

Closing the gap? Dynamic analyses of emission efficiency and sector productivity in Europe

Giovanni Marin
IMT LUCCA ADVANCED STUDIES
Piazza San Ponziano, 6
55100 Lucca (Italy)
Phone: +39 349 8555247
giovanni.marin@imtlucca.it

Abstract

The current paper the patterns of emission efficiency growth of 23 manufacturing sectors for 12 European countries with a focus on five emissions (CO₂, NO_x, NMVOC, SO_x and CO). Emission efficiency growth is expected to be triggered by improvement in the efficiency of frontier countries through the diffusion of better technologies to laggard countries. This effect is likely to differ according to the distance from the frontier country. Finally, the role of productivity patterns (Total Factor Productivity) and energy prices dynamics is assessed.

Results based on the European NAMEA (National Accounting Matrix including Environmental Accounts) further merged with sector accounts highlight significant spillovers from leaders in emission efficiency and a general tendency to converge for laggard countries and sectors (except for NMVOC emission efficiency). Energy prices induce substantial improvements in emission efficiency, with the effect being generally stronger for sectors and countries far from the emission efficiency frontier. Finally, total factor productivity (TFP) is strongly correlated with emission efficiency while the distance from TFP frontier harms significantly emission efficiency growth.