

A Framework for Assessing Just Transitions: Spatial Winners and Losers in Europe's Green and Digital Transformations

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The green and digital transitions are reshaping Europe's economic geography, yet their distributive consequences remain uncertain. Recent research shows that these transitions may either mitigate or reinforce regional inequalities depending on the spatial distribution of skills, technological capabilities and institutional conditions. Evidence from energy and digitalization studies suggests that more advanced regions are often better positioned to benefit from emerging opportunities, while lagging regions face higher vulnerabilities (Sasse & Trutnevyte (2023)). At the same time, intra-regional divides may deepen, particularly in rural and ageing areas (Capello & Caragliu (2025)). These findings highlight the need for analytical tools capable of capturing how skill-biased structural change interacts with interregional income interdependence.

This paper develops a structural framework to assess regional exposure to the opportunities and risks of the green and digital transitions. We integrate ESCO's skill taxonomy and CEDEFOP's occupation-sector matrices into the FIGARO-REG multiregional input-output system, endogenizing households following the Miyazawa (1976) approach. This allows us to examine how skill-related structural components propagate through interregional value chains and shape the spatial mechanics of income generation and distribution, as captured by the K matrix Carrascal-Incera & Hewings (2024). We construct indicators of sectoral intensity in green and digital skills, as well as skills in decline associated with routine, carbon-intensive or easily automatable tasks. These indicators are used to design two hypothetical extraction experiments that quantify the structural contribution of each skill component to regional income balances and inequality, similar to the analysis by Chen et al. (2018).

Building on previous work showing that regional income positions are sustained by asymmetric spillovers embedded in interregional production and income linkages, this paper extends the analysis of income interdependence to the context of the green and digital transitions. By integrating skill-based indicators into the Miyazawa framework, we provide a structural decomposition of how different skill components contribute to regional income formation through the K matrix, revealing how shocks propagate unevenly across regions. This perspective allows us to assess whether the transitions amplify or attenuate the asymmetric spillovers that reinforce persistent territorial inequalities. In doing so, the paper contributes to current debates on European cohesion policy by offering a tool to identify which regions are structurally better positioned to benefit from the transitions and which remain vulnerable to these structural changes.