Efficiency-equity trade-off in the Irish carbon tax: A CGE investigation of mixed revenue recycling schemes [1, 2]

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INTRODUCTION

Although carbon taxation is a cost-effective way to reduce emissions, it tends to come with economic costs and often impacts lower income households the most. To prevent these unfavourable outcomes, the government can redistribute the carbon tax revenue which is called "Revenue Recycling" (RR). This is done in two main ways: by either reducing other taxes or giving money directly to households. The former has economic benefits, i.e., efficiency gain, while the latter has distributive benefits, i.e., equity gain. Clearly, there is a trade-off between them. Most studies examine only one way of using these revenues or another but not a mix of both. This paper looks at how revenues from the Irish carbon tax can be used to improve the economy and better the income distribution at the same time.

DATA AND METHODS

To do this, we use a Computable General Equilibrium (CGE) model. This type of model represents an entire economy, comprehensively. One can introduce a new policy to the model and study the impact it would have compared to not introducing that policy. The Ireland Environment, Energy and Economy (I3E) model is Ireland's CGE model that focuses on the impacts of environmental policy. Using this, the paper evaluates 16 different RR scenarios: one with no new policies, one where the carbon tax increases gradually in line with the government's commitment, five "pure" RR where the carbon tax revenue is recycled by either

reducing a tax (corporate, sales or wage) or giving money directly to households (via welfare transfers or lump-sum payments), and nine "mixed" RR where the carbon tax revenue is recycled using a combination of both. We study the impact of each scenario on emissions, the economy and income distribution.

RESULTS

A carbon tax policy on its own reduces emissions substantially but causes a decline in economic activity. It reduces the income of all households, but the rich are hurt more than the poor due to the way Ireland's welfare system responds to rising unemployment and prices. Three of the "pure" RR schemes confirm the literature's consensus that lowering other taxes creates economic benefits, while increasing income inequality. On the other hand, increasing household transfers further improves equity with negative macroeconomic outcomes, such as reduced GDP. However, the results suggest combining a sales tax cut with increased welfare payments can improve both efficiency and equity.

CONCLUSIONS

A carbon tax with "pure" RR schemes can achieve reduced emissions and one of improved economic performance or income equity, but not all three. In contrast to most of the literature, we study "mixed" RR schemes and find that this can generate better outcomes. Specifically, combining a sales tax cut with increased welfare transfers can result in a triple dividend of reduced emissions, economic benefits, and increased equity. When doing so, the government should devote most of the carbon tax revenue to the welfare transfer budget given the system's inherent ability to respond to adverse economic conditions. The debate on carbon taxation focuses on the level of the tax, whereas this paper suggests the debate should include the design of a carbon tax RR scheme.