

Energy Efficiency and Productivity: A Worldwide Firm-level Analysis

Pierluigi Montalbano,^a Silvia Nenci,^b and Davide Vurchio^c

Improving energy efficiency is a growing policy priority for many countries in the world and is widely recognized as one of the most cost-effective and readily available means of addressing numerous energy-related issues such as energy security, the socio-economic impacts of high energy prices, and climate change. The launching of the so-called “Agenda 2030” has introduced the energy issue to the Sustainable Development Goals (SDGs). Among other things, SDG 7 establishes the need to prioritize energy-efficient practices and, specifically, to double the global rate of improvement in energy efficiency by 2030 (Target 7.3). Since manufacturing and industrial activities are among the primary energy users and are thus also responsible for CO₂ emissions, industrial firms have been put under political and social pressure to re-examine their energy awareness practices and move towards greater energy efficiency.

Although important to policymaking, very few academic studies measure the contribution of energy efficiency to firm performance. Most studies are carried out at the aggregate level or focused on developed economies, whereas relatively few firm-level analyses have been carried out for developing countries. This work aims to fill this gap. Taking advantage of the national representative World Bank Enterprise Survey (WBES) data, we contribute to the current literature by providing one of the most comprehensive firm-level analyses to date in terms of geographical coverage for the period 2006-2018. To this end, we apply a standard constant return to scale Cobb-Douglas production function expanded to energy efficiency.

Our findings show a positive relationship between energy efficiency and firm-level productivity worldwide, although with some degree of heterogeneity in firm size, industry, and geographical regions. These results are robust to a set of sensitivity tests and when using different techniques. They are consistent with those obtained by previous firm-level analyses, although the latter are focused on a narrower set of countries, do not control for panel dimension, and analyze different time-spans.

This work provides empirical support for the messages conveyed by international institutions regarding the positive relationship between environmental actions and firm performance, thus supporting the efforts to improve the private sector’s energy efficiency. It shows that the implementation of Agenda 2030 is not only a fundamental step for sustainable development, but also a tool for fostering firm-level productivity.

a Corresponding author. Sapienza University of Rome, Department of Social Sciences and Economics, P.le A. Moro, 5 – 00185 Rome (IT) & University of Sussex, Department of Economics, Jubilee Building, Falmer, Brighton, BN1 9SJ (UK). EMAIL: pierluigi.montalbano@uniroma1.it.

b Contact details. Roma Tre University, Department of Economics, Via Silvio D’Amico, 77 - 00145 Rome (IT).

c University of Bari “Aldo Moro”, Department of Economics and Finance, Largo Abbazia Santa Scolastica - 70124 Bari (IT).