A decomposition of the aggregate energy intensity change of Spanish manufacturing industry*

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Abstract

Energy efficiency has come to occupy a prominent place in the economic and environmental agenda of many countries. It has received particular attention in the European Union, where a considerable number of Directives and other legislative initiatives have been passed in the last two decades (e.g. Directive 2006/32/EC and 2012/27/EU. The definition and measurement of energy efficiency changes is yet another challenge. Energy efficiency is typically proxied by the rate of aggregate energy intensity, calculated as the ratio of energy consumed to GDP. The index number decomposition analysis is the usual approach to analyze the changes in a country's aggregate energy intensity (see Ang and Zhang, 2000 for a survey of these methods).
In this paper we analyze the energy intensity change by combining the traditional index decomposition analysis approach with frontier efficiency methods. We apply this framework to decompose and analyze the sources of the variation in energy intensity in Spanish manufacturing industries and regions for 1999-2007.

Key words: Energy Intensity, Energy efficiency, Technical Change, Compositional Effects.

JEL classification: Q40, Q43, D24, L60

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