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The Environmental Kuznets Curve in Bulgaria

The Environmental Kuznets Curve hypothesizes an inverted-U relationship between a certain pollution indicator and GDP per capita. Grossman and Krueger (1991) first introduced the curve. As the country becomes more developed and reaches a certain point of GDP per capita, pollution level starts declining. David Stern, however, notices that the hypothesis rose to prominence because few people paid attention to the econometric issues involved, such as serial dependence or stochastic trends in time series data. This paper tests this hypothesis for Bulgaria, an emerging economy that has experienced a change from a centrally planned economy to a market economy. It plans to overcome the shortcomings of other studies by testing for issues with the data. Several indicators of pollution are used in a time series framework. Tests for integration and cointegration are carried out. One country studies provide a supplemental picture to panel data studies that have been done. Jalil et al. (2010) suggest that a time series analysis for a single country may provide better framework to study the relationship. Some support for the hypothesis is found.

Another issue of interest is the turning point, or the level of income at which pollution starts declining. The literature reports many diverging levels. Some of them are so high that they make it unrealistic that developing countries will reach such high GDP-per-capita to be able to experience the benefits of declining pollution. The time series we have at our disposal is from 1970-2008. That gives us a sufficiently large period to be able to explore differences between the periods when Bulgaria was a centrally planned and market economy. A number of studies working on CO2 emissions find an ever increasing positive correlation between CO2 and economic growth for example Chang (2010) for China, Ozturk and Acaravci (2010) for Turkey and Pao and Tsai (2010) for Russia. Those are all sizable economies. Bulgaria is a small country that experienced transition and thus represents a more unique case. Many of the developing countries do not have the resources of China, thus the Bulgarian experience may be more relevant to them.

The basic model to be estimated is

* *CO2/pop)t = α + δt + β1(GDP/pop)t+β2(GDP/pop)t2 + εt*

where pop is population, *(CO2/pop)t is CO2 emission per capita at time t, (GDP/pop)t is GDP per capita at time t, t =1,2, ... ,T.*

Specification tests will be carried out. The model will be estimated for a number of polluters, such as CO2, methane, nitrous oxide, ammonia, sulphur dioxide. The relationship will be further investigated, causation will be studied between GDP growth and pollution. Their long term relationship will also be investigated.