

On the Carbon Tax in Golosov et al.'s 2014 Dynamic Stochastic General Equilibrium Central Planning Model

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This work presents a comprehensive analytical solution to Golosov et al.'s 2014 optimal control formulation of the carbon tax problem within a central planning framework. While the original paper focused solely on solving the problem based on first-order necessary conditions, our approach involves deriving the actual value function. This not only enhances rigour and completeness but also provides direct access to the carbon tax as the derivative of the value function (adjusted for the Lagrangian constraints) with respect to the carbon stock in the atmosphere. In contrast, the carbon tax in Golosov et al.'s work is only implicitly inferred by comparing two setups: a central planning problem, as explored in our study, and a decentralized equilibrium setup. The paper concludes with a numerical sensitivity analysis.