Earthquake Shocks and the Erosion of Local Comparative Advantage: Evidence from Italy's Industrial Districts

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Abstract

Disasters such as earthquakes are hinge events that can produce lasting effects on local economic structures. They disrupt production and employment but may also transform local comparative advantages that support regional medium and long-term competitiveness. In the disaster literature, attention often focuses on short-term performance indicators. Less consideration is given to whether and how such shocks alter long-term regional specialisation. Within this context, specialisation may strengthen competitiveness and recovery capacity thanks to agglomeration economies and dense production networks, but it may also amplify vulnerability when the shock directly affects dominant sectors and local interdependencies propagate the disturbance.

This paper analyses the long-term structural consequences of the 2012 Emilia-Romagna earthquake, asking whether pre-existing industrial specialisation amplified vulnerability compared to more diversified local economies. Emilia-Romagna is an informative case due to the dense manufacturing fabric of SMEs and industrial districts, characterised by localised value chains and consolidated specialisations. The coexistence within the seismic "crater" of strongly specialised district areas and more diversified non-district areas allows us to examine how different productive configurations condition the long-term effects of the shock.

The empirical design is based on a panel of 29 Labour Market Areas (LMAs) included in the official 2012 seismic crater, observed over 2004–2021. According to the ISTAT, 15 affected LMAs are industrial districts and 14 are non-district areas. Causal effects are identified through a systematic application of microsynth across a broad portfolio of structural indicators,

providing a comprehensive view of disaster impacts by capturing both immediate disruptions and medium-term adjustments across interconnected dimensions of the local productive structure. Outcomes include two-digit sectoral Revealed Comparative Advantage and aggregate indicators (Economic Complexity Index, Herfindahl–Hirschman Index, Krugman Specialisation Index, and diversity measures), estimated using both local units and employment.

Results show that in industrial districts comparative advantages in key manufacturing sectors decline and remain lower for several years, alongside a shift towards a production structure closer to the national average. In non-district LMAs, deviations are smaller and less persistent. The evidence suggests that highly specialised production systems may display structural fragility when shocks affect sector-specific assets and dense local production networks, highlighting a trade-off between efficiency in stable periods and robustness under systemic disruption, with implications for post-disaster industrial and regional policy.