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What Are the Distributional Implications of Climate Policies? Recent Evidence from Developing Countries

Summary

To avoid catastrophic effects on natural and human systems, bold action needs to be taken rapidly to mitigate climate change. Despite this urgency, the currently implemented and planned climate mitigation policies are not sufficient to meet the global targets set in Paris in 2015. One reason for their current inadequate rollout is their perceived negative distributional effects: by increasing the price of goods, climate mitigation policies may increase both poverty and inequality. In addition, they may disrupt labour markets and increase unemployment, especially in sectors and areas dependent on fossil fuels. As a result, public protests in many countries have so far blocked or delayed the implementation of climate policies.

New avenues of research, discussed in this Briefing Paper, are turning the tide. First, it has been shown that carbon pricing may not be regressive in developing countries, contrary to the evidence in advanced economies. In a similar positive direction, findings from global-level and cross-country studies assessing the effects of climate mitigation policies on labour markets estimate that reaching climate goals will actually generate a small net increase in jobs. Nonetheless, the price effect of carbon pricing and the impact on the labour market of climate policies will both create losers: increases in prices would worsen poverty as lower-income households would need to pay more to purchase the same goods; similarly, specific countries, sectors, areas and workers (such as low-skilled ones) will witness job disruption or loss.

Second, social protection policies can be implemented to compensate households and workers negatively affected by climate policies and to address negative distributional effects. Compensation for higher prices can be achieved through the use of cash transfers to households, which can be funded by revenues from climate policies such as carbon taxes. Full compensation can be achieved by using only a small share (about 30%–50% according to case studies) of the tax revenues generated. The remaining share could be used for other purposes, such as climate-friendly investments. Similarly, when looking at labour market effects, social protection, especially labour market policies such as retraining and unemployment relief, become critical in addressing the needs of negatively affected workers.

Clearly, the achievement of environmental and social goals need not be mutually exclusive. With appropriate policy mixes, both poverty and environmental degradation can be reduced. This policy implication needs to be communicated more widely to increase the acceptance of climate polices. This is partially already achieved by recent plans such as the European Green Deal. From a research and policy perspective, more studies in developing countries are needed, including evidence on non-market climate policies and extending beyond the short-term effect of higher prices on the purchasing power of households. Finally, international cooperation can play an important role in policy coordination, financing and building social protection systems in lower-income countries.

Introduction

Climate change is one of the most pressing issues of our time. In order to limit increases in global mean temperatures to below 2°C or 1.5°C, a significant array of market-based and non-market climate policies needs to be quickly implemented to reduce carbon emissions. Market instruments include pricing mechanisms such as Pigouvian taxes and emissions trading schemes (ETSs), both of which treat climate change as a negative external effect to be reflected in prices. Many economists favour market mechanisms for their efficiency in achieving a reduction in emissions. In addition, these instruments generate revenues to be used for compensation and other purposes. Yet, non-market instruments, including regulations, standards, technology-support policies and voluntary agreements, are also needed to achieve net zero emissions by 2050.

In view of the enormous efforts required to lower increases in temperature rises, the use of these policies has so far been insufficient. One of the major barriers to their implementation is public acceptability, which in turn depends on the perceived justice of climate policies: meeting environmental goals should not worsen poverty and social outcomes. The importance of social justice in climate policies has been highlighted by protests in some countries, for example by the yellow vests movement in France, and it also figures prominently in global policy agreements such as the 2030 Agenda and the Paris Agreement of 2015 on climate change. It is therefore critical to consider the distributional effects of climate policies, namely who is most heavily affected by these policies. Studies that focus on inequality compare the proportional effects of climate policies on the income of richer and poorer groups. These studies refer to policies that make low-income households pay proportionally less compared to high-income households as progressive; policies that have the opposite effect are defined as regressive. In addition to inequality, it is also critical to look at the general effects on poverty or welfare. For example, in the case of carbon pricing, even if the policy has progressive effects and reduces relative inequality, poorer households need to be compensated for total short-term welfare losses due to higher prices.

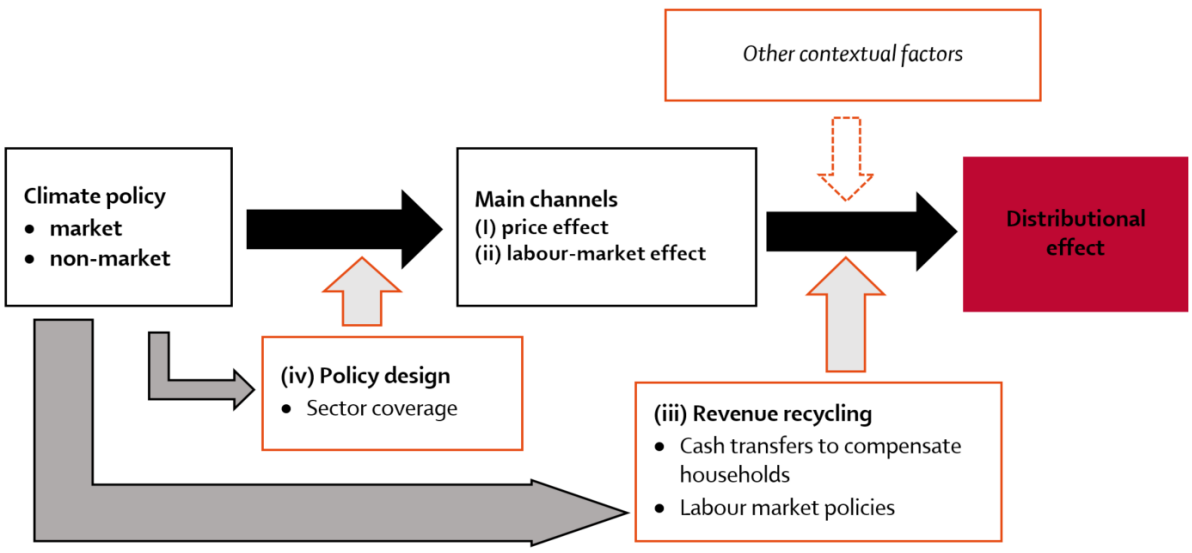
This Briefing Paper discusses the main channels generating distributional effects of climate policies and summarises new evidence for developing countries. While the existing research on environmental policies has focused primarily on their impacts in high-income countries, recent research has started also to explore their impact in lower-income economies. This is critical for two reasons. First, developing countries are increasingly implementing climate mitigation policies. Second, these countries are different in terms of many structural characteristics compared to higher-income economies, making research findings from the latter less applicable.

The channels of distributional implications of climate policies

How do different climate policies affect poverty and inequality (and income more generally)? Figure 1 shows the main channels, including: (i) the (direct and indirect) increases in prices that affect households as consumers; in fact, climate policies, especially carbon pricing, can increase prices of goods, and not just of energy, at least in the short term; (ii) the impact on households and workers caused by changes to demand for labour, and to structural transformations. This channel is especially relevant to countries, sectors and workers relying on fossil fuels, high-carbon processes and energy-intensive production.

On the positive side, climate policies also present opportunities to avoid these negative distributional effects and create positive social outcomes. Market policies, such as carbon pricing, generate revenues that, among other goals, compensate households for the negative effects previously outlined. This process is referred to as "revenue recycling". In

Figure 1: The distributional effects of climate mitigation policies



Source: Author

high-income countries, this takes different forms, including the reduction of labour and income taxes. In developing countries, directing income to households through targeted programmes can play a more prominent compensatory role, given higher informality rates and expanding social protections systems. In addition, non-market climate policies that do not create revenues can be designed to address implications for poverty and inequality. Relevant examples are block-pricing, which allows purchase of a limited amount of energy at a subsidised price, or targeted energy-efficiency investments. See channels (iii) and (iv) in Figure 1.

Recent evidence

A growing number of studies explore the distributional implications of economy-wide (global or national) climate policies for developing countries – the focus of this Briefing Paper. The literature is mainly represented by ex-ante studies that simulate the potential effect of climate policies. In fact, the possibility of ex-post studies (that estimate the effect of actual policies after their implementation) is limited as poorer countries have been less successful in implementing carbon pricing, and climate-mitigation policies generally. In the next paragraphs, the main findings from these studies are summarised, starting with cross-country ones.

Price effect

When looking at the effects of climate policies on poverty and inequality through higher prices (channel (i)), the analysis focuses on the incidence and short-term effects of carbon pricing. This is done by using mainly multiregional input–output (MRIO) modelling, assuming that higher prices are fully passed through to consumers.

Few studies implement a cross-country analysis. Dorband et al. (2019) find that carbon pricing would be, on average, progressive for low-income countries. The progressive nature of a carbon tax declines as countries become richer. One explanation for this is consumption patterns, as in lower-income countries the poorest households spend proportionally less on energy compared to richer households. Dorband et al. also find that a tax of US$30 per ton of carbon would represent around 2.5% of the total expenditure of poorest households. Recent systematic reviews of studies on distributional effects of market-based climate policies confirm that these policies become progressive for lower-income countries. This research also found that the **sectoral coverage** of carbon pricing significantly matters. For example, a carbon tax on gasoline fuel is more progressive compared to a general carbon tax, because in lower-income countries car ownership rates are low for poor households.

Going beyond average cross-country findings, studies focusing on single economies show how contextual factors matter and results differ by country. For example, a study on China shows how carbon pricing would be regressive. Conversely, a study in Mexico shows that the effect of a carbon tax on aggregate welfare would be small and slightly progressive. The effects would become more regressive when greenhouse gases linked to food consumption are taxed, as poor households spend a large share of their income on food. As a further example, another study also indicates that a carbon tax would be mildly progressive in Thailand.

While the previous studies look at the effects of increased prices from carbon taxation, what happens in the case of **revenue recycling (channel (iii))**? In a recent study on Peru, Malerba et al. (forthcoming) estimate that a carbon tax would be distributionally neutral, but poverty would be decreased by directing just under half of the revenue towards poorer households. Studies on Ecuador and Mexico arrive at similar findings. In the same spirit, a cross-country study of Latin America estimates that using 30% of revenue from a carbon tax would be sufficient to compensate poorer households for higher prices. The finding that only a share of revenue is needed to achieve compensation is crucial since it implies that the remaining share could be dedicated to purposes such as further climate-friendly investments.

In summary, the evidence suggests that, unlike in richer economies, carbon taxes would not produce regressive outcomes in developing countries. In addition, it confirms that the effects of climate policies depend upon many factors, both contextual and design, including the sector coverage and the recycling mechanisms used. Nonetheless, even when carbon pricing has progressive effects that reduce inequality, poorer households need to be compensated for short-term welfare losses from higher prices.

Labour-market effect

Would workers in developing countries also be affected by climate policies in labour markets? Recent studies dealing with this question are based on different modelling methodologies. They consider both carbon pricing and direct changes to energy production systems. Findings at the global level point towards a net job increase as a result of climate policies and energy transitions. One explanation for this is that renewable energy is more labour intensive than conventional energy. Nonetheless, this overall global net increase in jobs is estimated to be small.

Importantly, the impacts will significantly differ across groups; in fact, few countries, areas and sectors will be negatively impacted. Analysis of shorter-term effects of global energy transition (Montt et al., 2018), or of a global carbon price, predicts that while many advanced and developing economies (such as Brazil) will witness net job gains and positive labour outcomes, few industrialising developing countries will be negatively affected in terms of competitiveness and job losses. From a macro-perspective, it is the energy-exporting developing countries that will witness job losses.

At the micro-level, studies from more advanced economies show that lower-skilled workers will be more at risk of losing their job. Ex-ante studies on lower-income countries arrive at similar results. This means that lower-income families will not only face decreases in welfare due to higher prices of purchased goods, but they may also be confronted with a decreased income from their labour. These negative effects will be concentrated in specific areas and sectors, such as

coal production. Social protection policies, especially those that focus on the labour market, such as retraining and the provision of unemployment benefits, can play an important role in countering these negative effects. Nonetheless, compared to advanced economies, lower-income countries witness high informality and low coverage of labour market policies that hinders their use. One final point to underline is that studies of the outcomes on labour markets in developing countries suffer from many limitations. In particular, general equilibrium studies need to take more account in their modelling of the different contextual characteristics (such as high informality) of such countries, thereby improving the quality of their data.

Policy implications and the way forward

As carbon pricing and wider mitigation policies are needed, it is paramount to address their distributional implications to increase their justice and public acceptability. Anticipating these negative effects and implementing policy packages comprising both climate and social policies is a promising solution. The recently planned European Green Deal and the proposed American Green New Deal take this issue into consideration by proposing just transition mechanisms and social protection measures for potentially affected workers. As developing countries develop their own green plans, how can we foster an understanding of the distributional implications of climate mitigation policies? From a methodological point of view: More studies for developing countries are needed, going beyond the short-term effect of higher prices on welfare. This requires improvements in data availability and the related modelling assumptions.

- Research analysing compensation packages to households needs to give greater consideration to the current architecture of social-protection policies instead of simulating ideal types. New programmes may in fact be difficult to implement in the short term.
- Research on distributional implications needs to include additional impacts, such as those on health, which is a main beneficiary of climate-mitigation policies and of lower pollution.

Policy makers can, in turn, use research findings to avoid negative distributional effects when implementing climate policy; research findings need to be better communicated in order to advocate climate policy on the grounds of social goals, thereby making them more acceptable to the public. In addition, development cooperation can have a significant role in:

- Investing in statistical capacity to improve data availability, and contributing to the building of social protection systems in developing countries.
- Favouring cooperation between countries in implementing mitigation policies, as climate is a global common good. Development cooperation can also help in directing finances from richer to poorer nations, compensating for higher emissions, both current and historical, from industrialised countries.

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