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Discounting Future Climate Change and the Equilibrium Real Interest Rate

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The social discount rate is a crucial element required for valuing future damages from climate change. A consensus has emerged that discount rates should be declining with horizon, i.e., that the term structure of discount rates should have a negative *slope*. However, much controversy remains about the appropriate the overall *level* of discount rates.

We contribute to this debate from a macro-finance perspective, based on the insight that the equilibrium real interest rate, commonly known as r*, is the crucial determinant of the level of discount rates. First, we show theoretically how r* anchors the term structure of discount rates, using the modern macro-finance theory of the term structure of interest rates to provide a new perspective on classic results about social discount rates. Second, we show empirically that new macro-finance estimates of r* have fallen substantially over the past quarter century---consistent with a broader literature that documents such a secular decline. Bayesian estimation of a state-space model for Treasury yields, inflation and the real interest rate allows us to quantify both the decline in r* and the resulting downward shift of the term structure of social discount rates. Third, we document that this decline in r* and the social discount rate boosts the social cost of carbon and has quantitatively important implications for assessing the economic consequences of climate change. In essence, we demonstrate that the lower new normal for interest rates implies a higher new normal for the present value of climate change damages.