An Empirical Investigation into the Behavior of CO2 Emissions during Business Cycles

Tim Scholz
Department of Economics
University of Guelph

Abstract
This paper uses the Hodrick-Prescott filter to decompose per capita CO2 emissions data into long-run cycles and short-term fluctuations. The same is done with per capita GDP and its cyclical relationship with CO2 is analyzed. Seventy-nine countries are studied, and the time periods 1950-2003, 1950-1973 and 1974-2003 are analyzed separately. Large differences in the cyclical relationship are apparent, both among countries and over time. Countries with the largest GDP exhibit the most pro-cyclical behavior, while developing economies display convergence in cyclical behavior. The emissions in countries with relatively high economic growth from 1950-2003 display pro-cyclical behavior like that of developed economies. Clean energy use, measured by the CO2 intensity of energy consumption, is a significant variable in explaining cyclical differences among developed countries.