Abstract. There is a long-standing debate on the relationship between economic development and environmental quality. From a sustainable development viewpoint there has been a growing concern that the economic expansion of the world economy will cause irreparable damage to our planet. In the last few years several studies have appeared dealing with the relationship between the scale of economic activity and the level of pollution. In particular, if we concentrate on local pollutants many empirical contributions have identified a bell-shaped curve linking per capita pollution to per capita GDP (in the case of global pollutants like CO₂ the evidence is less clear-cut). This behavior implies that, starting from low per capita income levels, per capita emissions or concentrations tend to increase but at a slower pace. After a certain level of income (which typically differs across pollutants) – the “turning point” – pollution starts to decline as income further increases. In analogy with the historical relationship between income distribution and income growth, the inverted-U relationship between per capita income and pollution has been termed “Environmental Kuznets Curve”. The purpose of this paper is not to provide an overview the literature: there are several survey papers around doing precisely that. We instead reconsider the explanations that have been put forth for its inverted-U pattern. We consider the literature from this perspective. In addition, without resorting to any econometric estimation, we consider whether simple data analysis can help to shed some light on the motives that can rationalize the Environmental Kuznets Curve.

Key words: environmental quality, economic growth, development.

1. Introduction: What is the Environmental Kuznets Curve?

When investigating the empirical relationship between income inequality and per capita income levels in 1965 Simon Kuznets could not possibly have imagined that his name would have been subsequently associated to any empirical relationship involving income levels and having a bell (or inverted-U) shape. One of the most thoroughly analyzed to date is the empirical reduced-form relationship between (a country or world’s) economic development and the environment.

Admittedly the relationship between economic growth and pollution is very complex, depending upon a host of different factors. Among these are: the size of the economy, the sectoral structure (including the composition of energy demand), the vintage of the technology, the demand for environmental quality, the level (and

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quality) of environmental protection expenditures. All these aspects are interrelated. For example, countries with the same sectoral composition of output may have a different level of emissions if their capital stocks are different in terms of technological vintage. More generally, while the study of the impact of economic growth on the environment is a significant endeavor, the analysis of feedback effects of the environment on a country well being is even more challenging a task.

The above considerations are the likely explanation of why this research field has been explored firstly on empirical grounds and only afterwards with the help of theoretical models. Indeed, the study of the causes and effects of a country’s economic growth is probably one of the most challenging of the whole economic discipline. Investigating the probably bi-directional link between development and environment adds further difficulties to an already complex phenomenon.


Given all these contributions it is difficult to say something new or original. At the same time, it is not the goal of this paper to produce the most updated review of the literature. Instead, we would like to consider the issue of the relationship between economic development and the environment from a different tack. We will review the traditional explanations put forth for an inverted-U EKC relationship and consider them with the help of both specific contributions to the literature and of data analysis. In this last respect we follow Levinson (2002) who notes that sophisticated econometrics is not needed to demonstrate that environmental quality deteriorates with economic growth: “All one needs to do is show that there are some countries and some pollutants for which a time series of pollution plotted against GDP per capita shows a downward trend” (Levinson, 2002, p. 2).

The paper is organized as follows. In the next section, we ask why the EKC is relevant and to whom. The nature of the relationship between economic growth and environment and the notion of EKC is briefly reviewed. Section 3 carries out a very selective review of the EKC literature highlighting the aspects the various studies have in common and their limitations and drawbacks. Section 4 is the main part of the paper and considers alternative explanations offered for the inverted-U relationship linking pollution to economic growth. Here some data analysis is undertaken. Some conclusions are drawn in the closing section.

2. Why the Environmental Kuznets Curve is of interest to experts and non-experts alike

At the 1997 Kyoto summit the industrialized countries agreed upon an overall 5% reduction in greenhouse gas emissions from 1990 levels over a first commitment