

Carbon Emissions and Business Cycles - Corrigendum^{*}

Hashmat Khan¹, Christopher R. Knittel², Konstantinos Metaxoglou¹, and Maya Papineau¹

¹Department of Economics, Carleton University, Canada

²Sloan School of Management, MIT, and NBER, United States

November 17, 2024

In Table 3 of the article “Carbon Emissions and Business Cycles,” *Journal of Macroeconomics*, 60, 2019 (1–19), the forecast error variance shares of carbon emissions to policy shocks in panel C were mistakenly reported as the actual fraction (share) of the forecast error variance rather than the percentage contribution. For example, at the 20-quarter horizon, fiscal and monetary shocks actually account for 8.5% and 11.1% of the variation in carbon emissions, respectively. The values for the policy shocks should be multiplied by 100 to reflect the percentage contribution. This correction means that the contribution of policy shocks to the variation in emissions fluctuations is small but not negligible. Our main conclusion that more than two-thirds of the variation in emissions is driven by a macroeconomic shock not yet identified in the literature remains unchanged.

^{*}We thank Lilia Karnizova (University of Ottawa) for discovering the error in reporting the variance shares for policy shocks.

1 Corrections

We have provided corrections to the statements related to policy shocks in the paper and the Table 3 with the corrected panel C for policy shocks. These are as follows:

Abstract

Original text: Government spending and monetary policy shocks account for less than 1 percent.

Revision: Neither government spending nor monetary policy shocks account for more than 11 percent of the variation in emissions.

Page 3

Original text: Both shocks account for a negligible amount of the emissions FEV. Thus, neither monetary policy nor government spending shocks are important sources of the variation in emissions.

Revision: The monetary and government spending shocks account for an amount of the emissions FEV that is mostly comparable to that of the unanticipated IST shock. In other words, neither monetary policy nor government spending shocks are more important sources of business-cycle variation in emissions than the anticipated IST shock.

Page 11

Original text: Both shocks account for a negligible amount of the emissions' FEV, less than 0.11 percent. Thus, neither monetary policy nor government spending shocks are important sources of the variation in emissions. Put differently, the case for introducing monetary and government spending shocks in E-DSGE models for studying business cycle variation in emissions is not strong based on the evidence presented here.

Revision: Neither monetary policy nor government spending shocks account for more than 11 percent of the emissions' FEV. Put differently, the case for introducing monetary and government spending shocks in E-DSGE models for studying business cycle variation in emissions is not particularly strong based on the evidence presented here.

Page 13

Original text: The demand side—government spending and monetary policy—shocks account for a very small, less than 1 percent, share of emissions' variance.

Revision: Neither of the demand side—government spending and monetary policy—shocks accounts for more than 11 percent of the emissions' variance.

Table 3: Emissions: percent of forecast error variance attributed to shocks, **corrected**

Horizon	A. Reduced-form	B. Technology				C. Policy	
	GDP Choleski	NT Unant.	IST Unant.	NT Ant.	IST Ant.	Government Spending	Monetary Policy
1	2.831	4.309	5.505	7.169	0.005	2.296	1.179
2	10.617	4.619	6.406	4.535	3.339	5.206	1.330
3	19.612	4.922	6.558	4.713	8.939	6.491	1.610
4	26.065	5.585	9.234	5.479	12.602	6.248	1.757
5	29.272	6.014	9.437	5.674	14.724	6.257	2.357
6	31.734	6.091	9.684	5.896	16.409	6.588	3.560
7	33.482	6.161	9.730	6.058	17.546	6.665	4.606
8	34.677	6.215	9.811	6.192	18.552	6.712	5.740
9	35.450	6.252	9.819	6.285	19.415	6.820	6.989
10	35.954	6.277	9.851	6.353	20.152	6.885	8.083
11	36.266	6.293	9.871	6.400	20.831	6.973	8.949
12	36.449	6.308	9.903	6.432	21.457	7.095	9.654
13	36.539	6.321	9.921	6.453	22.033	7.232	10.187
14	36.567	6.330	9.935	6.465	22.571	7.389	10.559
15	36.556	6.337	9.945	6.471	23.071	7.563	10.809
16	36.523	6.341	9.954	6.470	23.536	7.747	10.970
17	36.475	6.345	9.962	6.463	23.967	7.937	11.063
18	36.421	6.347	9.969	6.452	24.365	8.126	11.109
19	36.365	6.349	9.976	6.435	24.730	8.310	11.128
20	36.309	6.351	9.982	6.414	25.063	8.487	11.130

Note: The table shows the percent of emissions' forecast error variance that is attributed to the reduced-form, technology, and policy shocks. NT refers to neutral technology and IST refers to investment- specific technology. In the case of the technology shocks in Panel B, we distinguish between unanticipated and anticipated shocks. The shocks are identified using the SVAR specifications and methodologies summarized in Table 1. The horizon is measured in quarters.