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Digest

Climate change, migration costs, and policy

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In his JMP, Tueting argues that quantitative climate-migration models typically treat the cost of moving as a pure utility loss, overlooking that part of it is a monetary cost paid up front. Because that cost weighs most heavily on low-income households, it matters for who bears the damage from climate change and which policies can address it.

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Quantitative spatial models are increasingly used to evaluate the welfare losses of climate change (for a recent review, see Desmet & Rossi-Hansberg (2024)). In these models, migration is a central margin of adaptation: as warming lowers productivity in some places, people can move to others. How costly it is to move therefore shapes both how large the losses are and who bears them. Typically, this cost is modeled as a utility loss, often specific to origin, destination, and sector, and backed out from observed migration flows (e.g., Tombe & Zhu (2019)). Because low-income workers move less than others from the same region, despite often large gains from moving, such calibrations implicitly assign them higher moving costs, without taking a stand on where those costs come from.

The empirical literature suggests part of the answer: some of the cost of moving is monetary. Cash transfers increase migration (for example, Bryan et al. (2014); Bastian & Black (2024), Gazeaud et al. (2023)), as does access to credit (Cai, 2020). Part of the cost of moving, then, must be paid up front from a household's budget.

This distinction matters for how we interpret both moving costs and the immobility of low-income workers. When low-income individuals do not migrate in response to climate change (Cattaneo & Peri, 2016), is it because of preferences (e.g., stronger attachment to home) or financial constraints? The answer also shapes policy: if immobility is due to poverty, interventions targeting financial barriers become first-order.

In my paper, I build a quantitative spatial general equilibrium model in which migration costs have both a monetary and a non-monetary component. I calibrate the model to Brazilian data and show that it naturally captures the fact that, compared with others from the same region, low-educated and low-income workers migrate least. I then simulate the welfare losses of climate change across the income distribution and isolate the role of household liquidity in shaping them. In a counterfactual exercise, I show that subsidizing migration could raise the welfare of low-income workers, reduce climate-induced welfare losses, and increase national output.

The case of Brazil

I study Brazil, a country with large regional differences in climate, agricultural productivity, and income. The North is hot, predominantly agricultural, and low-income; the South is cooler, more industrialized, and higher-income. Under projected warming paths, crop yields in the North fall sharply as temperatures exceed critical thresholds (Schlenker & Roberts, 2009), while the South is less exposed. This creates strong incentives for workers to relocate – but the ability to do so is unevenly distributed.

Model simulations without policy intervention indicate that projected climate change damages are highly regressive. The workers most exposed to falling agricultural productivity – low-income, low-educated workers in the hot North – are also the least able to move in response, and falling incomes tighten their budget constraint further.

With concave utility, the same up-front cost of moving imposes a larger utility loss on low-income workers. All else equal, the model therefore generates lower emigration rates among them. In a counterfactual, I neutralize this channel with a migration subsidy that scales inversely with income, so that paying for the move weighs equally on everyone. Non-monetary costs, such as attachment to home, are left unchanged. The modeled subsidy has large economic effects, and low-income welfare rises substantially. Warming still reduces agricultural productivity; what the subsidy changes is who has to stay and absorb the loss. The gains are not only distributional: because the newly mobile workers move toward more productive regions, aggregate output rises as well.

Policy implications and open questions

When people do not move because they cannot afford to, any redistributive policy affects migration through two channels: it changes the value of being in a specific location, and it changes the budget available to reach a desired destination. Models in which moving costs are pure utility capture only the first channel; the monetary cost in my model adds the second. The evidence suggests that it matters:

Bastian & Black (2024) find that US Earned Income Tax Credit expansions raised out-migration from distressed rural counties, a mobility effect from a policy with no migration objective, likely attributable to easing liquidity constraints for vulnerable populations.

Climate policy already pays people to stay – disaster relief, income support – and it could pay them to move. The bill for staying is large: Deryugina (2017) finds that US hurricanes raise government transfers for a decade, mostly through social insurance rather than disaster aid. If households who cannot move are also those supported afterward, immobility is not only a private loss but a claim on the public budget. Sponsoring migration instead may be cheaper than it looks: in my model, a back-of-the-envelope calculation suggests that the additional output generated by the subsidy covers a large fraction of its cost, making the policy partly self-financing. Whether it would cost less than supporting those who stay remains to be evaluated. Aron-Dine (2025) offers related evidence for Puerto Rico after Hurricane Maria, in a model where migration must be financed up front: households value rebuilding subsidies below their budget cost, while a small migration subsidy generates value well above it.

What remains open is design: how large a transfer should be, who should receive it, whether it is better paid before a shock or after, and whether policy should also help people choose where to go. Bringing monetary migration costs into the literature on optimal spatial transfers (Fajgelbaum & Gaubert, 2020) is an important avenue for future research, especially in developing countries, where financial barriers to moving are likely to matter most.

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