The Great Dispersion in Energy Productivity Across Firms

Josh De Lyon and Antoine Dechezleprêtre

Abstract

This paper explores the differences between firms' energy productivity – value added per joule of energy – and its relationship with economic performance based on representative data from Chile, Croatia, France, Indonesia, Lithuania, Netherlands, Portugal, and Sweden. It documents wide dispersion in energy productivity across firms within narrowly defined industries, which significantly exceeds differences in labour productivity. On average, the 90th percentile firm is 21 times more energy productive than the 10th percentile firm in the same industry, compared with five times for labour productivity. Even comparing firms producing the same 8-digit product or of similar size, there is huge dispersion in energy productivity. There is no sign that this dispersion is narrowing down over time. Addressing this dispersion could have huge implications: raising the energy productivity of the least productive firms to the energy productivity of the 25th percentile firm in their industry would reduce aggregate energy and emissions by almost half for the same level of output. Machine learning prediction models and linear regression show that the most important factor in explaining within-industry differences between firms' energy productivity is labour productivity, suggesting a link between economic and energy efficiency. Carbon pricing, stronger competition, and access to finance also explain dispersion, suggesting a role for policies.

For a working draft, please write to:

josh.delyon@oecd.org

antoine.dechezlepretre@oecd.org