

Out in the Cold: Effect of Temperature Shocks on Evictions

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Motivation and Research Question

Eviction rates have increased steadily in the past decades



Source: Spivack (2020) in New York Magazine



Source: Gross (2018) in Aspen Public Radio

Understanding drivers of evictions has become a pressing policy question

- **Consequences** of evictions are becoming better known. Collinson et al. (2021):
 - Evicted households: ↑ rate of homelessness; ↓ future earnings and credit access.
 - Effects are particularly acute for Black and female tenants.

- **Causes** of evictions are still not well understood (Desmond and Gershenson, 2017)

This paper investigates an environmental driver of evictions

Do cold winter shocks impact evictions in the US?

Quotes in Desmond (2016), documenting the story of families that underwent eviction

Lorraine had used \$150 of her rent money to pay a defaulted utility bill with the hope of having her gas turned back on. She wanted to take a hot shower, scrub away the smell. She wanted to feel clean, maybe even something closer to pretty.

Then her car gave out at the worst time—winter—when money was tightest. Ned had been working with a construction crew, which all but shut down in the colder months. They didn't have enough money to repair the car, and Pam lost her job. That's when they fell behind with Tobin.

This paper in a nutshell:

Data: Near-universe of eviction filings and evictions in the US (2010-2016); and winter temperatures at the county level.

Main result: cold winter weather shocks \uparrow evictions

Mechanisms:

- Heating fuel prices: effects aggravated by \uparrow heating fuel prices.
- Labor: effects driven by counties with \uparrow employment shares in more weather-exposed industries, specially if wages experience negative growth shocks.

Contribution to the literature:

1. How do environmental outcomes impact economic inequality?

Banzhaf and Timmins (2019), Hsiang et al. (2019), Ma et al. (2019)

- Novel mechanism: environmental shocks → economic inequality
- Cold shocks → evictions → encroachment of poverty

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2. What are the consequences of energy poverty?

González-Eguino (2015), Chirakijja et al. (2019), Churchill and Smyth (2020), He and Tanaka (2019)

- ↑ fuel prices with ↓ temperatures lead to ↑ evictions
- Calls for energy prices to be more progressive (Borenstein et al., 2021)

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3. What are the causes of evictions?

Collinson et al. (2021), Desmond (2016), Desmond and Gershenson (2017)

- Sheds light on environmental roots of evictions
- Helps elucidate what policies might mitigate eviction rates

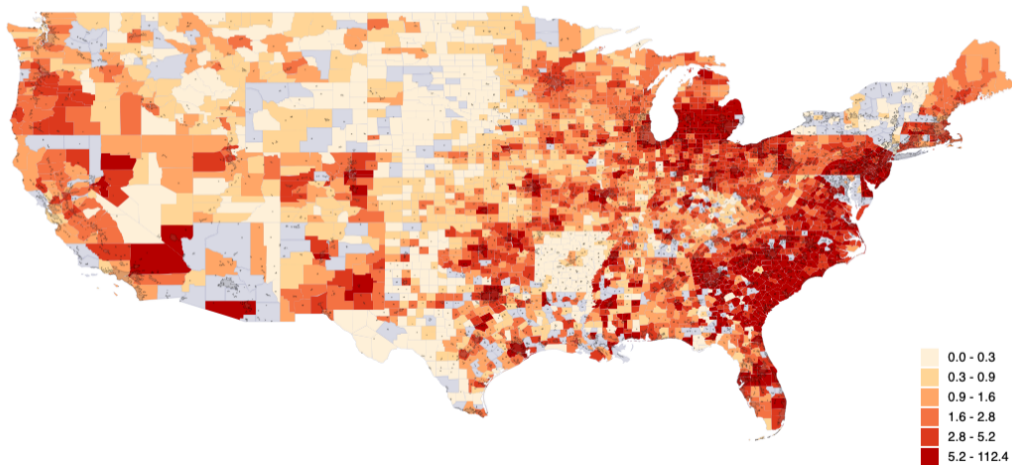
Outline of the talk:

- Data
- Empirical strategy
- Results: main, heterogeneity, mechanisms, policy
- Conclusion

Data

Eviction Filings in the US (2010-2016)

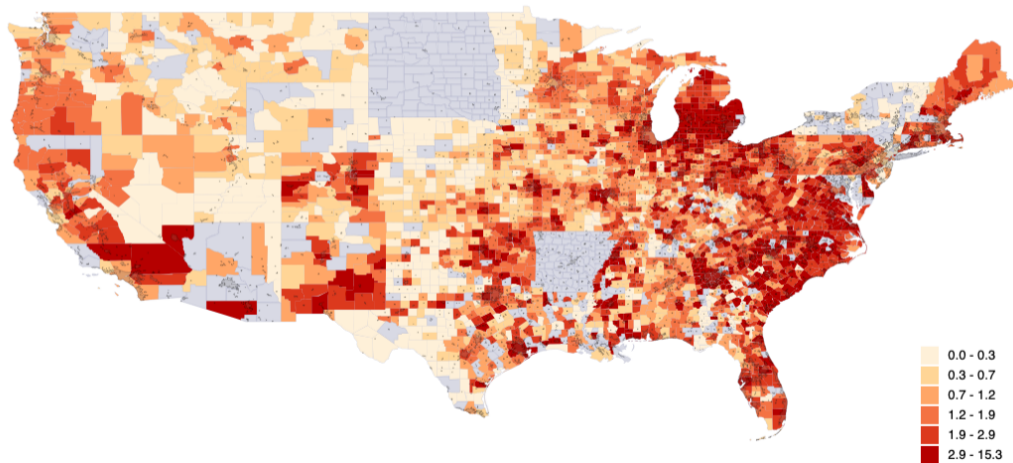
Eviction filings: eviction cases filed in a county in a year



▶ Table

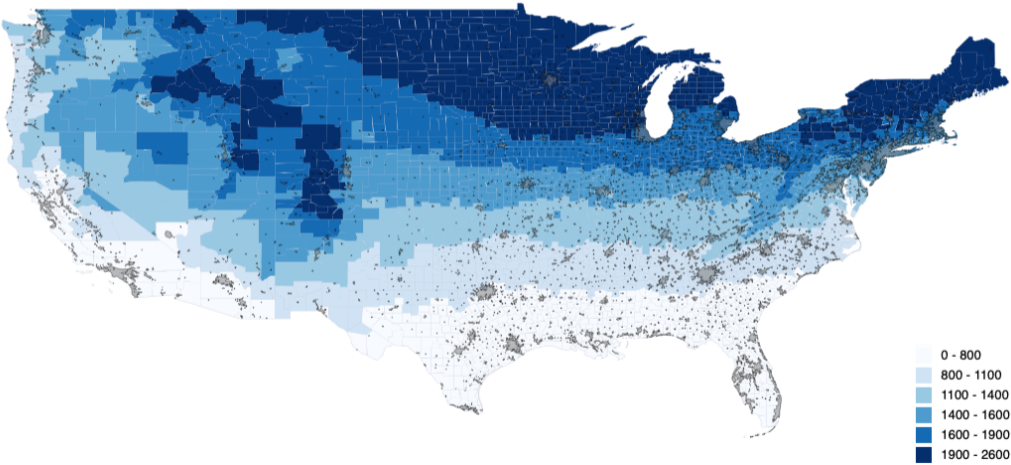
Evictions in the US (2010-2016)

Evictions: eviction cases that resulted in a tenant ordered to vacate a property



Winter temperatures: Heating Degree Days (HDD) - Average

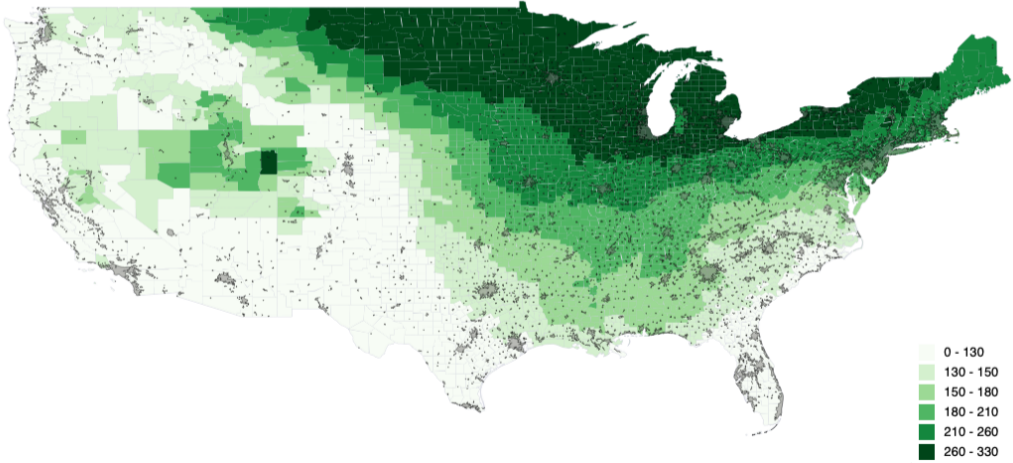
Heating Degree Days: commonly used metric to estimate energy demand for heating



▶ Table

Winter temperatures: Heating Degree Days (HDD) - Standard Deviation

I exploit random winter HDD variation within counties



▶ Table

Empirical approach

Impacts estimated with a fixed effects model

→ Exploit random variation in HDD within counties across years

$$y_{csy} = \beta \cdot HDD_{csy} + \mu_{cs} + \delta_{sy} + \varepsilon_{csy}$$

- y_{csy} : total eviction filings (in logs) or evictions (in logs) in county c of state s in year y
- HDD_{csy} : 100 heating degree days during the first quarter of year y in county c of state s
- μ_{cs}, δ_{sy} : County and state-year fixed effects
- ε_{csy} : standard errors clustered at the county level

→ $\beta > 0$: cold weather shocks \uparrow evictions

To explore mechanisms: shift-share type of instruments

Explore changes in β with local fuel prices and wages in weather-exposed industries.

To address endogeneity, I exploit shift-share types of instruments:

- Instead of local natural gas prices:
 - Baseline share of natural gas use \times National average growth in natural gas prices
- Instead of local wages in weather-exposed industries.
 - Baseline share of workers in relevant industries \times National average growth in wages

Results

Cold weather shocks \uparrow evictions

HDD winter _{c,y}	0.036*** (0.011)	0.031** (0.013)	0.044*** (0.012)
HDD fall _{c,y-1}		0.0093 (0.020)	
HDD spring _{c,y}		0.030 (0.030)	
HDD winter _{c,y-1}			0.027** (0.012)
HDD winter _{c,y-2}			0.036*** (0.012)
<hr/>			
Precipitation (cuadratic)	✓	✓	✓
Filings (log) _{c,y-1}	✓	✓	✓
P-value joint H_0		0.009	0.000
Observations	15,348	15,348	15,348

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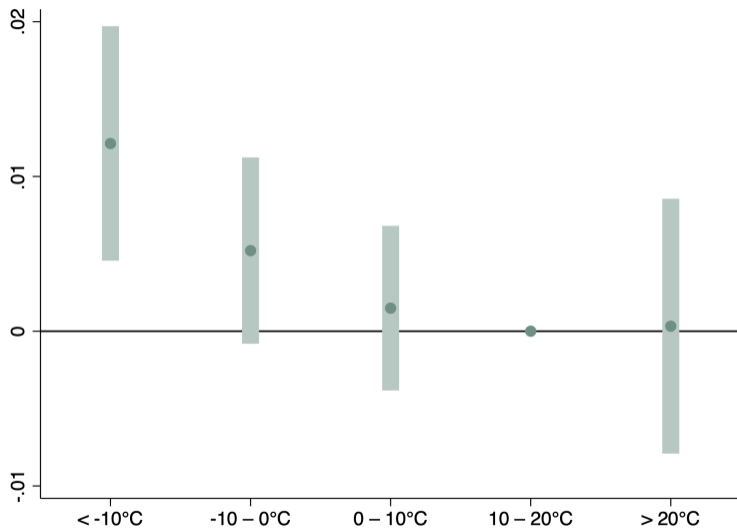
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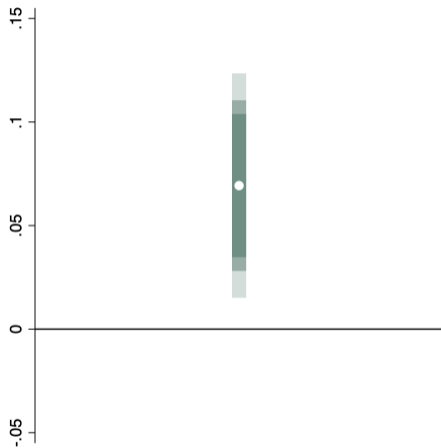
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Cold weather shocks \uparrow evictions: temperature-bins

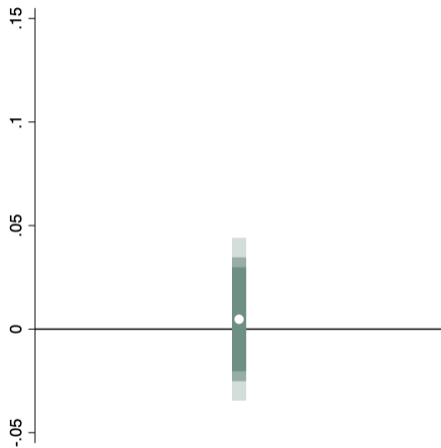


Effects driven by counties with lower shares of White population

White (%): Below median



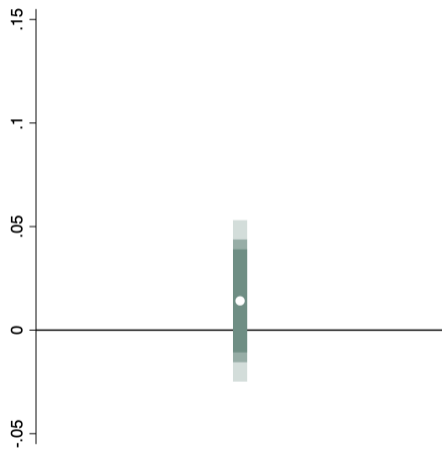
White (%): Above median



► Correlation

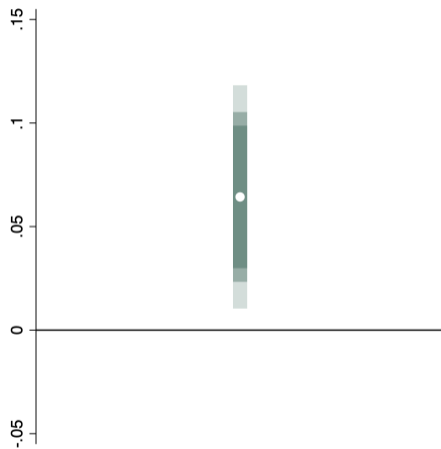
Effects driven by counties with lower incomes

Poverty rate (%): Below median



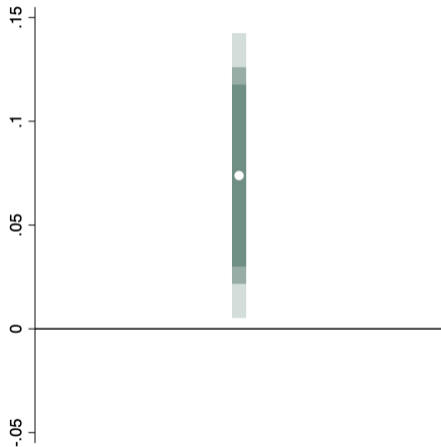
► Correlation

Poverty rate (%): Above median

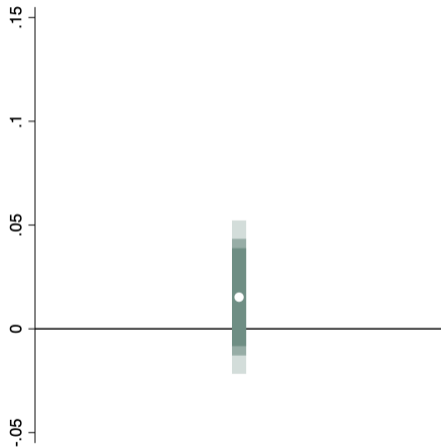


Effects concentrated in counties with warmer winters on average

Average HDD: Below median



Average HDD: Above median



▶ Correlation

Effects aggravated by \uparrow natural gas prices

	Natural Gas	Electricity
HDD winter _{cy}	0.052*** (0.013)	0.032** (0.016)
HDD winter _{cy} × NG share _c × NG price growth _y	0.17*** (0.059)	
HDD winter _{cy} × Elec share _c × Elec price growth _y		-0.18 (0.34)
Observations	16,313	16,313

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Effects driven by weather-exposed industries

HDD winter _{cy}	0.016 (0.020)	-0.012 (0.021)	0.090*** (0.024)
Tercile	1	2	3
Observations	4,983	5,518	5,750

Effects driven by weather-exposed industries

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Effects driven by weather-exposed industries, particularly if wages ↓

HDD winter _{cy}	0.0090 (0.021)	-0.0026 (0.023)	0.10*** (0.026)
HDD winter _{cy} × Wage growth _y	0.17 (0.18)	-0.25 (0.17)	-0.30* (0.18)
<hr/>			
Tercile	1	2	3
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Further results. Effects driven by counties with:

- ↑ mortality due to cardiovascular and respiratory diseases [▶ Table](#)

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- Policies banning utility disconnection [▶ Table](#)

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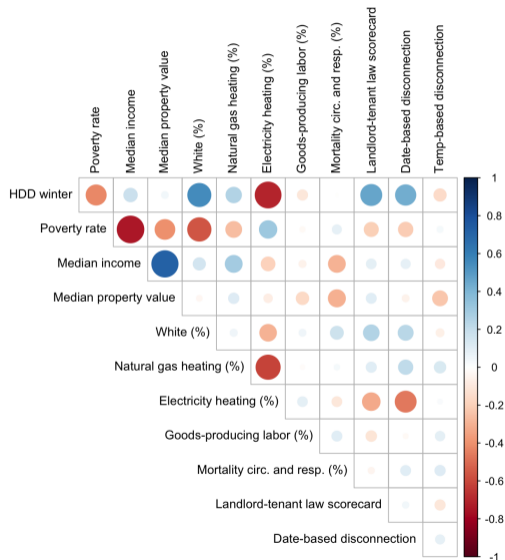
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 - ↑ worker benefits of weather-exposed industries during cold winters
- Climate-change-induced average ↑ temperatures might not ameliorate these effects

Thank you for your attention

Descriptive Statistics [▶ Go back](#)

Variable	Mean	SD (within)	SD (between)	N	Counties	Years (average)
HDD winter	1382	183	512	21728	3104	7.0
Filings	885	457	4415	18813	2827	6.7
Evictions	375	279	1445	17525	2643	6.6

Correlation matrix [▶ Go back](#)



Baseline circulatory and respiratory disease [▶ Go back](#)

HDD winter _{cy}	0.026 (0.020)	0.054** (0.022)	0.056** (0.023)
Tercile	1	2	3
Observations	5,299	5,465	5,370

State policies leaning pro-tenant or pro-landlord [▶ Go back](#)

HDD winter _{cy}	0.045** (0.019)	0.023 (0.016)
<hr/>		
State landlord-tenant laws	Pro-landlord	Pro-tenant
Observations	8,318	7,995

Regulation banning utility disconnection [▶ Go back](#)

HDD winter _{cy}	0.046*** (0.014)	-0.0081 (0.026)	0.052*** (0.018)	0.014 (0.016)
Date-based disconnection	✓	×	–	–
Temperature-based disconnection	–	–	✓	×
Observations	10,829	5,484	8,050	8,263

Regulation banning utility disconnection [▶ Go back](#)

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