Chapter 5
The Effects of Environmental Taxes, Renewable Energy, and Globalization on Carbon Dioxide Emissions:
European Country Experiences

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ABSTRACT

This chapter aims to study the impacts of environmental taxes, renewable energy, economic growth, and the globalization index on carbon dioxide emissions in European Union countries. In this context, we present a literature review that evaluates these various connections. In terms of methods, we seek to use panel data (e.g., Fixed Effects and Random Effects), the cointegration panel (FMOLS), Quantile Regressions, Panel Corrected Stand Errors method, and the GMM-System estimator from 1995-2020. The study also intends to assess the unit root and cointegration tests on the variables used in econometric research. The data will be collected from the World Bank, IMF, OECD, and KOF Swiss Economic Institute. Regarding hypotheses and econometric results, empirical studies demonstrate that the globalization of the economy and economic growth can increase carbon dioxide emissions. When it comes to environmental taxes and renewable energy, they contribute to improving the environment.

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INTRODUCTION

In recent years, fiscal policy has contributed to environmental improvement, namely with the practice of environmental taxes (e.g., Dâmaso & Leitão 2023; Sackitey 2023; Dogan et al. 2023; Rakpho et al. 2023; Bashir et al. 2020; Bozatli & Akca 2023).

The scarcity of natural resources and negative externalities on the environment has raised some concerns among economies and countries. Pigou (1932) introduced the relationship between costs and benefits and their environmental interaction. The author states that general equilibrium is achieved when the marginal private cost equals the marginal social cost. However, when the marginal social cost exceeds the marginal private cost, the State must intervene. In this context, the polluter must pay in proportion to what he pollutes. However, Coase (1960) states that externalities on environmental issues should consider the agent causing pollution and the agent harmed by the pollution; this agreement should be negotiated between both parties and benefit both. Climate change, namely greenhouse effects and global warming, was committed through the Kyoto Protocol (1997) and the Paris Agreement (2015). In this context, fiscal policy, namely environmental taxes, emerges as a fundamental instrument for regulation and an attempt to create fairer economies concerned with sustainable development. Thus, it can be inferred that environmental taxes allow the achievement of the objectives established in the various ecological summits and have stimulated the interest of academics from different areas of knowledge, such as economists, lawyers and tax experts, in favor of this theme. There are undoubtedly several ways to evaluate this issue, whether from an econometric, legal or tax perspective. Still, the general objective is to understand the impact of environmental taxes on climate change.

Thus, as a rule, studies consider that environmental taxes allow renewable energy and better energy efficiency. In the long run, there may be better allocation of energy resources.

The study by Dâmaso & Leitão (2023) evaluates the effect of environmental taxes on reducing carbon dioxide emissions. The authors use time series to compare the effect of environmental taxes on carbon dioxide emissions in Portugal and Spain. The study demonstrates that renewable energies and environmental taxes contribute to environmental improvement in Iberian countries.

The experience of OECD countries was investigated by Bashir et al. (2020) using the GMM-system estimator and quantile regressions. The econometric results demonstrate that renewable energies and environmental taxes decrease carbon dioxide emissions. Moreover, the coefficient of ecological innovation is negatively correlated with CO_2 emissions. In this line and based on the Argumented Mean Group Estimator (AMG) and the autoregressive distributed lag model (ARDL), the study