Swedbank

Macro Focus

What central banks can do to fight climate change

- Climate change poses risks to financial stability and is thus within central banks' mandates
- The Bank of England is in the lead; the Federal Reserve is farthest behind
- Central banks should step up research, improve disclosure and assess their own balance sheets to mitigate climate-related risks

> *"The economy is changing all the time in response to a large number of forces. Monetary policy is always having to analyse and assess these forces and their impact on the economy. But few of these forces have the scale, persistence and systemic risk of climate change*." Guy Debelle, Deputy Governor, Reserve Bank of Australia, March 12, 2019

The costs of inaction on climate change are rising. The stakes are high, including risks to financial stability. Central banks are increasingly engaging in the debate. Their mandates, interpretations, and sense of urgency vary. In this analysis, we review how far central banks have come and what to expect in the coming years. Our conclusion is that central banks both should and will step up research and regulations to combat climate change. Both action and inaction will influence financial systems significantly.

Central bank leaders and laggards

Mark Carney, the governor of the Bank of England (BoE), was the first to talk about the financial implications of climate change and the risks they bring about in his famous "tragedy of the horizon" speech (Bank of England, 2015). The BoE remains one of the most active central banks in this respect, although it has been joined by others. Last year, the ECB become more vocal on the issue and joined the Network for Greening the Financial System (NGFS), established a year earlier. The Swedish Riksbank joined in December 2018. **The first progress report by NGFS members** (currently 26 central banks and regulatory authorities globally) **acknowledges climate-related risks as a source of financial risk and affirms that addressing these risks is within the mandates of central banks** and supervisors to ensure resiliency of the financial system (NGFS, 2018).

The debate is now shifting more to what central banks and regulators should do and how much lies within their mandates. Among the major central banks, the Federal Reserve is probably the only notable exception; it has not engaged in any of these activities. Early this year, four former chairs of the Federal Reserve (Yellen, Bernanke, Greenspan, and Volcker) joined leading US economists in an unprecedented call for a carbon tax in the US, warning about the risks of climate change and urging immediate action (Climate leadership council, 2019).

Climate change is a risk to financial stability, as well as to growth and inflation

There are two main channels through which climate change poses financial risks, as initially framed by the BoE (Scott, van Huizen, and Jung, 2017): (i) physical effects from extreme weather events or changing climate conditions and (ii) the impact of transition to a lower-carbon economy. The first set of risks directly affects the value of physical assets (e.g., financial losses due to droughts, floods, storms) and hinders productivity. But the latter is equally important, as it can also cause changes to valuations due to, e.g., stranded assets in fossil-fuel-related industries. Mercure et al (2018) show that there is a substantial risk that the world economy could face a carbon bubble. The authors emphasize that this potential bubble poses a financial stability concern that "**if not deflated early, could lead to a discounted global wealth loss of US$1-4tn, a loss comparable to the 2008 financial crisis**". Central Banks should thus take into account climate-related risks. Financial stability can be undermined through higher insurance claims, portfolio losses, sentiment shocks, and defaults on loans.

Climate change

Extreme Weather	Global Warming	Transition Risks	Opportunities
Volatility in production and inflation **Damage** to buildings and infrastructure **Direct and indirect effects** on the energy sector, insurance sector, manufacturing sector, finance sector, tourism	Risk of lower **productivity** and production **Re-allocation of investments** to adjust to a warmer climate crowds out capital to other productive investments	**Financial instability** due to overinvestment in fossil fuels and fossil technology, lower valuation or even "stranded assets" **High initial investment costs** for climate adaptation crowds out capital to other investments	**New technology** and innovations raise productivity **Investment** in infrastructure that contributes to higher growth

Another set of risks arises from how climate change affects the medium-term inflation outlook and economic growth. This has been less discussed by central banks. Yet, there have been a couple of notable speeches by ECB governors recently on the impact of climate change on monetary policy conduct. So far, the impact of extreme weather on inflation and output through commodity price developments and output losses has been temporary; however, this may change, thus warranting adjustment of monetary policy (ECB, 2018b).

What central banks can do to fight climate change

There are a number of things that central banks, together with financial regulators and relevant international bodies, can do to fight climate change. Some are already doing these, while others lag behind. Here is therefore a summary of what central banks can do, with the caveat that the formal authority of regulation also differs across central banks.

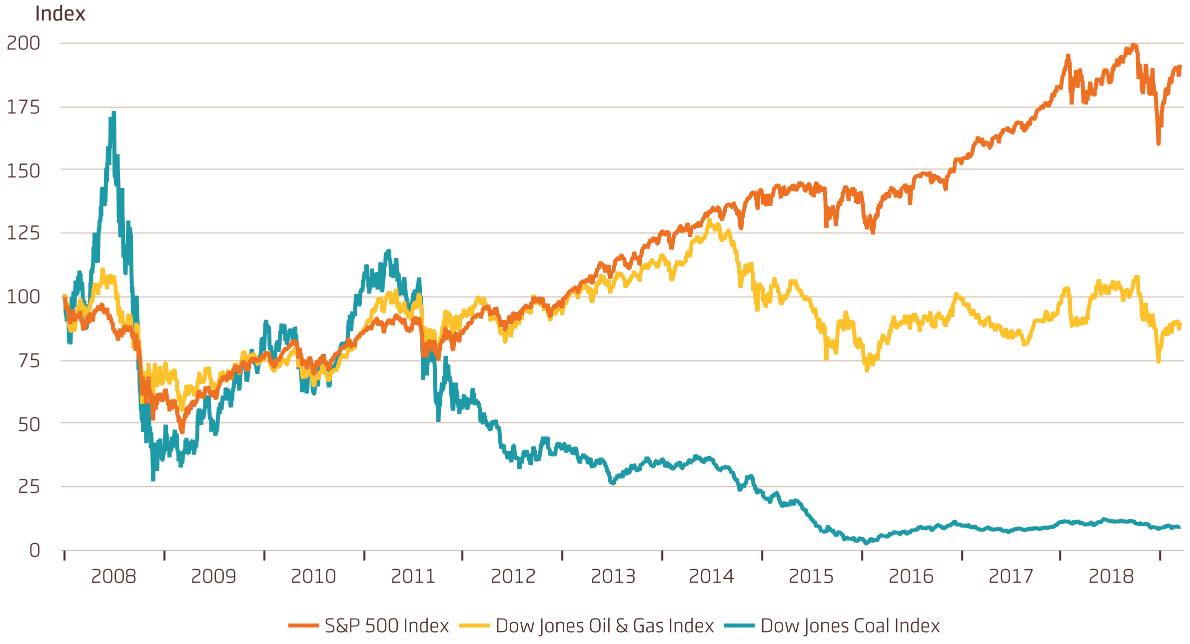
Research. Central banks have ample resources for research, which can be used to understand the risks and their financial implications better and to develop necessary tools and models. The BoE is particularly active on this front, having published a number of research pieces framing a way of thinking about the physical and transitional risks mentioned above. The Riksbank, in comparison, has so far only produced one short research note (Olovsson, 2018).

There are several challenges for quantitative assessment of the risks associated with climate change. The major one is lack of data and **the inability of standard central bank macroeconomic models to take climate change into consideration**. Another problem is that the historical developments normally incorporated in models do not help much in predicting the future, since we are just starting to see the impact of climate change on the economy. Models incorporating economics, the carbon cycle, and climate science do exist, most notably the DICE (the dynamic integrated model of climate and the economy) and RICE (the regional integrated model of climate and the economy) models developed by Nordhaus (Nordhaus, 2017). For his research, Nordhaus was awarded the Riksbank Prize in memory of Alfred Nobel in 2018. There is significant scope for central banks to improve analysis by actively encouraging the inclusion of climate risks into macroeconomic modelling.

Better disclosure. Central banks can demand better disclosure of exposure to climate risks for central banks themselves, and they can encourage investors and companies to do so also. **The Financial Stability Board Task Force on Climate-Related Financial Disclosures (TFCFD)**, chaired by Mr. Carney, has come up with recommendations for companies for disclosure on governance and strategy, and risk management, as well as particular metrics and targets used to assess and manage relevant climate-related risks and opportunities (TFCFD, 2017). The BoE has conducted an internal review of the UK banking sector to check exposures to climate change; its survey showed that only 10% of the banks take a long-term view of the impact (Bank of England, 2018). De Nederlandsche Bank has conducted a similar exercise, showing that exposure to carbon-intensive sectors is large enough to pose potential systemic risks (see Campiglio et al, 2018).

The transition to a lower-carbon economy: some fossil-fuel sectors are already suffering

S&P 500 Index, Dow Jones Oil & Gas and Dow Jones Coal Index, Price Return, Close, USD, Index 100=2008-01-01



Sources: Swedbank Research & Macrobond

The BoE is also making plans to include in 2019 the impact of climate change in bank stress tests. The Swedish Financial Supervisory Authority has also been considering stress tests and has so far argued that Swedish banks, insurance companies, and capital investors have low adaptation risks, given their limited exposure to climate-related risks (Finansinspektionen, 2016). However, the Swedish economy and financial sector face substantial indirect risk because of their openness and small size.

Financial and prudential regulations. Discussions are intensifying on whether to incorporate climate-related risks into reserve, liquidity, or capital requirements. So far, this kind of assessment is mostly used by central banks in the emerging markets. For example, the central bank of Brazil requires banks to engage in environmental and social stress testing and incorporate these risks into capital requirements, and the central banks of China and Indonesia are considering inclusion of these risks in their macroprudential frameworks (Dikau and Ryan-Collins, 2017).

Financial and prudential regulation is also increasingly discussed in advanced economies. **For example, "green-supporting" or even "brown-penalising" factors for capital requirements are being explored in the EU**, i.e., the possibility of giving banks capital relief for their green lending or, instead, penalising carbon-intensive investments. This remains a controversial measure, though, and some argue that the design of capital requirements should remain risk-based, as it may jeopardise prudential policy objectives otherwise. It is also likely to be difficult to identify those companies within carbon-intensive sectors that engage in low-carbon investments, or to prevent high-carbon companies raising capital in other jurisdictions instead.

Monetary policy adjustment. Central banks' balance sheets have expanded massively since the financial crisis due to the use of quantitative easing (QE) as a monetary policy instrument. **These large-scale asset purchases by central banks have opened up the possibility of engaging in "green QE"**. So far, the central banks that have commented on the idea have pushed back; they view QE as a cyclical policy instrument (e.g., ECB, 2018a). In addition, some green assets do not meet the eligibility criteria set by the central banks and purchasing them might worsen the quality of central banks' portfolios.

However, some green assets, e.g., held by the ECB, do meet eligibility criteria. **The ECB already holds about 24% of eligible green bonds issued in the public sector and about 20% of private sector green bonds that were purchased under its existing programmes** (under the principle of market neutrality; see ECB, 2018a,b). It can thus be said that the ECB indirectly (or unintentionally) is already engaging in "green QE". At the same time, carbon-intensive sectors accounted for nearly half of the corporate bonds purchased by the ECB during recent years. The ECB argues against green QE on the grounds that excluding carbon-intensive sectors from their purchases would have reduced the intended scope and effectiveness of its QE programme substantially (ECB, 2018a).

Furthermore, Yves Mersch, a member of the Executive Board of the ECB, mentions green bond price bubbles among the risks arising from a possible undervaluation of risks (ECB, 2018a). Given that the demand for green bonds has risen dramatically in recent years, while supply has been lagging behind, this may be a valid argument, especially since additional financing is unlikely to solve the problem of a lack of "green" projects. Yet, as central banks have pointed out themselves, there is also a risk of overvaluation of corporate bonds from carbon-intensive sectors, i.e., the transition risks outlined above. The risks of a "carbon bubble" are significant (Mercure et al, 2018) and most likely are greater than the risks of mispricing green bonds. Hence, the risk argument can be used both for and against greening central bank balance sheets. In any case, boosting green projects will primarily be done with government policies through environmental regulations, incentive schemes, and infrastructure investments.

What central bank should do

Central banks should use their authority to do research, improve disclosure, and enforce financial and prudential regulations (within their mandates). They should also investigate whether monetary policy instruments, such as QE, can be used to stimulate climate-friendly investments. This is important for two reasons. First, QE is likely to be a frequently used monetary policy instrument, as in the coming decades, policy rates will remain low and even close to zero in many countries. **Hence, central banks' own purchases can both hinder or facilitate the development of green bonds and other new financial instruments**. Second, it is important that central banks disclose the risks associated with their own balance sheets. As the costs of inaction of climate change rise, and as the risk of financial instability associated with brown bonds increases, central banks should not only push other financial institutions to disclose and adjust to such risks. They should do so themselves.

Finally, it should be remembered that central banks' mandates differ across countries and that only a few banks in advanced economies also encompass a regulatory authority. Thus, regarding climate-related risks for financial stability, cooperation between central banks and supervisory authorities is crucial. For many central banks, price stability remains the primary focus of their mandates. Potential changes to the mandates should be considered only with great caution in order to preserve central banks' independence and not to shake market sentiment/expectations. It is thus likely that in the nearest future the focus will remain on collecting comprehensive data and developing robust models to analyse climate-related financial risks, as well as improving disclosure and understanding of these risks in the financial and business sectors. For their own credibility, **it is important that central banks are at the forefront of climate-related research, disclosure of climate-related financial instability risks**, and their integration into decision-making.

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