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Scaling up climate adaptation finance during periods of growing public debt, inflation and natural disasters[1]

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Summary

In 2021, economic losses from natural catastrophes were USD 270 billion. Poor physical climate risk assessment limits the scaling up of adaptation finance, which is still lagging behind mitigation finance in emerging markets and developing economies (EMDEs) but also high-income countries.

Physical climate risk pricing and portfolio risk assessment is still at an early stage. Most analyses are focused on firm level shocks, but they neglect the asset-level dimension of risks, which in turn leads to a severe underestimation of losses. Risk assessment and estimation of the transition investments needed should be incorporated into corporate valuation and sovereign debt sustainability analysis.

Adapting to physical climate risks requires **massive investments**. Because of high upfront costs, risks and the long-time horizons of infrastructure projects, adaptation finance faces larger hurdles than mitigation investments. Climate vulnerable countries are sometimes in a vicious circle of debt and climate change.

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Limited fiscal space and debt sustainability challenges frequently prevent them from adapting to climate change. **Innovations in adaptation technologies** are still slow and still primarily rely on public funding.

Financing could consist of multiple layers. **Public finance** should play a central role, followed by the international climate finance pledges, such as the adoption of the Glasgow Climate Pact. **Private finance** is also key, with blended finance arrangements by development finance institutions and multilateral development banks, in addition to the issuance of sustainable debt instruments such as 'pay-for-success'.

Finally, there is a crucial need to develop **climate-aligned debt restructuring** accompanied by substantial debt relief in some countries, as well as **countercyclical financing instruments** such as the IMF Catastrophe Containment and Relief Trust. This would allow EMDEs to have systems in place for the quick release of finance when disaster strikes.

Financing climate adaptation during a period of sovereign debt crisis

The Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) presented evidence of the growing economic and financial impacts of climate (see in particular Chapter 15). Adapting to physical climate risks requires timely and massive investments. Yet poor physical climate risk assessment limits the scaling up of adaptation finance, which is still lagging behind mitigation finance in both (EMDEs) and high-income countries[2].

Increased fiscal spending during the Covid-19 pandemic, rising inflation from higher energy prices, and high levels of public debt in many EMDEs have raised concerns about debt sustainability and their sovereign spending capacity for climate adaptation. Many of these countries are indeed highly vulnerable to climate change-related disasters and are already being severely hit by climate hazards, as well as by the chronic physical consequences of climate change (e.g. temperature increases, biodiversity loss, and sea-level rises).

Recent research has highlighted that climate risks do not happen in isolation but can compound both among themselves (e.g. multiform flood risks) as well as with other natural shocks (e.g. pandemics). When risks compound, they affect the magnitude and duration of the shock in the economy with implications for the fiscal and financial policy response. Nevertheless, a growing number of countries, including EMDEs, do not have the fiscal space and/or debt capacity to fund a recovery from such a shock, let alone a more resilient recovery that would also lower their climate vulnerability.

The 2022 Annual Meetings of the Boards of Governors of the International Monetary Fund (IMF) and the World Bank (WB), as well as the G7 Summit, highlighted the need to address debt sustainability when making public spending to work towards climate mitigation and adaptation. However, a strategic framework for climate adaptation finance is not yet available, and there is a lack of tailored adaptation finance instruments.

There is a major gap in climate finance that needs to be filled to avoid the worst impacts of climate change. Between 2011 and 2020, global finance almost doubled; annually global climate investments amounted to approximately USD 480 billion. However, this amount needs to be scaled up and the world needs an additional USD 4.3 trillion in annual climate finance flows until 2030.

Adaptation finance consists of multiple layers. The central role is played by public finance, followed by the international climate finance pledges, such as the adoption of the Glasgow Climate Pact, with a

[2] See for example the report on 'Adaptation finance in the context of covid-19' by the Global Center on Adaptation, as well as the United Nations' on 'Adaptation Gap' and 'Emissions Gap'.

commitment of providing USD 100 billion annually from developed to developing countries. Furthermore, the mobilisation of private finance within blended finance arrangements by development finance institutions (DFIs) and multilateral development banks (MDBs) could play an important complementary role, alongside sustainable debt issuance and instruments such as 'pay-for-success'.

Given their mandate and structure, DFIs and MDBs can scale up adaptation finance in EMDEs in a sustainable and inclusive way, while nudging the private sector to invest more. Nevertheless, to deliver on EMDEs' call for better climate finance for development[3], the current climate finance architecture needs to be substantially changed and adapted, and knowledge gaps for adaptation need to be addressed[4].

Although the Paris Agreement states that financial flows should be aligned with resilience goals (in particular Article 2.1(c)), there is evidence that finance is potentially flowing in the wrong direction and exacerbating the problem[5]. With this in mind, it is crucial to build and transform the wider financial system in a way that supports better resilience. In short, the goal would be to build a banking and financial system which would finance productive, climate resilient, low-carbon, and socially inclusive development.

Between countercyclical financing instruments and debt restructuring

Climate vulnerable countries are in a vicious circle of debt and climate change. Their fiscal space for financing climate adaptation investments is at an all-time low. Limited fiscal space and debt sustainability challenges have prevented several EMDEs from accessing climate finance to adapt and build up their resilience to climate change.

In these conditions, several complementary options could be considered, involving different financial actors.

On the one hand, an increase countercyclical financing could allow EMDEs to have systems in place for the quick release of finance when a disaster strikes. The IMF has two tools that could address this gap: the Catastrophe Containment and Relief Trust (CCRT) and the Resilience and Sustainability Trust (RST). Both tools are being scaled up from their current coverage.

Furthermore, a significant capital increase for MDBs is needed, in addition to reforms advanced by the recent G20 report on MDBs' capital adequacy framework. Notwithstanding new liquidity and more concessional finance, some countries will still not be able to mobilise the finance needed for adaptation investments without the need for comprehensive debt restructuring.

On the other hand, traditional approaches to debt sustainability (e.g. debt restructuring) should be rethought in the context of the climate-debt conundrum, moving away from the concept of debt capacity to the concept of debt impact. Indeed, climate-aligned debt restructuring will not be possible without substantial debt relief for many of these countries. In contrast, conditioning explicitly linking climate change mitigation and adaptation strategies to debt restructuring outcomes could help all climate vulnerable countries, in particular the most economically and climate vulnerable ones.

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[3] See for example the address given by the prime minister of Barbados, Mia Amor Mottley, at the General Debate at the 77th Session of the General Assembly of the United Nations, New York, 20-26 September 2022.

[4] See Article 6.4 of the Paris Agreement, which introduces a mechanism that contributes to mitigating greenhouse gas (GHG) emissions and support sustainable development.

[5] For example, non-resilient infrastructure investments or the gross fixed capital formation in high-carbon activities.

New tools, such as the Debt Sustainability Analysis (DSA) developed by the IMF and the World Bank, can incorporate physical climate risk and the transition investments needed into traditional debt sustainability analysis. Furthermore, many developing countries (particularly in South America) will need to cope not only with physical risks but also with climate transition spillover risks as a result of the uncoordinated introduction of climate policies at the regional level. Finally, risks emerging from the compounding of shocks – like hazards, such as multiform flood risk or climate and pandemics – should be integrated into debt sustainability analyses because, quite simply, when shocks compound, they amplify losses.

Towards tailored adaptation finance

Adaptation finance faces larger hurdles than mitigation investments because there are high up-front costs and risks related to adaptation investments, in addition to the well-known risks and challenges of investing in emerging markets and developing economies. The longer time horizons of infrastructure projects make it very challenging to develop profitable business models. Adaptation investments are split into capital and operating expenditures, which makes it more difficult to track their performance. Furthermore, market failures, the lack of long-term adaptation planning support and the lack of national adaptation investment plans limit private sector involvement.

Concerns may also arise because it is not always clear how emerging investment vehicles (e.g. green, sustainability-linked, social, impact, or resilience bonds) generate returns, as well as who should oversee the implementation of the projects. Uncertainty about the economic consequences of climate impacts and the efficiency of adaptation technologies represents a major constraint that hinders project-level investments.

Adaptation finance is often unattractive to private finance because of underpriced risk and a lack of economies of scale. Indeed, while large physical climate risks are mostly expected to play out (losses) in the mid to long term, adaptation cost manifest in the short run. That is why almost all adaptation finance is provided through the public sector, even though there are also opportunities for the private sector[6].

Physical climate risk pricing and portfolio risk assessment is still at an early stage. Most analyses focus on firm-level shocks but they neglect the asset-level dimension of risks, which in turn leads to a severe underestimation of losses. Although stock markets seem to react mildly to hazards occurrence[7], the pricing of risk is typically related to the general attention given to climate change, investors' appetite for green assets, as well as the personal experiences of professional investment managers – who tend to overreact to a climate-related disaster if they are located within the disaster region. Real estate markets show a growing internalisation of extreme weather events – homes exposed to sea level rise typically sell at 7 % below their market value, which grows over time driven by sophisticated buyers. These mixed results can be explained by a heterogeneity in beliefs about inundation projections due to climate change.

Natural disasters related to climate change impose significant damages to corporate profits. In 2021, economic losses from natural catastrophes stood at USD 270 billion. However, firms' efforts to cope with climate physical risks are limited. Only 23 % of firms have started communicating their short-term

[6] Especially when it comes to early warning systems, mangrove protection and climate resilient infrastructure. For more information, see Chapter 2 of the IMF's Global Financial Stability Report: 'Navigating the high-inflation environment', October 2022.

[7] In a recent study, examining how the stock market reacts to the uncertainty faced by firms due to extreme weather events, the authors found that the stock options of firms with a physical presence in a hurricane's landfall region, exhibit large and long-lasting implied volatility increases, thus reflecting significant uncertainty.

adaptation strategies. Firms communicate on how they adapt by adjusting their operation capabilities in the short run but long-term measures such as capital expenditures, the development of new technologies and relocation are rarely communicated. Furthermore, there is no rise in patents for adaptation technologies over the last 20 years. Adaptation patents are highly reliant on government support. Since mid-2000s, more than 40 % of patents covering adaptation technologies have received government support.

Opportunities: data architecture, climate scenarios, climate economics and financial modelling

Currently, there is a ballooning number of various models and datasets for physical climate risk assessment. However, a lack of transparency about their methodologies and missing elements limits the usability of their results. The development of a better data and information architecture (through disclosures, taxonomies and transition plans including adaptation) is crucial for supporting finance's mobilisation for adaptation and internalising the negative effects of GHG emissions.

Strengthening the climate data infrastructure would allow for the measurement of spatial and sectoral inequalities – the two very important components for ensuring adaptation's effectiveness[8]. Climate risk-related data should be perceived as a common good, and since investing in data infrastructure is costly, the public sector should take the initiative[9].

Beyond data gaps that need to be filled, there are many opportunities for strengthening the relevance of climate finance tools:

- *Physical climate risk scenarios* which should account for tail acute risks and their compounding effects, as well as indirect losses and economy-financial sector feedback;
- *Geolocalised data* that can contribute to firms' business and value chain, and help to avoid the large underestimation of climate financial shocks for investors;
- *Macro-financial models* that can analyse the full extent of physical climate and transition risks to the economy and financial system. Such models would allow for economic-financial feedback, the interplay of investors' expectations and policy credibility, to be actively considered. This in turn allows for a clear departure from rational expectations in the context of climate deep uncertainty. For example, Stock-Flow Consistent (SFC) behavioral models can be used to analyse the double materiality of climate physical and transition risks;
- *Financial network models* for balance sheet climate stress tests. These models will allow for the identification of drivers of contagion, from shock reverberation to implications on financial stability at both the individual and systemic level.

Scaling up climate adaptation investments requires identifying risks and co-benefits related to projects' implementation. Accounting for co-benefits from investments in adaptation would increase their

[8] A step forward is the Global Resilience Risk Initiative (GRII) which was launched at COP27.
[9] The IMF is engaging in many projects related to capacity building in developing countries and is planning to issue a joint IMF/Bank for International Settlements/Organisation for Economic Co-operation and Development/World Bank implementation guidance for high-level principles related to taxonomies and other alignment methodologies.

profitability and make them more attractive to private finance. The net present values of investing in climate change are outweighed by benefits[10].

However, if adaptation co-benefits are not recognised and properly accounted for, improved DSA (which considers the climate-related risks for countries) may even exacerbate the issues for climate-vulnerable countries. Thus, leading to a decrease in their sovereign credit rating and an outflow of capital. Furthermore, if climate-vulnerable countries are also exposed to climate transition risk (e.g. fossil fuel exporters), their sovereign credit ratings would additionally decrease. Because of this, climate risk models are needed to support the analysis of the potential reduction of risk that can be achieved through investments in adaptation, and account for positive externalities.

It is important to remember that mitigation and adaptation are complementary and yet the cost and impact of action (or inaction) plays out at different time scales. Mitigation and adaptation can be considered as substitutes if a reduction in the cost of a strategy increases its use and thus decreases the reliance on the other. They can also be considered as complements if a strategy increases when the marginal productivity of the other increases.

An essential step for adaptation was announced last November at COP27 with the launch of a 'loss and damage' fund for EMDES. Nevertheless, in the absence of ambitious mitigation policies aimed to decrease the global use of fossil fuels (and thus GHG emissions), financing adaptation would not be sufficient in itself to build resilience to climate change, since the driver of the problem persists.

A low-carbon transition may also be subject to trade-offs. For instance, a global net zero strategy would have negative fiscal impacts in most South American countries because a large share of their fiscal revenues is related to the production of hydroelectric power. Another example is the trade-off between biodiversity preservation and climate neutrality in New Zealand.

That is why there is a need for growth trajectories to be aligned with climate and development goals. Investing in a low-carbon climate resilient and socially inclusive growth path would be a desirable solution. The goal is to re-orient the whole economy and not only to focus on project finance. Climate change measures are currently 'going against the wind' because the policy structure is not made to fight climate change. A re-thinking of policy and the economy would create clear benefits for implementing climate policies.

However, the uncertainty of political decision-making processes makes this idea less feasible. Without clear policy signals for investing in low-carbon technologies and adaptation, and policy credibility, investors may not adjust their expectations about risk associated to high vs low-carbon technologies, or vulnerable vs resilient activities, to mobilise the capital needed. Indeed, the interplay between investors' expectations and climate policy credibility is crucial for mobilising (or not) the climate finance needed to achieve the Paris Agreement targets at the global level.

Taxes and energy markets regulation are a good example of policies which could create incentives for a change in behaviour and increase funds available for some measures, if properly designed and implemented. Global fiscal measures like a global carbon tax could prevent environmental spill overs and environmental dumping from the Global North to the Global South. Such measures would be the first commitment to bring policy credibility and would enable conditions for investors to deliver.

[10] See for example, the IMF's World Economic Outlook: 'Countering the Cost-of-Living Crisis' and the 'Climate Change 2022: Impacts, Adaptation and Vulnerability', Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

High-level policy reforms should start in the global North, and they need to be tailored to each country's financing needs and other specificities of their economies.

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