Environmental Kuznets Curve: A Comparison between Consumption-and Production-Based CO_2 Emission

Abstract

The 'environmental Kuznets curve' (EKC) refers to an inverted-U-shaped relationship between some pollutant level and per capita income. Since the early 1990s, a considerable number of empirical studies have been conducted on the EKC. However, almost all the previous studies search for evidence of EKC with the production-based emissions. With the increase of globalization in past decade, there are more and more emissions embodied in trade, which leads to a considerable gap between consumption- and production-based emissions. Compared to the production-based studies, a consumption-based study is more relevant for the purpose of global emission control and reduction. This study estimated the EKC with consumption- and production-based CO_2 emission for 40 countries during the period 1995 to 2009. We find that when the trade effects are excluded (consumption-based estimation), the EKC becomes flatter and the turning point moves to the right. This indicates that the income's effect on emission reduction is over-estimated by the production-based estimations. The inverted-U shaped relationship still exists, but the GDP per capita of the turning point are higher if we take the international trade into consideration.

Keywords: environmental Kuznets curve, consumption-based emission, CO_2 emission.