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Declining CO2 Price Paths

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Declining CO_2 Price Paths

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Zoom: https://montclair.zoom.us/meeting/register/tJAqdOqvqj0tHtDxsajKEqTG_Qu-jUHNwcD6

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Gernot Wagner teaches climate economics at NYU, co-wrote *Climate Shock*, and writes Bloomberg's *Risky Climate* column. gwagner.com/ezclimate

Risk and uncertainty are important in pricing climate damages. Despite a burgeoning literature, attempts to marry insights from asset pricing with climate economics have largely failed to supplement—let alone supplant—decades-old climate–economy models, largely due to their analytic and computational complexity. In this work, we introduce a simple, modular framework that identifies core trade-offs, highlights the sensitivity of results to key inputs, and helps pinpoint areas for further work.

Abstract Pricing greenhouse-gas (GHG) emissions involves making trade-offs between consumption today and unknown damages in the (distant) future. While decision making under risk and uncertainty is the forte of financial economics, important insights from pricing financial assets do not typically inform standard climate–economy models. Here, we introduce EZ-Climate, a simple recursive dynamic asset pricing model that allows for a calibration of the carbon dioxide (CO2) price path based on probabilistic assumptions around climate damages. Atmospheric CO2 is the "asset" with a negative expected return. The economic model focuses on society's willingness to substitute consumption across time and across uncertain states of nature, enabled by an Epstein–Zin (EZ) specification that delinks preferences over risk from inter-temporal substitution. In contrast to most modeled CO2 price paths, EZ-Climate suggests a high price today that is expected to decline over time as the "insurance" value of mitigation declines and technological change makes emissions cuts cheaper. Second, higher risk aversion increases both the CO2 price and the risk premium relative to expected damages. Lastly, our model suggests large costs associated with delays in pricing CO2 emissions. In our base case, delaying implementation by 1 y leads to annual consumption losses of over 2%, a cost that roughly increases with the square of time per additional year of delay. The model also makes clear how sensitive results are to key inputs.

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