The Ethics of CLIMATE CHANGE

Weighing our own prosperity against the chances that climate change will diminish the well-being of our grandchildren calls on economists to make hard ethical judgments

BY JOHN BROOME

What should we do about climate change? The question is an ethical one. Science, including the science of economics, can help discover the causes and effects of climate change. It can also help work out what we can do about climate change. But what we *should* do is an ethical question.

Not all "should" questions are ethical. "How should you hold a golf club?" is not, for instance. The climate question is ethical, however, because any thoughtful answer must weigh conflicting interests among different people. If the world is to do something about climate change, some people—chiefly the better-off among the current generation—will have to reduce their emissions of greenhouse gases to save future generations from the possibility of a bleak existence in a hotter world. When interests conflict, "should" questions are always ethical.

Climate change raises a number of ethical questions. How should we—all of us living today—evaluate the well-being of future generations, given that they are likely to have more material goods than we do? Many people, some living, others yet to be born, will die from the effects of climate change. Is each death equally bad? How bad are those deaths collectively? Many people will die before they bear children, so climate change will prevent the existence of children who would otherwise have been born. Is their nonexistence a bad thing? By emitting greenhouse gases, are the rich perpetrating an injustice on the world's poor? How should we respond to the small but real chance that climate change could lead to worldwide catastrophe?

CHRIS GOULD

Many ethical questions can be settled by common sense. Sophisticated philosophy is rarely needed. All of us are to some extent equipped to face up to the ethical questions raised by climate change. For example, almost everyone recognizes (with some exceptions) the elementary moral principle that you should not do something for your own benefit if it harms another person. True, sometimes you cannot avoid harming someone, and sometimes you may do it accidentally without realizing it. But whenever you cause harm, you should normally compensate the victim.

Climate change will cause harm. Heat waves, storms and floods will kill many people and harm many others. Tropical diseases, which will increase their range as the climate warms, will exact their toll in human lives. Changing patterns of rainfall will lead to local shortages of food and safe drinking water. Large-scale human migrations in response to rising sea levels and other climate-induced stresses will impoverish many people. As yet, few experts have predicted specific numbers, but some statistics suggest the scale of the harm that climate change will cause. The European heat wave of 2003 is estimated to have killed 35,000 people. In 1998 floods in China adversely affected 240 million. The World Health Organization estimates that as long ago as 2000 the annual death toll from climate change had already reached more than 150,000.

In going about our daily lives, each of us causes greenhouse gases to be emitted. Driving a car, using electric power, buying anything whose manufacture or transport consumes energy—all those activities generate greenhouse gases that contribute to climate change. In that way, what we each do for our own benefit harms others. Perhaps at the moment we cannot help it, and in the past we did not realize we were doing it. But the elementary moral principle I mentioned tells us we should try to stop doing it and compensate the people we harm.

This same principle also tells us that what we should do about climate change is not just a mat-

KEY CONCEPTS

- Future generations will suffer most of the harmful effects of global climate change. Yet if the world economy grows, they will be richer than we are.
- The present generation must decide, with the help of expert advice from economists, whether to aggressively reduce the chances of future harm or to let our richer descendants largely fend for themselves.
- Economists cannot avoid making ethical choices in formulating their advice.
- Even the small chance of utter catastrophe from global warming raises special problems for ethical discussion.

—The Editors

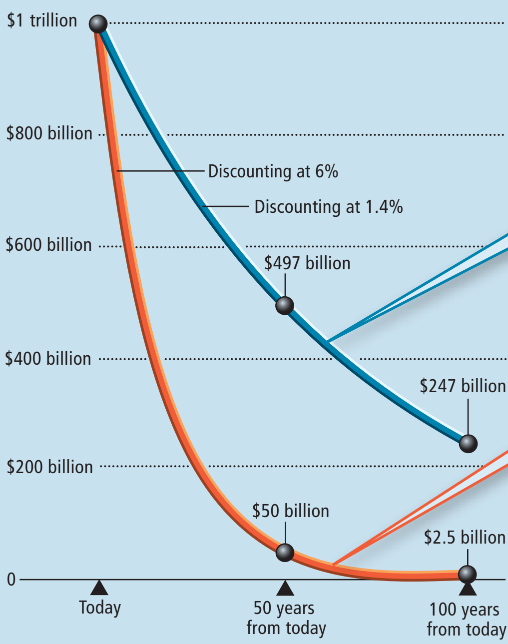
[DISCOUNTING MADE SIMPLE]

HOW MUCH DO WE CARE ABOUT THE FUTURE?

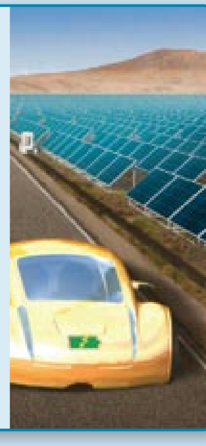
Economists usually value goods received in the future less highly than goods received today. But how much less? If the discount rate is 6 percent a year, goods worth $1 trillion received one year from today are worth only about $940 billion today. (Because economists discount continuously, the actual present value is $941.8 billion.) Economists Nicholas Stern and William Nordhaus have recently reached dramatically divergent conclusions, embodied in the discount rates they apply, about how much to spend today on goods available only to future generations.

HOW DISCOUNTING EVALUATES FUTURE GOODS

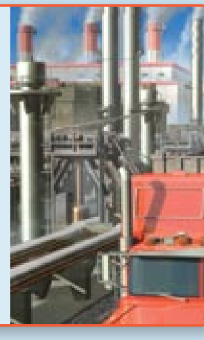
The graph shows how the value economists assign today to receiving goods worth $1 trillion in the future depends both on the discount rate and on how far into the future the trillion dollars' worth of goods will be received.



Nicholas Stern's 1.4 percent discount rate places a relatively high value on the well-being of future generations. A trillion dollars' worth of goods received in 100 years is valued at $247 billion today. In fact, Stern argues, the world needs to begin investing 1 percent of its total production, or about $500 billion today, on efforts to reduce greenhouse gases.



William Nordhaus's 6 percent discount rate places far less value than Stern's rate does on the well-being of future generations. A trillion dollars' worth of goods in 100 years is valued at only $2.5 billion today, hardly enough to justify the costs of greatly reducing greenhouse gases.



ter of weighing benefits against costs—although it is partly that. Suppose you calculate that the benefit to you and your friends of partying until dawn exceeds the harm done to your neighbor by keeping her awake all night. It does not follow that you should hold your party. Similarly, think of an industrial project that brings benefits in the near future but emits greenhouse gases that will harm people decades hence. Again suppose the benefits exceed the costs. It does not follow that the project should go ahead; indeed it may be morally wrong. Those who benefit from it should not impose its costs on others who do not.

Ethics of Costs and Benefits

But even if weighing costs against benefits does not entirely answer the question of what should be done about climate change, it is an essential part of the answer. The costs of mitigating climate change are the sacrifices the present generation will have to make to reduce greenhouse gases. We will have to travel less and better insulate our homes. We will have to eat less meat. We will have to live less lavishly. The benefits are the better lives that future people will lead: they will not suffer so much from the spread of deserts, from the loss of their homes to the rising sea, or from floods, famines and the general impoverishment of nature.

How much should we sacrifice today to improve the lives of future people richer than we are?

Weighing benefits to some people against costs to others is an ethical matter. But many of the costs and benefits of mitigating climate change present themselves in economic terms, and economics has useful methods of weighing benefits against costs in complex cases. So here economics can work in the service of ethics.

The ethical basis of cost-benefit economics was recognized recently in a major report, the *Stern Review on the Economics of Climate Change*, by Nicholas Stern and his colleagues at the U.K. Treasury. The *Stern Review* concentrates mainly on comparing costs and benefits, and it concludes that the benefit that would be gained by reducing emissions of greenhouse gases would be far greater than the cost of reducing them. Stern's work has provoked a strong reaction from economists for two reasons. First, some economists think economic conclusions should not be based on ethical premises. Second, the review favors strong and immediate action to control emissions, whereas other economic studies, such as one by William

KENN BROWN AND CHRIS WREN *Mondolithic Studios*

Nordhaus of Yale University, have concluded that the need to act is not so urgent.

Those two issues are connected. Stern's conclusion differs from Nordhaus's principally because, on ethical grounds, Stern uses a lower "discount rate." Economists generally value future goods less than present ones: they discount future goods. Furthermore, the more distant the future in which goods become available, the more the goods are discounted. The discount rate measures how fast the value of goods diminishes with time [*see box on opposite page*]. Nordhaus discounts at roughly 6 percent a year; Stern discounts at 1.4 percent. The effect is that Stern gives a present value of $247 billion for having, say, a trillion dollars' worth of goods a century from now. Nordhaus values having those same goods in 2108 at just $2.5 billion today. Thus, Stern attaches nearly 100 times as much value as Nordhaus does to having any given level of costs and benefits 100 years from now.

The difference between the two economists' discount rates is enough to explain the difference between their conclusions. Most of the costs of controlling climate change must be borne in the near future, when the present generation must sacrifice some of its consumption. The benefits will mostly come a century or two from now. Because Stern judges the present value of those benefits to be higher than Nordhaus does, Stern can justify spending more today on mitigating climate change than Nordhaus can.

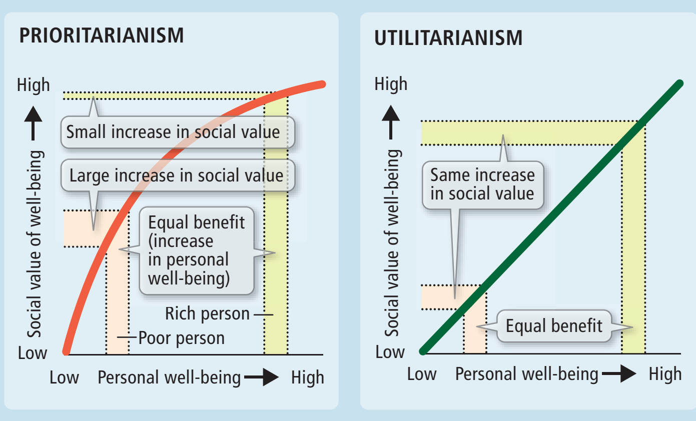
DEVASTATING COASTAL EROSION in the Alaskan village of Shishmaref, caused by the loss of permafrost and storm-buffering sea ice in a rapidly warming climate, is forcing the villagers to abandon their island homes and relocate to the mainland.

The Richer Future

Why discount future goods at all? The goods in question are the material goods and services that people consume—bicycles, food, banking services and so on. In most of the scenarios predicted for climate change, the world economy will continue to grow. Hence, future people will on average possess more goods than present people do. The more goods you already have, the less valuable are further goods, and so it is sound economic logic to discount them. To have one bathroom in your house is a huge improvement to your life; a second bathroom is nice but not so life-changing. Goods have "diminishing marginal value," as economists put it.

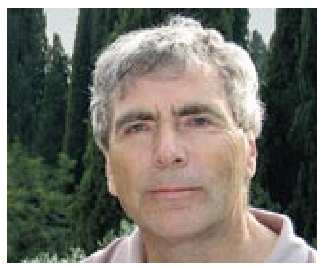
But there may be a second, purely ethical reason for discounting goods that come to relatively rich people. According to an ethical theory known as prioritarianism, a benefit—by which I mean an increase in an individual's well-being—that comes to a rich person should be assigned less social value than the same benefit would have if it had come to a poor person. Prioritarianism gives priority to the less well off. According to an alternative ethical theory known as utilitarianism, however, a benefit has the same value no matter who receives it. Society should simply aim to maximize the total of people's well-being, no matter how that total is distributed across the population [*see box below*].

THEORIES OF VALUE disagree about the social value of distributing equal benefits to rich and poor. Prioritarianism assigns greater social value to a given increase in well-being if it reaches a poor person. Utilitarianism assigns the same social value no matter how benefits are distributed.



LUIGI MITTONE (*Broome*); GABRIEL BOUYS *AFP/Getty Images* (*Alaska coast*)

[THE AUTHOR]



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What should the discount rate be? What determines how *fast* the value of having goods in the future diminishes as the future time in question becomes more remote? That depends, first, on some nonethical factors. Among them is the economy's rate of growth, which measures how much better off, on average, people will be in the future than they are today. Consequently, it determines how much less benefit future people will derive from additional material goods than people would derive now from those same goods. A fast growth rate makes for a high discount rate.

The discount rate also depends on an ethical factor. How should benefits to those future, richer people be valued in comparison to our own? If prioritarianism is right, the value attached to future people's benefits should be less than the value of our benefits, because future people will be better off than we are. If utilitarianism is right, future people's benefits should be valued equally with ours. Prioritarianism therefore makes for a relatively high discount rate; utilitarianism makes for a lower one.

The debate between prioritarians and utilitarians takes a curious, even poignant turn in this context. Most debates about inequality take place among the relatively rich, when they consider what sacrifices they should make for the relatively poor. But when we think about future people, we are considering what sacrifices we, the relatively poor, should make for the later relatively rich. Usually prioritarianism demands more of the developed countries than utilitarianism does. In this case, it demands less.

Which is worse, the death of a child in 2108 or the death of a child today?

Temporal Distance

Another ethical consideration also affects the discount rate. Some philosophers think we should care more about people who live close to us in time than about those who live in the more distant future, just because of their temporal distance from us. If those philosophers are right, future well-being should be discounted just because it comes in the future. This position is called pure discounting. It implies we should give less importance to the death of a 10-year-old 100 years in the future than to the death of a 10-year-old now. An opposing view is that we should be temporally impartial, insisting that the mere date on which a harm occurs makes no difference to its value. Pure discounting makes for a relatively high discount rate; temporal impartiality makes for a lower one.

To determine the right discount rate, therefore, the economist must answer at least two ethical questions. Which should we accept: prioritarianism or utilitarianism? And should we adopt pure discounting or be temporally impartial?

These questions are not matters of elementary morality; they raise difficult issues in moral philosophy. Moral philosophers approach such questions by combining tight analytical argument with sensitivity to ethical intuitions. Arguments in moral philosophy are rarely conclusive, partly because we each have mutually inconsistent intuitions. All I can do as a philosopher is judge the truth as well as I can and present my best arguments in support of my judgments. Space prevents me from setting forth my argu-

MEASURING CATASTROPHE?

Climate change raises much harder and more important ethical issues than the appropriate value of the discount rate. One is the chance of utter catastrophe. The Intergovernmental Panel on Climate Change reports several studies of how global temperatures will increase in the long run if atmospheric greenhouse gases reach the warming equivalent of about 550 parts per million of carbon dioxide (a level expected within a few decades). Most of the studies estimate the probability is 5 percent or more that the increase will be above eight degrees Celsius (14.4 degrees Fahrenheit). The disruption caused by such temperatures would pose some risk—no one can say how much—of a devastating collapse of the human population, perhaps even to extinction. Any such event would be so bad that even multiplied by its small chance of occurrence, its badness could dominate all calculations of the harm that climate change will cause. Working out how bad such an event would be is an urgent but very difficult ethical problem.

For example, a population collapse will cause the premature deaths of billions of people. So one must try to estimate how bad, ethically speaking, it is for a person to die early. That may sound like a hard-hearted question, but the value of human life is already recognized as a necessary element in public policy. For example, the World Health Organization has developed a measure of the "burden of disease"—the harm done to people by disease, including the harm suffered by those who are killed by disease. The WHO is already applying the measure to estimate the harm done by climate change.

Catastrophe raises an even harder ethical question. If humanity becomes extinct or the human population collapses, vast numbers of people who would otherwise have existed will not in fact exist. The absence of so much potential humanity seems an overwhelmingly bad thing. But that is puzzling. If nonexistence is a harm, it is a harm suffered by nobody, since there is nobody who does not exist. How can there be a harm that harms nobody?

Some philosophers insist there can be no such harm. They think that extinction or population collapse will do no harm apart from causing early deaths. Other philosophers disagree; they think the loss of future humanity would indeed be exceedingly bad. If they are right, they will still have to judge in quantitative terms just how bad it would be.

The issue remains one of the hardest and most debated problems in practical philosophy. But until a satisfactory answer is found, it will be impossible to properly judge the badness of climate change. —*J.B.*

CLIMATE SHIFT to unprecedentedly dry weather, along with the diversion of water for irrigation, has converted this former reservoir in China's Minqin County into desert.

ments here, but I have concluded that prioritarianism is mistaken and that we should be temporally impartial. For more detail, see chapter 10 of my book *Weighing Goods* (1991) and section 4.3 of my book *Weighing Lives* (2004).

Market Discount Rates?

Stern reaches those same ethical conclusions. Since both tend toward low discounting, they—together with Stern's economic modeling—lead him to his 1.4 percent rate. His practical conclusion follows: the world urgently needs to take strong measures to control climate change.

Economists who oppose Stern do not deny that his practical conclusion follows from his ethical stance. They object to his ethical stance. Yet most of them decline to take any ethical position of their own, even though they favor an interest rate higher than Stern's. As I have explained, the correct discount rate depends on ethical considerations. So how can economists justify a discount rate without taking an ethical position?

They do so by taking their higher discount rate from the money market, where people exchange future money for present money, and vice versa. They adopt the money-market interest rate as their interest rate. How can that be justified?

First, some values are determined by people's tastes, which markets do reveal. The relative value of apples and oranges is determined by the tastes revealed in the fruit market. But the value that should be attached to the well-being of future generations is not determined by tastes. It is a matter of ethical judgment.

So does the money market reveal people's ethical judgments about the value of future well-being? I doubt it. The evidence shows that, when people borrow and lend, they often give less weight to their own future well-being than to their present well-being. Most of us are probably not so foolish as to judge that our own well-being is somehow less valuable in old age than in youth. Instead our behavior simply reflects our impatience to enjoy a present benefit, overwhelming whatever judgment we might make about the value of our own future. Inevitably, impatience will also overwhelm whatever high-minded arguments we might make in favor of the well-being of future generations.

But for the sake of argument, suppose people's market behavior genuinely reflected their judgments of value. How could economists then justify proclaiming an ethically neutral stance and taking the discount rate from the market? They do so, purportedly, on democratic grounds—leaving ethical judgments to the public rather than making them for themselves. The economists who criticize Stern claim the democratic high ground and accuse him of arrogantly trying to impose his own ethical beliefs on others.

They misunderstand democracy. Democracy requires debate and deliberation as well as voting. Economists—even Stern—cannot impose their beliefs on anyone. They can only make recommendations and argue for them. Determining the correct discount rate requires sophisticated theory, and we members of the public cannot do it without advice from experts. The role of economists in the democratic process is to work out that theory. They should offer their best recommendations, supported by their best arguments. They should be willing to engage in debate with one another about the ethical bases of their conclusions. Then we members of the public must reach our own decisions with the experts' help. Without their help, our choices will be uninformed and almost worthless.

Once we have made our decisions through the democratic process, society can act. That is not the job of economists. Their recommendations are inputs to the process, not the output of it. The true arrogance is imagining that you are the final arbiter of the democratic process.

Ethical considerations cannot be avoided in determining the discount rate. Climate change raises many other ethical issues, too; one crucial one, the problem of catastrophic outcomes, is mentioned in the box on page 100. It will require serious work in ethics to decide what sacrifices we should make to moderate climate change. Like the science of climate change, the ethics of climate change is hard. So far it leaves much to be resolved. We face ethical as well as scientific problems, and we must work to solve them. ■

MORE TO EXPLORE

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