

Review

Reviewed Work(s): *The Global Deal: Climate Change and the Creation of a New Era of Progress and Prosperity* by Nicholas Stern

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The Global Deal: Climate Change and the Creation of a New Era of Progress and Prosperity. By Nicholas Stern. New York: Public Affairs, 2009. Pp. viii, 246. \$26.95. ISBN 978-1-58648-669-3. JEL 2009-1489

The Global Deal cannot be read in isolation. It must instead be viewed in the context of the flurry of activity across the economics and climate communities that followed the publication of the *Stern Review on the Economics of Climate Change* (Nicholas Stern et al. 2006a). The *Review* accomplished many things in many places. It brought climate change to the fore in many policy discussions, particularly in Europe. There, its economic estimates of the economic cost of warming were heralded as the last and best word on the subject even though they were clearly outliers when compared to other estimates drawn from the very same climate literature. In other places, like North America, the *Review* was essentially ignored except in the community of academic economists—a community whose mainstream was suddenly introduced to an externality of potentially enormous consequence fraught with extraordinary uncertainty. Controversy erupted in its wake as a result and served as a full-employment act for any economist who knew even a little bit about the underlying science. I think that it

is fair to say that most commentators thought that the *Review* was right when it concluded that an economic case could be made for immediate action on climate change (the point of *Review* from the very start), but most also seemed to think that it was right for the wrong reasons.

Debates swirled around many aspects of the *Review*, to be sure, but pervasive criticism of the acceptance a single very low discount in its damage calculations seemed to evoke the ire of Professor Lord Stern the most. He and his team released a sensitivity analysis as a postscript almost immediately, but to no avail (Stern et al. 2006b). Many criticized his choice of 0.1 percent for the pure rate of time preference in the main text on efficiency grounds but he responded with moral and ethical arguments (see, for example, William D. Nordhaus 2007 or Martin L. Weitzman 2007). Others objected that actual decisionmakers display time preferences in excess of 2 percent or 3 percent or even 4 percent but he asserted that their behavior was irrelevant for a global problem involving multiple generations who will inhabit the planet over the next several centuries (see, for example, David J. Evans and Haluk Sezer 2004 or 2005). Still others pointed out that discussions about pure time preference were too narrow because aversion to risk and aversion to inequality were at least as important in producing large estimates of discounted damages in an uncertain world but he was not moved to change from logarithmic utility that held both parameters at unity (see, for example, David Anthoff, Cameron Hepburn, and Richard S. J. Tol 2009).

In the face of it all, Professor Lord Stern insisted that the choice of a discount rate cannot be rationalized on the basis of observations or logical arguments driven by efficiency criteria. His selection of 0.1 percent was made on ethical grounds and he remains certain in his opinion that its application to climate change alone was justified because climate change is such a unique problem whose implications extend ubiquitously over space (every citizen in every part of the world) and time (over the next two or three or more centuries). It seems relatively clear to me, as a participant in the discussion and an observer to the personal level to which the conversations have descended, that *The Global Deal* represents Professor Lord Stern's attempt to clarify

his position—writing on a blank slate, if you will, with pages of explanation of exactly how he thinks that the climate problem might be handled most effectively and why. How else can anyone explain the subtitle: *Climate Change and the Creation of a New Era of Progress and Prosperity?*

A brief introduction to *The Global Deal* offers a little more detail about the events that followed the much-heralded release of the *Stern Review* and a concise statement of his purpose in picking up the blank slate: “I am not a campaigner; my purpose is to give careful arguments explaining why we must act, that we know how to act effectively, and that the results will give us a better world for our children and grandchildren” (p. 6). It is followed by an equally brief discussion in chapter 1 of why climate change represents a market failure of global proportions. Emissions of greenhouse gases from anthropogenic sources “constitute the greatest market failure the world has seen. Thus, at the heart of economic analysis *must be*: the *ethics of values both within and between generations*; international collaboration; an appreciation of risk; and *changes way beyond minor adjustments*, or ‘marginal increments’ in the jargon so beloved by economist” (pp. 11–12; my emphasis). And how might we come to see what to do to repair such an enormous failure? Recognize the centrality of *risk and scale* to conclude that “Standard, marginal cost–benefit analysis is appropriate for the latter kind of decisions (e.g., single investment decisions like building a new bridge). For climate change, however, the relevant economics are much more difficult and profound” (p. 13). In Stern’s world, solutions to the climate change problem must involve reducing emissions on the scale required with maximal efficiency to keep costs down *and* considerations of equity with respect to both the costs of mitigation and adaptation as well as the residual damages that cannot be avoided—considerations that necessarily incorporate differences in income, technological capacity, and historical responsibility.

The text then proceeds fairly straightforwardly through chapters that set out the challenges posed by the risks generated by climate change over time and the scale of actions that will be required to slow or reverse that change (mitigation) and to ameliorate the risks that cannot be avoided (adaptation). The second half offers

insight into policies that would be required to promote and sustain action on *the global deal* as described on pages 146–47. Under “Targets and trade,” the *global deal* calls for 50 percent cuts in world emissions of greenhouse gases by 2050 relative to 1990 levels. Since developed countries must lead the way, they must agree to immediate and binding reduction targets of 20 percent to 40 percent by 2020 and 80 percent by 2050 as developing countries demonstrate commitment to low-carbon growth through sharing technologies and creating trading and other financial mechanisms. Developing countries must take on targets by 2020 so that their emissions peak no later than 2030; and emissions from fast-growing middle-income countries must peak earlier in 2020. All of this would be supported by a “cap and trade” system whose credit allocations to developing countries would produce resource flows of between \$50 and \$100 billion per year by 2030. Under “Funding,” the *global deal* envisions public funding to promote capacity to halt deforestation at a cost of \$15 billion per year. Funds in the amount of \$5 billion per year would sustain the development, demonstration and shared diffusion of new technologies ranging from solar to future and carbon capture and sequestration. Developed countries would also invest \$75 billion per year by 2015 to underwrite the extra cost of developing sustainably in a world that is experiencing climate change.

In support of this proposed solution, Professor Lord Stern has attempted to describe many if not all of the complicated economic arguments for immediate action to slow the pace of climate change and ameliorate impacts that we cannot or will not avoid. He tries to drill down into the details of policy design and thereby identify the need for new institutions and actions. And he should be commended for the attempt—an attempt that many hoped would follow the *Stern Review* and the tempest that its advocacy tone had created.

It is important to note, however, that *The Global Deal* was written in the fall of 2008—so much had changed in the climate world since the release of the *Stern Review*. It would not be fair to suggest that he should have foreseen the fiasco that was Copenhagen in December of 2009 or the persistent stalemate that marked the at least the first six months of 2010 in the

United States Senate. But unpredictable events of this sort give me pause when I realize that he failed to incorporate some of what the climate research community had learned in the preparation of the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) when he set out to write this text. Take, for example, this simple but profound language of the Summary for Policymakers of the Synthesis Report of the AR4 that was approved unanimously in November of 2007 by all of the countries who have signed onto the United Nations Framework Convention on Climate Change: “Responding to climate change involves an *iterative risk management* process that includes *both adaptation and mitigation* and takes into account *climate change damages, co-benefits, sustainability, equity and attitudes to risk*” (IPCC 2007; my emphasis; p. 22). This is to me the fundamental conclusion of the AR4. It is clearly consistent with some of the approach adopted here; but it should have told Professor Lord Stern to think more about responding to unpredictable political and scientific events as he was framing his *deal*.

To be more specific, the *global deal*, as summarized above and described at length in the last several chapters, seems to assume that it would be possible to write climate policy for the entire century in 2008. The discussion therefore misses entirely the *iterative* nature of effective climate policy over the coming century and beyond, and so it misses entirely any discussion of what and effective flexible policy structure might require—monitoring how mitigation policies are working and how international participation is progressing, on the one hand, and keeping track of new advances in science, on the other. The text therefore lacks any adequate description of the difficulties involved in designing international and domestic institutions that could affect those adjustments while maintaining a durable overall commitment to stabilizing concentrations.

To be sure, the *global deal* devoted considerable attention to rich and developing country obligations in the near term and devoted some attention to the problems of setting national policy in places like the United States before expanding economies like China and India and Brazil sign on and well before developing countries might do the same thing. It speaks to the global budget for next

forty years or so but it identifies the appropriate share that should be borne by the United States and other developed countries without justification and without contingency. Both are value judgments and both are time dependent. Would 80 percent reductions by 2050 still be the right target for developed countries in 2025 if emissions from fast-growing countries did not peak in 2020? Would they still be correct if the science changed profoundly? Suppose, for example, that Susan Solomon et al. (2009) is right and stable but higher temperatures will be locked in for millennia by peaks in atmospheric concentrations that will likely occur before the middle of this century? In such a world, it could easily be the case that converging to a lower concentration target from above would have no effect on the long-term climate. Surely, the design of global policies even in the near term would have to change quite dramatically to accommodate such new information. In short, spending so much time describing the details of a rigid proposal made it impossible for Professor Lord Stern to devote any space to the practical working definition of “iterative”—how to frame transitional policies so that they might be effective in the long term and maximally efficient in the short term as new science and new emission-reducing patterns emerge.

Professor Lord Stern does try to adopt a risk-management approach, and he actually tries to make the case for immediate action in terms of reducing the likelihoods of some very uncomfortable futures without relying on the contentious damage estimates from the *Stern Review*. The text does, for example, speak about some catastrophic risks that loom in the dark tails of some impacts distributions; these are the low probability–high consequence events that are perhaps even difficult to quantify in either regard and about which we are unlikely to learn very much in a timely way. Unfortunately, the text goes on to assert that good policy can avoid some of these risks, and we know that is not true. Good mitigation policy may reduce the likelihood (in an unquantifiable way—another institutional problem) and good adaptation policy may reduce consequence (in ways that are site specific and path dependent); but we know from the financial meltdown and the Gulf of Mexico oil spill that hedging cannot produce guarantees.

Since the line of argument advertised in the early pages focuses on risk and the entire text shies away from the damage estimates from the *Stern Review* that attracted so much attention, it is difficult to understand why so much space was devoted to the discounting issue—an issue that is only formally applicable in that context. Discussions of discounting early in the volume turned on thought exercises that dismiss market or empirically based arguments, but they missed the more practically oriented discussion of the same issues by K. J. Arrow et al. (1995). When dismissing the position of some that market rates of interest are appropriate, Professor Lord Stern ignores the work of many who use those rates to estimate the two parameters of interest—pure rate of time preference and the elasticity of the marginal utility of consumption. Had he not missed that application, he could have noted that the second parameter was the Arrow–Pratt measure of relative risk aversion that would influence not only the denominator of discounted value calculations of damages, but also the numerator (through certainty equivalents of the sort he calculates in the *Stern Review* and inequality aversion that can reflect the implications of his person *A* versus person *B* thought experiment). Both effects can go a long way to bring damage estimates from more conservative readings of the climate impacts literature up to levels advanced in the *Stern Review*.

Discounting issues were also addressed later in the text when the cost of inaction was broached, but for questionable reasons. Why rely on estimating economic damages (the cost of inaction calibrated in what is known as the social cost of carbon) when the real value of a risk-based approach is derived in its ability to move the discussion past what the author asserts, correctly in my view, is “a very weak and unreliable peg for policy” (p. 101). The risk-based approach supports sound and transparent policy analyses and avoids starting with any attempt to work out the level at which the MSC (SCC) and the marginal abatement cost (MAC) are equalized. The alternate approach to mitigation, which Professor Lord Stern accepts here and elsewhere, “considers the appropriate targets (for policy) from the perspective of risks and costs, and seeks out the cheapest method, generally using a price

mechanism, of reaching the targets” (p. 101). MAC therefore becomes a guiding standard that can be compared qualitatively against a range of imprecise and incomplete SCC estimates as a “laugh test,” and carbon pricing problem becomes one of determining how to bring certain desirable technological advances to the fore of economic feasibility. But can MAC estimates be trusted? Perhaps, but this discussion seems to accept without question a global greenhouse gas abatement cost curve prepared by McKinsey and Company. The 2030 version is replicated on page 49 and shows significant opportunities to reduce emissions with negative costs. Since these options are not being adopted, it should be clear that significant barriers must exist; and so reliance on a price mechanism to promote abatement is quite suspect.

The details that Professor Lord Stern offers in support of this approach are most clearly gleaned from his discussion of four approaches to the mitigation problem (page 91). Risk analysis grounded in thought experiments comes first. In it, the willingness to pay to reduce likelihood of temperature increase of 3 degrees C from 50 percent (BAU) to 3 percent (500 ppm limit without overshoot) is posed as an informative number. Would it be 2 percent of GDP or 3 percent of GDP? Stern uses this question to criticize the “slow policy ramp” that Nordhaus (2008) derives from optimization exercises, but the text is mute on how to include complicating factors into the question—factors such as how the likelihood of achieving the 500 ppm limit would depend unpredictably on which countries participate in emissions reduction and when their efforts would produce peak emissions? Again, the specter of how to iterate must be confronted so that the thought exercise does not imply that we can and should write climate policy in 2008 or 2010 for the entire century.

The second approach asks people to quantify their willingness to pay for higher development rates later in the century. The uncertainty here may look to be economic but the effect of climate change on development pathways cannot be ignored. The third approach involves comparing quality of life story lines over possible futures in an effort to build qualitative contexts within which productive policy discussions can be conducted. The fourth approach finally involves

quantifying damages avoided as in the *Stern Review* and many other integrated assessment models. Instead of giving partial coverage to why estimates of damages vary so much with parameters that involve value judgments, this discussion might have complemented its concern over aggregate damage estimates with some explanation of the very clever certainty equivalent method employed in the *Stern Review* and why results from those calculations were so widely and wildly misquoted and misinterpreted. It might have also strengthened the case for the risk approach by exploring what is not and cannot be included in economic estimates.

The second approach to mitigation noted above recalled explicitly Professor Lord Stern's earlier emphasis that coping with climate change and promoting sustainable development are, to his mind, the two greatest challenges of this century. Throughout the text, he correctly notes that it is impossible to disentangle the two because climate impacts will impede development (e.g., retard or reverse progress toward achieving Millennium Development Goals) and development will influence climate change. He did, however, miss the synergy first identified in Barry Smit et al. (2001) and Tariq Banuri et al. (2001) between the underlying determinants of capacities to adapt and to mitigate with what might be viewed as prerequisites for sustainable development. Informed by this synergy, the *global deal* might have explored how to prevent developed countries from misusing these synergies in negotiations. Just as mitigation cannot rely exclusively on price signals, investment in adaptation cannot rely exclusively on development aid.

Indeed, the ancillary discussion of adaptation and adaptive capacity is particularly weak. It misses much of the temporal and spatial scale complications that are site specific (exposure and sensitivity to climate change and changing climate variability) and development path dependent (through the underlying determinants of adaptive capacity). Both imply enormous diversity that must be accommodated somehow by global and national adaptation programs that cannot be top-down; they must, instead, be supportive and flexible in providing partnerships in action and knowledge. Since much of the risks to which communities will adapt are driven by the

manifestation of climate change through changes in the frequency and intensity of extreme events, new institutions must somehow cope iteratively across a wide array of contexts. It follows that a more modern discussion would have focused on describing how to inform local, state, regional, and national adaptation plans as they respond to their specific risks contingent on how global concentrations are moving. The challenge is to provide coherent and consistent financial and collaborative support to site-specific adaptors that is durable but not inflexible.

Finally, it is unfortunate that this potentially important sequel to the *Stern Review* frequently mixes shabbily referenced bits taken from the literature with contestable statements that are offered as fact. For example, the text refers to estimates of the annual cost of adaptation authored by the Secretariat of the United Nations Framework Convention on Climate Change (\$28–\$68 billion by 2030). Stating that these estimates were based on a restrictively narrow definition of adaptation, Professor Lord Stern then asserts a working hypothesis that adaptation would cost \$50–\$100 billion annually by 2015 and as a near-term reflection of his apparently off-line assessment that these costs would “rise very rapidly into the many trillions (of dollars per year) if climate change is not managed sensibly” (p. 175). In a post “climate-gate” environment, this sort of escalation almost to the point of hyperbole without substantiation is not a contribution. What is required now, even for books like this, are carefully nuanced arguments that are always anchored on clear line-of-sight references back to original sources.

Nonetheless, *The Global Deal* does offer some insight into how one learned economist views the climate change problem. While the specifics of the deal will depreciate quickly as the future unfolds unpredictably, Professor Lord Stern does in fact make a strong case for immediate action both in mitigation and adaptation as part of a sustainable development strategy for the planet. And this time, he is right for some of the right reasons.

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World Development Report 2010: Development and Climate Change. By World Bank. Washington, D.C.: World Bank, 2010. Pp. xxi, 417. \$26.00, paper. ISBN 978–0–8213–7987–5.
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As the countries of the world wander in aimless directions trying to discern a viable climate change policy, the World Bank has jumped into the fray and announced that it is ready and eager to engage in mitigation and adaptation activities in developing countries on behalf of donor countries. Perhaps not as a surprise, the *Report* endorses dramatic and immediate expenditures to solve this global problem. There is no original research in this *Report*. Rather, it is a selective compilation of findings from both refereed sources and casual publications that support a policy of aggressive near term mitigation of greenhouse gases and adaptation responses. The *Report* argues that anything less than stringent and immediate emission reductions would lead to catastrophe and that the program is both affordable and feasible. The *Report* ignores more modest policy responses as the failure of "gradualist" thinking, in short, economics.

The arguments of the *Report* appear to be wrapped in pure science. The *Report* begins with the link between manmade emissions of greenhouse gases and rising temperatures. Subtly interwoven in this narrative of cause and effect, however, is a collection of unsupported claims that are more fanciful than factual. For example, the *Report* claims on page 5 and elsewhere that even a 2°C warming above historic levels (a little more than a 1°C warming above current temperatures)