

Finance and Climate Resilience: Evidence From the Long 1950s US Drought

Based on BFI Working Paper No. 2023-82, “[Finance and Climate Resilience: Evidence from the Long 1950s US Drought](#),” by Raghuram G. Rajan, Chicago Booth; and Rodney Ramcharan, USC Marshall

Areas affected by the 1950s drought where access to credit was constrained experienced sharp declines in bank lending, net emigration, and population declines. In contrast, agricultural investment and long-run productivity increased in drought-exposed areas with access to credit, even allowing some of these areas to surpass similar areas that were unaffected by the drought.

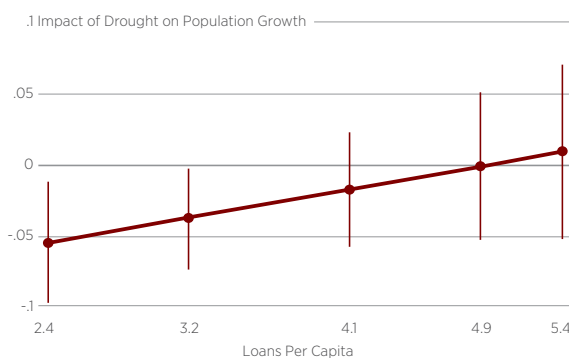
As our chances of avoiding the climate crisis diminish, researchers are increasingly shifting their focus from mitigation to adaptation, studying such questions as: What factors help populations adapt to adverse climate shocks? Do these factors affect long range outcomes? In this paper, the authors tackle these questions in the context of a long drought that affected significant areas of the United States during the 1950s.

The authors use granular banking data along with information on demographics, agricultural investment, and technology adoption during the

decades following the drought to assess whether access to financing helped shape the long-run adjustment to the drought, and the specific channels through which this adjustment occurred. They find the following:

- The profound and long-lasting demographic shifts associated with large climate shocks are mediated by access to bank financing. Counties where residents had the least access to credit in 1950 experienced a much larger decline in population growth (-6.3 percentage points) during the decade of the drought than counties at the median level of loans per capita (-1.5 percentage points).
- These effects are even larger in the long run: In the 30 years following the drought, counties with the least access to credit in 1950 experienced population declines of 10.3 pps, while counties at the median level of credit access declined 4.9 pps between 1950 and 1980.
- These differences are not owed in any significant way to direct effect of credit availability on population growth. Rather, these population shifts are the result of emigration out of drought-affected areas with limited credit access, as well as long-run changes in fertility and mortality. Following the drought, the ratio of 20- to 29-year-olds, for instance, declined in drought exposed counties with limited credit access, while the share of those over 70 increased.

Figure 1 • The Impact of Drought on Population Growth, by Credit Access (1950 - 1960)



Note: This graph plots the impact of drought exposure on population growth between 1950 and 1960 (on the vertical axis) against credit access (on the horizontal axis). Population change is measured in log points and credit access is measured in terms of counties' average share of loans per capita as of 1950. The figure includes data for the sample of affected counties, and the vertical lines show standard errors.

- These migration patterns result in long-run demographic declines in drought-exposed areas without access to credit. Due to the out-migration of young adults, the number of live births in drought-affected counties with low credit availability had fallen by 1960. In addition, since the population left behind is older, the post-drought mortality rate rose.
- Bank lending increased sharply in response to the drought in areas with greater ex-ante credit availability. This relative surge in lending reflects a specific credit supply response to drought-related credit demand, as there is no similar pattern before the drought.

In the second part of their paper, the authors home in on the role of credit specifically. Noting that ex ante per capita credit levels may proxy for a variety of other factors that could influence the economic adjustment to an adverse shock, they use two different strategies to identify the role of credit availability in shaping the economic adjustment to the drought. They show the following:

- First, the authors identify a set of similar towns where the credit supply varies due to a decades-old regulation governing bank entry. This quasi-experiment reaffirms that greater credit availability induces large and persistent differences in long-run outcomes between towns that were affected similarly by the drought.
- Given that most agricultural loans are made to nearby borrowers and that state lines tend to significantly hamper lending, the authors next test whether there is more outmigration from towns with low credit availability when there are nearby in-state towns with high credit availability than when there are nearby out-of-state towns with high credit availability. They show that high credit availability in nearby in-state towns reduces population growth in towns with low credit availability, but there is no such effect for towns with high credit availability, or if credit availability is high in nearby out-of-state towns.

In the final part of their paper, the authors examine how communities used financing to preserve their livelihoods and incomes. They find the following:

- Farms located in areas with greater access to credit were more likely to innovate in a range of areas after the drought. For example, the share of acreage that was irrigated tended to increase on farms in drought-exposed counties with access to credit. Credit availability also helped finance a shift to more drought tolerant crops; production of sorghum, a well-known drought resistant grain, expanded significantly more in counties with high credit availability. In addition, mechanization, such as the adoption of tractors and trucks, was significantly higher in counties with greater access to credit.
- These differences in investment eventually induced large, long-run differences in farm productivity and income. By 1978, the average value of farmland was about 6.45% lower in drought-exposed counties at the 10th percentile of ex-ante credit distribution, while at the 90th percentile of credit distribution, the impact of the drought is positive, with average farmland values increasing by 5.2%. Long-run farm productivity was highest among drought exposed farms with both access to credit and the physical means to adapt through ground water irrigation, even exceeding that in non-drought exposed areas.
- These effects spilled over to local economies. The number of retail establishments declined significantly in drought-hit counties with low credit availability relative to drought-hit counties with high credit availability, an effect that persists long after the drought ended. Manufacturing firms also tended to suffer because of the drought in areas with low credit availability.

Given the growing concern that mitigation efforts will be insufficient to prevent climatic catastrophes from increasing in frequency and impact, adaptation is an important focus. These results suggest that one way to help poor countries, which are most deeply affected by climate change, is to improve access to finance, especially when physical adaptation is possible within the local community. This can also help limit the extent of climate-induced migration, especially to parts of the world that are unprepared to absorb migrants.

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