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GREENING THE DIGITAL LANDSCAPE: EXAMINING THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES, RENEWABLE ENERGY ON CO_2 EMISSIONS IN FINLAND

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Abstract

This study aims to investigate the influence of information and communication technologies (ICT), renewable energy, trade openness, and economic growth on carbon dioxide (CO_2) emissions in Finland from 1990 to 2020. To achieve the objective of this study, the present study employs correlation analysis, multicollinearity approach, unit root tests, cointegration regression, robustness tests with CCR, and diagnostic tests. This study considers CO_2 emissions as the dependent variable, while explanatory variables are ICT, renewable energy, trade openness, and economic growth. The findings of unit root test explore that all the variables are following the stationary process at first difference. Moreover, the cointegration analysis reveal that all variables are strongly cointegrated with CO_2 emissions. Besides, the outcomes of fully modified ordinary least square (FMOLS) and dynamic ordinary least square (DOLS) reveal that ICT, and economic growth increase the overall level of CO_2 emissions. In contrast, renewable energy consumption helps increase environmental sustainability. Moreover, the absence of multicollinearity, heteroscedasticity, and serial correlation underscores the consistency and reliability of regression findings. For robustness, canonical cointegrating regression (CCR) test findings are consistent with the FMOLS and DOLS regressions. Finally, the findings suggest that policymakers should consider sustainable green practices in ICT sector and increase the share of renewable energy consumption, which are essential for achieving long-term environmental goals in Finland.

Key words: CO_2 emissions, economic growth, information and communication technology, renewable energy, trade openness

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