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Collective Action in an Asymmetric World

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Abstract

A central authority possessing tax and expenditure responsibilities can readily provide an efficient level of a public good. Absent a central authority, voluntary arrangements must replace coercive ones, and significant under-provision must be expected. International public goods are particularly challenging due to the substantial asymmetries among nations. Small-interest nations have strong incentives to ride cheaply. Our empirical results reveal cheap riding intentions in providing for climate change mitigation, a critical international public good. The evidence is provided by individual nations Intended Nationally Determined Contributions voluntarily pledged for the Paris Climate Change Conference. We find that larger nations made much larger pledges in proportion to both their Gross National Incomes and their historical emissions. Implications for the Nordhaus Climate Club and carbon-tax proposals are discussed. To achieve Pareto optimality despite disparate cheap-riding incentives, we propose the Cheap-Riding Efficient equilibrium. That solution takes the Nash equilibrium as a base point, and then applies the principles of either the Nash Bargaining solution or the Lindahl equilibrium to proceed to the Pareto frontier.

Keywords: international public good, alliance, Nash equilibrium, Lindahl equilibrium, asymmetric game, climate change, greenhouse gas emissions, Climate Club

JEL codes: H4, C7, D7

1. Introduction

Prior to the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change in Paris in December 2015, the European Union and almost all individual nations had submitted their Intended Nationally Determined Contributions (INDCs). Each INDC lays out the climate action the submitter intends to take under the new international climate agreement, the Paris Agreement. An important component of the INDCs are the nations' intended reductions in greenhouse gases (GHGs). Despite enthusiasm for the Paris Agreement, including from economists involved, those pledged reductions (assuming optimistically that they are met) are unlikely to come close to controlling GHGs to the overall level that the scientific community

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