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## Comment Alex Bowen

### Introduction

This chapter by Branstetter and Pizer offers a very good and fair appraisal from a US perspective of the background to and prospects for international negotiations on reducing emissions of greenhouse gases. The chapter's insights benefit from the authors' firsthand experience of participating in policy formation, which has led them to extol the virtues of creative ambiguity in international negotiations. It concludes that there will be, in David Victor's phrase, "variable geometries in participation" in future collective action to mitigate climate change. This analysis recognizes that there is room for "coalitions of the willing" and the evolution of broader-based collective action over time. It leads to a more sophisticated and nuanced conclusion than the recently popular claim that the search for global top-down agreements is likely to be replaced by bottom-up measures by citizens' groups and nation states in isolation.

As far as the ultimate prospects for halting human-induced climate change are concerned, the authors are perhaps surprisingly optimistic at a time when global greenhouse gas emissions may be rising faster than ever<sup>1</sup> and revised long-run prospects for emerging-market economies are outweighing the

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1. The International Energy Agency estimates energy-related carbon dioxide emissions to have increased by over 5 percent from 2009 to 2010 (press release, May 30, 2011).

depressing effect of the world's economic slowdown.<sup>2</sup> They write that "it is our view that the United States will eventually enact comprehensive climate legislation." "Even Kyoto critics . . . concede that they will most likely result from a strong, broad-based agreement with legally binding targets." "The vast majority of US industry would be largely unaffected by carbon regulation in the short run."

I want to discuss four issues that the chapter raises in my mind. First, what is one to make of the apparent conflict between simple economic logic and political reality that the authors suggest exists? Second, what will the key lines of fracture be among nations in the future as they grapple with anthropogenic climate change? Third, what are the costs and benefits of a gradual ramp-up policy versus a "big bang"? And, finally, what are the consequences of the "variable geometries" approach?

### **The Apparent Conflict between Simple Economic Logic and Political Reality**

The authors suggest that while simple economic logic might argue for a global unified approach, political reality points toward a future of fragmented carbon regimes. This echoes Elinor Ostrom (2009), who, in a recent paper for the World Bank, discusses what she calls a "polycentric approach" for coping with climate change. Similar to Branstetter and Pizer, she notes that "[t]he classic theory of collective action predicts that no one will change behavior and reduce their energy use unless an external authority imposes enforceable rules that change the incentives faced by those involved." But she goes on to point out that "[t]wo broad grounds exist for doubting whether sole reliance on the conventional theory of collective action is a wise scientific strategy. The first is the weakness of empirical support for the conventional theory of collective action. . . . The second is the existence of multiple externalities at small, medium, and large scales within the global externality that has been of primary concern in the academic and policy literature" (Ostrom 2009, 32).

Charles Kolstad (2011) also takes issue with apparently simple economic logic, drawing attention to the apparent willingness of individual countries to go it alone in tackling transborder environmental issues in the absence of a comprehensive international environmental agreement. He observes that experiments to examine the incidence of free riding, together with casual empiricism in the real world, suggest that far more cooperation takes place than conventional theory would predict. But if one broadens the concept of utility to allow for the possibility of "impure altruism" (Andreoni 1990), these empirical observations make more sense. There may be much more scope for international climate cooperation than conventional economic wisdom suggests.

2. See Blanford, Richels, and Rutherford (2009).

Certainly, it is striking that a substantial range of climate-change mitigation actions are being planned by small countries, both developed and developing, without an overarching legally binding agreement in place (or, indeed, even on the horizon). By some calculations, pledges before and immediately after the Copenhagen Conference of 2009 amounted to pledges to cut emissions by some 15 percent from business-as-usual levels by 2020 (Stern and Taylor 2010). Admittedly, these pledges are not legally binding, but they were unlikely to have been made without the conference to concentrate minds and cast the glare of international publicity over countries' aspirations. So perhaps there is good reason for a degree of optimism about the future growth of such policies. The more general message is that if simple economic logic appears to contradict political reality, it is a good idea to review the apparent logic—and the choice of axioms and simplifications used to model economic actors' behavior.

### **What Will the Key Lines of Fracture Be among Nations in the Future?**

That brings me to the next issue: who are the key economic actors and what are their interests? I was rather surprised at this chapter's focus on the divide between developed and developing countries and emphasis on the West versus the rest. That may make sense if one is sticking to a global, top-down view of nation states attempting to negotiate a global agreement, and it reflects the Kyoto Protocol distinction between Annex 1 countries and the rest. But in a more polyvalent world of variable geometries, one might well want to look beyond the veil of the nation state and ask, how would various climate-change policies affect returns to capital, labor, and owners of various natural resources, and how are these factors of production distributed across countries?

In the climate-change domain, the distribution of ownership of fossil fuel resources is a key issue. I am struck by how one piece of simple economic logic, Hotelling's insight into the pricing of exhaustible natural resources, has barely been taken on board in the climate-change policy literature, despite having a long pedigree in the theory—for example, it is not discussed in the JEL article that Branstetter and Pizer cite (Aldy et al. 2010). But back in the 1980s, Hans-Werner Sinn introduced the “green paradox,” by which efforts to support renewable energy development might accelerate fossil fuel depletion and increase emissions (see discussion in Sinn 2008). The relevance of exhaustible resource theory for climate change has been elaborated by a number of authors, such as Michael Hoel (2009) in a fascinating paper entitled “Bush Meets Hotelling.”

Yet the Organization of Petroleum Exporting Countries (OPEC) and Russia have in some sense been the “dog that didn't bark” in international negotiations. If world carbon prices follow the trajectory integrated assessment models suggest is necessary to keep below the 2°C ceiling on global temperature increase to which the vast majority of countries have signed up,

fossil fuel prices will be depressed. As a recent European Bank for Reconstruction and Development (EBRD) report explained very clearly (EBRD 2011), the oil and gas exporters of the former Soviet Union stand to lose a huge amount from adverse changes in their terms of trade. And the integrated assessment models may themselves underestimate the height to which carbon prices may have to rise to choke off fossil fuel consumption. As far as I am aware, hardly any of them incorporate a Hotelling effect in their structure.

I would, therefore, have liked to have heard more from the authors about the role of fossil fuel interests in international climate-change policymaking—not just OPEC’s and Russia’s roles in international negotiations but, for example, the role of coal owners in US climate-change politics. That role is pertinent to the question of whether Europe and the United States are likely to be on the same side of the policy divide in the future, or whether Europe will be lining up with other fossil fuel-poor countries against countries such as the United States, Canada, Russia, Saudi Arabia, and Australia. More generally, economic analysis of international policy should consider who the key stakeholders are and what motivates them, looking behind the veil of the nation state if necessary. In effect, that is what Heckscher, Ohlin, and Samuelson did in international trade theory.

### **Comparing “Ramp Up Policy Gently” and Going for a “Big Bang”?**

That links to the third issue that I want to raise. The authors argue that standard economic analysis suggests that the efficient pricing path involves setting carbon prices relatively low to begin with, but rising over time. But the natural resource pricing literature suggests that one may have to start with much higher carbon prices, high enough to drive fossil fuel rents to zero. Even if one regards the Hotelling-based argument as a theoretical curiosity, despite the empirical insights to which it has given rise, there is a debate to be had over what “relatively low” means.

If one is a proponent of using a very low pure rate of time preference in discounting costs and benefits from public policies, the logic dictates starting with a higher carbon price than otherwise that rises less rapidly thereafter.<sup>3</sup> The transition of the capital stock to a low-carbon mix would still be gradual, because of replacement cycles and time to build, but it would be faster than with market-interest-rate-based discounting. The UK Committee on Climate Change reckons the United Kingdom needs a carbon price of £30 per tonne CO<sub>2</sub>e by 2020 if it is to meet its emission reduction target, which itself is designed to be consistent with European commitments to the 2°C ceiling (Committee on Climate Change 2011). Modeling exercises to calculate price trajectories consistent with the 2°C ceiling suggest that

3. This is the approach adopted in Stern (2007). It is controversial, but has a long pedigree in welfare economics.

a price of anywhere from \$13 to \$263 per tonne is necessary by 2020. This distribution suffers from sample selection bias because it excludes the results of studies that imply that it is infeasible to keep below the ceiling. Working back to the present using a real social discount rate of, say, 3 percent (plus a factor to reflect the decay of greenhouse gases from the atmosphere) would yield, for most modeled price trajectories, a current carbon price of more than a few dollars.

I concede that, in the immediate future, while many countries face high levels of involuntary unemployment, trying to induce rapid structural change is risky. But there are ways in which the economic slowdown can be turned to the advantage of climate-change objectives (Bowen and Stern 2010). Whether gradually increasing the carbon price from a low base, so that people barely notice, is compatible with the changes in consumption and investment patterns that would reduce emissions is a moot point. Such an approach might also raise doubts about political commitment to the carbon-pricing regime over the long term. The alternative big bang approach can be seen as a way of demonstrating commitment and establishing the reputation of the policy authorities.

More generally, there is a question of how rapidly to bring in any new international policy regime. Does it make sense to do things by halves? Do some aspects of the regime necessarily require a step change? The literature on policy reform and sequencing after the fall of Soviet communism may have something to teach climate-change analysts.

### **Should National Policies Adopt the “Variable Geometries” Approach?**

Finally, there is the question of whether the variable geometries approach is applicable nationally. In my view, there are significant dangers in a domestic pick-and-mix approach to tackling climate change. Growing recognition of the threat of global climate change has drawn attention to several important market and policy failures in addition to the central environmental externality of greenhouse gases, including spillovers from innovation, network economies, information asymmetries, moral hazard from policymakers' difficulties in precommitting, and economically inefficient tax systems.

These failures have not now been recognized for the very first time, of course. But their costs now need to be reassessed. If the climate threat can galvanize action across the board, there is clearly scope for a Pareto-superior outcome, if the appropriate side payments—to developing countries and fossil fuel owners, for example—can be arranged. This is why the World Bank, the Organization for Economic Cooperation and Development (OECD), and others are emphasizing the virtues of green growth. But this requires improved policies on several fronts. In this connection, it would have been interesting to learn the authors' views about the state of play in international discussions about low-carbon technology transfer, intellectual

property rights, transnational energy infrastructure, and “measurement, reporting and verification.”

However, siren voices have been suggesting that effective mitigation can be brought about largely by supporting low-carbon R&D. The advice is to soft-pedal on carbon pricing. Yet a range of studies (e.g., Fischer and Newell 2008) make clear that the overall costs of mitigation are likely to be much higher if we do not use all the tools in the toolbox. That does not seem like good politics, let alone economics. And many national policy mixes are piecemeal, not designed as a whole, and likely to be far from cost-effective. The OECD (2011) has amply made that point with respect to the United Kingdom. On some calculations, the implicit carbon price in the United Kingdom varies across sectors and uses from zero to nearly £250 per tonne CO<sub>2</sub>e.

The fact that this conference took place at the Bank of England provokes the thought that environmental policymakers could take a leaf out of the monetary policy book to create a more robust and coherent domestic policy mix. One option would be to give a single public authority constrained discretion to pursue national emissions targets, using a defined set of delegated policy instruments. In the United Kingdom, for example, the Secretary of State for Energy and Climate Change could consider handing over carbon pricing and feed-in tariff rates to the Committee on Climate Change.

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