



## SCIENCE

# What Does Today Owe Tomorrow?

APRIL 28, 2014

**Justin Gillis**

BY DEGREES

If you had driven north on Highway 101 toward San Francisco a few summers ago, you might have noticed a banner hanging from a freeway bridge. “What have future generations done for us?” it asked.

The question not only answers itself, but implies a follow-up question, as was presumably the intention of the anonymous provocateur who posted it. If future generations have given us nothing, should we spend our hard-earned money trying to make the world better for them?

This issue has long hovered over discussions of climate change, but it came into acute focus over the past few weeks as two new reports were released by the Intergovernmental Panel on Climate Change, the United Nations body that periodically reviews the science and economics of the issue.

Scientists have struggled for decades to understand what might happen to the earth, physically, if we continue pouring greenhouse gases into the atmosphere at ever-rising rates. They have made some headway, but the uncertainties remain substantial. The worst-case possibilities are deeply frightening, but the likelihood they will become a reality is unknown.

All the more difficult, then, is the task of figuring out what the projected climatic changes might do to human society, which is in large part an economic question. How severe will the damages be; what present-day policies might reduce them; what will those policies cost; and are they a worthwhile investment compared to the many alternatives for spending our money?

Tackling these issues is not for the timid, but some economists do it for a

living. They have to take the best projections they can get from physical scientists, then incorporate these into elaborate numerical models of how the economy will evolve over the coming centuries.

As you might imagine, the results depend on many assumptions, and particularly on the question of how much value to attach in the present to the hypothesized suffering of future people. You can find arguments in economic journals for spending nothing on climate change, and arguments that we should be spending trillions of dollars to head off the apocalypse.

Most economists who do this work come down in the middle. Their analyses tend to suggest that, because we have dawdled so long, the economic damage from climate change is going to be substantial, no matter what we do from here. They also generally find that this damage is likely to be dwarfed by bigger economic trends unrelated to climate, like the evolution of technology and shifts in population.

Despite those findings, the typical economic analysis suggests that it is still worth trying to limit climate change — in other words, not only can the damage be reduced somewhat, but the future benefits of doing so outweigh the current costs.

Most economists in the field think the rational thing to do is to put a price on emissions of greenhouse gases, which would in turn raise the price of gasoline and of electricity generated from coal. That would discourage emissions in the short run — people might, say, buy more efficient cars or better insulate their houses to avoid higher bills — and it would tilt the market in favor of cleaner energy sources in the long run. It would also have some valuable side benefits, like cleaning up the localized pollution from coal-burning power plants that is chopping years off people's lives in Chinese cities.

But what should the price of greenhouse emissions be? This is where things get sticky.

If you wanted only to reduce the damages that are virtually certain to occur, you might come up with a pretty low number — say, a few extra cents tacked on at the gas pump. But that course would rest on the assumption that climate change will proceed fairly smoothly. In other words, what we will see might look a lot like the changes we have already seen, except gradually becoming more intense. Human society might adjust to that pretty well through normal market behavior.

But as the United Nations panel pointed out, the physical scientists see a

distinct risk that things will not work that way. We might cross some temperature threshold beyond which a rapid, highly disruptive change in the climate would occur.

We know this can happen because it has happened in the earth's geologic history, before seven billion people were in harm's way. For instance, as the last ice age was ending, glaciers melted so fast at one point that the sea level rose at the rate of perhaps a foot per decade, 10 times faster than today.

Suppose we were to spew enough heat-trapping gas into the air to produce a rapid collapse of the polar ice sheets and thus a rapid rise of sea level. Human society could be thrown into panic. Tens of millions of people might have to be moved. Trillions of dollars of productive capital, including many of the world's major coastal cities, might have to be abandoned.

Because the likelihood of this sort of thing is unknown, economists cannot really figure out how to work such risks into their economic models. But they certainly understand them in principle. That is why many of them recommend that we push harder on climate policies than we otherwise might — in other words, set a higher emissions price — to buy ourselves some insurance against the worst-case possibilities.

Whether you agree with that is not, in the end, an economic question.

It is a question of how much you believe you owe those living in the future — not just your own children or grandchildren, but the generations of people who will come long after we are gone.

A version of this article appears in print on April 29, 2014, on page D3 of the New York edition with the headline: What Does Today Owe Tomorrow?.

## **Next in Science**

### **To Divide the Rent, Start With a Triangle**

---

© 2014 The New York Times Company