



Will We Adapt? Labor Productivity and Adaptation to Climate Change in the United States

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Will humans be able to adapt to climate change? What would evidence of adaptation look like? Postdoctoral Fellow Jisung Park and public policy PhD student Patrick Behrer have been working to explore empirical evidence related to the impact of hot days on labor productivity. Jisung spoke about their research in Monday's energy policy seminar, explaining that their analysis suggests that the impacts of heat stress on productivity are real, but also that adaptation to heat stress is possible, within limits, and perhaps already happening.

Inspired by the intuition that work is harder in the heat and by research evidence that supports the idea that heat stress causes declines in labor productivity, Park and Behrer used twenty seven years of county-level payroll data as an indicator of labor productivity and examined the relationship between annual payroll amounts and the number of days 90 degrees and above in a county in a given year.

They found some interesting relationships, Park reported. First, on average, counties had lower payrolls during years with more high temperature days—an average payroll reduction of .08% per additional annual high temperature day (after controlling for factors like macroeconomic shocks and regional economic trends). The effect was particularly strong in “highly exposed” industries, such as construction and transportation.



Given this evidence that heat reduces productivity, the next question has to do with adaptation, Park explained. Does heat always reduce productivity by the same amount, or can people adapt, reducing the impact of heat on productivity? It seems likely that hotter parts of the country would take steps to adapt to high temperature days, Park said, in order to help maintain productivity despite high temperatures. If so, then one would expect a hot day to have less of an impact on productivity in Houston than in Boston, for example. To test this intuition, Park and Behrer compared the relationship between heat and productivity in counties with many hot days and in counties with few hot days. As predicted, they found the impact of hot days in areas with many hot days was less than the impact in areas with few hot days.

A “significant proportion” of this regional difference can be explained by air conditioning, Park noted. In counties where hot days are common, businesses and households are more likely to install air conditioning and engage in other helpful adaptations, helping workers to maintain productivity on hot days. However, Park noted, there are limits to what air conditioning can do in some vulnerable occupations, such as construction, at least using current technologies.

Overall, Park said, this research points to a couple of factors that could be included in the calculation of the social cost of carbon—on the one hand, the need to include the impact of climate change on productivity—but at the same time, the need to account for how that impact can be partially offset by adaptation.

Park spoke as part of the Kennedy School's Energy Policy Seminar Series, which is sponsored by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.