

3rd Annual Congress on

Pollution and Global Warming

&

4th International Conference on

Past and Present Research Systems of Green Chemistry

October 16-18, 2017 Atlanta, USA

Reassessing economic growth, carbon emissions, and the UNFCCC: A difference-in-differences approach

Eren Cifci and Matthew E Oliver

Georgia Institute of Technology School of Economics, USA

The nexus between economic growth and the environment has long been a key topic in economic and policy research. It is well understood that economic growth leads to environmental degradation in the early stages of development. However, when the current presidential administration declared that the United States would rescind its participation in the Paris Agreement on climate change despite its status as one of the leading countries in the Agreement, a debate reemerged about the effectiveness of climate agreements in curbing GHG emissions at the expense of economic growth. This work responds to this revitalized debate by reassessing the empirical link between economic growth, GHG emissions, and international climate agreements. The United Nations Framework Convention on Climate Change (UNFCCC) is considered by many as the most significant international collaboration in the fight against climate change. However, few studies on the link between economic growth and the environment control for the effect of the UNFCCC on reducing GHG emissions; therefore, empirical estimates of the impact of growth on emissions may not fully reflect the effectiveness of international climate agreements. To our knowledge, our study is the first to examine this important relationship. Specifically, we utilize a difference-in-differences (DID) model to examine growth and GHG emissions in Annex-I countries and non-Annex I G20 countries before and after the Kyoto Protocol was signed, as a proxy for the effect of UNFCCC on emissions reductions. Additionally, unlike most existing growth and environment studies, which only use carbon dioxide (CO₂) emissions as a proxy for environmental degradation, we use a broader measure of emissions which includes CO₂, methane (CH₄), nitrous oxide (N₂O), other and F-gases. We control for serial correlation, heterogeneity, and other potential endogeneity problems. Preliminary results indicate that the Kyoto Protocol agreement led to a statistically significant reduction in GHG emissions.

Pooled Estimation	T0 Model 1	T0 Model 2	T1 Model 1	T1 Model 2
Log GDP per capita	0.892*** (0.0007)	0.872*** (0.0130)	0.749*** (0.0002)	0.726*** (0.0003)
Log GDP per capita square		-7.39e-11*** (7.09e-22)	-6.35e-11*** (7.09e-22)	-6.89e-11*** (7.09e-22)
Log population	0.002*** (0.00004)	0.002*** (0.00004)	0.002*** (0.00003)	0.001*** (0.00003)
Energy Use		2.62e-08*** (7.25e-08)	7.04e-08*** (8.62e-08)	4.73e-08 (2.45e-08)
Renew Energy			-0.204*** (0.0000)	-0.202*** (0.0000)
GasOx/Share				-0.00010 (0.00010)
Constant	-0.210 (0.275)	-28.22*** (0.216)	-28.79*** (0.210)	-28.33*** (0.203)
Observations	2,280	2,724	2,724	282
R-squared	0.028	0.030	0.031	0.030

Adjusted R-squared values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1: Pooled Ordinary Least Square estimations results

Biography

Eren Cifci has completed his MA from College of Business Administration, Kent University. He wrote his MA thesis on Labor Economics. He as MS student is currently doing research in Environmental Economics at Georgia Institute of Technology School of Economics. He also would like to pursue his PhD in Economics

ecifci@agtech.edu

Notes: