

Climate Econometrics Newsletter



Highlighted Research



Trend analysis of the airborne fraction and sink rate of anthropogenically released CO₂

Bennedsen, M., Hillebrand, E., & Koopman, S.J.
in *Biogeosciences*

Is the fraction of anthropogenically released CO₂ that remains in the atmosphere (the airborne fraction) increasing? Is the rate at which the ocean and land sinks take up CO₂ from the atmosphere decreasing? The answers to these questions are crucial for our understanding of the carbon cycle. The authors analyse these questions statistically by means of a dynamic multivariate model and find no statistical evidence that the airborne fraction is increasing, but there is evidence that the sink rate is decreasing, meaning the land and ocean are becoming less efficient at absorbing CO₂. The authors illustrate how these results can be explained by non-linearities in the relationship between the flux of CO₂ to the land sink and the level of atmospheric CO₂ concentrations.

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First-in, first-out: Driving the UK's per capita carbon dioxide emissions below 1860 levels

Hendry, D.F. in *VoxEU*

Using his own recently developed saturation estimation methods, David identifies three major policy interventions that have had an impact on CO₂ emissions levels in the UK since 1860: an Act of Parliament in 1926 that created the UK's nationwide electricity grid leading to a substantial increase in energy efficiency; the start of the switch from coal gas to natural gas in 1969 where the costs of conversion of equipment were funded; and the combination of the UK's Climate Change Act (CCA) in 2008 with the EU's renewable directive of 2009. Blog here.

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Econometric modelling of climate systems: The equivalent of energy balance models and cointegrated vector autoregressions

Pretis, F. in *Journal of Econometrics*

There is great uncertainty about future climate change and its associated economic impacts. To ensure effective policy, it is important that models try to account for the impact of human activity on climate change, and in turn, how climate affects human activity. Econometric models can and have been successfully used for this, but models estimating these links have to be supported by empirical evidence and the underlying climate physics. The paper shows how (simple) climate system models can be estimated using econometric methods consistent with physical processes. Blog here.

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Pitfalls in comparing Paris pledges

Rowan, S. in *Climatic Change*

Analysing Canadian and Russian greenhouse gas (GHG) emissions trajectories over 1990–2015, at the end of which period countries submitted their intended nationally determined commitments (NDCs) at the Paris climate conference, illustrates that both governments' choice of reference year exerted a strong influence on the apparent percentage reductions of their targets. Specifically, their chosen reference years make the percentage reductions appear larger than alternative reference years, since

national GHG emissions fluctuate throughout this period. Blog here.

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Probabilistic sea-level projections at the coast by 2100

Jevrejeva, S., Frederikse, T., Kopp, R.E., Le Cozannet, G., Jackson, L.P. & van de Wal, R.S.W. in *Surveys in Geophysics*

To better understand what drives the uncertainty, the authors reviewed the current methodology employed in making probabilistic sea-level projections. The projections considered in this review framework were based on climate change emission scenarios. While short term projections tend to project similar sea-level rises across all scenarios (from strong mitigation to business-as-usual), things get more complicated when passing 2050. Long-run projections diverge between low and high emissions scenarios primarily because it is difficult to determine what might happen to ice loss in Antarctica and Greenland, and in particular how sensitive this could be to escalating emissions. Blog here.

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Sensitive intervention points in the post-carbon transition

Farmer, J.D., Hepburn, C., Ives, M.C., Hale, T., Wetzer, T., Mealy, P., Rafaty, R., Srivastav, S., & Way, R. in *Science*

The authors propose a research and policy agenda to identify, model, and trigger “sensitive intervention points” (SIPs) in the transition to a post-carbon economy. The article describes two broad classes of SIPs: ‘kicks’ and ‘shifts’. From strategically targeting investments in low/zero/negative emission technologies with the fastest rate of unit cost reductions; to shifting the underlying dynamics of future policy decisions through legislation that creates new committees, builds accountability mechanisms, and ‘locks-in’ procedures that cumulatively ratchet-up policy ambition; to activating and mobilizing the pro-climate “silent” majority through movements, campaigns, and coalition-building; the article describes how our limited time and resources to mitigate climate change might be best mobilized over the next several decades. Blog here.

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Upcoming Events



- EGU 3-8 May, Vienna - Call for papers now open
- Climate Econometrics Summer School 20-22 July, Oxford
- Econometric Models of Climate Change Conference (EMCC-V), 27-28 Aug, Victoria, BC
- Dynamic Econometrics Conference 15-17 Sept, Bergamo
- COP26 9-20 Nov, Glasgow
- AGU 7-11 Dec, San Francisco

Articles we found interesting



This small German town took back the power - and went fully renewable

Bertie Russell in *The Conversation*

News



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