sult in a book that is highly relevant to both forestry practitioners and academics. *Logjam* provides a first-hand understanding of the complex dynamics of international forestry politics and negotiations, illustrating what has worked, and what has not worked, in international negotiations.


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In *A Question of Balance*, Yale economics professor William Nordhaus empirically estimates the costs of climate change and the benefits of policy to lessen it. He uses a sophisticated computer model that integrates economic forecasts with climate prediction, and finds that doing nothing to lower carbon emissions will cost nearly three percent of global output by 2100. He recommends a policy costing a tenth of a percent (0.1 percent) of global output, in which governments institute an increasingly higher price on carbon. This carbon price would need to be adopted via a coordinated effort across countries and time. The first chapter of the book summarizes the work in primarily non-jargon terms; later sections discuss how the model is developed and the equations on which it is based. In subsequent chapters, Nordhaus considers the costs and benefits of a number of alternative climate change policies, stresses the importance of globally-coordinated action, contemplates how to deal with uncertainty in predictions, and supports the institution of carbon taxes.

Nordhaus’ estimates of costs of not curbing climate change are markedly lower than another recent estimate using similar methodology. The well-publicized *Stern Review* predicts more dire consequences of doing nothing, costing up to 20 percent of global output.¹ The difference between Stern’s and Nordhaus’ estimates lies in part with the choice of the discount rate. For those familiar with the argument in the economics literature surrounding the *Stern Review’s* use of a surprisingly low 1.4 percent discount rate, Nordhaus’ 4 percent may be more believable. In order to keep costs to only 0.1 percent of global output, Nordhaus proposes an (admittedly ambitious) “optimal” policy in which all countries agree to institute a carbon price that increases over time, starting from $27 per metric ton in 2005. In his model this policy would yield a 2.6°C increase in temperature between 1900 and 2100, compared to the 3.1°C scenario with no policy intervention.

Nordhaus makes a strong case for putting a price on carbon. He supports the use of a tax to signal price, arguing that it is a more efficient market mechanism than subsidies would be. Taxes on carbon would provide signals to consumers so that they would have a price incentive to buy more environmentally-

friendly products. In addition, a carbon price would provide an efficient mechanism to transmit the message about the costs of greenhouse gas emissions to billions of people and entities engaged in creating the problem. To drive this point home, Nordhaus suggests that the reader should trust no politician’s commitment to curbing global warming if she or he does not advocate a price on carbon.

The methodology used to garner these predictions and prices is an “Integrated Assessment Model” (IAM). These types of models are common in predictions of the costs of climate change; the Stern Review also uses this methodology. This type of model uses economic equations to describe the macro-economy, as well as climate equations to estimate future temperature. Together these equations are used to predict how the economy will change climate and vice versa. Parameters of the model are calibrated as time goes on and more data becomes available.

Nordhaus is certainly one of the best at using IAM and has been developing his model for many years. He spends a great deal of time considering uncertainty, risks, and the robustness of results with respect to parameter values. If you are suspicious that deterministic modeling can provide accurate forecasts, however, then you will have trouble putting much faith into Nordhaus’ exact numbers. You will also have trouble accepting predictions based on any such modeling, including those found in more scientific fields. The main problem (of which Nordhaus is well aware) with such models is the vast uncertainty associated with not just the future climate, but also how economies will be affected by the future climate. Because of this uncertainty, use of such modeling is heavily contested inside economics.

Despite this problem, this estimation provides us with at least some understanding of how much we should spend to avoid further climate change. While the forecasts may not eventually prove to be perfect, the book’s primary message remains the same and is its most valid: resources devoted to curbing climate change must be reasonably balanced with the benefits gained from doing so. To act otherwise is to risk diverting resources from curing society’s other ills.

References