical appeals to take into account climate change in lending and risk management. There are draft climate-related disclosure guidelines, meetings, workshops, documented publications and speeches from high-ranking central bank officials on climate change to influence banks and other regulated financial institutions to consider climate risk in decision-making. Climate change is now featured in monetary policy reports, highlighting its relevance to economic stability. Forward guidance is a policy instrument that central banks can use to signal upcoming policy changes concerning climate change, with specific timelines for implementing these policies, thus, encouraging financial institutions to align in advance with regulatory expectations. The Peoples' Bank of China (PBC), the Central Bank of China, followed 'window guidance'[1] to encourage its regulated banks and financial institutions to accelerate credit to green projects (Dikau & Volz 2021).

Embedding Climate Change in Corporate Governance and Oversight

Top-level leadership has the apex responsibility to plan, strategise and set the organisation's culture. The challenge for the financial sector is to prioritise environmental outcomes over financial aspects. While integration and inclusion of the climate change dimension in financial operations has made some progress in the banking sector, climate change teams often remain disconnected from financial decision-making, thereby, weakening their influence on strategies, products, investments and lending.

Conclusion

Globally, there is an increased momentum to bring climate change to the centre of financial discussions to meet the funding needs of climate actions. If climate change concerns are not integrated with financial decision-making, economies, societies and financial systems would be at great risk. Against this background, central banks must play a pivotal role, not only in bridging the green investment gap but also in accelerating the structural transition to a sustainable economy. Past precedents show that financial regulators have used financial policy to support economic activities that create positive externalities. A proactive approach from central banks can improve capital allocation and make the system more resilient to climate change risk.

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[1] Window guidance, also known as 'moral suasion' and 'jawboning'.

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