

Chapter 16

Spatial Analysis of Environmental Degradation: The Role of International Trade and Democracy

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ABSTRACT

This paper explores the drivers of environmental degradation by using spatial panel data models to account for spatial interdependence among countries. Despite a large body of literature investigating the relationship between international trade, democracy, and the environment, previous studies have produced mixed results, partly due to the conceptualizations of variables and methodological limitations. This paper addresses these limitations by proposing alternative measures of trade openness and democracy while accounting for spatial dependence between countries. The results reveal that income, economic complexity, democracy, energy intensity, and agricultural land contribute to CO2 emissions, while forest area is negatively associated with environmental degradation. The results also reveal that while trade openness has statistically significant and positive direct effects, there are strong spillover effects as well. Indeed, the negative spillover effects of trade openness outweigh the direct effects, leading to a mitigating impact on environmental degradation.

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1. INTRODUCTION

Environmental degradation refers to the deterioration of the environmental systems and can take many forms, including the depletion of natural resources, water and air pollution, and the extinction of wildlife (Patterson, 2021). Due to the vital role of the environment in human life, each of these problems can lead to serious social, economic and political consequences. Among them, problems closely related to environmental changes such as migration, health, inequality and sustainable development have begun to come to the fore on the political agenda in recent years. Therefore, monitoring environmental systems and determining the factors contributing to environmental degradation are considered essential for understanding the nature of these problems and designing policies to protect environmental quality.

There is a growing body of literature investigating the drivers of environmental degradation and environmental quality. However, many aspects of this topic still require further scrutiny due to its importance. For instance, a strand of the literature focuses solely on the relationship between economic growth and environmental pollutants, through testing the Environmental Kuznets Curve (EKC) (Grossman and Krueger, 1991; Grossman and Krueger, 1995). The EKC hypothesis implies that in the initial stages of economic development, environmental quality tends to be considered as a luxury good, leading developing countries to make a choice between a clean environment and economic growth. However, as countries reach a certain level of development, environmental quality becomes a normal good. As a result, the opportunity cost of implementing more stringent environmental policies decreases that makes a clean environment preferable to economic growth (Bernauer, Kalbhenn, Koubi and Spilker, 2010). The EKC hypothesis, while making significant implications regarding the relationship between income and environmental quality, is frequently criticized for its reliance on a relatively simplified relationship that does not allow for the differentiation of the impact of income from other factors. Empirical studies indicate that the relationship between environmental degradation and income levels does not follow a standard pattern as proposed by the EKC hypothesis. Instead, it varies depending on the selected countries and environmental indicators such as CO₂ and SO₂ (Bernauer et al., 2010; Stern, 1998).

A second strand of the literature, on the other hand, focuses on the political economy of environmental degradation and discusses the possible effect of democracy and political institutions on environmental degradation. However, the majority of previous studies report mixed results regarding this effect. In one of the earliest studies on the topic, Congleton (1992) suggests that in addition to economic considerations and policies, deterioration of the environment is closely related to the type of political systems and institutions.

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