Overview

This paper explores the potential role for carbon prices in the decarbonization of the US economy, at a national and state level. It explores the effectiveness of carbon pricing policy, and the trade-off between realizing reductions in GHG emissions and the economic and political feasibility of policy. We apply a new state-level macroeconomic simulation model (E3-US) to explore the impacts of the imposition of different levels of carbon tax, initially within a single state, and then across the US as a whole, setting out at each stage the emissions reductions that might be achieved and the macroeconomic implications, including both direct impacts (price impacts on energy consumers) and indirect/induced effects (through supply chains, and the impacts of changing prices on consumption of various goods/services) including rebound effects, where the recycling of carbon tax revenues back into the economy can lead to additional energy demand and emissions. The aim is to demonstrate the potential impacts of carbon taxation policy in a non-optimised economy.

The paper is organized as follows: after the introduction, the second section gives a brief outline of the context for the macroeconomic assessment of carbon taxes, and considers how such policies might be made more politically acceptable on the basis of such macroeconomic analysis. The third section presents the modelling methodology applied, and the fourth section sets out the scenarios modelled and the findings. In the final section conclusions and ideas for further analysis are set out.

Section 2: Context

In this paper, we apply an econometric energy-environment-economy model, built upon a post-Keynesian framework, to assess the macroeconomic impacts of carbon taxes. Neoclassical economics discusses carbon taxes from the cost perspective; however, there is a substantial body of evidence that environmental taxation can have a positive impact on economic growth and competitiveness (European Environment Agency 2012) (The Ex'tax Project 2016) (OECD 2017). This can potentially bolster the arguments in favour of the introduction of a carbon tax; if such a policy can increase employment, and raise household incomes, alongside reducing emissions and reducing other taxes (as with I-732) or promoting a better natural environment (I-1631), then it may prove more attractive to the population.

The defeat of carbon tax measures at the state level (most notably I-732 and I-1631 in Washington State) can be seen as something of a litmus test for carbon taxes in the current political climate. A key question for future policy in this area therefore is what level of carbon taxation can feasibly be approved by voters (either directly, as was the case in Washington State, or indirectly, whereby an elected figure will only support a carbon tax policy that will not lead to them being ousted at the next election), and what are the emissions reduction that such a policy could achieve; most fundamentally, is the emissions reduction worth the political capital that would have to be expended to realise such a policy?

Section 3: Findings

The analysis finds that macroeconomic impacts depend heavily upon how revenues raised by the tax are treated; when they are re-distributed (in this analysis, via tax cuts) then the loss of GDP (when an individual state acts unilaterally) are minimised, although emissions reductions are also reduced. When action is taken at a federal level (i.e. across all states) then positive GDP effects can be observed once revenue recycling is taken into account. Under an ambitious carbon tax scenario, US GDP could be up to 8% higher in 2050 than in the counterfactual, while total CO₂ emissions could be reduced by over 15% in the same year.
Section 4: Conclusions

Given the political and social constraints in the US currently, it seems unlikely that any state will be able to introduce carbon tax legislation that will have a material impact upon GHG emissions. This makes it clear that any policy aimed at more stringent reductions would struggle to gain acceptance.

However, our analysis has shown that a more ambitious policy could achieve substantial emissions reductions, primarily by encouraging a switch in power generation from coal to gas, and through reducing energy consumption from industry and households. The specific design of policy matters, however; revenues from the imposition of the tax should be redistributed – although this paper does not seek to explore the impact of different methods of revenue recycling. The coverage of the tax also matters; the wider the geographical jurisdiction of policy, the greater the opportunity for carbon emission reductions.

Perhaps most importantly, this analysis finds that even the most ambitious scenarios in this modelling do not achieve emissions reductions in line with the stated aims of most local, state or federal actors; this highlights that carbon taxes are only part of the solution to reducing GHG emissions in the US, and a balanced portfolio of policies (likely including measures encouraging energy efficiency, and measures to encourage the take-up of specific technologies such as electric vehicles and renewable electricity generation) will be required to move the US onto a path towards becoming a low-carbon economy.

Some of these findings (primarily the potential for positive macroeconomic outcomes) run counter to the established narrative (for example, (Diamond and Zodrow 2018)); this is primarily due to the underlying view of markets and agents which underpin the different modelling approaches (i.e. optimising agents versus econometrically-estimated behaviours). However, the factors identified as key determinants of outcomes are in common with the existing literature.

References


