Climate Change and the Decline of Labor Share

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Extended Abstract

Research Question The labor share has declined substantially in recent decades, breaking its historical stability as one of Kaldor's stylized facts. While existing explanations emphasize technological change, globalization, and market structure, this paper proposes a new perspective: climate change as a structural driver of the decline in labor share. We ask whether rising exposure to extreme temperatures has systematically reduced the labor share.

Empirical Strategy We construct a novel dataset combining U.S. county–industry-level labor shares with granular daily weather data. Our baseline model estimates the effect of extreme temperature exposure on labor share at the county–industry level using a panel model with county, state-by-year, and industry-by-year fixed effects. This specification isolates within-county variation in climate exposure while controlling for time-varying state-level institutions and nationwide industry trends.

Main Results We find that an additional 10 hot days (>77°F) reduces the labor share by 0.63 pp and 10 cold days (<50°F) reduces the labor share by 0.89 pp. The effects are robust to alternative temperature thresholds, treatment windows, and extensive controls.

Mechanism: Climate-Induced Automation First, we show that the impact of extreme temperatures is stronger in industries with greater climate exposure (e.g., outdoor or non-climate-controlled environments) and with greater automation potential (e.g., routine, manual, or hazardous tasks). Second, using both BEA capital data and IFR robot data, we demonstrate that industries more exposed to extreme temperatures increase robot adoption. Together, these results are consistent with climate-induced adoption of labor-saving technology.

Macroeconomic Implications Our aggregate calculation shows that between 2001 and 2019, the increase in hot days dominates the decrease in cold days, leading to a decline in labor share of 0.58 pp, accounting for 15% of the observed decline. In contrast, during the 20th century, the opposing effects largely offset each other, in line with the historical stability of the labor share.

Contribution This paper contributes to three strands of literature: Labor share: It identifies climate change as a previously overlooked driver of labor share decline. Climate economics: It links climate-induced labor productivity losses to long-run distributional outcomes. Technological change: It provides evidence of climate-induced automation as a form of directed technological change. By linking climate change to factor income distribution, this paper offers a unified perspective on both the historical stability and the recent decline of the labor share.