



TECHNICAL RESPONSE

POLICY FORUM

Response to comment on “Fairness considerations in global mitigation investments”

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We welcome the analysis of Semieniuk *et al.* (1) as an additional sensitivity to illustrate a more extreme distribution of regional contributions to climate mitigation investments that supports our main conclusion regarding the North-South divide in mitigation investment capabilities. In response to Semieniuk *et al.* we would like to first point out that, in defining the required global mitigation investments for the 2020 to 2030 period, our study relies on the estimates in the sixth assessment report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) WGIII (2). These are based on diverse sources and underlying models that to varying degrees reflect regional differences in technology costs and consider both purchasing power parity (PPP) and market exchange rates (MERs). We use these IPCC estimates as a starting point and focus entirely on the question of how much of the needed regional investments, given different fairness considerations, should be financed from sources within a region.

We agree with Semieniuk *et al.* that applying MER would indeed result in higher differences between countries' relative capabilities to finance low-carbon investment needs. We argue, however, that using PPP is an approximation that is more legitimate in the context of our analysis. This is primarily because it is established practice in the literature to use PPP exchange rates for comparing the relative capabilities of different countries (3). For instance, the European Commission uses the GDP in PPPs of member states to set financial transfers between countries when allocating structural funds (4). PPP exchange rates can therefore also be considered an appropriate base for calculating countries' capacity to

finance investments in other regions. The opportunity costs of international flows to finance investments elsewhere would be investment within a given region, which, by definition, should be valued at prices in the region. PPP exchange rates are thus more appropriate in reflecting these opportunity costs as they approximate how much of the currency of one country would be needed to buy a similar basket of goods and services in another country. MERs do not capture cost of living differences or reflect the different abilities to pay for goods and services in different countries.

Second, we think it is questionable whether the share of international trade in climate mitigation investments is as substantial as stated by Semieniuk *et al.* This is because a considerable fraction of mitigation investments, particularly in LMICs, will arise on the demand side, e.g., building retrofits and efficient new buildings, mobility infrastructure, the installation of PV panels etc., which are

dominantly local investments requiring local labor and materials. Even considering essential powerplant and equipment for low-carbon energy supply, the local components, including construction costs, labor, etc. are considerable. This is evident also, for instance, when one compares the levelized cost of energy (LCOE) of solar photovoltaics (SPV) across countries, which differs widely even though the PV cells themselves are usually imported from a limited number of suppliers (5).

Finally, the use of PPP exchange rates is also consistent with the wider literature on international income inequality and comparative capabilities. PPP exchange rates provide a standardized measure for comparing investments across countries with different economic structures and levels of development. In contrast to MER, PPP correct for differences in the cost of living and production factors across countries. This is critical for understanding the capacity of different regions or nations for financing mitigation investments and the related opportunity costs of not doing so. Thus, although MERs may provide a clearer picture of the actual costs of internationally traded goods and services, we feel that MERs are less appropriate as measures of comparative capability, which is necessary for our analysis, as much of the mitigation investments needed in LMICs are likely to be dominated by local investments.

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