# Abstract

Foreign direct investment (FDI) is a key pathway for upgrading modern green technologies and promoting economic development, but the research on the impact of FDI on carbon dioxide ($CO_2$) emissions and the relevant mechanisms remains inconclusive and lacks systematic exploration. This study first reviews three theoretical foundations of FDI and environmental pollutants: the pollution haven hypothesis, the scale effect hypothesis and the pollution halo hypothesis. Subsequently, the study innovatively discusses the moderating effects of institutional quality and economic growth based on related research on institutional quality and carbon emissions, and the Environmental Kuznets Curve (EKC) hypothesis. Using a sample of 27 European Union (EU) countries from 2000 to 2020, this study adopts the two-step system generalized method of moments (GMM) method and finds that FDI significantly increases production-based $CO_2$ emissions but has a significant negative impact on consumption-based $CO_2$ emissions. Moreover, by introducing interaction terms, this study finds that both institutional quality and economic growth can mitigate the impact of FDI on production-based $CO_2$ emissions. Therefore, governments need to strengthen environmental management and implement policies to encourage green consumption among the public.



# Keywords

FDI; $CO_2$ emissions; pollution haven hypothesis; Environmental Kuznets Curve; GMM