

Title of the paper:

Economic Development as a Determinant of Desertification Risk: Exploring a local-EKC Hypothesis

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Text of the abstract

Understanding causes and effects of the economic growth at different temporal and spatial scales as well as its implications on the environment represents an intriguing topic in the whole economic discipline. Moreover, many countries/regions have shown marked growth rates over the last century, but this experience could not be longer repeatable in the present (and future) social and ecological conditions. Indicators of 'de-coupling' and 're-linking' between economic growth and environmental degradation are therefore becoming increasingly popular in detecting and measuring improvements in natural resource efficiency with respect to economic activity.

As a natural extension of de-coupling analysis, studies on the Environmental Kuznets Curve (EKC) have tried to disentangle this topic from a development perspective. The 'stylised fact' emerging from those analyses suggests the existence of an 'inverted-U' relationship which occurs between indicators of environmental quality degradation and levels of per capita income. According to the EKC hypothesis, accelerated wealth creation by economic growth is a precondition for technological progress that in turn would provide a better environment and the means to sustain it. Customers on lower income levels prefer commodities other than the environment, resulting in the lack of 'greening' of products and policies. EKC studies have so far concentrated on short- and long-term air pollution and, on a lesser extent, deforestation. Relatively few studies concern other environmental matters. Moreover, only a restricted number of papers addresses the relationship between a synthetic index of environmental quality and income level.

On the other hand, EKC hypothesis has received some critical responses. Among the several questions addressed in the literature, the most relevant could be synthesised as follows: (i) a continued economic growth is not a sufficient precondition for reducing pressure on the environment without important policy intervention, (ii) the EKC relation has been shown to be valid for few specific environmental processes; (iii) in general, it illustrates the shift from land-intensive to capital-intensive forms of agriculture with growing capital availability and decreasing energy profits in primary sector, but provides little information regarding total environmental impact; and (iv) there are few theoretical grounds for the existence of EKC for land resource depletion. Notwithstanding the soundness of such criticisms, we believe that EKC correctly indicates (often with some adjustments) the positive effects of government policies that are usually more ambitious in high-income countries/regions.

Contrasting the classical cross-country analyses, local-EKC studies are becoming more frequent as the availability of highly-disaggregated economic and environmental data rapidly increases. Moving from cross-country to single-country studies, carried out by using very disaggregated spatial units, mitigates the problems associated with data comparison from different countries.

The aim of this paper is to analyse in Italy, at the district scale, a possible relationship between a proxy of per capita income and a synthetic index of desertification risk, following the suggestions of local-EKC framework. Taken as a leading process of natural resource depletion, desertification is a world-wide environmental and societal problem that reduces soil fertility with important impacts on agriculture and even on other economic sectors.

Following the standard EKC approach, first, second, and third-order polynomial regressions were carried out by using changes (1990-2000) of the environmental index as the dependent variable and some economic variables as predictors, including per capita (district) value added and several control variables, testing also for spatial effects. The spatial unit used here was the Local Labour Market Area (LLMA) district. The best fit was a linear form incorporating spatial effects where income, and thus the (district) level of economic development, is inversely associated to desertification risk. Second- and third-order polynomial forms did not increase the goodness of fit. As expected, spatial effects proved to be important in the income-environment relationship explored here.

The paper discusses the econometric results from both the development and the environment point of view. Furthermore, the use of a district spatial unit like the LLMA grid is discussed compared to other possible choices. LLMA districts appear as original and economically-relevant units aimed at comparing environmental indicators with economic variables estimated from national accounts and census surveys. The analysis lastly provides suggestion concerning the policies suitable for to other world regions with similar economic and ecological characteristics.