

# White Flight from Asian Immigration: Evidence from California Public Schools

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# Introduction

## ► Motivation:

- ▷ Asians = fastest-growing racial group in the U.S. (Pew, 2017 & 2019)
  - +72% between 2000 and 2015 (11.9M → 20.4M)
- ▷ High levels of residential segregation across the U.S. ⇒ racial sorting across schools
  - “More than half of the nation’s schoolchildren are in racially concentrated districts, where over 75% of students are either white or nonwhite” (NYT, 2019)
- ▷ Growing body of econ. lit. on the existence, magnitude, and mechanisms of white flight in response to in-migration of Blacks and Hispanics
- ▷ However, not much on responses to inflows of Asians, a group that is on average more educated (higher achieving) and higher income

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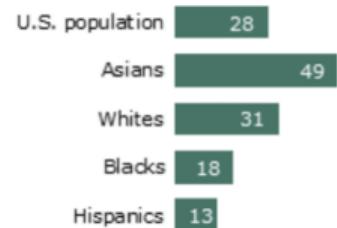
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*% with a bachelor's degree or more, among ages 25 and older, 2010*



*Median household income, 2010*



Source: Pew Research Center

# Introduction (cont'd)

## ► Motivation (cont'd):

- ▷ Anecdotal evidence that white flight from Asian students exists in public school districts
- ▷ Aversion to academic competition with newly arrived, higher-achieving Asian students may play a role:
  - ▶ newspapers and online quotes

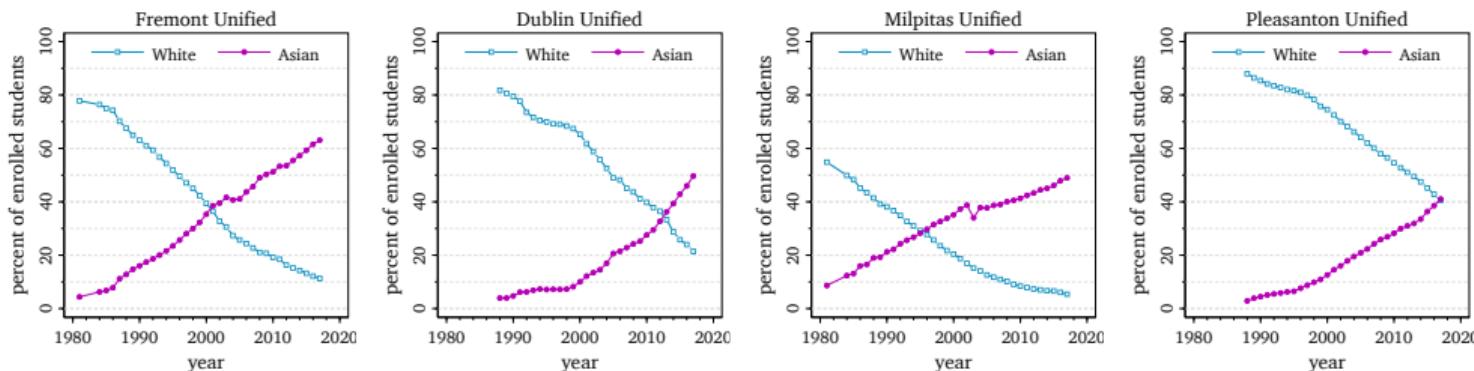
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► Other select Bay area school districts

► Enrollment levels in CA, by racial/ethnic group

Source: California DOE

# This paper

## ► **Research question:** To what extent does the arrival of Asian students cause white flight?

- ▷ Does white enrollment respond to the enrollment of new Asian students in their school district?
- ▷ If so, what are the mechanisms behind the observed white flight?

## ► **Approach:**

- ▷ Establish facts on Asian arrivals in CA and responses from whites
- ▷ Try a causal analysis, using a shift-share instrument
- ▷ Present a theoretical model of white spatial location decisions to help us think about the potential mechanisms behind the facts
- ▷ Empirically test the model's predictions to distinguish between:
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  - Pure racial distaste for Asians
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- ▶ **Context:** Californian public school districts, grades K-12, 2001-2016
- ▶ **Empirical method:** Use established patterns of Asian migrations as of 2000 to predict the settlement of new inflows from 2001 to 2016 (shift-share instrument, a.k.a. Bartik/Card instrument)
- ▶ **Preview of main empirical findings:**
  - ▷ White flight in Californian public schools from the arrival of Asian students
  - ▷ However, white flight observed only in suburban areas
  - ▷ Each newly enrolled Asian student leads to the departure of approximately 2.5 white students
  - ▷ Although school districts' academic performance improves following the arrival of Asian students, suggestive evidence that whites' aversion to educational competition with their Asian peers is stronger than the preference whites may have for higher-performing peers

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# Related literature

## ► Research on white/native flight from minority entrants:

- ▷ Flight from immigrants: Card (2001), Betts and Fairlie (2003), Sá (2015) [UK], Murray (2016), Farre, Ortega, and Tanaka (2018) [Spain]
  - ▷ Flight from Hispanics: Cascio and Lewis (2012)
  - ▷ Flight from Blacks: Boustan (2010), Shertzer and Walsh (2019)
- ⇒ Estimates of white/native flight from most closely related studies range from 1.4 to 2.7

## ► Asian immigration literature:

- ▷ Very little knowledge about this large and growing immigrant group
- ▷ Mostly research on the reasons why Asians have higher incomes in the modern period (Chiswick, 1983; Hirschman and Wong, 1986; Suzuki, 1995, 2002; Sue and Okazaki, 2009; Lee and Zhou, 2015; Hilger, 2017)

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# Roadmap

1 Introduction

2 Background

- Trends in Asian immigration in the U.S. and CA

3 Empirical methods

4 Main empirical results

5 Spatial model

6 Mechanisms

7 Concluding remarks

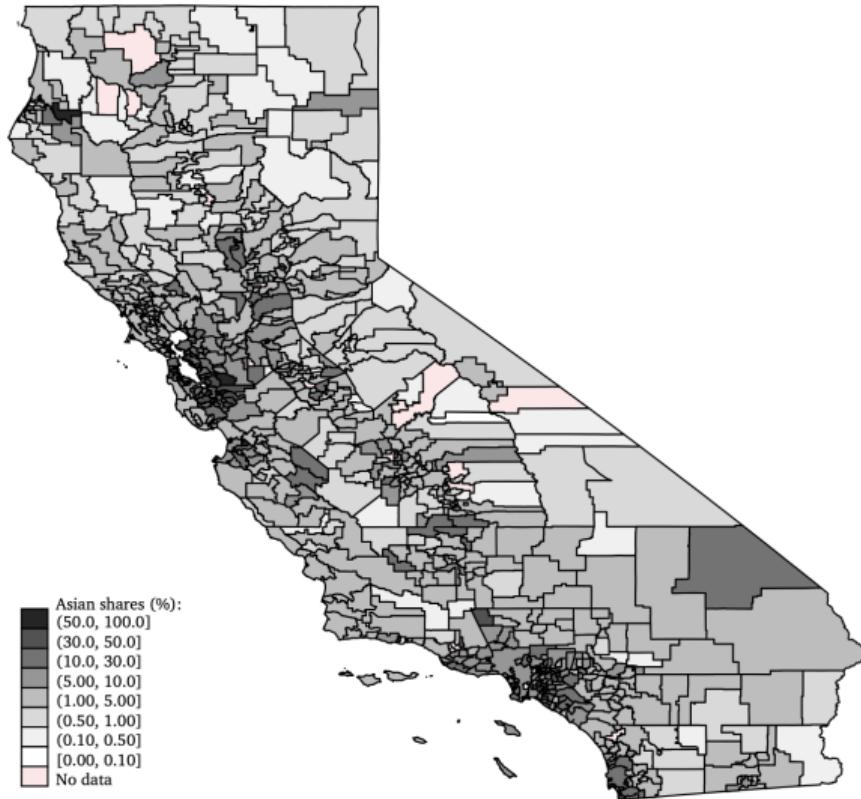
# Background: Trends in Asian immigration in the U.S. and CA

- ▶ Change in patterns of Asian immigrant settlement over time (Li, Skop & Yu, 2007)
  - ▷ 1980s to mid-1990s: settle in central city enclaves – e.g., “Chinatown,” “Little Tokyo,” or “Manilatown”
  - ▷ From mid-1990s onwards: rapid rate of suburbanization – Asians move to suburbs, especially if belong to middle and upper classes
    - Better living conditions and public amenities
    - Decent housing
    - High-performing schools
- ▶ California (CA) as a case study
  - ▷ 1/3 of the total Asian population in the U.S. live in CA
  - ▷ Asians ≈ 15% of CA population (5M)
  - ▷ Focus on public schools
    - Data availability
    - Substantial variation in Asian population shares across CA

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# Share of Asian students across CA in 2000



▶ Zoom in SF ▶ Zoom in LA

Sources: California Department of Education (DOE) & U.S. Census Bureau



# Defining rural/suburban/urban areas

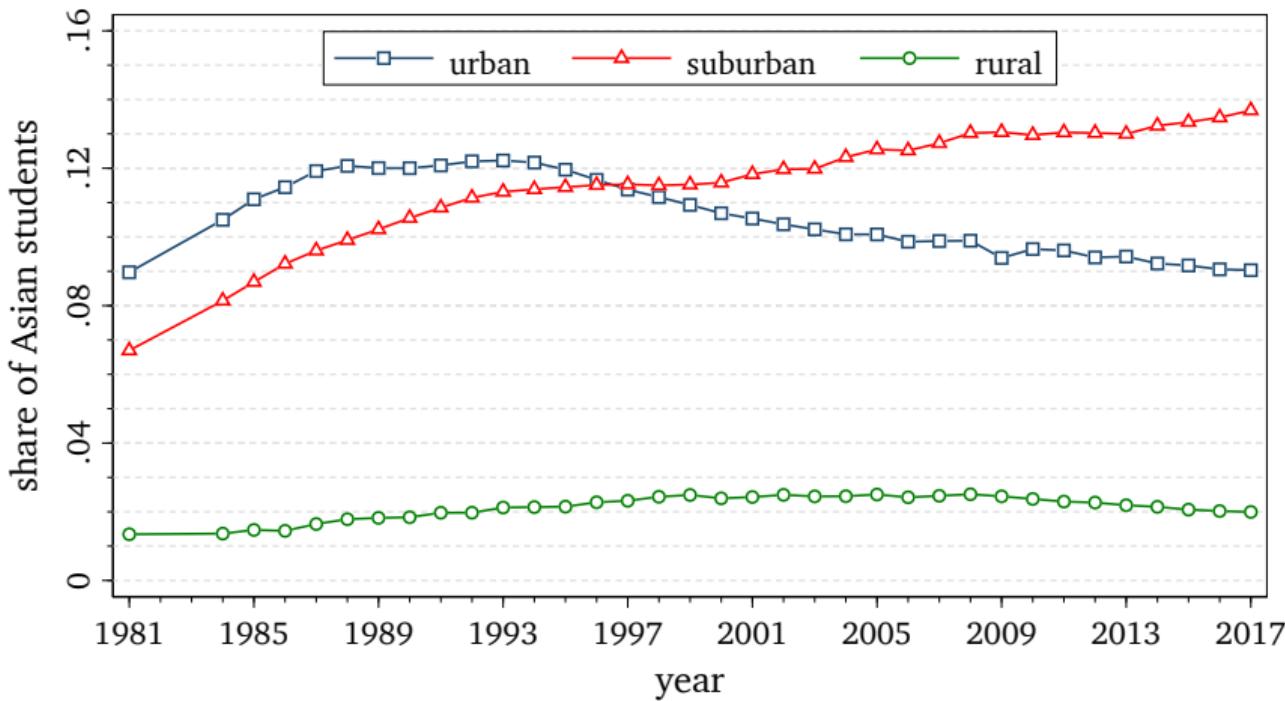
- ① Map each county of CA to its corresponding metropolitan area, using the 2000-2011 definition from IPUMS USA ⇒ crosswalk dataset of counties and metropolitan areas in CA
- ② Combine this crosswalk dataset with the public-school enrollment data from the California DOE, and define our urban status variable as follows:
  - ▷ Step 1: Any counties that do not appear in the IPUMS data → rural areas
  - ▷ Step 2: Sort the dataset by county and school district size (based on total enrollment)
  - ▷ Step 3: Largest school district (based on its public-school student population) → urban areas
  - ▷ Step 4: Remaining school districts → suburban areas

[◀ Back to time series](#)

[◀ Back to scatter plots](#)

[◀ Back to main table](#)

# Growing share of Asian students in suburban areas



► Definitions of urban status

► US vs CA

► Enrollment levels in CA, by racial/ethnic group

Source: California Department of Education (DOE)

# Roadmap

1 Introduction

2 Background

3 Empirical methods

- Empirical strategy: OLS
- Empirical strategy: IV
- Data

4 Main empirical results

5 Spatial model

6 Mechanisms

7 Concluding remarks

# Empirical strategy: OLS

## ► OLS specification:

$$White_{d,t} = \alpha_0 + \alpha_1 Asian_{d,t} + \alpha_2 Total_{d,t-1} + \pi_t + \delta_d + \epsilon_{d,t} \quad (1)$$

$White_{d,t}$  : enrollment of white students in school district  $d$  in year  $t$

$Asian_{d,t}$  : enrollment of Asian students in school district  $d$  in year  $t$

$Total_{d,t-1}$  : total enrollment of school district  $d$  in the previous year

$\pi_t$  : year fixed effects (FE)

$\delta_d$  : school district FE

## ► Endogeneity concerns: endogenous locations

- ▷ Simultaneous causation: Asians might prefer to locate in districts with low white populations  $\Rightarrow$  any negative estimated relationship would not be driven by white flight but by Asian demand
- ▷ Sorting: Asians might prefer to locate in ethnic enclaves (networks, job opportunities, etc.)

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# Empirical strategy: IV

## ► 2SLS specification: ▶ Identifying assumptions

$$\text{1st stage: } \widehat{\text{Asian}}_{d,t} = \beta_0 + \beta_1 \widehat{\text{AsianPred}}_{d,t} + \beta_2 \widehat{\text{Total}}_{d,t-1} + \omega_t + \rho_d + \eta_{d,t} \quad (2)$$

$$\text{2nd stage: } \widehat{\text{White}}_{d,t} = \gamma_0 + \gamma_1 \widehat{\text{Asian}}_{d,t} + \gamma_2 \widehat{\text{Total}}_{d,t-1} + \lambda_t + \phi_d + \varepsilon_{d,t} \quad (3)$$

## ► Shift-share instrument: predicted level of enrolled Asian students in district $d$ in year $t$

$$\widehat{\text{AsianPred}}_{d,t} = \widehat{\text{AsianEnr}}_{d,\tau} + \sum_{i=\tau+1}^t \Delta \widehat{\text{AsianEnr}}_{d,i} \quad (4)$$

where, for  $j \in \{\text{Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese}\}$ ,

$$\Delta \widehat{\text{AsianEnr}}_{d,t} = \frac{\widehat{\text{AsianEnr}}_{d,\tau}}{\widehat{\text{AsianPop}}_{d,\tau}} \sum_j (\text{Share}_{j,d,\tau} \times \text{Flow}_{j,t}) \quad (5)$$

$\widehat{\text{Total}}_{d,t-1}$  : total enrollment of school district  $d$  in the previous year

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$\widehat{\text{AsianEnr}}_{d,\tau}$  : enrollment of Asian students in district  $d$  in base year  $\tau$

$\widehat{\text{AsianPop}}_{d,\tau}$  : total population of Asian residents in school district  $d$  in base year  $\tau$

$\text{Share}_{j,d,\tau}$  : base-year share of residents in ethnic group  $j$  in district  $d$ , as a fraction of all people from group  $j$  in the U.S.

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# Data

## ► Education data:

- ▷ California Department of Education
  - Enrollment counts by gender and by racial group
  - Public schools, K-12, 1981-2017
- ▷ U.S. Census Bureau (2017 GIS TigerLine)
  - School district boundaries

## ► Population data:

- ▷ Department of Homeland Security (DHS) Yearbook of Immigration Statistics
  - National yearly inflows of immigrants by country of origin
  - National population levels of Asians by country of origin
- ▷ U.S. Census Bureau (decennial Census data)
  - Population by racial group at the tract level
  - School district population (2000)

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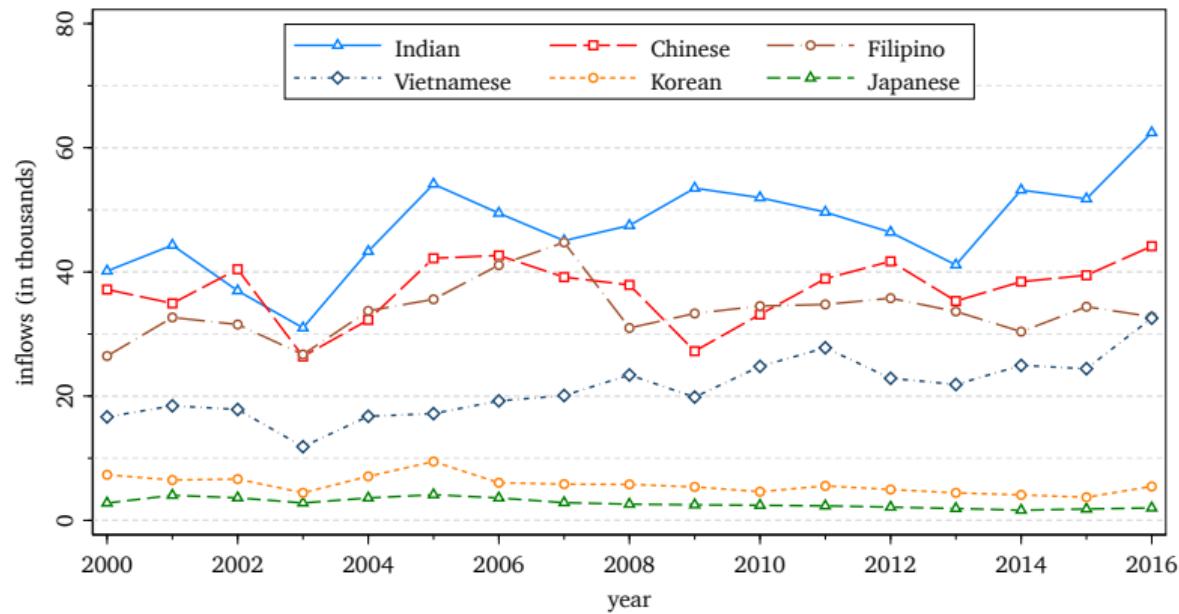
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# Time series of inflows (new arrivals only), by Asian country of origin

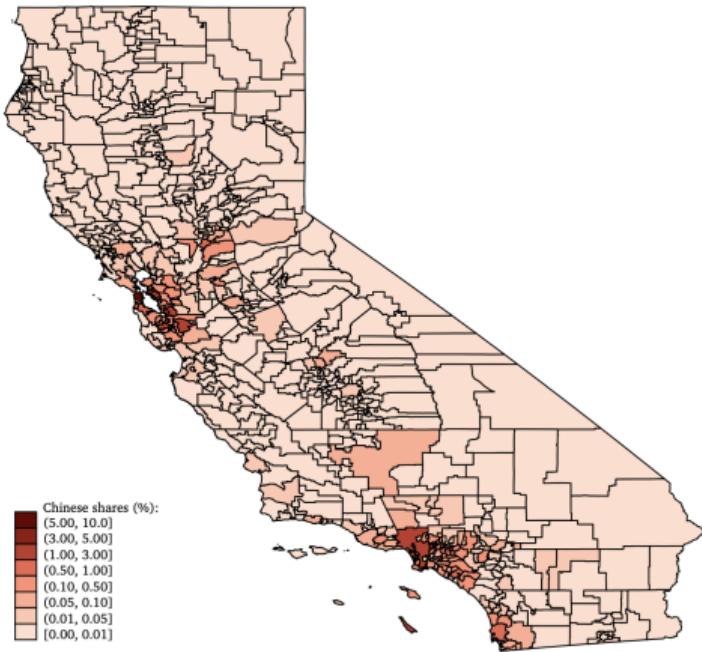
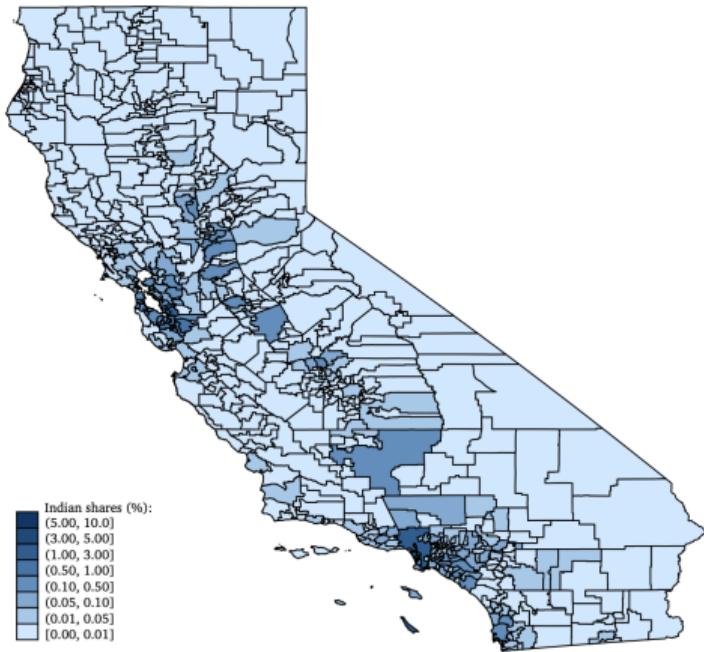
Source: DHS



Notes: 'Inflows' represent only new arrivals. Source: Department of Homeland Security. Indian = Bangladesh + India + Pakistan; Chinese = China + Taiwan + Hong Kong; Vietnamese = Vietnam; Korean = South Korea + North Korea; Japanese = Japan. Data for 2003, 2004 and 2005 are nonexistent in the raw data and have therefore been extrapolated

# Shares of Indian (left) and Chinese (right) people in CA as of 2000

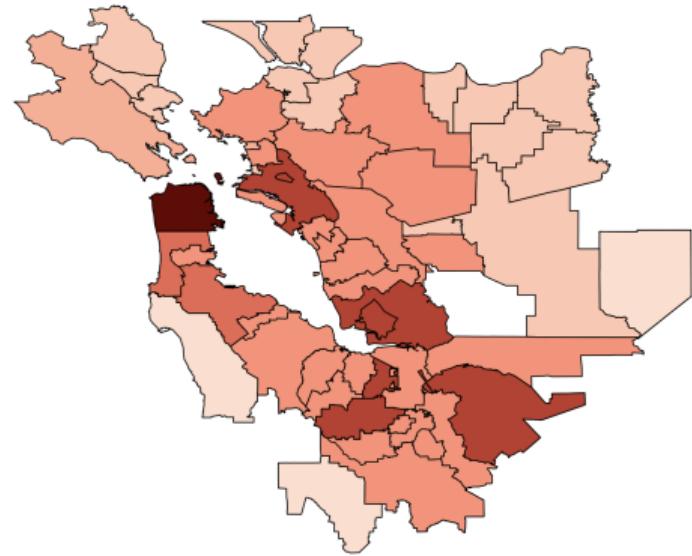
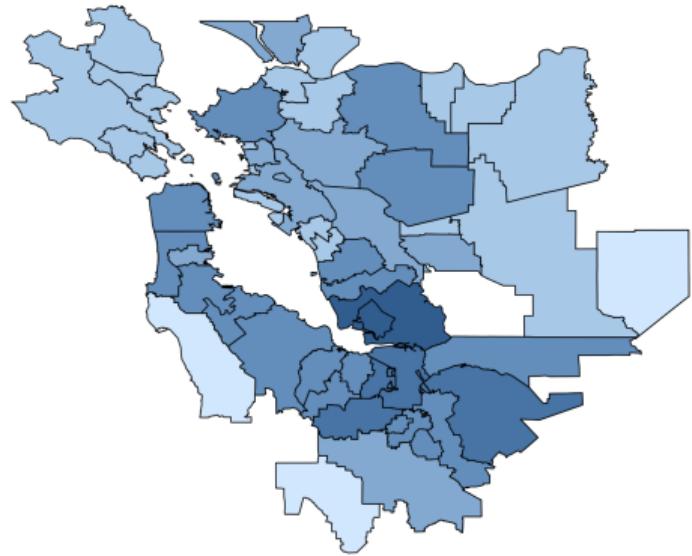
% of Indian/Chinese people nationwide who live in a given district



Notes: Card-style share = Indian/Chinese population in a school district divided by the nationwide population of Indian/Chinese, then multiplied by 100.

# Shares of Indian (left) and Chinese (right) in the Bay area as of 2000

% of Indian/Chinese people nationwide who live in a given district



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- ▶ Bartik-style shares
- ▶ Maps for Filipino & Vietnamese people
- ▶ Maps for Indian & Chinese people in LA area
- ▶ Maps for Filipino & Vietnamese people in LA area
- ▶ Scatter plots of Asian group shares

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# White flight from Asian students in suburban areas

Sample:	Rural			Suburban			Urban		
Specification:	OLS	1st stage	IV	OLS	1st stage	IV	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)	White (4)	Asian (5)	White (6)	White (7)	Asian (8)	White (9)
Asian	0.687 (0.498)		11.83 (8.984)	-0.433*** (0.0790)		-2.531*** (0.702)	0.502** (0.218)		0.165 (0.389)
$\widehat{\text{AsianPred}}$		-0.676 (0.471)			0.860*** (0.242)			-1.558*** (0.224)	
Total <sub>t-1</sub>	0.560*** (0.0639)	0.00726** (0.00366)	0.438*** (0.101)	0.163*** (0.0318)	0.185*** (0.0243)	0.533*** (0.126)	0.0314 (0.0805)	0.0676*** (0.0175)	0.0884 (0.0878)
Observations	1,999	1,999	1,999	9,578	9,578	9,578	432	432	432
First-stage F-stat	—	—	2.00	—	—	12.44	—	—	43.85

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument ( $\widehat{\text{AsianPred}}$ ) uses 2000 as base year. The inflows data used to construct the instrument come from the Department of Homeland Security. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

► First-stage scatter plots: rural areas

► First-stage scatter plots: suburban areas

► First-stage scatter plots: urban areas

► Robust SE's

► 1990 instrument

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► CPS data

► Definitions of urban status

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► Robust SE's ► 1990 instrument ► Full sample ► Full sample, 1990 instrument ► CPS data ► Definitions of urban status

# White flight from Asian students in suburban areas

Sample:	Rural			Suburban			Urban		
Specification:	OLS	1st stage	IV	OLS	1st stage	IV	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)	White (4)	Asian (5)	White (6)	White (7)	Asian (8)	White (9)
Asian	0.687 (0.498)		11.83 (8.984)	-0.433*** (0.0790)		-2.531*** (0.702)	0.502** (0.218)		0.165 (0.389)
AsianPred			-0.676 (0.471)			0.860*** (0.242)			-1.558*** (0.224)
Total <sub>t-1</sub>	0.560*** (0.0639)	0.00726** (0.00366)	0.438*** (0.101)	0.163*** (0.0318)	0.185*** (0.0243)	0.533*** (0.126)	0.0314 (0.0805)	0.0676*** (0.0175)	0.0884 (0.0878)
Observations	1,999	1,999	1,999	9,578	9,578	9,578	432	432	432
First-stage F-stat	—	—	2.00	—	—	12.44	—	—	43.85

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. The inflows data used to construct the instrument come from the Department of Homeland Security. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

► First-stage scatter plots: rural areas ► First-stage scatter plots: suburban areas ► First-stage scatter plots: urban areas

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# Roadmap

1 Introduction

2 Background

3 Empirical methods

4 Main empirical results

5 Spatial model

- Setup, assumptions, equilibrium
- Predictions

6 Mechanisms

7 Concluding remarks

# Spatial model to explain white flight

## ► Theoretical model of white spatial location decisions in response to an Asian inflow

(Boustan, QJE 2010; Cascio and Lewis, AEJ EP 2012)

### ► Setup: We focus on the choice of a school district within a region

- Utility associated with a school district for a white household:  $U(p, k, z; \xi) = \bar{u}$   
with housing price  $p$ , share of Asian enrollment in the school district  $k$ , peer quality  $z$ , and district quality shifter  $\xi$   
(to help us think about endogeneity:  $\xi \uparrow \Rightarrow$  might attract families)
- Total district enrollment:  $L = W + A + O$   
where W/A/O is a school district's enrollment of Whites/Asians/Other ethnic groups, respectively

### ► Assumptions:

- $p = f(L, \epsilon)$ : housing price is a function of # households in the district (proxied by total district enrollment), and is determined by the price elasticity of housing supply  $\epsilon$
- $z = g(k) = g(A/L)$  and  $\partial U / \partial p \leq 0$
- $\partial U / \partial k$  ambiguous, depending on whether distaste or preference for Asians
- $\partial U / \partial z$  ambiguous because parents like high-quality peers if they improve their own kid's performance, but dislike them if perception of grading on a curve or competition (which may be important in CA (Bleemer, 2021))

### ► Equilibrium: ► details

- No household can  $\uparrow$  its utility by moving to another district  $\Rightarrow$  in each district, equilibrium values  $(p^*, k^*, z^*)$

# Spatial model to explain white flight

## ► Theoretical model of white spatial location decisions in response to an Asian inflow

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# Predictions of the model

► **Predictions:** What happens to the number of white students who will leave or enter a school district following an inflow of Asian students? (assuming housing supply is not perfectly elastic)

- ① **Housing price channel:** Asian inflow  $\Rightarrow \uparrow$  housing prices ( $\partial p / \partial L > 0$ )  $\Rightarrow p^*$  restored if 1-to-1 flight of white students in response to Asian students' arrival ( $(\partial U / \partial p)(\partial p / \partial L) < 0$ )
- ② **Distaste for Asians:** whites strictly prefer to leave the school district, even at  $p = p^*$   $\Rightarrow$  to restore equilibrium, more than one white departure for every Asian arrival

Why would there be distaste?

- Direct animus ( $\partial U / \partial k < 0$ )
- Indirect effect of concern that higher achieving peers may generate competition ( $\partial U / \partial z < 0$ ) – e.g., grading on a curve (Cullen, Long and Reback, 2013; Antecol, Eren and Ozbeklik, 2014; Bui, Craig and Imberman, 2014; Bleemer, 2021)

- ③ **Preferences for / attraction to Asians:**

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 $\Rightarrow$  white outflows attenuated; can even observe inflows

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# Taking the predictions to the data

## ► Housing price channel?

- ▷ Test it by thinking about the housing-supply condition
  - Inelastic  $\Rightarrow$  1-to-1 departure
  - Elastic  $\Rightarrow$  new constructions  $\Rightarrow$  departure rate less than 1-to-1

We found more than 1-to-1 departure, so can rule out housing price channel as the main/sole mechanism

- ▷ Observed variation in housing-market responses in CA
  - Approach: break the sample by growing vs. shrinking areas (imperfect measure of housing supply though)
  - Preview of results: no differential responses depending on housing-market condition  
 $\Rightarrow$  distaste or preference for Asians

## ► Distaste or preference for Asians?

- ▷ Do Asian students  $\uparrow$  a school district academic performance? Yes ( $\partial z / \partial k > 0$ )!
- ▷ Approach: check for distaste vs. preference by school district's socio-economic status (SES) tercile
- ▷ Preview of results: preference/attraction in low-income areas, but distaste in middle-/high-income areas

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# Roadmap

1 Introduction

2 Background

3 Empirical methods

4 Main empirical results

5 Spatial model

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# No differential effect by growing vs. shrinking school districts

Dependent variable:		White				
Specification:		OLS		IV		
Sample:	Non-missing average pre-2000 growth	Average pre-2000 growing	Average pre-2000 shrinking	Non-missing average pre-2000 growth	Average pre-2000 growing	Average pre-2000 shrinking
	(1)	(2)	(3)	(4)	(5)	(6)
Asian	-0.433*** (0.0790)	-0.428*** (0.0797)	-0.947*** (0.137)	-2.532*** (0.702)	-2.545*** (0.733)	-2.301*** (0.558)
Total <sub>t-1</sub>	0.163*** (0.0318)	0.162*** (0.0317)	0.433*** (0.0928)	0.534*** (0.126)	0.534*** (0.131)	0.842*** (0.143)
Observations	9,562	8,860	702	9,562	8,860	702
First-stage F-stat	—	—	—	12.45	11.60	10.24
Dep. var. mean	2,167	2,232	1,348	2,167	2,232	1,348

Notes: Growing (shrinking) districts are those with a non-negative (negative) average annual growth rate over the 1981-2000 period. All specifications include year fixed effects and district fixed effects. The inflows data used to construct the instrument come from the Department of Homeland Security. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

# Having more Asians ↑ the district's academic performance

Dependent variable:		Academic Performance Index (API) score							
Specification:		OLS				IV			
Sample:	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Asian share	-105.3*** (34.38)	60.17** (28.41)	21.38 (41.00)	-4.883 (38.45)	-92.61 (98.58)	154.4** (60.51)	283.1 (308.0)	1450.2* (810.1)	
Total <sub>t-1</sub> (÷ 1000)	0.256 (0.489)	0.178 (0.755)	1.812*** (0.697)	0.398 (0.665)	0.219 (0.588)	-0.420 (0.863)	0.969 (1.161)	-0.687 (1.087)	
Observations	7,152	2,487	2,401	2,264	7,152	2,487	2,401	2,264	
First-stage F-stat	—	—	—	—	31.37	122.10	14.25	3.78	
Dep. var. mean	755.1	836.5	742.4	679.0	755.1	836.5	742.4	679.0	

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district × year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Sample restricted to suburban areas. The inflows data used to construct the instrument come from the Department of Homeland Security. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

# Richer white students are more responsive

Dependent variable:		White							
Specification:		OLS				IV			
Sample:	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Asian	-0.433*** (0.0790)	-0.652*** (0.0858)	-1.112*** (0.199)	0.881*** (0.185)	-2.531*** (0.702)	-1.246*** (0.230)	-3.083*** (0.608)	1.709*** (0.297)	
Total <sub>t-1</sub>	0.163*** (0.0318)	0.281*** (0.0783)	0.314*** (0.0614)	-0.00540 (0.0356)	0.533*** (0.126)	0.456*** (0.106)	0.675*** (0.130)	-0.0842** (0.0353)	
Observations	9,578	3,343	3,214	3,021	9,578	3,343	3,214	3,021	
First-stage F-stat	–	–	–	–	12.44	67.27	24.76	47.21	
Dep. var. mean	2,167	2,803	2,577	1,026	2,167	2,803	2,577	1,026	

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. The inflows data used to construct the instrument come from the Department of Homeland Security. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

# Poorer white students are attracted to Asian students

Dependent variable:		White							
Specification:		OLS				IV			
Sample:	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Asian	-0.433*** (0.0790)	-0.652*** (0.0858)	-1.112*** (0.199)	0.881*** (0.185)	-2.531*** (0.702)	-1.246*** (0.230)	-3.083*** (0.608)	1.709*** (0.297)	
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Observations	9,578	3,343	3,214	3,021	9,578	3,343	3,214	3,021	
First-stage F-stat	–	–	–	–	12.44	67.27	24.76	47.21	
Dep. var. mean	2,167	2,803	2,577	1,026	2,167	2,803	2,577	1,026	

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2 Background

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# Concluding remarks

## ► Summary:

- ▷ White flight from Asian students in public schools in past couple decades in Californian suburban areas
- ▷ On average, the arrival of each new Asian student led approximately 2.5 white students to leave their public school district
- ▷ Suggestive evidence that the main driving mechanism is whites' racial distaste for Asian students, which is stronger than the positive preferences whites have for higher-quality peers, except in poorer public school districts (presumably because harder to flee for poorer families)

## ► Next steps:

- ▷ Where do white students flee to? Move out of the school district? Stay in the school district but go to a private school?
- ▷ Gett data on population counts by age at the tract level (to look at school-age population)
- ▷ Add housing price data
- ▷ Try looking at Gallup survey data (attitudes towards other races)
- ▷ Try getting data on college-going or high-school dropout rates, by school district
- ▷ Try analysis using commuting zones → check if moves due to labor-market opportunities

## ► Thank you! Comments and questions are welcome!

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# Quotes from newspapers and online reviews

## ► Palo Alto, CA

▷ “Top schools in nearby, whiter Palo Alto, which also have very high test scores, also feature heavy course loads, long hours of homework and overly stressed students [...]. But whites don’t seem to be avoiding those institutions, or making the same negative generalizations [...], suggesting that it’s not academic competition that makes white parents uncomfortable but academic competition with Asian-Americans.” (Wall Street Journal, 2005)

## ► San Jose, CA

▷ “White kids with good grades get looked at like they have “passing” grades, while Asian kids with “passing” grades seem to be looked at as invalids. The school was 75% Asian in 2005 so... you can draw your own conclusions as to how this will factor into your or your child’s experience here.” (Yelp, 2011)

## ► Irvine, CA

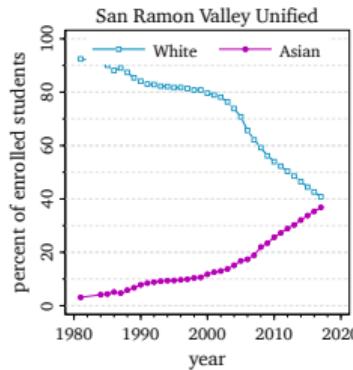
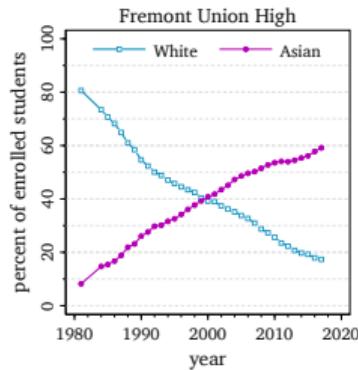
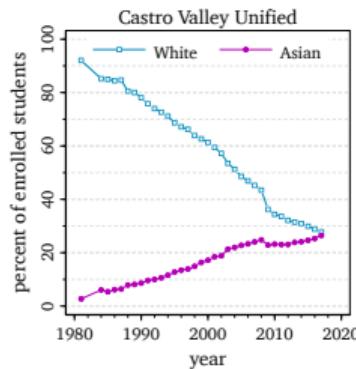
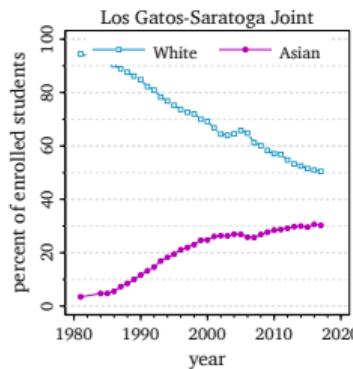
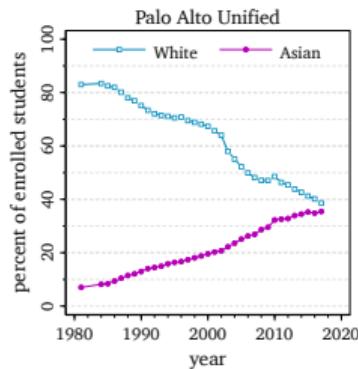
▷ “For white residents of Irvine, the boom has brought much to like – rising home values, stellar test scores and an explosion of ethnic restaurants, cultural celebrations and retail spaces that have brought international sophistication to a place once known as cookie-cutter suburbia.” (Los Angeles Times, 2017)

## ► Similar reports from Rockville, Maryland; Tenafly, New York; Johns Creek, Georgia; and Princeton, New Jersey

[◀ Back to Motivation](#)

[◀ Back to Predictions](#)

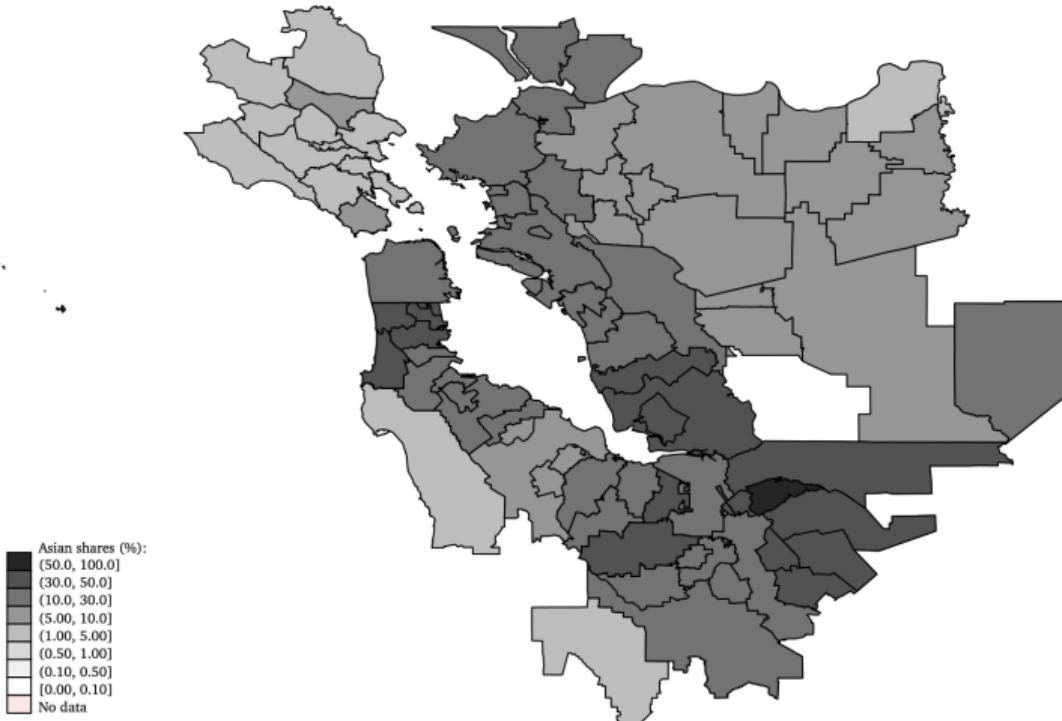
# Enrollment in select Bay area school districts



◀ Back

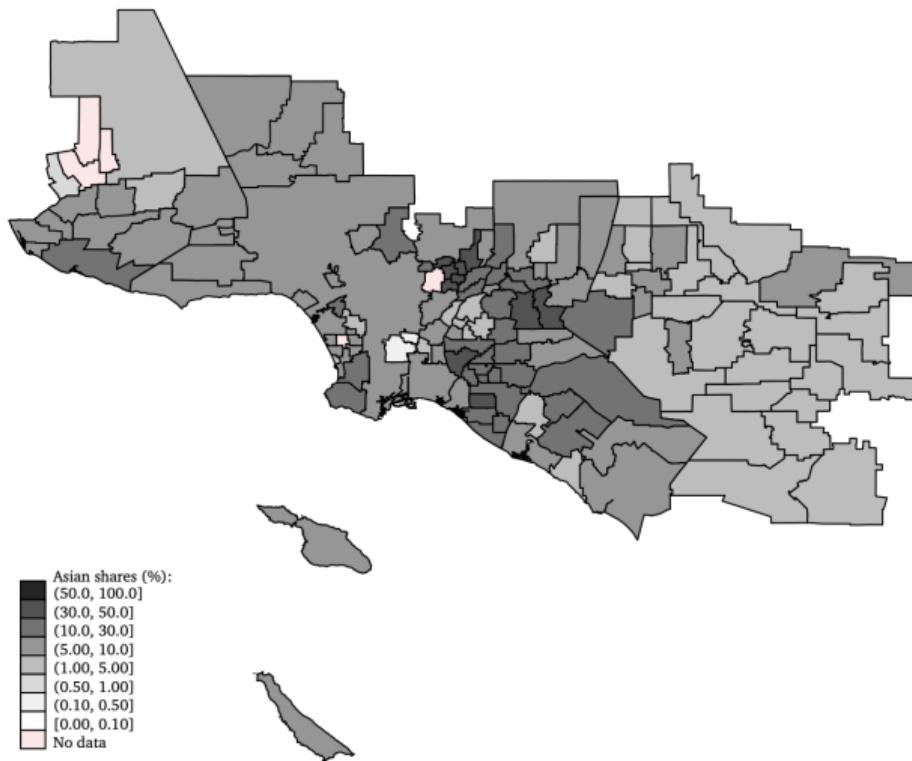
Source: California DOE

## Share of Asians across districts in the Bay area in 2000



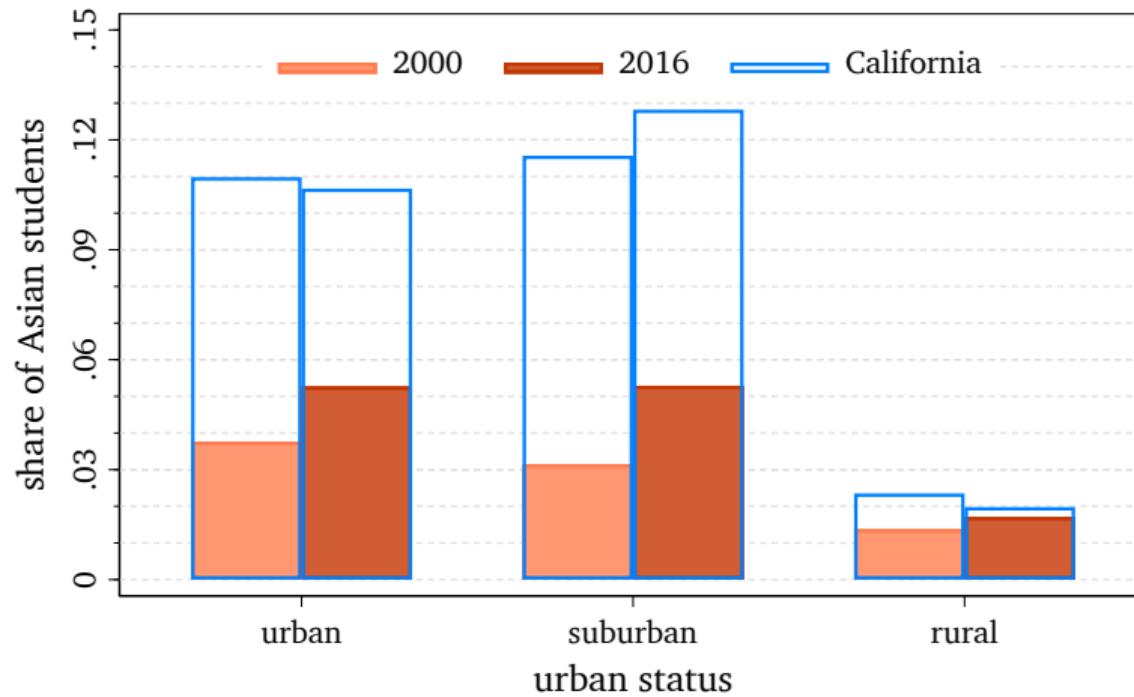
 Back

# Share of Asians across districts in the LA area in 2000



◀ Back

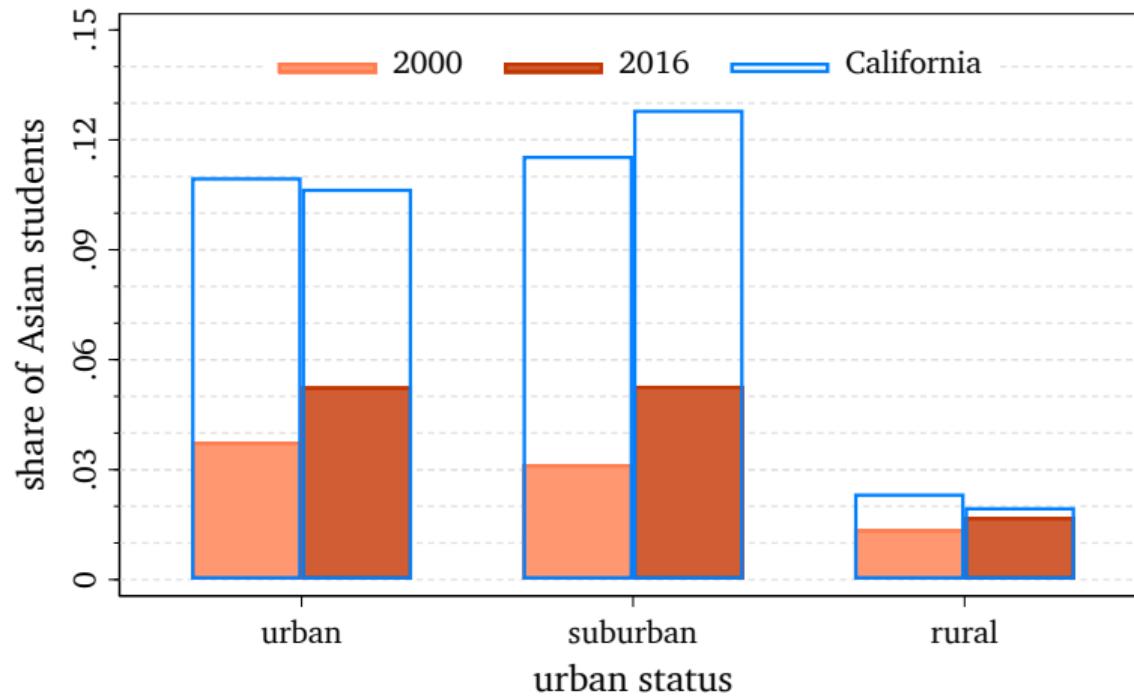
# Asian enrollment by urban area: US vs CA



◀ Back

Source: National Center for Education and Statistics

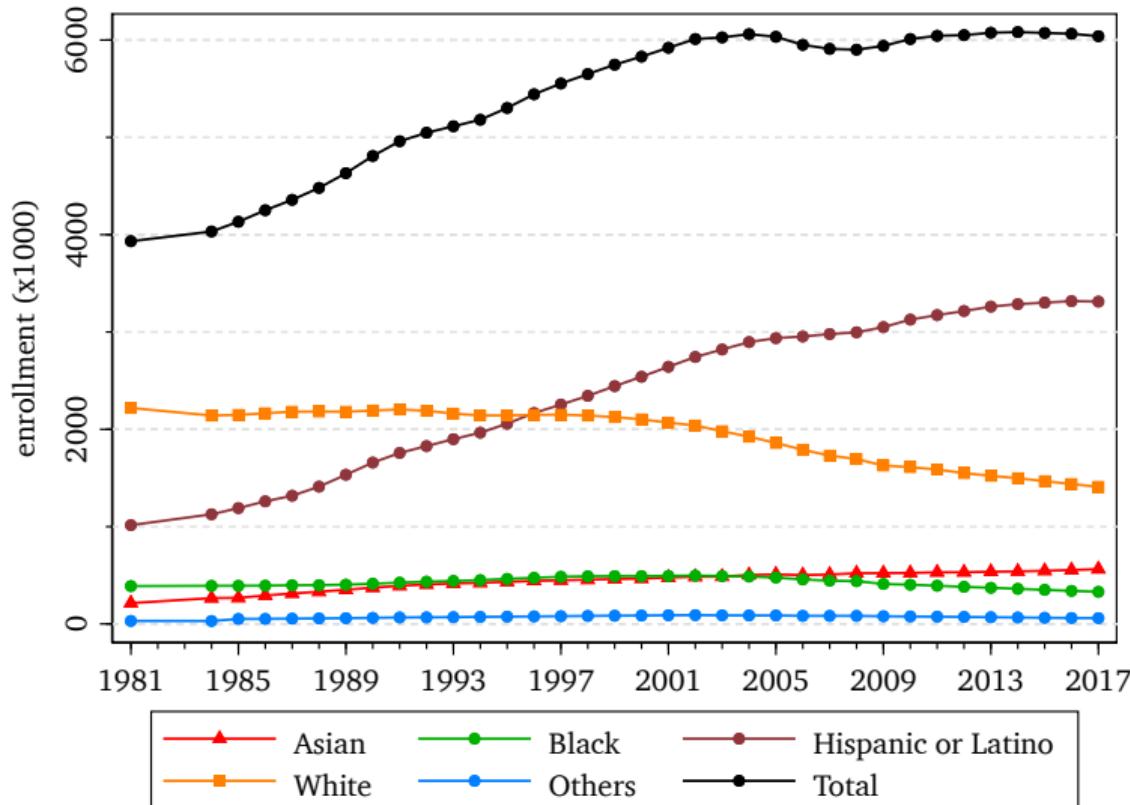
# Asian enrollment by urban area: US vs CA



◀ Back

Source: National Center for Education and Statistics

# Enrollment levels over time in California, by racial/ethnic group

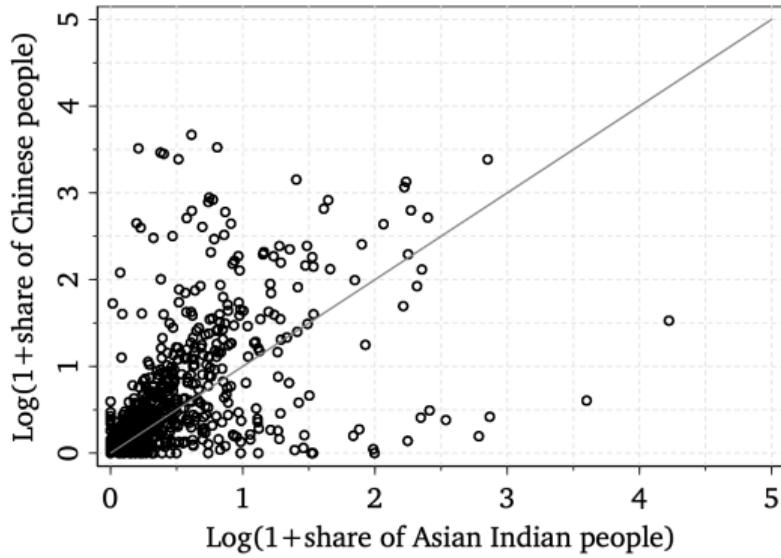


◀ Back

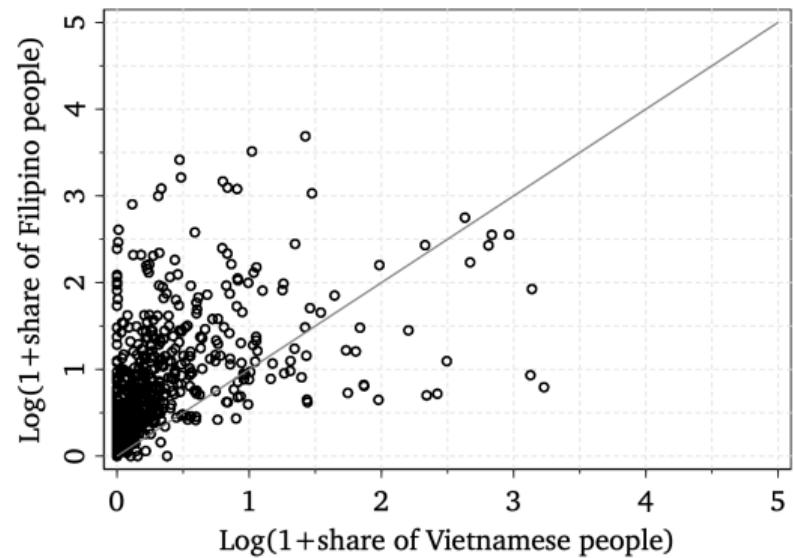
# Scatter plots of Bartik-style shares in suburban districts as of 2000

Log version

(a) Chinese vs. Indian



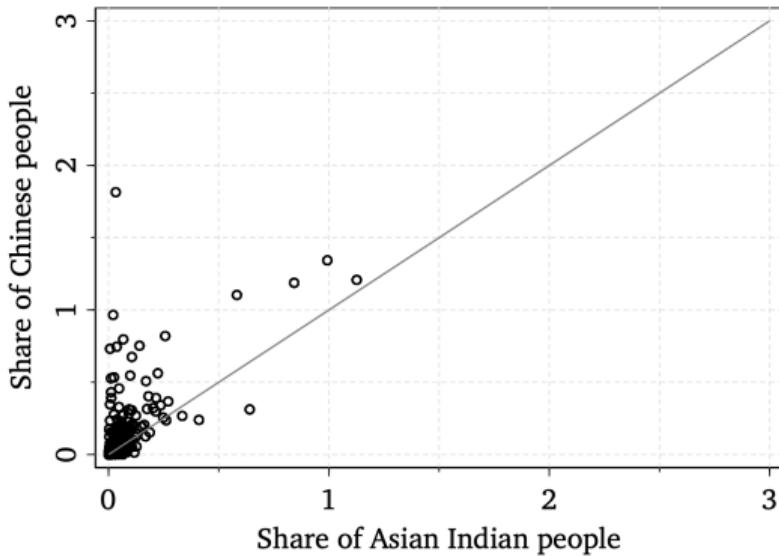
(b) Filipino vs. Vietnamese



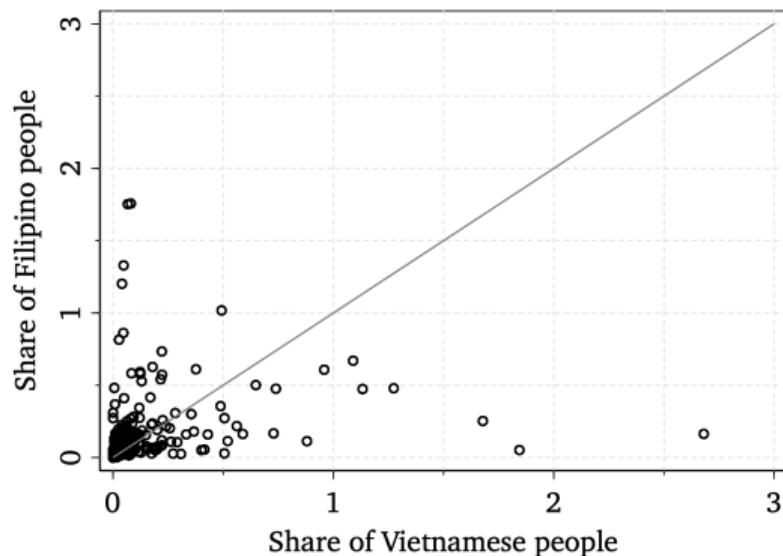
◀ Back

# Scatter plots of Card-style shares in suburban districts as of 2000

(a) Chinese vs. Indian



(b) Filipino vs. Vietnamese



◀ Back

► Log(1+share)

► Chinese vs. Filipino + Chinese vs. Vietnamese

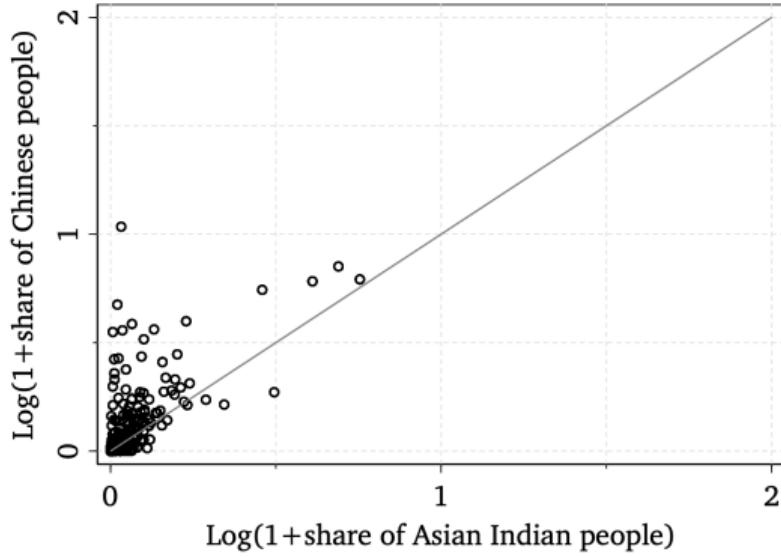
► Indian vs. Filipino + Indian vs. Vietnamese

► Filipino vs. Indian

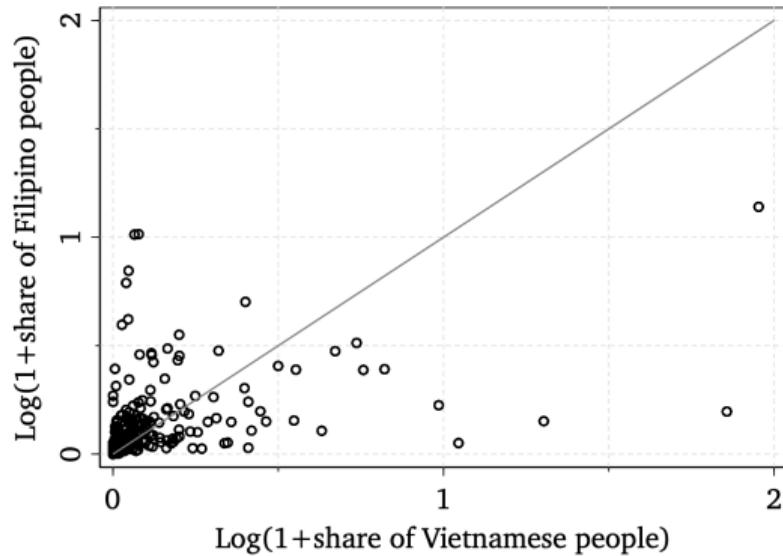
# Scatter plots of Card-style shares in suburban districts as of 2000

Log version

(a) Chinese vs. Indian



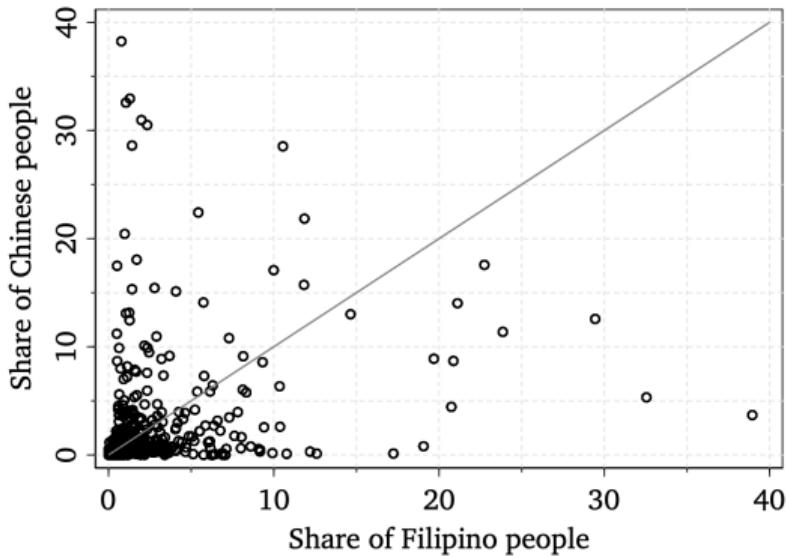
(b) Filipino vs. Vietnamese



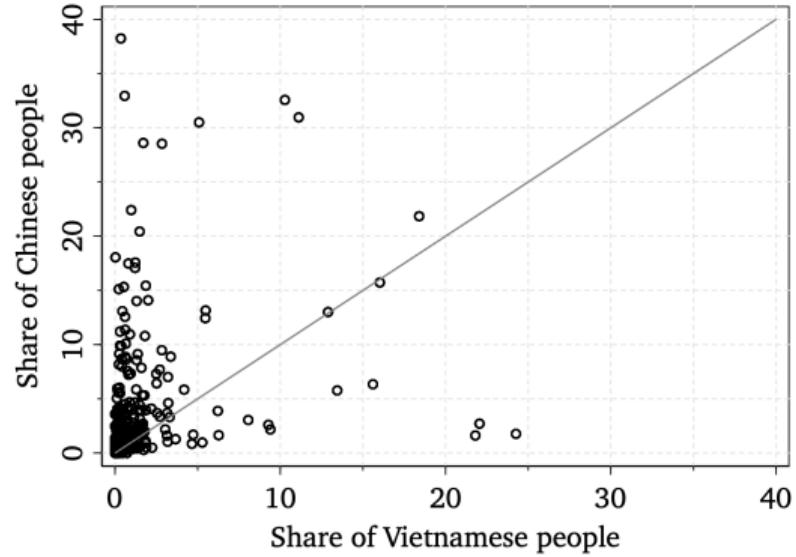
◀ Back

# Scatter plots of Bartik-style shares in suburban districts as of 2000

(a) Chinese vs. Filipino



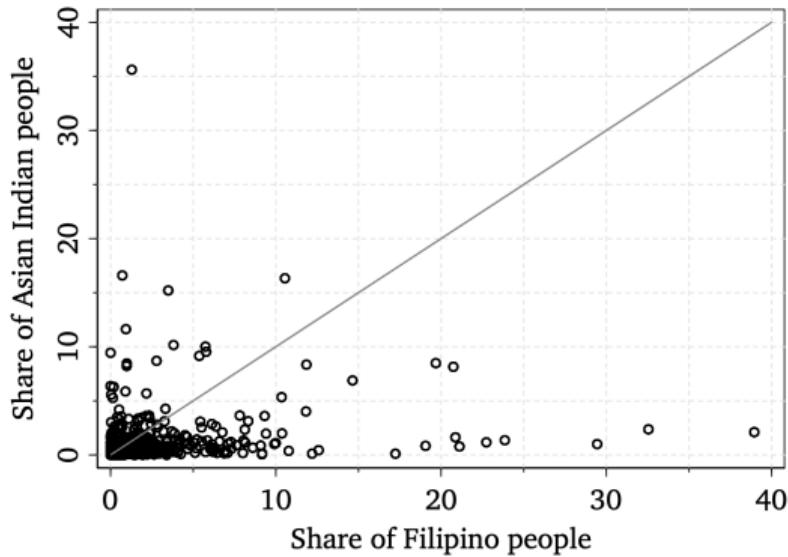
(b) Chinese vs. Vietnamese



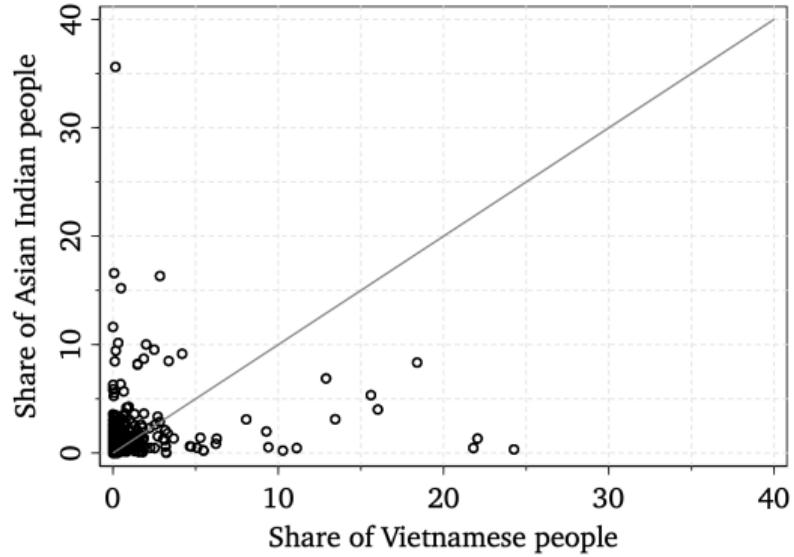
◀ Back

# Scatter plots of Bartik-style shares in suburban districts as of 2000

(a) Indian vs. Filipino

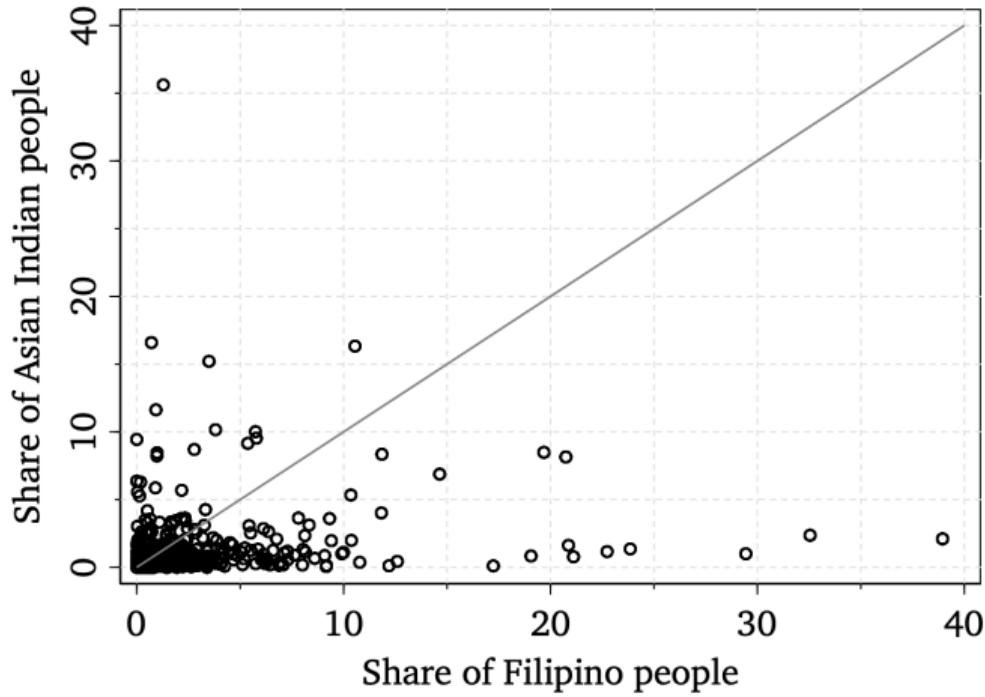


(b) Indian vs. Vietnamese



◀ Back

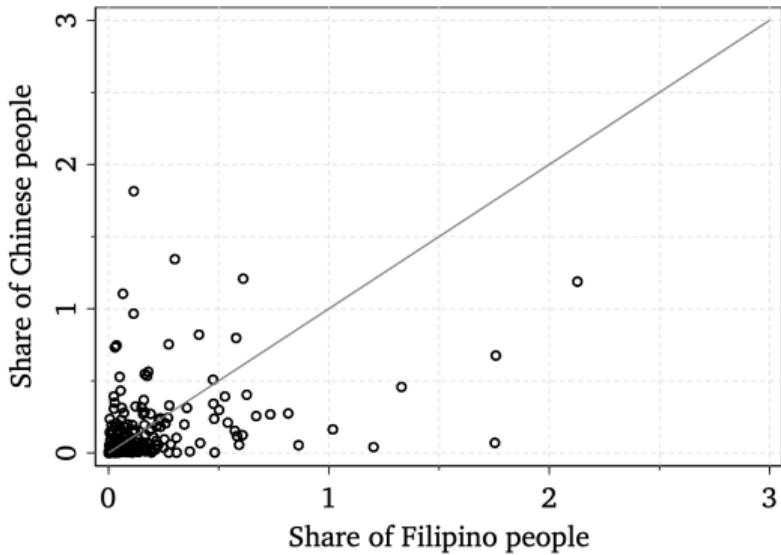
# Scatter plots of Filipino vs. Vietnamese (Bartik-style) shares in suburban districts as of 2000



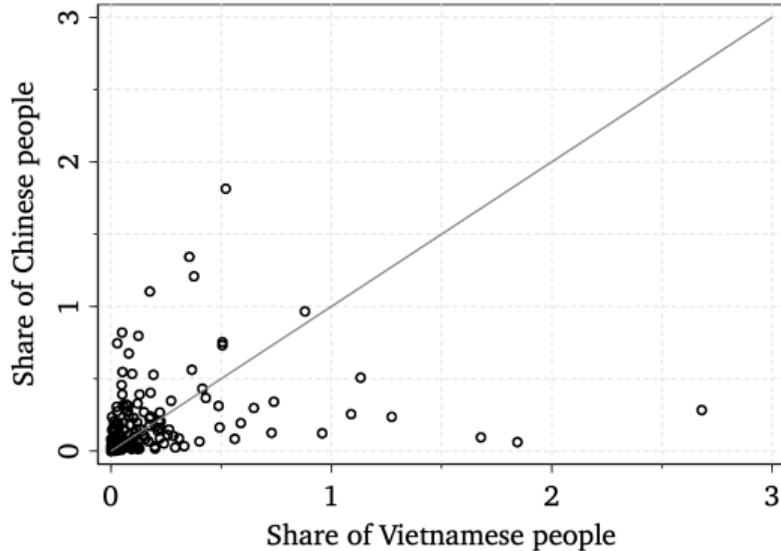
◀ Back

# Scatter plots of (Card-style) shares in suburban districts as of 2000

(a) Chinese vs. Filipino



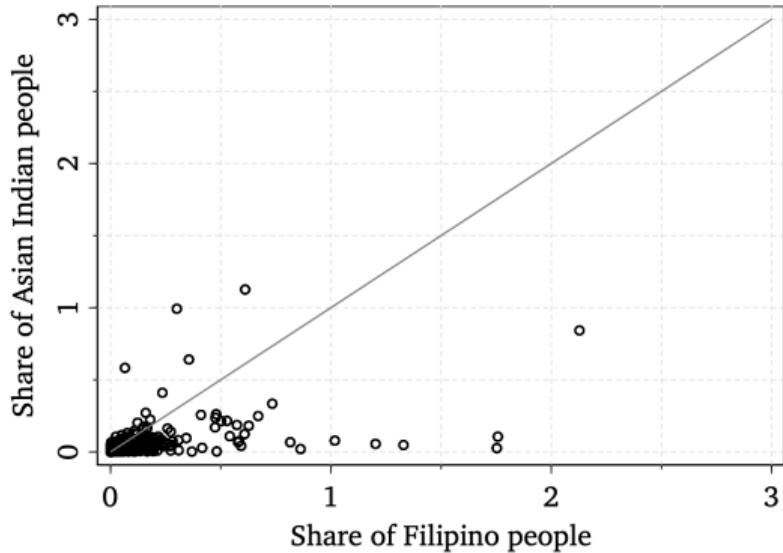
(b) Chinese vs. Vietnamese



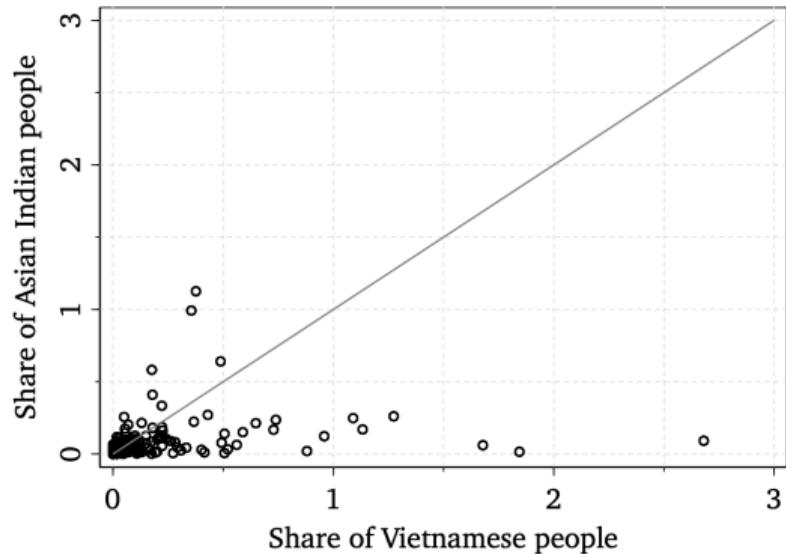
◀ Back

# Scatter plots of (Card-style) shares in suburban districts as of 2000

(a) Indian vs. Filipino

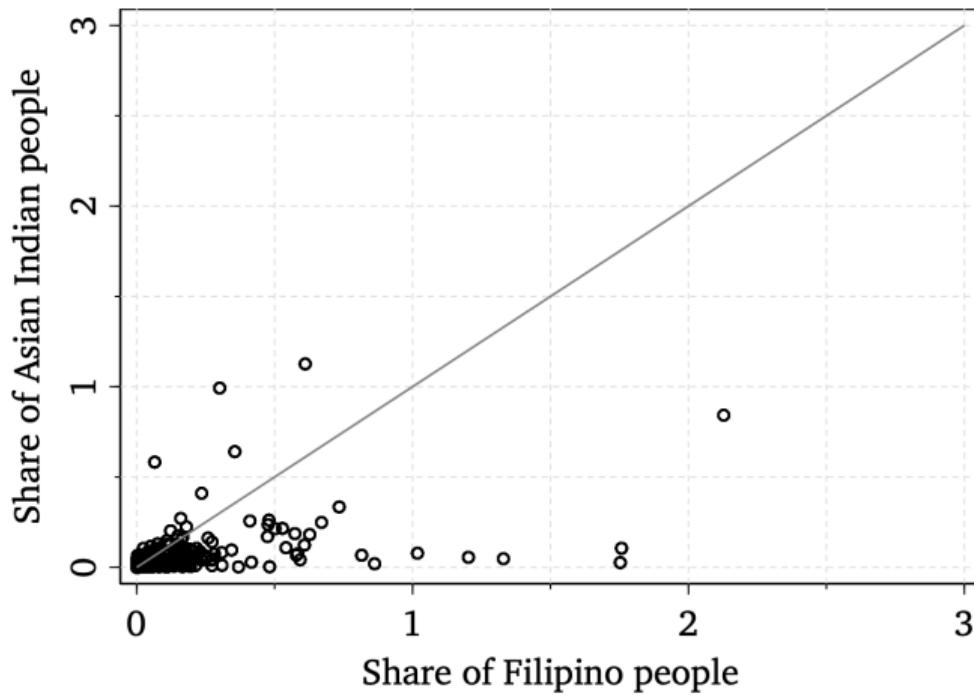


(b) Indian vs. Vietnamese



◀ Back

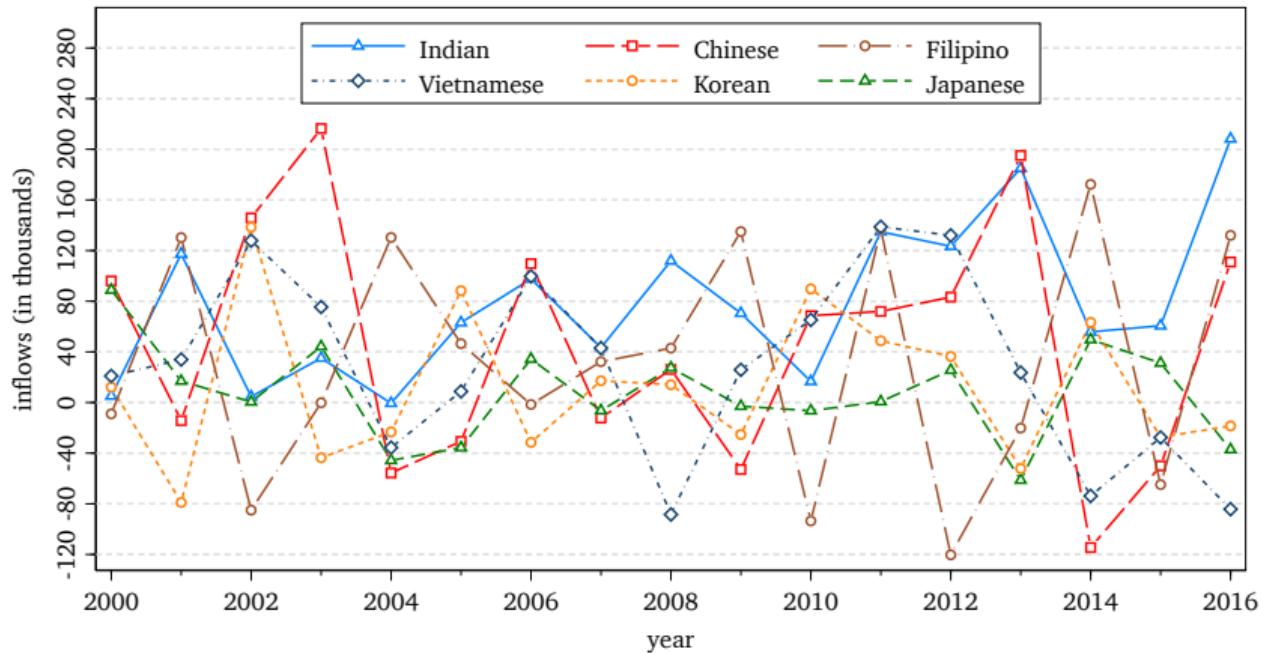
# Scatter plots of Filipino vs. Vietnamese (Card-style) shares in suburban districts as of 2000



◀ Back

# Time series of inflows, by Asian country of origin

Source: CPS

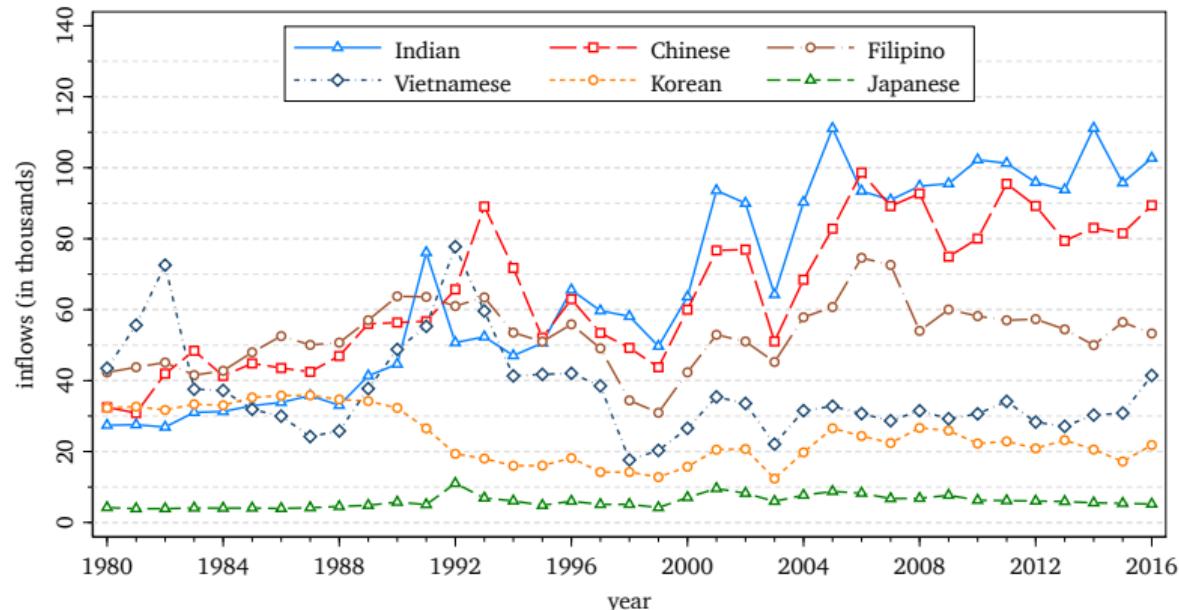


Notes: "Inflows" represent only new arrivals. Source: Current Population Survey. Indian = Bangladesh + India + Pakistan; Chinese = China + Taiwan + Hong Kong; Vietnamese = Vietnam; Korean = South Korea + North Korea; Japanese = Japan.

◀ Back

# Time series of inflows (new arrivals + adjustments of status), by Asian country of origin

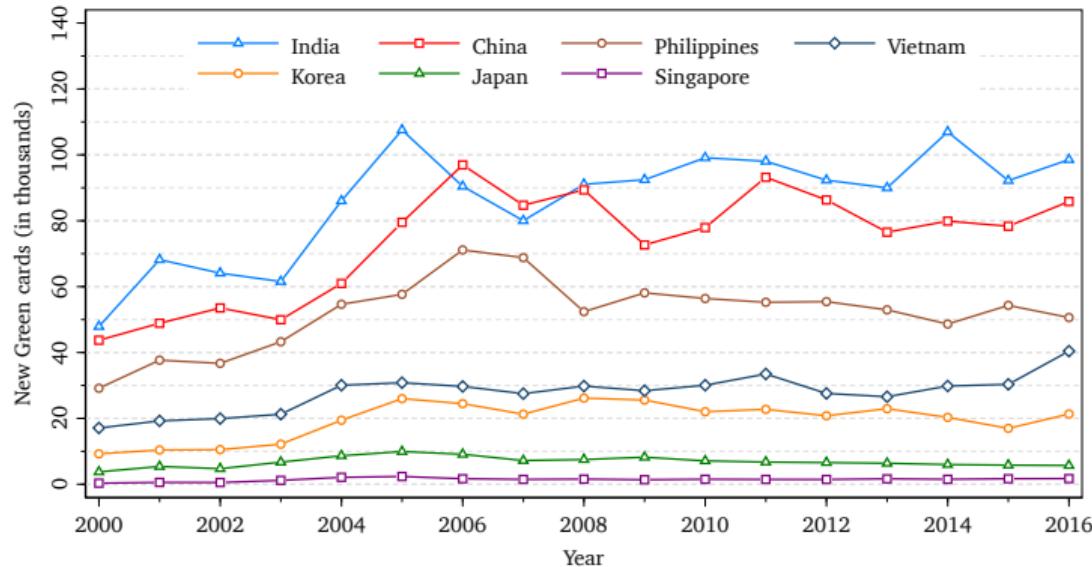
Sources: OECD & Paper Immigration Book



Notes: Indian = Bangladesh + India + Pakistan; Chinese = China + Taiwan + Hong Kong; Vietnamese = Vietnam; Korean = South Korea + North Korea; Japanese = Japan. Sources: OECD & Paper Immigration Book.

◀ Back

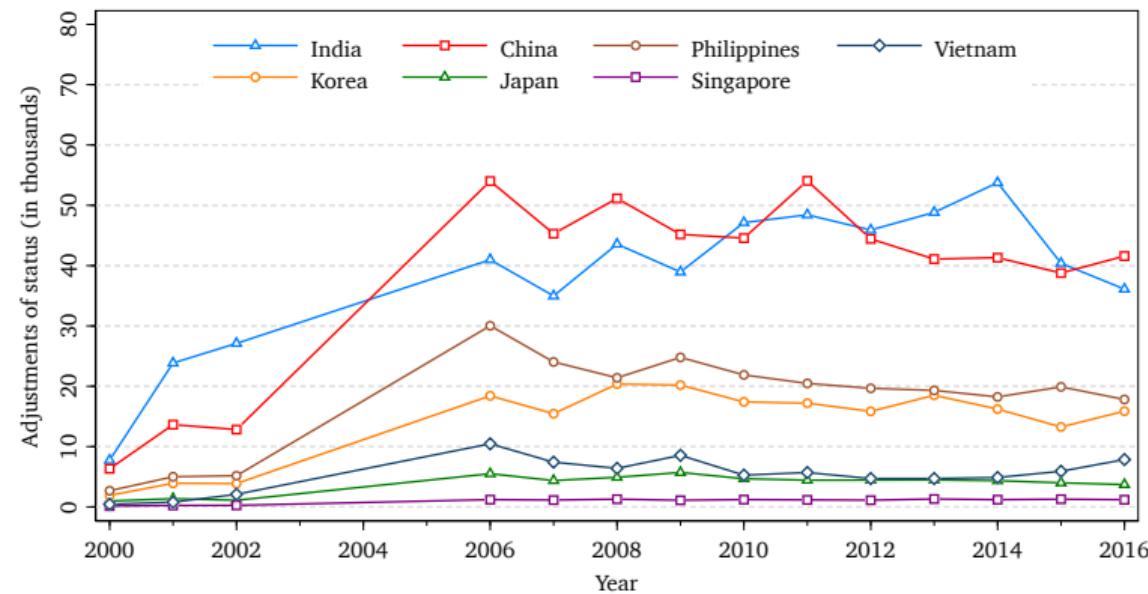
# Time series of new Green cards (new arrivals + adjustments of status) for foreign nationals who are granted lawful permanent residence, by Asian country of last residence



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: Department of Homeland Security.

◀ Back

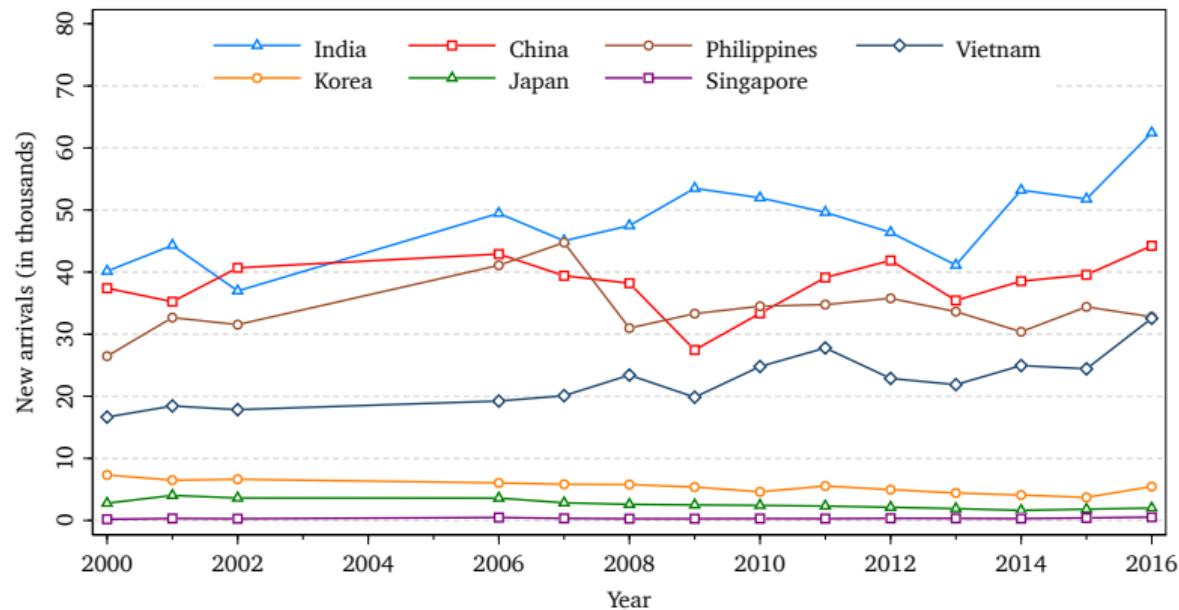
# Time series of adjustment of status for foreign nationals who are granted lawful permanent residence, by Asian country of last residence



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: Department of Homeland Security.

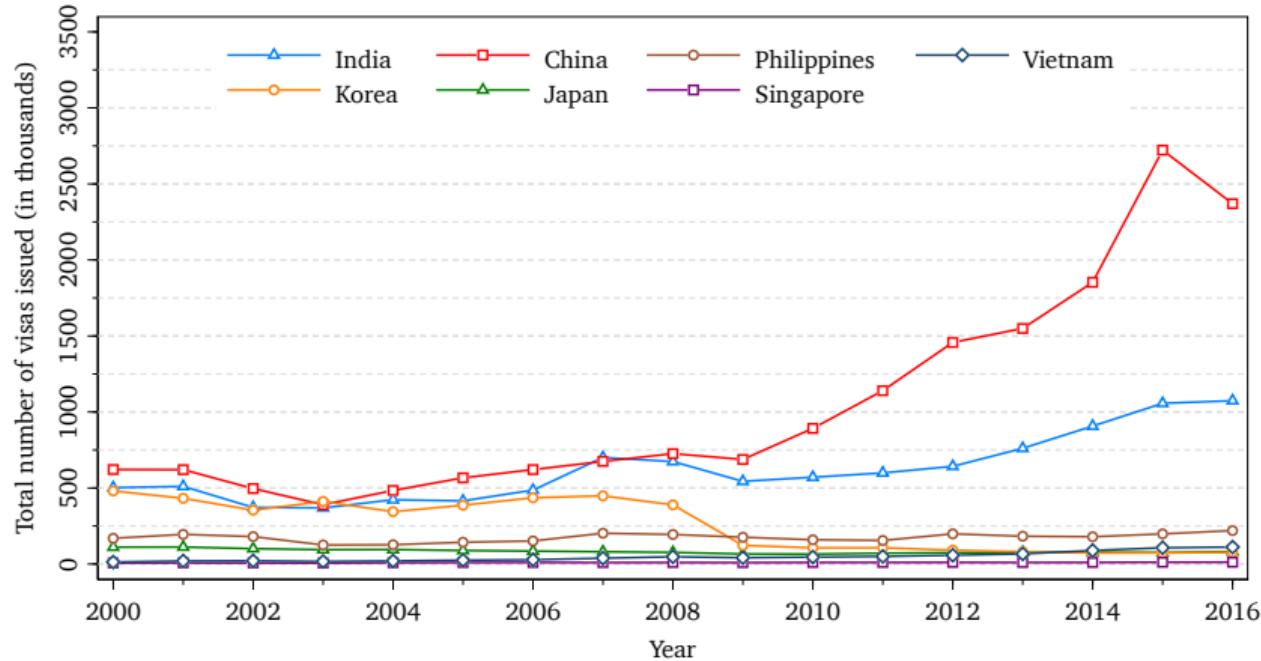
◀ Back

# Time series of new arrivals for foreign nationals who are granted lawful permanent residence, by Asian country of last residence



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: Department of Homeland Security.

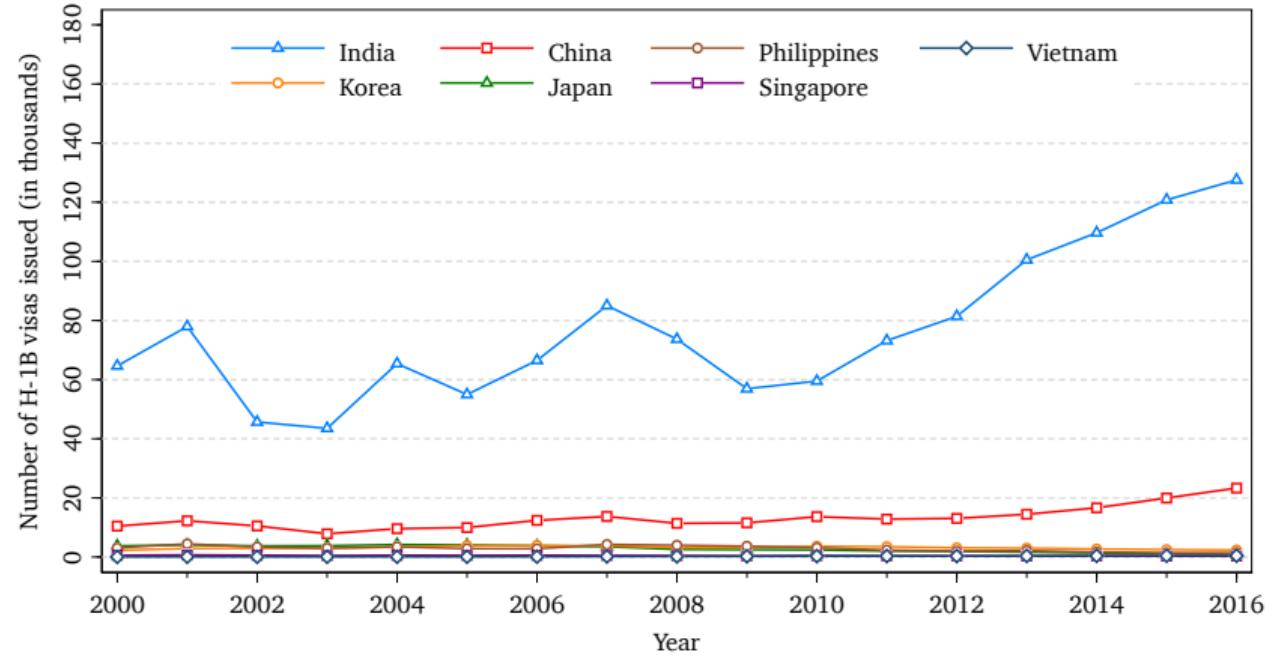
# Time series of total visas issued, by Asian country of origin



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: U.S. Department of State.

◀ Back

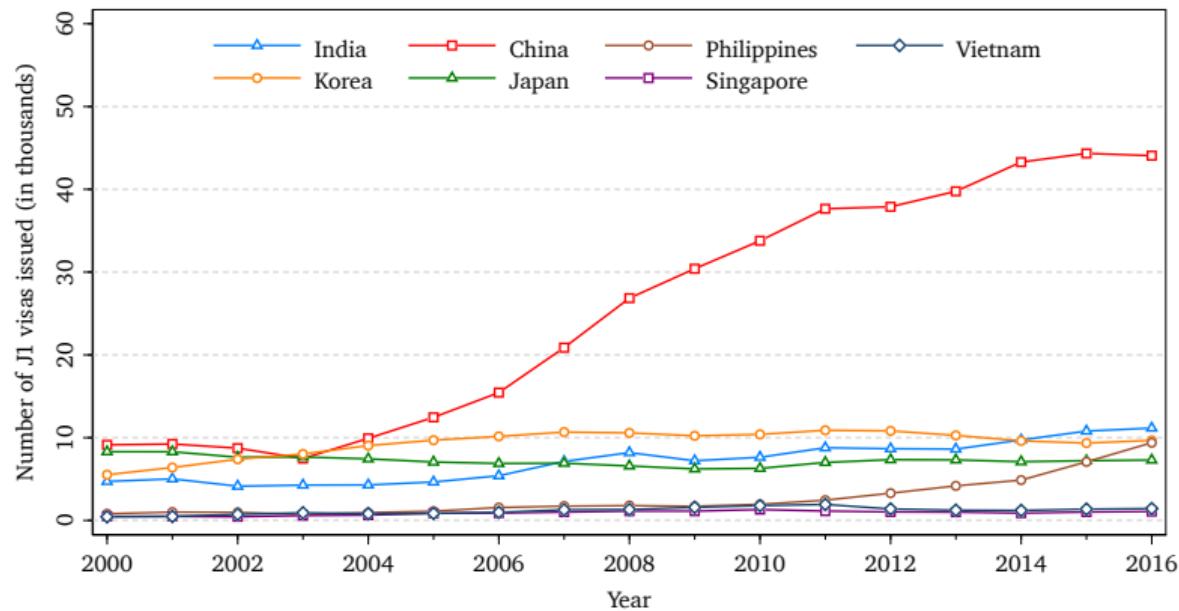
# Time series of H-1B visas issued, by Asian country of origin



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: U.S. Department of State.

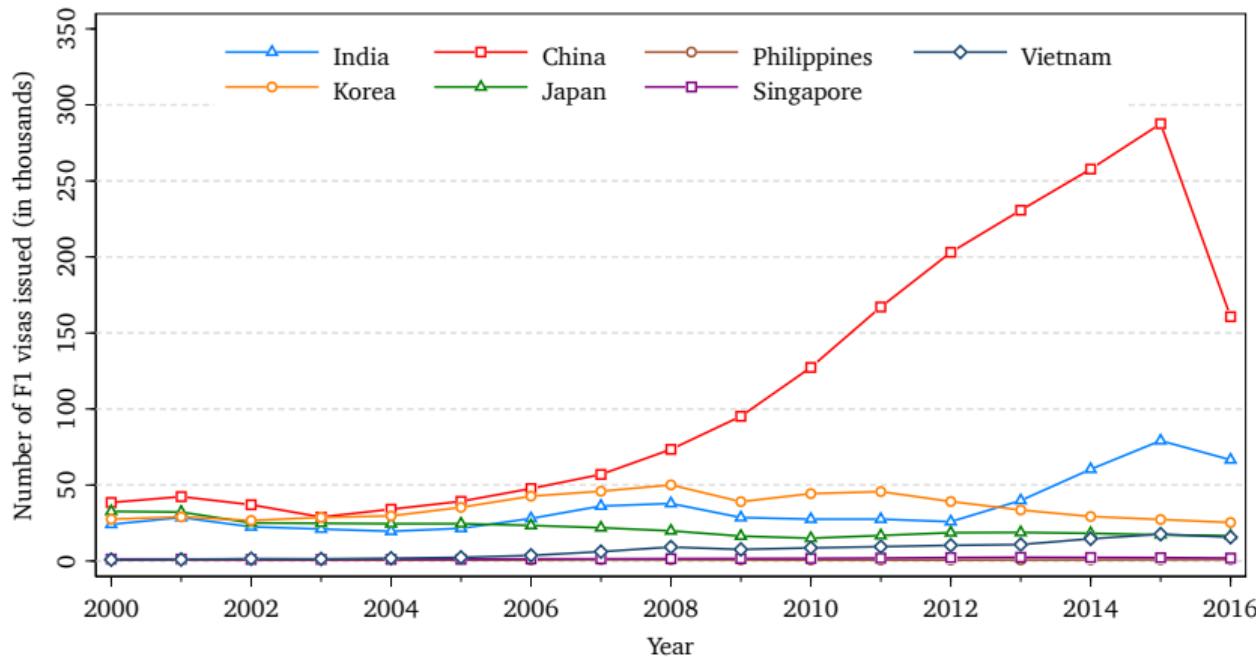
◀ Back

# Time series of J1 (exchange visitor) visas issued, by Asian country of origin



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: U.S. Department of State.

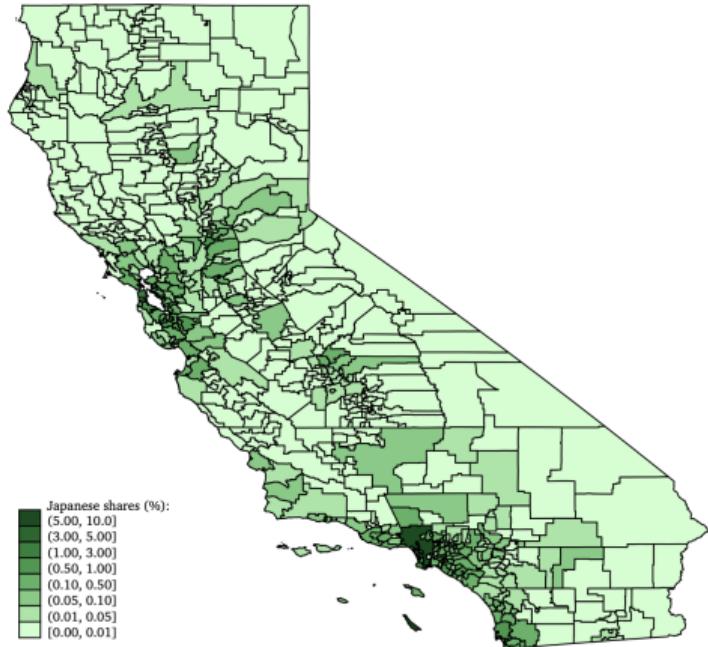
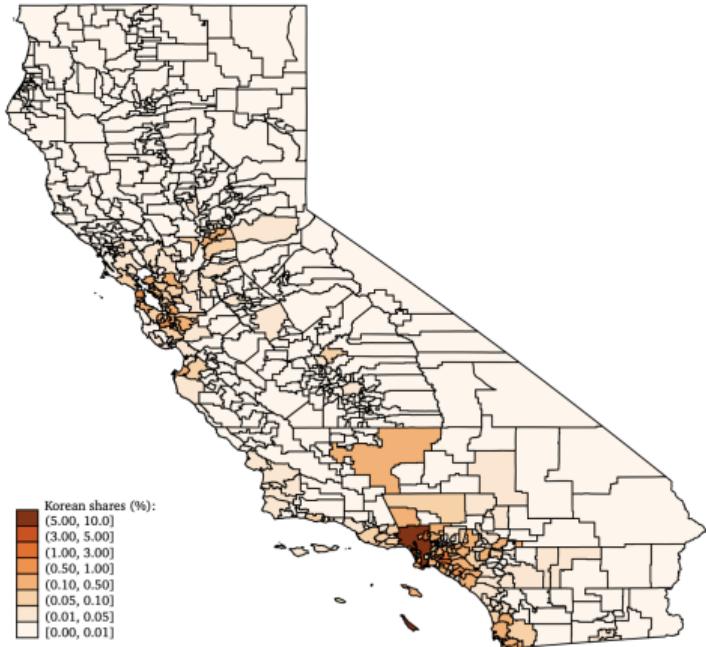
# Time series of F1 (student) visas issued, by Asian country of origin



Notes: India = Bangladesh + India + Pakistan; China = China + Taiwan + Hong Kong + Macau; Korea = South Korea + North Korea. Source: U.S. Department of State.

◀ Back

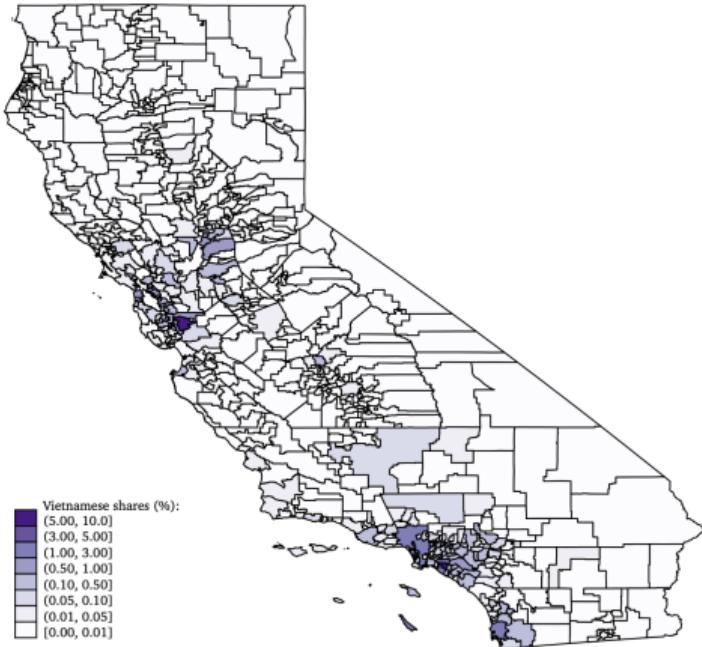
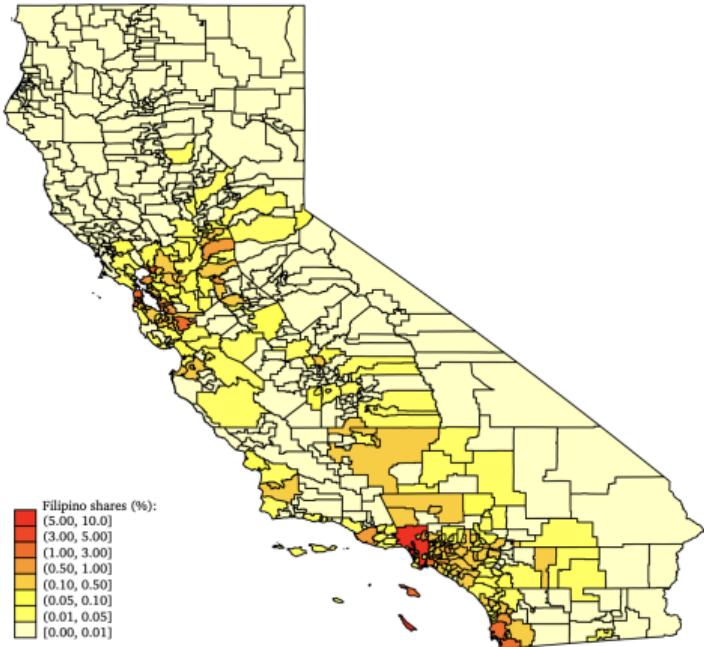
# Card-style shares of Korean (left) and Japanese (right) people in California as of 2000



Notes: Card-style share = Korean/Japanese population in a school district divided by the nationwide population of Korean/Japanese, then multiplied by 100.

◀ Back

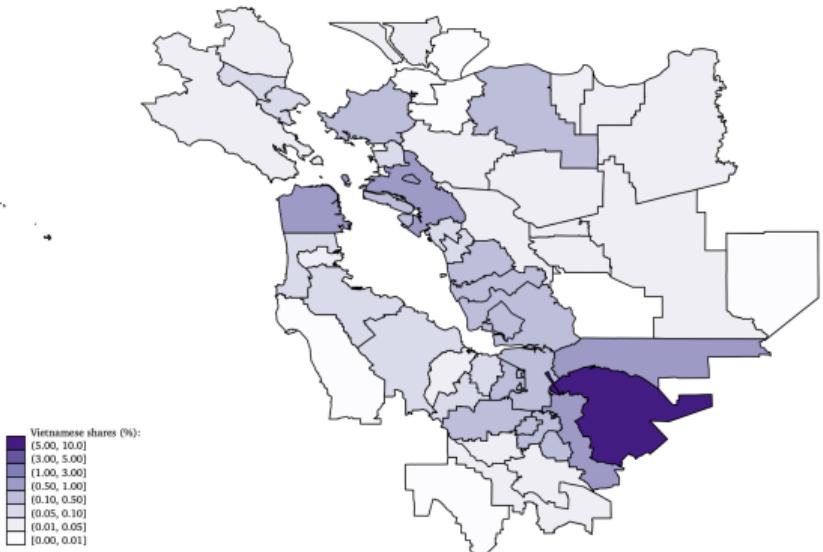
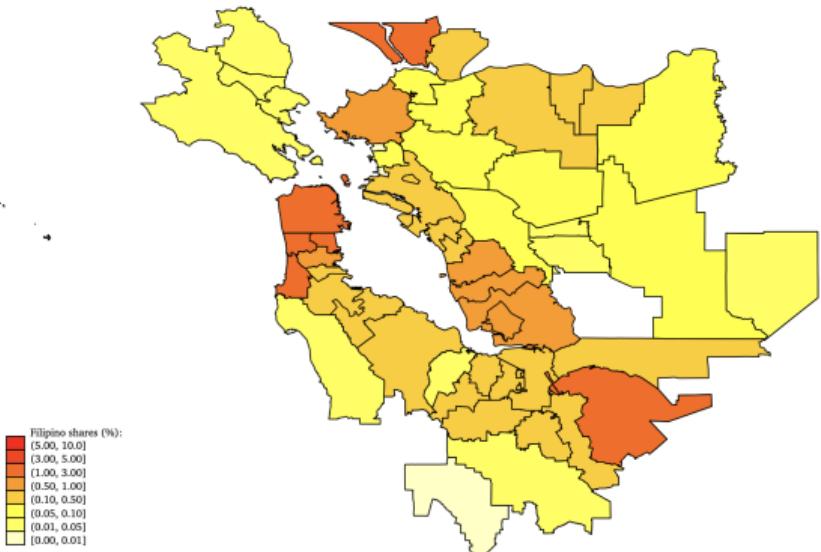
# Card-style shares of Filipino (left) and Vietnamese (right) people in California as of 2000



Notes: Card-style share = Filipino/Vietnamese population in a school district divided by the nationwide population of Filipino/Vietnamese, then multiplied by 100.

◀ Back

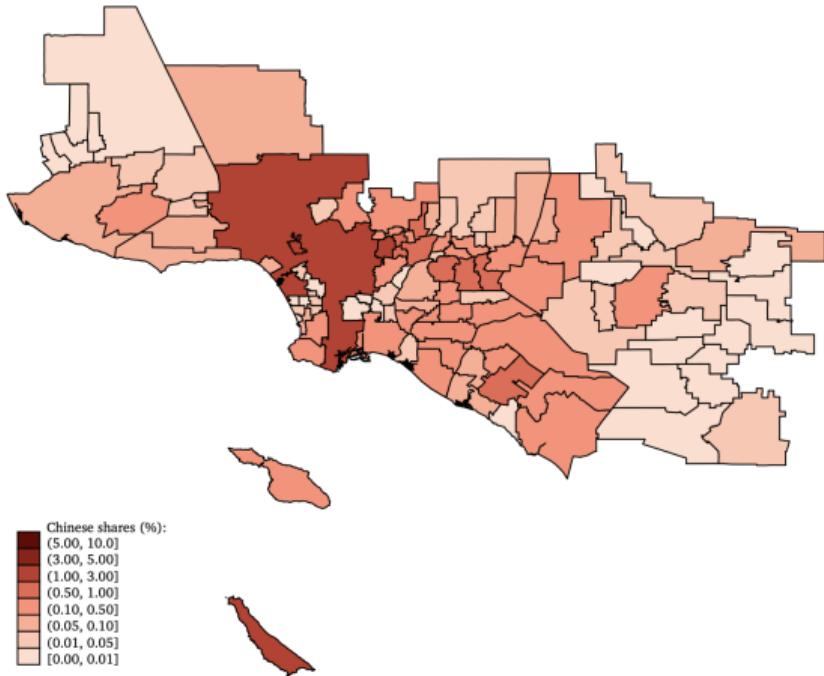
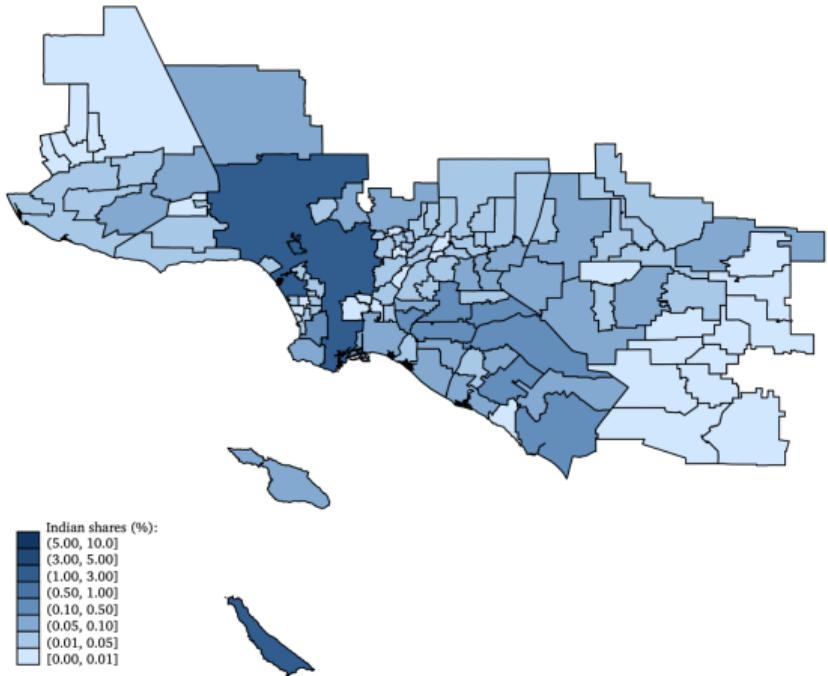
# Card-style shares of Filipino (left) and Vietnamese (right) people in the Bay area as of 2000



Notes: Card-style share = Filipino/Vietnamese population in a school district divided by the nationwide population of Filipino/Vietnamese, then multiplied by 100.

◀ Back

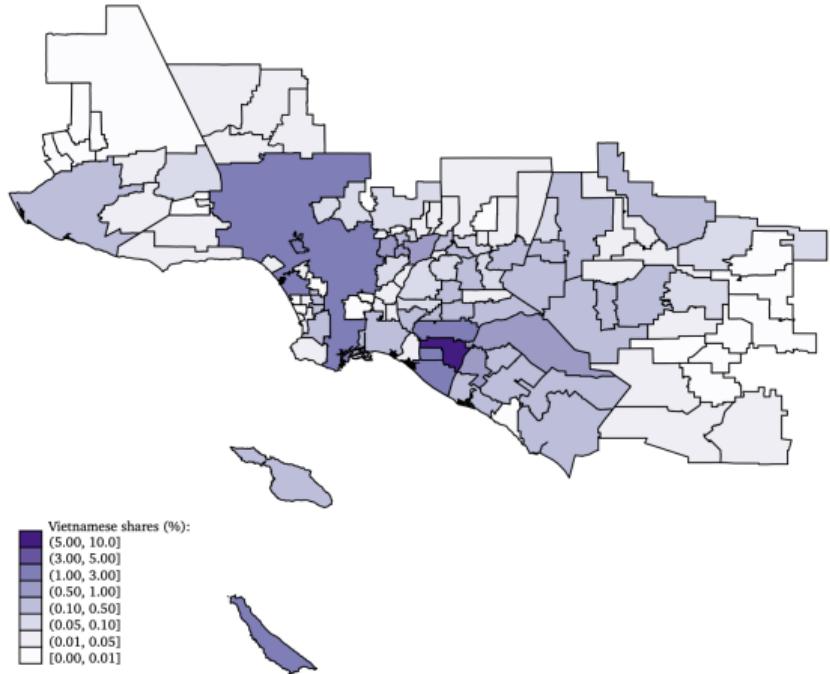
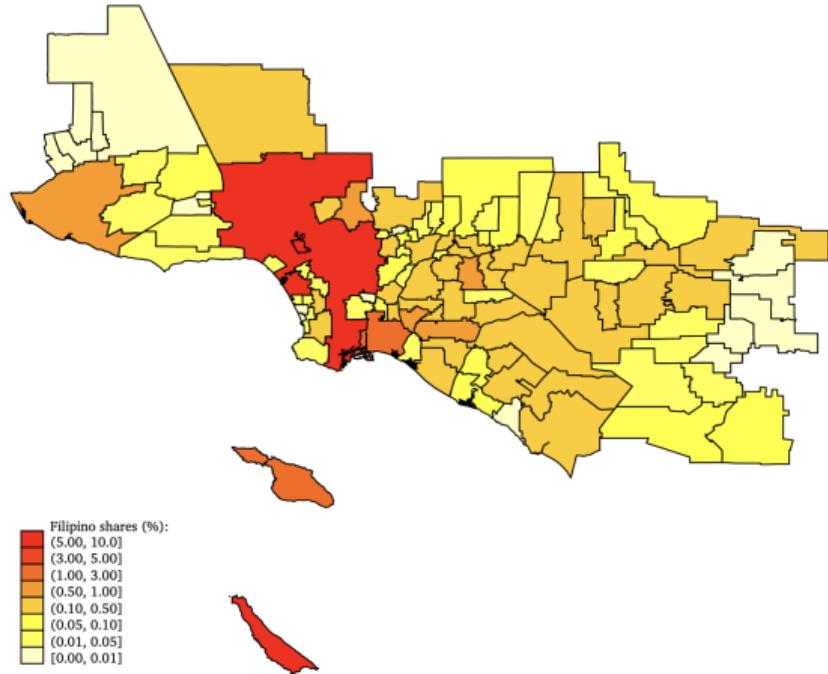
# Card-style shares of Indian (left) and Chinese (right) people in the Bay area as of 2000



Notes: Card-style share = Indian/Chinese population in a school district divided by the nationwide population of Indian/Chinese, then multiplied by 100.

◀ Back

# Card-style shares of Filipino (left) and Vietnamese (right) people in the LA area as of 2000



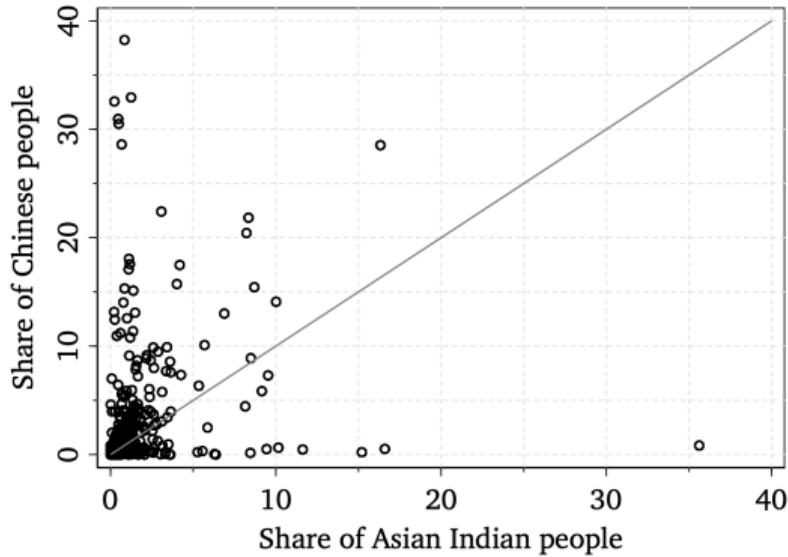
Notes: Card-style share = Filipino/Vietnamese population in a school district divided by the nationwide population of Filipino/Vietnamese, then multiplied by 100.

◀ Back

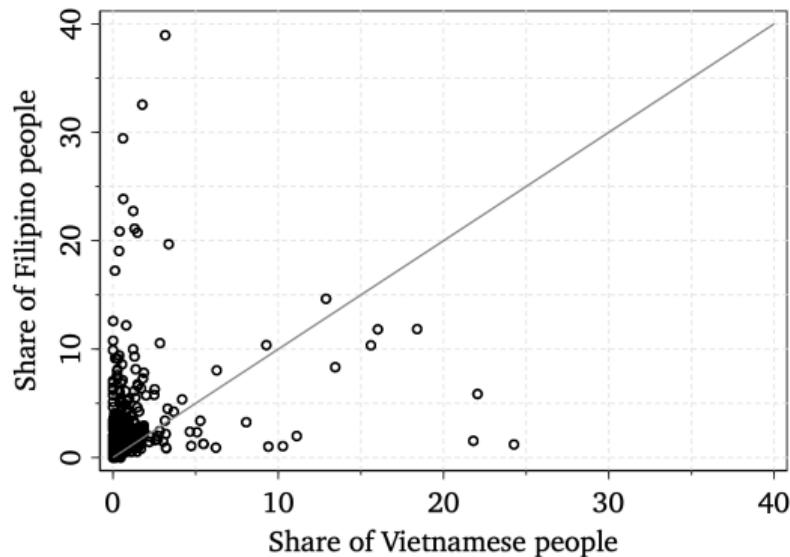
# Scatter plots of Bartik-style shares in suburban districts as of 2000

% of a given Asian ethnic group in a district

(a) Chinese vs. Indian



(b) Filipino vs. Vietnamese



◀ Back

▶ Log(1+share)

▶ Card-style shares

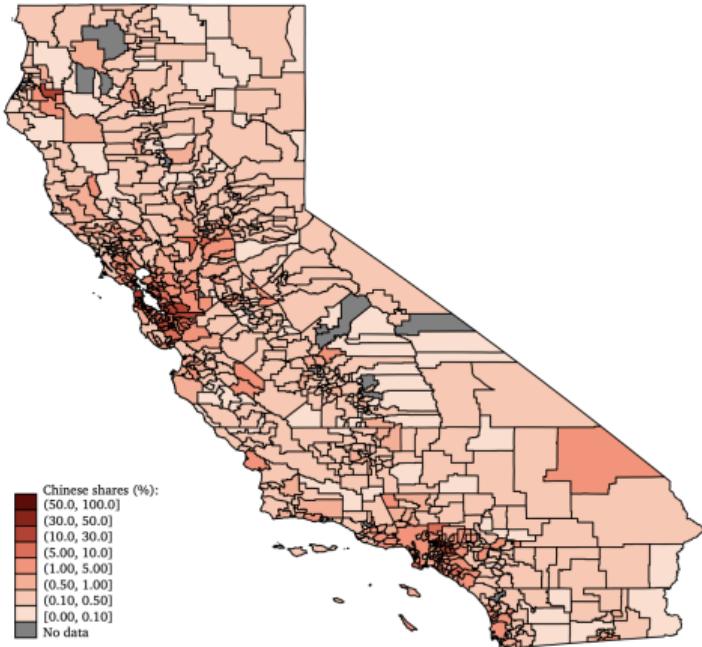
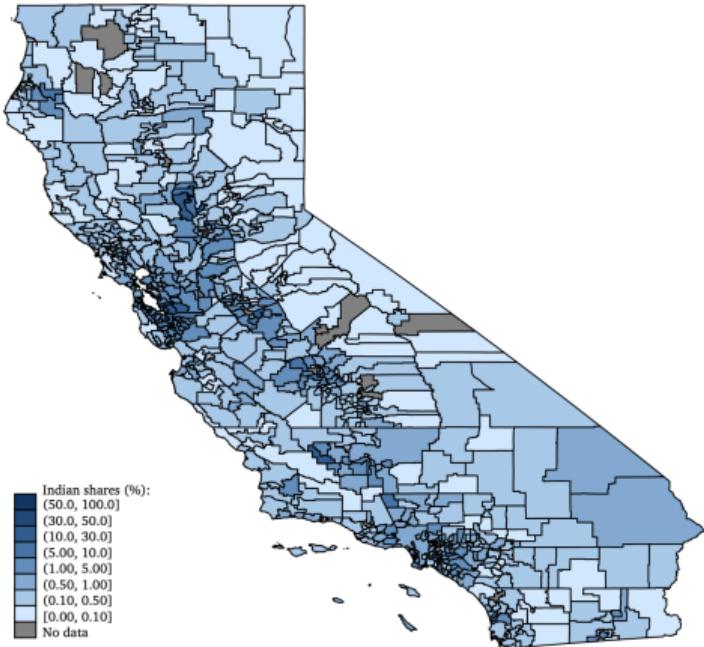
▶ Chinese vs. Filipino + Chinese vs. Vietnamese

▶ Indian vs. Filipino + Indian vs. Vietnamese

▶ Filipino vs. Indian

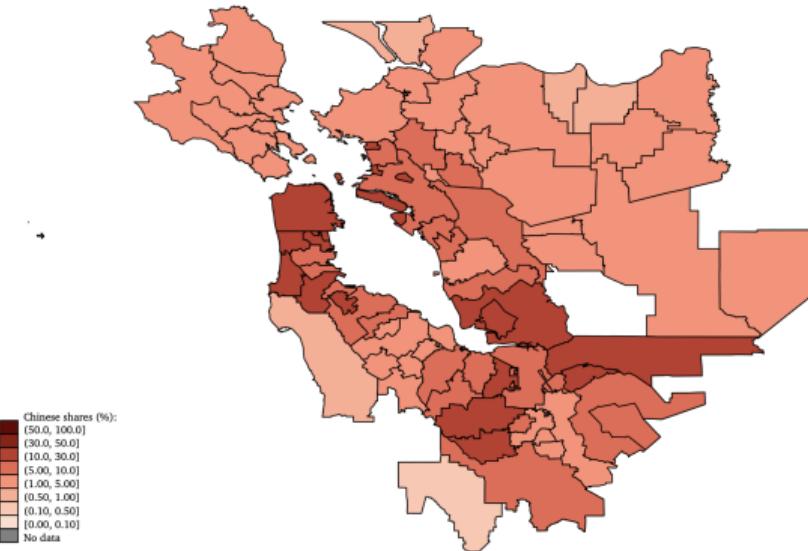
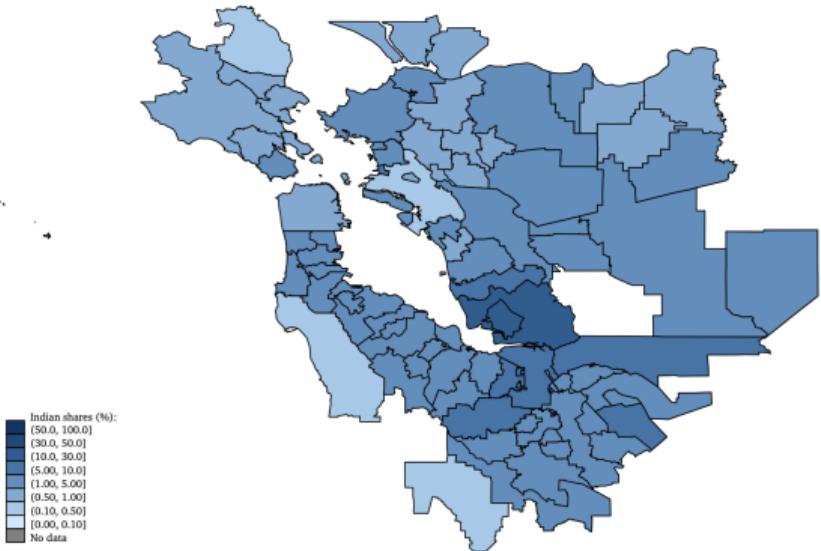
▶ Definitions of urban status

# Bartik-style shares of Indian (left) and Chinese (right) people in California as of 2000



Notes: Bartik-style share = Indian/Chinese population in a school district divided by the school district total population, then multiplied by 100.

# Bartik-style shares of Indian (left) and Chinese (right) people in the Bay area as of 2000



Notes: Bartik-style share = Indian/Chinese population in a school district divided by the school district total population, then multiplied by 100.

◀ Back

► Maps for Filipino & Vietnamese people

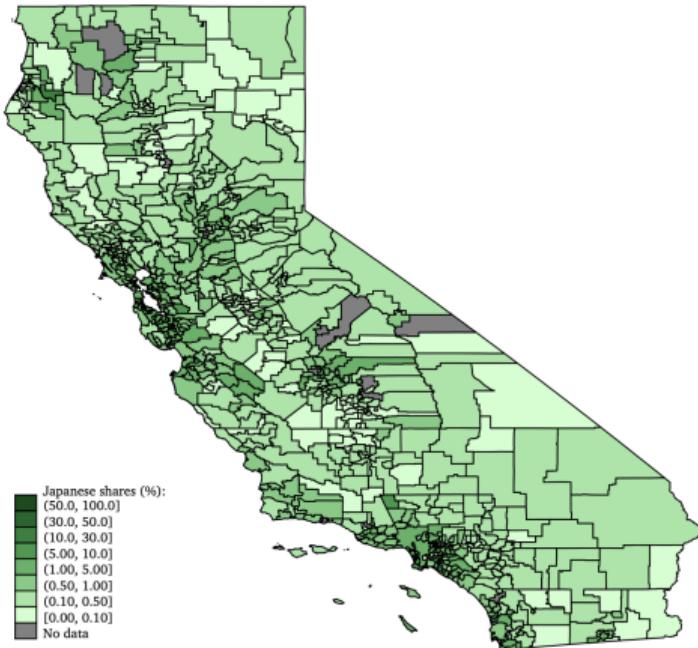
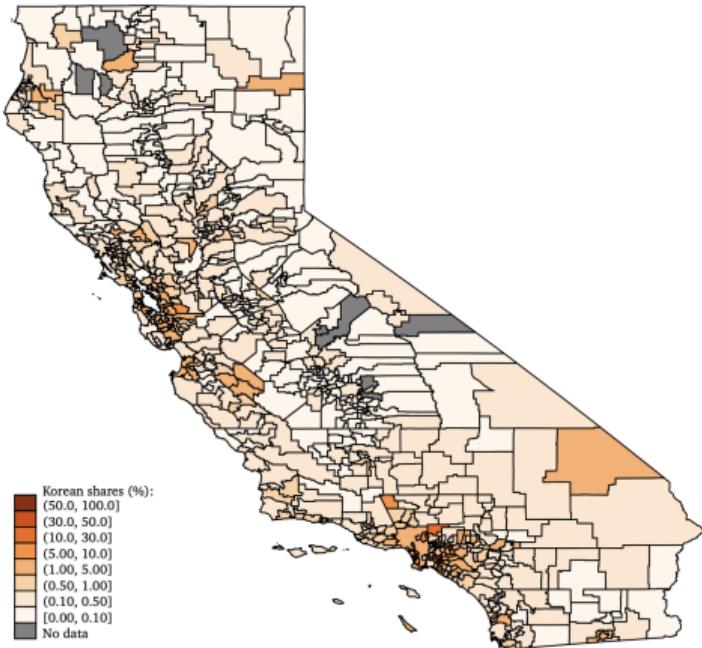
► Maps for Indian & Chinese people in LA area

► Maps for Filipino & Vietnamese people in LA area

► Scatter plots of Asian group shares



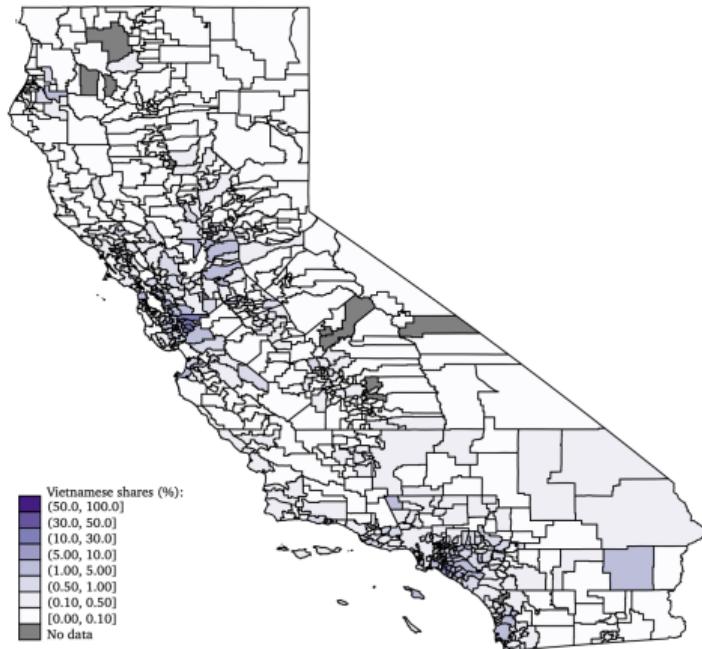
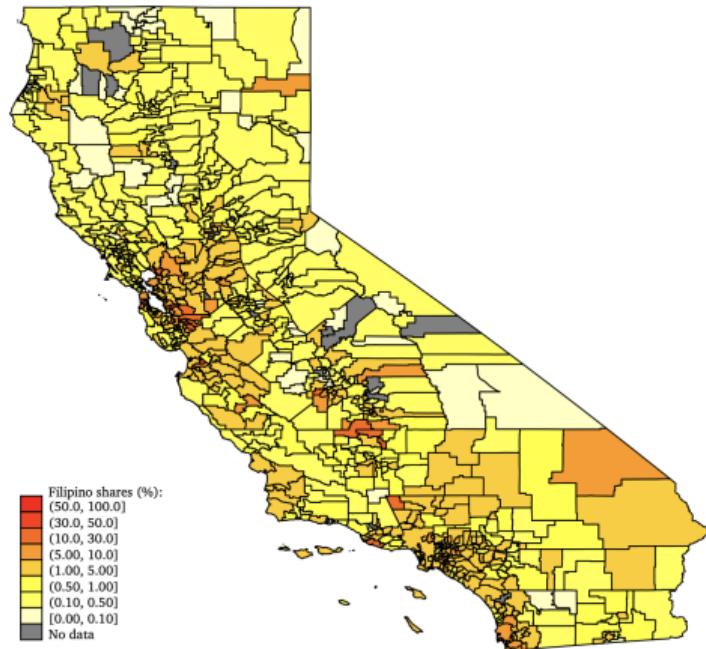
# Bartik-style shares of Korean (left) and Japanese (right) people in California as of 2000



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◀ Back

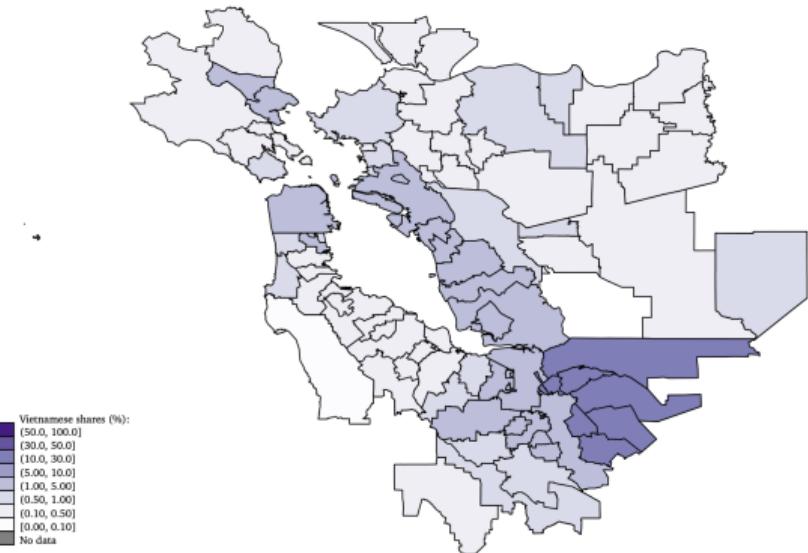
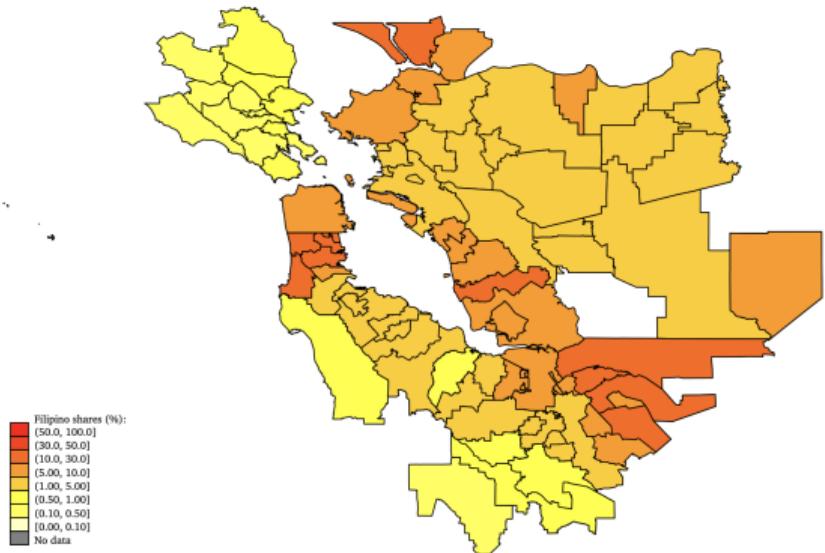
# Bartik-style shares of Filipino (left) and Vietnamese (right) people in California as of 2000



Notes: Bartik-style share = Filipino/Vietnamese population in a school district divided by the school district total population, then multiplied by 100.

◀ Back

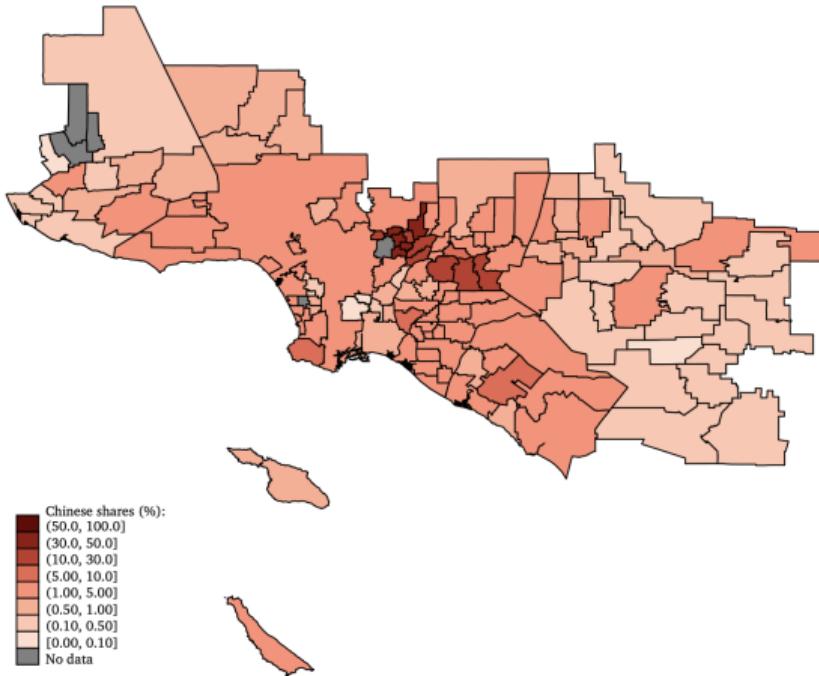
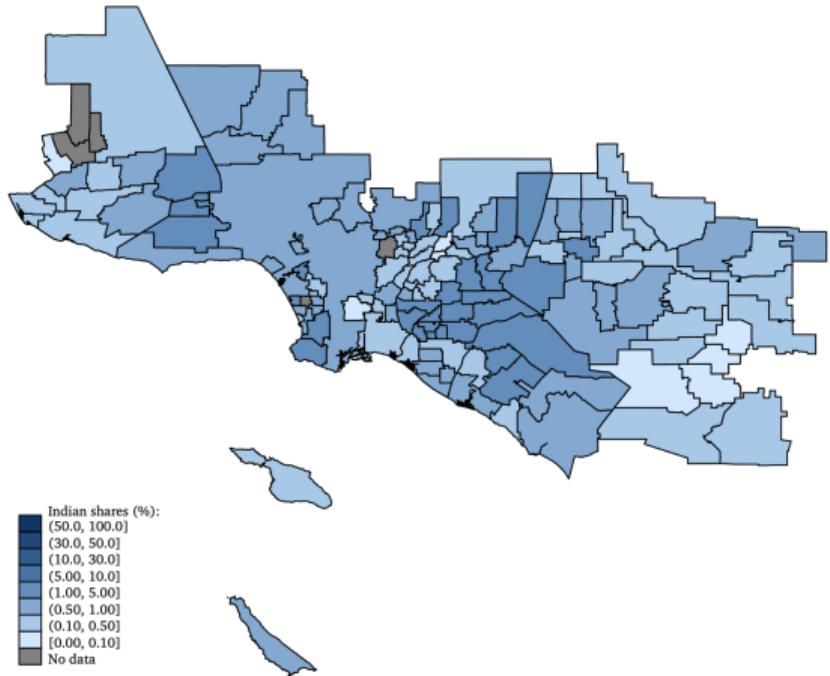
# Bartik-style shares of Filipino (left) and Vietnamese (right) people in the Bay area as of 2000



Notes: Bartik-style share = Filipino/Vietnamese population in a school district divided by the school district total population, then multiplied by 100.

◀ Back

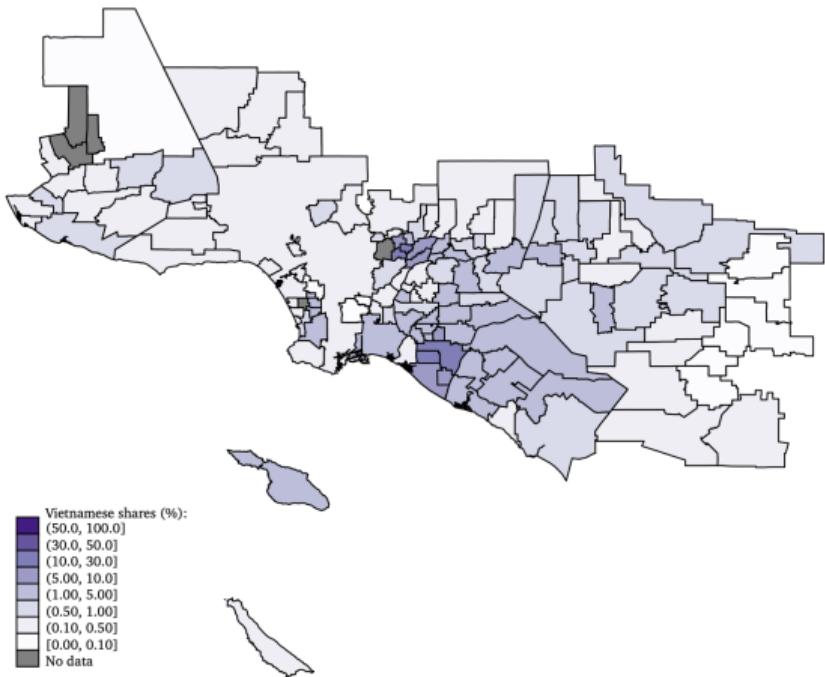
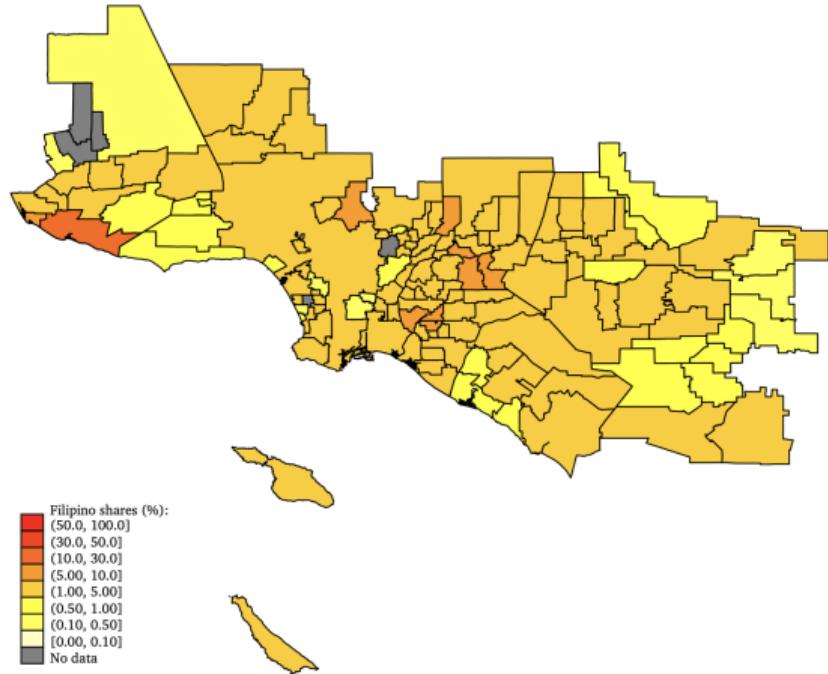
# Bartik-style shares of Indian (left) and Chinese (right) people in the Bay area as of 2000



Notes: Bartik-style share = Indian/Chinese population in a school district divided by the school district total population, then multiplied by 100.

◀ Back

# Bartik-style shares of Filipino (left) and Vietnamese (right) people in the LA area as of 2000



Notes: Bartik-style share = Filipino/Vietnamese population in a school district divided by the school district total population, then multiplied by 100.

◀ Back

# IV identifying assumptions

## ① Exogeneity:

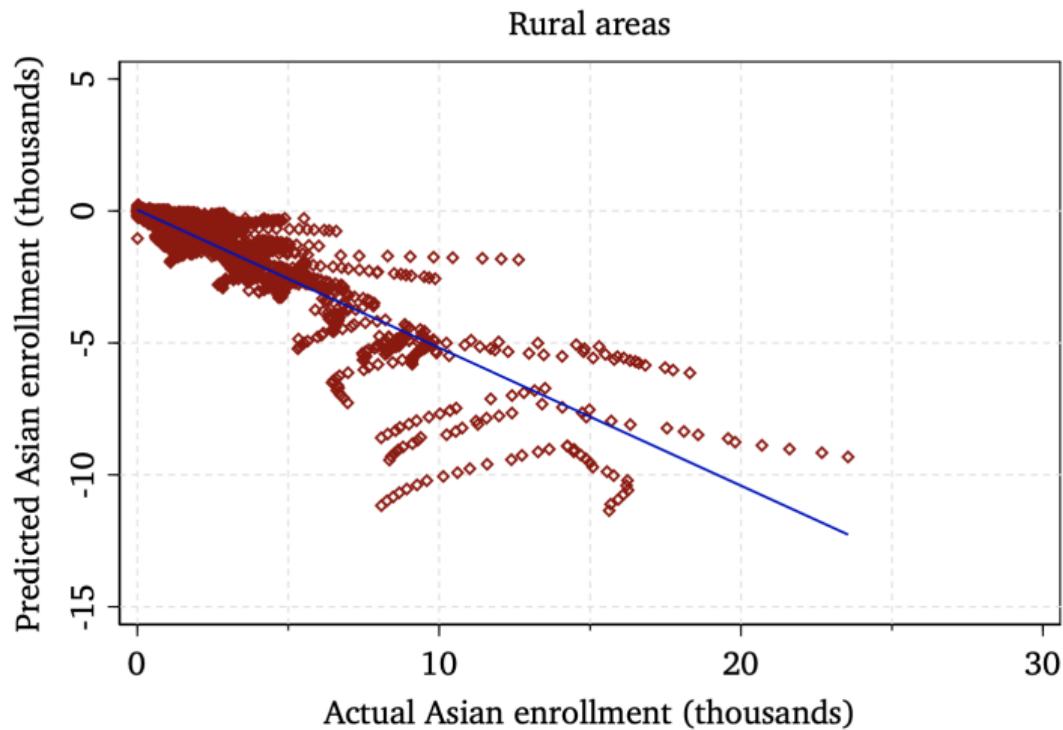
- ▷ **Exogeneity of the shares:** Unobserved factors determining the initial distribution of Asian immigrants among California school districts in the base year are uncorrelated with local economic conditions and all other determinants of white location choice in subsequent years
- ▷ **Exogeneity of the shocks:** The national flow of Asian immigrants in a given year is exogenous to differential shocks to school districts

## ② Relevance:

- ▷ New Asian immigrants do actually settle where their historical brethren settled – i.e., predicted Asian schoolchildren enrollment is strongly and positively correlated with actual Asian schoolchildren enrollment in each district

◀ Back

# Predicted vs. actual Asian enrollment in rural areas

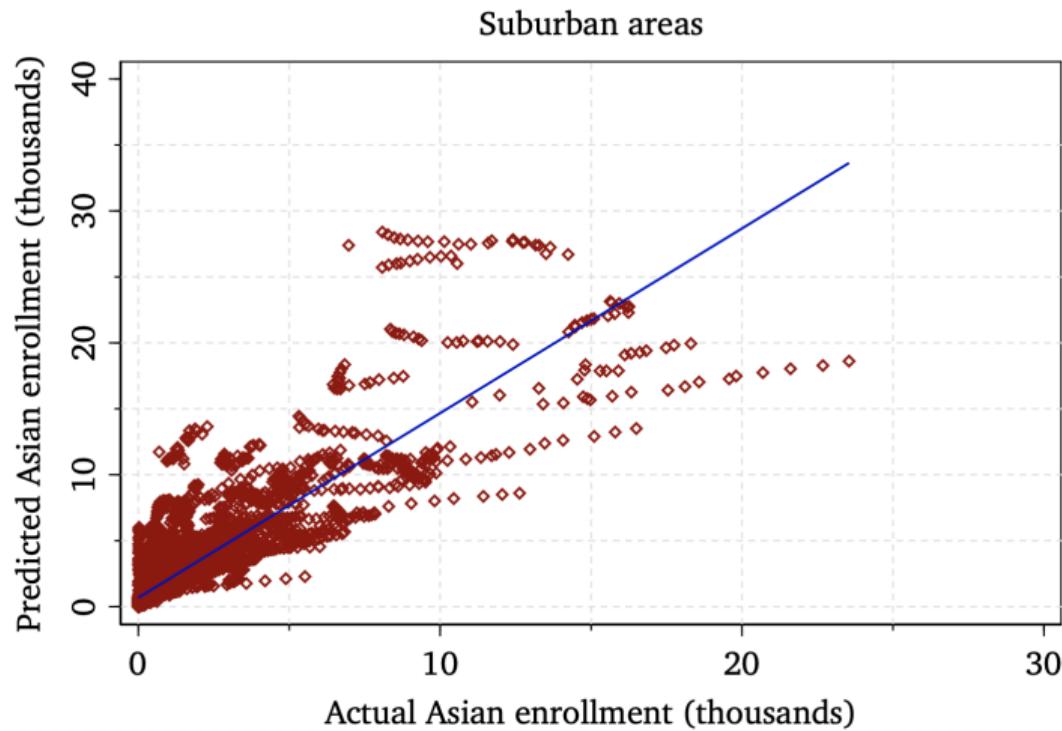


◀ Back to main table

▶ Suburban areas

▶ Urban areas

# Predicted vs. actual Asian enrollment in suburban areas

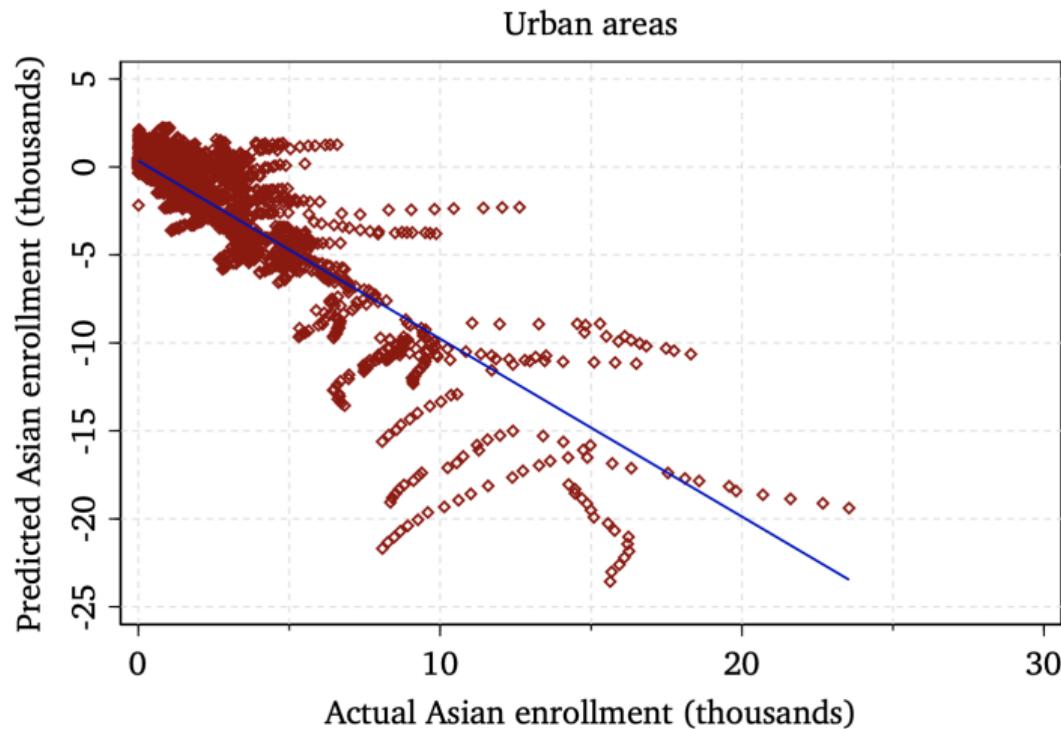


◀ Back to main table

▶ Rural areas

▶ Urban areas

# Predicted vs. actual Asian enrollment in urban areas



◀ Back to main table

▶ Suburban areas

▶ Rural areas

# White flight from Asian students in suburban areas

Robust standard errors

Sample:	Rural			Suburban			Urban		
Specification:	OLS	1st stage	IV	OLS	1st stage	IV	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)	White (4)	Asian (5)	White (6)	White (7)	Asian (8)	White (9)
Asian	0.536 (0.615)		11.94** (5.505)	-0.451*** (0.0803)		-2.568*** (0.446)	0.544** (0.218)		0.136 (0.258)
AsianPred			-0.309 (0.212)			0.448*** (0.133)			-0.772*** (0.122)
Total <sub>t-1</sub>	0.563*** (0.0642)	0.00564* (0.00302)	0.459*** (0.0522)	0.152*** (0.0295)	0.152*** (0.0216)	0.461*** (0.0705)	0.0339 (0.0803)	0.0561*** (0.0172)	0.0955* (0.0535)
Observations	1,999	1,999	1,999	9,530	9,530	9,530	432	432	432
First-stage F-stat	-	-	6.38	-	-	32.56	-	-	134.72

Notes: All specifications include year fixed effects and district fixed effects, and control for the total number of students in the previous year ("Total<sub>t-1</sub>"). The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (AsianPred) uses 2000 as base year. Robust standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# White flight from Asian students

Full sample

Specification:	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)
Asian	-0.297*** (0.106)		-5.164 (3.353)
$\widehat{\text{AsianPred}}$		0.209 (0.135)	
Total $_{t-1}$	0.138*** (0.0302)	0.152*** (0.0218)	0.853* (0.492)
Observations	11,961	11,961	11,961
First-stage F-stat	—	—	2.39

Notes: All specifications include year fixed effects and district fixed effects, and control for the total number of students in the previous year ("Total $_{t-1}$ "). The instrument ( $\widehat{\text{AsianPred}}$ ) uses 2000 as base year. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# White flight from Asian students

Full sample, with 1990 as base year for IV

Specification:	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)
Asian	-0.304*** (0.0986)		74.17 (593.2)
$\widehat{\text{AsianPred}}$		-0.0104 (0.0830)	
Total $_{t-1}$	0.149*** (0.0300)	0.151*** (0.0237)	-11.13 (90.12)
Observations	10,983	10,983	10,983
First-stage F-stat	-	-	0.02

Notes: All specifications include year fixed effects and district fixed effects, and control for the total number of students in the previous year ("Total $_{t-1}$ "). The instrument ( $\widehat{\text{AsianPred}}$ ) uses 1990 as base year. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# White flight from Asian students in suburban areas

1990 as base year for IV

Sample:	Rural			Suburban			Urban		
Specification:	OLS	1st stage	IV	OLS	1st stage	IV	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)	White (4)	Asian (5)	White (6)	White (7)	Asian (8)	White (9)
Asian	1.285* (0.689)		2.600** (1.159)	-0.441*** (0.0745)		-4.104** (1.792)	0.504*** (0.186)		0.397 (0.323)
AsianPred		-0.420*** (0.0607)			0.239** (0.112)			-0.402*** (0.0719)	
Total <sub>t-1</sub>	0.515*** (0.0631)	0.00998*** (0.00243)	0.500*** (0.0654)	0.147*** (0.0294)	0.164*** (0.0251)	0.706*** (0.260)	0.118* (0.0708)	0.0206 (0.0203)	0.133* (0.0731)
Observations	1,725	1,725	1,725	8,778	8,778	8,778	480	480	480
First-stage F-stat	-	-	47.31	-	-	4.46	-	-	30.60

Notes: All specifications include year fixed effects and district fixed effects, and control for the total number of students in the previous year ("Total<sub>t-1</sub>"). The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (AsianPred) uses 1990 as base year. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# White flight from Asian students in suburban areas

Source: CPS data

Sample:	Rural			Suburban			Urban		
	OLS	1st stage	IV	OLS	1st stage	IV	OLS	1st stage	IV
Dependent variable:	White (1)	Asian (2)	White (3)	White (4)	Asian (5)	White (6)	White (7)	Asian (8)	White (9)
Asian	0.687 (0.498)		12.17 (11.00)	-0.433*** (0.0790)		-2.389*** (0.617)	0.502** (0.218)		0.228 (0.368)
AsianPred			-0.432 (0.363)		0.618*** (0.171)			-1.164*** (0.161)	
Total <sub>t-1</sub>	0.560*** (0.0639)	0.00774** (0.00352)	0.434*** (0.116)	0.163*** (0.0318)	0.182*** (0.0239)	0.508*** (0.113)	0.0314 (0.0805)	0.0697*** (0.0184)	0.0777 (0.0863)
Observations	1,999	1,999	1,999	9,578	9,578	9,578	432	432	432
F-stat on excl. IV	-	1.37	-	-	12.89	-	-	47.24	-

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. The inflows data used to construct the instrument come from the Current Population Survey. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# Spatial model to explain white flight: equilibrium

► **Theoretical model of white spatial location decisions in response to an Asian inflow** (Bousstan, QJE 2010; Cascio and Lewis, AEJ EP 2012)

▷ Equilibrium:

- No household can  $\uparrow$  its utility by moving to another district – i.e.,  $\bar{u} = u$  for the next highest utility  $u$  that the marginal household would experience if it chose to move to a different school district in its choice set
- A school district with high school quality ( $\uparrow$  utility) must also have a compensating characteristic, such as higher housing costs ( $\downarrow$  utility)
- Same model drives Asian residential choices  $\Rightarrow$  decomposition of Asian settlement into exogenous and endogenous demand (identification problem addressed with an IV approach)
- In spatial equilibrium, all white households prefer their district of residence to all others in their pool of choice (within a given geographic region)  $\Rightarrow$  in each district, equilibrium values  $(p^*, k^*, z^*)$

◀ Back

# Spatial model to explain white flight (cont'd)

► **Theoretical model of white spatial location decisions in response to an Asian inflow** (Bousstan, QJE 2010; Cascio and Lewis, AEJ EP 2012)

▷ Discussion:

- Most of the literature assumes that inflows of other non-white minorities negatively impact school quality amenities
- Some evidence that Asians improve the quality of public schools ( $\partial z / \partial k > 0$ ) → empirical test
- Direction of white migration in response to an Asian inflow is uncertain → need empirical evidence
- Economic literature suggests that household utility ↑ in school quality (Black, 1999; Deming, Hastings, Kane, and Staiger, 2014; Abdulkadiroglu, Pathak, Schellenberg, and Walters, 2019)
- Qualitative evidence indicate that some white parents dislike the new educational achievement and competition that Asian students bring into the classroom
- ⇒ Unique model incorporating the opposing forces of whites' negative preference for Asian diversity and positive preference for academic quality

◀ Back

# Predictions of the model

- ▶ **Predictions:** What happens to the number of white students who will leave or enter a school district following an inflow of Asian students? (assuming housing supply is not perfectly elastic)
  - ▷ Case 1: exactly one white departure for every Asian entrant ⇒ **housing price channel** (whites' location decisions are racially agnostic)
    - ↪ If further assume that  $\partial z / \partial k > 0$ , then ambiguous effect (going in opposite directions), so cannot conclude if whites exhibit racial distaste or not
  - ▷ Case 2: more than one white departure for every Asian entrant ⇒ **racial distaste for Asians**
    - ↪ If further assume that  $\partial z / \partial k > 0$ , then whites' racial distaste outweighs the positive preference for the increased school quality
      - ▶ newspapers and online quotes
  - ▷ Case 3: fewer than one white departure for every Asian entrant ⇒ **attraction for Asians**
    - ↪ If further assume that  $\partial z / \partial k > 0$ , then the magnitude of whites' positive preference for the increase in school quality outweighs their racial distaste (if any exists)

◀ Back

▶ Discussion

# Predictions of the model

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◀ Back

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◀ Back

▶ Discussion

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  - ▷ Case 3: fewer than one white departure for every Asian entrant ⇒ **attraction for Asians**
    - ↪ If further assume that  $\partial z / \partial k > 0$ , then the magnitude of whites' positive preference for the increase in school quality outweighs their racial distaste (if any exists)

◀ Back

▶ Discussion

# Richer whites are more responsive

Robust standard errors

Dependent variable:		White							
Specification:		OLS				IV			
Sample:	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Asian	-0.451*** (0.0472)	-0.670*** (0.0502)	-0.845*** (0.148)	0.711*** (0.271)	-2.568*** (0.446)	-1.378*** (0.156)	-15.86 (21.73)	6.154** (2.762)	
Total <sub>t-1</sub>	0.152*** (0.0171)	0.285*** (0.0419)	0.243*** (0.0295)	0.00784 (0.0275)	0.461*** (0.0705)	0.467*** (0.0601)	2.554 (3.336)	-0.369** (0.160)	
Observations	9,538	3,375	3,158	3,005	9,538	3,375	3,158	3,005	
First-stage F-stat	–	–	–	–	32.55	151.18	0.50	4.49	
Adjusted R-squared	0.978	0.986	0.973	0.947	0.955	0.983	0.228	0.760	
Dep. var. mean	2,175.7	2,907.3	2,394.4	1,124.2	2,175.7	2,907.3	2,394.4	1,124.2	

Notes: All specifications include year fixed effects and district fixed effects, and control for the total number of students in the previous year ("Total<sub>t-1</sub>"). The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Robust standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# Poorer white students are attracted to Asian students

Dependent variable:		White							
Specification:		OLS				IV			
Sample:	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Asian	-0.433*** (0.0790)	-0.652*** (0.0858)	-1.112*** (0.199)	0.881*** (0.185)	-2.389*** (0.617)	-1.244*** (0.236)	-2.943*** (0.579)	1.691*** (0.312)	
Total <sub>t-1</sub>	0.163*** (0.0318)	0.281*** (0.0783)	0.314*** (0.0614)	-0.00540 (0.0356)	0.508*** (0.113)	0.455*** (0.107)	0.649*** (0.126)	-0.0825** (0.0361)	
Observations	9,578	3,343	3,214	3,021	9,578	3,343	3,214	3,021	
First-stage F-stat	–	–	–	–	12.89	65.79	28.88	41.13	
Dep. var. mean	2,167	2,803	2,577	1,026	2,167	2,803	2,577	1,026	

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. The inflows data used to construct the instrument come from the Current Population Survey. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

# Having more Asians ↑ the district's academic performance at the top

Robust standard errors

Specification:	API score (school quality)							
	OLS				IV			
Sample:	Non-missing 2000 API score	Top third 2000 API	Middle third 2000 API	Bottom third 2000 API	Non-missing 2000 API score	Top third 2000 API	Middle third 2000 API	Bottom third 2000 API
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Asian share	-116.0*** (22.65)	50.83** (23.90)	-12.71 (21.49)	175.1** (83.04)	-191.4** (75.96)	188.7*** (48.70)	317.7 (343.0)	5360.4 (5607.8)
Total <sub>t-1</sub> (÷ 1000)	0.210 (0.323)	0.821 (0.556)	1.334*** (0.462)	-0.294 (0.432)	0.388 (0.364)	0.104 (0.630)	0.610 (0.803)	-4.534 (4.628)
Observations	7,081	2,461	2,368	2,252	7,081	2,461	2,368	2,252
First-stage F-stat	-	-	-	-	71.26	206.48	5.86	1.14
Adjusted R-squared	0.926	0.905	0.863	0.871	0.926	0.904	0.852	0.545
Dep. var. mean	2,292.7	2,908.3	2,658.0	1,178.8	2,292.7	2,908.3	2,658.0	1,178.8

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district × year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Sample restricted to suburban areas. Robust standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%. API stands for Academic Performance Index and ranges from 200 to 1000.

◀ Back

# Richer white students are more responsive, poorer white students are attracted to Asian students

By school quality (API score)

Dependent variable:		White							
Specification:		OLS				IV			
		Non-missing 2000 API (1)	Top third 2000 API (2)	Middle third 2000 API (3)	Bottom third 2000 API (4)	Non-missing 2000 API (5)	Top third 2000 API (6)	Middle third 2000 API (7)	Bottom third 2000 API (8)
Asian		-0.433*** (0.0789)	-0.656*** (0.0864)	-0.901*** (0.230)	0.774*** (0.199)	-2.526*** (0.700)	-1.253*** (0.233)	-6.190 (5.003)	4.277** (1.829)
Total <sub>t-1</sub>		0.163*** (0.0318)	0.280*** (0.0793)	0.311*** (0.0573)	-0.0135 (0.0396)	0.533*** (0.126)	0.457*** (0.108)	1.336 (1.022)	-0.333** (0.155)
Observations		9,530	3,311	3,198	3,021	9,530	3,311	3,198	3,021
First-stage F-stat		—	—	—	—	12.44	63.62	1.43	3.93
Dep. var. mean		2,177	2,768	2,565	1,118	2,177	2,768	2,565	1,118

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# Poorer white students are more responsive

By % of students eligible for free or reduced price meals (FRPM)

Dependent variable:		White							
Specification:		OLS				IV			
Sample:		Non-missing 2000 perc. elig. FRPM (1)	Top third 2000 perc. elig. FRPM (2)	Middle third 2000 perc. elig. FRPM (3)	Bottom third 2000 perc. elig. FRPM (4)	Non-missing 2000 perc. elig. FRPM (5)	Top third 2000 perc. elig. FRPM (6)	Middle third 2000 perc. elig. FRPM (7)	Bottom third 2000 perc. elig. FRPM (8)
Asian		-0.433*** (0.0790)	0.514*** (0.191)	-0.675*** (0.208)	-0.662*** (0.0838)	-2.531*** (0.702)	4.168 (3.759)	-4.396*** (1.416)	-1.342*** (0.253)
Total <sub>t-1</sub>		0.163*** (0.0318)	0.0646* (0.0366)	0.165*** (0.0569)	0.324*** (0.0778)	0.533*** (0.126)	-0.273 (0.322)	0.820*** (0.227)	0.520*** (0.110)
Observations		9,578	3,020	3,247	3,311	9,578	3,020	3,247	3,311
First-stage F-stat		—	—	—	—	12.44	1.12	7.42	40.90
Dep. var. mean		2,167	902	2,605	2,892	2,167	902	2,605	2,892

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# Slightly stronger effect in below-median growing school districts

Above- vs. below-median average pre-2000 enrollment growth

Dependent variable:		White				
Specification:		OLS			IV	
Sample:	Non-missing average growth	Above-median average growth	Below-median average growth	Non-missing average growth	Above-median average growth	Below-median average growth
	(1)	(2)	(3)	(4)	(5)	(6)
Asian	-0.433*** (0.0790)	-0.412*** (0.0867)	-0.449*** (0.131)	-2.531*** (0.702)	-1.682*** (0.289)	-2.734* (1.433)
Total <sub>t-1</sub>	0.163*** (0.0318)	0.0472 (0.0298)	0.338*** (0.0554)	0.533*** (0.126)	0.281*** (0.0745)	0.747*** (0.243)
Observations	9,578	4,797	4,781	9,578	4,797	4,781
First-stage F-stat	—	—	—	12.44	33.73	3.08
Dep. var. mean	2,167	2,358	1,975	2,167	2,358	1,975

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument ( $\widehat{\text{AsianPred}}$ ) uses 2000 as base year. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# Stronger effect in growing school districts

Robust standard errors

Dependent variable:		White					
Specification:		OLS			IV		
		Non-missing average growth	Average growing	Average shrinking	Non-missing average growth	Average growing	Average shrinking
		(1)	(2)	(3)	(4)	(5)	(6)
Asian		-0.451*** (0.0472)	-0.481*** (0.0490)	0.158** (0.0729)	-2.568*** (0.446)	-2.305*** (0.357)	0.774*** (0.154)
Total <sub>t-1</sub>		0.152*** (0.0171)	0.173*** (0.0198)	0.0750*** (0.0177)	0.461*** (0.0705)	0.453*** (0.0632)	0.0317* (0.0191)
Observations		9,538	8,028	1,510	9,538	8,028	1,510
First-stage F-stat		–	–	–	32.55	41.51	59.75
Adjusted R-squared		0.978	0.979	0.966	0.955	0.961	0.962
Dep. var. mean		2,175.7	2,393.9	1,015.5	2,175.7	2,393.9	1,015.5

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district  $\times$  year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Robust standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# No differential effect by growing vs. shrinking school districts

Source: CPS

Dependent variable:		White				
Specification:		OLS		IV		
Sample:	Non-missing average pre-2000 growth	Average pre-2000 growing	Average pre-2000 shrinking	Non-missing average pre-2000 growth	Average pre-2000 growing	
	(1)	(2)	(3)	(4)	(5)	
Asian	-0.433*** (0.0790)	-0.428*** (0.0797)	-0.947*** (0.137)	-2.390*** (0.617)	-2.396*** (0.642)	-2.441*** (0.605)
Total <sub>t-1</sub>	0.163*** (0.0318)	0.162*** (0.0317)	0.433*** (0.0928)	0.508*** (0.113)	0.508*** (0.117)	0.884*** (0.150)
Observations	9,562	8,860	702	9,562	8,860	702
First-stage F-stat	—	—	—	12.90	12.14	8.93
Dep. var. mean	2,167	2,232	1,348	2,167	2,232	1,348

Notes: Growing (shrinking) districts are those with a non-negative (negative) average annual growth rate over the 1981-2000 period. All specifications include year fixed effects and district fixed effects. The inflows data used to construct the instrument come from the Current Population Survey. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

# Having more Asians ↑ the district's academic performance at the top

Specification:	Academic Performance Index (API) score							
	OLS				IV			
	Non-missing 2000 API score (1)	Top third 2000 API (2)	Middle third 2000 API (3)	Bottom third 2000 API (4)	Non-missing 2000 API score (5)	Top third 2000 API (6)	Middle third 2000 API (7)	Bottom third 2000 API (8)
Asian share	-112.0*** (36.20)	46.48 (29.86)	8.926 (28.22)	77.92 (115.8)	-108.4 (98.41)	170.7*** (64.66)	252.5 (347.1)	5141.2 (6108.7)
Total <sub>t-1</sub> (÷ 1000)	0.268 (0.489)	0.504 (0.748)	1.287** (0.633)	-0.229 (0.807)	0.257 (0.589)	-0.274 (0.856)	0.481 (1.268)	-4.788 (5.359)
Observations	7,117	2,473	2,380	2,264	7,117	2,473	2,380	2,264
First-stage F-stat	—	—	—	—	31.12	121.45	5.45	0.64
Dep. var. mean	755.3	836.6	747.8	674.5	755.3	836.6	747.8	674.5

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district × year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001–2016 period. The instrument (*AsianPred*) uses 2000 as base year. Sample restricted to suburban areas. The inflows data used to construct the instrument come from the Department of Homeland Security. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

# Having more Asians ↑ the district's academic performance at the top

Source: CPS

Dependent variable:		Academic Performance Index (API) score							
Specification:		OLS				IV			
Sample:	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	Non-missing 2000 school district SES index	Top third 2000 school district SES index	Middle third 2000 school district SES index	Bottom third 2000 school district SES index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Asian share	-105.3*** (34.38)	60.17** (28.41)	21.38 (41.00)	-4.883 (38.45)	-34.48 (98.83)	167.4*** (55.22)	382.2 (265.2)	1359.3* (744.5)	
Total <sub>t-1</sub> (÷ 1000)	0.256 (0.489)	0.178 (0.755)	1.812*** (0.697)	0.398 (0.665)	0.0483 (0.586)	-0.502 (0.862)	0.650 (1.121)	-0.619 (1.027)	
Observations	7,152	2,487	2,401	2,264	7,152	2,487	2,401	2,264	
First-stage F-stat	-	-	-	-	26.22	89.57	30.97	3.39	
Dep. var. mean	755.1	836.5	742.4	679.0	755.1	836.5	742.4	679.0	

Notes: All specifications include year fixed effects and district fixed effects. The unit of observation is a school district × year. District IV sample used (only the districts for which the instrument is available; Los Angeles Unified and San Francisco Unified Districts dropped) for the 2001-2016 period. The instrument (*AsianPred*) uses 2000 as base year. Sample restricted to suburban areas. The inflows data used to construct the instrument come from the Current Population Survey. Spatial HAC (a.k.a. Conley) standard errors reported in parentheses – these standard errors are adjusted for spatial and temporal correlation within 1,000 km and 10 decades. Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

◀ Back

