Local incidence of a Massachusetts carbon tax

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Several existing studies estimate the incidence of potential national level carbon taxes using various approaches. This literature predicts noticeable variation in incidence across geographic and income groups, but also indicates that there will be significant variation among households within a given geographic or income group. This variation is key to understanding the political feasibility of carbon taxes. Moreover, there is reason to expect that the incidence of state level carbon taxes will differ from the incidence of national carbon taxes due to variation in which products are taxed and the degree to which increases in firm costs will be passed on to consumers. In this project, I adapt Ummel's (2016) carbon tax incidence methodology to measure the direct household incidence of a proposed Massachusetts carbon tax. Like Ummel, I use the nationally representative Consumer Expenditure Survey (CEX) to predict household level consumption of directly taxed products as a function of a large set of household characteristics. Preliminary analysis uses a seemingly unrelated regression model, while future work will explore the use of quantile regression or machine learning techniques to generate fitted relationships. Using these fitted relationships, I predict consumption of the same products for the Massachusetts households in the Public Use Microdata Sample (PUMS) of the American Community Survey. PUMS households are allocated to local legislative districts using iterative portionate fitting so that the simulated households match the legislative district totals along several demographic characteristics. This procedure provides an estimate of the distribution of household level consumption of taxed products within each legislative district. From this data, I simulate the operation of the proposed Massachusetts carbon tax among consumers and predict the expected tax payment and rebate for each household to generate a distribution of incidence by legislative district. I compute the percentage of households in each district that are expected to experience a net gain. Finally, I compute the percentage of households in each district that are expected to experience a net gain (loss) greater than or equal to various percentages of their household income. In addition to the specific results for Massachusetts, I provide customizable R code to conduct these calculations for other states or other tax proposals.