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Are economists getting climate dynamics right and does it matter?

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We show that several of the most important economic models of climate change produce climate dynamics inconsistent with the current crop of models in climate science. First, most economic models exhibit far too long a delay between an impulse of CO₂ emissions and warming. Second, few economic models incorporate positive feedbacks in the carbon cycle, whereby CO₂ uptake by carbon sinks diminishes at the margin with increasing cumulative CO₂ uptake and temperature. These inconsistencies affect economic prescriptions to abate CO₂ emissions. Controlling for how the economy is represented, different climate models result in significantly different optimal CO₂ emissions. A long delay between emissions and warming leads to optimal carbon prices that are too low and too much sensitivity of optimal carbon prices to the discount rate. Omitting positive carbon cycle feedbacks also leads to optimal carbon prices that are too low. We conclude it is important for policy purposes to bring economic models in line with the state of the art in climate science.