The Coalition of Finance Ministers for Climate Action

New approaches to quantifying the fiscal impacts of physical climate change

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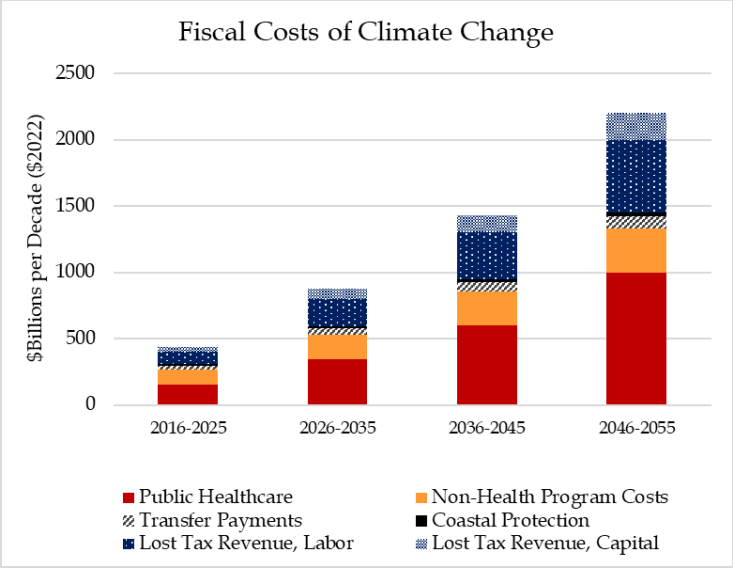
Climate change may affect public budgets in numerous ways including through the costs of public programs (e.g., healthcare), the need for adaptation (e.g., protective coastal infrastructure), tax revenues (e.g., via negative impacts of increased heatwaves on labor productivity and earnings), borrowing costs (e.g., via negative impacts of sea-level rise on housing prices and thus local property tax revenues), and populations/social programs (e.g., via mortality and migration effects). While modeling efforts have historically focused on the fiscal impacts of climate *policies* such as fossil fuel taxes, a nascent literature is developing methods to quantify the fiscal impacts of physical climate change.

New research combines established regression methods to empirically quantify the impacts of extreme weather events or risks on fiscal outcomes with downscaled climate model projections of changes in (future) weather patterns and relevant additional modeling (e.g., of adaptation or demographic change) to evaluate changes in fiscal outcomes due to climate change.[1] Examples of this approach range from studies on costs of fire suppression (OMB, 2024), municipal borrowing (e.g., Goldsmith-Pinkham et al., 2023), and crop insurance subsidies (Diffenbaugh et al., 2021) to public healthcare (e.g., Barrage, 2024). New research also integrates climate change into quantitative models, such as sovereign default (e.g., Mallucci, 2022; Phan and Schwartzman, 2023) or macroeconomic public finance models, to project its fiscal and welfare costs.

Figure 1 presents estimates from a public finance model developed for the U.S. (Barrage, 2024). As of 2026, climate change may cost U.S. taxpayers upward of US$88 billion per year (in 2022 dollars), rising to US$220 billion/year by 2050 in a medium/high emissions scenario (approximately equating to RCP 6.0). While these estimates are large relative to prior projections of U.S. climate change impacts, increasing estimated damages by 23–33% over prior studies (e.g., Nordhaus, 2011; Hsiang et al., 2017), they are likely an underestimate, as they omit effects such as wildfire impacts on healthcare costs. Emerging research suggests that wildfire smoke may be among the most underestimated U.S. climate change impacts (Qui et al., 2024).

Figure 1: Projected climate change impacts on public expenditures and tax revenues in the United States in a moderate/high warming scenario (approximately equating to RCP 6.0)



Source: Author, based on data from Barrage (2024)

1 A rich and growing literature also empirically quantifies impacts of past weather events on fiscal outcomes without future projections (e.g., Akyapi et al., 2022; Noy and Nualsri, 2011; Mohan and Strobl, 2020, Deryugina, 2017; Jerch et al., 2023; Liao and Kousky, 2022, Miao et al., 2018).

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