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How much should we spend to fight against climate change? The value of backstop technologies in a simplified model

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Abstract-

The estimation of the social cost of climate change is typically carried out with complex, difficult to interpret, integrated assessment models (IAMs). Instead, this paper presents a simple, tractable model with which to estimate the willingness to pay of societies against climate change. The model is based on an already comprehensive and intuitive one developed by Besley and Dixit, which has been modified by including a backstop technology (e.g., a renewable energy technology). This improved formulation allows for a more realistic representation of the climate change problem in that it is able to include the decoupling of economic growth and GHG emissions. The model allows us to understand the implications of different assumptions, such as the rate of growth of the economy, or the damages expected from climate change, on the willingness to pay against it. Our results show that, for a baseline scenario, the willingness to pay (WTP) is 0.52% of annual GDP, lower than that obtained by Besley and Dixit, which shows the significant benefits of developing competitive mitigation technologies. Our results also show the benefits of international collaboration, or of devoting more resources to R&D, as efficient ways to fight against climate change.

Index Terms- climate change; mitigation; adaptation

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