

# Effects of Disasters and Subsidies on Income Inequality: Evidence from Japan

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## Abstract

This paper investigates the dynamic effects of natural disasters on income inequality in Japan and the mediating role of intergovernmental transfers. Using municipality-level data from 1999 to 2022, we employ a staggered difference-in-differences approach to account for treatment timing, repeated exposure, and heterogeneity. We find that while disasters have limited effects on the Gini coefficient and Theil index, the P90/P10 ratio significantly declines following the first disaster event, indicating a reduction in inequality at the tails. In contrast, disaster-related intergovernmental transfers exhibit a sharp but temporary increase, fading within a few years. Mediation analysis reveals that these fiscal transfers do not materially explain the observed changes in inequality, suggesting that market-driven mechanisms rather than fiscal redistribution drive post-disaster distributional dynamics. Furthermore, we document significant heterogeneity: earthquakes generate more pronounced inequality effects than other disaster types, and inequality dynamics diverge between cities and rural towns despite similar fiscal responses.

**Keywords:** Natural disasters; Income inequality; Intergovernmental transfers; Staggered difference-in-differences; Japan