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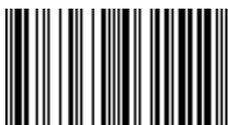
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Hypothesis for a Risk Cost of Carbon: Revising the Externalities and Ethics of Climate Change

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Abstract Standard market-based policies for addressing climate change mostly aim to internalize the Social Cost of Carbon (SCC) into the economy with either carbon taxes or cap-and-trade schemes. Standard policies are failing to manage the systemic risk of dangerous-to-catastrophic climate change for a variety of reasons. In this chapter we clarify and expand on a market hypothesis that argues for a second externalized cost of carbon, called the Risk Cost of Carbon (RCC), as the appropriate solution to this risk problem.

The combination of the SCC and RCC creates a new paradigm of complementary market pricing for the dual objectives of maximizing economic welfare and managing systemic risk, respectively. Introducing the RCC addresses the problem of how to decouple Gross World Product (GWP) from carbon emissions, and how to solve the paradox of time discounting under systemic risk. Subsequently the RCC could have major implications for climate change economics, public policy, and sustainability theory. The hypothesis is novel by taking into consideration both the entropy and the mass of the carbon budget.

The RCC is technically defined as the cost of imposing risk tolerances (%) on climate mitigation objectives, and it has units of US\$ per tonne of carbon dioxide equivalent (CO₂-e) mitigated. The RCC is internalized with a 'global carbon reward' that manages a tradeoff between market efficiency and climate certainty. The carbon reward is issued as a parallel currency, and with an exchange rate that is managed by central banks over a rolling 100-year planning horizon. A key recommendation is to test the hypothesis with experiments.

JEL Codes E5, F5, H23, I3, O19, O2, O44, P2, Q01, Q43, Q5

Keywords Climate change, Systemic risk, Risk management, Carbon price, biophysical, thermodynamics, entropy, Central bank, Monetary policy, Parallel currency, macroprudential.

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1. Introduction

The topic of this chapter is the theoretical plausibility of a second externalized cost of anthropogenic greenhouse gas (GHG) emissions, called the *Risk Cost of Carbon* (RCC), whereby the first externalized cost is already established as the Social Cost of Carbon (SCC). Chen, van der Beek and Cloud (2017) originally postulated the existence of the RCC, which they describe as the cost of managing climate risk with positive incentives guided by cost-effectiveness analysis. The possible existence of the RCC