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**The Distributional Incidence of a Carbon Tax Swap - The Double Dividend of Redistribution**

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# The Distributional Incidence of a Carbon Tax Swap – The Double Dividend of Redistribution Extended Abstract

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One major obstacle in the implementation of carbon pricing policies is the argument that poor households are hit disproportionately hard by this type of policy, due to the relatively high share of their income that is spent on carbon-intensive goods (Fullerton et al., 2010). In this study we assess the distributional impacts of carbon pricing, by modeling this important mechanism, namely the minimum level of carbon-intensive consumption each household needs to consume. Our main finding is that the optimal policy mix for achieving environmental and distributional objectives simultaneously is a combination of a uniform carbon tax with differential decreases in income taxes.

We argue in the following way: First, we verify that carbon pricing without redistribution of the revenues has a regressive effect in our model. We then show that the regressivity of the carbon pricing can be neutralized, when an optimizing government implements policies that use carbon revenues to alleviate income taxes of households, according to their income level. Finally we show that if the government is not able to differentiate between households, the overall incidence of the tax reform is again regressive. To obtain a distribution neutral tax reform transfers between households would have to be set up, which would have a negative effect on the overall efficiency.

It is a well established result in the so called double dividend debate, that if the preexisting tax system is assumed to be inefficient, substituting a distorting tax for a carbon tax can enhance overall efficiency ("strong double dividend")(Bovenberg, 1999). If the preexisting tax system is not assumed

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to be inefficient, there still exists the possibility of a "weak double dividend" (Goulder, 1995; Bovenberg, 1999): using the revenues from a carbon tax to finance cuts in other taxes is more efficient than lump-sum recycling of these revenues. Distributional concerns of such a tax swap are largely ignored in this debate.

On the other hand there is a large body of literature on the distributional impacts of carbon taxation. Studies based on consumer surveys (Hassett and Metcalf, 2007; Metcalf et al., 2010) and computable general equilibrium models (Rausch et al., 2011; Metcalf et al., 2010; Fullerton and Heutel, 2007) largely agree that the overall effect of a carbon tax is regressive, but the effect of a green tax reform can be made progressive by means of transfers or other mechanisms. An overview of the the extensive literature is provided in the excellent article by Bento (2013).

We depart from this literature in three aspects: First, we account for the fact that poor households spend a higher fraction of their income on carbon intensive goods (OECD, 1995)<sup>1</sup> by giving the agents non-homothetic preferences. Each agent needs to consume a minimum level of a carbon-intensive good. Second, we model an important characteristic of modern tax systems, namely that governments differentiate between households when setting the tax level. Third, we determine the optimal policy choice, if a government chooses labor and carbon taxation to meet a certain budget.

There are several channels through which carbon pricing can affect the distribution within an economy (Fullerton, 2010) . An additional benefit of our approach is that, once the model is calibrated, we can quantify for how much of total regressivity the effect that we choose to model is responsible.

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<sup>1</sup>This relation might not be true for developing countries, see for example (Shah and Larsen, 1992; Yusuf and Resosudarmo, 2007)

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