

Too Hot to Work? Temperature and Household Labor Allocation in the Tropics

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Background

- The anticipated impacts of climate change appear to be particularly pronounced in low-income countries, where weather-exposed sectors are major sources of people's livelihoods.
- In addition to a direct effect on sector production and productivity, climate change may influence individual welfare through behavioral shifts that alter the ways they produce and consume.
- Given the limited capacity to cope with exogenous production shocks, it is conceivable that both short-term weather fluctuations and climate change may significantly shape household inputs allocation decisions.

Objective

- This study addresses a critical empirical question by quantifying the causal effect of temperature anomalies on household labor allocation decisions in rural Nigeria, where weather-exposed smallholder farmers dominate the agricultural sector.

Materials and Methods

- We use a nationally representative panel survey, encompassing rich information on household labor allocation and migration patterns.
- We took advantage of high-resolution weather data, ERA5, which appears to be less prone to measurement errors than ground-station-based data.
- We employ a canonical fixed-effect model to quantify the impact of rising temperatures on the allocation of household time across on-farm and off-farm labor activities.
- We built on previous work by providing more flexible measures of growing season temperature anomalies, wherein we divide the historical distributing of temperature into 10 deciles.

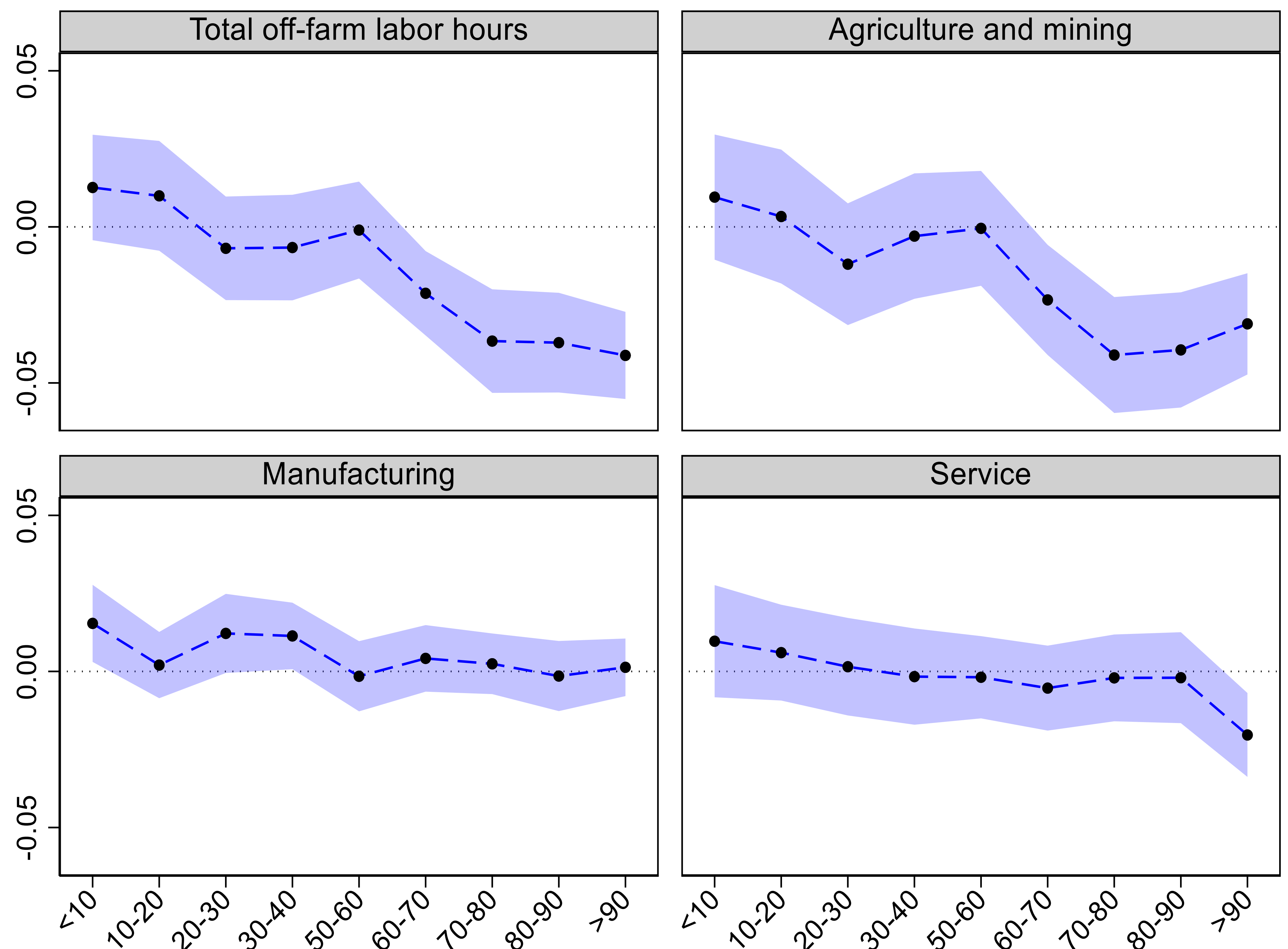
$$y_{ivt} = \sum_{k=1}^K \beta_k N_{vt}(k) + \gamma x_{ivt} + \lambda_i + \mu_{st} + \epsilon_{ivt}$$

- where $N_{vt}(k)$ is the number of days during the growing season with temperature falling within the k^{th} percentile bin in village v and time t .

Results: on-farm labor use



Results: off-farm labor use



Conclusion

- Our findings show that hotter growing seasons not only reduce the use of household labor on family farm, but also reduce the allocation of household time to off-farm work activities, suggesting limited reallocation of labor resources to alternative income-generating tasks.
- Our results also highlight the pivotal role of agricultural productivity in mediating the relationship between temperature and farm labor use.
- In light of these findings, it is evident that climate change poses a significant threat to the agricultural sector and not only reduces crop yields but also results in the diversion of productive resources away from agriculture, adding insult to injury.