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# Cleaner Firms or Cleaner Products? How Product Mix Shapes Emission Intensity from Manufacturing

Geoffrey Barrows\* and H el ene Ollivier†

## Abstract

We explore the contribution of product mix in determining firm and aggregate emission intensity. First, using detailed firm-product emission intensity data from India, we find that more efficient firms are less emission intensive, and that products with the largest sales tend to be cleaner than other products within the firm. We also find that emission intensity in India dropped significantly between 1990-2010 through reallocations across firms, while product mix played a counteracting role in increasing firm emission intensity. Next, we develop a multi-product multi-factor model with heterogeneous firms, variable markups, and monopolistic competition in which each product has a specific emission intensity. We find that pro-competitive market developments lead to an improvement in the aggregate emission intensity – through reallocations across firms – even though firms can become dirtier or cleaner through product mix. This theoretical result fits particularly well the empirical facts.

*Keywords:* heterogeneous firms; product mix; emission intensity; trade and the environment  
*JEL codes:* F14; F18; Q56

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