

PRODUCTIVE ENERGY USE AND ECONOMIC GROWTH: ENERGY, PHYSICAL AND HUMAN CAPITAL RELATIONSHIPS

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The “Cátedra de Economía de la Energía y Medio Ambiente” – *Chair of Energy Economics and the Environment* – is a recent research group in the Seville University. It was founded in 2011 with the sponsorship of the *Fundació Privada Roger Torné* and 5 researchers. Since then, 14 research papers have been published in SSCI indexed journals with high impact factor, 10 more researchers have been incorporated from Seville University and other Spanish and international centres and we are involved in 5 international R&D projects.

The paper presented in this seminar is one of the last research papers we have done, and it is now under review in *Energy Economics* journal.

Abstract

Ecological, and biophysical economists and historians of economics consider that availability of energy inputs has played a key role in driving economic growth in industrialized and emerging economies. Nevertheless, being very sensitive to structural characteristics or stages of economic development, the strength of this link differs among countries. This study analyzes the role of energy in economic growth from a geographical standpoint by estimating an aggregate translog production function, with human and physical capital and productive energy use as production factors, within a growth framework. Panel data of 38 major countries for the period from 1995 to 2007 were used. The strength of the link between energy and growth is analyzed for the whole sample and the following relevant country groups: OECD, BRIC, NAFTA, East Asian, East European and EU15 countries. Obtained results show that the calculated productivity elasticities with respect to energy use are positive for all country groups. BRIC countries have higher elasticities, around 0.37, and EU15 countries have lower elasticities, around 0.12. Weak substitutability relationships between energy and capital are observed for all groups, except for BRIC and East European countries, which show complementarity relationships.

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