



“Gheorghe Asachi” Technical University of Iasi, Romania



DYNAMIC RELATIONSHIP BETWEEN CARBON EMISSIONS AND CLIMATE POLICY UNCERTAINTY: A DYNAMIC SYMMETRIC AND ASYMMETRIC FOURIER CAUSALITY ANALYSIS

Veli Yilanci¹, Uğur Ursavaş^{2*}

¹*Department of Economics, Çanakkale Onsekiz Mart University, Çanakkale, Turkey*

²*Department of Economics, Zonguldak Bülent Ecevit University, Zonguldak, Turkey*

Abstract

This paper tests the causal link between climate policy uncertainty (CPU) and carbon dioxide (CO₂) emissions in the United States from April 1987 to February 2022. In this paper, we use a novel CPU index recently developed and employ a novel econometric methodology, dynamic symmetric and asymmetric Fourier causality tests. The findings of the causality tests show a symmetric causality relationship from CO₂ to CPU, and a unidirectional causality runs from positive shocks of CO₂ to positive shocks of CPU. We also run the causality test in a dynamic framework to test the instabilities in the causality relationship. The dynamic symmetric causality test results show a significant unidirectional causality from CO₂ (CPU) to CPU (CO₂) for specific periods. Since different shocks may affect the causality relationship, we test the causality relationship by considering positive and negative shocks. The asymmetric causality test results show a significant unidirectional asymmetric causality from positive shocks of CO₂ (CPU) to positive shocks of CPU (CO₂) for certain periods. Finally, the asymmetric causality test results also show a unidirectional asymmetric causality from negative shocks of CO₂ (CPU) to negative shocks of CPU (CO₂) for certain periods. Based on our results indicating a significant causal link between CPU and CO₂, governments and policymakers should avoid policies and decisions that may lead to such uncertainties.

Keywords: carbon emissions, climate policy uncertainty, dynamic symmetric and asymmetric causality, United States

Received: June, 2022; *Revised final:* October, 2022; *Accepted:* January, 2023; *Published in final edited form:* January 2023

* Author to whom all correspondence should be addressed: e-mail: ugurursavas86@gmail.com; ugur.ursavas@beun.edu.tr