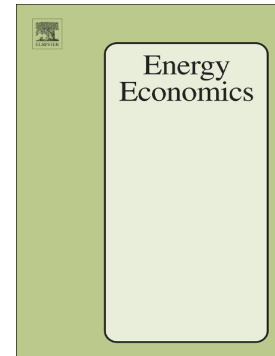


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Bounds Testing Approach to Analyzing the Environment Kuznets Curve Hypothesis: The Role of Biomass Energy Consumption in the United States with Structural Breaks

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Abstract: This paper re-examines the specification of the environmental Kuznets curve (EKC) for the US economy by accounting for the presence of a major renewable energy source and trade openness over the period 1960-2016. Biomass energy consumption and trade openness as well as oil prices are considered as additional determinants of economic growth, and consequentially of CO₂ emissions. The bounds testing approach to cointegration is used to examine the long-run relationship between the variables in the presence of structural breaks. The causal relationship between the variables is investigated by applying the VECM Granger causality test and accommodating structural breaks. The results confirm the presence of cointegration between the variables. Moreover, the relationship between economic growth and CO₂ emissions is not only inverted-U shaped but also N-shaped in the presence of structural breaks and biomass. Biomass energy consumption lowers CO₂ emissions. Exports, imports and trade openness are also environment-friendly. The causality analysis underscores a feedback effect between biomass energy consumption and CO₂ emissions. Economic growth still Granger causes CO₂ emissions in this new setup.

Keywords: EKC; Biomass energy; Oil prices; Trade openness; Structural breaks.

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