

Carbon Pricing under Uncertainty about the Economy, Damages and the Climate System



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Abstract

A stochastic dynamic general equilibrium model of the economy is integrated with a model of the climate system and used to derive optimal climate policies. We allow for uncertainties about the economy, damages and the climate system, where we have geometric Brownian motion, Poisson processes for shocks to the economy, and climate tipping points. The optimal carbon pricing strategies are derived by solving complicated partial differential equations. However, to get a better understanding we put forward a simple, tractable, and easy-to-interpret formula for the optimal carbon price. We explain how this captures various precautionary and insurance motives and offer dynamic simulations of what can be done to limit global warming. We thus conclude with relevant insights for policy makers of how to internalise the adverse effects of global warming on economic productivity, the risk of recurring disasters, and the risk of climate tipping points.

About the Speaker

Rick van der Ploeg, Professor of Economics at the University of Oxford, also affiliated with CEPR, CESifo and University of Amsterdam. His research is on the economics of climate change, energy and the economics of resource-rich economies, focusing mainly on macroeconomic growth and open economy issues, financial questions, and problems in public economic and political economy. His PhD was in Control Engineering (Cambridge, 1981) and he has research interests in economic applications of stochastic dynamic optimisation. In the past he has been at the University of Cambridge, LSE, Tilburg, VU and the European University, Florence. He has also been a Chief Financial Spokesperson in the Dutch Parliament, State Secretary for Education, Culture and Science in the Netherlands, and Vice Chair of the UNESCO World Heritage Committee. He has extensive consultancy experience with supranational organisations, governments, and private businesses.