

Climate Change Issues and the Role of the IMF

David Henderson

Table of contents

- 1 A risky window of opportunity**
- 2 Repositioning: (i) taking a less presumptive and more accurate stance**
- 3 Repositioning: (ii) reserving judgement on the basis for policy**
 - A world-wide official consensus
 - The basis for consensus
 - Reserving judgement
- 4 Repositioning: (iii) confronting unwarranted presumptions**
 - Over-presumption: (i) going too far
 - Over-presumption: (ii) overstating the extent of what is known
 - Over-presumption: (iii) uncritically accepting a flawed advisory process
 - Panel and process
 - Policy commitment
 - Errors, omissions and lapses
 - Instances and sources of bias
 - Summing up
- 5 Repositioning: (iv) taking on a more extended role**
 - Continuity and change
 - The role of treasuries and finance ministries
 - Outline of an extended IMF agenda

Abstract

Two leading international agencies, the OECD and the IMF, are now becoming more closely involved with climate change issues, in conjunction with treasuries and finance ministries within their member countries. This broader official involvement opens up an opportunity: it could lead to a fuller and more balanced treatment of the issues. At present, however, there is little sign that the opportunity will be perceived as such. In both the agencies and national capitals, it seems to be taken for granted that ‘the science’ can be viewed as ‘settled’, and that the established advisory process which governments have created is objective and authoritative. This is not the right point of departure. In relation to these issues, a new framework is needed - less presumptive, more inclusive, more watertight professionally, and more attuned to the huge uncertainties that remain. Besides dealing with specifically economic aspects, where there is much to be done, work in both agencies should be directed more broadly to establishing such a framework.

Headings of action for the IMF

My proposals for the Fund form a sequence, from relatively modest (but significant) to more far-reaching. In headline form, they can be summarised as follows:

- **First, *back off*: define, and give expression to, a less presumptive and more accurate point of departure.**
- **Second, *reserve judgement*: a more considered point of departure, while taking full account of the established official policy consensus, should not take as given the basis and rationale for that consensus.**
- **Third, *take due note*: be aware of, and prepared to draw attention to, the strong elements of over-presumption which enter into official thinking and policies in this area. In particular, take note of the evidence that the established official advisory process, which governments – and, as it would seem, the Fund - place so much reliance on, is flawed.**
- **Fourth, and more controversially, *move in*: go ahead with actions designed to evaluate and to strengthen the advisory process.**

Climate Change Issues and the Role of the IMF

David Henderson¹

The text that follows formed the basis for a seminar presentation at the International Monetary Fund on 6 March 2008. It draws without specific acknowledgements on two recent articles of mine in the journal World Economics.²

1 A risky window of opportunity

To begin with, I would like to express my warm thanks for the invitation to make this seminar presentation at the Fund. Not only do I feel honoured by the invitation, but the occasion represents for me a unique and much-valued opportunity.

I shall use the occasion to put before you a personal view of climate change issues, and of the role that the IMF could now play in relation to them: my presentation is designed, unashamedly, as an exercise in persuasion.

I shall argue that the Fund could bring to the climate change debate a distinctive and much-needed contribution of its own: it could take the lead in framing a new approach to the issues. The approach that I have in mind would be broader, more balanced, and above all *less presumptive*. Since some of the presumptions I have in mind seem to be lodged here in 700 19th Street, Washington DC, my proposal could well imply some internal rethinking.

My subject is ‘climate change issues’, rather than ‘the economics of climate change’. True, I am an economist, not a climate scientist or a physicist. At the time when I became involved with climate change issues, by accident rather than design, towards the end of 2002, my involvement was limited to some economic aspects of the debate. Since then my interests and concerns have broadened, in ways that were neither planned nor expected by me. They now extend to the whole spectrum of climate change issues, and in particular to the treatment of those issues by governments and international agencies.

Here is a summary of my main argument, in which I refer to the OECD as well as the Fund.

Two leading international agencies, the OECD and the IMF, are now becoming more closely involved with climate change issues, in conjunction with treasuries and finance ministries within their member countries. This broader official involvement opens up an opportunity: it could lead to a fuller and more balanced treatment of the issues. At present, however, there is little sign that the opportunity will be perceived as such. In both the agencies and national capitals, it seems to be taken for granted that ‘the science’ can be viewed as ‘settled’, and that the established advisory process which governments have created is objective

¹ Formerly Head of the Economics and Statistics Department of the OECD, and currently a Visiting Professor at the Westminster Business School, London.

² ‘Governments and Climate Change Issues: The Case for Rethinking’ (Vol. 8 No. 2, April-June 2007) and ‘New Light or Fixed Presumptions?: The OECD, the IMF and the Treatment of Climate Change Issues’ (Vol. 8 No. 4, October-December 2007)

and authoritative. This is not the right point of departure. In relation to these issues, a new framework is needed - less presumptive, more inclusive, more watertight professionally, and more attuned to the huge uncertainties that remain. Besides dealing with specifically economic aspects, where there is much to be done, work in both agencies should be directed more broadly to establishing such a framework.

Let me underline some words from that final sentence. There is indeed much still to be done on the economics of climate change, and no doubt it is under this heading that the Fund's main contribution will be made. What I am now suggesting is a further extension of its concerns and tasks.

A precedent comes to mind here. Three years ago I submitted written evidence to the House of Lords Select Committee on Economic Affairs, which was then preparing its report, published in July 2005, on *The Economics of Climate Change*. In my submission I wrote:

‘The Committee can do a great service to public discussion and enlightenment, not only in this country but across the world, by accepting and acting on a simple though admittedly contentious guiding principle. *It should treat as still open a range of issues which the [Intergovernmental Panel on Climate Change] and its member governments consider as closed.* (Italics as in the original text.)

I would make a similar proposal today in relation to the Fund – and, for that matter, the OECD.

Of course, the two situations, of the Select Committee and the Fund, are not at all the same. It presents no problem for a group of British peers, none of them either holding or aspiring to ministerial office, to question accepted positions that Her Majesty's Government have taken. For an international agency, on the other hand, any such questioning of member governments is a serious matter. As a former national and international civil servant, I am well aware that the repositioning and the enlarged agenda that I have in mind for the Fund are far from riskless. As will become clear, I am suggesting that the IMF should take positions and pursue courses of action which not one of your client departments in member countries – that is to say, treasuries and finance ministries across the world – has so far chosen to adopt. This would be no light matter. Thoughts of lions' dens and hornets' nests may come to your minds. At the same time, however, I believe that those client departments are looking to the Fund, not just for confirmation of what their governments have already decided, but also for reasoned and well-founded proposals for improving the treatment of climate change issues.

I believe that improvements are greatly needed, and that governments are in fact mishandling the issues. This mishandling has two related aspects. First, actual official policies to curb (so-called) 'greenhouse-gas' emissions too often take the form of costly specific schemes and regulations, rather than a general price-based incentive such as a carbon tax: this is a subject which I hope and expect the Fund will give a lot of attention to, as part of its review of the economics. There is also, however, a more fundamental aspect. In my view, there is good reason to question the basis and rationale of current policies – the arguments, beliefs and presumptions which have led

so many governments to take decisive action and to agree that further action is required. It is this latter aspect that I shall focus on today.

The rest of my talk comes under four headings. Under each of these, I shall set out my case for *repositioning* on the Fund's part, for redefining its point of departure and widening its range of concerns. My proposals form a sequence, from relatively modest (but significant) to more far-reaching. In headline form, they can be summarised as follows:

- First, *back off*: define, and give expression to, a less presumptive and more accurate point of departure.
- Second, *reserve judgement*: a more considered point of departure, while taking full account of what I call the *official policy consensus*, should not take as given the basis and rationale for that consensus.
- Third, *take due note*: be aware of, and prepared to draw attention to, the strong elements of over-presumption which enter into official thinking and policies in this area. In particular, take note of the evidence that the established official advisory process, which governments – and, as it would seem, the Fund, place so much reliance on, is flawed.
- Fourth, and more controversially, *move in*: go ahead with actions designed to evaluate and to strengthen the advisory process.

2 Repositioning: (i) taking a less presumptive and more accurate stance

By way of illustrating what I see as over-presumption today within the Fund, and hence my suggestion for backing off, I will take the address that one of your Deputy Managing Directors, Takatoshi Kato, delivered on behalf of the Fund to the recent mass meeting in Bali – the 13th Conference of the Parties to the UN Framework Convention on Climate Change. Had I had been asked my opinion before the event, I would have suggested two changes at any rate in Mr Kato's text.

First, here is the opening sentence.

'Climate change is the largest collective action problem that the world faces'.

This form of words is open to objection on two grounds. The first ground is over-confidence: 'may well be' is more accurate than 'is'. Second, the term 'climate change' is misused here. Along with the OECD Secretary-General at Bali and elsewhere, and in company also with the heads of the UNDP and the UNEP in a recent joint statement, Mr Kato, without actually saying so, used the term 'climate change' to refer *only* to changes arising from human activity, as though no other factors were involved. But other factors *are* involved: climate change can occur, has occurred, and may well be occurring now, independently of human activity. Hence this use of language, though admittedly sanctioned by the UN Framework Convention and followed in the Stern Review, is misleading. The Fund should not fall into it.

Here then is my suggested alternative form of words for that opening sentence. In relation to climate change, it draws on the more accurate language of the piece in the last *World Economic Outlook*, entitled 'Climate Change: Economic Impact and Policy Responses', by MM. Jones, Keen, Norregaard and Strand. Suggested new wording is italicised.

‘Climate change resulting from man-made increases in atmospheric ‘greenhouse gas’ concentrations may well be the largest collective action problem that the world faces’.

Incidentally, while the WEO piece uses the term ‘climate change’ correctly, the authors are too presumptive in saying that it ‘presents a serious challenge to human welfare’. I would have argued for replacing ‘presents’ by ‘could present’.

Here is another sentence from Mr Kato’s address for which, had opportunity beckoned, I would have proposed some changes:

‘Early and sustained action is needed to avoid future harm, given the latest evidence emerging from the climate science and the rapid growth in global emissions projected for the coming decades without policy intervention.’

This wording too is over-confident. Further, it is misleading, in that it gives the impression that no action, or ‘policy intervention’, is currently under way or in prospect, which is far from being the case. I would have suggested:

‘Further prompt and sustained action may well be needed to avoid future harm, given the latest evidence emerging from the climate science and the rapid growth in global emissions projected for the coming decades without additional policy intervention’.

In a recent article I grouped the above quotes from these two Fund sources together with some similar high-level OECD statements. I said of these texts collectively that:

‘Like the Stern Review, they take too little account of the multiple uncertainties which still pervade this whole array of subjects and the range and depth of professional disagreements that still exist. They treat as established facts what should be viewed as no more than working hypotheses. In both the OECD and the Fund, the issues are being prejudged’.

So my opening argument today is that the Fund should back off from following the crowd. Simply in the interests of accuracy, it should from now on eschew forms of over-presumptive language that are in general use.

Aside from the above repositioning, what else can be said about the point of departure that is appropriate for the Fund? To answer that question, it is necessary to bear in mind the official policy consensus.

3 Repositioning: (ii) reserving judgement on the basis for policy

A world-wide official consensus

With few exceptions, governments across the world are firmly committed to the view that anthropogenic global warming constitutes a serious problem which requires official action at both national and international level. A recent high-level restatement to that effect was contained in the Declaration issued at the close of the G8 Summit meeting in Heiligendamm last June. In paragraph 49 of the Declaration the G8 leaders said that ‘global greenhouse emissions must stop rising, followed by substantial global emission reductions.’ In pretty well every democratic country, this official consensus is not at all a matter of political controversy: to the contrary, it enjoys general cross-party support.

The consensus is not new. Climate change issues, and in particular the extent and possible consequences of anthropogenic global warming, have been on the international agenda for 20 years or more; and it is now over 15 years since governments decided, collectively and almost unanimously, that determined steps should be taken to deal with what they agreed was a major problem. The decisive collective commitment was made in 1992, through the Framework Convention which almost all countries have ratified. The Convention specifies that its 'ultimate objective' is

'to achieve ... stabilization of greenhouse gas emissions in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.

Precisely this form of words is repeated in the Heiligendamm G8 Summit Declaration.

Since 1992, many governments have acted, at state and provincial as well as national level, and collectively within the European Union, through what is now a wide range of measures and programmes, to curb emissions, of CO₂ in particular. They have entered into commitments accordingly. Despite the limitations of what has so far been achieved, the accepted direction of policy remains clear and virtually unquestioned. Both nationally and internationally, new and far-reaching measures to curb emissions are under consideration or in prospect.

In taking this course, governments have met with widespread public approval. Prominent among the unofficial sources of support are media commentators on environmental and scientific issues, scientific bodies including the Royal Society, environmental NGOs, and, increasingly, large business enterprises. Further, there is strong public support for the consensus position among economists, as evidenced for example in the Stern Review and the list of those (including four Nobel prizewinners) endorsing it; in a public statement of December 2005 by 25 leading American academics; and in a similar recent statement signed by 271 university economists in Australia.

Given the history and the situation as thus outlined, I think it is both inevitable and right that the Fund, in line with the other international organisations which have been involved over a longer period with climate change issues, should take the official policy consensus as given: for the IMF as for other agencies, what your member governments have agreed has to be the basis on which your own work goes ahead. Let me emphasise that the less presumptive and more accurate use of language, which I have just suggested for the Fund, would not in any way put in question the policy consensus.

However, when it comes to the generally agreed basis and rationale for policy, what the Fund should take as given is more open to debate. Hence my suggested slogan under this heading, 'Reserve judgement', which I will now expand on.

The basis for consensus

What was it that persuaded governments across the world, more than 15 years ago, to take the possible dangers of anthropogenic global warming so seriously, and what is it

that has caused them to maintain and even intensify their concerns? I think the answer is straightforward. From the start the main influence was, as it still is, *the scientific advice provided to them*.

That advice can and does come from many sources; but the main single channel for it, indeed the only channel of advice for governments *collectively*, has been the series of massive and wide-ranging Assessment Reports produced by the Intergovernmental Panel on Climate Change (IPCC). The first of these, which appeared in 1990, formed the basis for the negotiations that led up to the drafting of the Framework Convention; and the three successor reports that have been prepared since 1992 have served to lend further support to the consensus then established. The last in the series, referred to for short as AR4, was completed and published in the course of last year. As with earlier reports, it chiefly comprises the massive separate volumes issued by each of the Panel's three Working Groups. Between them these three volumes, each with its own Summary for Policymakers, come to around 3,000 pages, and some 2,500 experts – authors, contributors and reviewers – were directly involved in preparing them: I refer to this small army of participants as the IPCC *expert network*.

The IPCC does not itself undertake or commission research: the Assessment Reports review and draw on the already published work of others. Most of this work is financed by governments, and the governments concerned thus have their own sources of information and advice: their thinking and actions do not necessarily depend on what the Assessment Reports have said. In the British case, for example, the Stern Review drew directly on already published scientific work, rather than on the draft texts of AR4 which were then becoming available. It may well be that if governments had never created the Panel official policies in most countries would have evolved in much the same way, in response to much the same advice. The work of the IPCC forms one element in the advisory process, but not by any means the whole of it.

All the same, the Panel is influential and important in its own right. Its reports carry substantial weight, with public opinion as well as its member governments, because of their wide-ranging coverage of the issues, their extensive and ordered scientific participation, the extended review process that they go through, and the fact that the Panel alone is authorised to serve and inform the world as a whole. Its special place in the scheme of things has been widely acknowledged. In their Summit Declaration, the G8 leaders explicitly referred to IPCC reports as a prime source. More recently, the work of the Panel has received further and conspicuous international recognition through the award of the 2007 Nobel Peace Prize, which it shared with Al Gore. It is standard practice to cite the IPCC as an authority, as both the OECD Secretary-General and Mr Kato did in their respective Bali presentations.

Through its three working groups, the IPCC covers the whole spectrum of topics that are raised by the subject of climate change, including economic aspects. However, the central element in the body of advice which it provides, and which so many governments have relied on, relates to the scientific aspects which are reviewed in the reports from its Working Group I. Commenting on the latest of these reports, at the time of its release just over a year ago, a leading British climate scientist, Professor Mike Hulme, said that it 'presents an authoritative assessment of the scientific understanding of climate change as a physical phenomenon'. This in particular is

what the 20-year process of inquiry by the Panel, and the large and growing body of work that it draws on, is seen as having chiefly contributed. The WGI scientific assessment, and the published work that entered into it, are taken by governments as both authoritative and conclusive.

Reserving judgement

Given past history and the confidence so widely placed in the key science-related messages, as conveyed most recently in AR4, it is easy to explain the strong assertions that I queried above on the part of leading officials in the Fund and the OECD. Both organisations appear to be taking it as given, and as not to be questioned or even considered within the studies they have now embarked on, that the established official policy consensus is well grounded on scientific findings that can no longer be seriously doubted. In so concluding they are in line, not only with other international agencies, but also with their official clients in treasuries and finance ministries. All the same, I hold that this is not the right point of departure for either agency (or for the clients). I believe that today's widely shared presumptions concerning the scientific basis of policy go further than is either necessary or wise.

Such a judgement may itself appear as highly presumptive. Why (you could well ask) should acceptance of widely received scientific opinion be placed under the heading of 'undue presumption'? Why should the Fund officials who are now becoming more closely involved with climate change issues, who with few exceptions are not scientifically knowledgeable and who have an exacting agenda of their own, spend time and energy trying to second-guess the considered scientific advice that their governments have commissioned and accepted? Why not simply ensure a due division of professional labour, and adopt as the agreed point of departure for the Fund's economic studies what is widely taken to be an established scientific consensus?

A similar line of questioning was put to me not long ago, in a more directly personal way, by a much respected fellow-economist. He wrote, with manifest signs of incredulity:

'You have formed the clear and strong view that what is overwhelmingly the opinion of the relevant scientific community in all of the leading countries is wrong. I do not see that there is a rational basis for an outsider to the science taking the view that the weight of established scientific opinion is probably wrong.'

In commenting on my colleague's remarks, some substantial rewording is called for. First, my position is not as he stated it. I have never argued, I do not argue now, that 'the science' is 'wrong': there is a clear and well recognised difference between questioning and denial, between being an agnostic and being an atheist. Further, his reference to scientific opinion as 'established', which implies permanently settled beyond question, is not appropriate. 'Prevailing', 'dominant' or 'generally accepted' are more accurate terms, and from now on I shall use the first of these.

All the same, my colleague would be justified in asking, no less pointedly, a reformulated question. What grounds can a layman and an outsider have, first, for taking an agnostic and questioning view on matters that fall outside his own sphere of

expertise, and where there appears to be a professional consensus, and second, for arguing that, even against the 20-year history just sketched out, key government departments and international agencies should now be ready to do the same? What reasons can be given for thinking that the prevailing scientific opinion, which provides the point of departure and the main justification for a world-wide policy consensus, should be treated as less than authoritative?

In the section that now follows, I respond to these pertinent questions. I believe that my dismissive professional colleague, along with the OECD Secretary-General, Mr Kato, Nicholas (now Lord) Stern, and received opinion generally, is presuming too much. I hold that the Fund, *without departing from the official policy consensus, and without taking the position that 'the science' is wrong*, should not go so far as to align itself with currently received opinion. Rather, it should take due note of the ways in which climate change issues are subject to mishandling through acceptance of unwarranted presumptions.

4 Repositioning: (iii) confronting unwarranted presumptions

Within the generally received opinion of today, three interrelated leading elements are:

- (1) That the official policy consensus, as interpreted today by governments and international agencies, mirrors prevailing scientific opinion and goes no further than that opinion would warrant.
- (2) That prevailing scientific opinion must now be viewed as no longer open to serious question.
- (3) That the process of review and inquiry from which prevailing scientific opinion has emerged, and in particular the IPCC process as its leading element, are professionally above reproach.

.All these beliefs are unfounded. They betray respectively a lack of awareness of the present extent of overstatement, over-confidence, and ingrained bias.

Forms of over-presumption: (1) going too far

On the part of well placed persons and institutions, official and unofficial, it is common to find highly-coloured and presumptive assertions which go well beyond prevailing scientific opinion as reported in the text of AR4. Here are a few characteristic instances:

- Tony Blair, as British Prime Minister, together with his Dutch counterpart, in a joint letter of October 2006 to other EU leaders: 'We have a window of only 10–15 years to take the steps we need to avoid crossing a catastrophic tipping point'.
- President Sarkozy of France, in some remarks last year shortly before his election to office: 'what is at stake is the fate of humanity as a whole'.
- The Secretary-General of the UN, Ban Ki-moon, writing in the latest *Human Development Report* (p. 23): 'Climate change threatens the whole human family'.
- Nicholas Stern, writing in *The Guardian* (30 November 2007): 'We risk damage on a scale larger than the two world wars of the past century'.
- Just before the Bali meeting opened, 150 business leaders placed a double full-page advertisement in the *Financial Times* with what they termed a 'Bali

communiqué'. In this document they asserted that : 'There is no doubt that the fate of our civilisation hangs in the balance'.

Such assertions are specimens of what I have termed the *heightened milieu consensus*. All of them, and countless others of their kind, purport to be statements of fact; but in reality they are no more than conjecture. They represent extrapolations, not direct well-founded inferences, from AR4 and the array of studies that it draws on. Although they do not accurately mirror prevailing scientific opinion, they have now become widely accepted presuppositions of policy. One illustration of this kind of official thinking is that some governments, including my own, have seen fit to distribute to schools, as an officially recommended source, Al Gore's film, *An Inconvenient Truth*.

Interestingly, assertions such as those I just quoted have been criticised by Professor Hulme, speaking in 2006, as forms of what he called 'a discourse of catastrophe [which] is a political and rhetorical device'. Referring to the above quotation from Tony Blair, he described our then Prime Minister as among 'recent examples of the catastrophists', and said: 'The language of catastrophe is not the language of science. It will not be visible in next year's global assessment [AR4] from the world authority of [the IPCC]'.³ He went on to contrast the respective positions of the 'catastrophists' and the climate scientists.

However, while Hulme was right about the more guarded language of AR4, the unqualified contrast that he went on to draw does not hold good. While Blair may have deserved to have the label of 'catastrophist' attached to him for the remarks just quoted (and others like them), it was not with him that they originated. He and his Dutch co-signatory, as also Sarkozy and Ban in the above quotations, almost certainly did not write their own speeches. What they said was presumably sanctioned, and probably drafted, by their scientific and environmental advisers and by the departments those people work in; and had it not been so sanctioned, those advisers and departments could have ensured – *they could ensure now, if they saw fit to do so* - that future high-level public statements would take a more measured and qualified tone.

The fact is that there is no clear dividing line between 'catastrophists' and climate scientists. It is influential climate scientists, taking a more sombre view than Hulme, who write or approve the 'catastrophist' scripts of leading lay figures, and who in some prominent cases have made similar pronouncements of their own. It was on the basis of views conveyed by climate scientists that the opening sentence of the Stern Review's 'summary and conclusions' reads (p. xv): 'The scientific evidence is now overwhelming: climate change is a serious global threat, and it demands an urgent global response'. Such views, though widely held by scientists, are neither definitive nor fully representative.

This is not to say that the scientists in question are wrong, nor that the strong above assertions by leading figures are provably mistaken. The moral to be drawn is twofold.

- First, and to repeat: the alarm-prone positions widely taken by political leaders, top international civil servants, eminent scientists in fields other than climate

³ In a piece entitled 'Viewpoint: Chaotic world of climate truth', *BBC News World*, November 2006.

science, leading industrialists, widely read commentators and media outlets, and an array of NGOs, not to mention some eminent economists, do not mirror the more considered language of AR4: they go well beyond it.

- Second, and not surprisingly: in relation to most if not all aspects of this whole complex of issues, there exists a range of expert views concerning the evidence and the conclusions to be drawn from it.

This brings me to my second category of over-presumption.

Forms of over-presumption: (2) overstating the bounds of what is known

On the opening page of the WEO article that I referred to above, the authors say that it ‘briefly lays out what is known about the science of climate change, to set the scene for a review of its economic impact’. I think the use of ‘known’ in this connection is not appropriate. ‘Widely held’: yes. ‘Almost universally believed’: perhaps. But ‘Known’ goes too far.

Again, the G8 Summit Declaration refers to ‘the scientific knowledge as represented in the recent IPCC reports...’ Had I been a pre-Summit Sherpa, I would have argued for changing ‘scientific knowledge’ to ‘the weight of scientific opinion’.

The fact is that what is under review here is a climate system of extraordinary complexity which is far from being well understood. The IPCC itself has taken a lot of trouble to weigh and categorise the varying degrees of confidence with which (as it concludes) particular statements can be made; and its Third Assessment Report (TAR) of 2001 contained an instructive diagram showing what it described as ‘the cascade of uncertainties’.⁴ The cascade includes the future course of economic change; the resulting changes in emissions of CO₂ and other anthropogenic ‘greenhouse gases’; the effects of projected emissions on atmospheric concentrations of those gases; the resulting effects on estimated radiative forcing, and the further consequences for surface temperatures; and the possible climatic, biophysical and socio-economic impacts of specified temperature increases. All of these uncertainties remain today; and I would add, as a further aspect, that since 2001 serious questions have been raised about evidence which the Panel has drawn on of past temperature changes: hence the actual extent and significance of recent global warming are now more in doubt than before.

The depth of continuing uncertainty about the properties of the climate system, and the wide range of expert views today, form the subject-matter of a notable document recently brought out by the office of the Republican ranking member of the Environment and Public Works Committee of the US Senate.⁵ This report is a kind of nonconformist anthology: it presents, through summary direct quotation, the recently-

⁴ The diagram is to be found on p. 79 of the Technical Summary of the report from the TAR’s Working Group I.

⁵ The report is available at

http://epw.senate.gov/public/index.cfm?FuseAction=Minority.Blogs&ContentRecord_id=f80a6386-802a-23ad-40c8-3c63dc2d02cb

expressed views of some 400 professionals from different relevant subject areas, all of whom question one or more aspects of prevailing views on climate change issues.⁶ Two leading themes that emerge from the dossier are:

- Since ‘the causes of climate change are many, various and very incompletely understood’,⁷ it is difficult – some would say impossible – to isolate the effects of human activity.
- Natural influences on the climate, as opposed to the consequences of human activity, have continued to predominate. A number of the scientists quoted place special emphasis on solar influences.

An aspect of the dossier worth noting is that many of those who appear in it are meteorologists: their perspective was new to me. On my count, no less than 55 American meteorologists are quoted. This lends weight to the view expressed by one of them (Cohen, p. 37), who has written: ‘I do not agree with all the IPCC’s conclusions and know through peer discussions that the idea of a consensus in the meteorological community is false’.

Of course, the fact that nonconformist views of various kinds are still widely held by informed persons does not serve to discredit the widely accepted hypothesis that ‘dangerous anthropogenic interference with the climate system’ is taking place, or the official policy consensus that is linked to it. Nor does it justify inaction. But the contents of the dossier lend weight to an assessment made by another instructive document, published a year or so ago, called the *Independent Summary for Policymakers*.⁷ The authors conclude that, while the hypothesis of anthropogenic global warming ‘is credible, and merits continued attention’, it ‘cannot be proven by theoretical arguments, and the available data allow [it] to be credibly disputed’.

Statements to the effect that ‘the science’ is ‘settled’, that the scientific evidence is now ‘overwhelming’, and that ‘the scientific debate is now over’, are unwarranted. As I have noted, such assertions are not drawn direct from AR4. However, they could not have gained such widespread acceptance were it not for the continuing flaws that have characterised the large-scale established official process of review and inquiry which, though it extends well beyond the work of the IPCC, finds its fullest expression in the Assessment Reports.

Forms of over-presumption: (3) uncritically accepting a flawed advisory process

Over the past 20 years governments everywhere, and many outside observers too, have placed uncritical reliance on the advisory process as a whole and the work of the IPCC in particular. I believe that this widespread trust is unwarranted, and that this fact puts in doubt the accepted basis of official climate policies. This is not, as suggested by Stern Review authors, merely a matter of ‘procedures’ as distinct from

⁶ I have to declare an interest here, since I am one of those cited – though not in relation to scientific aspects.

⁷ This form of words is taken from evidence presented in December 2006 by the Australian scientist Robert Carter to the US Senate committee already referred to.

⁷ The report was prepared by a group of ten scientists, in the light of comments from 43 other named reviewers, under the auspices of the Fraser Institute of Canada and with Ross McKittrick as Coordinator. It is presented as an alternative summary of the relevant science to that provided in the official draft Summary for Policymakers of the IPCC’s Working Group I which forms part of AR4.

substance. *If and in so far as the established advisory process that the world relies on is lacking in objectivity, and is not professionally watertight, the basis and rationale of the official policy consensus are put in question.*

Panel and process

Why do governments, and outsiders too, place so much trust in the IPCC? I think that the trust largely results from the wide and structured expert participation that the IPCC process ensures. People visualise an array of technically competent persons whose knowledge and wisdom are effectively brought to bear through an independent, objective and thoroughly professional scientific inquiry. Indeed, many outside observers identify the Panel with the network, as though well-qualified and disinterested experts were the only people involved. The reality is both more complex and less reassuring.

A basic distinction has to be made between the IPCC as such, that is to say the *Panel*, and the IPCC *process*. The two are not the same, and the process involves three quite distinct groups of participants.

The first of these groups comprises the *Panel* itself, which controls the preparation of the reports, along with its two subsidiary bodies. The Panel effectively comprises those officials whom governments choose to send to Panel meetings. My impression is that, generally speaking, these are not high-ranking persons. They include scientists as well as laymen. Numbers are not fixed, but a typical Panel meeting might involve some 300-400 participants. Working directly for the Panel is the IPCC *Secretariat*, though this is a small group whose functions are mainly of a routine administrative kind. A more influential body is the 28-strong IPCC *Bureau*, comprising high-level experts in various disciplines from across the world, chosen by the Panel. The Bureau acts in a managing and coordinating role under the Panel's broad direction.

The second group is made up of the now 2,500-strong *expert network*, the persons who put together the draft Assessment Reports. This network is separate and distinct from the Panel itself. There is little or no overlap between the two bodies.

Last but far from least, there are the government departments and agencies which the Panel reports to: it is here, and not in the Panel itself, that the ultimate 'policymakers' are to be found. The relevant political leaders and senior officials within these departments and agencies make up the core of what I call the *environmental policy milieu*. This milieu also comprises leading non-official members of the IPCC Bureau, past as well as current; and together with the most influential members of the Panel itself, these latter persons make up what may be termed the informal *directing circle* of the IPCC.

Policy commitment

The IPCC as such has been formally instructed by its member governments, in the 'principles governing IPCC work,' that its reports 'should be neutral with respect to policy'. However, this instruction must be interpreted as referring specifically and exclusively to the contribution made by the expert network through the reporting process. It does not, *and could not*, apply to the other two participating groups. The

official Panel members, as also the policy milieu which they report to, are almost without exception far from neutral: they are committed, *inevitably and rightly*, to the objective of curbing emissions, as a means to combating climate change, which their governments agreed on when they ratified the Framework Convention; and most of them are likewise committed to the kinds of policies that their governments have adopted in pursuit of that objective. As officials, they are bound by what their governments have decided. That is the context within which the three successive IPCC Assessment Reports prepared since 1992 have been put together by the network and reviewed by member governments. The clients and patrons of the expert network, with few exceptions, take it as given that anthropogenic global warming is a serious problem which demands, and has rightly been accorded, both national and international action. Thus departments and agencies which are not—and cannot be—‘policy neutral’ are deeply involved, from start to finish, in the preparation of the Assessment Reports.

It is against this background, of a committed milieu, that some basic features of the reporting process have to be borne in mind. The choice of lead authors for the Assessment Reports largely rests with the already-committed member governments, since lists that they provide form the starting point for the selection process; complete draft texts of the Working Group reports go to these governments for review; and it is governments, as represented in the Panel, that sign off on the final versions of the Assessment Reports and amend the draft Summaries for Policymakers before they approve these also for publication. The fact is that departments and agencies which are not – and cannot be – uncommitted in relation to climate change issues are deeply involved, from start to finish, in the reporting process.

Do these facts in themselves put in question the expert reporting process and the Assessment Reports? As a former national and international official, I would say: No, not necessarily. Policy commitment on the part of member governments could in principle go together with a resolve to ensure that the reporting process remained open, thorough, objective and policy-neutral. This indeed is what governments believe, or at least maintain, is the state of affairs that they have created; and I think many outside persons believe or presume the same. In this generally accepted picture of the IPCC process, an invisible Chinese wall separates the committed patrons and clients of the reporting process from the array of disinterested scientists, policy-neutral in their expert capacity, who take part in it.

I have come to believe that this picture is not accurate, and that the expert reporting process is flawed. Despite the numbers of persons involved, and the lengthy formal review procedures, the preparation of the IPCC Assessment Reports is far from being a model of rigour, inclusiveness and impartiality. In my view, the flaws in the process, can be largely accounted for by a pervasive bias on the part of the people and organisations that direct and control it. I shall comment first on some flaws and then on the forms and sources of bias.

Errors, omissions and lapses

Despite the numbers involved, the expert process has not ensured appropriately broad professional involvement. A case in point is the treatment of statistical issues. A leading American statistician, Edward Wegman, has noted that:

‘The atmospheric science community, while heavily using statistical methods, is remarkably disconnected from the mainstream community of statisticians in a way, for example, that is not true of the medical and pharmaceutical communities’.

As for economics, Ross McKittrick, in written evidence to the House of Lords Select Committee, argued that after the Second Assessment Report, which appeared in 1995, ‘the IPCC could no longer claim to have the participation of mainstream professional economists’. I think that the subsequent list of AR4 participants lends support to this view.⁸

In relation to economic issues, a specific weakness in some IPCC documents has been the use of invalid cross-country comparisons of output (real GDP), based on exchange rates rather than purchasing power parity estimates: such comparative figures give a distorted picture of the world economy and the course of economic change. Some further misleading observations on this central topic are to be found in AR4, as also in the Stern Review.⁹

A basic general weakness in the reporting process is the uncritical reliance on peer review as a qualifying criterion for published work to be taken into account. Peer review provides no safeguard against dubious assumptions, arguments and conclusions if the peers are largely drawn from the same restricted professional milieu. What is more, the peer review process as such may be insufficiently rigorous. In particular, in cases where research has involved the assemblage and processing of large data sets, peer review does not guarantee due disclosure of sources, methods and procedures so that results can be replicated by others.

Failures of disclosure, of a kind that some leading academic journals would not tolerate and which would not be permitted in business prospectuses, have characterised published work that the IPCC has drawn on. The most notable case is that of the temperature reconstructions which entered into what became known as the ‘hockey-stick’ study. This piece of work, which was prominently featured and drawn on in the IPCC’s Third Assessment Report and afterwards, formed the basis for a striking and much-publicised claim that in the Northern Hemisphere the 1990s had been the warmest decade of the millennium and 1998 the warmest single year. Probably no single piece of alleged evidence relating to climate change has been so frequently cited and influential. The authors concerned failed (and later declined, until strong pressures were eventually brought to bear) to make due disclosure, and neither the publishing journals nor the IPCC required them to do so. Resistance to disclosure was eventually overcome only through a US Congressional committee investigation.

⁸ Wegman’s observation was made in one of his responses to questions put to him in the course of an inquiry carried out by a committee of the US House of Representatives. McKittrick’s evidence to the Select Committee is on pp. 262-3 of Volume II of the Committee’s report.

⁹ From late 2002 on, Ian Castles and I jointly put forward a critique of some leading aspects of the IPCC’s economic work, and in particular of the scenarios that provided emissions projections for both the third and fourth Assessment Reports, while authors involved in that work contested our criticisms. Following these exchanges, we published in 2005 a joint paper on international comparisons of GDP, and I reviewed and carried further the whole debate in a later article published in *Energy and Environment* (Vol 16. Nos. 3/4 (2005)).

Further issues of disclosure, and of the treatment of evidence, have arisen in relation not only to more recent temperature reconstructions but also to the instrument-based temperature series that the IPCC reports have relied on. In this latter context, eventual release of pertinent information has recently been secured only by bringing to bear British freedom of information legislation.

A related issue which has recently come into prominence is the treatment by IPCC lead authors, during the review process, of critical comments and suggestions for changes in the draft AR4 texts. Here again, it has been necessary to use freedom of information laws to break down official resistance to publication of the relevant exchanges, and the objectivity of some authors and of the review process has been put in question.

The whole complex of issues covered in these last few paragraphs – of non-disclosure, non-response, selective coverage, and bias within the reporting process – is treated at length in a recently-published paper by David Holland (2007).¹⁰ Admittedly, the argument chiefly focuses on just three key chapters of the WGI report alone. However, Holland's critique puts in question the claims to authority of arguments which have been at the core of the IPCC's treatment of the scientific evidence; and as has been noted above, it is 'the science' that has formed the accepted basis for the official policy consensus.

In these various cases, from the 'hockey-stick' study onwards, exposure of the problem, and the pressures for due disclosure, have come largely from private individuals: so far as I know, not a single government department or international agency has faced up to the issues. Prominent among the individuals concerned have been two Canadian authors, Stephen McIntyre and Ross McKittrick: both separately and in joint writings, they have made an outstanding contribution to public debate.¹¹ Holland's article draws on their work, as also on the key report from Edward Wegman and associates which was presented last year to a committee of the US House of Representatives.¹²

These latter sources are effectively disregarded in AR4, as also in the Stern Review and later papers by those involved with it. More broadly, the handling by the IPCC's directing circle of disclosure failures and other lapses reflects no credit on those involved: they have failed to acknowledge the problem and take appropriate action. In the relevant sections of AR4 the issue is evaded, while a misleading picture is presented of the various writings on the subject of temperature reconstructions. Here as in other instances, the response of the IPCC milieu to informed criticism has been inadequate, evasive or dismissive.

¹⁰ Holland's article is entitled 'Bias and Concealment in the IPCC Process: The "Hockey-Stick" Affair and Its Implications', and published in *Energy and Environment*, Volume 18 No. 7+8 (2007). The same issue of the journal contains several other articles relating to the IPCC including one of mine. One of the contributors is John Zillman, a leading climate scientist who took a prominent part in the Panel's work from the earliest stages; and his article offers a much more favourable assessment of the IPCC process than mine or Holland's or those of some other featured authors.

¹¹ McKittrick's website provides an annotated list of references.

¹² Wegman, Edward *et al.* (2006), 'Ad hoc Committee Report on the "Hockey Stick" Global Climate Reconstruction'. The report is available at http://energycommerce.house.gov/108/home/07142006_Wegman_Report.pdf

In the ‘principles governing IPCC work,’ laid down by governments and already quoted above, it is specified that the work of the Panel should be ‘open and transparent’. But one cannot apply these terms to a process in which key participants fail to disclose information that should from the start have been available in full, where such disclosure failures are condoned by those who control and direct the process, and where the information is eventually made available only through the agency of a Congressional inquiry and resort to freedom of information laws.

I have now come to think – and the thought had not formed in my mind when I first became involved with climate change issues - that the IPCC process, viewed as a whole and including the expert reporting process, is not professionally up to the mark. I think that the main reason for this deficiency is a strong and continuing element of bias that has always been present within both the environmental policy milieu and the IPCC directing circle. This ingrained bias goes beyond the formal commitment of the officials concerned to the established post-1992 intergovernmental consensus.

Instances and sources of bias

One aspect of prevailing official bias emerges indirectly from the public debate on climate change issues. Across the world, the treatment of these issues by environmental and scientific journalists and commentators is overwhelmingly one-sided and sensationalist: studies and results that are unalarming are typically played down or disregarded, while the gaps in knowledge and the huge uncertainties which still loom large in climate science are passed over. This pervasive one-sidedness on the part of so many commentators and media outlets is in itself worrying; but even more so, to my mind, is the fact that leading figures and organisations connected with the IPCC process, including government departments and international agencies, do little to ensure that a more balanced picture is presented.

The main reason for this, I think, is that members of the environmental policy milieu, and of the IPCC directing circle, are and always have been deeply committed persons. It is not just the IPCC process that is in question here. A more fundamental problem is the attitudes held by the responsible departments and agencies. Not only the Panel, but its official clients also, have throughout been characterised by what Clive Crook has termed ‘pre-commitment to the urgency of the climate cause’.¹⁴

Within the IPCC process, the first Chairman of the Panel, Bert Bolin, died quite recently, and in an obituary notice *The Times* (of London) described him as ‘playing a key role in communicating the dangers of climate change to government leaders and other decision makers’. His successors, alongside other leading international officials, have played a similar role.

¹⁴ *Financial Times*, 2 August 2007. Crook wrote there of the IPCC that ‘It is a seriously flawed enterprise and unworthy of the slavish respect accorded to it by most governments and the media’.

By way of illustration, here are three high-level public statements made in February last year, following the publication of the AR4 Working Group I report:

- Dr R. K. Pachauri, the Chairman of the IPCC, and hence of the IPCC Bureau: ‘I hope this report will shock people [and] governments into taking more serious action’.
- Achim Steiner, the Director-General of the UNEP: ‘in the light of the report’s findings, it would be “irresponsible” to resist or seek to delay actions on mandatory emissions cuts’.¹⁵
- Yvo de Boer, Executive Secretary of the Framework Convention: ‘the findings leave no doubt as to the dangers that mankind is facing and must be acted on without delay’.

These are strong assertions. In none of them was the wording taken directly from the report in question: these eminent persons were going beyond the WGI text, to draw their own confident and unqualified personal conclusions as to the lessons for policy. While they were fully entitled to form and air such opinions, their statements were not just summaries of ‘the science’, nor of course were they ‘policy-neutral’.

In speaking as they did on this occasion, these leading figures were conforming to an established pattern. From the earliest days, most if not all of those directing the IPCC process, within governments and outside, have shared the pre-commitment referred to by Crook; and had this not been the case, and known to be the case, *they would not have attained their leading positions within the process*. To take only the three current examples just quoted: Pachauri, Steiner and de Boer would not have sought their respective posts, nor would they have been seen by UN agencies and member governments as eligible to hold them, had they not been identified as fully committed to heightened milieu consensus views. The process is run today, as it has been from the start, by true believers. This accounts for the readiness of many of those concerned to make strong public pronouncements of the kind quoted above, which go beyond the more nuanced language of the Assessment Reports; to turn an unseeing eye to the disclosure failures and other professional flaws in the reporting process; and to view with equanimity or approval the lack of balance that characterises public debate. The official handling of climate change issues has been throughout, and continues to be, suffused with bias.

As to the expert network, my impression – admittedly, an outsider’s impression - is that over time, while growing in numbers (so that the stock of peer reviewers has expanded *pari passu*), it has become increasingly dominated by subscribers to the milieu consensus. I believe that has become more difficult for independent outsiders, who do not share accepted beliefs and presumptions of the IPCC milieu, and of the Panel’s parent bodies and sponsoring government departments and agencies which provide the overwhelming bulk of research funding in this area, to contribute usefully to the reporting process. For this and other reasons, some nonconforming experts have either declined to become involved with the process or have later withdrawn from it. The network has thus become more numerous but less inclusive. At the same time, it may have become harder for younger scientists, with careers still to make, not to fall in with received majority opinion which is both officially sponsored and strongly held. In evidence to the House of Lords Select Committee (Vol. II, p. 233) David Holland wrote, admittedly as an outsider: ‘If I were beginning my career I cannot

¹⁵ This and the following quotation are taken from a report (3 February 2007) in the *Financial Times*.

imagine that I could make a living in climate science without accepting the current consensus'. In both scientific circles and the reporting process, dissenters have been increasingly unrepresented, sidelined or eased out.

This is the background against which the professional lapses noted above are to be seen. They are symptomatic of a chronic bias which has characterised the both the IPCC milieu and its clients from the outset. The effects of this bias have intensified over time.

Summing up

In relation to climate change issues, governments generally and the OECD member countries in particular have locked themselves into a set of procedures, and an associated way of thinking—in short, a *framework*—which both reflects and yields over-presumptive conclusions which are biased towards alarm. These conclusions now form the basis of current policies and proposals to go further. They take as their point of departure the results of a flawed process, and they represent a dubious extension of those results.

In relation to climate change, and not only in the context of the IPCC, there is a clear present need to build up a sounder basis for reviewing and assessing the issues. Governments should try to ensure that they and their citizens are more fully and more objectively informed and advised. I will conclude by sketching out some ways in which the Fund, and I would hope the OECD also, given less presumptive points of departure in both cases, could now make a distinctive contribution to such a process.

5 Repositioning: (iv) taking on a more extended role

Continuity and change

First, a word of caution is in place. To repeat: recognising the current over-presumptions for what they are does not entail a prescription for rejecting or overturning today's official policy consensus. I am not arguing that prevailing scientific opinion is wrong, nor that any prospect of 'dangerous anthropogenic interference with the climate system' can be ruled out, nor that action to curb emissions is unwarranted. To the contrary, a non-presumptive approach has to recognise the possibility that (as Clive Crook has put it), anthropogenic climate change 'may indeed be mankind's biggest and most urgent challenge'. In any case, the world is not starting from scratch. Governments everywhere have signed up to the Framework Convention, and many of them have taken action and entered into commitments accordingly. They have done so in the belief that there is indeed an 'urgent challenge', and the three massive Assessment Reports that have appeared since 1992 have served to confirm them in this belief. The situation thus created has to be recognised for what it is. The existing policy consensus has to be taken as a point of departure by all the official agencies concerned, including both the OECD and the IMF together with their clients. To this extent, continuity rather than change is the order of the day.

Even against this background, however, a new and less presumptive approach would bring with it substantial changes. Neither the policy consensus nor the advice on

which it rests would be treated as authoritative or final. Both would be seen, not as representing established and final truth, but rather as a set of working assumptions. As such, they would be treated as subject to rigorous testing and review, and it would be a leading concern of policy to ensure that such testing and review takes place. Governments would no longer presume or aim at consensus. Rather, they would see to it that serious conflicts of professional opinion were aired and weighed, and that different independent sources were drawn on. They would promote open and informed debate, rather than presuming, in relation to any of the leading issues, either that ‘the debate is over’ or that the present advisory process is fully adequate to its task.

The role of treasuries and finance ministries

In adopting and contributing to a less presumptive and more balanced approach, the Fund would be making good an omission on the part of its client departments. Ever since becoming involved with climate change issues, I have argued that treasuries and finance ministries should play a more active, more sustained and better informed role in relation to them. In the British case, Her Majesty’s Treasury did indeed become closely involved from mid-2005, with the commissioning and publication of the Stern Review. However, the outcome of this exercise brought home to me the old adage, ‘Be careful what you wish for’.¹⁶ What I had actually proposed by way of finance ministry participation has still not come to pass.

In this matter, I consider that your clients are not measuring up to their responsibilities.

From the published material that I have seen, there is no sign that the grounds for concern that I outlined above are shared, or even that the possibility that they might exist is recognised, in any of the central economic departments of state. This is not a good situation. One of the few things that are agreed in relation to climate science issues is that the economic stakes, and the possible costs of mistaken policies, could be very high. This places a responsibility on those departments and agencies – as also, it could be argued, on the advisory units working directly for heads of government – to make informed assessments of their own, and not simply to take on trust and in full the received opinions of the environmental policy milieu and its chosen instruments – even when those opinions are endorsed from the outside by eminent scientists and scientific bodies.¹⁷

I am myself a former Treasury official; and much later, as Head of what was then the Economics and Statistics Department in the OECD Secretariat, I had close dealings over a number of years with economics and finance ministries in OECD member countries. I have been surprised by the failure of these ministries to get to grips with climate change issues, their uncritical acceptance of the results of a process of inquiry which is so obviously biased and flawed, and their lack of attention to the criticisms

¹⁶ Twin groups of us, scientists and economists numbering fourteen authors in total, published in December 2006 an extended dual critique of the Review (*World Economics*, Vol. 7, No. 4).

¹⁷ I commented on this latter aspect in the article referred to in footnote 2 above, pp. 206-7 and 219-24. I argue there, with supporting evidence, that ‘elements within the international scientific establishment appear as strongly committed, rather than neutral and objective, in relation to climate change issues’.

of that process that have been voiced by independent outsiders – criticisms which, as I think, they ought to have been making themselves.

My hope is that the Fund will now move in where its clients have so far failed to act. It would then review the official advisory process and evaluate the criticisms that have been made of it. It would give serious attention to the serious critics. In this connection, the doubts that can be entertained about the Assessment Reports, and the studies that enter into them, apply to the exercise as a whole, including the reports from Working Groups II and III which I have not specifically referred to above.

Moving in: sketch of a broader agenda

In defining the task as thus identified, some overlapping specific areas of concern and inquiry have already been indicated above. They include:

- *Disclosure.* Serious failures of disclosure have characterised published work that the IPCC has drawn on. These episodes would be reviewed, and conclusions drawn. My view is that governments should insist on true and full disclosure of data, sources and statistical procedures, as a precondition for published work to be taken into account in the review process. A proviso to that effect should be written into the IPCC's terms of reference.
- *Evaluation and verification.* Basic doubts and criticisms have been voiced in relation to temperature series which the IPCC and governments have relied on. The studies and results in question would be made the subject of independent expert review, with Fund involvement.
- *The treatment of data.* Statistical procedures followed in key studies have been called in question. In this context also, criticisms should be independently evaluated, as in the Wegman report, and appropriate lessons drawn for the future.
- *Assessment of widely used models.* The various models which now play a central part at successive stages of inquiry into climate change could well be made the subject of independent review by experts in other fields including econometrics.
- *Objectivity.* The IPCC's treatment of both sources and critics has given rise to what appear as well founded charges of bias.
- *Participation.* The range of expert participation, official and unofficial, could be broadened to good effect. Among those who appear as underrepresented in the network are economic historians and statisticians.
- *Plurality of sources.* A wider range of expert sources should be developed and drawn on. Even if the IPCC process were beyond challenge, which is far from being the case, it is imprudent for governments to place such heavy reliance, in matters of extraordinary complexity where huge uncertainties remain, on this particular source of information, analysis and advice.

These are headings only: the list does not claim to be exhaustive, and careful project definition would be needed in each case.

It will be seen that all of the headings relate to matters which fall largely outside 'the economics'. However, they are all proper subjects of consideration by Fund (and OECD) staff members. It is true that few economists or statisticians are well equipped to follow the scientific debate. But many of them are well qualified to judge whether influential studies have made due disclosure of sources and procedures, whether the selection and treatment of data have been professionally up to par, how far valid

criticisms under these headings have been fully taken into account by the responsible authors, reviewers and agencies, whether in relation to economic and statistical aspects the expert network is adequately representative, and how far the advisory process has ensured a balanced and informed treatment of arguments and evidence.

I suggest to you that the Fund should not fail to give attention to these key issues, which its staff are competent to judge, through inadvertence or over-caution. I hope that it will now focus on them to good effect, and that in doing so it will increasingly engage the attention and win the approval of its client departments.

Of course, there are many ways in which new studies carried out at the Fund could shed further light on more strictly economic aspects of climate change: several suggestions could be made under this heading. But in a wider perspective, it is by extending the area of official inquiry, and *steering clear of undue presumptions*, that the IMF, and I would hope the OECD also, could now make a special and much-needed contribution