

**CORE: A CLIMATE AND ENERGY INTEGRATED RISK CONTRIBUTION  
FRAMEWORK FOR THE OECD AND ITS SUBGROUPS**

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## ABSTRACT

This paper proposes a novel framework, CORE (Climate, Energy, and Risk contribution framework across the OECD), to measure systemic risk at the country level by integrating financial risk contribution with climate and energy determinants. The study investigates how climate variables (precipitation and temperature) and energy factors (electricity generation, energy consumption, GHG emissions and population) influence each OECD country's contribution to systemic risk as a whole, using monthly data from 2000 to 2022. A systemic index is constructed and systemic risk contribution measures are defined and developed. Principal Component Analysis (PCA) is employed for dimensionality reduction, along with panel regression and subgroup analyses for G7, Nordic, and emerging blocs. Marginal effects plots are used to illustrate context-dependent relationships. The results reveal that the impact of climate on a country's risk contribution varies based on climate-energy profiles and population dynamics, producing mixed outcomes. These findings provide targeted insights for policymakers addressing systemic risk.

**Keywords:** Risk contribution; climate risk; energy; OECD; population; risk turnover; systemic index; G7; Nordic; emerging bloc

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