CAN MARKET MECHANISMS AMELIORATE THE EFFECTS OF LONG-TERM CLIMATE CHANGE?

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Abstract. Land prices, insurance rates, future markets, mortgage terms, and other market mechanisms may be expected to guide short-term economic response to climatic change as its effects become apparent to investors. On the other hand, the pervasive influence of discount rates on investment decisions makes it unlikely that the market will give satisfactory guidance to investments that must be undertaken long before the appearance of the climatic effect they are intended to mitigate. For this reason, only government is likely to undertake such long-term investments as large civil works intended to modify hydrology (irrigation, seawall dikes), and research and development in agriculture or other technologies which need to be adapted to new climatic conditions, while the effects of climate change are still distant and uncertain.

Decisions regarding very large 'macroprojects', as well as decisions which determine the siting of installations that have long-term consequences for the environment (e.g., dump sites for disposal of long-term hazardous wastes) should carefully consider the effects of climate change regardless of current market signals. Strategic planners for government and industry should take steps now to identify those decisions for which planning is now beginning, and which need to take into account the effects of long-term climate change.

Scientific research on long-term climate change has predicted global changes which are of immense significance but of uncertain nature, geographical distribution, and timing. Worse yet from the point of view of policy makers, most of these effects will not be felt for decades or even centuries – a time horizon very poorly matched to that of human decision making. Yet it is hard to think of any issue, except nuclear war, that is of greater importance to future generations.

Whatever the success of measures to minimize the emission of greenhouse gases, it is clear that adjustment to the Earth's new climate will be one of humanity's major problems of the 21st Century and beyond. It is thus reasonable to ask whether this adjustment will take care of itself through the automatic workings of the marketplace, or conversely whether specific policy interventions will be required to mitigate the costs of this adjustment.

Market-Driven Adjustment to Near-Term Climate Change

If the impact of climate change were already apparent, the workings of the market might well be adequate to guide private investors to adjust to the new situation. As

the consequences of climate change worked their way through the economy, people and capital resources would move away from areas which suffered from the changed situation toward areas that have benefited.

Real estate prices, for example, would reflect the prospective new climate and sea level. Beach properties due to be submerged would be decreased in value, as would farms newly exposed to drought. Conversely, towns near the new shoreline would increase in value, along with land in deserts that were about to become well-watered. Insurance policies and portfolio diversification would make it possible for investors to hedge against uncertainties regarding the extent and geographic distribution of anticipated climatic change. Insurance premiums on buildings affected by the newly increased frequency of hurricanes, storm surges, and other climate extremes would increase. Future prices of crops due to increase in scarcity would increase, while those of crops likely to become plentiful would decrease. Farmers would adjust their production technology and their marketing practices to accommodate the new patterns of temperature and rainfall, including the increased variability in climate and the consequent increased likelihood of closely spaced repetition of years of drought and flood.

As is the case with any great economic change, the major social adjustment to climate change will be through the movement of people from areas which are hurt by climate change to areas which benefit from it. Adjustment will thus indeed take place, albeit frequently at great human cost. Experience with natural disasters such as earthquakes shows that poor and marginal people caught in areas unfavorably affected by climate change are likely to lack the resources to respond, and for this reason will be hurt the most. This principle is likely to hold internationally as well as within nations. Miami Beach can afford to invest in seawalls to protect its investment in tourism – but Bangladesh may well be unable to afford by itself the investments needed to protect its people from flooding and storm surges. And the Maldives Islands may be hard put to protect themselves from being totally submerged.

Foresight, and in this way assist even medium term adjustment to climate change. As facts become available, prudent investors would take advantage of the low prices of farmland and vacation sites that are about to increase in value, while divesting themselves of farmland that was about to become subject to drought, or shore properties that were due to be submerged. (Some of them would no doubt do so at the expense of the totally uninformed, or by inducing panic selling of assets which still retain value – another example of the human cost of adjustment by purely market mechanisms.)

It is less clear, however, whether the market can effectively address those consequences of long-term climate change which are still distant in time and whose timing, magnitude and geographical distribution are still uncertain. For example, will market-driven decisions regarding long-lived infrastructure whose operating life will extend long into the 21st Century be influenced by the prospective impact of climate change? In addressing this question, we shall also identify some types of