

Stress discounting*

Frédéric Cherbonnier[†]
Christian Gollier[‡]
Aude Pommeret[§]

June 14, 2022

Abstract

Standard evaluations of public policies involve discounting the flow of expected net benefits at a risk free discount rate. Consequently, they systematically ignore the insurance benefits of policies that hedge the aggregate risk, such as enlarging capacities of intensive care and vaccine production, or implementing adaptation investments in the face of climate change. To solve this problem, asset pricing theory recommends adjusting the discount rate to the risk profile of the policy, but few countries have attempted to implement this complex solution. In this paper, we develop an equivalent approach based on the property that the value creation of a project under uncertainty equals the expected value of its state-contingent NPV, using the relevant state-contingent discount rate. In our "stress discounting" system, projects are evaluated under two polar risk-free economic scenarios, one business-as-usual scenario, and one low-probability catastrophic scenario, in the spirit of the now well-established banking regulation. Ramsey discounting should be performed in each scenario to estimate the corresponding scenario-contingent NPV, which is a simple task. The project creates a positive social value if and only if its expected contingent NPV is positive. This approach automatically values the insurance benefits of projects whose net benefits are negatively correlated with economic growth. We extend this approach to value carbon mitigation projects, combining the two economic scenarios with two polar climatic scenario. We hope that this simpler and more intuitive method will induce more countries to better integrate the key value of risk when shaping optimal public policies, in particular those with long-lasting consequences.

Keywords: Discounting, carbon pricing, rare disasters, cost-benefit analysis.

JEL codes: G12, H43, Q54.

*The research leading to this paper has received indirect funding from Ademe, Engie, EDF, Total, SCOR through TSE research contracts, and from the Chair "Sustainable Finance and Responsible Investments" at TSE. It has also been funded by the Agence Nationale de la Recherche under grants ANR-17-CE03-0010 - LONGTERMISM and ANR-17-EURE-0010 (Investissements d'Avenir program).

[†]Toulouse School of Economics, Sciences-Po Toulouse.

[‡]Toulouse School of Economics, University of Toulouse-Capitole.

[§]IREGE, University Savoie Mont Blanc.