Finding Home When Disaster Strikes: Dust Bowl Migration and Housing in Los Angeles

Diogo Baerlocher
University of South Florida

Gustavo S. Cortes
University of Florida

Vinicios P. Sant'Anna
MIT

Workshop in Applied and Theoretical Economics
October 18, 2024

Motivation

- Natural disasters displace an increasing number of people every year
  - ↳ 1.7% of the U.S. adult population (2024 Census Bureau Household Pulse Survey)
  - ↳ Over 4.3 million were displaced by natural disasters in 2023 alone!

- The scientific community predicts an increase in natural disasters in future decades

Motivation

- Natural disasters displace an increasing number of people every year
  - ↳ 1.7% of the U.S. adult population (2024 Census Bureau Household Pulse Survey)
  - ↳ Over 4.3 million were displaced by natural disasters in 2023 alone!
- The scientific community predicts an increase in natural disasters in future decades
- ***Migration*** is a crucial mechanism in lessening negative welfare effects
  Desmet & Rossi-Hansberg (2015); Cruz & Rossi-Hansberg (2021); Bilal & Rossi-Hansberg (2023)
- Many people will be displaced by disasters and will seek refuge somewhere else

> How does the migration of *"climate refugees"* impact housing markets in receiving cities?

Motivation

- The arrival of migrants usually ***increases house prices and rents*** in receiving regions [*Saiz (2003, 2007); Ottaviano & Peri (2006); Ang et al. (2023)*]

Motivation

- The arrival of migrants usually ***increases house prices and rents*** in receiving regions [*Saiz (2003, 2007); Ottaviano & Peri (2006); Ang et al. (2023)*]

- Local impacts also depend on how the locals perceive the migrants
  ↳ "*Distaste*" for migrants can cause incumbent "*flight*" and ***house prices may fall***
  ↳ Previous literature has explored: (1) Differences by ethnicity, national origin, and culture [*e.g., Saiz & Wachter (2011); Sá (2015); Moraga et al. (2019)*] ; (2) Racial differences [*e.g., Boustan (2010); Akbar et al. (2022); Bayer et al. (2022)*]

Motivation

- The arrival of migrants usually ***increases house prices and rents*** in receiving regions [*Saiz (2003, 2007); Ottaviano & Peri (2006); Ang et al. (2023)*]

- Local impacts also depend on how the locals perceive the migrants
  - ↳ "*Distaste*" for migrants can cause incumbent "*flight*" and ***house prices may fall***
  - ↳ Previous literature has explored: (1) Differences by ethnicity, national origin, and culture [*e.g., Saiz & Wachter (2011); Sá (2015); Moraga et al. (2019)*] ; (2) Racial differences [*e.g., Boustan (2010); Akbar et al. (2022); Bayer et al. (2022)*]

- ***This paper:*** Natural disaster-induced migrants [*Boustan et al. (2012); Daepp et al. (2023)*]
  - ↳ Similar race and ethnicity
  - ↳ They were *"pushed"* to migrate: alleviate selection concerns
  - ↳ Refugees are economically vulnerable

Contributions

1. The impacts of climate disaster-induced migration on housing *(Daepp et al. , 2023)*
   - ↳ Dust Bowl as an ***exogenous shock*** pushing people to migrate
   - ↳ Comparing individuals with similar race and ethnicity
   - ↳ Effects at the ***address level***

Contributions

1. The impacts of climate disaster-induced migration on housing *(Daepp et al. , 2023)*
   - ↳ Dust Bowl as an ***exogenous shock*** pushing people to migrate
   - ↳ Comparing individuals with similar race and ethnicity
   - ↳ Effects at the ***address level***

2. The economic consequences of the 1930s American Dust Bowl *(Hornbeck 2012; 2023)*
   - ↳ Effects on housing are still unknown
   - ↳ Housing as an important component of wealth

Contributions

1. The impacts of climate disaster-induced migration on housing *(Daepp et al. , 2023)*
   - ↳ Dust Bowl as an ***exogenous shock*** pushing people to migrate
   - ↳ Comparing individuals with similar race and ethnicity
   - ↳ Effects at the ***address level***

2. The economic consequences of the 1930s American Dust Bowl *(Hornbeck 2012; 2023)*
   - ↳ Effects on housing are still unknown
   - ↳ Housing as an important component of wealth

3. Los Angeles Address Sample: ***geocoded and linked*** across the 1930–1940 Censuses

Historical Background

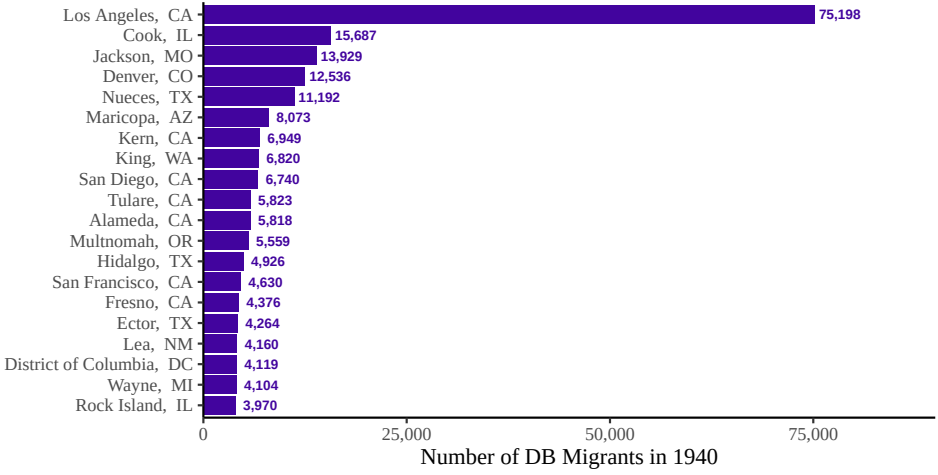
- The 1930s Dust Bowl: One of the most severe natural disasters in U.S. History, resulted from combined weather conditions, prolonged drought, and farming techniques

Historical Background

- The 1930s Dust Bowl: One of the most severe natural disasters in U.S. History, resulted from combined weather conditions, prolonged drought, and farming techniques
- Dust storms ("black blizzards") caused illness, damage, and death
- Historians estimate that close to 60% of the area's population left their homes

Kansas (1935–1936). *Credit: (L) FDR Library Digital Archives; (R) Kansas Historical Society*

Top 20 County Destinations



Data

Summary Statistics

- Historical U.S. Census 1930–1940 (full-count, restricted access): IPUMS USA
  - ↳ House prices (from house values and rents), and resident composition
    House Prices
  - ↳ Household characteristics: age, education, race, etc

Data Summary Statistics

- Historical U.S. Census 1930–1940 (full-count, restricted access): IPUMS USA
  - ↳ House prices (from house values and rents), and resident composition House Prices
  - ↳ Household characteristics: age, education, race, etc

- Los Angeles Address Sample: geocoded and linked addresses
  - ↳ Linked addresses 1930–1940 from *Cortes & Sant'Anna (2024)* Basic Steps Balance
  - ↳ ***[NEW!]*** Geocoding of addresses from 1930 and 1940 (Urban Transition Historical GIS Project by *Logan et al., 2023*)

Data Summary Statistics

- Historical U.S. Census 1930–1940 (full-count, restricted access): IPUMS USA
  - ↳ House prices (from house values and rents), and resident composition House Prices
  - ↳ Household characteristics: age, education, race, etc

- Los Angeles Address Sample: geocoded and linked addresses
  - ↳ Linked addresses 1930–1940 from *Cortes & Sant'Anna (2024)* Basic Steps Balance
  - ↳ ***[NEW!]*** Geocoding of addresses from 1930 and 1940 (Urban Transition Historical GIS Project by *Logan et al., 2023*)

- Immigration from Dust Bowl areas from *Hornbeck (2012, AER)*
  - ↳ 1940 Census: County of residence in 1935

- Redlining information: Mapping Inequality Database: *Nelson and Winling (2023)*

- Census linking project: *Abramitzky, Boustan and Eriksson (2012, 2014, 2019)*

Empirical Strategy

- How did the presence of Dust Bowl migrants affect the evolution of housing prices? Our typical regression is of the following form

$$\Delta y_{i,n} = \alpha_n + \beta \cdot \Delta D_{i,n} + \gamma' X_{i,n,1930} + \epsilon_{i,n},$$

- $\Delta y_{i,n}$ is change in an ***outcome variable*** in address i in neighborhood n, $\Delta D_{i,n}$ is the change in the influence of ***migrants from Dust Bowl*** areas, α_n are ***neighborhood fixed effects***, and $X_{i,n,1930}$ include ***pre-determined address level controls***

Empirical Strategy

- How did the presence of Dust Bowl migrants affect the evolution of housing prices? Our typical regression is of the following form

$$\Delta y_{i,n} = \alpha_n + \beta \cdot \Delta D_{i,n} + \gamma' X_{i,n,1930} + \epsilon_{i,n},$$

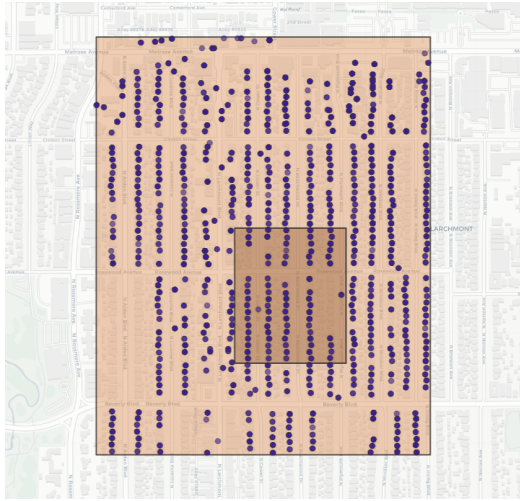
- $\Delta y_{i,n}$ is change in an ***outcome variable*** in address i in neighborhood n, $\Delta D_{i,n}$ is the change in the influence of ***migrants from Dust Bowl*** areas, α_n are ***neighborhood fixed effects***, and $X_{i,n,1930}$ include ***pre-determined address level controls***

- When $\Delta D_{i,n}$ is an indicator variable, our model is equivalent to a ***classic DID*** (with controls) such that β represents the ATT if the usual assumption holds (no selection bias)

  ↳ Assumption: Within neighborhoods, conditional on pre-determined characteristics and compared to other migrants, there is no selection bias

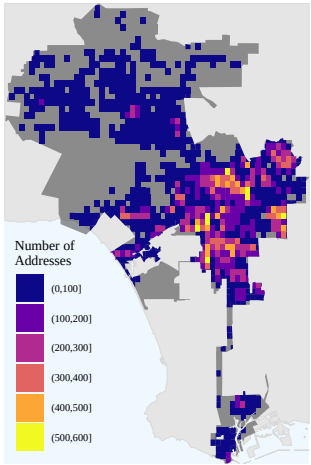
Defining Neighborhoods

- Grid-level neighborhoods
  ↳ 30 arc seconds (≈ 1 km near Equator)
- Sub-divisions
  ↳ 10 arc seconds (≈ 300 m near Equator)
- Match commonly used rasters data
- Consistent across Censuses (unlike enumeration districts that rely on decade-by-decade crosswalks)

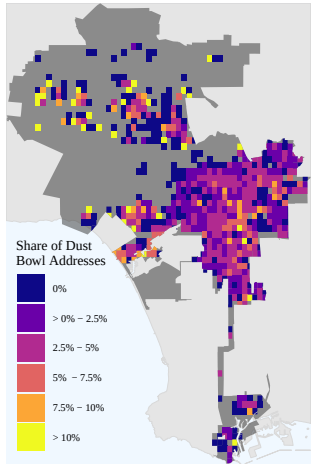


Geographic Distribution of Dust Bowl Migrants in Los Angeles

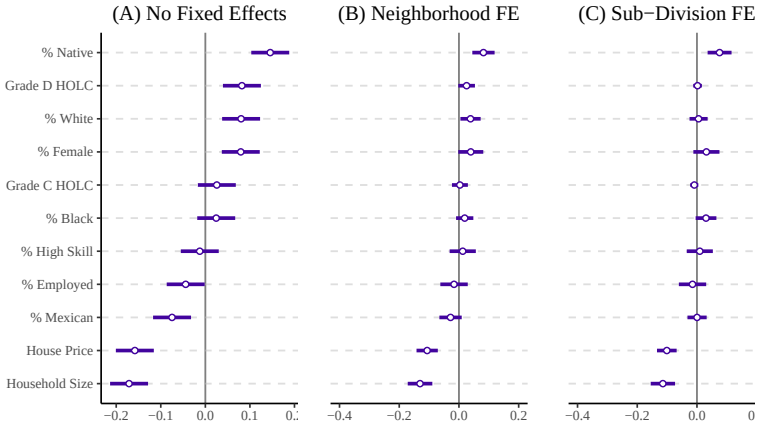
(A) Number Households in 1930



(B) Dust Bowl Migrants in 1940



Fixed Effects and Selection



Direct Effects

- We estimate the direct effect using the following model

$$\Delta \log \text{House Price}_{i,n} = \alpha_n + \beta \cdot \mathbb{1}[\text{DB Migrant}_{i,n} > 0.05] + \gamma' X_{i,n,1930} + \epsilon_{i,n}.$$

- DB Migrant is the share of household heads that migrated from a Dust Bowl county between 1935 and 1940 in address i in neighborhood n
  - ↳ The share is relevant for multi-family units

Direct Effects

Table: **Effects of Dust Bowl Migration on House Prices**

	$\Delta \log(\textit{House Price})_{1930:40}$							
	No Fixed Effects		Grid–neighborhood Fixed Effects		Sub–division Fixed Effects		Enum. District Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dust Bowl Migrant	–0.091***	–0.076***	–0.055***	–0.051***	–0.041**	–0.039**	–0.053***	–0.047***
	(0.016)	(0.016)	(0.017)	(0.017)	(0.018)	(0.018)	(0.016)	(0.017)
Observations	8,148	8,148	8,148	8,148	8,148	8,148	8,148	8,148
R–squared	0.383	0.402	0.501	0.506	0.637	0.640	0.508	0.512
Clusters			665	665	2,625	2,625	700	700
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

- Dust Bowl-inhabited homes had a 5 percentage points lower price growth rate over the decade than other U.S.-born migrants.

Other Direct Effects

- The effect is present in ***both owner-occupied and rented units***, but more concentrated on homes previously owner-occupied in 1930 By Tenure

Other Direct Effects

- The effect is present in ***both owner-occupied and rented units***, but more concentrated on homes previously owner-occupied in 1930 By Tenure
- Owner-occupied properties that received Dust Bowl migrants were about 4 p. p. ***more likely to become rental units*** than other migrant-occupied homes. Tenure Status

Other Direct Effects

- The effect is present in ***both owner-occupied and rented units***, but more concentrated on homes previously owner-occupied in 1930 By Tenure
- Owner-occupied properties that received Dust Bowl migrants were about 4 p. p. ***more likely to become rental units*** than other migrant-occupied homes. Tenure Status
- Properties receiving Dust Bowl migrants saw a significant intensification of use, accommodating ***larger families*** and a considerably ***larger number of individuals***. Size

Spillover Effects

- To assess the effects of Dust Bowl migration on neighbors, we keep only non-migrants in the sample. Then, estimate the following model

$$\Delta \log(\textit{House Price})_{i,n,1930:40} = \alpha_n + \beta^{Renter} \cdot \log(\textit{Proximity})_{i,n} \times \mathbb{1}^{Renter}_{i,n,1930} + \beta^{Owner} \cdot \log(\textit{Proximity})_{i,n} \times \mathbb{1}^{Owner}_{i,n1930} + \eta \cdot \mathbb{1}^{Renter}_{i,n1930} + \gamma' X_{i,n,1930} + \epsilon_{i,n}$$

- $\textit{Proximity} = \frac{1}{\textit{Distance}_{i,n}}$, where *Distance* is the minimum distance to a DB house i

Proximity to Dust Bowl Migrants and House Prices

Density

Panel B. Heterogeneity by Tenure in 1930

	$\Delta \log(\textit{House Price})_{1930:40}$							
	No Fixed Effects		Grid–neighborhood Fixed Effects		Sub–division Fixed Effects		Enum. District Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\log(\textit{Prox.}) \times \textit{Renter}$	–0.013***	–0.012***	–0.011**	–0.010**	–0.012***	–0.010**	–0.013***	–0.011**
	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)
$\log(\textit{Prox.}) \times \textit{Owner}$	–0.055***	–0.038***	–0.024***	–0.020***	–0.018***	–0.014***	–0.024***	–0.019***
	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Renter	0.052**	0.009	–0.062**	–0.069**	–0.080***	–0.085***	–0.062**	–0.073***
	(0.022)	(0.022)	(0.028)	(0.028)	(0.025)	(0.025)	(0.027)	(0.027)
Observations	65,341	65,341	65,341	65,341	65,341	65,341	65,341	65,341
R–squared	0.344	0.368	0.432	0.438	0.495	0.498	0.438	0.444
Clusters			857	857	4,352	4,352	750	750
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

- Even within a tiny area, houses located 1% closer to Dust Bowl migrants saw an average house price growth rate smaller by 1 p.p. (2 p.p.) among renters (owners) over the decade.

Dust Bowl Migrants and the Probability of Moving

- Evidence thus far is consistent with "distaste" for living near Dust Bowl family.
- Can we observe ***resident "flight"*** in response to DB migration?
- The challenge is to track individuals across Censuses

Dust Bowl Migrants and the Probability of Moving

- Evidence thus far is consistent with "distaste" for living near Dust Bowl family.
- Can we observe ***resident "flight"*** in response to DB migration?
- The challenge is to track individuals across Censuses
- Our solution: two measures for moving out:
  1. Demographic-based measure: compares the characteristics of the individuals in the same address between 1930 and 1940.
  2. Individual-linked measure: link individual census records using existing crosswalks *Abramitzky, Boustan and Eriksson (2012, 2014, 2019)*

Dust Bowl Migrants and the Probability of Moving

- We run the following model:

$$\mathbb{P}(Moved)_{i,n} = \alpha_n + \beta \cdot \log(Proximity_{i,n}) + \log(Proximity) \times Renter_{1930} + Renter_{1930} + \gamma' X_{i,n,1930} + \epsilon_{i,n}$$

- $\mathbb{P}(Moved)_{i,n}$ is a dummy variable that equals one if the head of household moved out of address i by 1940.

Dust Bowl Migrants and the Probability of Moving

Demographic-Based Measure

Panel A. Individual-Linked Move Measure

	Grid–neighborhood Fixed Effects				Sub–division Fixed Effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(*Proximity*)	0.018***	0.010***			0.027***	0.017***		
	(0.004)	(0.003)			(0.005)	(0.005)		
log(*Prox.*) × *Renter*			0.008***	0.005**			0.016***	0.013***
			(0.003)	(0.002)			(0.004)	(0.004)
log(*Prox.*) × *Owner*			–0.005	–0.005			0.002	0.002
			(0.006)	(0.006)			(0.007)	(0.007)
Renter			0.498***	0.445***			0.499***	0.449***
			(0.029)	(0.028)			(0.032)	(0.032)
Observations	19,745	19,745	19,745	19,745	19,745	19,745	19,745	19,745
R–squared	0.065	0.134	0.274	0.284	0.212	0.267	0.384	0.393
Clusters	764	764	764	764	3,487	3,487	3,487	3,487
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

- The presence of Dust Bowl migrants significantly influenced local residential mobility patterns, particularly for renters.

Mechanisms

- Discrimination
  - ↳ Often called “Okies,” or “hillbillies”
  - ↳ Stereotypes of poor, welfare-seeking, and unsuccessful Dust Bowl migrants were common
  - ↳ Many historical accounts of discrimination
- Crowding
- Disinvestment

Dorothea Lange/Farm Security Adm. via Library of Congress

LA Times

High-Medium *vs* Low Erosion Migrants

- *Hornbeck (2012, 2023)* shows that areas in the Great Plain that were more eroded faced more substantial declines in agricultural land values, access to credit, population, and employment.

High-Medium *vs* Low Erosion Migrants

- *Hornbeck (2012, 2023)* shows that areas in the Great Plain that were more eroded faced more substantial declines in agricultural land values, access to credit, population, and employment.

- Results:

  ↳ ***Direct and Spillover effects*** on house prices are primarily driven by migrants from High-Medium Erosion areas, which weakens the discrimination mechanism Direct Spillover

High-Medium *vs* Low Erosion Migrants

- *Hornbeck (2012, 2023)* shows that areas in the Great Plain that were more eroded faced more substantial declines in agricultural land values, access to credit, population, and employment.

- Results:

  ↳ ***Direct and Spillover effects*** on house prices are primarily driven by migrants from High-Medium Erosion areas, which weakens the discrimination mechanism Direct Spillover

  ↳ The ***effects on family size and number of families*** are similar among erosion level, weakening the crowding mechanism Size

Concluding Remarks

- We study the impact of climate refugees on housing markets in receiving regions:
  - ↳ Houses inhabited by Dust Bowl migrants in LA had lower growth in house prices
  - ↳ Houses located closer to DB migrants had a lower growth rate in their home prices
  - ↳ We observe a high probability of moving out in response to DB's presence on rented units
- Social perceptions and crowding are unlikely to drive the results

Thank You!

Diogo Baerlocher
University of South Florida
baerlocher@usf.edu

BACKUP SLIDES

The Address Linking Approach: Basic Steps

Back

1. Clean street names and account for common abbreviations (e.g., St = Street, Ave = Avenue, N = North, ...)
2. Clean House number, removing special characters
3. Restrict the sample to addresses unique by state, city, street name, and house number in 1930.
4. For each record in 1930, look for records in 1940 that match exactly on state, city, street name, and house number.

- At this point, there are two possibilities:

1. If a unique match exists, this pair of observations is considered a match.
2. If there are no exact matches
   - ↪ The algorithm searches for exact matches among street names without suffixes
   - ↪ If a unique match exists, this pair of observations is considered a match.

Balance Table

Back

	Full Sample		Linked Sample		Final Sample	
	N (1)	Mean (2)	N (3)	Mean (4)	N (5)	Mean (6)
Dust Bowl Migrants	508,491	0.037	112,575	0.029	73,489	0.03
Other Internal U.S.-Born Migrants	508,491	0.11	112,575	0.084	73,489	0.083
House Value (1930 US$)	165,884	5,766	44,540	4,898	32,918	4,879
Rent (1930 US$)	324,210	59.16	66,984	58.35	41,794	61.67
High Skill	508,491	0.626	112,575	0.629	73,489	0.648
Employed	508,491	0.637	112,575	0.648	73,489	0.663
White	508,491	0.946	112,575	0.954	73,489	0.959
Native	508,491	0.782	112,575	0.752	73,489	0.762
Age	508,491	46.549	112,575	48.277	73,489	48.485
Single	508,491	0.112	112,575	0.069	73,489	0.055

Table: **Descriptive Statistics**

Variables	N (1)	Mean (2)	SD (3)	Min (4)	Max (5)
Migration and Population Movement					
Dust Bowl Migrants	73,489	0.030	0.170	0	1
Other Internal U.S.-Born Migrants	73,489	0.083	0.276	0	1
Housing Outcomes					
House Price 1930	73,489	50.864	219.693	0.11	8,500
Avg. House Price Gr.	73,489	–0.024	0.783	–9.32	6.96
Employment and Skill Level Shares					
High Skill 1930	73,489	0.537	0.489	0	1
Employed 1930	73,489	0.756	0.421	0	1
Resident Characteristics (1930)					
White	73,489	0.934	0.247	0	1
Black	73,489	0.019	0.137	0	1
U.S.-Born	73,489	0.738	0.433	0	1
Foreign	73,489	0.229	0.414	0	1
Mexican	73,489	0.033	0.177	0	1
Number of Families	73,489	2.234	3.366	1	101

Back

House Price Across Tenure Status

Back

- A consistent comparison between owner-occupied and renter-occupied properties depends on a common price metric across ownership status.
- Census data did not provide this information.
- We regress separately for 1930 and 1940

$$P_{i,n} = \alpha_n + \delta \cdot r_{i,n} + \gamma' X_{i,n} + \epsilon_{i,n} \tag{1}$$

- P_i is the log of house price (monthly rent or house value)
- r_i: an indicator for whether the address contains at least one unit rented
- $X_{i,n}$ the complete set of control variables
- neighborhood fixed-effects:
- δ represents the log of the user cost of owner-occupied housing or capitalization rate.

Table: **Dust Bowl Migration and the Role of Tenure Status in 1930**

Panel B. Tenure Status Change

	$\Delta Tenure\ Status_{1930:40}$							
	No Fixed Effects		Grid–neighborhood Fixed Effects		Sub–division Fixed Effects		Enum. District Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DB Migrant × *Renter*	–0.012	–0.011	–0.011	–0.010	–0.011	–0.010	–0.014*	–0.012
	(0.010)	(0.010)	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)
DB Migrant × *Owner*	0.045***	0.044***	0.042**	0.041**	0.036	0.035	0.042**	0.041**
	(0.015)	(0.015)	(0.019)	(0.019)	(0.024)	(0.024)	(0.020)	(0.020)
Renter	–0.660***	–0.642***	–0.663***	–0.651***	–0.677***	–0.662***	–0.651***	–0.638***
	(0.009)	(0.010)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Observations	8,197	8,197	8,197	8,197	8,197	8,197	8,197	8,197
R–squared	0.471	0.475	0.536	0.539	0.688	0.690	0.521	0.523
Clusters			667	667	2,636	2,636	700	700
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

Back

Table: **Effects on Household Size and Number of Residents**

	$\Delta Household\ Size_{1930:40}$				$\Delta Residents_{1930:40}$			
	Grid FE (1)	Sub-Div. FE (2)	Grid FE (3)	Sub-Div. FE (4)	Grid FE (5)	Sub-Div. FE (6)	Grid FE (7)	Sub-Div. FE (8)
DB Migrant	0.047***	0.046***			0.100***	0.090***		
	(0.012)	(0.013)			(0.018)	(0.019)		
DB Migrant × Renter			0.030**	0.031**			0.088***	0.071***
			(0.013)	(0.015)			(0.021)	(0.023)
DB Migrant × Owner			0.091***	0.088***			0.134***	0.146***
			(0.023)	(0.026)			(0.026)	(0.031)
Renter			–0.043***	–0.041**			–0.088***	–0.079***
			(0.014)	(0.017)			(0.018)	(0.020)
Observations	8,197	8,197	8,197	8,197	8,197	8,197	8,197	8,197
R–squared	0.513	0.657	0.515	0.658	0.410	0.585	0.413	0.587
Clusters	667	2,636	667	2,636	667	2,636	667	2,636
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓

Back

Table: **Dust Bowl Migration and the Role of Tenure Status in 1930**

Panel A. Effects on Prices by Tenure Status

	$\Delta \log(\textit{House Price})_{1930:40}$							
	No Fixed Effects		Grid–neighborhood Fixed Effects		Sub–division Fixed Effects		Enum. District Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DB Migrant × *Renter*	–0.069***	–0.060***	–0.043**	–0.040**	–0.040*	–0.038*	–0.037**	–0.033*
	(0.019)	(0.019)	(0.019)	(0.019)	(0.022)	(0.022)	(0.018)	(0.018)
DB Migrant × *Owner*	–0.127***	–0.109***	–0.079**	–0.077**	–0.042	–0.039	–0.084***	–0.079**
	(0.030)	(0.030)	(0.032)	(0.032)	(0.034)	(0.035)	(0.031)	(0.031)
Renter	–0.174***	–0.147***	–0.125***	–0.117***	–0.092***	–0.084***	–0.129***	–0.121***
	(0.018)	(0.019)	(0.018)	(0.020)	(0.022)	(0.023)	(0.019)	(0.020)
Observations	8,148	8,148	8,148	8,148	8,148	8,148	8,148	8,148
R–squared	0.391	0.406	0.504	0.509	0.639	0.641	0.512	0.515
Clusters			665	665	2,625	2,625	700	700
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

- The effect is present in both owner-occupied and rented units but more concentrated on homes previously owner-occupied in 1930.

Back

Table: **Probability of Move and Dust Bowl migrant presence.**

Panel B. Demographic-Based Move Measure

	Grid–neighborhood Fixed Effects				Sub–division Fixed Effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\log(Proximity)$	0.003	0.004			0.006	0.007*		
	(0.003)	(0.002)			(0.004)	(0.004)		
$\log(Prox.) \times Renter$			0.005**	0.007***			0.006	0.008**
			(0.002)	(0.002)			(0.004)	(0.004)
$\log(Prox.) \times Owner$			–0.006	–0.005			0.0002	0.0006
			(0.004)	(0.004)			(0.005)	(0.005)
$Renter$			0.239***	0.247***			0.218***	0.228***
			(0.020)	(0.020)			(0.021)	(0.021)
Observations	34,491	34,491	34,491	34,491	34,491	34,491	34,491	34,491
R–squared	0.034	0.045	0.095	0.101	0.130	0.139	0.184	0.189
Clusters	834	834	834	834	4,123	4,123	4,123	4,123
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

Back

Table: **Density of Dust Bowl families and Housing Prices.**

Panel B. Heterogeneity by Tenure in 1930

	$\Delta \log(\textit{House Price})_{1930:40}$					
	No Fixed Effects		Grid–neighborhood Fixed Effects		Enum. District Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)
DB Dens. × *Renter*	–0.097***	–0.083***	–0.063*	–0.056*	–0.133***	–0.123***
	(0.014)	(0.015)	(0.036)	(0.034)	(0.041)	(0.038)
DB Dens. × *Owner*	–0.260***	–0.168***	–0.096***	–0.074**	–0.159***	–0.129***
	(0.016)	(0.016)	(0.036)	(0.034)	(0.037)	(0.035)
Renter	–0.195***	–0.140***	–0.135***	–0.122***	–0.127***	–0.114***
	(0.008)	(0.008)	(0.010)	(0.010)	(0.011)	(0.010)
Observations	65,341	65,341	65,341	65,341	65,341	65,341
R–squared	0.345	0.368	0.432	0.438	0.438	0.444
Clusters			857	857	750	750
Log Prices (1930)	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓

Back

Table: **Direct Effects of Dust Bowl Migration on House Prices by Erosion Level at the Origin**

	$\Delta \log(\textit{House Price})_{1930:40}$							
	No Fixed Effects		Grid–neighborhood Fixed Effects		Sub–division Fixed Effects		Enum. District Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High and Medium Erosion Origin	–0.104***	–0.089***	–0.062***	–0.057***	–0.050***	–0.049**	–0.058***	–0.051***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.018)	(0.018)
Low Erosion Origin	–0.047	–0.035	–0.033	–0.032	–0.010	–0.004	–0.035	–0.032
	(0.030)	(0.030)	(0.030)	(0.030)	(0.037)	(0.037)	(0.028)	(0.028)
Observations	8,148	8,148	8,148	8,148	8,148	8,148	8,148	8,148
R–squared	0.383	0.400	0.456	0.461	0.465	0.468	0.462	0.465
Clusters			665	665	2,625	2,625	700	700
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls		✓		✓		✓		✓

Back

Table: **Housing Prices and Proximity to Dust Bowl Families by Erosion**

	Grid–neighborhood Fixed Effects			Sub–division Fixed Effects		
	(1)	(2)	(3)	(4)	(5)	(6)
log(Prox. High-Medium Erosion)	–0.019***		–0.019***	–0.015***		–0.012***
	(0.004)		(0.004)	(0.004)		(0.004)
log(Prox. Low Erosion)		–0.005	0.007		–0.013*	–0.004
		(0.006)	(0.006)		(0.006)	(0.007)
Observations	65,341	65,341	65,341	65,341	65,341	65,341
R–squared	0.433	0.433	0.433	0.495	0.495	0.495
Clusters	857	857	857	4,352	4,352	4,352
Log Prices (1930)	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓

Back

Table: **Effects on Household Size and Number of Residents by Erosion**

	$\Delta Household\ Size_{1930:40}$				$\Delta Residents_{1930:40}$			
	Grid FE (1)	Sub-Div. FE (2)	Grid FE (3)	Sub-Div. FE (4)	Grid FE (5)	Sub-Div. FE (6)	Grid FE (7)	Sub-Div. FE (8)
DB Migrant	0.047***	0.046***			0.100***	0.090***		
	(0.012)	(0.013)			(0.018)	(0.019)		
High and Medium Erosion Origin			0.042***	0.041***			0.095***	0.093***
			(0.013)	(0.014)			(0.019)	(0.020)
Low Erosion Origin			0.061***	0.062**			0.117***	0.082**
			(0.021)	(0.024)			(0.030)	(0.033)
Observations	8,197	8,197	8,197	8,197	8,197	8,197	8,197	8,197
R–squared	0.513	0.657	0.513	0.657	0.410	0.585	0.410	0.585
Clusters	667	2,636	667	2,636	667	2,636	667	2,636
Log Prices (1930)	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓

Back

The Los Angeles Times: March 13, 1940 Back

Supervisors Back Workers' Protest on Hiring of Migrants

A sympathetic ear was given yesterday by the Board of Supervisors to the plea of 25 La Verne citrus workers who sent a communication to the body complaining that migrant workers are taking their jobs on ranches and in orchards.

Acting on a resolution presented by Supervisor William A. Smith of Whittier, the board urged the employers of farm labor in the county to give employment preference to established residents.

"These dust-bowl migrants," Smith's resolution stated, "by agreeing to work at a lower wage, offer a threat to the present standard of living and the wage scale in this county.

"The displacement by newcomers will tend to increase the county tax rate by compelling displaced workers and their families to apply for charity."