Supply Shocks in Rare-Earths and Innovation for the Clean Energy Transition: Firm-level Evidence from France

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Abstract

How do firms adjust their innovation decisions following supply disruptions in critical minerals? We examine this question by estimating the impact of the 2010 rare-earth elements (REEs) supply shock on the innovation activities of French firms along the clean technology supply chain. Combining patent and customs data for the 2002–2018 period, we exploit heterogeneity in firms' product mixes to measure their exposure to the shock. Using a difference-in-differences framework with continuous treatment, we find that firms more exposed to the REE supply shock significantly increased innovation along the REE clean technology supply chain, particularly in downstream segments such as permanent magnets and wind energy generators.

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Keywords: Rare-Earths, Supply Disruption, Trade, Innovation, Technological Change, Critical Minerals, Clean Energy Transition

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