Introduction: changing climate, changing economists?

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Climate issues have only recently become of interest to disciplines outside climatology. Up until the late 1970s, historians, geographers and economists rarely touched on the subject.¹ In 1988, politicians seized the occasion of a meeting of the G7 and the General Assembly of the United Nations to introduce it into their discourse and to officially solicit economic expertise on the matter. Ten years later, 172 countries signed the Kyoto Protocol, setting a timetable for reducing the emission of six greenhouse gases, together considered to be the main cause of global warming over the last 50 years. The role of economists has grown constantly since then, to such a point that their discourse seems to have gained equal pertinence to that of climatologists on the subject today (Hirshleifer, 1985). Economists do not generally work in a hybrid manner, as their approach to the fields of sociology, anthropology and law bears witness. They typically adopt their economic methods and apply them to their subjects of study. This volume is not only another occasion for climate economists to develop their analyses and formulate recommendations; it is also an opportunity to reconsider all that is at stake with their appropriation of this field.

Ten years after the signing of the Protocol, the results obtained remain a far cry from the exhortations of Kyoto. What was the role of economics in the scientific and political debates of that period? Although at the origin of international negotiations leading up to the Protocol, climatologists quickly found themselves pitted against economists whose authority in the field no longer seemed to be questioned. Economists’ positions on climate change have become dominant. In general, they are hostile to the rapid reduction of emissions; they usually favour applying taxes. How has economic discourse come to have such legitimacy in the climate debates?

A first response can be found in the probabilistic approach and statistical methods that economists diffuse at the political level, and which appear to be so user friendly to politicians. Serving as a governmental tool since the eighteenth century, statistics has become the ‘instrument of proof’ since the nineteenth century and its closer linkage with probability theory

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Changing climate, changing economy (Foucault, 2004; Desrosières, 2008). In climate analysis, statistics is used only after the climate models have produced enough results and the data have been registered in a workable form.

In the 1950s and 1960s, weather forecasting was explored using physics-based models describing the movement of the atmosphere and the water cycle from ocean-surface evaporation to the formation of precipitation. Developed with a view to meteorological applications, these models were then applied to climatic time scales of a month and more. The forecasts involved average values rather than the monitoring of individual perturbations. The first experiments conducted in the 1960s confirmed that these models were capable of simulating the main characteristics of the climate. Whereas weather is measured in terms of temperature, pressure, precipitation, wind, dew-point or visibility, climate is described in terms of averages, frequencies and extremes. Climate data are therefore available in the form of statistical series. Economists take part in the process of quantification of weather phenomena by expressing in numerical form what had been expressed in words. This is not a neutral transformation. It requires the prior creation and explicit formulation of equivalence conventions, involving comparisons, codified and reproducible negotiations and calculations leading to the numerical expression. Measurement in the strict sense of the term comes afterwards, as the regulated implementation of those conventions. Things are supposed to exist in measurable form, like the height of a mountain. Measurement is the second stage of quantification, once the convention has been established among researchers (Desrosières, 2006).

Economic discourse is influential, because it is predisposed to normativity and adapts easily to one of the key factors of climate study: uncertainty, a concept about which economists have constructed a powerful body of literature (Pradier, 2006). In the field of climate study, uncertainty has certainly not diminished: when asked how the surface temperature of the planet is going to evolve, environmental scientists give more or less the same answer today as the US National Academy of Sciences did in the 1970s. A doubling in the concentration of CO₂ could lead to a rise in temperature of somewhere between 1.5 and 4.5°C. In one sense, as Thomas Schelling points out in Chapter 1, uncertainty is in fact greater now, for two reasons: first, because it takes a good deal of courage to propose estimations that diverge from the ones that have been accepted for the last 30 years, and second, because the mechanisms of climate have turned out to be much more complicated than expected. The factor of 3 (from 1.5 to 4.5°C), by which estimations vary, stems largely from the way the role of the oceans and clouds is dealt with. Thomas Sterner (Chapter 4) reminds us that not everything is uncertain, such as the impact of greenhouse gases.
on temperature increases. The highest degree of uncertainty, however, is found in the economic costs of climate change.

To what extent do the concepts and methods developed in economics offer the appropriate analytic tools for understanding the situation and the best normative benchmarks for determining action? A detour through the history of economic thought can help answer that question. Olivier Godard (Chapter 2) invites us to look at economists’ ambition to discipline the climate study fields using the most general concepts and models, which were created in other contexts to resolve problems such as price information, market imperfections or asset pricing. From a mainstream view, the environmental issue can be considered as nothing more than a problem of restoring optimality in the allocation of goods between agents with incompatible demands. There exist at least two branches of economics that do not agree with this standard analysis: ecological economics and socio-economics. Nonetheless, it is the recommendations of the dominant economic worldview that are heard over these branches and adopted by policy makers.

The contrast is strong between the time scale – a half-century or more – of such policy recommendations and growth. This challenge for researchers, used to basing their studies on a production–consumption cycle of goods and services in a market in which supply and demand adjust quickly, forces economists to find an appropriate framework in which they can build and develop their approach. Michel Armatte (Chapter 3) questions the methodology of scenarios. Overall, they answer the needs of the scientific, political and NGO communities in terms of both the production of assessments and the negotiation of mitigation and adaptation policies. The division of labour between these communities responds to a demand for policy assessment, which prevails over purely epistemological rationales and over the organization of the supply of scenarios, models and results to meet that demand.

Scenarios decontextualize the climate question, reducing it to issues of calculation to such an extent that the policy recommendations it produces are in some way ‘locked’ in to the economic argument. Economists, for instance, discount future costs and benefits at a positive rate. Reducing global carbon emissions or investing in technologies for mitigating global warming would involve huge costs now, but the benefits from averting economic disruptions would only be enjoyed in 50 years’ time or more. When economists evaluate public projects, they typically use long-term interest rates on government bonds to discount future benefits and costs, which they consider to be the ‘opportunity cost of capital’. The expression refers to the rate of interest that could be earned by investing in government bonds rather than in the project whose benefits and costs are being
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evaluated. If you discount, for instance, at 4 per cent a year, a dollar’s worth of additional consumption benefits 100 years from now would be worth less than 3 cents today. This is another way of saying that as the price for giving up one dollar’s worth of consumption today, you would expect to have more than 30 dollars’ worth of consumption benefits available 100 years from now. Economic models of climate change have shown that if you use an annual discount rate of, say, 4 per cent, the negative benefits are greater than the sum of the discounted benefits from curbing net carbon emissions. Doing something about climate change now, the calculations imply, would be to throw money away.

Discounting appears to suppress the concerns raised by environmentalists involving future environmental damages caused by human activities today. This has led some people to reject the concept of discounting, or more generally of cost–benefit analysis. Thomas Sterner challenges that view in Chapter 4 by demonstrating that the problem is not discounting itself, but how it is used. He brings to the fore that discounting contains two fundamental questions involving economic analysis: will growth – hidden behind this coefficient – be possible for centuries to come? How will prices behave? Generally speaking, the discounting rate mirrors the image we have of our future, and notably of our confidence level, or catastrophic posture. On this subject, Martin Weitzman (Chapter 5) places us precisely in a situation where relative risk aversion is positive (a hypothesis shared by all the integrated assessment models), and where climate change could generate a catastrophe, without us knowing the objective probabilities of that catastrophe occurring. The latter is verified, because there is no history (on the scale of several million years) of the CO₂ concentrations reaching the levels that they have today. Weitzman shows that all the conclusions of cost–benefit analyses – that we should wait before acting to strongly reduce emissions – are invalidated. This result is of capital importance.

How can we determine the level of concentration of greenhouse gases below which this conclusion – the ‘dismal theorem’ – no longer applies? Several authors have sought to define the optimal form that climate policy should take, particularly as regards the choice between taxes and quotas. These papers, based on a previous article by Weitzman (1974), conclude that taxes are better than quotas, because they would allow us to adapt the level of emissions if predictions of the cost of emissions reduction turn out to be inaccurate. In particular, taxes are still preferable even in the presence of a catastrophe if we do not know at what level of CO₂ concentrations the catastrophe might occur (Pizer, 2003). These works are nevertheless based on probability density functions without the ‘fat tails’, which are, in the above-cited article by Weitzman, due to the absence of objective
probabilities. Would taking into account this factor alter the conclusion that taxes are better than quotas?

Economics does more than just formulate policy recommendations, it emphasizes who the main victims of global warming will be: those concentrated in the developing world. As a result, it is difficult to mobilize the main actors responsible for climate change, because they do not feel threatened over the short term by the consequences. The crucial issue then, as Schelling points out, is how to make the recommendations agreed by the international community enforceable. On this point, it may be that we are currently witnessing a turning point in the attitude of economists. As Weitzman says, the important thing is that the authors reach the right conclusions, even if it is for the wrong reasons (Weitzman, 2009).

The contributions in this volume tend to converge on how economics should analyse climate change. Such unanimity is harder to find in the world at large, or in the part of the research world that is interested in this question. Differences of opinion often arise, not out of differences in the fundamental science, but out of differences in the economic analysis. In the final contribution of this book, the participants of the round table (Chapter 6) – including Inge Kaul, Thomas Schelling, Robert Solow, Nicholas Stern, Thomas Sterner and Martin Weitzman – try to draw lessons from these differences and suggest directions for future research and policy. As Nicholas Stern puts it, economists have no monopoly on the two key questions of the debate: how big are the damages of climate change, and how much do we care about the future? Inge Kaul suggests that global cost–benefit, along with disaggregated, analyses of climate change could answer these questions. It would reveal who the winners of a future global deal would be and the scope for making compensatory transfers to the potential losers. Economists and policy makers could then construct win–win bargains. Finding win–win solutions requires political will and the recognition on the part of the winners that under conditions of policy interdependence, national interests may often best be served through successful cooperative policy approaches at the international level. This could, in turn, put a stop to the hesitation – based on economic and political global inequity – that we see in coming to action.

NOTE

1. Among the first publications by economists on the subject is the 600-page report co-authored by Thomas Schelling in 1979: Energy: The Next Twenty Years. The report dedicated only a few pages to greenhouse gases, which have become one of the central themes in climatology today.
REFERENCES


