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From Stochastic Shocks to Structural Burden: Quantifying Systemic Climate-Related Economic Risks in the European Union.

Abstract. Despite the well-documented acceleration of climate-related economic losses in Europe, existing research has largely treated these damages as isolated stochastic events rather than as structurally embedded fiscal risks. This gap leaves EU fiscal governance frameworks inadequately prepared for the persistent, spatially concentrated, and temporally depen dent nature of such losses. This study addresses this gap by investigating the systemic transformation of climate-related economic risks within the European Union, arguing that climate losses have evolved from unpredictable stochastic shocks into a persistent, struc tural burden on the European economy. Consequently, the paper advocates for a paradigm shift in EU climate policy-moving toward anticipatory fiscal instruments, harmonised resilience financing, and monitoring systems designed to mitigate systemic volatility and cross-country economic asymmetry rather than merely responding to isolated disaster events.

Keywords: climate-related losses; systemic risk; sustainable development; spatial concentration; climate economics; anomaly detection; economic resilience