Closing the Waste Haven: Innovation Responses to China's 2018 Waste Import Ban

Abstract

This study examines whether the sudden closure of the world's largest waste haven induced technological innovation in waste-exporting countries. For decades, high-income economies relied on China to process post-consumer waste, outsourcing disposal rather than expanding domestic treatment capacity. This equilibrium was abruptly disrupted in 2018 by China's National Sword policy, which banned imports of major categories of foreign solid waste and sharply tightened global waste-processing constraints. Using a novel country-year panel of 38 OECD countries from 2010 to 2020 that combines environmental patent data with bilateral waste trade flows, we exploit the ban as an exogenous shock to global waste-processing capacity. Employing a within-country pre-post design and a continuous treatment difference-in-differences approach that leverages cross-country variation in pre-ban dependence on China for waste exports, we document a significant increase in waste management innovation following the ban, with no comparable response in other environmental technology domains. The innovation response is substantially stronger in countries that were more reliant on China prior to the ban. Domain-level analysis reveals that post-ban innovation is highly concentrated in recycling, sorting, separation, and material recovery technologies, which expand domestic waste-processing capacity. These findings provide causal evidence that the loss of access to a major waste haven induces directed technological change, highlighting innovation as a central adjustment mechanism through which environmental trade restrictions can trigger domestic capability building rather than mere trade diversion.

<Keywords: China's waste import ban; induced innovation; waste management; environmental regulation; waste havens>