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DETERMINING THE EFFICIENCY OF INVESTMENTS AND EVOLVING TEMPORAL-SPATIAL TRENDS IN ENVIRONMENTAL GOVERNANCE USING THE STOCHASTIC FRONTIER ANALYSIS (SFA) MODEL

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Abstract

Environmental pollution has become a major global problem. However, despite increased environmental investment, studies have not clarified whether environmental pollution has been effectively controlled. On the basis of 1998-2014 panel data on three types of industrial waste from 31 mainland China provinces, a stochastic frontier analysis (SFA) model was used to estimate the input efficiency of environmental governance in China, explore the overall characteristics of input efficiency, and explore the evolving trends in terms of the degree of match between environmental input efficiency and input efficiency in various provinces. The results indicate that (1) the input and output of the environmental governance of industrial pollution are positively correlated. The population, industrialization level, and area of a region have a negative impact on the efficiency of investment in environmental governance, whereas gross domestic product, education level, urbanization, and foreign direct investment have a positive impact on it. (2) Generally, the trend in the input efficiency of China's environmental governance is downward. The average value of the central provinces is the only one that is greater than the national average, and the efficiency of environmental governance in each province exhibits a downward trend. Convergence analysis indicates that the efficiency of environmental investment in various Chinese provinces is moving toward differentiation and that the provinces within each region have developed to a balanced level, although a large gap exists between their equilibrium levels. (3) The degree of matching between investment efficiency is not very high, and only six provinces in central and east China exhibit the characteristics of "high input-high efficiency." On the basis of these conclusions, we propose four key policy recommendations.

Key words: environmental governance efficiency, temporal-spatial evolution trend, Mainland China; three types of industrial waste, scholastic frontier analysis

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