

COMMENTS ON DEREK LEMOINE, “ESTIMATING THE CONSEQUENCES OF CLIMATE CHANGE FROM VARIATION IN WEATHER”

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- This study: Examines what we can (and cannot) learn from data on **weather** about **impact of changing climate**.
- Assumes agents are dynamically optimizing their responses to current and future expected climate via responses to weather shocks.

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- At issue is can we determine $L(\Delta T)$ from weather data.

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 - More generally, what do firms' responses to weather shocks tell us about climate change **impacts**.
- We expect firms' response to climate shocks will be greater than to transient weather shocks. But how do firms distinguish climate shock from weather shock, given the only data is for weather?

Fundamentals: Theoretical Foundation

- Firm (“agent”) chooses actions A_t (e.g., adjusts inputs) in reaction to weather w_t and w_{t-1} , “background climate” C , and weather forecasts $f_t = C + \zeta v_t$ to max PV of payoffs:

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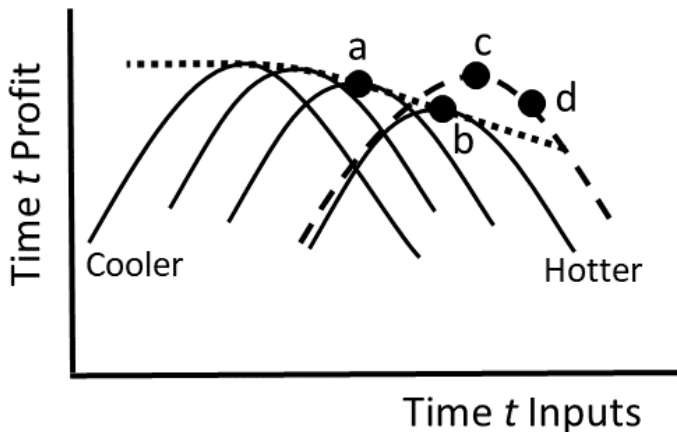
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- Actions depend on past weather, current weather, and forecasts of future weather.

Temperature and Input Choices

- (1) In a to b , static choice of inputs (envelope theorem).
- (2) In a to c , dynamic adjustment.



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- Suppose estimators are unbiased. What do they tell us about impacts?

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 - They tell us nothing about long-run adaptation, including endogenous technical change.

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- What to do? *Hybrid strains of wheat and corn.*

Adaptation: U.S. Wheat Production, 1839–1929

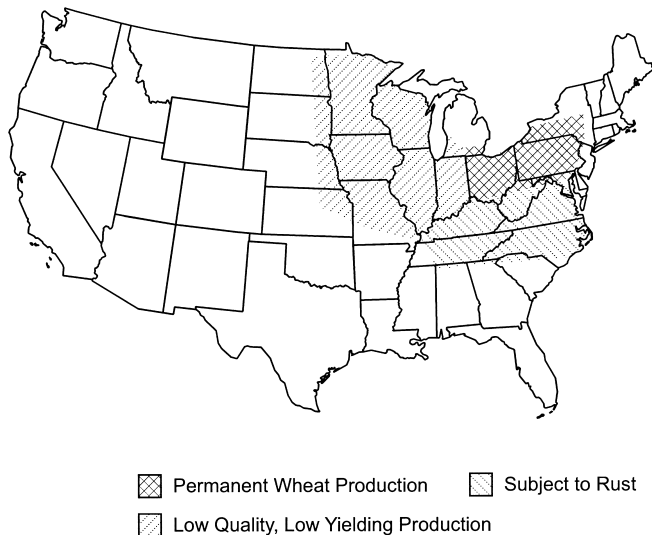


Fig. 6.1 The “potential wheat-producing area” in the United States in 1858

Source: Compiled from Klippart (1860).

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- We want to know the long-run economic impact of climate change — i.e., the “damage function.”
- Weather data across regions and time simply can't tell us what the impact of climate change will be 50 or 100 years from now.

Conclusions

- What are the take-aways here?
 - There is a large and growing literature that tries to tease out impacts of climate change from data on weather, often combining time series and cross-section information.
 - Derek shows how different kinds of adjustment costs can lead to bias in commonly-used estimators.
 - For example, the nature of adjustment costs can determine whether fixed effects estimators of the effects of weather on actions understate or overstate the long-run effects.
- Interesting, but doesn't get at what (for me) is the real problem.
- We want to know the long-run economic impact of climate change — i.e., the “damage function.”
- Weather data across regions and time simply can't tell us what the impact of climate change will be 50 or 100 years from now.
- The search for the holy grail goes on!