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Characteristics and Drivers of Greenhouse Gas (GHG) emissions from China's Manufacturing Industry: A Threshold Analysis

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Abstract : Only a handful of literature have used to non-linear model to investigate the influencing factors of greenhouse gas (GHG) emissions in China's manufacturing sectors. And there is a limit in investigating quantitatively and systematically the mechanism of correlation between economic development and GHG emissions considering inherent differences among manufacturing sub-sectors. Considering the sectorial characteristics, the manufacturing sub-sectors with various impacts of output on GHG emissions may be explained by different development modes in each manufacturing sub-sector, such as investment scale, technology level and the level of international competition. In order to assess the environmental impact associated with any specific level of economic development and explore the factors that affect GHG emissions in China's manufacturing industry during the process of economic growth, using the threshold Stochastic Impacts by Regression on Population, Affluence and Technology (STIRPAT) model, this paper investigated the influence impacts of GHG emissions for China's manufacturing sectors of different stages of economic development. A data set from 28 manufacturing sectors covering an 18-year period was used. Results demonstrate that output per capita and investment scale contribute to increasing GHG emissions while energy efficiency, R&D intensity and FDI mitigate GHG emissions. Results also verify the nonlinear effect of output per capita on emissions as: (1) the Environmental Kuznets Curve (EKC) hypothesis is supported when threshold point RMB 31.19 million is surpassed; (2) the driving strength of output per capita on GHG emissions becomes stronger as increasing investment scale; (3) the threshold exists for energy efficiency with the positive coefficient first and negative coefficient later; (4) the coefficient of output per capita on GHG emissions decreases as R&D intensity increases. (5) FDI shows a reduction in elasticity when the threshold is compassed.

Keywords : China, GHG emissions, manufacturing industry, threshold STIRPAT model
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