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FINANCING CLIMATE CHANGE
MITIGATION AND ADAPTATION
IN DEVELOPING COUNTRIES

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Financing Climate Change Mitigation and Adaptation in Developing Countries¹

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Overview

The UN Framework Convention on Climate Change (UNFCCC), under which the negotiations on climate change are being conducted, recognized that a just transition requires developed countries providing financial assistance to developing countries to help them in meeting the cost of mitigation and adaptation. This chapter attempts to quantify the scale and possible composition of international financial assistance that will be required to help developing countries manage climate change and suggests how to evolve an agreed position in international negotiating fora.

The chapter is in four parts. The first section, “The Historical Background,” provides a brief historical review of how the commitment to provide financial assistance evolved since the start of the negotiations in 1992. The second section, “Investment Requirement of the Transition,” reviews estimates emerging from different studies of the additional investment that developing countries will have to make to meet the challenge of containing global warming to 1.5 degrees Celsius above preindustrial levels and provides an assessment of the potential scale of international financial assistance that might be needed to make this investment possible. The third section, “MDB Lending as a Mechanism for Leveraging Private Flows” examines the role of multilateral development banks in raising the amount of financial flows to the required level. In the final section, we provide conclusions that emerge out of this synthesis.

¹ This paper is part of a chapter of a book published by Brookings Institution.

The Historical Background

The UNFCCC recognizes a basic asymmetry between advanced countries and developing countries in terms of their historical contribution to the problem of global warming and their current capacity to manage it. Global warming is caused by the increasing concentration of greenhouse gases (GHGs), particularly CO₂, in the atmosphere and at the time the UNFCCC was established this increase was largely due to the advanced countries using fossil fuels as their main source of energy as they industrialized. The developing countries were latecomers to industrialization and had contributed very little to the accumulated concentration of GHGs. Their level of energy consumption and emissions per capita was also much lower, and the resources available to them for mitigation were also clearly inadequate. This led to the argument that developed countries must provide developing countries with a reasonable volume of international assistance to meet the costs of mitigation and adaptation. This was a logical consequence of the principle of common but differentiated responsibilities and respective capabilities which is enshrined in the UNFCCC.

Recognizing this asymmetry, the first stage of the negotiations, which culminated in the Kyoto Protocol in 1997, focused primarily on imposing restrictions on emissions on advanced countries. It was recognized that the development objectives of the developing countries would necessitate increasing energy consumption, leading to higher emissions. Therefore, no obligation for reducing emissions was imposed on them and it was also understood that they would receive international assistance for undertaking voluntary mitigation actions. There was, however, no agreement on what this financial assistance would be.

The Kyoto Protocol was a failure. The United States never ratified it, Canada withdrew in 2011, and Japan, New Zealand, and Russia did not continue after the first commitment period (2008–2012). The absence of any commitment on the part of developing countries became a sticking point, particularly because China was growing exceptionally rapidly, and its emissions had increased very considerably, but being classified as a developing country in the UNFCCC framework, it was exempt from restrictions.

This led to a growing focus in the Conference of the Parties (COP) on the need to obtain *some* commitment on mitigation from the developing countries. The first step forward in this direction was at COP15 in Copenhagen, 2009, when a group of developed countries led by the United States and developing countries, notably China, India, South Africa, and Brazil, agreed on the so-called Copenhagen Accord. In the accord, the developing countries accepted that they should take some mitigation measures, which in many cases comprised reducing the emissions intensity of GDP. To assist in this process, the advanced countries set a goal to jointly mobilize U.S. \$100 billion per year by 2020 as *new* and *additional* financial assistance to developing countries.

The amount of U.S. \$100 billion per year was determined entirely arbitrarily. It was not based on any quantification of the additional cost that climate change abatement measures in developing countries would entail, for the simple reason that the precise extent of these measures was not known in 2009. The assistance was also envisaged to be a combination of public and private flows, but the relative proportions of the two components were left unspecified. There was also no clarity on what flows would count as “additional” toward the fulfilment of the obligation. The Copenhagen Accord was initially not supported by all countries, but a year later in 2010, at COP16 in Cancun (Mexico), all countries adopted the Cancun Agreement that enshrined the main features of the 2009 Accord. The Green Climate Fund (GCF) was established under the UNFCCC to facilitate the transfer of funds.

The next major step forward was at COP21 in Paris in 2015, when nearly all developing countries committed to taking various mitigation measures, including targets for reducing emissions intensity of GDP, increasing the share of renewables in electricity generation, and afforestation. Although the broadening of the commitment to contain emissions was rightly applauded, no attempt was made to recompute the amount of assistance that might be needed commensurate with the new commitments. Instead, the earlier promise to reach an additional U.S. \$100 billion per year by 2020 was reiterated. The ambiguity about its composition, in terms of public and private flows, remained as did the lack of clarity on what flows would qualify as additional.

The actual delivery of assistance against this promise has been disappointing. The extent of the shortfall cannot be estimated precisely because of the lack of clarity on the additionality of flows. The

OECD (2022) estimates that the flow of climate finance reached U.S. \$83.3 billion in 2020, but other estimates, such as by Oxfam (2020), are much lower.¹

COP26 in Glasgow in 2021 was widely seen as the next major advance in the area of mitigation commitments because almost all countries committed to reducing the absolute amount of emissions to net zero by various dates around the mid-century. The new commitments made by developing countries are much stronger than those made at COP21, which were primarily limited to reducing the emissions intensity of GDP. Meeting the new net zero commitments calls for massive investments in the energy and related sectors. An important consequence of this change is that the old estimate of U.S. \$100 billion per year of financial assistance needs to be reassessed based on the scale of the effort developing countries have to make, with the added burden of adaptation.

The Glasgow Pact recognized the need for recalibrating the scale of financial assistance, but it did not quantify what needed to be done. It regretted that the promised U.S. \$100 billion had not yet been met and *urged that it be fully delivered urgently and through to 2025*, after which the scale of assistance would have to be substantially expanded. The scale of increase needed beyond 2025 was left to be negotiated in subsequent COPs, but no progress has been made on this so far. Getting agreement on the scale of financial assistance to developing countries is clearly critical if the effort to combat climate change has to gain traction.

Investment Requirement of the Transition

The first step in determining the additional financing needed must be to agree on the scale of the additional investment that developing countries will have to make to reach net zero and implement adaptation measures. The amounts involved are clearly very large.

It will require investments in the power sector shifting away from fossil fuel-based electricity generation to non-fossil fuel-based generation, particularly renewables. In addition, sectors such as transport, which currently use petroleum and natural gas, will have to shift to electricity. This process of electrification will generate additional demand for electricity, requiring much more investments in clean energy. It will also call for new investments in the automotive sector as it shifts to producing electric vehicles. Industries in the “hard-to-abate” category, such as steel, fertilizers, and petroleum refining, which use fossil fuels for heating and as feedstock, will have to shift to alternatives such as green hydrogen. Urban buildings, both commercial and residential, have to be made more energy efficient. Non-CO₂ emissions from agriculture will need to be eliminated by improved methods of cultivation and cattle pasture. Despite all these efforts, some areas will still generate CO₂ emissions (e.g. cement manufacturing) which will have to be offset by expanded carbon sinks via afforestation, and carbon capture, utilization and storage. All these changes involve increased investment levels in pursuit of mitigation.

In addition to investments linked with mitigation, countries will also have to undertake investments for adaptation to manage the consequences of climate change that has already taken place and will continue for some time even if we succeed in limiting global warming to +1.5 degrees Celsius by 2100. While investments in mitigation will be frontloaded, those on adaptation are likely to be backloaded.

1. U.S. \$19–22.5 billion in 2017–2018.

Several estimates of the investment needed to manage climate change in the world have been made by different studies.

- Inter-governmental Panel on Climate Change (2018) estimated average annual investments in the global energy sector of about 2020 U.S. \$2.8 trillion per year between 2016 and 2035.
- International Energy Agency (2021a) estimated a requirement of U.S. \$4 trillion per year between 2021 and 2030 for the energy sector globally. Since the current global annual spending on clean energy is estimated at about U.S. \$750 billion, the additional investment needed is U.S. \$3.25 trillion per year.²
- McKinsey Global Institute (2022) estimated that between 2021 and 2050 the world will need investment of U.S. \$4.5 trillion per year in energy systems and land use. Of this, U.S. \$3.5 trillion will be additional and U.S. \$1 trillion will be a reallocation from current high emission assets to low emission assets.
- International Monetary Fund (IMF)³ has estimated the need for energy and related investments amounting to U.S. \$3.3 trillion per year up to 2030.
- Climate Policy Initiative (2021) has estimated a total need for climate finance at U.S. \$4.35 trillion each year by 2030, against current levels of only U.S. \$632 billion. This implies an incremental investment need of U.S. \$3.72 trillion.

These estimates vary between U.S. \$2.8 and U.S. \$4.5 trillion per year, amounting to about 3 to 4 percent of the global GDP. However, our purpose in this chapter is limited to assessing the scale of financial assistance that may need to be extended to developing countries. Furthermore, China, which belongs to this group, can be reasonably excluded because it has the capacity to meet its financing needs without external assistance. Our concern can therefore be narrowed to the additional investment requirements of the developing countries other than China.

A recent study that attempts to estimate the investment requirement of this group of countries is Bhattacharya, Dooley, Kharas, and Taylor (2022).⁴The

2. Another study estimates that annual investments in renewables in developing countries need to exceed U.S. \$1 trillion by 2030, as against U.S. \$150 billion in 2020 (IEA, 2021b).

3. IMF Managing Director Kristalina Georgieva's opening remarks at IMF Policy Dialogue on June 1, 2022. Accessible at <https://www.imf.org/>

4. This study updates an earlier study by Bhattacharya and Stern (2021).

study focusses on the “incremental investment” needed above the baseline of 2019, and using this definition it estimates an incremental requirement of U.S.

\$1.3 trillion by 2025, rising to U.S. \$3.5 trillion by 2030. This covers not only investment in the energy and related sectors but also investment in adaptation, sustainable agriculture, and preservation of natural resources, as well as investment/expenditure in human capital through education and the skill development needed in a changing world. A more recent paper by Songwe, Stern, and Bhattacharya (2022), which was submitted to COP27, builds on the Bhattacharya et al. (2022) paper and concludes that developing countries excluding China would need incremental investment of around \$2.4 trillion by 2030 on developing low-carbon energy systems, building adaptation and resiliency infrastructure, and restoring natural capital to meet their climate commitments and the related development objectives. This estimate is significantly lower than Bhattacharya et al. (2022) because it prioritizes spending on climate actions, and therefore does not include the expenditure on human capital development.

Bhattacharya et al. (2022) make it clear that the increase in investment being proposed should not be viewed as a cost of decarbonization which implies that the same resources could have been deployed in other areas for achieving a higher growth. It is best viewed as the investment needed to put these economies on an inclusive and sustainable growth path, as envisaged in the 2030 sustainable development goals (SDGs), which also involves an acceleration of growth and higher incomes. In other words, the investment requirement is not just the investment needed to decarbonize the *existing* growth path: it is the incremental investment needed to achieve the higher growth rates envisaged by the SDGs while decarbonizing the economy.

Table 12.1 summarizes the suggestions made by Bhattacharya et al. (2022) on the ways in which the resources needed could be mobilized. Domestic and international resources are projected separately, and in each case there are estimates of the increase that can be expected on a business-as-usual (BAU) basis, together with estimates of the additional amount needed to meet the incremental investment requirement for 2025.

It is not easy to define what is “truly additional” investment, because the additional cost of an investment is only the extra cost that is above that of a planned “usual” kind of investment. For example, RE is more capital intensive than conventional power, and the investment required in RE may well involve higher costs. But against this, we would avoid building new conventional power capacity and subsequently avoid producing (or importing) fossil fuels, all of which must be factored in besides the social and environmental savings.

Financing Climate Change Mitigation and Adaptation in Developing Countries

Table 12.1. Additional financing needed by 2025, over 2019 levels, in developing countries other than China (billion, 2019 US dollars)

(\$billion)	Total Incremental Need*	Increase Expected Under BAU	Additional Required
Domestic resources	653 (50%)	236	417
International financing	652 (50%)	112	540
<i>of which . . .</i>			
<i>ODA</i>	96 (7.4%)	12	84
<i>MDB non concessional</i>	126 (9.7%)	27	99
<i>Bilateral non concessional</i>	35 (2.7%)	4	31
<i>Private flows</i>	395 (30%)	69	326
TOTAL	1,305 (100%)	348	957

Note: Figures in parentheses are percentages of the total.

Source: Bhattacharya et al. (2022).

An important feature of the projections in Table 12.1 is that as much as half of the resources needed to finance the incremental investment envisaged must be met by domestic sources. This is relevant for future COP negotiations because developing country negotiators have often tended to assume that the UNFCCC implies that the entire cost of climate change mitigation and adaptation to developing countries must be provided in the form of international financial assistance. This expectation is perhaps encouraged by Article 4.3 of the UNFCCC, which refers to the provision of “new and additional financial resources to meet the *agreed full costs* incurred by developing countries.” However, the convention provides no operational definition of the phrase “agreed full costs,” and this opens the door to multiple interpretations.

In practice, negotiators will have to be guided by what is realistic. In the following paragraphs we comment on the expected contributions from each source of financing.

Domestic Financing Component

As noted above, about half the total incremental investment needed will have to be financed through incremental domestic resources. About U.S. \$236 billion is expected to come on a BAU basis and this must be supplemented by an additional domestic effort of U.S. \$417 billion. This additional domestic effort (above the BAU level) is about 1.4 percent of the GDP of these countries in 2025.

Planning to raise a substantial part of the resources needed domestically is only realistic, given the limited appetite in the international community to commit resources to this field. It is also sensible from a macroeconomic perspective since too large a dependence on external financing would require the recipient economies to run unsustainably large current account deficits. These would in turn require a corresponding real appreciation of the currency, which may undermine their export potential.

Furthermore, since the inflows would not be grant flows for most countries, a larger dependence on international sources of finance would involve a considerable build-up of foreign debt. Most developing countries have experienced a sharp increase of foreign debt as a consequence of the pandemic and this is now widely seen as a source of vulnerability. Any projected further increase in international debt exposure will only increase vulnerability on this count.

The proportion of domestic financing will obviously vary across countries. The low-income countries, for example, could legitimately expect to rely less on domestic resources with a larger international contribution in the form of concessional assistance. There is no separate estimate available for the climate change-related investment requirements of low-income countries, but since the total GDP of these countries is only 3 percent of the total GDP of emerging market and developing economies (EMDEs), excluding China, the additional requirement of concessional assistance for these countries would be relatively manageable.

Middle-income countries will have to mobilize at least half and possibly more of the resources needed from domestic sources. This has important domestic policy implications. Since a large part of the investment needed, especially in constructing energy-related infrastructure and in building climate resiliency, will have to take place in the public sector, it will put strain on public finances which in turn will call for steps to improve the government's fiscal position. This will inevitably pose politically difficult choices, including achieving increases in tax revenues and/or eliminating inefficient subsidies, including especially fuel subsidies.

Serious consideration needs to be given in this context to the scope for imposing an appropriate form of carbon taxation. Both the imposition of carbon taxes and the elimination of fuel subsidies will be criticized on the grounds that they adversely affect the budgets of poorer households. This is a legitimate concern, but this problem can be dealt with by targeted cash transfers to vulnerable households, while allowing the bulk of the users of fossil fuels to contribute to revenue mobilization.

The fiscal burden that climate-related investment poses for the public sector can be minimized if the private sector can be persuaded to invest through various forms of public-private partnership. The scope for such experiments will obviously vary from country to country, but developing countries would be well advised to explore these options thoroughly.

Role of International Financing

If half of the financing needed comes from domestic efforts, the remaining half has to be met by international finance. As shown in Table 12.1, this comes to about U.S. \$642 billion in 2025. Of this only about U.S. \$112 billion is projected to become available on a BAU basis, leaving about U.S. \$530 billion to be raised in the form of additional international financing.

The scale of the challenge can be seen from the fact that the additional amount required is nearly five times the expected flow of international financing into this subgroup of countries under BAU. It is also over five times the U.S.

\$100 billion per year that has been talked about thus far!

There are four different sources from which such resources could come viz. (a) bilateral official development assistance (ODA); (b) non-concessional lending by multilateral development banks (MDBs); (c) bilateral non-concessional lending (export credit institutions, national development banks); and finally (d) international private finance in the form of equity investments (FDI) or external loans.

The first three of these components are public flows whereas the fourth consists of private flows and

the considerations determining the levels of these two types of flows are very different. Public flows are essentially determined by conscious decisions of governments in developed countries to direct their resources to finance climate investment in developing countries. Private flows are determined largely by market conditions including the investment environment in recipient countries.

It hardly needs to be stated that the international environment at present does not encourage optimism about the scale of the response we can expect through public flows. Most developed countries face a strained fiscal situation, arising from expansionary steps taken to deal with the pandemic, and the actions taken by their central banks to curb inflation have made the situation even more constrained. The situation is further complicated by the geopolitical confrontation caused by the Russian invasion of Ukraine and growing frictions with China. These developments have fragmented global solidarity and greatly weakened support for multilateral action. And yet, the threat of climate change can only be met through greater global cooperation and trust.

In the rest of this section we proceed on the assumption that although the current situation does not warrant optimism about the willingness of the major developed countries to provide additional public funds, the situation will improve in future so the world can embark on a cooperative effort on the scale that is needed to manage climate change. We also consider what is needed to achieve the very large response from the private sector that is implicit in Table 12.1.

Role of Official Development Assistance (ODA)

ODA is the only source of external finance that low-income countries can rely upon since they cannot afford non-concessional long-term loans and are unlikely to attract private capital. The BAU increase in ODA projected by Bhattacharya et al. (2022) is only U.S. \$12 billion. This is a realistic assessment of the prospects in the current situation, but the authors rightly make a strong case for increasing ODA for the poorest countries by U.S. \$96 billion by 2025—a 50 percent increase over the 2019 level.

An increase of this order is clearly highly optimistic, but it is reasonable to argue that as normalcy returns, the major donors would be willing to consider raising ODA substantially. It is worth noting that the resulting ODA level implied in these projections would only constitute 0.45 percent of the donors' GDP expected in 2025.

Public Bilateral Flows

Bilateral non-concessional flows include export credits and loans from national development banks or sovereign investment funds. There is evidence of interest in financing project-specific partnerships in certain areas, such as accelerated phasing out of coal power plants, development of infrastructure for green energy, etc. For example, the U.S. International Development Finance Corporation announced in December 2021 that it would provide U.S. \$500 million to help finance capacity expansion of a U.S.-based solar photovoltaic (PV) manufacturer in India. The investment is intended to strengthen the supply chain of key products strategic to the interests of the donor country. Similarly, the German development bank, KfW, has loaned Colombia U.S. \$160 million to support the transition to RE and adoption of EV technology in the country.

The BAU increase in these flows constitutes the smallest component among the different sources of finance, but Bhattacharya et al. (2022) argue that, with additional effort, it might be possible to mobilize an additional U.S. \$31 billion

above the BAU level. This would double the size of these flows to U.S. \$70 billion by 2025. This projection would strain bilateral budgets, especially if ODA is also to be increased as projected above, but it is possible that the preference for dealing with developing countries bilaterally, chosen for ideological and political compatibility, may make it easier to expand flows through such windows in the near future.

Long-Term Nonconcessional Lending from MDBs

Middle-income developing countries do not need ODA, but they do require long-term capital, at reasonable rates, to undertake the investments required to manage climate change. Many of these countries, especially those in Asia, expect to grow rapidly over the coming decades, and this will require substantial investments in energy and related infrastructure. If they build infrastructure of the conventional, highly carbon intensive type (e.g., coalpower plants), the world will be locked into a high emissions pathway with no chance of reducing emissions to net zero by 2050.

Expanded MDB lending designed to support a shift to more climate-friendly infrastructure could make a decisive contribution to abating climate change. The major MDBs that could provide official long-term capital are the World Bank, the International Finance Corporation (IFC), the Asian Development Bank (ADB), the European Investment Bank, the New Development Bank, the Asian Infrastructure Investment Bank, and the various regional development banks.

The increase in non-concessional MDB lending projected by Bhattacharya et al. (2022) on a BAU basis is only U.S. \$27 billion by 2025. If this could be supplemented by an additional flow of U.S. \$99 billion, it would provide incremental finance of U.S. \$126 billion by 2025, with further expansion expected by 2030. However, an expansion on this scale is only possible if the G7 countries, which effectively control most of the MDBs, support it.

There is recognition by the developed countries that the MDBs have a role to play in this area. In a recent address to the Atlantic Council, US Treasury Secretary Janet Yellen outlined the U.S. perception of a whole range of global issues and also touched on the problem of providing development finance to developing countries. She recognized that there was a big gap between the investment needed to achieve developmental goals including climate change and what was on offer. As she put it “experts put the funding need in trillions, and we have so far been working on billions”. In that context she acknowledged that MDBs had a role to play when she said “we need to evolve the development finance system including the World Bank and the regional development banks to our changing world, in particular to better mobilize private capital and fund global public goods”. However, she went on to say that “MDBs alone will never meet the scale of financing needed, so we also need to revisit our strategies for making capital markets work for people in developing countries.”⁵

The projections in Table 12.1 recognize that the private sector has a very large role to play but they also imply a very substantial expansion in MDB lending. This is because there are constraints on what can be done by private capital and the expansion of MDB lending is necessary to address these constraints. These issues are discussed in the next two sections.

International Private Finance

The potential for mobilizing private capital to finance climate change-related investments has received a great deal of attention, especially after the formation of the Glasgow Financial Alliance for Net Zero (GFANZ)—a group of over 450 firms, with more than U.S. \$130 trillion in assets under management. GFANZ has participated actively in COP discussions and emphasized that the scale of capital available is large. However, the ample availability of capital in world markets contrasts with a very modest actual inflow. The total flow of all private finance to EMDEs in 2019 was only U.S. \$377 billion, and most of this has gone to a handful of countries. Of this, OECD (2022) estimates that climate-related finance was only about U.S. \$13 billion.

In keeping with the modest actual outcomes thus far, Bhattacharya et al. (2022) project that the incremental flow of private finance in 2025 on a BAU basis will be only U.S. \$69 billion. However, they argue that this could be increased further by U.S. \$326 billion through special efforts. We need to delve a little more deeply into why the actual flow of private capital into climate finance is so limited.

The most common explanation for the limited involvement of private investors thus far is that there are not enough well-prepared projects in EMDEs which could be picked up for financing. This is undoubtedly true, but there are many other reasons which also need to be addressed.

An obvious reason is that most recipient countries are vulnerable to macro-economic uncertainties which could lead to a collapse in the exchange rate, and ultimately debt defaults. Concern on this count has only heightened due to the rise in interest rates consequent to the efforts to combat high inflation and the continuing uncertainty created by rising geopolitical tensions.

In addition to these macroeconomic risks, there are project-specific risks.⁶ Land acquisition, for example, can become a politically charged issue. Where the borrowing sector is highly regulated, as is the case with electricity, there are risks due to regulatory uncertainties which could affect the price at which power can be sold. In addition, there are project-specific political risks because of unpredictable actions by governments. India, for example, has seen power purchase agreements being revoked after a new government came to power at the state level because the price negotiated by the previous government appeared, ex-post, to be too high.⁷ Similar problems have arisen in other developing countries. All these problems are magnified by poor legal redressal mechanisms for nonperformance of contract, especially if the government becomes a party to the dispute as can happen when sovereign guarantees are invoked. These risks are bound to be reflected in high costs of capital in the form of higher interest rates or expected returns on equity.

The development of a “green bonds” market is often mentioned as having a potential for lowering capital costs for climate change projects. This is certainly a welcome development, but the extent of benefit should not be overstated. One issue that arises is that entry into the green bonds market will be subject to a complex and costly process of certification that the resources mobilized are used for genuinely green investments and not as a form of greenwashing.⁸ More importantly, it does not overcome the problems posed by project-specific or country-specific risk. Qualified issuers from developing countries will in effect compete with other issuers of such bonds in developed countries. The green bond certification may help reduce the interest rates to the extent that socially conscious investors are willing to accept a lower return for resources invested in climate friendly projects but the benefit on this count is unlikely to exceed 50 basis points. The total interest (or in the case of equity, the expected return on capital) will have to cover all the other risks which make these projects riskier than those in developed countries. Reducing these risks requires separate and credible action on many fronts.

One can take the view that these are systemic weaknesses that have to be addressed by the developing countries themselves if they want to tap into the large pool of global private capital available. However, this is precisely the area

5. Remarks by Secretary of the Treasury Janet L. Yellen on “Way forward for the global economy,” U.S. Department of the Treasury, April 13, 2022.

6. See Le Houérou and Lankes (2023) on this.

7. See the subsection on electricity distribution companies in Chapter 4 on India.

8. There is growing concern about “greenwashing” as a result of which investors are now demanding not just certification of intent at the time of issuance, but also certification of actual deployment according to declared intent. This would involve annual audit during the construction period, the expense for which would have to be borne by the issuer.

where MDBs can play a positive role by partnering with both the government and the private sector to reduce the objective risks involved. The fact that an expanded role for MDBs is needed to enable them to leverage private flows, which would not otherwise materialize, is not well appreciated by most advocates of private finance. We explore the issues involved in detail in the next section.

MDB Lending as a Mechanism for Leveraging Private Flows

There are many ways through which MDBs could leverage a larger flow of private finance and these are itemized below:

1. The simplest is by co-investing with the private sector in the same project. The involvement of an MDB as a co-investor in equity, or even just a co-lender to a project, can leverage additional private flows if the MDB involvement assures private investors, especially passive investors like sovereign wealth funds and pension funds, about the quality of the project preparation. It can also create a reasonable presumption that if problems arise during development and operation stages of the project, the government would adopt a constructive approach, something which cannot be readily assumed for a pure private-sector project.
2. MDBs can also leverage private finance in climate-related projects through other credit enhancement mechanisms. For example, first loss guarantees could reduce risks for the private sector and thus encourage a larger flow of private finance. The World Bank's Multilateral Investment Guarantee Agency (MIGA) already offers guarantees against political risk, but the proposed guarantees would have to cover other risks as well. Since such guarantees expose the MDBs to a potential loss, they have to be priced appropriately but since the risk perception of the MDB extending the guarantee is considerably lower than that perceived by private investors otherwise, the net effect would lead to lower costs.
3. MDBs can also engage in various forms of "blending," which would encourage a greater flow of private finance.⁹ For example, some potential investors may be unwilling to take on a large exposure in a particular project, while being perfectly willing to take a position on a pool of climate projects. MDBs, especially the IFC and the private sector arm of the Asian Development Bank, can help by advising countries how best to create such a pool of projects. They can also help to create a standard framework for projects in countries that are seeking international institutional investors enabling transparency and ease of investment (see Le Hou  rou & Lankes, 2023).
4. Another innovative approach which MDBs could adopt is creating structured finance arrangements. These could take the form of senior tranches of debt with a lower risk and a correspondingly lower return, which sovereign wealth funds and private pension funds may prefer, and junior tranches with a higher risk and a correspondingly higher return, which national development banks and MDBs may pick up.

9. See for further reference Lankes (2021).

5. Most importantly, MDBs can help to reduce the objective degree of risk. For example, power projects face the danger of nonpayment for electricity supplied because the distribution company (discom) is financially unviable.¹⁰ MDBs can help to address this problem by engaging in sectoral lending aimed at pushing reforms in the energy sector, which will improve the financial viability of the discoms over time. If the reforms succeed, the need for MDBs to leverage private capital will decline over time, but since this could take many years, there is a strong case for encouraging an active involvement of MDBs to start the process.

All these possibilities call for a strong expansion in MDB lending in the years ahead. An expansion on the scale envisaged in Table 12.1 will necessitate expanding their capital base. This will involve shareholders bearing some fiscal cost, but this will be small because it is limited to the paid-up capital which would be a relatively modest proportion of the total increase in authorized capital, which is what determines the expansion in lending. Even this fiscal cost would be spread out over time. The need for such leveraging will decline as successful private flows into climate projects are seen to be viable, but that perception will take time to establish. Bhattacharya et al. (2022) project that total incremental investment, which is \$1.3 billion by 2025, will have to reach \$3.5 billion by 2030. Adjusting other components proportionally, this implies incremental international private flows reaching about \$1 trillion by 2030. To leverage flows of this order, MDB financing in 2030 would have to reach say \$335 billion above the level in 2019. In other words, we need to plan for an early increase in MDB flows, using means other than a capital increase for the next few years, while trying to get a capital increase by 2025 to support the increase in private flows up to 2030. The need for continuing MDB support to private investment beyond 2030 can be reviewed at that time.

It is a puzzle that developing countries have not pushed vigorously for expansion in MDB lending in COP meetings. One reason could be that climate change negotiators of developing countries have traditionally preferred climate finance being routed through the Green Climate Fund (GCF), which was set up under the UNFCCC to be the vehicle for climate financing. This may reflect the fact that GCF funding does not involve the kind of intrusive conditionality normally associated with MDB lending. However, the scale of financing available via the GCF is very limited—only around U.S. \$10 billion over a five-year period—and there is little possibility of that being expanded. In fact, one of the arguments we make for expanding MDB lending is the policy conditionality of MDBs, which could induce sector reforms necessary to make climate-related investments more attractive to private investors. Developing countries would be well advised to review their position on the expansion of MDB lending before COP28 and come out strongly in favor of such an expansion if the climate commitments undertaken are to be met.

Ideally, the international community should be able to generate a consensus on providing the increase in capital needed for an expansion in MDB lending. However, in the case of the World Bank, the US Administration would have to get approval from the US Congress. Given the situation the US Administration is currently facing in resolving the debt ceiling problem, there is little likelihood of any early agreement on a large capital increase. We can hope that the situation may improve, perhaps after the US Presidential election in 2024. However, the urgency of expanding climate-friendly investment is such that we need to consider interim solutions which allow the World Bank to expand its role without an expansion in its capital base in the near future. There are three options that could be considered.

One is to move from the present excessively conservative gearing ratios under which the World Bank operates and adopt higher ratios that would allow it to expand lending substantially. This would not require legislative approval from shareholders, which may be politically difficult to obtain, but it would require their support in the Board of the Bank. It may be argued that higher gearing ratios might compromise the AAA rating these institutions currently enjoy, but it is not certain if that would indeed be the case, at least not for modest increases.

10. Burgess et al. (2020) find that the poor performance of the electricity distribution sector in many countries is in part due to institutional (and social) factors that translate into huge financial losses which compound over years and limit the discoms' ability to invest in upgradation and maintenance of the distribution network, thereby creating a negative feedback cycle. For an assessment of the situation in India, see Chapter 4.

Even if it was, the impact on borrowing costs would be marginal at best. It would certainly allow the Bank to expand lending over the next several years in anticipation of a future expansion in the capital base.¹¹

The World Bank can also scale up climate finance by shifting all or nearly all future lending commitments to climate-related projects including adaptation. Masood Ahmed (2021)¹² has proposed that the World Bank could be repurposed to focus entirely on climate and other global risks (such as pandemics) in developing countries. This fits in with Secretary Yellen's reference to "mobilizing private capital to promote public goods". Given the importance of starting the energy transition, a good case can be made for a substantial restructuring of the World Bank's activities along these lines. If successful over the next several years, it would build a strong case for capital expansion later.

It is worth noting in this context that the ADB has committed that three quarters of its operations will be in programs that support climate change mitigation and adaptation, and has also announced an ambitious expansion in climate finance through 2030. The World Bank and other MDBs should follow suit. A problem with this approach is that these ambitious targets can be "gamed" by the management by adopting loose criteria for defining climate-related projects, but they could still make a substantial difference.¹³

Another alternative to expanding the capital base of the MDBs is for advanced countries to work with MDBs through country partnerships for financing specific climate-related investments or packages of such investments. Such partnerships rely on the MDBs to structure the agreed program, and bilateral financing is then used to supplement the resources provided by the MDBs. In such arrangements, the MDBs in effect play the role of facilitating the expansion of non-concessional bilateral financing (discussed earlier in this chapter), while directing them to climate related investments. This is being attempted for South Africa (U.S. \$8.5 billion), Vietnam (U.S. \$15.5 billion), and Indonesia (U.S. \$20 billion) under the Just Energy Transition Partnership program between the governments of the respective countries and those of participating developed countries such as the United Kingdom, the United States, France, Germany, Japan, and the European Union, which also involves the World Bank and other regional MDBs. The partnership is intended to help the countries phase out coal power plants and accelerate the transition toward RE. Given the volume of bilateral resources committed, this has the potential to scale up climate finance significantly.

While any effort to increase financing for climate change should be welcomed, it should be noted that these arrangements can be criticized as a dilution of multilateralism. Bilateral donors getting involved directly in financing partnerships would obviously affect the choice of countries to be assisted much more than if the same resources were placed at the disposal of an MDB. It could also lead to a departure from open competitive bidding in procurement, if individual donor country partners restrict their aid to finance supplies from their country, or in certain circumstances, allow limited competitive bidding which prohibits supplies from some suppliers. These are valid considerations, but the imperative of expanding climate finance would justify this as a second-best solution, pending a larger expansion of direct MDB lending in future.

11. The report of the G20 on the capital adequacy frameworks of the MDBs (G20 2022) recommends incorporating a "prudent" share of the callable capital as a special shareholder guarantee, while retaining their credit-ratings, to raise the risk-taking capacity of the MDBs and create additional capital headroom. The major MDBs, according to the report, had about 91 percent of the total subscribed capital (U.S. \$1.3 trillion) as callable capital in 2020, and a small share of it can be used for the purpose. This would, however, require the approval of the banks' shareholders.

12. "The World Bank must be repurposed to focus on climate—or net zero is a pipe dream." Masood Ahmed in the *Independent*, November 19, 2021. <https://www.independent.co.uk/climate-change/opinion/world-bank-climate-investment-net-zero-b1958514.html>

13. MDBs may need to take other measures, for example, relaxing the single borrower limit observed by the World Bank, which will force it to reduce its lending to India from 2023 onward. Such limits are arbitrary and constrain bank lending to countries that have borrowed in the past, regardless of their creditworthiness. MDB lending for climate action should at least be exempt from any such arbitrary limits.

The need to tailor World Bank lending to the objective of leveraging private sector involvement raises some issues of institutional culture that have been pointedly raised by Le Houérou and Lankes (2023). They point out that the World Bank has relatively little experience with dealing with private sector partners whereas the IFC does. However, the IFC typically engages with each private sector project transactionally. Neither does it deal with the government on broader issues of sector policy. Yet what is needed is precisely a form of engagement that would provide such a scalable template which can be replicated for multiple projects with an engagement with the government on sector level issues. The solution clearly lies in much closer co-operation between the World Bank and the IFC, with a constructive use of their respective staff capabilities. However, as the authors point out this is easier said than done. With a new President of the World Bank having an impressive private sector background, perhaps some imaginative solutions to this problem will receive high level attention.

Using SDRs for Climate Finance

Surplus special drawing rights (SDR) are another potential source of international public funding for climate change. About U.S. \$650 billion (SDR 456 billion) was allocated to all IMF members in August, 2021, of which 58 percent was allocated to developed countries that are unlikely to need it for balance of payments (BOP) purposes. Upon direction by the G7, the IMF's Executive Board has established a Sustainability and Resilience Trust (SRT) based on voluntary contributions of SDRs from countries that do not need them. This trust will be used to fund climate-related projects in developing countries through loans to be repaid over a 20-year period. The interest rate will be slightly higher than the low interest rate applicable to SDRs, and there will be a moratorium for the first ten and a half years. Close to U.S. \$40 billion have been pledged to the fund thus far.¹⁴

While the terms of borrowing are attractive, the utilization of these funds is proposed to be restricted only to countries that have an IMF program. These needs rethinking. IMF programs are generally designed to deal with relatively short-term BOP problems, whereas climate finance is needed for long-term investments that may be needed even for countries that are currently not facing a BOP problem. While countries that have to go for IMF programs would be well advised to avail of these funds, countries that do not have a crisis are unlikely to do so, partly because borrowing from the IMF could involve a reputational risk as it can be seen as an acknowledgment of being unable to manage the BOP. The problem of resistance to borrowing from the IMF can be overcome if similar trusts are set up in the World Bank and the other regional development banks, all of whom are authorized holders of SDRs. Since such trusts depend upon donors willing to pool their SDR allocations, donor countries may welcome the flexibility they gain by having such trusts set up in different regional development banks. The expertise required for infrastructure lending and the capacity to design the sector policy reforms that are needed in these sectors is much larger in the MDBs than in the IMF.

Mobilizing Political Support for MDB Expansion

The logical forum to influence decisions pertaining to the World Bank and the regional development banks is the G20, which includes all the major developed and developing countries. An important step taken recently in the G20 Finance Ministers meeting in India in April 2023 was the appointment of an international expert group co-chaired by NK Singh from India and Larry Summers from the US, to prepare a roadmap for a more contemporary MDB ecosystem, including operational restructuring, coordination mechanism with other MDBs,

14. Press release no. 22/261 of the IMF, dated July 16, 2022. <https://www.imf.org/en/News/Articles/2022/07/16/pr22261-md-g20-statement>

and evaluation of financial needs by and from MDBs to enable them to better support global efforts on sustainable development and climate change management. The group is expected to submit its report in two volumes.¹⁵ Hopefully, the recommendations of the group would be considered during the G20 Summit in September, and elicit a favorable response.

The G20 Presidency is currently held by India, and then by Brazil in 2024 and South Africa in 2025. It is to be hoped that this succession of developing country presidencies can build an effective global consensus on financing climate change. Political developments have made the G7 more important than it was meant to be on issues of international economic cooperation. However, since the chairs of the G20, and a few other developing countries, are usually invited to G7 meetings, there is an opportunity to persuade the G7 to support a decisive expansion in MDB finance for climate change.

Conclusions

It is clear that the energy transition in developing countries that is needed to meet the expanded commitments announced by developing countries at COP26 requires large increases in investment in the EMDEs (excluding China) amounting to as much as 4 percent of GDP above the levels that would occur under BAU assumptions by 2025. Financing this increase will present major challenges. Developing countries must plan a credible negotiation strategy that can yield success in the years ahead. We recommend the following approach in future COP negotiations:

1. The starting point must be a realistic assessment of the scale of additional investment needed and clarity on how much of it can be financed through some combination of additional domestic effort and international flows. The gap between the additional investment needed and the resources available on a BAU basis is so large that developing countries have to accept that almost half of the additional investment needed must be mobilized from domestic sources. The proportion might be lower for low-income countries and higher for others.
2. Even if a substantial allowance is made for mobilization of domestic resources, the scale of international flows will have to expand severalfold from current levels. Unlike in the past, there should be a clear separation of the amount of international finance that will be provided through official sources (bilateral and multilateral) and the amount through private flows. Advanced countries cannot be held responsible for meeting the targets for private flows as these will be determined by market perceptions of private participants and the quality of policy in developing countries wishing to attract such flows. However, they must take responsibility for meeting targets for public flows.
3. The funding requirements of low-income countries are relatively modest in absolute terms, but they have to be met dominantly by public flows, and that too on concessional terms. The mix between concessional and non-concessional flows will have to take into account the needs of low-income countries.

15. The first volume of the report, released during the G20 Finance Ministers meeting in July 2023, estimates that incremental investments amounting to U.S. \$3 trillion will be needed for implementing climate change mitigation- and adaptation-related measures and for achieving the SDG targets in EMDEs (ex. China) by 2030 (G20 2023). Two-thirds of this amount (i.e., U.S. \$2 trillion) must be mobilized through domestic resources, while the rest would need to come from international sources. Half of the external financing needed (i.e., U.S. \$500 billion), the Independent Expert Group expects, can come from official public sources of finance, of which 52% (i.e., U.S. \$260 billion) must be raised through the MDBs. This will effectively quadruple the level of MDB finance compared to 2019 levels. The report emphasizes that MDB lending should be geared to leverage the additional private flows which are expected to meet the other half of external financing required.

4. The requirements for international finance of middle-income countries could be met through a combination of public flows (bilateral and MDB) and private funding, in which the latter will have to play a much larger role. Even so, it will be necessary to plan for a substantial expansion in MDB lending to leverage private flows. Advanced countries can make a definitive contribution to climate change management by facilitating this expansion in MDB lending.
5. The expanded MDB lending should be explicitly designed to leverage private funding into climate finance as much as possible. This may call for new ways of operation for the World Bank Group, with IBRD, IFC and MIGA working together.
6. There is also a need to set separate targets for mitigation and adaptation finance. Adaptation-related measures will largely depend on public investments, and this will need to be supported by public international finance.
7. The scale of MDB financing needed over the medium term is such that an expansion in the capital base will be essential. However, since an agreement on this may take time, it should be possible as an immediate objective to (1) expand MDB lending through relaxation in the gearing ratios; (2) direct the MDBs to shift the composition of their lending toward climate-related finance, much more than they are already doing; and (3) relaxing the arbitrary single country limits on lending that exist in the World Bank. Unless these limits are removed or suitably relaxed (for example by exempting climate-related lending from these limits) the World Bank will not be able to play any significant role in supporting climate-related finance in India.
8. Developing countries have not been vocal in pushing for an expanded role for MDB lending along these lines in COP meetings. They should do so in COP28.
9. The G20 has in the past been an effective forum for taking decisions on MDBs. The G20 Finance Ministers have set up a committee of experts to make recommendations on strengthening the MDBs to support global actions on climate change mitigation and adaptation, and sustainable development at the scale needed. Hopefully, the Committee's recommendations can form the basis of a new consensus on international financing for climate change which could be endorsed in the G20 Summit in September 2023.

Getting agreement on the agenda sketched out above will not be easy in the current international environment, but there is no question that it is a worthwhile task to attempt. After all, the very future of the planet is truly at stake.

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