

Comprehensive national accounting for CO₂ emissions under the polluter pays principle*

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Abstract

We examine the polluter pays principle as a rationale for the treatment of CO₂ emissions in the World Development Indicators of the World Bank. Since current emissions increase future damage, the properties of sustainability indicators depend on how emissions are compensated over time. We investigate two different interpretations of the polluter pays principle: compensating for the social cost of carbon of current emissions (PPP1) or for the current damage of historical cumulative emissions (PPP2). We show that PPP1 does not lead to the World Bank expression of genuine saving—despite having been given as its rationale—while PPP2 essentially does if countries mitigate up to the point where the marginal cost of mitigation equals the global social cost of carbon. Our empirical application to recent genuine saving data shows that PPP1 makes developing countries appear less sustainable and current large emitters more sustainable, since decarbonization will reduce the net compensations over time. Moving from PPP1 to PPP2 counteracts this effect, as payments are shifted forward in time to compensate for the future damage that emissions cause. Our empirical results support the theoretical prediction that the World Bank expression makes countries appear less sustainable than under PPP2 when mitigation is less than efficient. Still, one might caution against empirical analyses which assume hypothetical compensations according to some version of the polluter pays principle, since actual compensations would have led to behavioral change.

Keywords: Climate change, comprehensive national accounting, genuine saving, social cost of carbon (SCC), sustainable development

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