CLIMATE CHANGE UNCERTAINTY DEBATES

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Anyone familiar with the climate change debate is familiar with the "scientific uncertainty" argument, which usually goes something like this:

The response to climate change must be based on sound science, not on speculation or theory. There is too much uncertainty and too much that we do not know about climate change. It would be irresponsible to undertake measures to reduce emissions, which could carry high economic costs, until we know that these are warranted.

Someone suggest that this argument can aid in convincing people to oppose action on climate change, especially when used as part of a broader set of arguments that include economic and standard rhetorical components. The foundation of the argument – that there is uncertainty in present scientific knowledge of climate change – is uncontroversial. But is there so much uncertainty that we should delay action on addressing climate change until we know more? According to this argument, the answer is yes.

To dissect this argument, let's consider three different arenas of decision making under uncertainty:

1. Criminal trial: Anyone who's watched TV knows that a criminal defendant is presumed innocent unless the prosecution succeeds in demonstrating guilt "beyond a reasonable doubt." In other words, the decision to act (i.e., convict) requires a high standard of proof. The requirement of overwhelming proof is based on a value judgment about the relative severity of the two possible ways a criminal verdict can err — either by convicting an innocent defendant, or by acquitting a guilty one. Society has long judged it worse to convict an innocent defendant than to acquit a guilty one, so the criminal trial has been biased to make that outcome less likely.

The crucial point here is that the standard for conviction is based on a normative judgment about the relative harm of the two possible errors. The worse we judge a particular error to be, the more we try to make it unlikely by biasing the decision-making process against it. In doing so, we willingly accept a heightened risk of making the other type of error, because we judge it to be less bad.

2. Civil trial: In civil law – private suits by one party against another, in which usually only monetary damages or requirements to change behavior are at stake – society has judged that there is no clear basis to believe one type of error or the other (i.e. errors that favor the plaintiff or the defendant) to be worse. As a result, civil suits are decided without bias, according to "the preponderance of the evidence."

3. National defense: In matters of national security, US policy often takes action based on threats that are not just uncertain but unlikely. In other words, even a slight risk of a threat is sufficient to justify action. The reason is that our government judges that the cost of being unprepared to meet a threat that does materialize is much worse than the cost of preparing for a threat that never materializes. This is well articulated by Secretary of State (at the time) Colin Powell when discussing why the USA was pursuing national missile defense: "[T]here is recognition that there is a threat out there... And it would be irresponsible for the United States, as a nation with the capability to do something about such a threat, not to do something about [it]... you don't wait until they are pointed at your heart. You start working on it now." (Remarks at the International Media Center, Budapest, Hungary, May 29, 2001). This can be considered as a strident articulation of the "precautionary principle".

What do these three examples tell us about climate change? The "uncertainty" argument we presented at the beginning of this post argues that we should wait until we have overwhelming evidence before acting to address climate change, adopting a standard similar to that for a criminal trial. On the other hand, environmentalists often use Powell's missile defense argument to advocate immediate action on climate change despite uncertainty.

Which standard for action should we adopt? The choice is not scientific; rather, it reflects a judgment about the relative costs of the possible errors. The argument that climate science is too uncertain to merit action would be appropriate if one judged it a worse mistake to limit greenhouse gases (GHG) emissions too much than not to limit them enough — i.e. that the economic losses from too much mitigation were much worse than the costs of unavoided impacts of climate change.

It is our opinion that this is not the case and that, in fact, the reverse situation appears more likely. If uncontrolled climate change and its impacts turn out to lie at or below the bottom of the present projected range, then an aggressive mitigation program would impose substantial unnecessary costs, presently estimated to lie between a few tenths of a percent and several percent of future GDP. But if climate change and impacts lie near or above the top of the present projected range, then not pursuing aggressive mitigation would likely expose the world's people to much more severe costs and risks, including a possibility of abrupt, catastrophic changes.

Thus, at its heart, the "scientific uncertainty" argument is not about science at all, but about a judgment about whether it is worse to under or overreact to climate change. Further, the argument is worded so as to imply that the "criminal trial" standard should be applied to GHGs — that GHGs are innocent until proven guilty beyond a reasonable doubt. We believe that a strong argument can be made that this standard is inappropriate and that overwhelming evidence is not necessary in order for us to begin taking action on climate change. We have enough evidence now.