



Air Pollution and Internal Migration in the United States

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We ask the simple but important question: do people in the United States move in response to air pollution? While many Americans express concern about the quality of the air where they live, there has been limited systematic evidence on whether pollution actually affects where households choose to live. We focus on fine particulate matter, known as $PM_{2.5}$, a form of air pollution associated with severe health risks.

We study migration between U.S. commuting zones from 2005 to 2019. This period is especially useful for our analysis because much of the country experienced large and persistent improvements in air quality. Since moving is a major decision, we expect households to respond more to long-term air quality conditions than to short-term pollution spikes. Our goal is to estimate whether cleaner air reduces out-migration and attracts in-migration, and whether dirtier air increases out-migration and deters in-migration.

Answering this question poses two main challenges. Polluted areas are often places with high economic activity and abundant jobs, which may attract residents even as they worsen local air quality. If we simply compare polluted and less polluted places, we may confuse the effects of pollution with the effects of the economic activity that creates it. A second challenge is that people often move relatively short distances, and nearby places tend to experience similar changes in pollution. If both the origin and destination become cleaner or dirtier at the same time, the effect of air quality on migration can be hard to detect.

To address the first challenge, we use changes in pollution caused by emissions from distant coal-fired power plants to isolate variation in air quality that is less likely to be driven by local economic conditions. In other words, we use the way pollution travels through the atmosphere from distant power plants to help identify the effect of $PM_{2.5}$ on migration decisions. To address the second challenge, we use a model that looks at migration flows from each origin commuting zone to each destination commuting zone. This allows us to consider pollution in both the place people are leaving and the place to which they might move.

Our main finding is that air pollution plays a meaningful role in internal migration. We find that higher $PM_{2.5}$ pollution in an origin commuting zone increases the share of households and individuals who move away. We also find that higher $PM_{2.5}$ pollution in a destination commuting zone reduces the share of people who move there. In short, pollution appears to push people out of affected areas and deter people from moving into them.

This pattern is strongest for moves between states. We do not find clear evidence that pollution affects within-state relocations in the same way. One likely explanation is that neighboring areas often share similar air quality. Therefore, moving a short distance may not allow people to meaningfully escape background air pollution, and longer-distance moves may offer more opportunity to relocate to places with substantially different environmental conditions. The similarity of air quality across neighboring areas also makes it difficult to disentangle the push and pull effects of air pollution.

We also find evidence that people are aware of local pollution conditions. In a complementary analysis, we examine survey responses about concern over air pollution and find that reported concerns are positively associated with actual $PM_{2.5}$ levels. This supports the idea that people's migration decisions may reflect awareness of environmental conditions where they live.

The size of the migration effects is economically meaningful. Using our long-difference estimates comparing 2005 and 2019, we conduct a thought experiment for a typical commuting zone. We consider what would happen if that area experienced an isolated $PM_{2.5}$ reduction of $3.85 \mu\text{g}/\text{m}^3$, which corresponds to the average observed decline over our sample period, while pollution elsewhere stayed unchanged. Under that scenario, the combined effect of avoided out-migration and additional in-migration would amount to about 2 percent of the commuting zone's population annually. This illustrates that air quality can be an important factor in relocation decisions.

At the same time, we emphasize that this thought experiment should not be interpreted as the observed migration effect of actual air quality improvements. In reality, pollution changes are usually not isolated. Neighboring and migration-linked areas often experience similar improvements, meaning that the attraction of cleaner air at a potential destination may be offset by cleaner air at the origin as well. As a result, actual observed migration responses will generally be smaller than the effect of an isolated local improvement.

Our findings hold meaningful policy implications. Air pollution policy is often evaluated in terms of health benefits. Our results suggest that air quality also affects where people choose to live. Cleaner air may help communities retain residents and attract new ones, while persistent pollution may contribute to population loss. These migration effects can have broader implications for local tax bases, labor markets, housing demand, and regional economic development.

We conclude that clean air is a valued local amenity that shapes migration decisions in the United States. People appear to respond to pollution by leaving dirtier areas and avoiding polluted destinations, especially when making longer-distance moves. Understanding these responses is important for policymakers who want to assess the full social and demographic consequences of air quality improvements.

References

Link to the full working paper discussed in this brief:

Keller, Michael, Christopher R. Knittel, Benjamin Krebs, and Simon Luechinger (2026), "Air Pollution and Internal Migration in the United States," [MIT CEEPR Working Paper 2026-16](#), August 2026

About the Authors



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Christopher Knittel is the George P. Shultz Professor of Energy Economics and a Professor of Applied Economics in the Sloan School of Management at MIT. He directs the Center for Energy and Environmental Policy Research (CEEPR) at MIT. Knittel's research studies consumer and firm decision-making and what this means for the benefits and costs of environmental and energy policy. His current work involves studying how the costs of climate change policy vary across households and firms and how this differs across policy choices. Knittel uses a variety of empirical methods for his research, including large-scale randomized control trials and machine learning techniques. Professor Knittel received his B.A. in economics and political science from the California State University, Stanislaus in 1994, an M.A. in economics from UC Davis in 1996, and a Ph.D. in economics from UC Berkeley in 1999.



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Simon Luechinger is a professor of economics at the University of Lucerne. His research interests lie in the fields of political economy and environmental economics. In environmental economics, he studies the social costs of air pollution and its effects on health, productivity, and location decisions. He also examines the effectiveness of environmental policies.



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