

Decoupling analysis and LMDI decomposition of carbon emissions from economic growth: the case of RCEP

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Abstract

The Regional Comprehensive Economic Partnership (RCEP), which involved the ten ASEAN (Association of Southeast Asian Nations) nations, China, Japan, South Korea, Australia, and New Zealand, is facing tremendous challenges concerning the balance between economic growth and carbon emissions. Although all RCEP members have made commitments under the Paris Agreement, the increasing GDP growth and carbon emissions in RCEP have excessively outpaced the global average. Under this circumstance, the core problem in policy and research is to which extent carbon emissions be decoupled from economic growth. Consequently, the study aims to explore the decoupling relationship between carbon emissions and economic growth and investigate the driving factors of carbon emissions in RCEP. The paper conducted the Tapio decoupling model to investigate the decoupling relationship in RCEP during 1990-2019 and combined the Kaya identity with LMDI decomposition to analyze the driving factors of carbon emissions (energy structure, energy intensity, economic growth, and population size). We found that: (1) RCEP still has not completely decoupled carbon emissions from economic growth. The weak decoupling accounted for the most time in RCEP countries. (2) Expansive coupling and expansive negative decoupling mainly occurred in developing countries; (3) Economic growth was the primary factor of increased carbon emissions in RCEP, which is more pronounced in developing countries with worse decoupling status; (4) Energy intensity and energy structure mainly contributed to carbon reduction, which is more pronounced in developed countries. To decouple economic growth from carbon emissions, RCEP should accelerate the energy transition, industrial adjustment and technology sharing.

Keywords: Carbon decoupling, Sustainable development, Carbon reduction, LMDI method