How Does Industrial Intellectualization Affect Energy Intensity? Evidence from China

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Since the 21st century, as the digital economy has flourished and the Fourth Industrial Revolution has deepened, emerging technologies have exerted a significant influence on social development, leading to the rapid informatization and digitalization of society. Therefore, in the digital age, industrial intellectualization and energy intensity may interact. In this study, an industrial intelligent system is constructed considering three aspects, and the relationship is explored between industrial intellectualization and energy intensity from 2006 to 2018 in China.

By exploring the relationship between industrial intellectualization and energy intensity, the pivotal conclusions are listed below. First, industrial intellectualization can effectively restrain energy intensity and thus restrain energy intensity with a significant lag effect. In the robustness test and the results shown after eliminating endogeneity, the conclusion remains reliable. Second, energy intensity shows strong spatial autocorrelation, and each region's energy intensity promotes the surrounding regions. This trend is generally increasing yearly. In addition, energy intensity has strong spatial agglomeration. Third, industrial intellectualization can effectively restrain not only the rise of the region's own energy intensity but also that in surrounding areas. Fourth, there are nonlinear effects of industrial intellectualization on energy intensity under different levels of economic growth, technological progress, industrial restructuring, educational progress, financial development, and environmental regulation.

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