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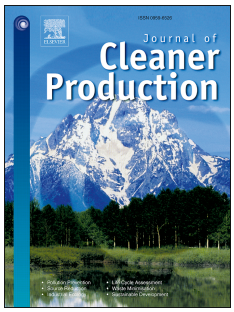

Technical change, inter-factor and inter-fuel substitution possibilities in Pakistan: A trans-log production function approach

Boqiang Lin, Izhar Ahmad

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Technical change, inter-factor and inter-fuel substitution possibilities in Pakistan: A trans-log production function approach

Corresponding Author: Boqiang (given name) LIN (Surname), Collaborative Innovation Center for Energy Economics and Energy Policy, China Institute for Studies in Energy Policy, Xiamen University, Xiamen 361005, Fujian, China. Tel: +86 5922186076; Fax: +86 5922186075

Email.bqlin@xmu.edu.cn, bqlin2004@vip.sina.com

Izhar (Given Name) AHMAD (Surname), China Center for Energy Economics Research, School of Economics, Xiamen University, Xiamen 361005, Fujian, China, Email.

izhareconomist@gmail.com

Directorate of Colleges, Higher Education, Archives and Libraries Department, Government of Khyber Pakhtunkhwa, Pakistan

Abstract

Energy consumption in Pakistan increased significantly over the last two decades primarily due to industrialization. In order to meet the growing energy needs, the government adopted short-term policies by setting up thermal power projects, which are more expensive both in terms of fiscal cost and environmental damages as compared to hydro power projects. The former has exposed Pakistan to international oil price shocks and environmental degradations. This study, therefore, attempts to analyze technical change using trans-log production function by employing non-energy factors (i.e. capital and labor) and energy factors (i.e. petroleum and natural gas) to estimate elasticity of substitution. The purpose of the study is to provide policy suggestions to the government on how to achieve high economic growth vis-à-vis improved energy security and environmental sustainability. The results reveal that capital-energy and labor-energy are substitutes, thereby suggesting the need for an increased focus on technological advancement and skilled employment generation to conserve energy and reduce CO_2 emission. A gradual elimination of energy subsidies, which will make energy price reflects its true cost, is required to