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Environmental Kuznets Curve for Turkey: A Spatial Econometric Analysis

Dilek Çetin[1]
Mine Kalay[2]
Seda Ekmen[3]

Abstract

The main idea behind the Kuznets Curve is as the economy is developed, economic inequality will first increase then eventually it will decrease. This curve is inverse-U shaped. This hypothesis is also used for environmental degradation instead of economic inequality. Kuznets Curve turns into Environmental Kuznets Curve when it is used for environmental analysis. Most of the papers used Carbon Dioxide (CO_2) or Sulfur Dioxide (SO_2) emissions to measure the environmental degradation levels. As in economics literature, the development level is measured with Gross Domestic Product (GDP) per capita. The main hypothesis of this study is to test the validity of Environmental Kuznets Curve for Turkey. Moreover, the main contribution is to take into consideration the spatial effects. Spatial econometric method is used to test our hypothesis. The main problem for the econometric level analysis is the lack of appropriate data in Turkish Statistical Institute. The Gross Domestic Product is available for NUTS-3 level (81 provinces) between 1987 and 2001 while Regional Gross Value Added at current prices is present for NUTS-2 level (26 sub-regions) from 2004 to 2011. The provincial shares in 2001 is used to disaggregate NUTS-2 level data. It is assumed that each province share in the regional value is constant over time for disaggregation. Sulfur dioxide (SO_2) data has different problem. From 1990 to 2006, SO_2 data is collected by Ministry of Health. After 2006, SO_2 data is gathered by Ministry of Environment and Urbanization till 2010 for all counties. The data belong to the province's main county is chosen due to reason that no aggregate or average value is available. Finally, the econometric analysis is done with the data which has disaggregated by the authors with several serious assumptions. Two different weighting matrix is utilized for spatial econometric estimation. Inverse distance matrix and binary neighboring matrix is constructed for 81 provinces for 2004 to 2010. According to Morans I and Geary's C spatial autocorrelation test results, spatial autocorrelation is verified for both weighting matrices. The first spatial econometric estimation results show that gross value added has a positive and significant sign although the square of the gross value added is negative but insignificant for both Spatial Autoregressive (SAR) and Spatial Error (SEM) Models. This result is reasonable because Turkey is a developing country. Environmental Kuznets Curve didn't pass the turning point yet for Turkey. 30% of the total effects is originated from the spatial effects.

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[1] Asst. Prof., Kirikkale University, Turkey
[2] Res. Asst., Hacettepe University, Turkey
[3] Asst. Prof., Yildirim Beyazit University, Turkey

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