Policy brief

CLIMATE CHANGE, FOOD SECURITY, AND CENTRAL BANKS IN DEVELOPING ECONOMIES*

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Channing Arndt International Food Policy Research Institute
Faaiqa Hartley University of Cape Town
Christopher Loewald South African Reserve Bank
Konstantin Makrelov South African Reserve Bank

ABSTRACT

Climate change represents a rapidly emerging challenge for central banks, particularly in developing economies. Central banks have tools to increase the economy's resilience, enable reallocation of resources to reduce costs and grasp opportunities, and smooth the transition to a low carbon economy. Specific measures, such as changes to selected macroprudential rules, merit consideration. The climate challenge also highlights two traditional mandates. First, price and financial stability support investment and long-term price discovery, both crucial to climate response. Second, central banks are already critical providers of information to public and private decision-makers. Creation and dissemination of knowledge that facilitates improved decision-making by public and private actors (notably investors) may be central banks' most important contribution to more favourable social, economic, and environmental outcomes in a context of climate change. The T20 can play important roles in facilitating this knowledge acquisition by central banks in developing countries.

CHALLENGE

Mitigation of and adaptation to climate change will prove to be sources of major structural change, with significant financial and macroeconomic impacts (Fankhauser and Tol 2005; Stern 2013; Deryugina and Hsiang 2014; Carney 2015; Bolton et al. 2020). Markets will seek to reflect these structural shifts in asset prices today. This process may not be smooth due to imperfect information, paucity and/or limited use of suitable analytical tools, and inherent climate change uncertainty.

While a growing literature highlights the critical role of central banks in confronting climate change, this literature mainly focuses on developed countries (Arndt et al. 2020). However, climate issues are likely to be more salient for developing economies due to their structural features. For example, developing economies typically have large and weather dependent agricultural and food sectors with large food insecure populations as well as underdeveloped financial sectors (Farid et al. 2016). This implies substantial price stability and growth challenges alongside concerns about financial stability and the implications of climate change for the pace of financial deepening. Compared with developed economies, developing economies also typically harbour some advantages that facilitate structural change, such as fewer legacy investments, ample endowments of sun and wind, and relatively rapid economic growth.

Central banks have tools to increase the economy's resilience, enable reallocation of resources to reduce costs and grasp opportunities, and smooth the transition to a low carbon economy. The challenge is to deploy these tools wisely, and the G20 is well positioned to facilitate the necessary developments to meet this challenge.

PROPOSAL

In many ways, climate change reinforces the importance of adherence by central banks to their core financial and price stability mandates. For example, developing countries are widely expected to require significant levels of foreign financing to fund climate interventions. These climate interventions are frequently characterised by relatively high up-front capital costs, low operating costs, and long payback periods. Examples of these sorts of interventions on the mitigation side include solar panels, wind turbines, hydropower installations, electricity transmission infrastructure, and electric vehicles. On the adaptation side, examples include agricultural research, irrigation infrastructure, and hardening of transportation infrastructure.

These relatively large up-front costs, low operating costs, and long payback periods imply that social discount rates play an important role in determining their viability. Relatively low and stable inflation reduces risk premia (for both inflation and exchange rates) and supports long-term price discovery thus improving access to foreign savings and lowering domestic interest rates. These factors effectively lower social discount rates, enabling greater investment, with particularly strong implications for the climate interventions described above.[1]

THE CASE FOR A DIFFERENT APPROACH

This highlighting of central banks' core mandates does not imply that business as usual should prevail, for two reasons. First, climate change complicates the attainment of traditional central bank mandates, particularly in developing countries. Consider climate change impacts. Unlike many other supply-side shocks, those from climate change are expected to be persistent, with frequently irreversible effects (Bolton et al. 2020). As noted, one of the main channels of climate change impacting central banks is through weather dependent sectors such as agriculture. Lesk, Rowhani, and Ramankutty (2016), in a cross-country study, find that droughts and extreme heat decrease cereal production by 9 to 10%. In many developing economies, the agricultural sector is both relatively large and has strong links with other sectors of the economy, such as agro-processing, leading to large spill-over effects. If, as is widely expected, climate change leads to more frequent and more severe shocks to agricultural production, these shocks will spread easily to other sectors of the economy with potential to generate significant price and exchange rate volatility.

Turning to mitigation, stabilisation of the global climate is only possible with substantial involvement from developing economies in global mitigation efforts. Absent these efforts, climate change impacts will become increasingly severe with strong implications for all countries. In the desired state of the world where all countries embark on sufficient and equitable mitigation efforts, central banks in developing countries must cope with the implied structural changes. For example, in South Africa, the transition from coal to renewable generation has significant implications for coal mining companies (privately held), coal fired

power generation assets (mainly state owned), the balance sheet of the state-owned electricity utility, and public and private pension fund assets. Electrification of transport may be even more disruptive. It will affect all liquid fuel infrastructure, many manufactures related to transport, and the bulk of vehicle maintenance operations. In these transitions to lower emissions development, there is ample scope for non-smooth transitions that might threaten financial, economic, and social stability.

In these senses, the departures from business as usual implied by climate change are being thrust upon central banks. Like many agents in the economy, central banks must adapt. But central banks can do more than adapt reactively. The second reason for departure from business as usual relates to the capabilities of central banks to proactively facilitate adaptation and mitigation. Proactive measures available to central banks include, for example: incentivising financial institutions to use certain asset classes as collateral when borrowing from the central bank; implementing changes to selected macroprudential rules which can influence relative price signals; implementing climate disclosure rules; and the sharing of information. These tools can be used to increase the economy's resilience to climate changes, enable reallocation of resources to reduce costs, grasp opportunities that climate change will create, and smooth the transition to a low carbon economy.

UNDERSTANDING IMPACTS AND KNOWLEDGE SHARING IS KEY

To successfully execute these two departures from current business as usual, however, central bankers in developing countries must thoroughly understand climate change and its impacts in their country's context. This in-depth knowledge of climate change induced implications will guide central banks' monetary policy formation and direct interventions. Perhaps more importantly, dissemination of this knowledge can fortify the key role central banks already play in facilitating improved decision-making by public and private actors (notably investors), leading to more favourable social, economic, and environmental outcomes. Thus, a major contribution of central banks to the issues surrounding climate change will be through analysis and information provision.

While international efforts are underway to assess climate risks in the optic of the role of central banks, these efforts have focused to date heavily on developed countries. But, as has been emphasised, developing countries are different. Beyond the aforementioned large exposure of most developing countries to weather dependent sectors such as agriculture, developing countries are also typically characterised by less fiscal and monetary space, smaller and less developed financial sectors, lower levels of digitalisation, lower domestic savings, higher borrowing costs, higher inflation, and lower credit ratings. Because of these many differences, the results from existing research into climate change and central banking may not apply to developing countries. Green quantitative easing is a good example. While small scale purchases as part of the ordinary operations of a central bank can support green investment,

large scale purchases can generate large economic costs (even hyperinflationary episodes) in developing economies due to differences in underlying conditions (Sargent 1982; CGFS 2019).[2]

Hence, the relevant knowledge base is small; and the research agenda is commensurately large. Specific elements of the agenda include modes for: encouraging the use of green assets as collateral when commercial banks borrow from the central bank, requiring financial institutions to account for climate risk in the calculation and measurement of financial sector risk, changing risk weights to reduce the risk profile of green assets in the calculation of macroprudential ratios, and understanding the possible distortionary impacts and unintended consequences of these interventions. The knowledge base that would lead to well-founded actions by central banks in developing countries in these domains is notably thin. Broader questions should also be addressed such as:

· What are the implications of climate change for monetary policy formation?
· How can financial inclusion be increased so that more people can benefit from climate financing?
· How can digitalisation be used to improve intermediation of climate funding?
· What financial and insurance products can accelerate climate change mitigation and adaptation in weather exposed sectors such as agriculture and improve food security?

While none of this will be easy, it is important to highlight that central banks are, in many dimensions, very well placed to undertake these analytical tasks. The nature of their work makes them comfortable dealing with risk and uncertainty and attuned to the importance of low frequency but high impact events. Structural change in the global climate has an analogue to structural change in an economy: both render historic patterns less useful (Bolton et al. 2020; Schlosser and Strzepek 2015). Analysts in central banks are constantly analysing systems whose fundamental parameters are shifting and seeking to understand the implications of these changes.

In other dimensions, analytics associated with climate change will take central banks into new domains. In particular, the nature of climate change demands greater accent on structural approaches that build on first principles and that can account for structural changes in the economy. New modelling frameworks that combine current central bank models with integrated assessment models, which are longer-term, supply side-oriented and structural, and that incorporate more detailed financial sector dynamics would help assess the risks resulting from climate change and provide qualitative evidence to guide decision making.

COLLABORATION AND COORDINATION CAN ADDRESS CAPACITY CONSTRAINTS

Given the challenges, a network approach to research and model development and use could help overcome the investment and resource constraints that developing countries face. The Network for Greening of the Financial System is a good example, but it is not enough

central banks. To forge into new analytical domains, central banks require new partnerships that comprehend climate outcomes, biophysical outcomes, economic outcomes, longer run structural change and, ultimately, their implications for risk, finance, and monetary policy. Collaborations and coordination between central banks, research agencies and networks, government, the private sector and civil society to facilitate knowledge creation and exchange is necessary because central banks alone do not have the tools to directly address climate change related market failures (Dikau and Volz 2019; Volz 2017).

Building new frameworks also requires data. Current data gaps are large in advanced economies and even larger in emerging and developing countries. Central banks have significant statistical departments and the ability to collect data (another advantage). Advances in technology allow for easier collection and management of administrative data. Central banks should develop their data capabilities to collect financial and other relevant data, which can support mitigation and adaptation. Central banks should also incorporate climate change factors in the compilation of official statistics, which will increase awareness of climate risks.

RECOMMENDATIONS FOR THE G-20

The key message in this note highlights the role of central banks in generating and disseminating information. This information should facilitate internal decision-making, ranging from fundamental monetary policy stances to developing specific climate risk related disclosure rules. It should also facilitate external decision-making, notably by informing policy and market decisions. Armed with solid analysis, central banks in developing countries have strong potential to play a critical role in confronting climate change.

To fully realise this potential, they will need help from the G20. The bulk of research on climate change has taken place in developed countries, principally the G20. In this regard the G-20 can support developing countries by:

1. Setting up initiatives/networks under the G-20 Finance Working Group or under the Sustainable Climate Finance Group to support central banks in developing countries with establishing analytical frameworks that are appropriate to their own circumstances and that generate country specific analysis. Collaborative research programs that build on expertise housed in developing country central banks, engage relevant institutions in developing countries, and leverage expertise available in the G20 are a promising path forward.

2. Providing expertise under the auspices of the G-20 to translate new information into policy interventions to support the development of country specific responses to benefit from the climate transition. The focus of central banks and other financial sector regulators in many developing economies must be on deepening financial markets, improving financial inclusion, macroeconomic stability and insurance coverage. These areas are well developed in G-20 economies. Sharing of Fintech solutions and assistance with their implementation will also be key to ensuring the resilience and readiness of financial sectors in developing economies to tackle climate change issues.

NOTES

1 Social discount rates in many emerging and developing economies are often based on long-term bond yields which incorporate an inflation risk premium and inflation expectations. In this case, reducing inflation expectations and the inflation risk premium lower the real and nominal social discount rate.

2 These include for example policy rates stuck at the zero lower bound and very strong deflationary pressures.

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ABOUT THE AUTHORS

Channing Arndt International Food Policy Research Institute (IFPRI), Washington DC (USA)

Head of the Environment and Production Technology Division at IFPRI. He has an established reputation for building institutional capacity in Mozambique, South Africa, Morocco, and Vietnam and within the African Economic Research Consortium. His programme of research has focused on agricultural development, poverty, growth, market integration, nutrition, gender, and discrimination, HIV/AIDS, technological change, trade policy, aid effectiveness, energy, bioenergy, climate variability, and the implications of climate change.

Faaiqa Hartley University of Cape Town (South Africa)

Researcher at the Southern Africa Labour and Development Research Unit at the University of Cape Town (UCT). Her research includes the use of economy-wide modelling techniques to understand and quantify the economic trade-offs and implications of developmental issues in South Africa and sub-Saharan Africa. Her current research focuses on issues of energy and climate change. Faaiqa also works with the Energy Systems Research Group at UCT and is part of the team developing and maintaining the South African linked energy-economic model, SATIMGE. Before joining UCT, Faaiqa was the director of the CGE modelling division at the National Treasury of South Africa.

Christopher Loewald South African Reserve Bank, Pretoria (South Africa)

Head of Economic Research at the South African Reserve Bank, responsible for research, forecasting, global economic analysis, and the writing of the Monetary Policy Review. He is a member of the SARB's Monetary Policy and Financial Stability committees. Prior to joining the Bank in 2011, he spent 13 years in the South African National Treasury in various senior policy roles, including Acting Head of the Budget Office in 2005 and 2006 and Deputy Director-General for Economic Policy from 2006 to 2011.

Konstantin Makrelov South African Reserve Bank, Pretoria (South Africa)

Lead Economist at the Research Department of the South African Reserve Bank. His work covers variety of topics related to monetary policy, economic growth and forecasting. He coordinates the Reserve Bank Climate Change Programme. Prior to joining the bank, Konstantin spent 12 years at the National Treasury, the last 6 years as Chief Director responsible for Economic Modelling and Forecasting. Konstantin holds undergraduate and postgraduate degrees from Wits University and a Ph.D. from SOAS, University of London.