

## **Economic complexity, international trade, and environmental pollution: an application of Miyazawa**

Topic: Input-Output Analysis: Trade and Global Value Chains Policies - II

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Since the formulation of the Environmental Kuznets Curve (EKC) at the end of the last century, several studies concerned with evaluating the relationship between economic development and environmental pollution have been developed, incorporating various factors in this analysis, such as trade openness, technological innovation, energy efficiency and economic complexity of countries. Although several studies explore the impact of each of these factors alone on environmental pollution, the literature still lacks an empirical study that seeks to systematize the joint relationship between international trade, economic complexity, and the level of environmental pollution in countries with different income levels. To fill this gap, this study analyzes the impact of international production and trade between developed and emerging countries, with different levels of economic complexity, on the pollution levels (measured by CO<sub>2</sub> emissions) of the producing nations and the receiving nations of polluting firms and/or dirty products.

We use the adaptation proposed by Fritz et al. (1998) for Miyazawa's regional trade multipliers, with data from the input-output and CO<sub>2</sub> emissions matrices, from the World Input-Output Database (WIOD), and the Economic Complexity Index (ECI), from the Observatory of Economic Complexity (OEC), for 36 countries over the period 2000 to 2014. The countries are divided into four regions, consisting of: (i) developed countries with high economic complexity; (ii) developed countries with low economic complexity; (iii) emerging countries with higher economic complexity; (iv) emerging countries with low economic complexity.

The results reveal that, in general, the more complex developed countries pollute less domestically than the developed countries with low complexity, corroborating the hypothesis that these countries have greater demand for more environmentally friendly policies and the greater complexity allows the accumulation of knowledge necessary for the development of green technologies. Furthermore, underdeveloped countries with higher complexity pollute more than less complex underdeveloped regions. This finding is in line with the hypothesis that countries with higher complexity are more industrialized than countries with lower complexity and consequently demand more energy from fossil fuels, which generates higher levels of carbon emissions.

Trade between underdeveloped countries at different levels of complexity with developed countries of high complexity generates more internal spread of pollution in emerging countries than trade with developed countries of lower complexity, which supports the assumption of pollution havens. The study advances the literature by systematically showing the mechanisms of environmental pollution propagation in the trade interaction of developed and emerging regions of the world from the perspective of economic complexity, which is tied to product sophistication and the knowledge available for the development of green technologies in nations.

### References

Fritz, O.M., Sonis, M. and Hewings, G.J.D. (1998) "A Miyazawa analysis of interactions between polluting and non-polluting sectors" *Structural Change and Economic Dynamics*, 9(3), pp. 289-305. doi:[https://doi.org/10.1016/S0954-349X\(98\)00037-X](https://doi.org/10.1016/S0954-349X(98)00037-X).