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中国钢铁工业能源-资本-劳动替代关系研究

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The energy-capital-labor substitution relationship of iron and steel industry in China

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摘要 本文将能源要素纳入到超对数成本函数,建立了中国钢铁工业生产要素的MES模型,选取中国钢铁工业1985-2006年的数据,对钢铁工业生产要素(包括能源、资本和劳动)之间的替代关系进行分析。结果表明,钢铁工业能源、资本与劳动三要素的自价格弹性都小于0,能源与资本、能源与劳动之间存在替代关系;能源价格变动对资本和劳动需求量的影响相对较大,而资本价格与劳动价格的变化对能源需求量的影响则相对较小,能源可被替代的程度较小。说明在给定钢铁工业总产出水平情况下,通过提高能源价格和税收水平,会激发企业节约能源的积极性,加大技术节能投资,提高能源效率,进而实现钢铁工业的可持续发展。

关键词： 钢铁工业　能源　MES模型　替代弹性

Abstract： A Morishima Elasticity of Substitution (MES) model of iron and steel industry is established based on translog production cost function. The spatial panel data of iron and steel industry in China from 1985 to 2006 are adopted. Energy, capital, and labor are main production factors in the model. The substitution elasticity is analyzed. The results are as follows: Self-Price Elasticity (SPE) of energy, capital, and labor is less than zero; SPE of capital is the smallest; Cross-Price Elasticity (CPE) and Morishima substitution elasticity is greater than zero. The results have proved the substitution relationship between energy and capital/labor, and energy could effectively substitute for labor and capital; however the substitution degree of labor and capital for energy is low. Therefore, it could stimulate the enthusiasm of enterprises to conserve energy, and increase investment in energy-saving technologies in order to improve energy efficiency by raising energy prices and the level of taxation.

Keywords： iron and steel industry　energy　MES model　substitution elasticity

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