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Does climate change affect income? New study sees robust link.

In the runup to a global climate conference in Paris, study finds evidence that economic performance in all regions is tightly linked to climate change.

By Pete Spotts, Staff writer | OCTOBER 21, 2015

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If global warming continues unabated, it could slash income around the world by more than 20 percent by century's end, compared with a world without global warming, according to a new study.

Some industrial countries would share in the losses, but the heaviest hits would come to developing countries in the tropics and subtropics, widening an already large gap between rich and poor nations, the study finds.

Overall, 77 percent of the countries on the planet would see per capita income fall.

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Countries projected to see increases in productivity included Canada, countries in central and northern Europe, and Russia – all of which would benefit from warming, at least for a time.

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The work by a trio of economists from the University of California at Berkeley and Stanford University in Palo Alto, Calif., sets out the first data-driven evidence that economic performance in all regions is tightly linked to climate, the researchers say. Their approach offers a new – some say more-precise – way to calculating the economic effect of climate change on national economies as well as the global economy.

The results are sobering. The study's estimates of the economic costs linked to unabated warming are 2.5 to 100 times larger than estimates in previous studies, notes Solomon Hsiang, a researcher at Cal Berkeley and member of the team that conducted the analysis.

The study comes at a time when countries are preparing for a two-week global climate conference in Paris, beginning Nov. 30, that aims to complete a draft treaty to deal with global warming. So far, 154 parties to the United Nations Framework Convention on Climate Change out of 196 have submitted their pledges for acting to either curb greenhouse-gas emissions or to slow the pace at which their emissions are increasing.

Hopes are running high that the agreement – the first to cover all countries – will put the world on track to hold the increase in global

average temperatures to 2 degrees Celsius (3.6 degrees Fahrenheit) by 2100. The pledges take effect after 2020.

Keeping countries on track beyond this initial period will be challenging. If the results hold up to further scrutiny, the analysis published today in the journal Nature suggests that the cost of inaction or insufficient action is



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higher than previously thought, yielding a better return on investments to curb greenhouse-gas emissions than previously estimated.

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One reason for the differences between this and previous studies may be a result of approach, Dr. Hsiang says. Many studies have been theoretical. Others that relied on economic and climate data used data that are relatively old.

For its work, the team behind the latest analysis, led by Hsiang and Stanford University economist Marshall Burke, used economic and climate data from 166 countries and covering the period 1960 to 2010.

The team used statistical tools to isolate temperature from other non-climate factors that can affect economic activity. Then they looked at the results.

The team's data suggested that productivity peaks when a nation's annual average temperature is about 13 degrees Celsius (55 degrees Fahrenheit). Below that temperature, productivity increases with warming. Above that point, productivity decreases. The decline in productivity with higher temperatures is somewhat steeper than the increase toward the 13-degree sweet spot.

With that relationship in hand, the researchers used climate projections to identify changes in each country's annual average temperature and its effect on the country's productivity and per capita income. Countries that stood to gain somewhat from warming currently sit on the cool side of 13 degrees, while the losers currently sit on the warm side.

For some researchers, the study represents an important advance in efforts to assess the economic costs of global warming.

The approach the team used is an improvement over those used in previous studies, notes Thomas Sterner, an economist at the University of Gothenburg in Sweden.

The study “will cause a stir and should have stark repercussions for policy,” he writes in a commentary accompanying the new analysis.

Others are less sure that the study brings clarity to the issue.



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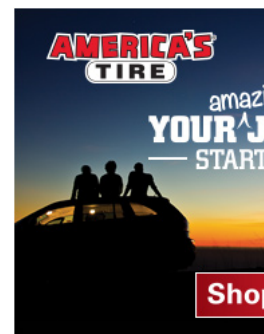
The researchers do a good job in the paper of describing the challenges and issues involved in attempts to connect and project temperatures and productivity, notes John Reilly, co-director of the Massachusetts Institute of Technology Joint Program on the Science and Policy of global Change in Cambridge.

But it's not clear the researchers have identified a cause, he adds.

“You have to assume that the statistics are actually telling us that it's causation and not simply correlations,” he says.

Moreover a study conducted by one of his colleagues at MIT suggests that “the warmest economies in warm areas were heavily affected by climate change, but once countries reached a certain level of economic activity, the climate signal seemed weaker,” Dr. Reilly says.

At the least, he adds, the study will stimulate a debate among economist about the best way to sift through the various factors that affect a country's productivity in order to isolate and assess global warming's economic effects.



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