Title: Impact of urbanization and CO2 emission on GDP: a case study of Ukraine

Author names: N. M. Zayed, N. R. Nahid, N. A. Ani, O. Tkachenko, E. Varaksina, N. Shyriaieva

Abstract: Purpose. Justification of the impact of carbon dioxide emissions and urbanization on economic growth in Ukraine.

Methodology. General and specific research methods were used. Quantitative research methods were based on econometric modeling, in particular, the use of the Generalized Method of Moments (GMM), and, to account for the non-stationarity of time series, Cointegration. Regression analysis was also used with multiple regression methods, which increased the relevance of the calculations. The method of comparing the results of these methodological approaches increased the reliability of the results.

Findings. In the case of Ukraine, a high level of influence of urbanization in Ukraine on GDP growth has been established, while carbon dioxide emissions do not play a significant role in increasing or decreasing GDP. Usually, this difference is explained by the different policies of Ukraine and the use of nuclear energy. The study proves that in Ukraine, the country has been able to increase its economic growth through environmentally friendly policies and urban planning. The conclusions presented in the study are also supported by the Environmental Kuznets Curve (EKC).

Originality. This study is the first to highlight the relation between urbanization and carbon dioxide emissions and Ukraine's economic growth. The significant impact of urbanization and CO_2 emission on GDP also has been tested by CUSUM and CUSUMQ tests for the first time.

Practical value. The results indicate that sustainable urbanization, the use of renewable energy, and the implementation of planned policies are important for Ukraine, which is essential for the country to maintain a balance between environmental impact and economic development in the long term. The results will be useful for employees of ministries and agencies, as well as researchers working on these issues.

Key words: carbon dioxide emissions, urbanization, sustainable development, GDP, environmental risk, environmental policy

https://doi.org/10.33271/nvngu/2026-1/093