DISTRIBUTIONAL AND EFFICIENCY IMPACTS OF HIGHER EU CLIMATE TARGETS

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Overview[1]

In September 2020, the European Commission published a proposal to increase the European Union's greenhouse gas emissions reduction target for 2030 from 40 percent to at least 55 percent below 1990 levels (European Commission, 2020). The proposal identifies carbon pricing, in the form of the EU Emissions Trading System (EU ETS) and national energy taxes in sectors covered by the Effort Sharing Regulation, as an important part of the new strategy. A key question surrounds how current carbon pricing policies in Europe should be amended to absorb the additional abatement. There is, in particular, a need to consider how the emissions reduction should be spread across sectors and countries. The implications of greater carbon market integration should also be understood, as the Commission's proposal highlights expanded emissions trading as a possible measure to complement the higher target.

Two relevant metrics for evaluating the policy design options are efficiency and cost incidence. In terms of efficiency, the cost associated with a higher target depends on the extent to which marginal abatement costs are equalized across polluters. This implies in segmented carbon markets that abatement costs can be curtailed by reducing emissions where it is cheapest. Efficiency can be further improved by integrating markets, since carbon price harmonization can fully equalize marginal abatement costs across polluters (Ranson and Stavins, 2016). Such efficiency considerations should be weighed, however, against the distributional implications across countries and households. EU climate policy is intentionally designed to compensate poorer member states (e.g., through the ETS auctioning rules), meaning any policy reform should ensure a fair burden sharing across countries. Moreover, any unintended distributional effects within countries (see e.g., Rausch et al., 2011) should be addressed to avoid jeopardizing the political feasibility of carbon pricing schemes. Overall, therefore, there is a need to consider how European carbon pricing policies can minimize overall costs from a higher emissions reduction target while ensuring an equitable burden sharing across countries and households.

This paper examines the between- and within-country distributional implications of various regulatory reforms of EU carbon markets that might be associated with an abatement target of 55 percent. In particular, we investigate how the economic incidence, both across countries and households, is impacted by different burden sharing rules and levels of carbon market integration. In terms of burden sharing, we explore various ways of allocating the additional abatement between ETS and non-ETS sectors, and across countries by ways of amending the Effort Sharing Regulation shares. We thereafter analyze how outcomes change for higher levels of carbon market integration across countries' non-ETS sectors.

Our paper provides one of the first analyses on the distributional implications of aligning European carbon pricing policies with a higher 2030 target. To this end, we shed new light on how different burden sharing rules across sectors and countries impact both household and country incidence. Our approach is made possible by combining economy-wide energy-economic data from the Global Trade Analysis Project (GTAP) with household-level data from two Eurostat surveys: the Household Budget Survey (HBS) for the expenditure side and the European Union Statistics on Income and Living Conditions (EU-SILC) for the income side. The analysis is furthermore carried out for various degrees of non-ETS integration to explore how outcomes might change if non-ETS markets are linked in coming years.

[1] Disclaimer: Our paper and abstract are based on data from Eurostat's 2010 Household Budget Survey (HBS) and Eurostat's 2010 European Union Statistics on Income and Living Conditions (EU-SILC). The responsibility for all conclusions drawn from the data lies entirely with the authors. The results and conclusions are solely those of the authors, and not those of Eurostat, the European Commission or any of the national statistical authorities whose data have been used.

Methods

The analysis is based on a static multi-sector, multi-region numerical general equilibrium model of the EU that incorporates income deciles for 21 countries. This allows us to examine how the costs and benefits from the various regulatory options are distributed across and within countries. The deciles in our model differ in their consumption patterns and income sources, meaning distributional effects on both the uses- and sources-side are captured.

Results

We find that the cross-country incidence depends on both the regional and sectoral abatement choice. Shifting non-ETS allowances across regions from richer to poorer member states benefits the latter on average. This is especially the case if non-ETS markets are linked, since lower-income countries can thereby export surplus allowances. With regard to sectoral abatement, the choice of ETS target (which implicitly reflects the share of abatement carried out in ETS sectors) can impact countries unevenly if non-ETS markets are segmented. In particular, lower-income countries favor a higher ETS target compared to richer member states because they gain considerable carbon revenue when abatement switches to ETS sectors. The discrepancy in countries' sectoral abatement preferences is reduced, however, in an integrated setting or if more non-ETS allowances are distributed to lower-income countries, since these countries thereby increasingly prefer a lower ETS target.

Our results also highlight the benefits of harmonizing carbon prices. In addition to improving efficiency, linking non-ETS markets disproportionately benefits lower-income countries. This importantly implies that integration can enhance average welfare in the EU without hurting poorer member states.

Within countries, we generally find evidence of progressive outcomes, independent of the sectoral abatement allocation, non-ETS burden sharing rule, and degree of non-ETS integration. Our results therefore indicate that a higher 2030 abatement target can be attained without disproportionately hurting lower-income households. The incidence further improves in many poorer countries if non-ETS markets are linked, since the gains flow disproportionately to lower-income households. These households in poorer countries also suffer comparatively less from higher non-ETS targets, as their richer counterparts typically bear the biggest burden.

Conclusions

Our paper examines the efficiency and distributional consequences of various EU climate policy design options for realizing a higher 2030 emissions reduction target. Combining household micro-data on expenditure and income from Eurostat's HBS and EU-SILC surveys with national income and products account data at the country level, we develop a multi-country, multi-commodity general equilibrium framework. The model enables assessing the within- and between-country distributional effects of various abatement allocation options across European countries and sectors for different degrees of non-ETS market integration. We find that lower-income countries prefer a larger share of ETS abatement compared to richer countries when non-ETS markets are fragmented. Countries favor more similar sectoral abatement splits, however, if non-ETS markets are linked or if the non-ETS burden of lower-income countries is relaxed. Integrating non-ETS markets increases efficiency, while the gains flow disproportionately to poorer member states. Within countries, we find evidence of progressive outcomes, independent of the degree of integration and abatement allocation. In lower-income countries, the poorer households typically benefit the most from integration, while richer households are especially hurt by higher non-ETS targets.

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