The Future of Fiscal Policy: American Economic Policy Debates in the 21st Century

Place Based Policy

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Week 2

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Outline

1. Motivation
2. Theory
   - Rosen Roback Model
   - Kline Moretti Model
3. Evidence from Specific Place Based Policies
   - Empowerment Zones
   - Local Government Spending
   - Moving to Opportunity
   - Moved to Opportunity: Evidence from Public Housing Demolitions
   - Million Dollar Plants
   - Big Push: Tennessee Valley Authority

Outline

People vs Places

- Many programs target resources towards disadvantaged neighborhoods or regions
- In US, fed gov spends approx $15 B per year on spatial programs while state and local govts spend approx $80 B per year
- Glaeser and Gottleib (2008, BPEA):
  - "The rationale for spending federal dollars to try to encourage less advantaged people to stay in economically weak places is itself extremely weak"
- What is the economic case (if any) for targeting places instead of people?

Stated objectives

- California Enterprise Zone Program:
  - "To stimulate economic development by providing tax incentives to businesses enabling private sector market forces to revive the local economy"
- Empowerment Zones:
  - "To create business opportunities and jobs in the most economically distressed areas of inner cities and the rural heartland"
- Tennessee Valley Authority:
  - "Touching and giving life to all forms of human concerns"

Motivation: Geographically concentrated economic activity

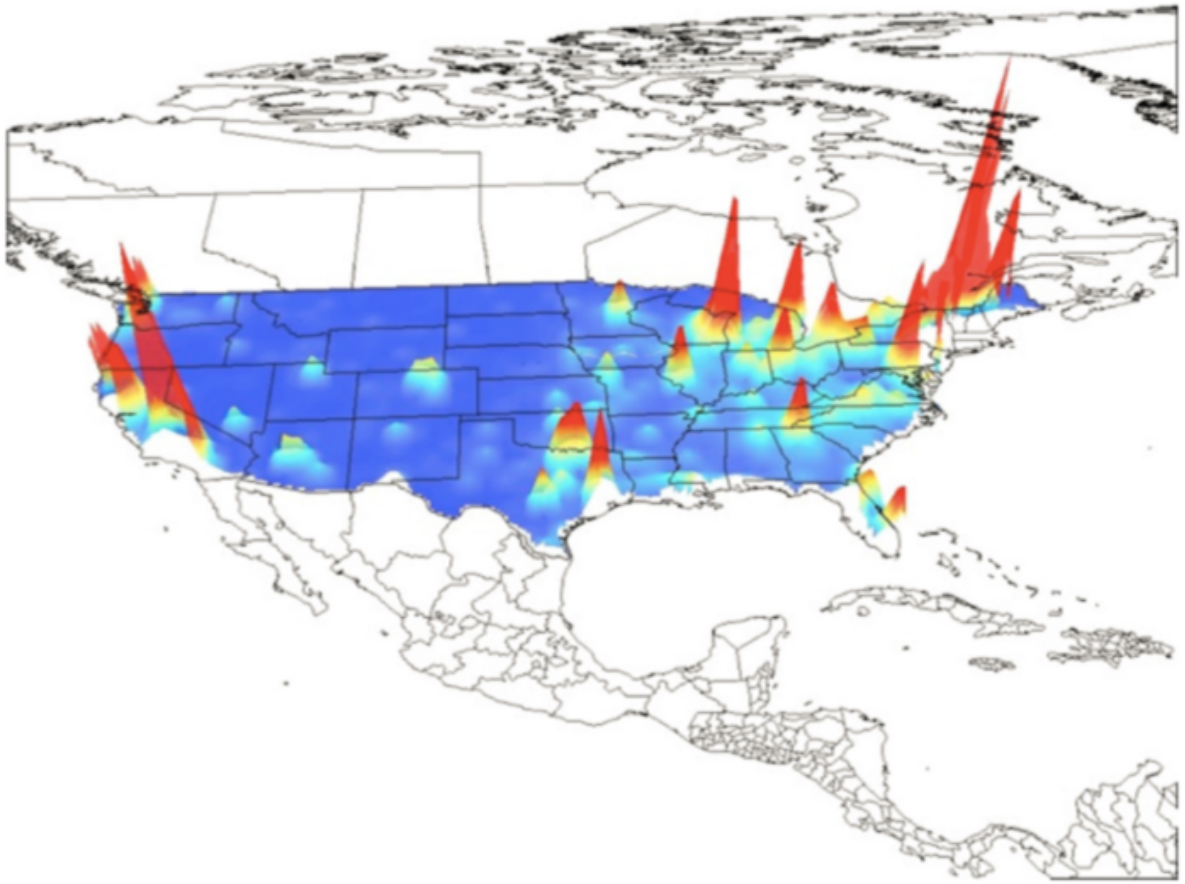
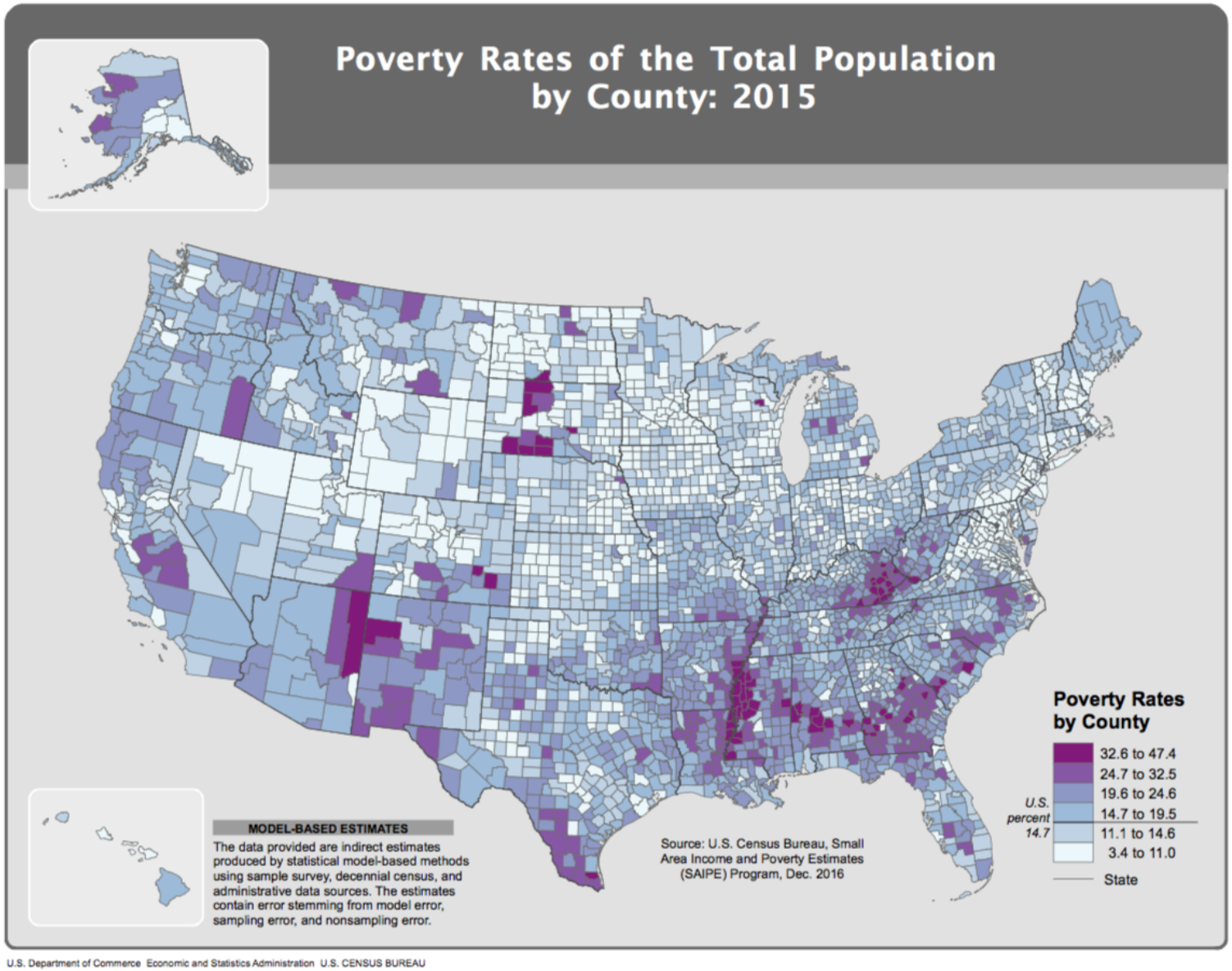


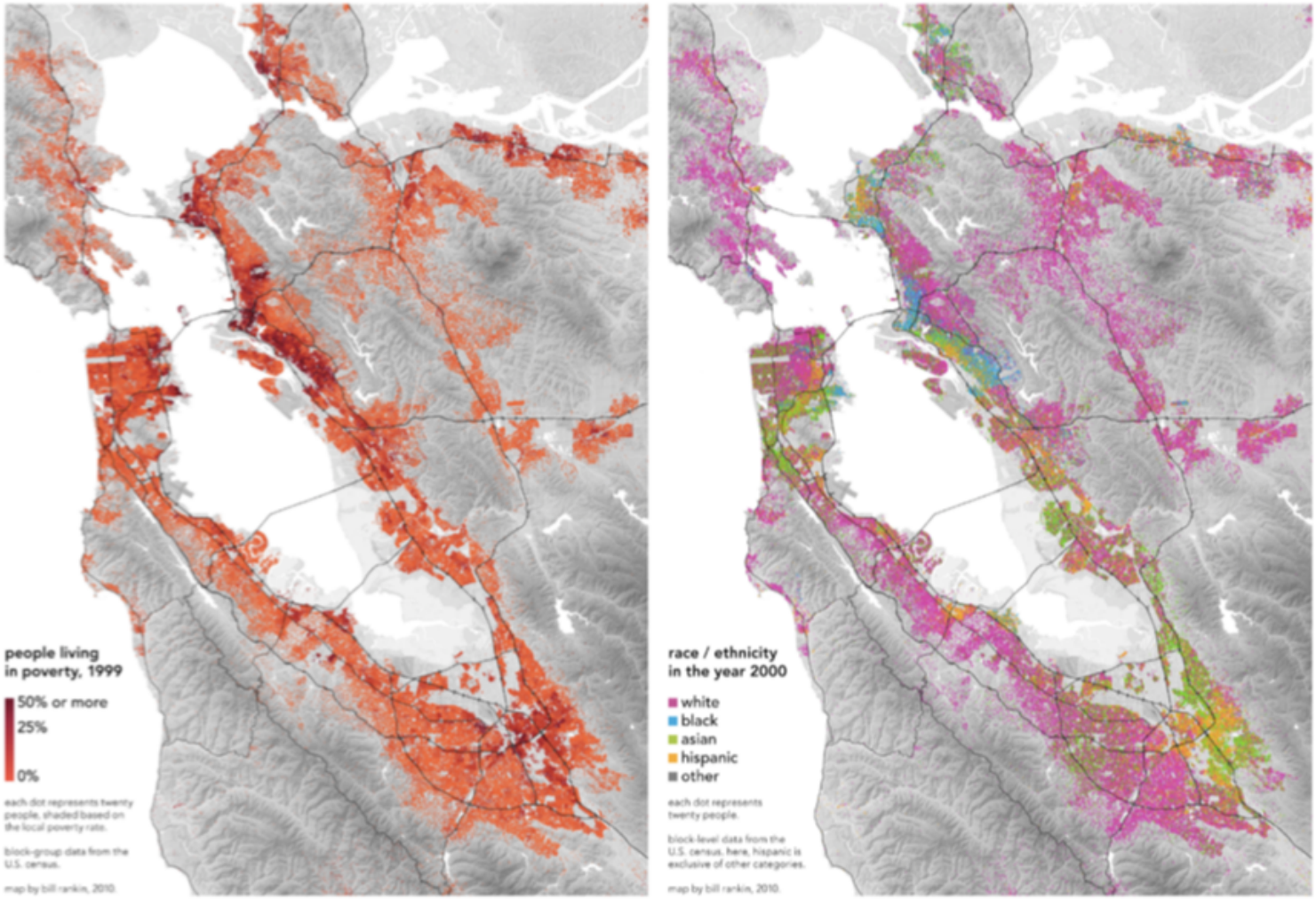
Figure 1 ***Spatial distribution of economic output in the US, by square mile.*** Notes: This figure reports the value of output produced in the US by square mile.

Source: Moretti (2011)

Motivation: Geographically concentrated poverty

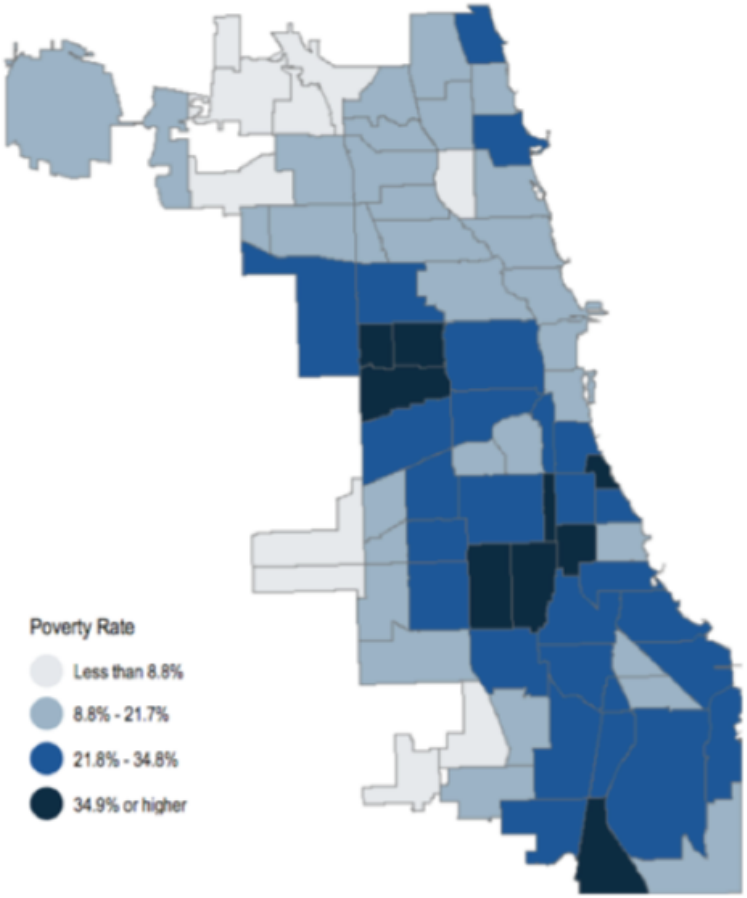


Motivation: Geographically concentrated poverty/race

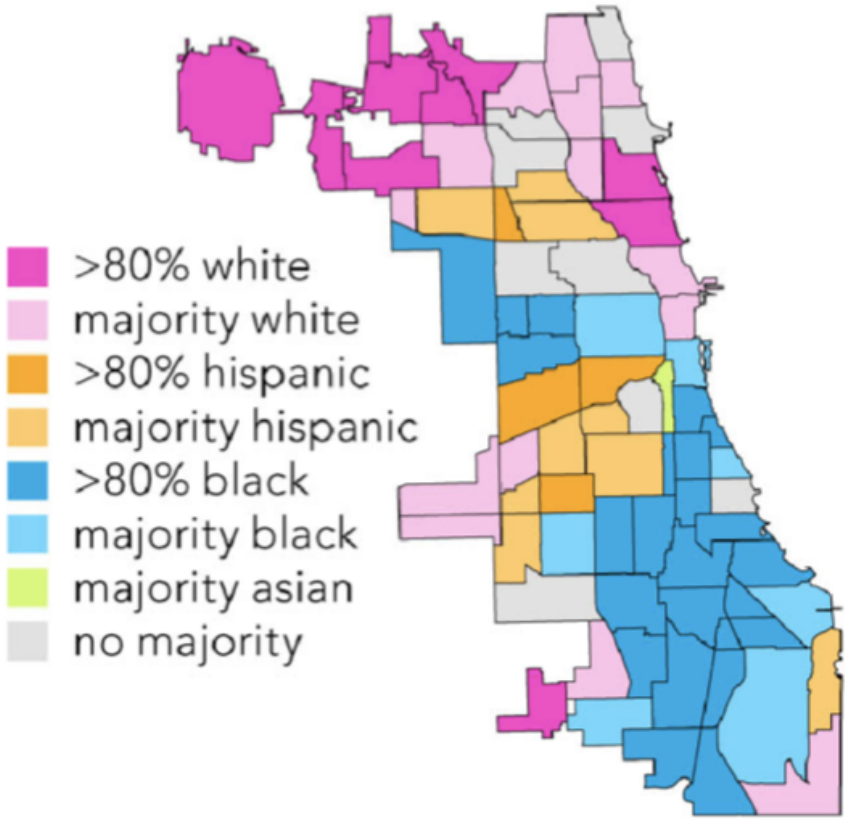


Source: Rankin (2010) using 2000 Census (http://www.radicalcartography.net/)

Motivation: Geographically concentrated poverty/race



The same data, aggregated by community area and shown with solid colors.



Source: Rankin (2010) and http://capitolfax.com/2013/01/17/todays-maps-illinois-poverty/ using 2010 Census

Motivation: Geographically concentrated shocks

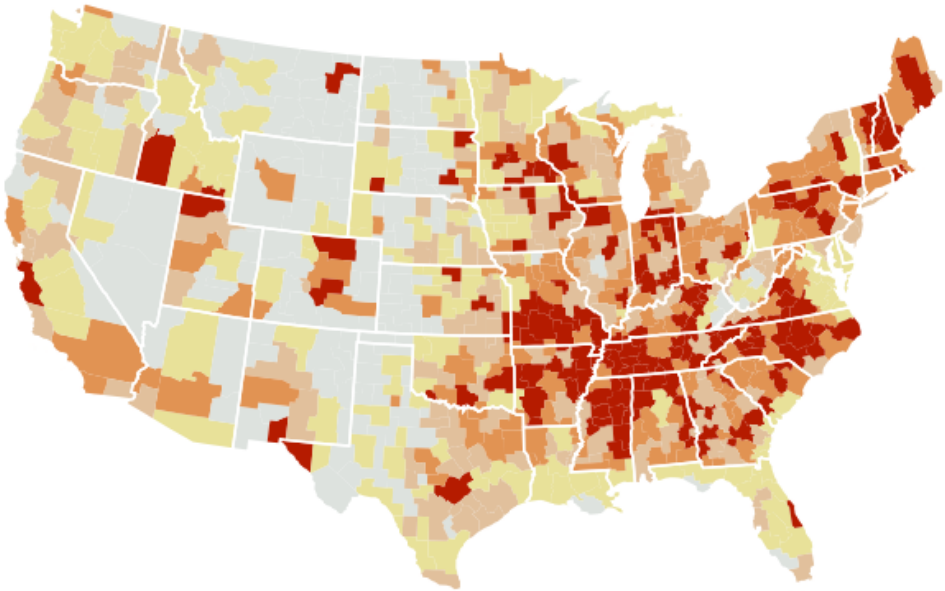
The Parts of America Most Vulnerable to China

Some areas of the U.S. were hit especially hard by China's rise, partly because those areas had lots of jobs in industries where imports surged the most.

Most-affected areas of the U.S.

Colors show which areas were most affected by China's rise, based on the increase in Chinese imports per worker in each area from 1990 to 2007. Hovering over each area on the map will show a demographic breakdown of that area, below, and its most-affected industries, at right.

Most-affected 20% | Second-highest 20% | Middle 20% | Second-lowest 20% | Least-affected 20%

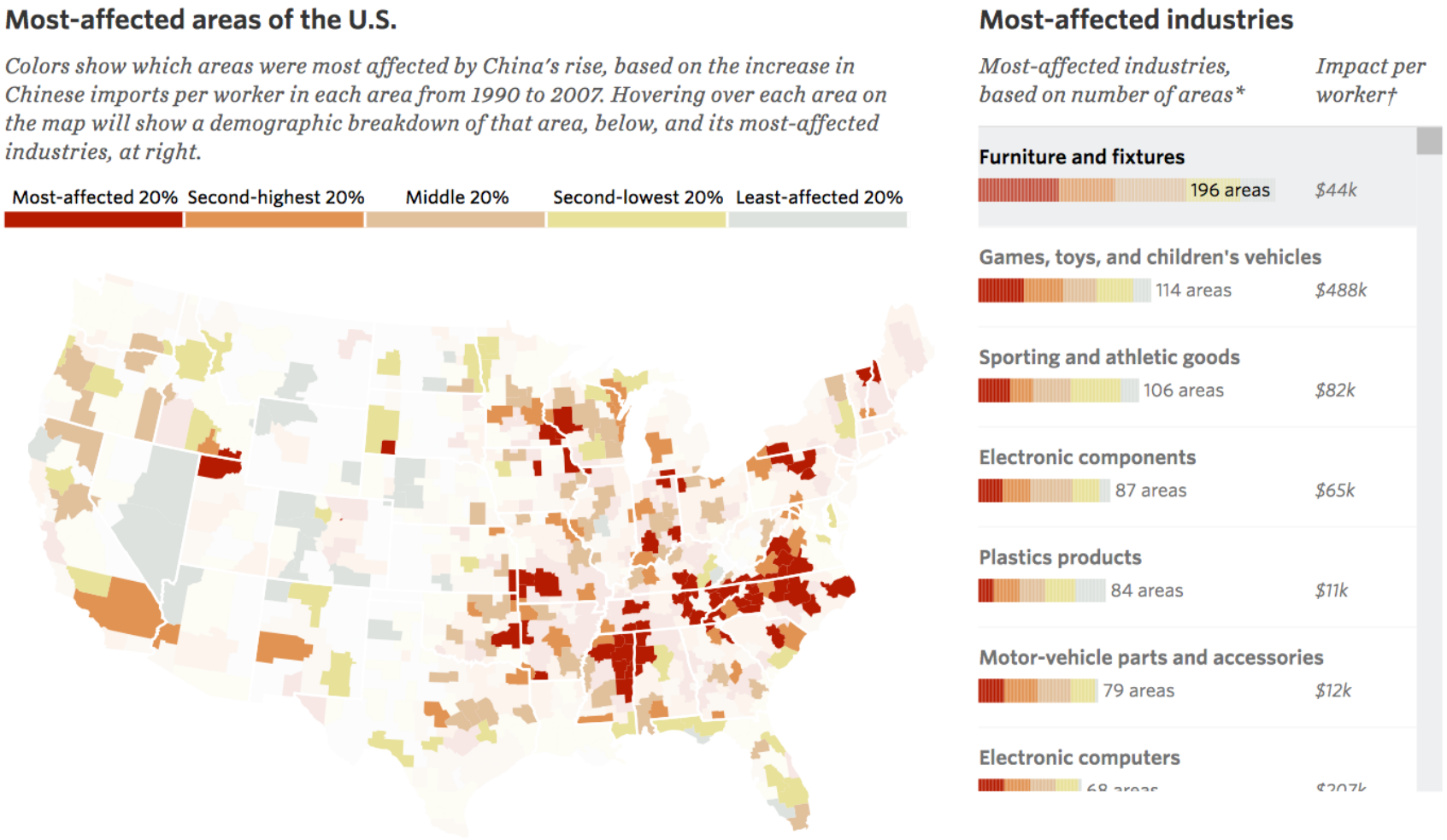


Most-affected industries

*Most-affected industries, based on number of areas**	*Impact per worker†*
Furniture and fixtures — 196 areas	$44k
Games, toys, and children's vehicles — 114 areas	$488k
Sporting and athletic goods — 106 areas	$82k
Electronic components — 87 areas	$65k
Plastics products — 84 areas	$11k
Motor-vehicle parts and accessories — 79 areas	$12k
Electronic computers	

Motivation: Geographically concentrated shocks

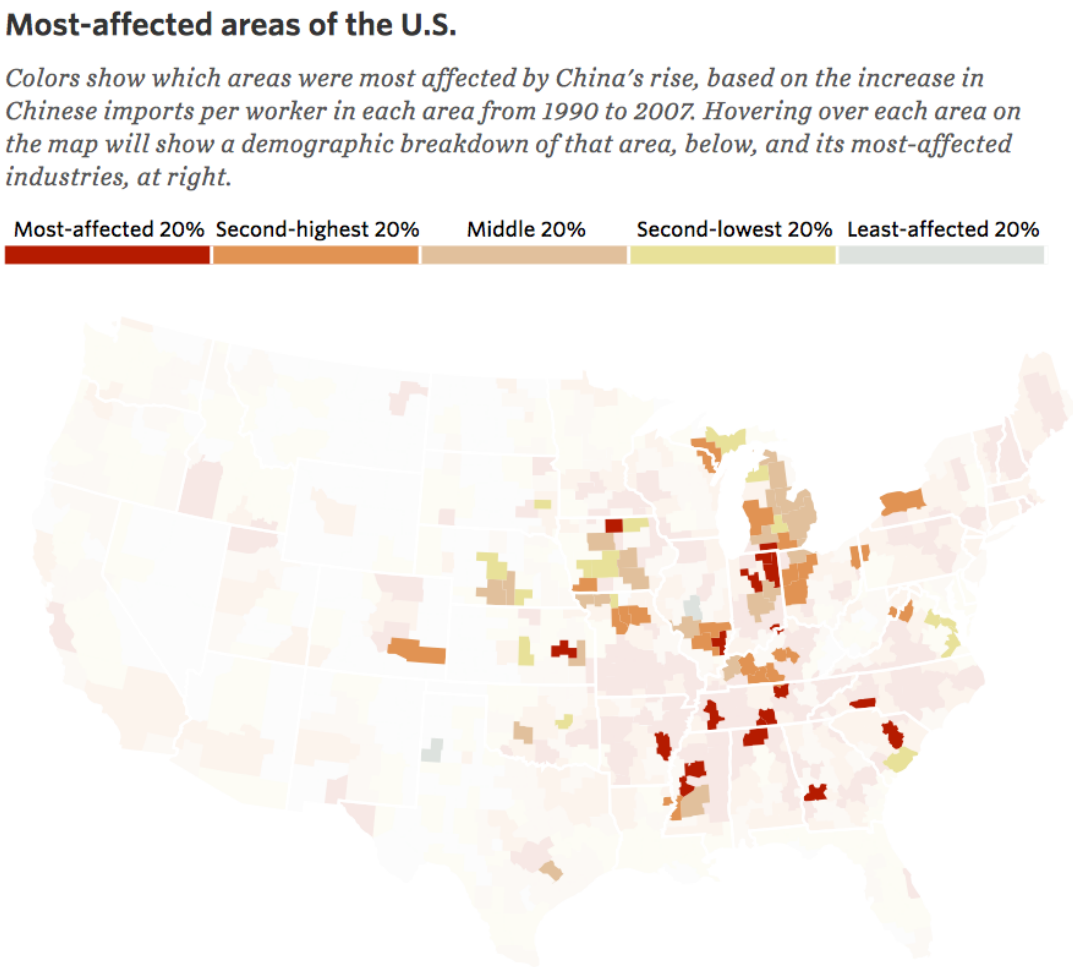
Furniture and fixtures

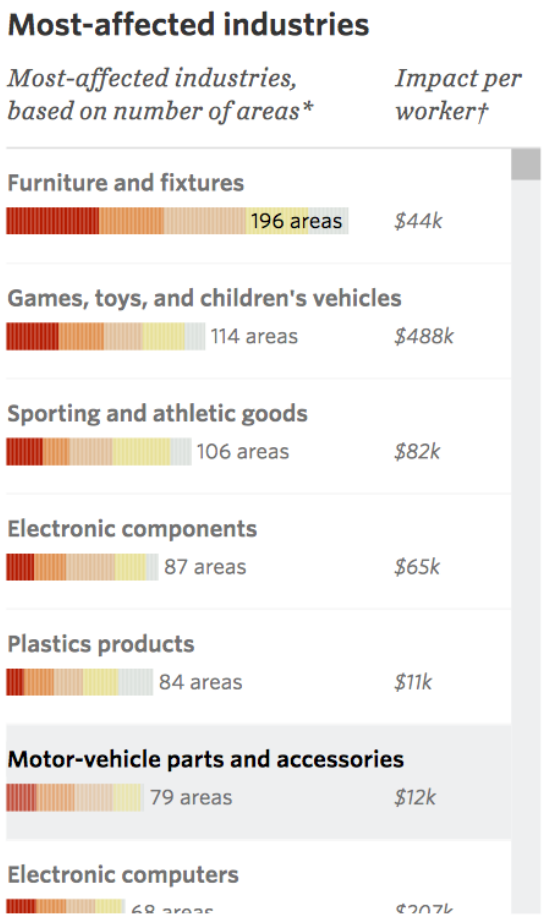


Source: Autor Dorn Hanson `http://chinashock.info`

Motivation: Geographically concentrated shocks

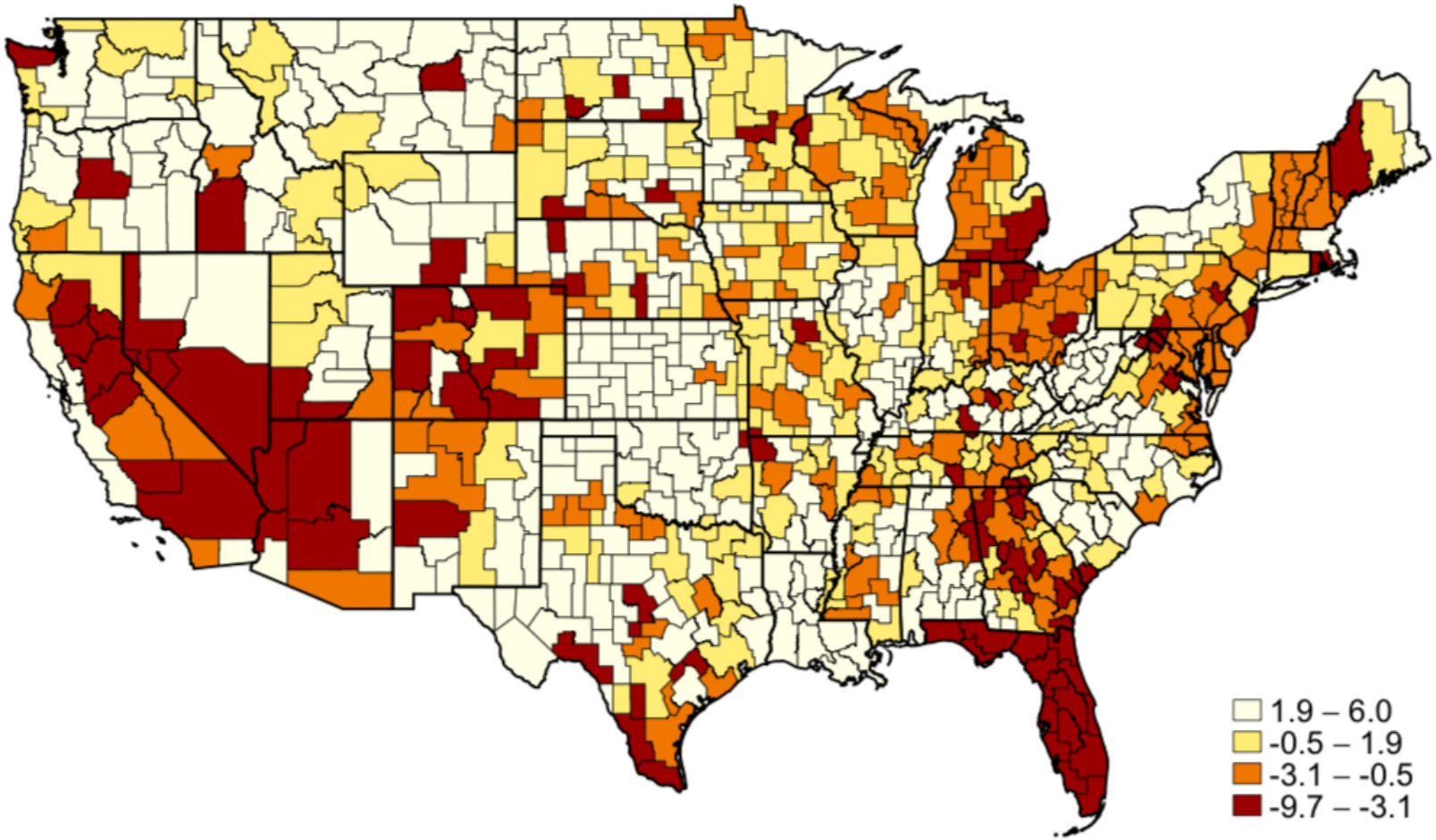
Motor-vehicle parts and accessories





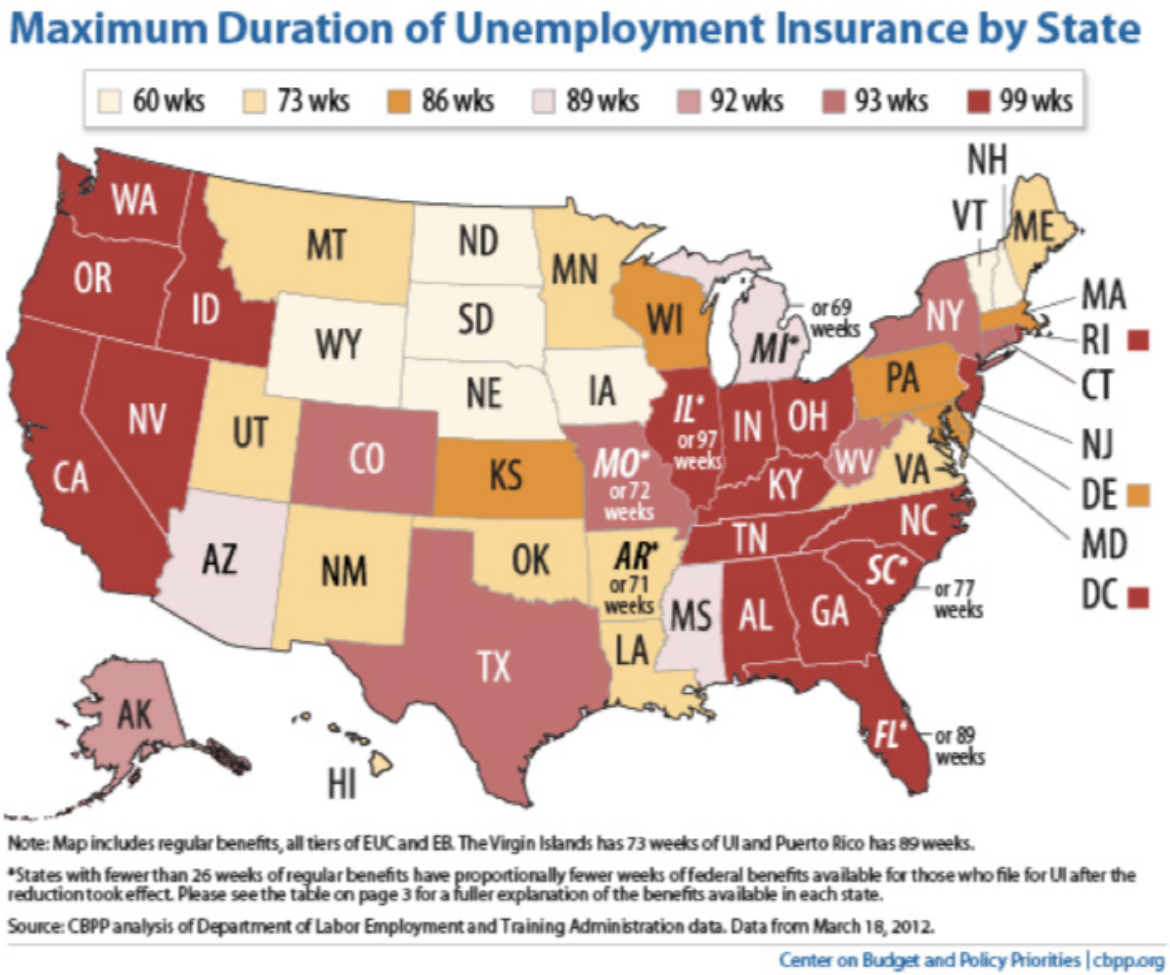
Source: Autor Dorn Hanson `http://chinashock.info`

Motivation: Geographically concentrated recessions



Source: Yagan (2016)

Motivation: Geographically concentrated policy responses



Source: CBPP (2012)

Motivation: Geographically concentrated unemployment

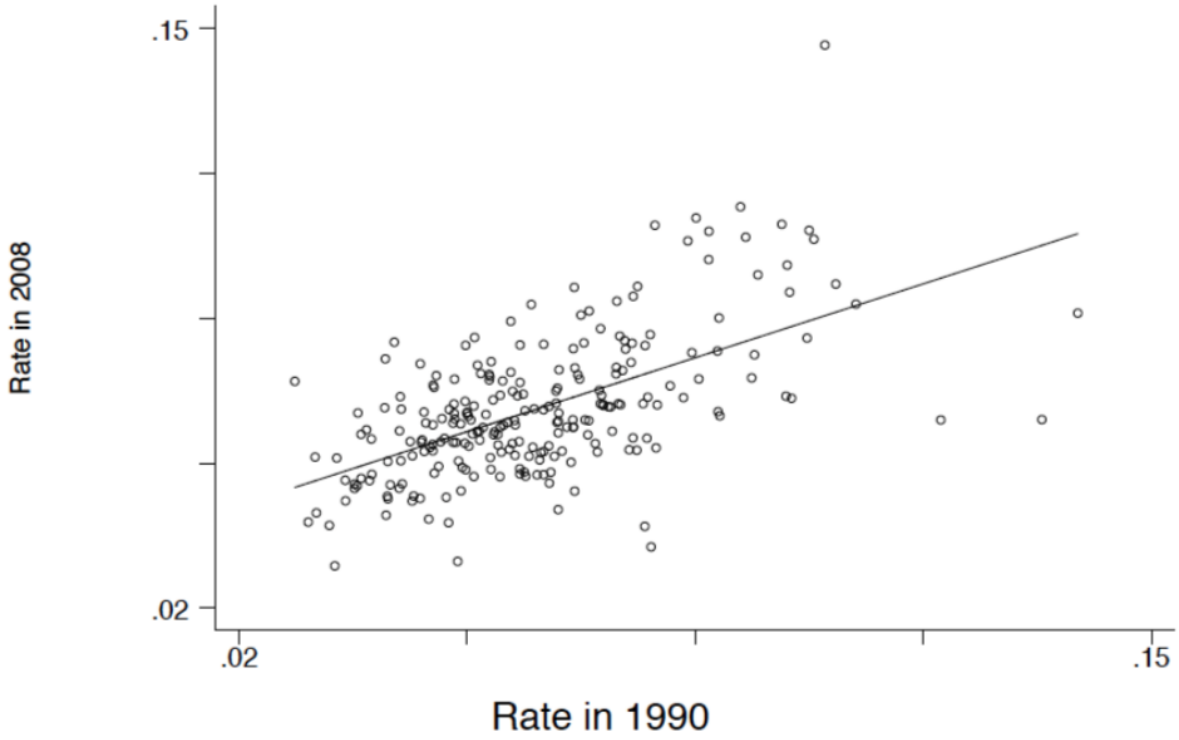
Table 1: Metropolitan Areas with the Highest and Lowest Unemployment Rates in 2008

Rank	Metropolitan Area	Unemployment Rate (1)	Adjusted Unemployment Rate (2)
	Areas with the Highest Rate		
1.	Flint, MI	.1462	.1399
2.	Yuba City, CA	.1099	.1072
3.	Anniston, AL	.1074	.0899
4.	Merced, CA	.1060	.0948
5.	Toledo, OH/MI	.1058	.1064
6.	Yakima, WA	.1047	.0970
7.	Detroit, MI	.1044	.1082
8.	Chico, CA	.1031	.1092
9.	Modesto, CA	.1027	.1021
10.	Waterbury, CT	.1023	.0918
	Areas with the Lowest Rate		
276.	Provo-Orem, UT	.0391	.0369
277.	Madison, WI	.0389	.0511
278.	Odessa, TX	.0383	.0307
279.	Fargo-Morehead, ND/MN	.0362	.0467
280.	Charlottesville, VA	.0348	.0362
281.	Houma-Thibodoux, LA	.0337	.0107
282.	Billings, MT	.0304	.0324
283	Rochester, MN	.0297	.0302

Motivation: Geographically concentrated unemployment

Differences are persistent ($\rho = .59$)

Figure 1: Unemployment Rates in 1990 and 2008, by Metropolitan Area

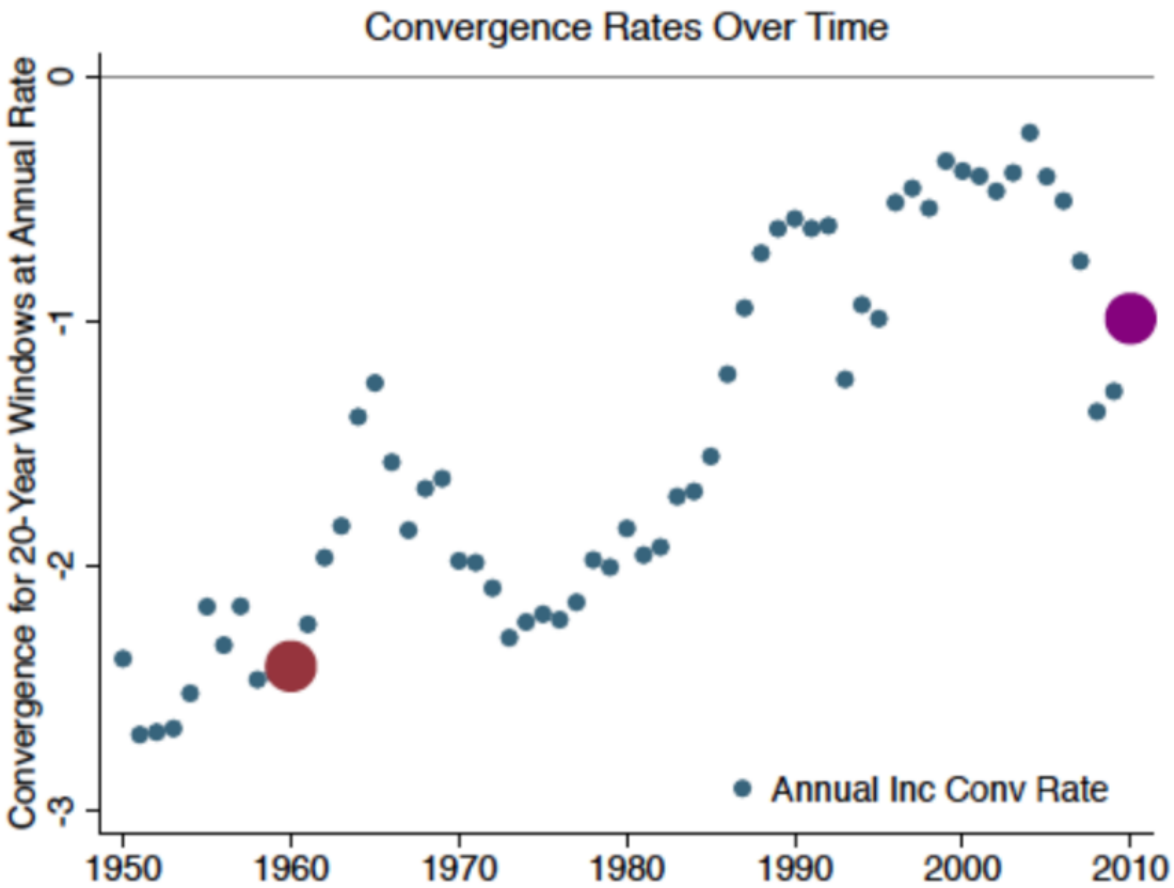


Notes: Data are from the 1990 Census of Population and the 2008 American Community Survey. The sample includes all individuals in the labor force between the age of 14 and 70.

Source: Kline Moretti (2013)

Motivation: Geographically concentrated unemployment

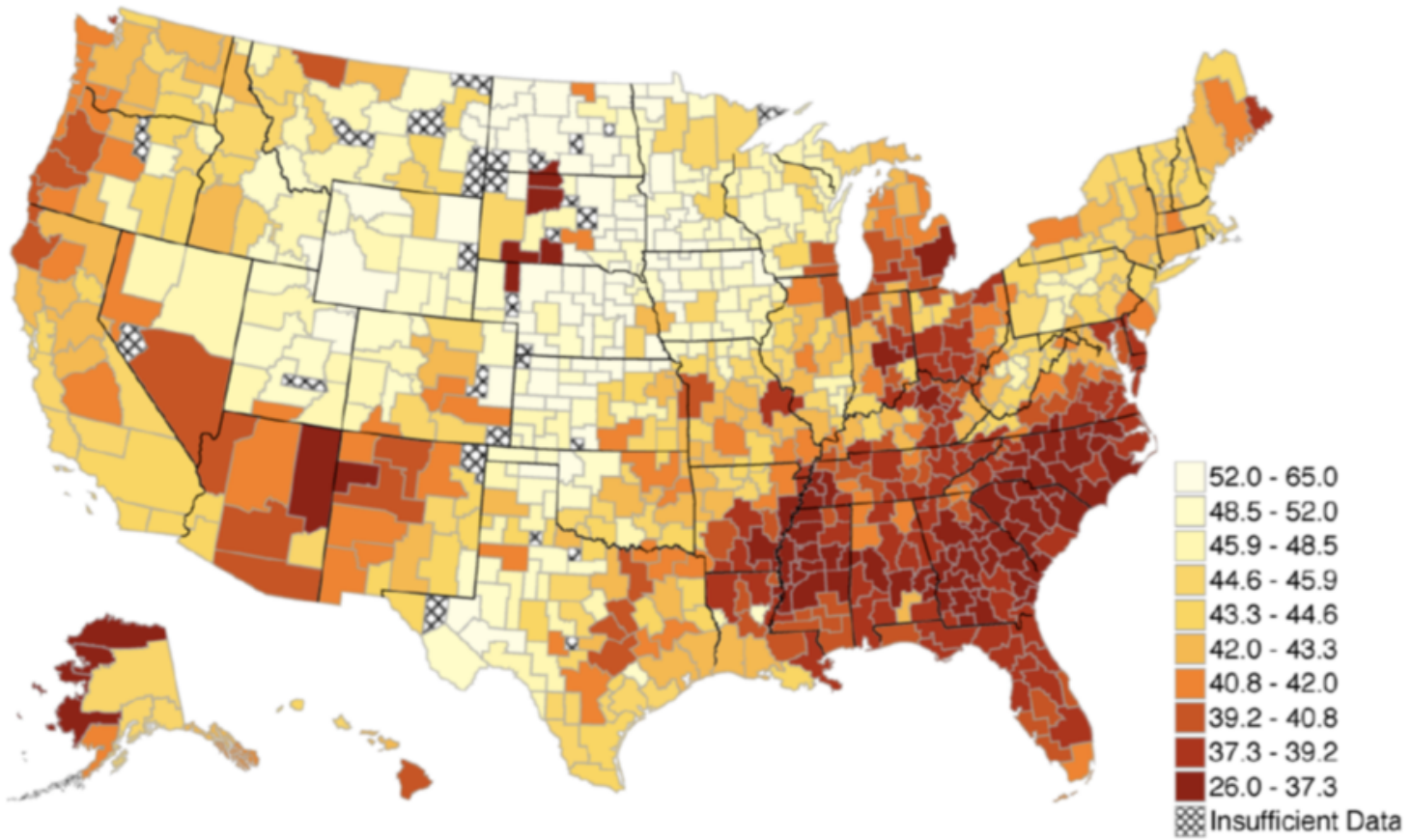
Convergence is slowing



Source: Ganong and Shoag (2014)

Motivation: Geographically concentrated upward mobility

A. Absolute Upward Mobility: Average Child Rank for Below-Median Parents ($\bar{y}_{25}$) by CZ



Source: Chetty-Hendren-Kline-Saez (2014)

Effects on political polarization (and many other outcomes)

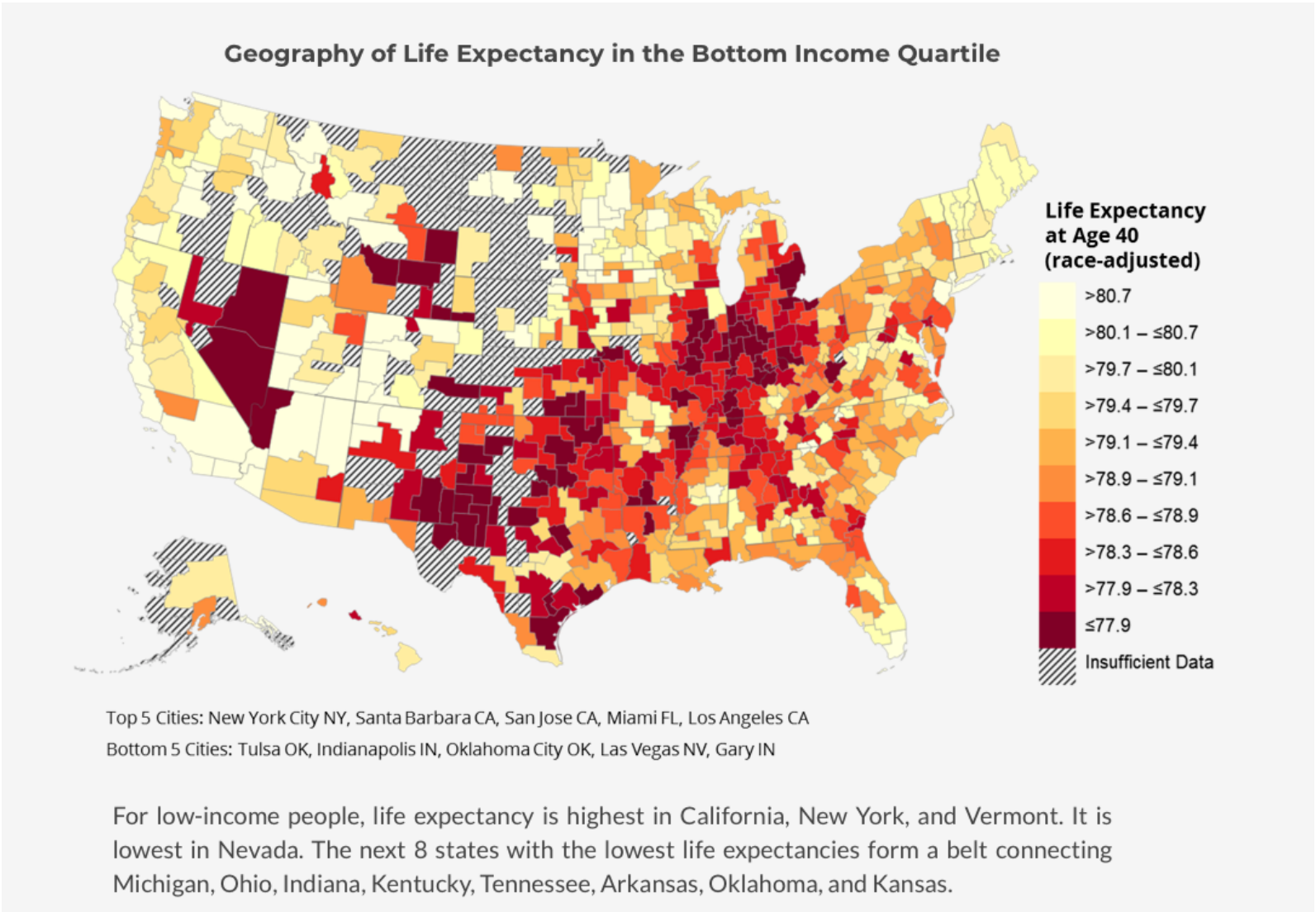
Table 5: Import Exposure and Change in Ideological Position of Election Winner 2002-2010. (Dependent Variables: 100 × Change in Indicators for Election of Politician by Party and Political Position)

	Change in Probability 2002-2010 that Winner has Given Political Orientation											
	Moderate		Liberal Democrat	Moderate Democrat		Moderate Republican	Conserv-ative Republican		Tea Party Member	
	(1)		(2)	(3)		(4)	(5)		(6)	
Δ CZ Import Penetration	-35.96	**	0.17	-22.91	**	-13.04	35.79	**	24.30	~
	(13.35)		(7.01)	(8.56)		(9.02)	(13.54)		(12.65)	
Mean Outcome Level in 2002	-19.7		2.6	-4.6		-15.0	17.0		11.7	
	56.8		19.9	27.0		29.8	23.3		6.1	

Notes: N=3,504 County*District cells."Liberal Democrats", "Moderates" and "Conservative Republicans" are defined as politicians whose Nominate scores would respectively put them into the bottom quintile, middle three quintiles, or top quintile of the Nominate score in the 107th (2001-2003) congress that preceeds the outcome period. A Tea Party Member is defined as a representative who was a member of the Tea Party or Liberty Caucus during the 112th (2011-2013) Congress. These two caucuses which are often associated with the Tea Party movement were first established in 2010 and 2011, respectively. All regressions include the full set of control variables from Table 1. Observations are weighted by a cell's share of total district population in 2000, and standard errors are two-way clustered on CZs and Congressional Districts. ~ $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$.

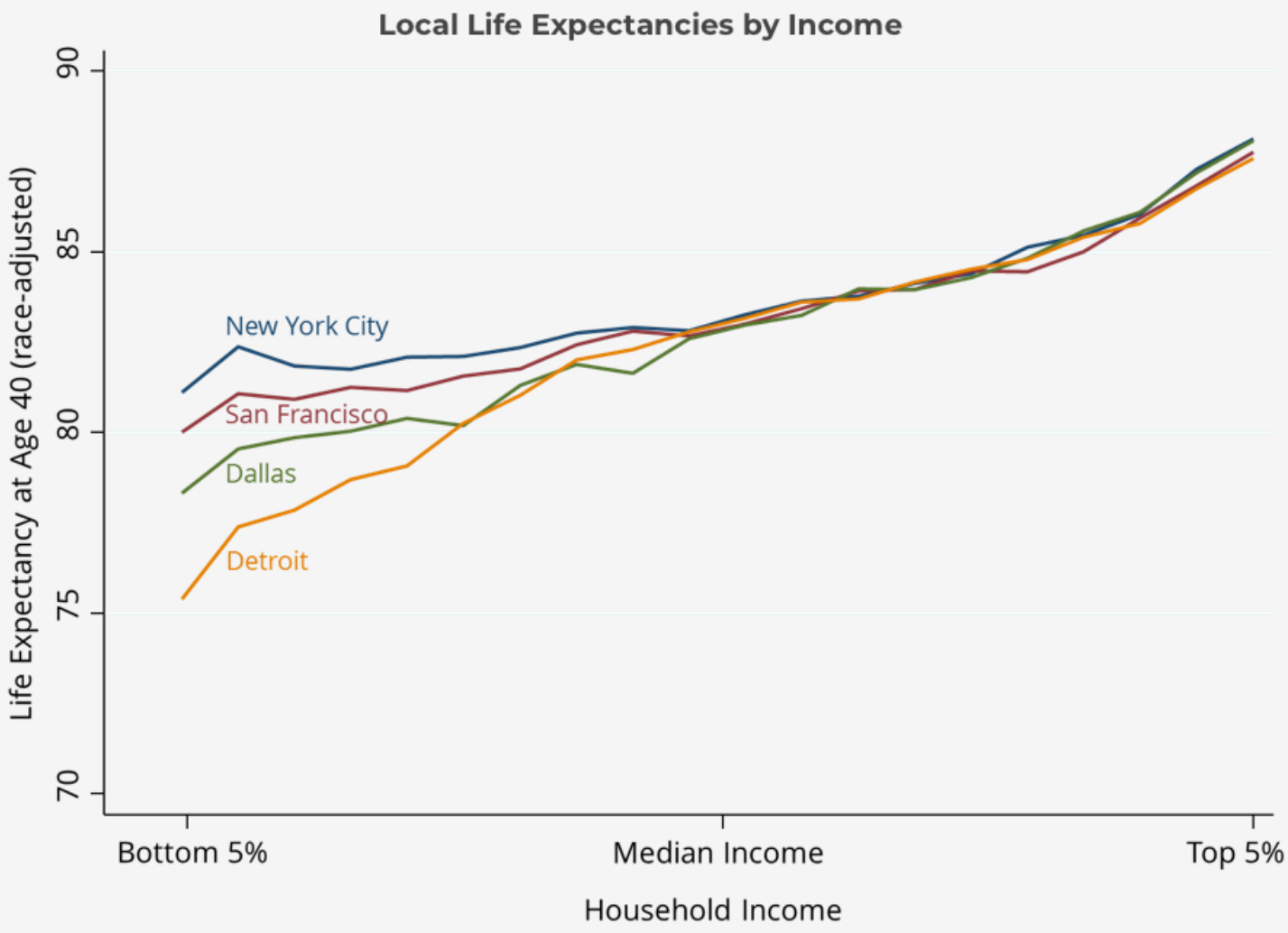
Source: Autor Dorn Hanson Majlesi (2017) `http://chinashock.info`. "Congressional districts exposed to larger increases in import penetration disproportionately removed moderate representatives from office in the 2000s. Trade-exposed districts with an initial majority white population or initially in Republican hands became substantially more likely to elect a conservative Republican, while trade-exposed districts with an initial majority-minority population or initially in Democratic hands became more likely to elect a liberal Democrat"

Stakes are high...



Source: `https://healthinequality.org`

Stakes are high...



Life expectancy varies substantially across cities, especially for low-income people. For the poorest Americans, life expectancies are 6 years higher in New York than in Detroit. For the richest Americans, the difference is less than 1 year.

Places as possibilities

"I do not see how one can look at figures like these without seeing them as representing possibilities." – Robert Lucas (1988)

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Rosen Roback Model

Overview

1. Goals
   - Characterize effect of amenity s change on prices (wages and rents)
   - Infer the value of amenities
2. Markets
   - Labor: price w, quantity N
   - Land: price r, quantity $L = L^w + L^p$ for workers and production
   - Goods: price $p = 1$, quantity X
3. Agents
   - Workers (homogenous, perfectly mobile)
   - Firm (perfectly competitive, CRS)
4. Indifference Conditions
   - Workers have same indirect utility in all locations
   - Firm has zero profit (i.e., unit costs equal 1)

Aside: Components of Models[1]

Three parts of any model

1. Exogenous parameters: model elements that are taken "as given"
2. Endogenous outcomes: model elements that "move around"
3. Equilibrium conditions: the set of rules that tells you what the endogenous model outcomes should be for a given set of exogenous model parameters.

"Given a [insert set of exogenous model parameters here], equilibrium is defined by the [insert endogenous model outcomes here] such that [list equilibrium conditions here]."

Exogenous parameters

- Workers Parameters: s, θ_W, γ, I
  - s is level of amenities
  - θ_W governs importance of amenities for utility
  - γ governs importance of goods for utility
  - $1 - \gamma$ governs importance of land for utility
  - I is non-labor income
- Firm Parameters: s, θ_F, α
  - s is level of amenities
  - θ_F governs importance of amenities for productivity
  - α is output elasticity of labor
  - $1 - \alpha$ is output elasticity of land

Endogenous Model Outcomes

- Labor: price w, quantity N
- Land: price r, quantities L^w, L^p for workers and production
- Goods: price $p = 1$, quantity X

so endogenous outcomes are w, r, N, L^w, L^p, X

Equilibrium Concept: Two key indifference conditions

In equilibrium, workers and firms are indifferent across cities with different levels of s and endogenously varying wages $w(s)$ and rents $r(s)$:

$$c(w(s), r(s), s) = 1 \tag{1}$$

$$V(w(s), r(s), s) = V^0 \tag{2}$$

where V^0 is the initial equilibrium level of indirect utility.

Specifically, in our example:
Given $s, \theta_W, \theta_F, \gamma, I, \alpha$*, equilibrium is defined by local prices and quantities* $\{w, r, N, L^w, L^p, X\}$ *such that 1 and 2 hold and land markets clear.*

N.B. We will mainly be focusing on prices: $w(s)$ and $r(s)$.

Solving for effect of amenity changes on prices

- Differentiate 1 and 2 with respect to s and rearrange, we have:

$$\begin{bmatrix} c_w & c_r \\ V_w & V_r \end{bmatrix} \begin{bmatrix} w'(s) \\ r'(s) \end{bmatrix} = \begin{bmatrix} -c_s \\ -V_s \end{bmatrix} \tag{3}$$

- Solving for $w'(s), r'(s)$, we have

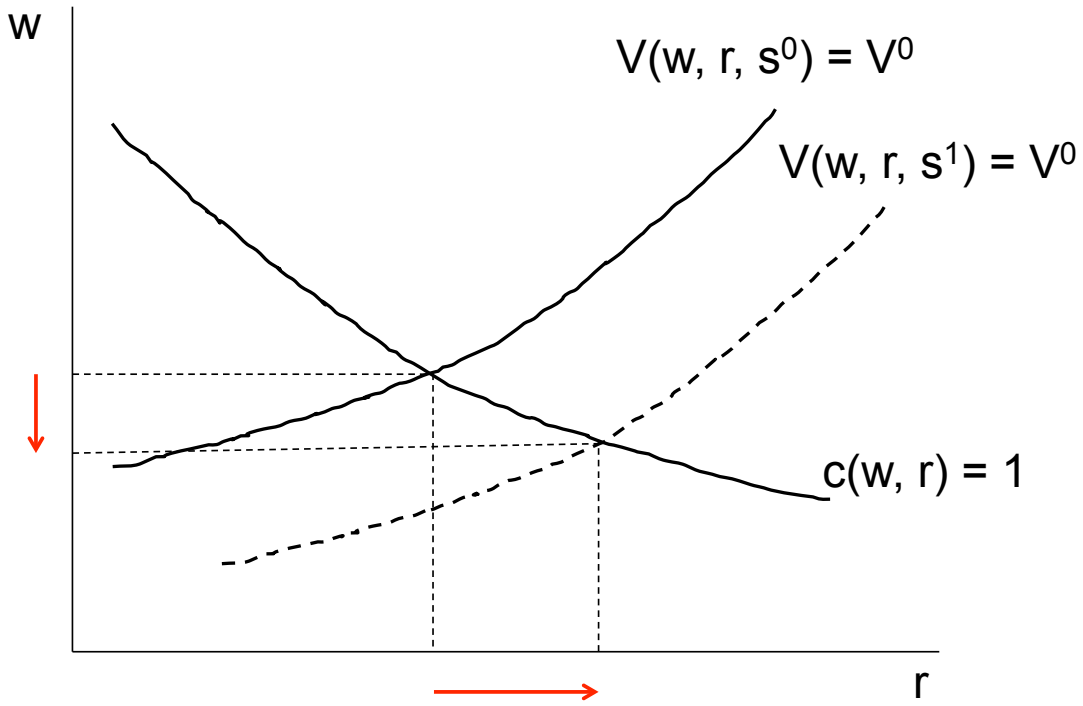
$$w'(s) = \frac{V_r c_s - c_r V_s}{c_r V w - c_w V_r}$$
$$r'(s) = \frac{V_s c_w - c_s V_w}{c_r V w - c_w V_r}$$

Effect of amenity changes on prices

- Special cases of interest:
  1. Amenity only valued by consumers: $\theta_F = 0 \Rightarrow c_s = 0$
  2. Amenity only has productivity effect: $\theta_W = 0 \Rightarrow V_s = 0$
  3. Firms use no land $1 - \alpha = 0$ and amenity is non-productive $\theta_F = 0$: $c(w(s)) = 1$, $c_r = c_s = 0$

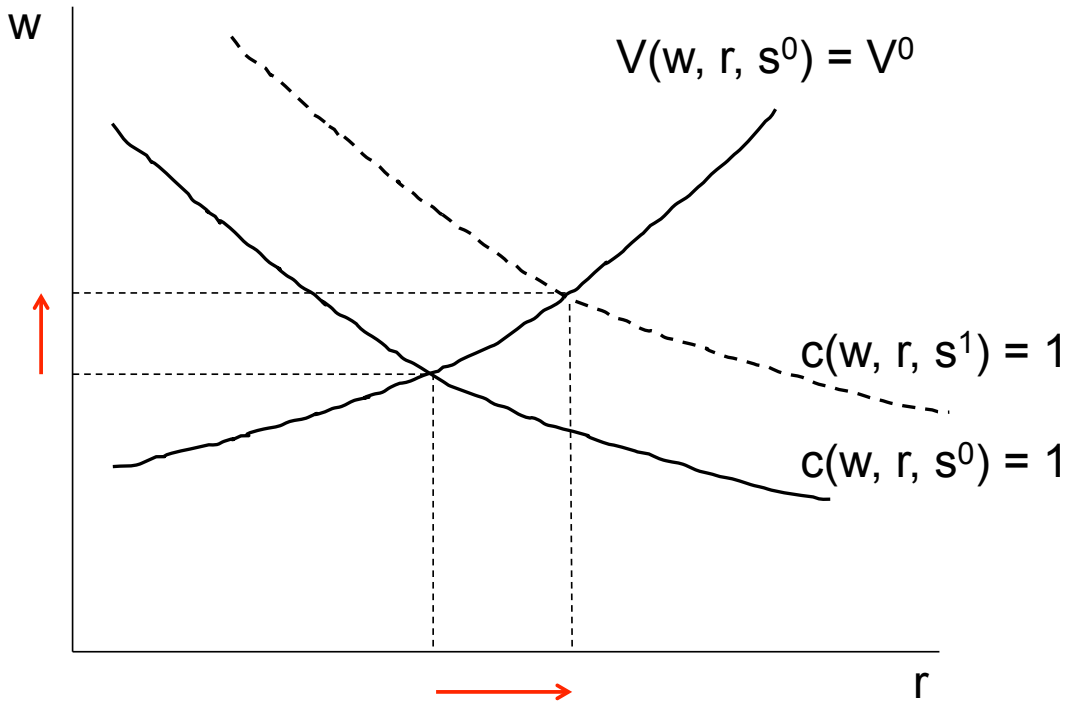
1. Amenity only valued by consumers: $\theta_F = 0 \Rightarrow c_s = 0$

- When $c_s = 0$, higher $s \Rightarrow$ higher r, lower l
- Workers are willing to pay more in land rents and receive less in pay to have access to higher levels of amenities



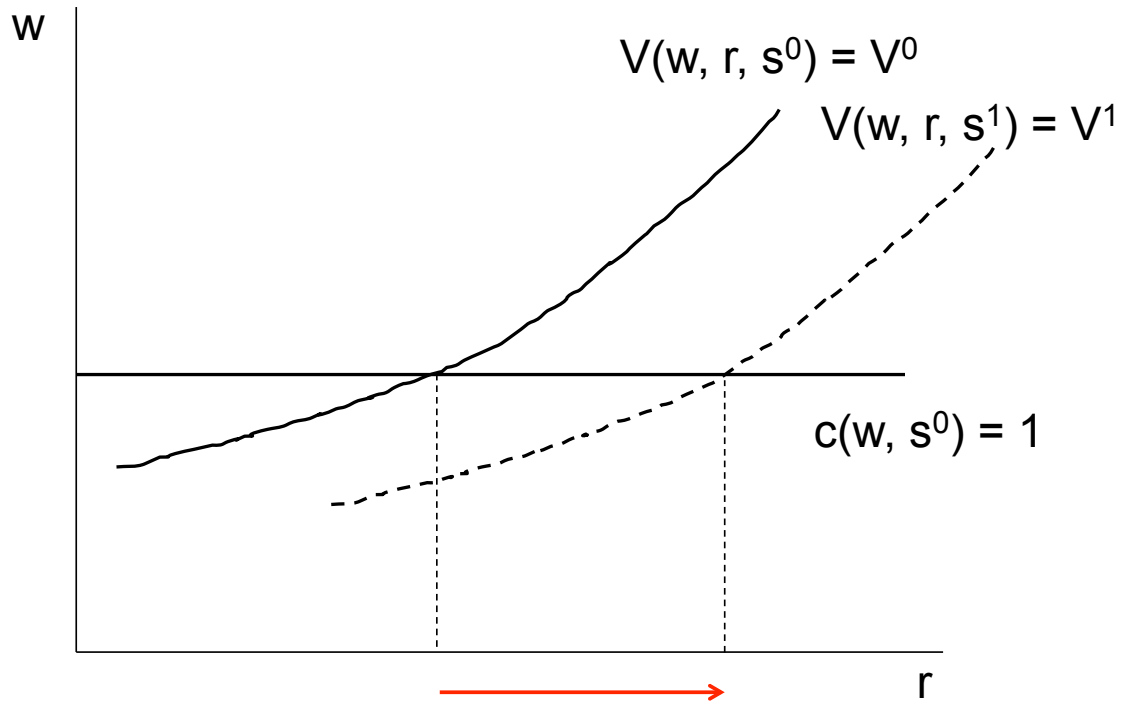
2. Amenity only has productivity effect: $\theta_W = 0 \Rightarrow V_s = 0$

- When $V_s = 0$, higher $s \Rightarrow$ higher r and higher l
- Firms are willing to pay more in land rents and wages to access higher productivity due to amenities



3. Firms use no land $\alpha = 0$, amenity not productive $\theta_F = 0$

- $\frac{V_s}{V_w}$ = marginal WTP for a change in s so the marginal value of a change in the amenity is "fully capitalized" in rents



Aside: evidence of the value of local public goods

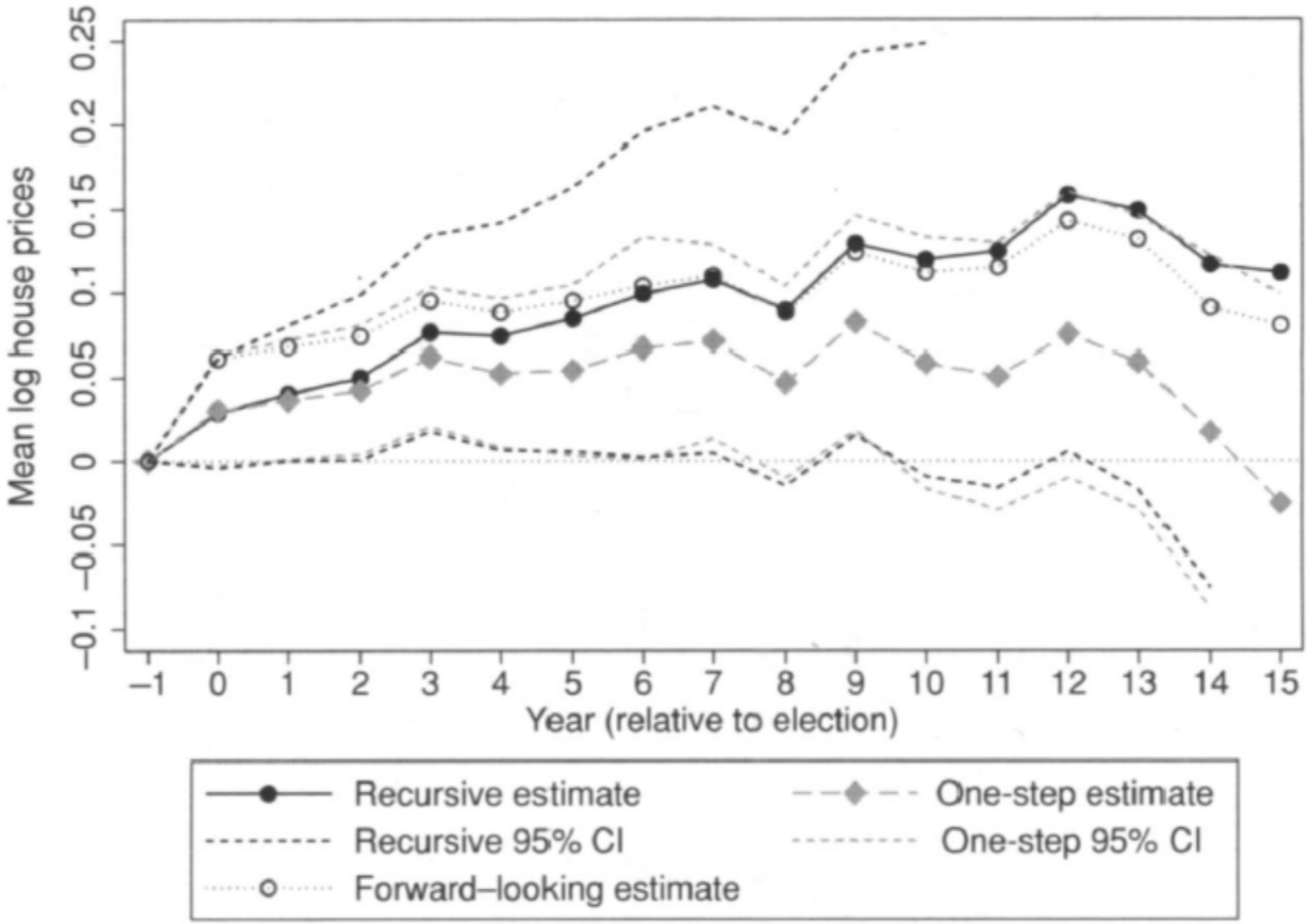


FIGURE VI
Recursive, One-Step, and Forward-Looking Estimates of Dynamic TOT Effects of Bond Passage on Log House Prices, by Years since Election

Source: Cellini, Ferreira, Rothstein (2010)

Rationales for place-based policies

- **Equity**
  1. Economists have generally been skeptical of equity-based arguments, as location is being used to serve a person-based motive: subsidizing poor households (see Glaser and Gottlieb, 2008)
  2. Could do so more directly through tax progressive or transfer programs
  3. Mobility can undermine spatial targeting. Rosen-roback model (with mobile workers and inelastic housing supply) predicts that entire benefit of location-based subsidies will be capitalized into land rents
  4. However, if workers (or firms) are less mobile, redistributive policies can benefit inframarginal workers (firms)
- **Efficiency:** Can remedy market failures
  1. Public Goods (amenities like public safety or productive public goods like roads)
  2. Agglomeration
  3. Labor market frictions
  4. Missing insurance/ credit markets
  5. Pre-existing distortions

Kline Moretti Model

Overview

1. Goals
   - Characterize effect of place-based wage subsidy on prices (wages and rents), city size, and welfare
   - Determine aggregate benefits (costs) and how they are distributed across agents and locations
2. Two Locations $c \in \{a, b\}$
3. Markets
   - Local labor and housing: price w_c, quantity N_c. Price r_c, N_c
   - Global capital and goods: price ρ, quantity K_c. Price $p = 1$, Y_c
4. Agents
   - Workers (continuum, have heterogeneous taste draws)
   - Landlord (representative, housing has upward sloping supply)
   - Firm (perfectly competitive, CRS, traded good)
   - Government provides ad valorem wage credit τ_c to firms
5. Key Indifference Condition
   - *Marginal worker* has same indirect utility in both locations

Preferences

- Indirect utility of individual i in location c is given

$$U_{ic} = \underbrace{w_c - r_c + A_c - t}_{\equiv v_c} + e_{ic}$$

- where
  - nominal wages w_c
  - cost of housing r_c
  - lump sum taxes t
  - local amenities A_c
  - common indirect utility component v_c
  - e_{ic} represents worker i's idiosyncratic preferences for location c

Source: Kline (2017)

Location Choice

▸ Aside on Discrete Choice

- Suppose two cities: a and b
- Household chooses city a if and only if

$$e_{ib} - e_{ia} < v_{ib} - v_{ia}$$

- The fraction of workers locating in city a can be expressed as:

$$N_a = \Lambda\left(\frac{v_a - v_b}{s}\right)$$

- s is scale parameter
  - $s \to 0$ "skating-rink" model ala Roback (1982)
  - $s \to \infty$ immobility
- Special case: $\Lambda(\cdot) = \frac{exp(\cdot)}{1+exp(\cdot)}$ is the standard logistic CDF
- N_a is increasing in:
  - the *real-wage gap*: $(w_a - r_a) - (w_b - r_b)$
  - the *amenity gap:* $A_a - A_b$

Source: Kline (2017)

Housing Supply

- Absentee landlords
- Constant elasticity inverse housing supply function:

$$r_c = z_c N_c^{k_c}$$

  - z_c governs housing productivity
  - k_c governs the elasticity of housing supply
- Landlord profits are constant fraction of total rents

$$\Pi_c = \frac{k_c}{k_c + 1} r_c N_c$$

Source: Kline (2017)

Production and price taking

- Firms produce a single good Y using labor and a local amenity
- Y is a traded good sold on international markets at price 1
- Cobb-Douglas production function with constant returns to scale:

$$Y_c = X_c N_c^{\alpha} K_c^{1-\alpha}$$

where:

  - X_c is a city-specific productivity shifter
  - N_c is the fraction of workers in community c
  - K_c is the local capital stock

- Firms can rent as much capital as desired at fixed price ρ

Source: Kline (2017)

A place based policy

- The government provides an ad valorem wage credit τ_c to employers in community c
- Financed by lump sum taxes on all workers in *both* locations
- Balanced budget constraint:

$$w_a \tau_a N_a + w_b \tau_b N_b = t$$

- Firms equate the marginal revenue product of labor to wages net of taxes:

$$w_c(1 - \tau_c) = \alpha \frac{Y_c}{N_c}$$

- First-order condition for capital:

$$\rho = (1 - \alpha) \frac{Y_c}{K_c}$$

Source: Kline (2017)

Labor demand

- Inverse labor demand schedule in location c:

$$\ln w_c = C + \frac{\ln X_c}{\alpha} - \frac{1-\alpha}{\alpha} \ln \rho - \ln(1-\tau_c)$$

where $C \equiv \ln \alpha + \frac{1-\alpha}{\alpha} \ln(1-\alpha)$

- inverse labor demand is *horizontal* in wage-employment space due to:
  - production function with constant returns to scale
  - elastic supply of capital at price ρ
  - firms make zero profits

Source: Kline (2017)

Labor labor market equilibrium

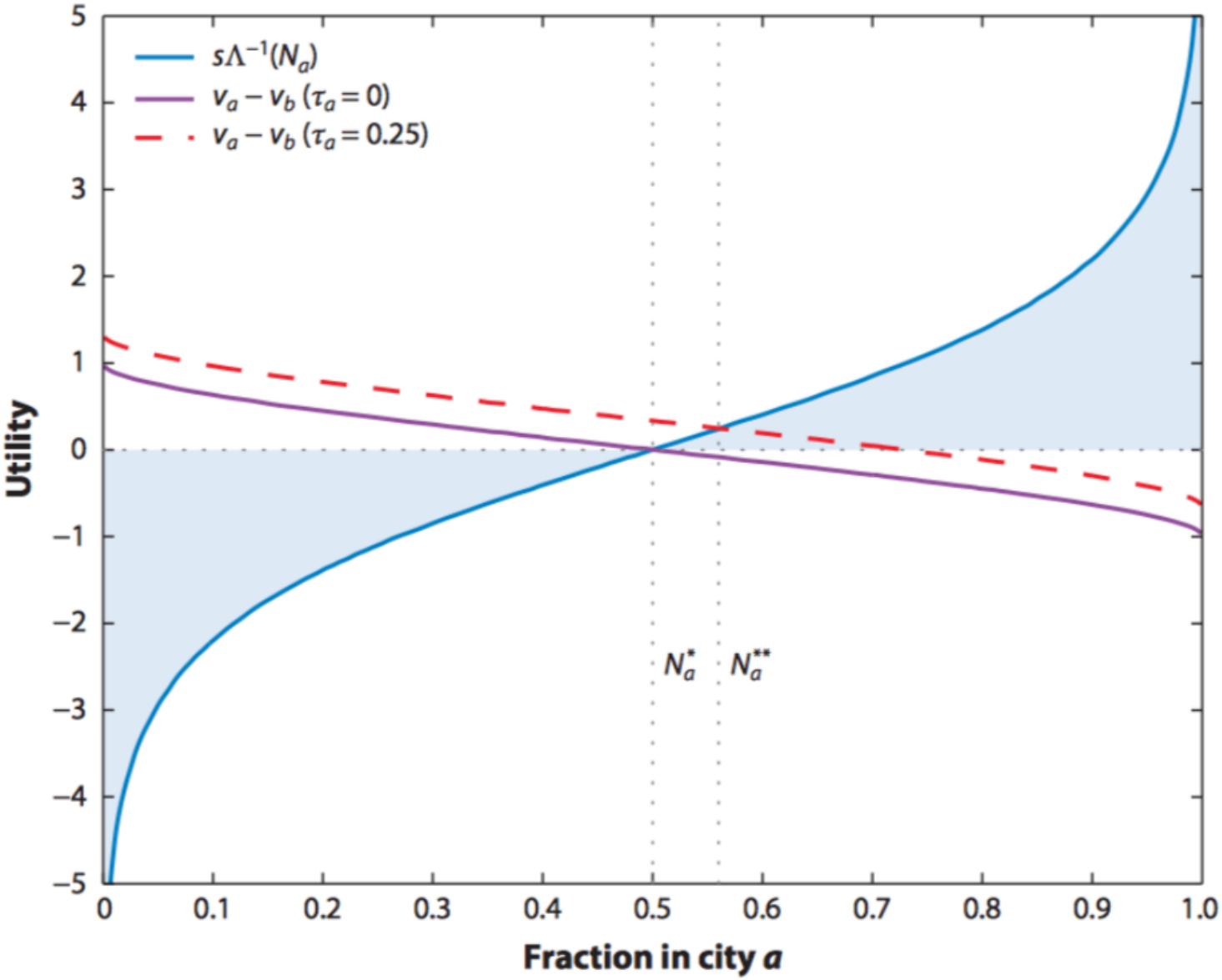
- Equilibrium: the marginal worker's relative preference for city b over city a equals the difference in real wages net of amenities:

$$\underbrace{s\Lambda^{-1}(N_a)}_{\text{Taste Differences}} = \underbrace{\frac{e^C}{\rho^{\frac{1-\alpha}{\alpha}}}\left(\frac{X_a^{\frac{1}{\alpha}}}{1-\tau_a} - \frac{X_b^{\frac{1}{\alpha}}}{1-\tau_b}\right)}_{\text{Wage difference}} + \underbrace{-\left(z_a N_a^{k_a} - z_b(1-N_a)^{k_b}\right)}_{\text{Rent difference}} + \underbrace{A_a - A_b}_{\text{Amenity difference}}$$

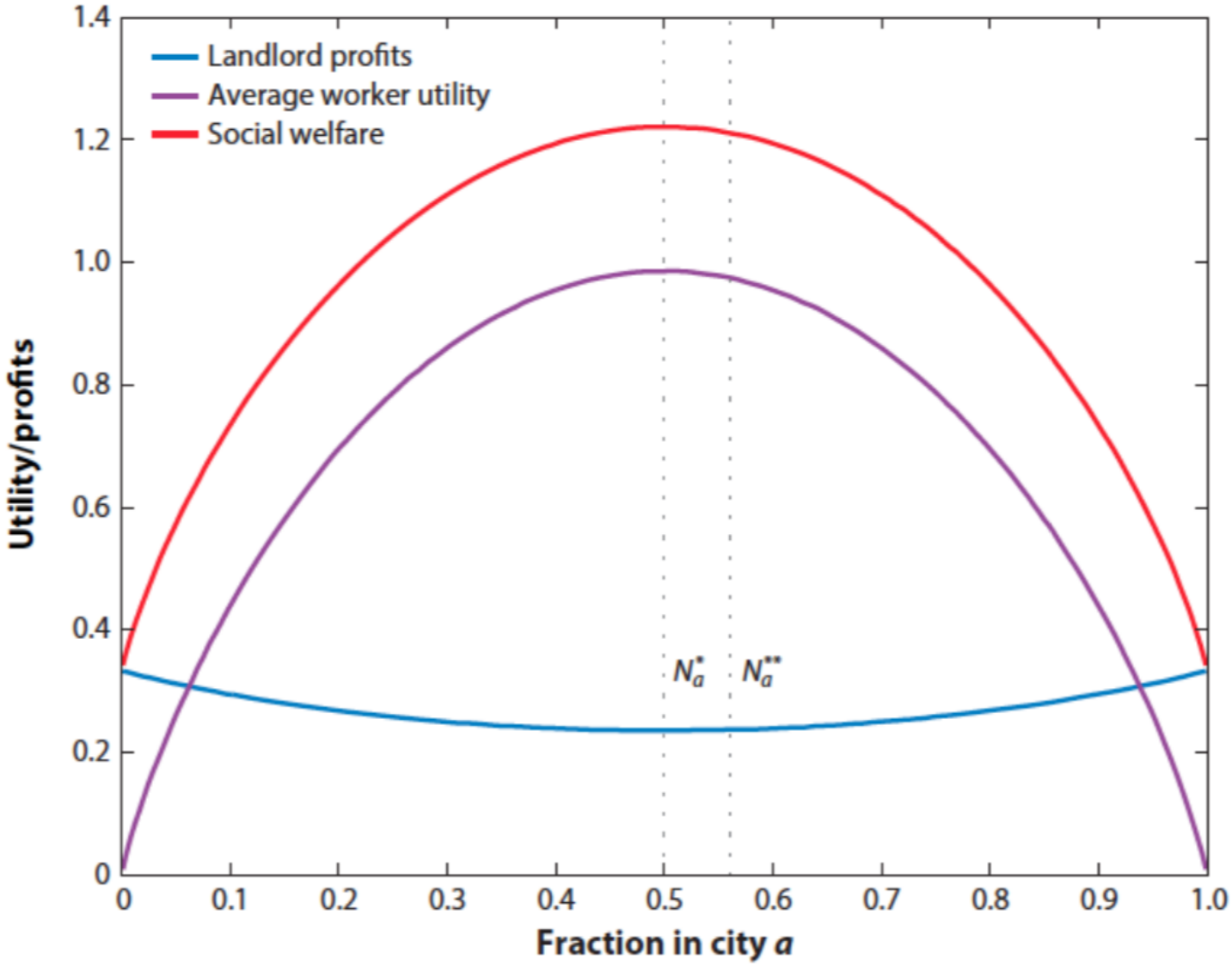
- LHS: quantiles of workers' relative preferences $(e_{ib} - e_{ia})$ for city b as a function of $N_a \Rightarrow$ supply curve to city a
- RHS: difference in mean utilities between the two communities $\Rightarrow$ relative demand curve for residence in city a vs. city b

Source: Kline (2017)

A subsidy raises city size

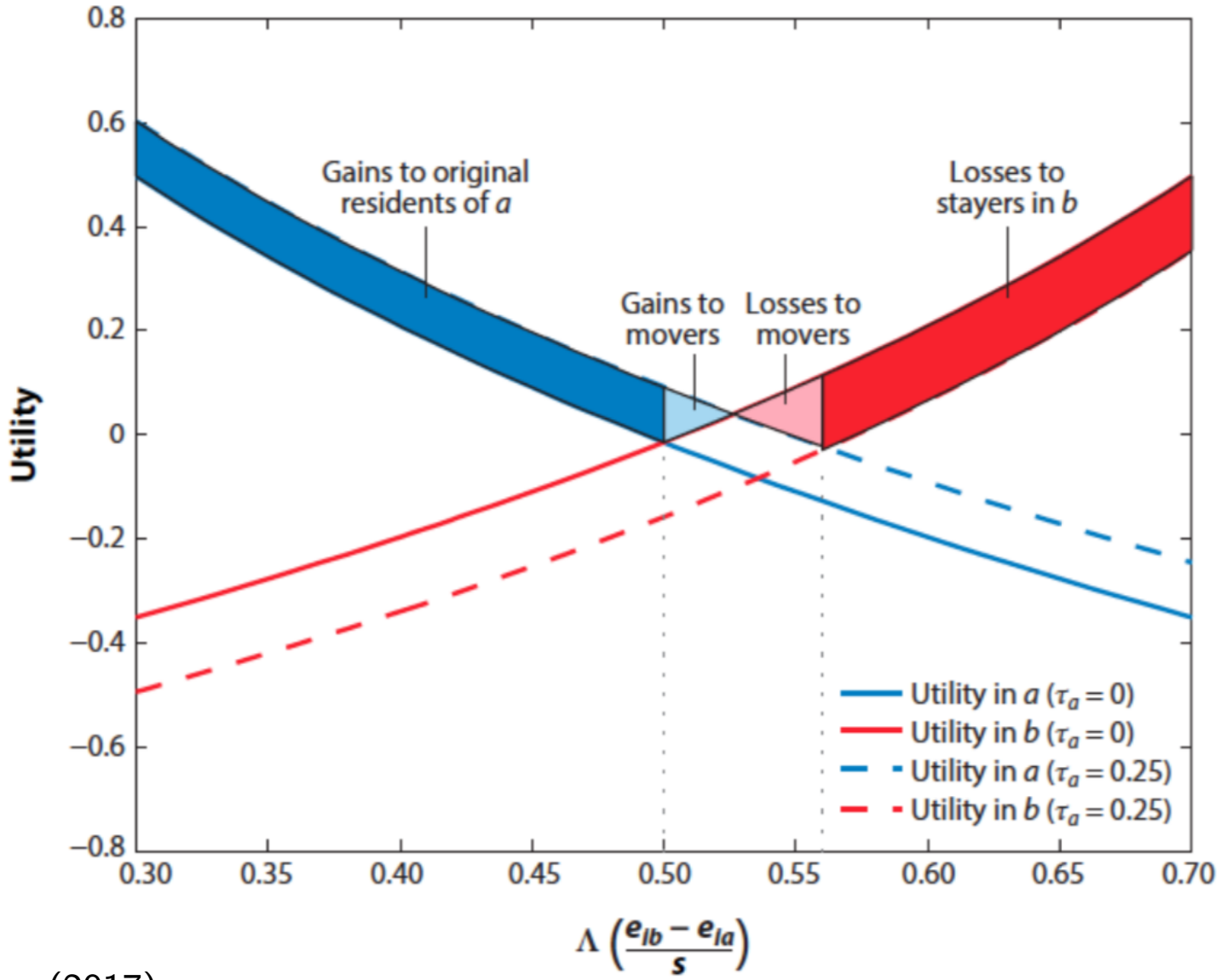


but decreases welfare (especially for workers)



Source: Kline (2017)

Who wins?



Source: Kline (2017)

Efficiency costs

- Average worker utility

$$V = E\, max\{U_{ia}, U_{ib}\} = s \log\left(exp\left(\frac{v_a}{s}\right) + exp\left(\frac{v_b}{s}\right)\right)$$

- For small subsidy, impact on welfare is impact on after-tax disposable income

$$\frac{dV}{d\tau_a} = N_a \frac{d(w_a - r_a)}{d\tau_a} + N_b \frac{d(w_b - r_b)}{d\tau_a} - \frac{dt}{d\tau_a}$$

- Net impact on worker utility + landlord profits

$$\frac{d\left(V + \Pi_a + \Pi_b\right)}{d\tau_a} = -\eta N_a \tau_a$$

where $\eta = -\frac{dN_a}{d(1-\tau_a)} \frac{1-\tau_a}{N_a} \geq 0$ gives mobility elasticity

- Harberger (1964) "triangle" approximation: $DWL \approx \frac{1}{2}\eta\tau_a^2 N_a$

Source: Kline (2017)

Summary

- Subsidizing a place yields a transfer to targeted households (and landlords) but distorts location decisions
- Efficient transfer: no quantity response / job creation!
- Ramsey (1927)-style targeting principle: subsidize locations that are least elastic
- Empirical question: when are elasticities big?

Source: Kline (2017)

Outline

1. Motivation
2. Theory
   - Rosen Roback Model
   - Kline Moretti Model
3. Evidence from Specific Place Based Policies
   - Empowerment Zones
   - Local Government Spending
   - Moving to Opportunity
   - Moved to Opportunity: Evidence from Public Housing Demolitions
   - Million Dollar Plants
   - Big Push: Tennessee Valley Authority

Empowerment Zones

Assessing a Prominent Place Based Policy (Busso et al.)

Case Study: Empowerment Zones

Detroit

Chicago

Assessing a Prominent Place Based Policy (Busso et al.)

Question

- What is the incidence of Round I of the federal urban Empowerment Zone (EZ) program?
- Evidence helps determine whether or not place based policies are effective in accomplishing their goals
- BGK conduct the first microfounded equilibrium welfare evaluation of a large-scale place based policy

Assessing a Prominent Place Based Policy (Busso et al.)

Empowerment Zone Program

- The EZ program is a series of incentives to encourage investment in the neediest urban and rural areas
- It consists of spatially targeted investments, such as employment tax credits and block grants

TABLE 1—1990 CHARACTERISICS OF FIRST ROUND EMPOWERMENT ZONES (EZ)

City	Total population	Population rank	Population in EZ	Poverty rate in EZ	Unemployment rate in EZ	EZ area (square miles)	Number of census tracts
Atlanta	395,337	37	43,792	58	20	8.1	20
Baltimore	736,014	13	72,725	42	16	7.1	23
Chicago	2,783,484	3	200,182	49	28	14.3	81
Detroit	1,027,974	7	106,273	47	28	19.5	42
New York	7,320,621	1	204,625	42	18	6.3	51
Philadelphia/ Camden	1,594,339	5	52,440	50	23	4.3	17

Source: 1990 Decennial Census and HUD.

Assessing a Prominent Place Based Policy (Busso et al.)

Program Benefits

- Employment tax credit
  - EZ employers were eligible for a credit of up to 20 percent of the first $15,000 in wages paid to each employee who lived *and worked* in the EZ.
  - Roughly 20% wage subsidy!
- Social Services Block Grant Funds (SSBG)
  - Each EZ became eligible for $100 million in SSBG funds.
  - Could be used for: infrastructure investment, improving access to credit, job training programs, childcare programs, promotion of homeownership, emergency housing assistance, etc.

Assessing a Prominent Place Based Policy (Busso et al.)

Methods: Empirical Strategy

- Empirical strategy involves comparing EZ neighborhoods to rejected and future zones using a difference-in-differences estimator
- $\Delta Y_{tzc} = \beta T_z + X'_{n(t)}\alpha^x + P'_c\alpha^p + e_{tzc}$
  - ΔY_{tzc} is change in outcome in tract t of zone z in city c
  - T_z is an indicator for EZ status
  - P_c is a vector of city characteristics
  - $X_{n(t)}$ is a vector of proxies for trends in productivity and amenities

Assessing a Prominent Place Based Policy (Busso et al.)

Data

- Household and establishment panel data comes from the Census, the Standard Statistical Establishment List (SSEL), and the Longitudinal Business Database (LBD)
- First-round EZ applications were obtained from the US Department of Housing and Urban Development
- Housing price data is from the Office of Federal Housing Enterprise Oversight (OFHEO)

Assessing a Prominent Place Based Policy (Busso et al.)

Program Impacts

Table 2
Selected Effects of Round I Empowerment Zone Designations, 1990–2000

Outcome	Estimated Effect
Log of Jobs (data from Longitudinal Business Database)	0.179***
Log of Jobs (data from U.S. Census)	0.145*
Log of Zone Jobs Held by Zone Residents	0.150
Log of Zone Jobs Held by Nonresidents	0.097
Log of Weekly Wage Income of Zone Residents	0.053**
Log of Weekly Wage Income of Zone Workers	0.017
Log of Weekly Wage Income of Zone Residents Working in Zone	0.133**
Log of Weekly Wage Income of Nonresidents Working in Zone	0.005
Log of Rent	0.006
Log of House Value	0.281**
Log of Population	0.028
Percentage Black	-0.011
Percentage with College Degree[a]	0.020***

Notes: Estimated impacts derived from regression-adjusted difference-in-differences model. Statistical significance levels based on a Wild bootstrap t-test are indicated as *** 1 percent; ** 5 percent; * 10 percent. For more details, see M. Busso, J. Gregory, and P. Kline, "Assessing the Incidence and Efficiency of a Prominent Place Based Policy," *American Economic Review* 103, No. 2 (2013): 897–947.

Jobs seem to go to mix of zone residents and non-residents

Wages rise most among zone residents working in zone.

No increase in rent. Small changes in demographics. But big increase In housing value

Before EZ

Camden (inside EZ), New Jersey, *1993*

After EZ

Same street in Camden (inside EZ), New Jersey, *2003*

Assessing a Prominent Place Based Policy (Busso et al.)

Incidence

- Significant increase in earnings for a poor population
- Negligible cost of living increase but possible windfall gain to homeowners
- Little change in demographic composition but probably not literally the original residents
  - Only 57% of households in same house as 5 years ago
- Risk of gentrification and landlord capture over longer run..
  - How to define success?

Assessing a Prominent Place Based Policy (Busso et al.)

Efficiency

- While population response negligible ($\eta_{pop} \approx .15$), quantity being subsidized is local jobs
- Very small target group (unbeknownst to HUD!)

TABLE 10—WELFARE ANALYSIS

	Total workers/ people/ households	Total annual payroll/ rents/housing value (in billion $)	OLS impact on wages/ rents/housing values	Increase in annual payroll/rents/housing value (in million $)	
				Baseline scenario (1)	Pessimistic scenario (2)
Panel A. Total impact of the program					
Zone residents working in zone	38,331	0.8	0.133	108.5	37.5
Zone residents working outside zone	140,708	3.3	0.036	117.5	0.0
Nonresidents working in zone	365,918	14.0	0.005	69.9	0.0
House renters in the zone	189,982	0.9	0.006	5.5	66.9
House owners in the zone	46,161	4.8	0.281	1350.4	499.8

- BGK estimate elasticity of (covered) jobs wrt $(1 - \tau)$ of

$$\eta_{jobs} \approx 1.25$$

- Efficiency cost roughly 13% of dollar value of subsidy

Taking Stock

- Efficiency costs depends on what is targeted
- Bigger geographic areas not always better
  - Isolated / depressed neighborhoods may be capable of being stimulated without inducing a flood of entrants
- Conditionality in benefits
  - Benefits for living and working in area?
  - Benefits tied to residence at some prior date?
- A precarious balance: too much stimulus raises cost of living, leads to turnover / gentrification

Bigger picture

- Reach the intended populations
  - Place itself as an additional dimension of disadvantage?
- Entail the smallest efficiency costs
  - More distortionary to influence location or labor supply choices?

But we've been assuming behavioral responses are distortionary. Could PBP improve efficiency?

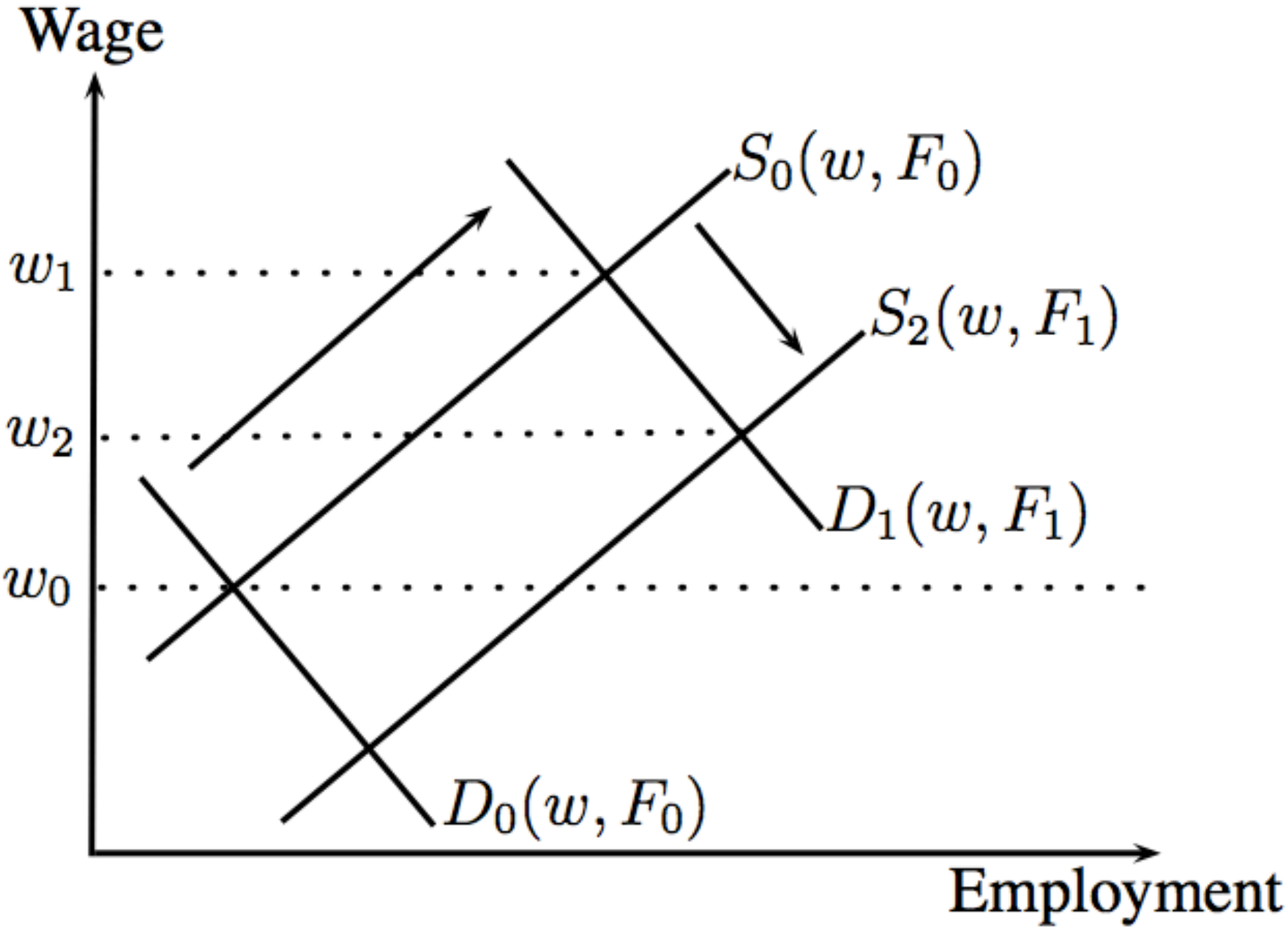
Local Government Spending

The Incidence of Government Spending (Suárez Serrato and Wingender)

Question

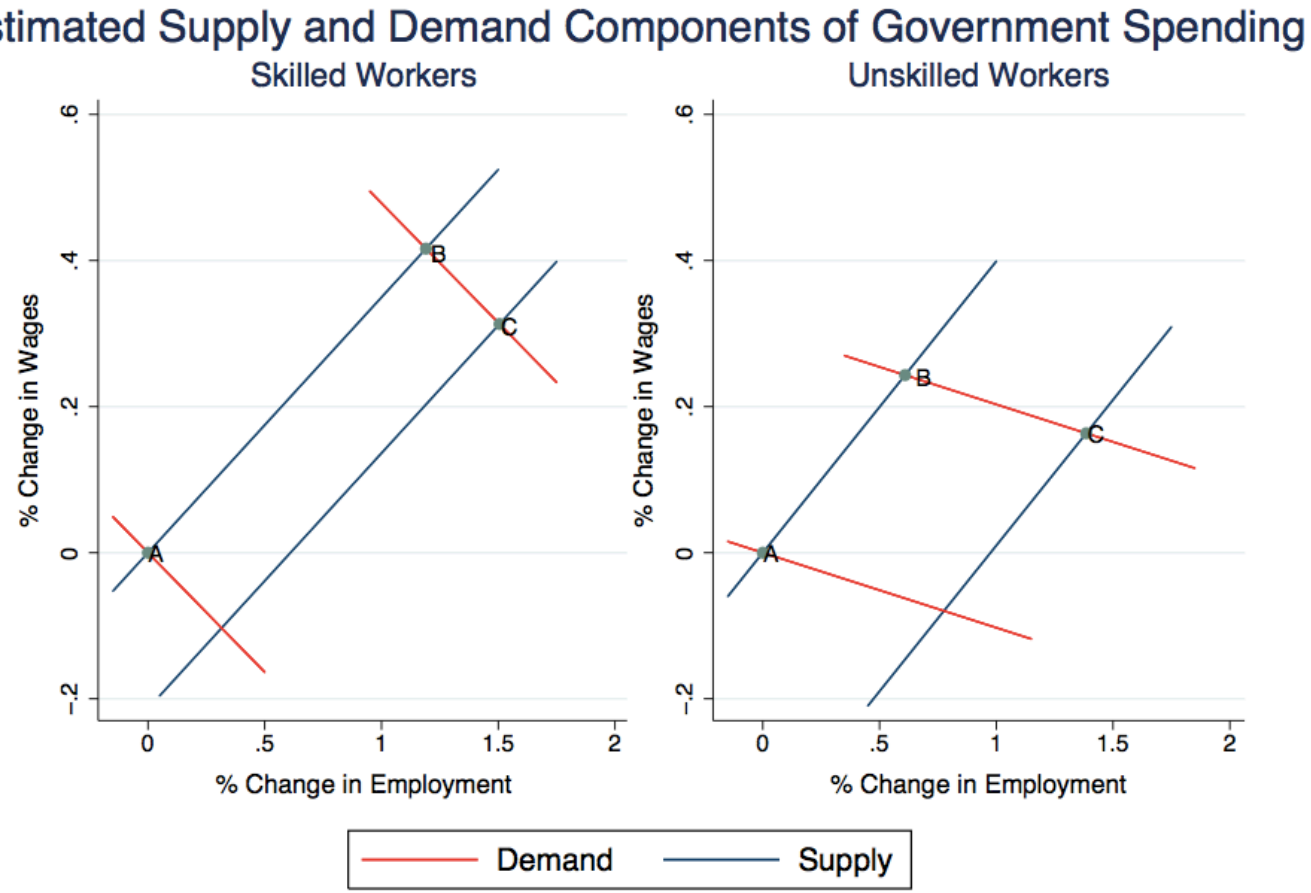
- Who benefits from government spending in the long run?
- (And could place based policies improve efficiency?)
- Results are important for setting spending levels and distributing funds across localities
- Contributes to literature with by estimating long-run spending effects and workers' valuation of government services

Figure 1: Supply and Demand Components of a Government Spending Shock



Decomposition of a 1% Increase in Government Spending

Figure 5: Estimated Supply and Demand Components of Government Shock



- Skilled: Supply Shift explains 19% of ΔN_c^S and 32% of Δw_c^S
- Unskilled: Supply Shift explains 53% of ΔN_c^U and 46% of Δw_c^U

The Incidence of Government Spending (Suárez Serrato and Wingender)

Methods: Policy Experiment #1

- Analyze impact of increasing spending per-adult by $\$1,000$
- Median spending per-adult is $\$10,235$
- Change in worker utility is given by

$$\begin{aligned}\frac{dV^i}{dv_c^i}\frac{1}{\lambda_c^i} &= N_c^i \frac{dv_c^i}{\lambda_c^i} \\ &= N_c^i \left(dw_c^i + dt_c^i - dr_c^i + \phi^i (w_c^i + t_c^i) \frac{dGS_c}{GS_c} \right)\end{aligned}$$

Table: Policy Experiment # 1 (Suárez Serrato and Wingender)

	Zero Value for Government Services	Including Value for Government Services
Welfare Effects		
Skilled Worker (25%)	$363	$1,012
Unskilled Worker (25%)	-$92	$751
Owners of Housing	$325	$325
Budget Impacts		
Decrease in Transfers	$15	$15
Increase in Taxes	$290	$290
Social Welfare	$650	$1,445

- An additional $1 of spending raises welfare by $1.45
- Ballard et al. (1985) report MCPF between 1.17 and 1.33

The Incidence of Government Spending (Suárez Serrato and Wingender)

Contribution

- Estimate long-term impacts of government spending
  - Find persistent effects on wages and migration
- Estimate incidence of government spending by skill
  - Supply components of shock explains large mobility responses of the unskilled and lower wage outcomes
  - Incidence on workers may be large enough to motivate spending on utilitarian grounds
  - Heterogenous valuations of government services suggest distribution of funds should target areas with low skill-shares

Moving to Opportunity

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

- Substantial disparities in economic outcomes across low vs. high poverty neighborhoods [e.g., Wilson 1987, Jencks and Mayer 1990, Cutler and Glaeser 1997]
- These disparities motivated the HUD Moving to Opportunity (MTO) experiment in the mid 1990's
  - Offered a randomly selected subset of families living in high-poverty housing projects housing vouchers to move to lower-poverty areas
- Large literature on MTO has found significant effects on adult health and subjective well-being
- But these studies have consistently found that the MTO treatments had no impact on earnings or employment rates of adults and older youth [e.g. Katz, Kling, and Liebman 2001, Oreopoulous 2003, Sanbonmatsu et al. 2011]

Source: Chetty Hendren Katz (AER, 2016)

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

- We revisit the MTO experiment and focus on its impacts on children who were young when their families moved to better neighborhoods
- Re-analysis motivated by a companion paper that presents quasi-experimental evidence on neighborhood effects [Chetty and Hendren 2015]
  - Key finding: **childhood exposure effects**
  - Every year in a better area during childhood → better outcomes in adulthood
  - Implies that gains from moving to a better area are larger for children who move when young

Source: Chetty Hendren Katz (AER, 2016)

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

- In light of this evidence on childhood exposure effects, we returned to MTO data to examine treatment effects on young children
- Link MTO data to tax data to analyze effects of MTO treatments on children's outcomes in adulthood
- Children we study were not old enough to observe outcomes in adulthood at the time of the MTO Final Impacts Evaluation (which used data up to 2008)

Source: Chetty Hendren Katz (AER, 2016)

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

- HUD Moving to Opportunity Experiment implemented from 1994-1998
- 4,600 families at 5 sites: Baltimore, Boston, Chicago, LA, New York
- Families randomly assigned to one of three groups:
  1. Experimental: housing vouchers restricted to low-poverty (<10%) Census tracts
  2. Section 8: conventional housing vouchers, no restrictions
  3. Control: public housing in high-poverty (50% at baseline) areas

Source: Chetty Hendren Katz (AER, 2016)

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

Most Common MTO Residential Locations in New York

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

- MTO data obtained from HUD
  - 4,604 households and 15,892 individuals
  - Primary focus: 8,603 children born in or before 1991
- Link MTO data to federal income tax returns from 1996-2012
  - Approximately 85% of children matched
  - Match rates do not differ significantly across treatment groups
  - Baseline covariates balanced across treatment groups in matched data

Source: Chetty Hendren Katz (AER, 2016)

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods

- We replicate standard regression specifications used in prior work [Kling, Katz, Liebman 2007]

$$y_i = \alpha + \beta_E^{ITT} Exp_i + \beta_S^{ITT} S8_i + s_i \delta_s + \epsilon_i$$

Treatment Indicators

Site Indicators

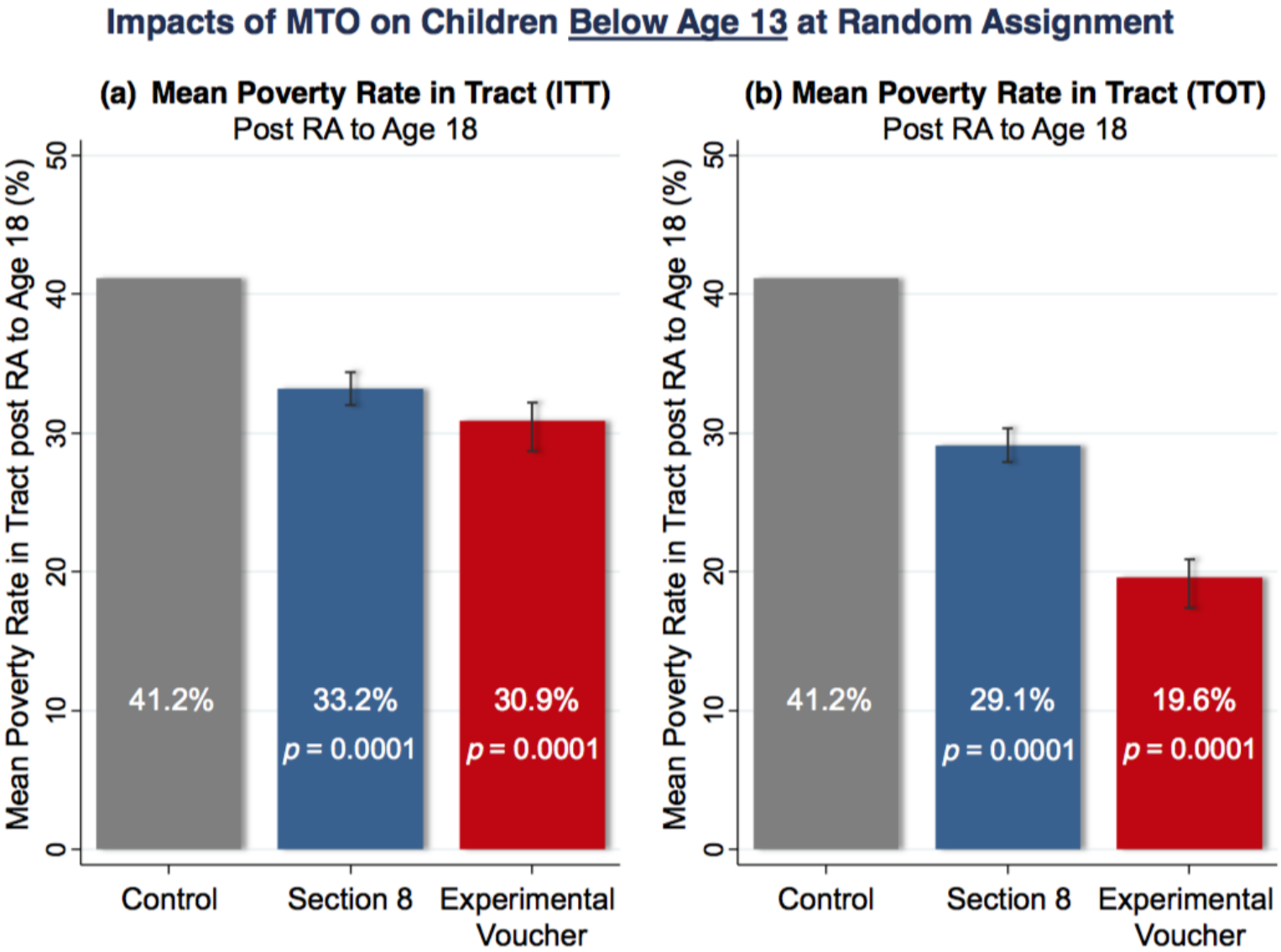
- These intent-to-treat (ITT) estimates identify effect of being *offered* a voucher to move through MTO

- Estimate treatment-on-treated (TOT) effects using 2SLS, instrumenting for voucher takeup with treatment indicators
  - Experimental take-up: 48% for young children, 40% for older children
  - Section 8 take-up: 65.8% for young children, 55% for older children

Source: Chetty Hendren Katz (AER, 2016)

Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods



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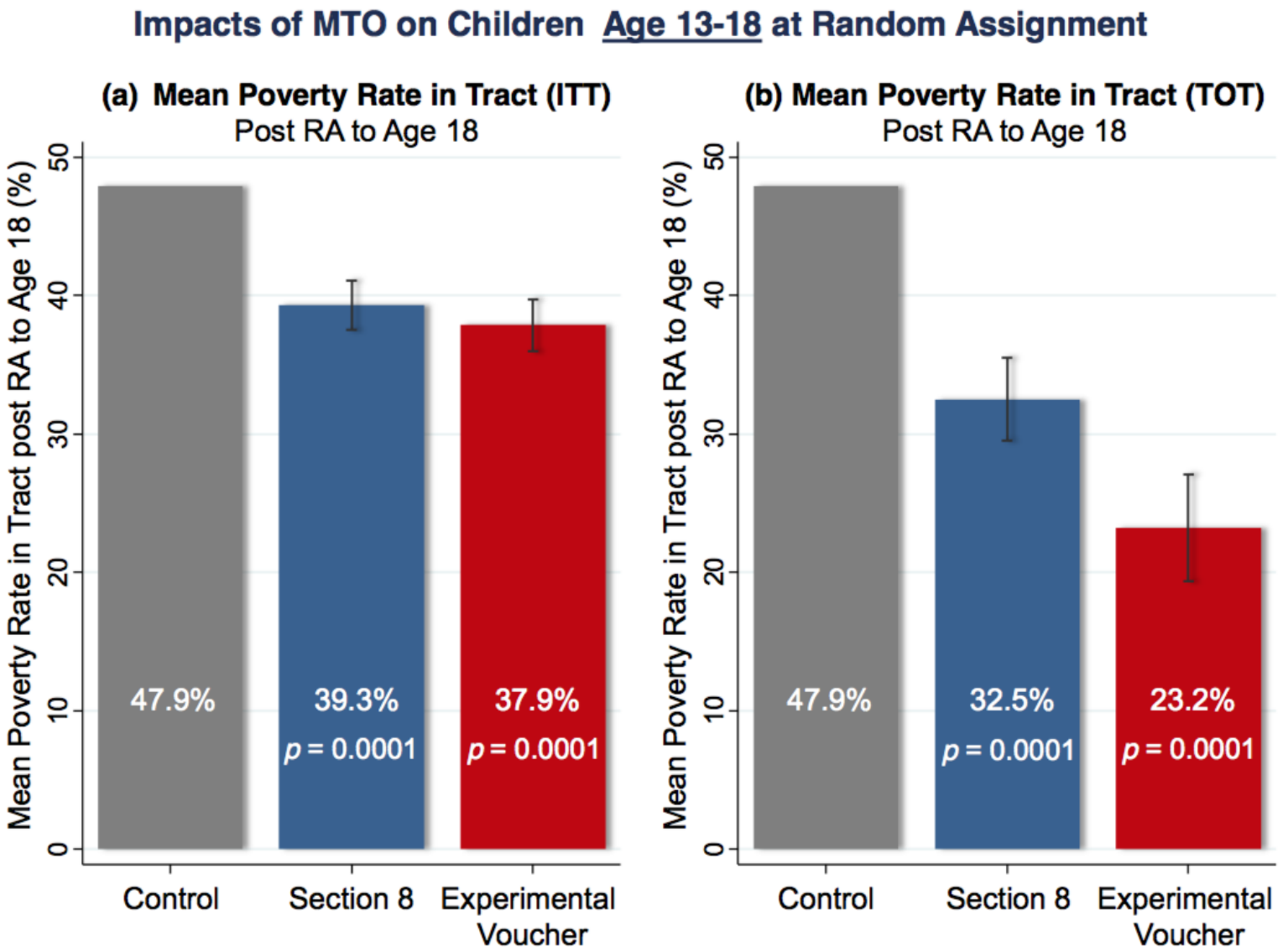
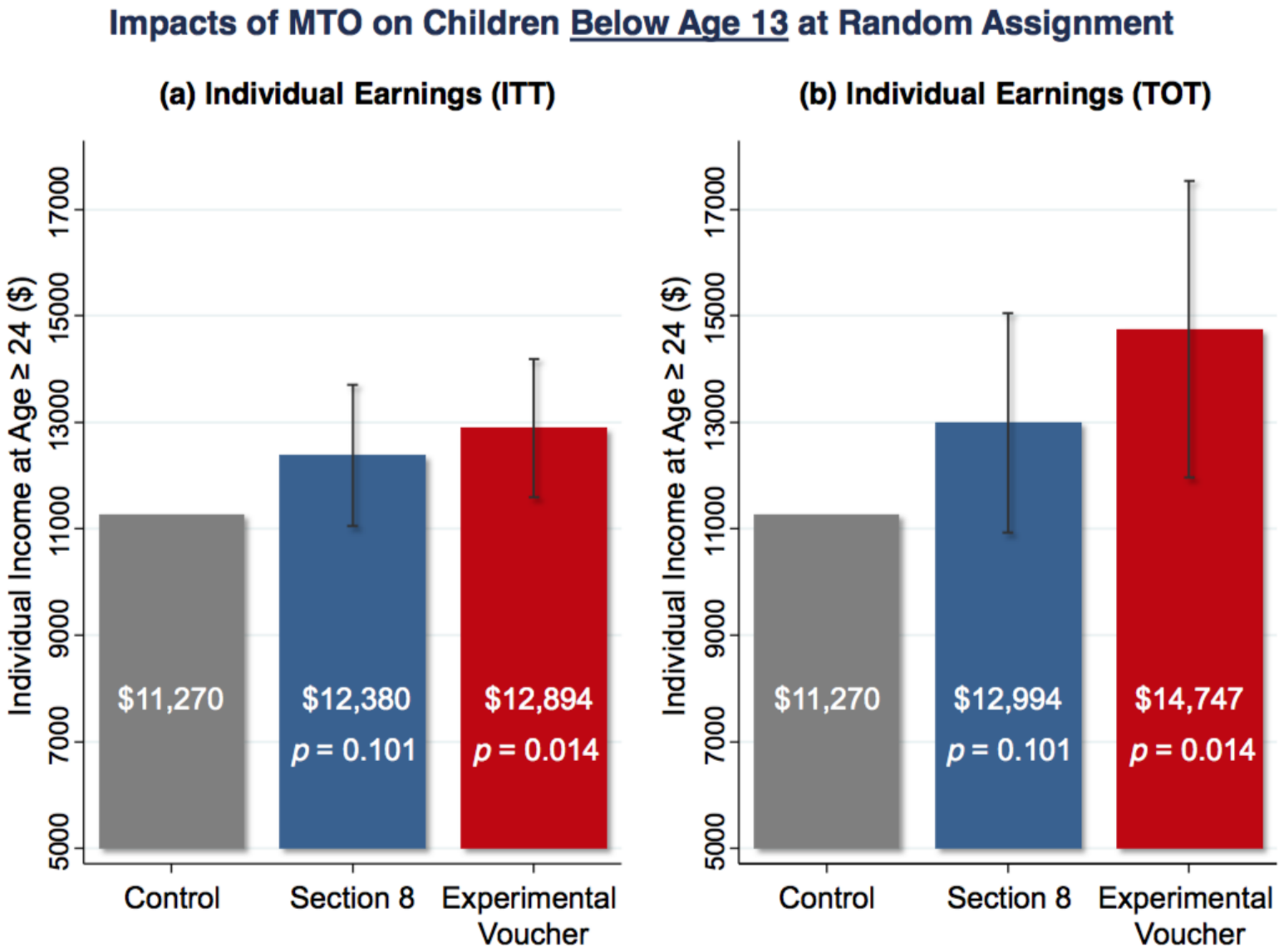
Effect of Exposure to Better Neighborhoods



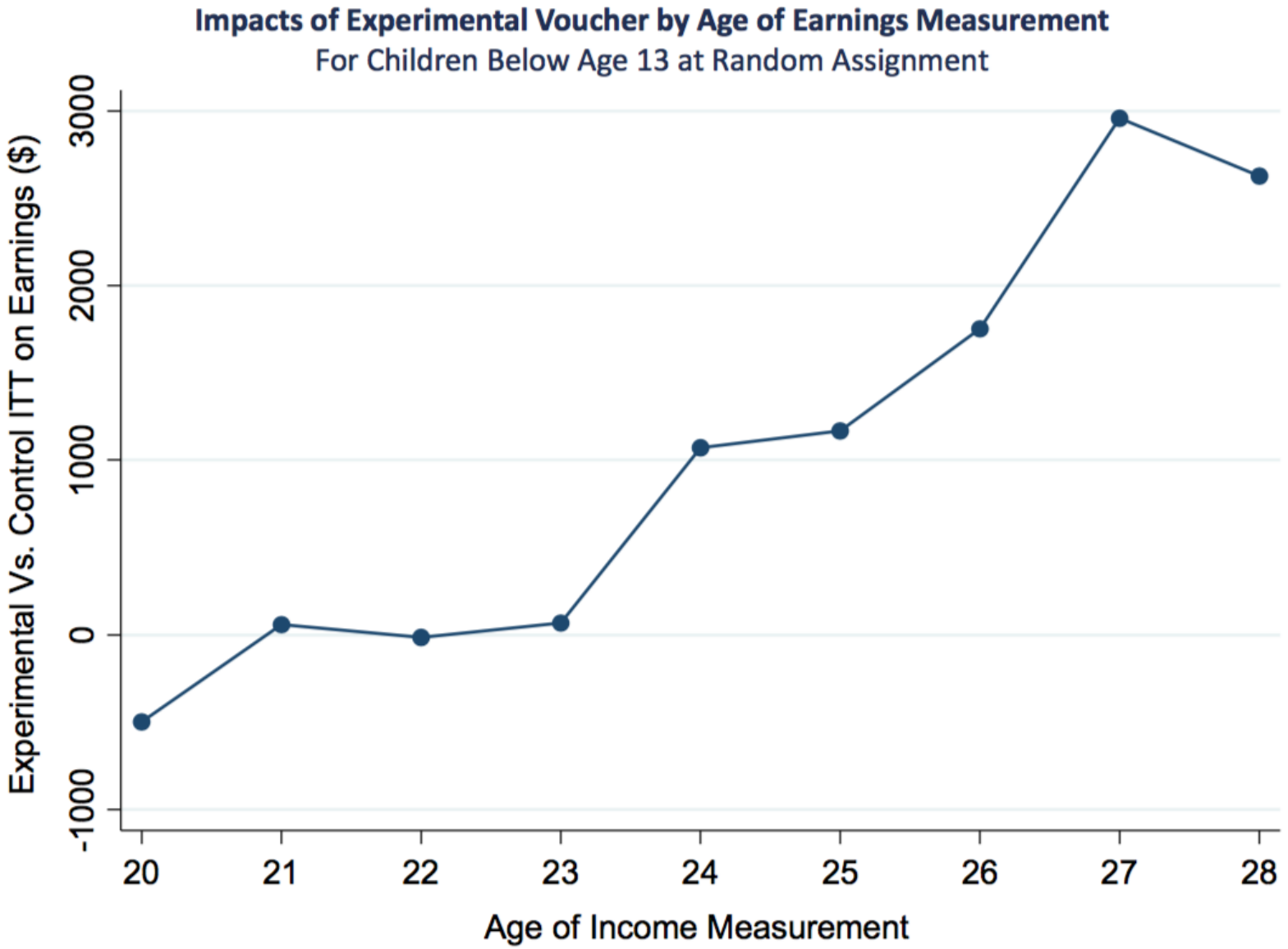
Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods



Chetty Hendren Katz (AER, 2016) on MTO

Effect of Exposure to Better Neighborhoods



Could improving places eventually save money?

Exposure specification: extra year of good neighborhood→extra $566 of age 26 earnings!

TABLE 8
Linear Exposure Effect Estimates

Dep. Var.:	Indiv. Earn. ($)	Household Income ($)		Coll. Qual. 18-20 ITT ($)	Married ITT (%)	ZIP Poverty Share ITT (%)	Taxes Paid ITT ($)
	2008-2012 ITT	2008-2012 ITT	Age 26 ITT				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Experimental × Age at RA	-364.1⁺	-723.7**	-564.9*	-171.0**	-0.582*	0.261⁺	-65.81**
	(199.5)	(255.5)	(282.8)	(55.16)	(0.290)	(0.139)	(23.88)
Section 8 × Age at RA	-229.5	-338.0	157.2	-117.1⁺	-0.433	0.0109	-42.48⁺
	(208.9)	(266.4)	(302.0)	(63.95)	(0.316)	(0.156)	(24.85)
Experimental	4823.3*	9441.1**	8057.1*	1951.3**	8.309*	-4.371*	831.2**
	(2404.3)	(3035.8)	(3760.9)	(575.1)	(3.445)	(1.770)	(279.4)
Section 8	2759.9	4447.7	-1194.0	1461.1*	7.193⁺	-1.237	521.7⁺
	(2506.1)	(3111.3)	(3868.2)	(673.6)	(3.779)	(2.021)	(287.5)
Number of Observations	20043	20043	3956	20127	20043	15798	20043
Control Group Mean	13807.1	16259.9	14692.6	21085.1	6.6	23.7	627.8

Source: Chetty, Hendren, Katz (2015)

Moved to Opportunity

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

How does growing up in a disadvantaged neighborhood affect long-run child outcomes?

- Large observational literature shows children from disadvantaged areas have notably worse outcomes
  - Ellen and Turner (1997); Cutler and Glaeser (1997); Altonji and Mansfield (2014); Chetty et al., (2014)
- Yet, some experimental evidence finds few significant effects of moving to better neighborhoods
  - Katz et al. (2001); Oreopolous (2003); Sanbonmatsu et al., (2011)
- Existence and size of neighborhood effects is uncertain
  - This view has started to change due to recent work: Chetty, Hendren and Katz (2015); Chetty and Hendren (2015)

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

What is public housing?

- Goal: Provide "decent" housing for low-income families
- Large residential buildings (high-rises) built in close proximity
  - A **collection** of buildings is called a housing project

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

Figure 1: Robert Taylor Homes

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

- Federally supported program, but owned and operated by local (city) authority
- Assistance is *not* an entitlement – long waiting lists
- Value of subsidy is large: $\approx$ \$8,000 per year (HUD, 2015)

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

- Descriptive statistics:
  1. Third largest public housing system during the 1990s
  2. Average household income: $7,000
  3. 20% of units have more than 5 people
  4. Nearly all residents are African-American

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

- Reaction to serious management and infrastructure problems
  - Buildings built during the 50s and 60s cheaply
  - Few believed the Chicago Housing Authority (CHA) could deal with maintenance issues
    - Scandals revealed officials had mismanaged public funds
- Local politicians proposed demolition and expanding voucher assistance
  - Limited funding for demolition

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

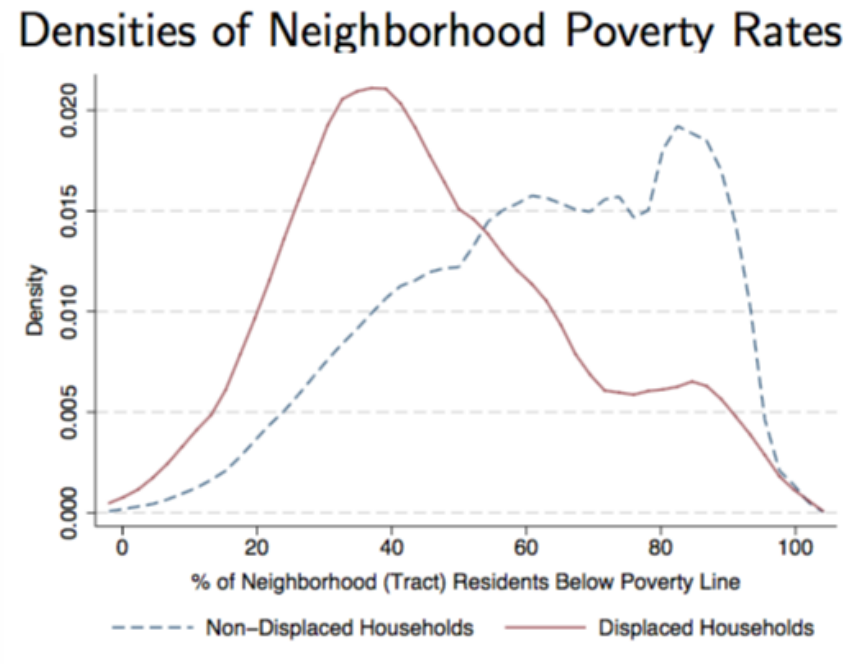
- Limited funding $\Rightarrow$ selection of buildings based on specific maintenance issues (Jacob, 2004)
  - Initial demolitions motivated by specific crises
  - Ex. Pipes burst in Robert Taylor high-rise buildings

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

- Provided housing vouchers and compensated for moving costs
  - Note: Vouchers and project-based assistance have the same rules $\Rightarrow$ No effect on budget set
- Households moved to lower poverty areas:



Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

Contribution

- Provide new evidence on neighborhood effects for children from two different housing policy interventions
    1. Natural experiment created by public housing demolition
    2. Housing voucher lottery
- Compare these two contexts to answer two questions:
    1. What are the benefits of relocating youth in a general population?
    2. Do children of volunteers benefit more or less than average?

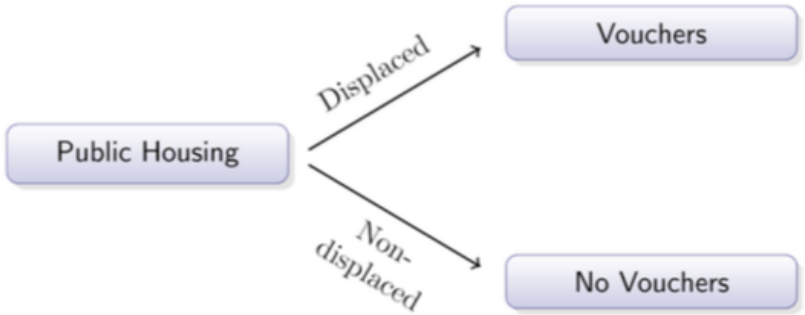
Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

Natural Experiment Research Design

Public Housing Demolition in Chicago



- Identification: Displacement unrelated to resident characteristics (Jacob, 2004)
- Results: Displaced children are (1) more likely to work, (2) have higher annual earnings and (3) have fewer arrests for violent crime

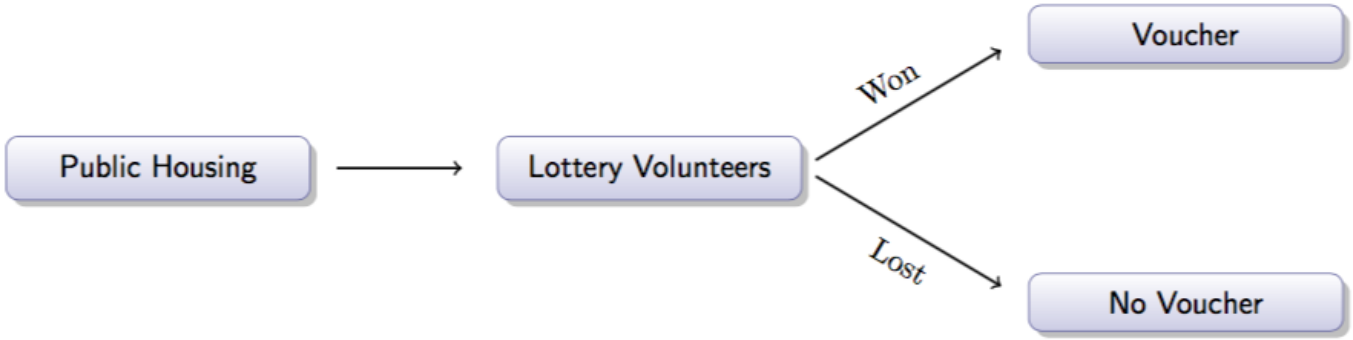
Source: Chyn (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

Lottery Design

The 1997 Chicago Housing Voucher Lottery



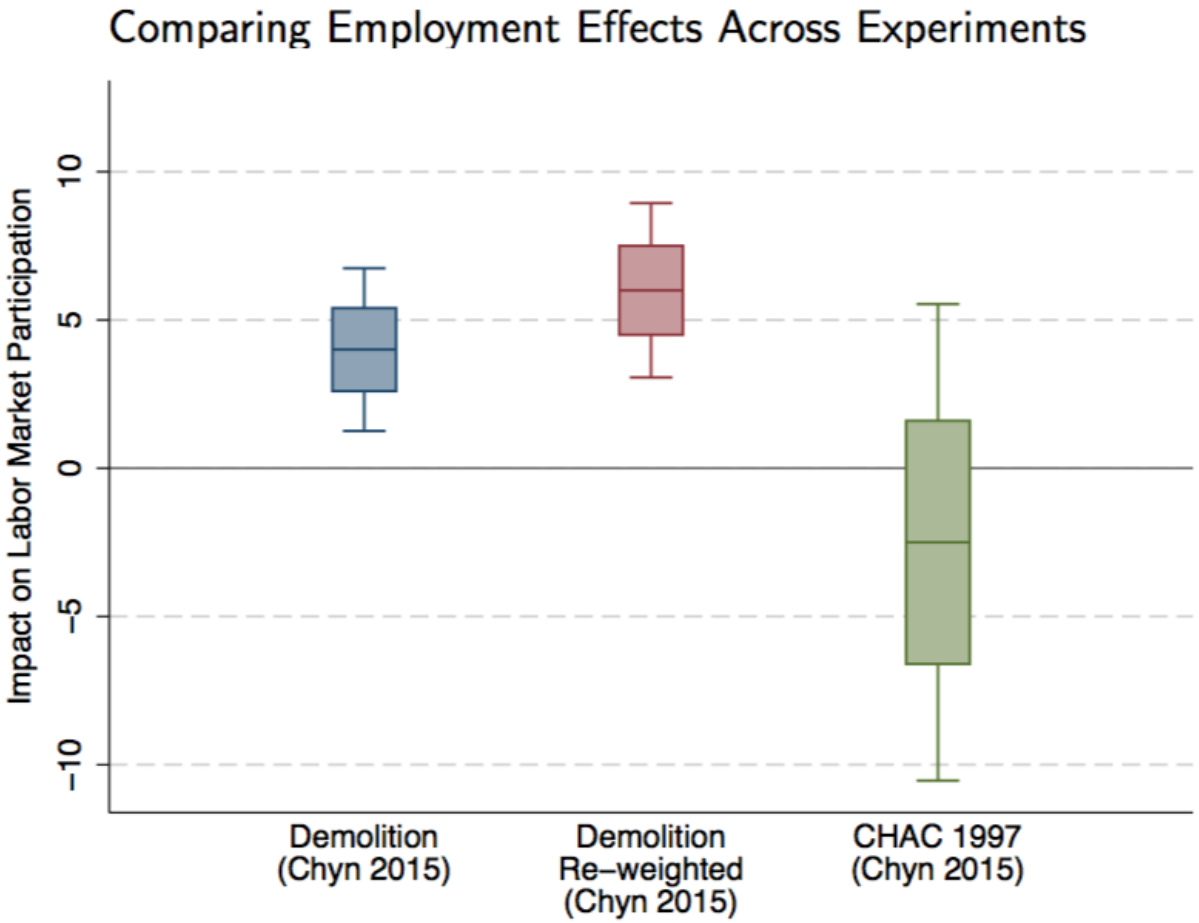
- Main finding: Small and not statistically significant effects on lottery children outcomes

Source: Chen (2017)

Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

Notable contrast between demolition and lottery results



Moved to Opportunity (Chen, 2017)

The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children

Interpreting the Evidence and Implications

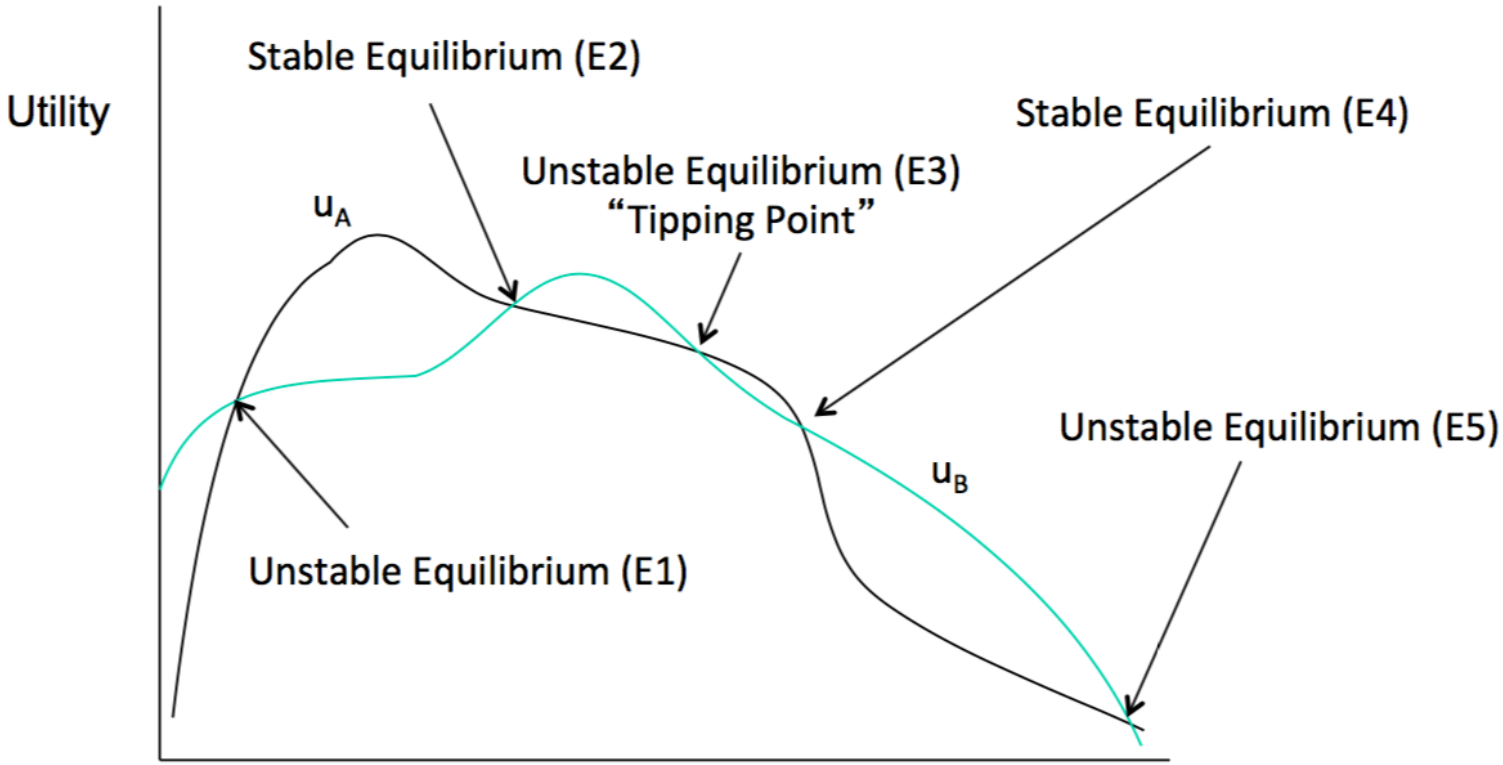
- Pattern consistent with larger benefits for children from households where parents have low demand for moving
  - Demolition ⇒ General set of households
  - Lottery ⇒ Subset with **high willingness** to move
- "Reverse Roy" and parental behavior in education studies:
  - Boston charter schools (Walters, 2015)
  - North Carolina school choice (Hastings et al., 2008)
- Benefits to moving children from public housing may be larger than estimates based on experiments such as MTO

Source: Chen (2017)

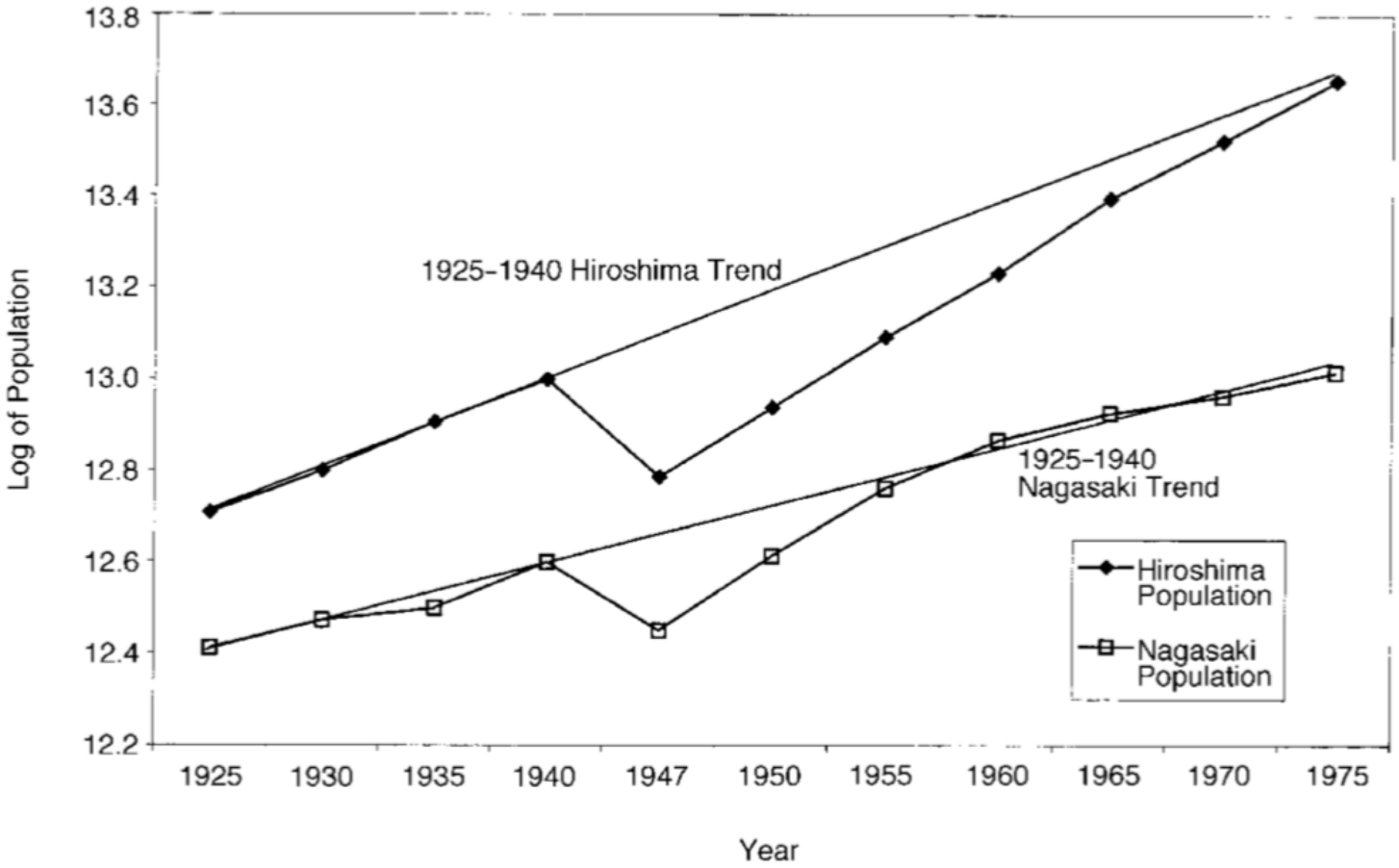
Million Dollar Plants

Agglomeration and the big push

Here there are two stable equilibria: one much better than the other



An un-natural experiment



Source: Davis and Weinstein (2002)

Million Dollar Plants (Greenstone et al.)

Question

- What is the impact of the opening of a large manufacturing plant on the total factor productivity (TFP) of incumbent plants in the same county?
- This work contributes to the policy debate on the importance of location-based incentives
- The authors add to the literature by providing evidence for the existence of agglomeration spillovers in a specific industry

Million Dollar Plants (Greenstone et al.)

Methods: Formal Model

Predictions in case of positive spillovers:

- The opening of a new plant will increase TFP of incumbents
- The increase in TFP may be larger for firms that are economically "closer" to new plant
- The density of economic activity in the county will increase as firms move in
- The price of locally supplied factors of production will increase

Million Dollar Plants (Greenstone et al.)

Methods: Empirical Estimation

Empirical strategy:

- Comparing the "winning" counties (where the new plant is located) to the "losing" ones (runner-ups) allows to isolate the effects that result solely from agglomeration
- Identification: use location rankings of firms to identify a valid counterfactual for what would have happened to incumbent plants in "winning" counties in the absence of the plant opening
- The research design is convincing at testing for agglomeration - it is realistic that "winning" counties would benefit from the concentration of economic activity

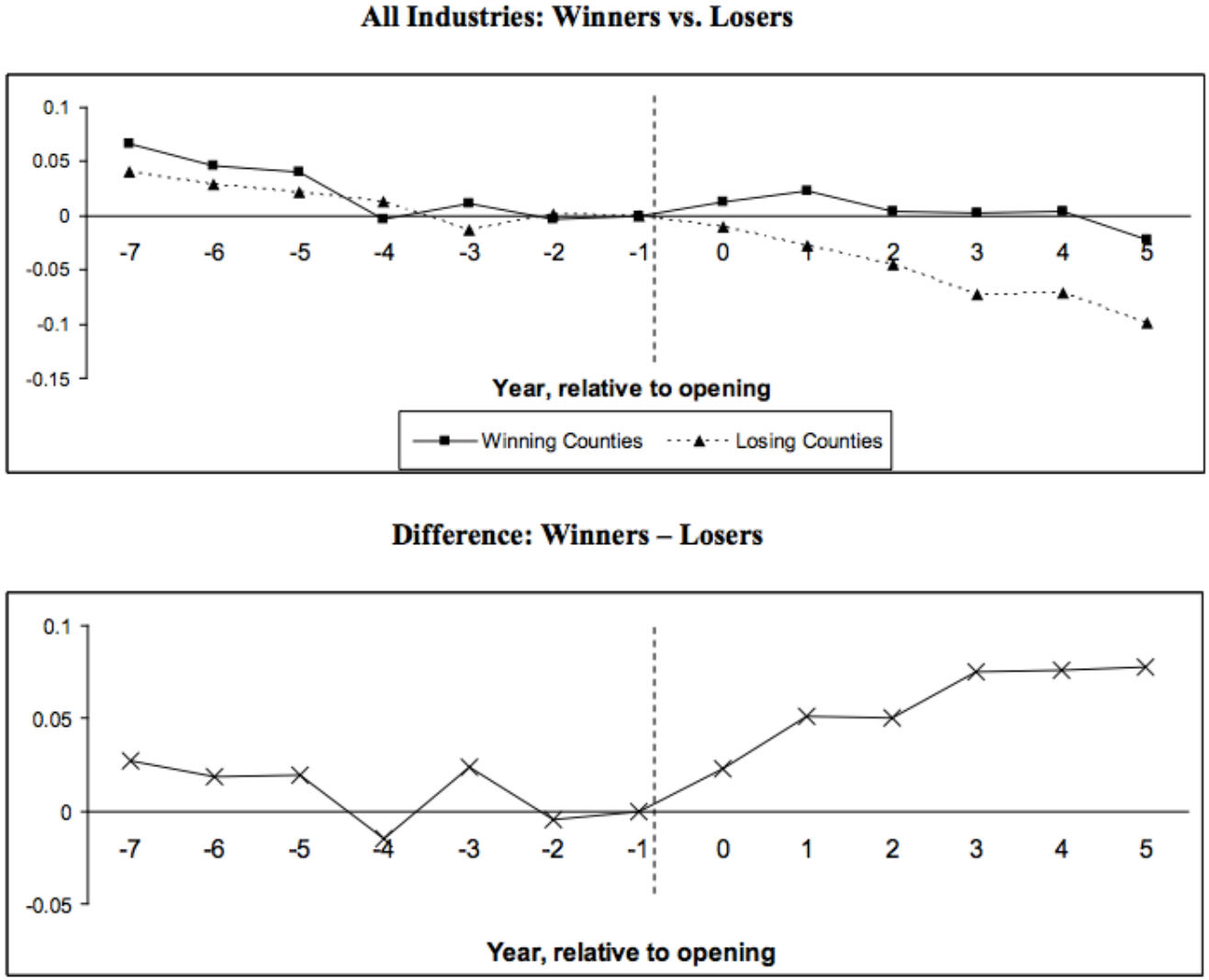
Million Dollar Plants (Greenstone et al.)

Data

- "Million Dollar Plant" articles from the Site Selection list the "winning" and "losing" counties.
- Information about the plants comes from the Census Bureau's Standard Statistical Establishment List (SSEL), the Annual Survey of Manufactures (ASM) and the Census of Manufactures (CM).
- The data on plant variables such as employment and value of shipments is panel for the opening year + 8 years before.

Figure: Incumbents' Productivity in WInning vs Losing Counties (Greenstone et al.)

Figure 1. All Incumbent Plants' Productivity in Winning vs. Losing Counties, Relative to the Year of a MDP Opening



Local Economic Development: TVA

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Question

- What are the effects of the Tennessee Valley Authority policy on local economies?
- Paper informs the debate on spatially targeted policies
- Kline and Moretti are the first to empirically quantify the long run social costs and benefits of a place based policy

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Methods: Empirical Strategy

- The empirical strategy is to compare long run changes in TVA counties with long run changes in non-TVA counties with similar characteristics
- This allows to isolate the effects of the TVA policy on economic growth, controlling for other influences
- Regression model: $y_{it} - y_{it-1} = \alpha + \beta X_i + (\epsilon_{it} - \epsilon_{it-1})$
  - $y_{it} - y_{it-1}$ is the change in the dependent variable between years $t-1$ and t for county i.
  - X_i is the vector of preprogram characteristics.

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Data

- The data comes from the Population Census, the Manufacturing Census, the Agricultural Census, and from Fishback, Haines, and Kantor (2011)
- It is used to create a county-level panel from 1900 to 2000
- Some of the variables are imprecise, and substantial measurement error is likely to be present at the beginning of the sample period

Figure: Impact of TVA on Growth Rate (Kline and Moretti)

Table 2a: Decadalized Growth Rates in TVA Region vs. Rest of U.S. 1900-1940

	Outcome	Point Estimate (Unadjusted)	Clustered S.E.	Point Estimate (Controls)	Clustered S.E.	Spatial HAC	N
		(1)	(2)	(3)	(4)	(5)	(6)
(1)	Population	0.007	(0.016)	0.010	(0.012)	(0.012)	1776
(2)	Total Employment	-0.009	(0.016)	0.005	(0.013)	(0.013)	1776
(3)	Housing Units	-0.006	(0.015)	0.007	(0.011)	(0.011)	1776
(4)	Average Manufacturing Wage	0.009	(0.018)	0.010	(0.021)	(0.021)	1428
(5)	Manufacturing Share	0.007*	(0.004)	0.005	(0.004)	(0.004)	1776
(6)	Agricultural Share	-0.007*	(0.004)	-0.001	(0.005)	(0.005)	1776
(7)	Average Agricultural Land Value	0.078***	(0.021)	0.025	(0.018)	(0.018)	1746

Figure: Impact of TVA on Growth Rate (Kline and Moretti)

Table 3a: Decadalized Impact of TVA on Growth Rate of Outcomes (1940-2000)

		Point Estimate (Unadjusted)	Clustered S.E.	Point Estimate (Controls)	Clustered S.E.	Spatial HAC	N
	Outcome	(1)	(2)	(3)	(4)	(5)	(6)
(1)	Population	0.004	(0.021)	0.007	(0.020)	(0.018)	1907
(2)	Average Manufacturing Wage	0.027***	(0.006)	0.005	(0.004)	(0.005)	1172
(3)	Agricultural Employment	-0.130***	(0.026)	-0.056**	(0.024)	(0.027)	1907
(4)	Manufacturing Employment	0.076***	(0.013)	0.059***	(0.015)	(0.023)	1907
(5)	Value of Farm Production	-0.028	(0.028)	0.002	(0.032)	(0.026)	1903
(6)	Median Family Income (1950-2000 only)	0.072***	(0.014)	0.021	(0.013)	(0.011)	1905
(7)	Average Agricultural Land Value	0.066***	(0.013)	-0.002	(0.012)	(0.016)	1906
(8)	Median Housing Value	0.040**	(0.017)	0.005	(0.015)	(0.015)	1906

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Methods: Formal Model

Formal Model:

- Utility is equalized across counties in each year: $\ln w_{it} + M_{it} = \overline{u_t}$
- It is used to create a county-level panel from 1900 to 2000
- Production function: $Y_{it} = A_{it} K_{it}^{\alpha} F_i^{\beta} L_{it}^{1-\alpha-\beta}$
- A_{it} is a local productivity level, L_{it} is the number of manufacturing workers, K_{it} is the capital stock, F_i is a fixed nonreproducable factor (i.e. natural features)

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Methods: Formal Model

- Labor demand:
$$\ln w_{it} = C - \frac{\beta}{1-\alpha} \ln L_{it} + \frac{\beta}{1-\alpha} \ln F_i - \frac{\alpha}{1-\alpha} \ln r_t + \frac{1}{1-\alpha} \ln A_{it}$$
- $C \equiv \ln(1-\alpha-\beta) + \frac{\alpha}{1-\alpha} \ln \alpha$
- $\ln A_{it}$ can be decomposed into a locational advantage component, a component due to agglomeration effects, an effect of TVA, and an idiosyncratic component:
$$\ln A_{it} = g(\frac{L_{it-1}}{R_i}) + \delta_t D_i + \eta_i + \gamma_t + \varepsilon_{it}$$
  - D_i is a dummy for TVA exposure

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Methods: Formal Model

- Direct TVA effect: impact on public infrastructure, as captured by δ_t coefficients
- Indirect TVA effect: increases in employment may cause further increases in productivity (agglomeration)
- The impact of a marginal increase in the productivity of TVA's investments on output: $\frac{dY_i}{d\delta} = \frac{1}{1-\alpha} Y_i (D_i + \frac{1-\alpha-\beta+\sigma_i}{L_i} \frac{dL_i}{d\delta})$
  - σ_i is the local agglomeration elasticity
- Steady state productivity: $\ln A_i = g(\frac{L_i}{R_i}) + \eta_i + \delta D_i$

Agglomeration Economies and the Tennessee Valley Authority (Kline and Moretti)

Methods: Structural Estimation

Structural Estimation:

$$\begin{aligned}
\ln(L_{it}) - ln(L_{it-1}) &= -\frac{1-\alpha}{\beta}(\ln w_{it} - \ln w_{it-1}) + \frac{\delta_t - \delta_{t-1}}{\beta} D_i \\
&+ \frac{\theta_1}{\beta}[g_1(\frac{L_{it-1}}{R_i}) - g_1(\frac{L_{it-2}}{R_i})] + \frac{\theta_2}{\beta}[g_2(\frac{L_{it-1}}{R_i}) \\
&- g_2(\frac{L_{it-2}}{R_i})] + \frac{\theta_3}{\beta}[g_3(\frac{L_{it-1}}{R_i}) - g_3(\frac{L_{it-2}}{R_i})] \\
&+ X_i'\tilde{\lambda} + \tilde{\gamma}_t + \tilde{\gamma_{t-1}} + \tilde{v_{it}}
\end{aligned}$$

- $\frac{\delta_t - \delta_{t-1}}{\beta}$ gives the change in direct effects of TVA between decades
- Spline coefficients $\frac{\theta_i}{\beta}$ determine the indirect effects, since they give the labor demand effects of within the relevant density range

Figure: Structural Estimates of Agglomeration Function (Kline and Moretti)

Table 6: Structural Estimates of Agglomeration Function (log basis)

	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) 2SLS	(6) 2SLS
Change in Log Manufacturing Density Spline Components:						
Low	0.078	0.053	0.052	0.349	0.323	0.325
	(0.030)	(0.031)	(0.030)	(0.109)	(0.122)	(0.123)
				[182.83]	[149.61]	[148.34]
Medium	0.072	0.075	0.069	0.339	0.327	0.319
	(0.049)	(0.050)	(0.050)	(0.097)	(0.101)	(0.103)
				[92.69]	[96.61]	[97.01]
High	0.084	0.090	0.086	0.306	0.304	0.307
	(0.059)	(0.059)	(0.059)	(0.134)	(0.135)	(0.136)
				[206.26]	[204.81]	[202.69]
Log Manufacturing Wages	**-1.5**	**-1.5**	**-1.5**	**-1.5**	**-1.5**	**-1.5**
TVA	0.024	0.027	0.029	0.008	0.011	0.012
	(0.013)	(0.013)	(0.014)	(0.011)	(0.011)	(0.012)
Regional Trends	no	no	yes	no	no	yes
1940 Manufacturing Density	no	yes	yes	no	yes	yes
Decade Effects	yes	yes	yes	yes	yes	yes
Controls for 1920 and 1930 characteristics	yes	yes	yes	yes	yes	yes
P-value equal slopes	0.981	0.799	0.837	0.891	0.980	0.982
P-value slopes equal zero	0.039	0.141	0.173	0.002	0.007	0.012
N	5462	5462	5462	5318	5318	5318

Other considerations: Second best arguments

Correct prior distortions that can interact w/ place:

- Deductibility of state and local taxes (Albouy, 2008)
- Hiring costs (Kline and Moretti, 2013)
- State sales / business taxes (Fajgelbaum, Morales, Suarez Serrato, Zidar, 2016)
- Housing regulations (Hsieh and Moretti, 2016)
- Payroll taxes?

Closing thoughts

- Place conveys useful information about preferences and endowments
- Odd to ignore when setting policy
- Equity - efficiency tradeoff looms large but "triangle" view may miss forest for trees
- Some under-explored questions:

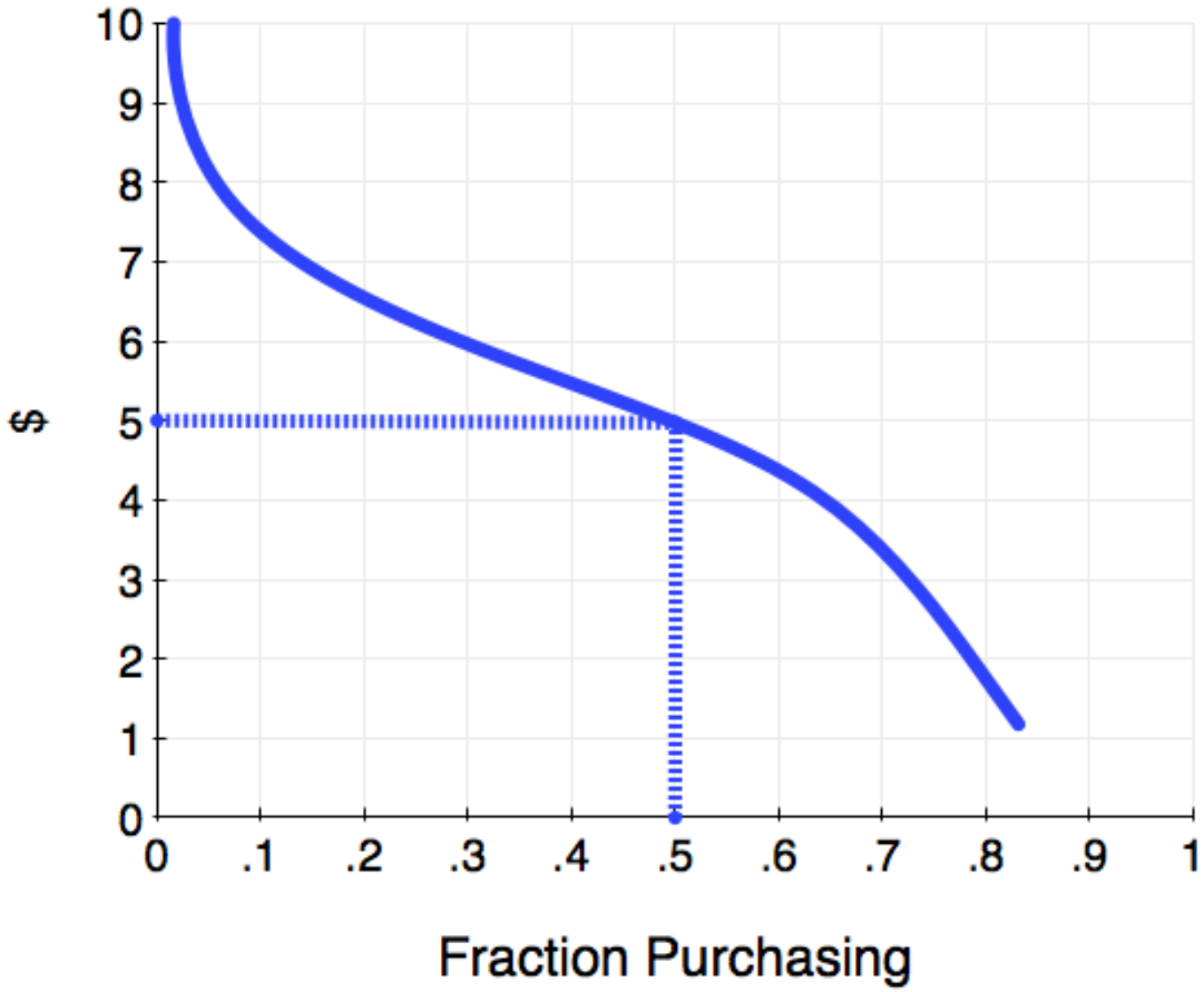
1. Picking winners: what do economists have to offer?
2. Paternalism and place: nudge households to move?
3. Coordinating expectations: is economic development like faith healing?

Appendix: Discrete Choice

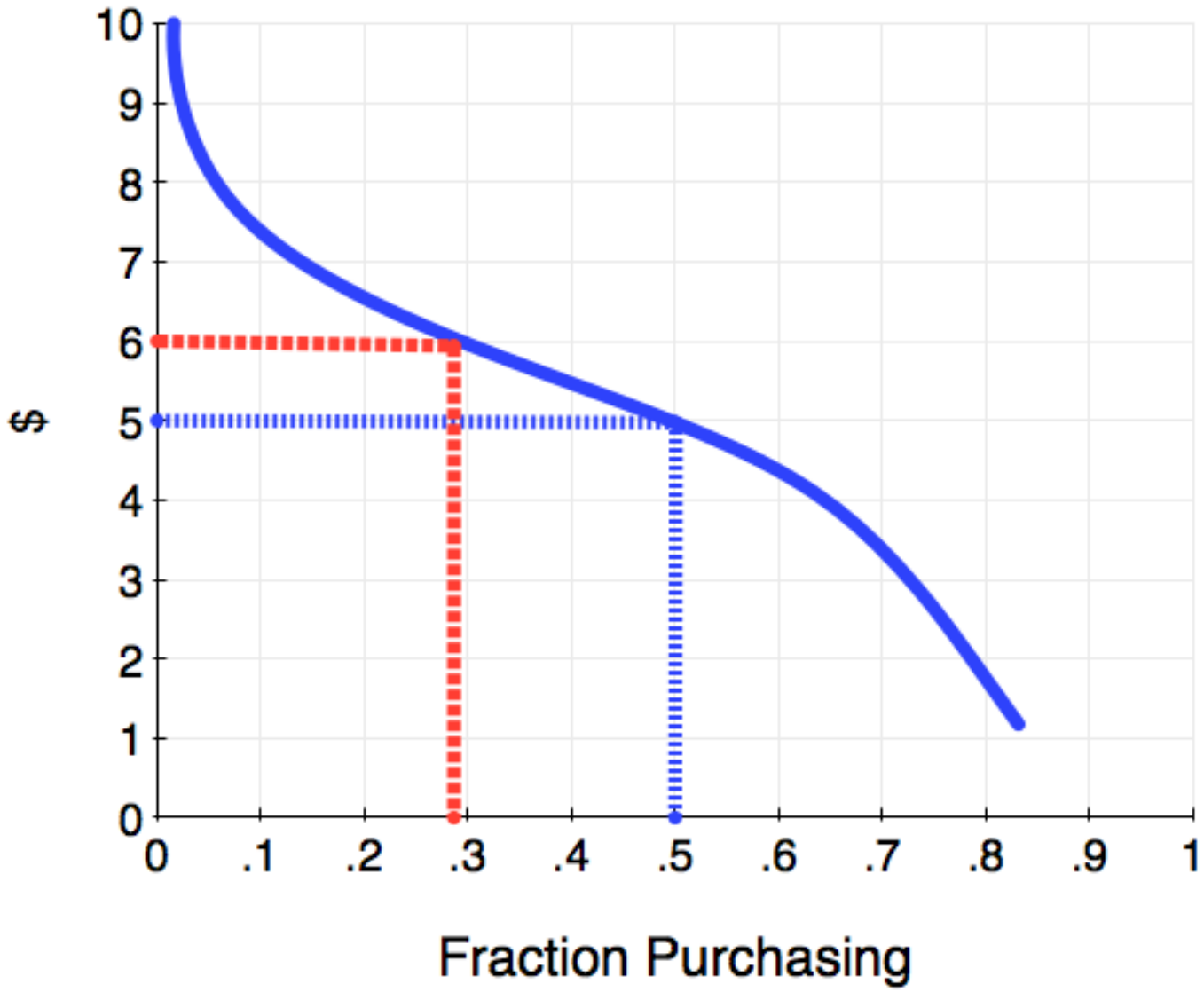
Aside on Discrete Choice

- Brief review of discrete choice
- CDF of tastes and demand curves
- Link to demand elasticities
- See Ken Train's *Discrete Choice Methods with Simulation* (free online) for very clear, helpful discussion

Consumers decide whether or not to buy



Consumers decide whether or not to buy



Consumers decide whether or not to buy

- The first graph shows the share of consumers buying a product is 50% when it's price is $5
- The second graph shows the share of consumers buying a product is 30% when it's price is $6
- How can we think about how responsive demand will be to changes in price when consumers are making discrete (i.e., buy or not) choices?

Analytical Setup

- Suppose that individual i buys if her value exceeds the price, i.e., buy if $v_i > P$
- This value can be a function of common things (e.g., income, credit conditions, etc) or idiosyncratic tastes but at this stage, specifying what is in v_i doesn't matter. The fraction of people who buy is:

$$\text{Prob}(Q = 1) = P(v_i > P) \tag{4}$$
$$= 1 - F(P) \tag{5}$$

- where $F(x)$ is the c.d.f. of v_i. Note this is why the demand curve looks like a CDF rotated clockwise 90 degrees
- A c.d.f. describes the probability that a real-valued random variable X with a given probability distribution will be found to have a value less than or equal to x

Elasticity of Demand

- What is the elasticity of this curve?

$$Q(P) = N(1 - F(P)) \tag{6}$$

- where N is the size of the population (e.g., number of potential consumers in your market)

$$\varepsilon^D = \frac{dQ(P)}{dP}\frac{Q}{P} \tag{7}$$

Elasticity of Demand

- What is the derivative?

$$\frac{dQ(P)}{dP} = -Nf(P) \tag{8}$$

- where N is the size of the population (e.g., first time home buyers in an area)
- f(x) is the probability density function (p.d.f.)

Elasticity of Demand

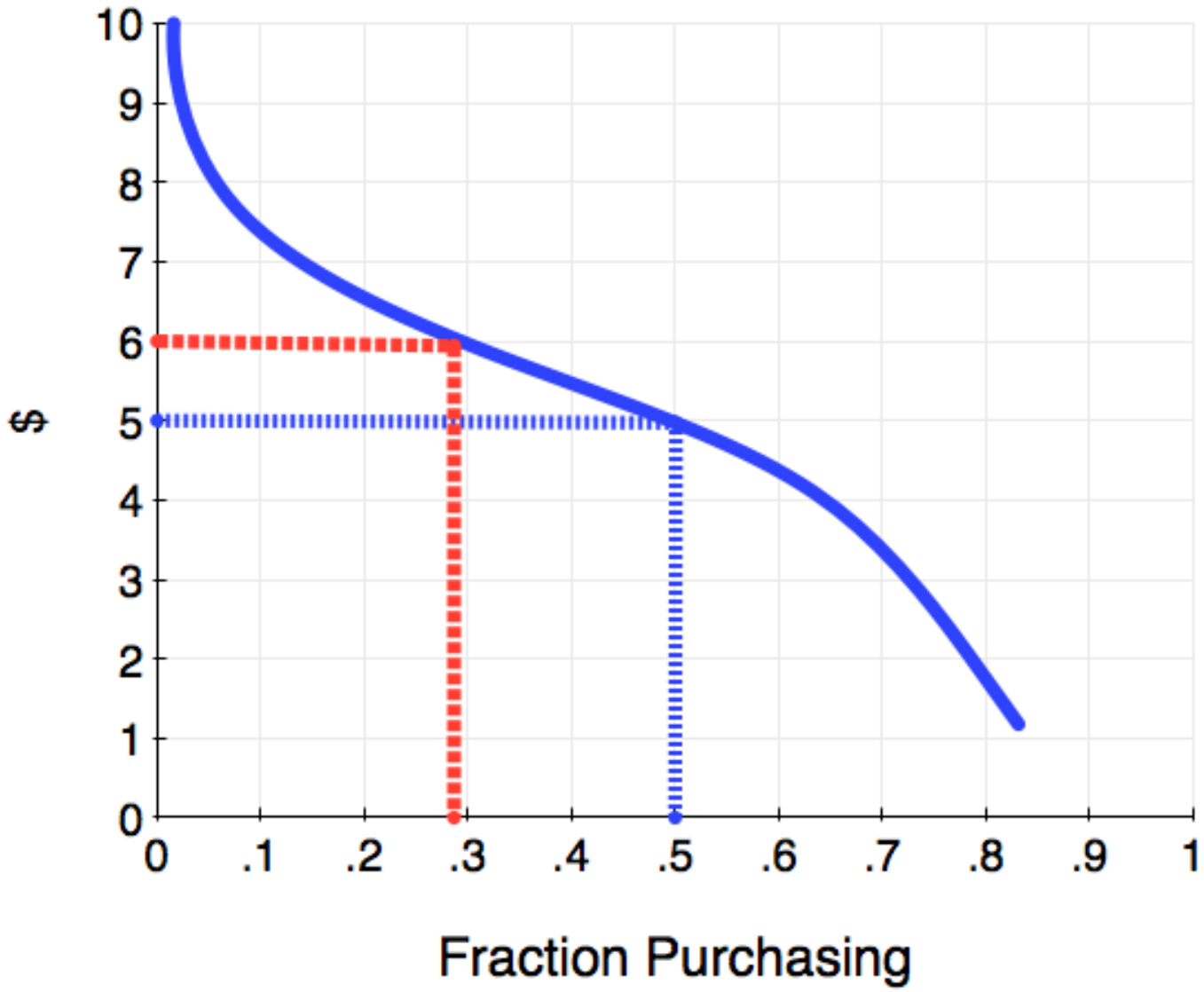
$$\varepsilon^D = \frac{dQ(P)}{dP}\frac{P}{Q} \tag{9}$$

$$= -Nf(P)\frac{P}{N(1-F(P))} \tag{10}$$

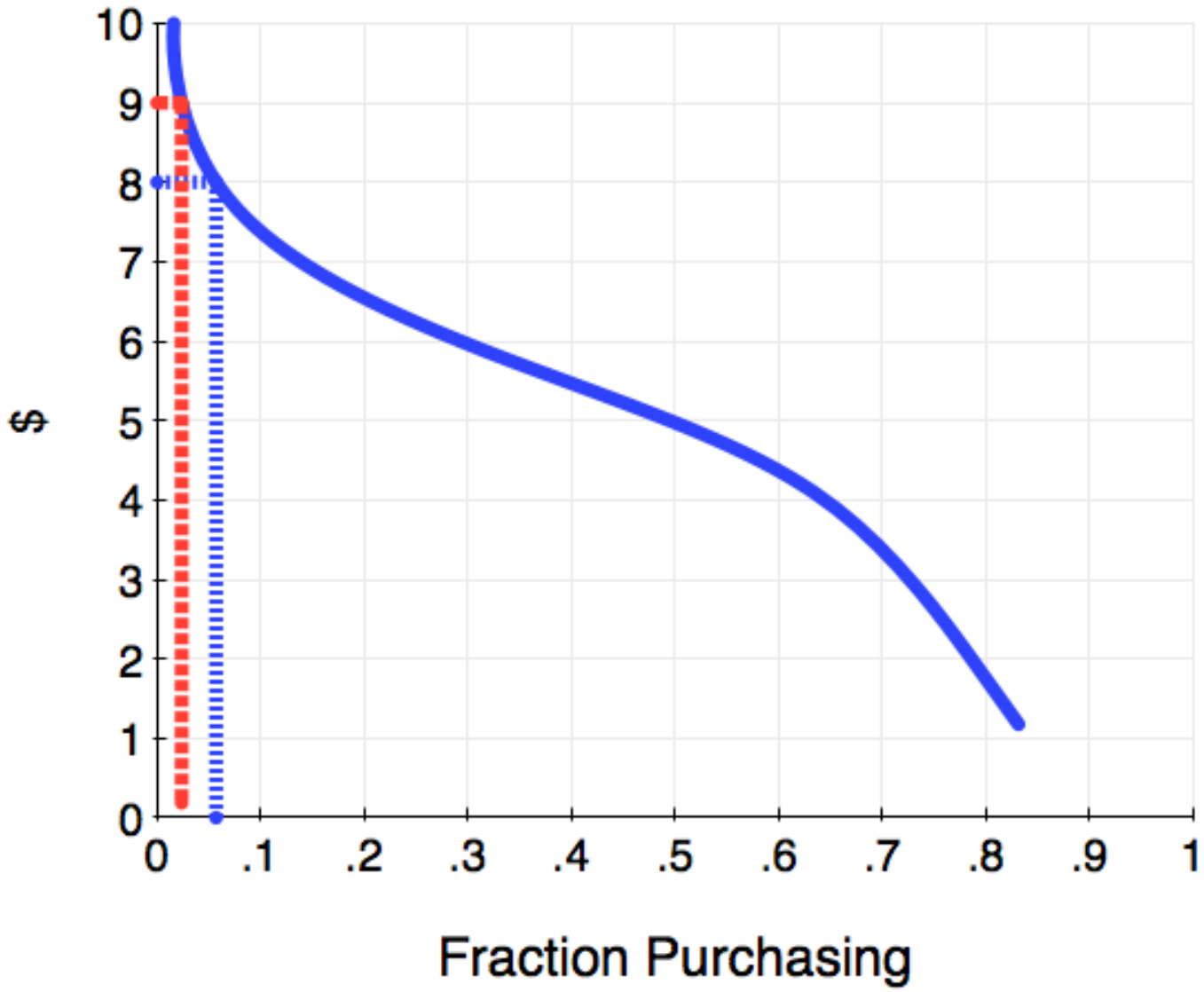
$$= \frac{-f(P)}{1-F(P)}P \tag{11}$$

- What matters for responsiveness is how big the density is at P relative to 1 minus the CDF

From $5, a $1 dollar increase in price ⇓ demand by 20%



From $8, a $1 dollar increase in price ⇓ demand by 2%



Elasticity of Demand: In words

Takeaways:

- For very homogeneous populations, you'll have very elastic demand
- If tastes are more spread out, you'll see smaller responses
- At the extreme in which everyone is the same, demand will be a step function, so there is some price above which no one will buy and below which everyone will buy.
- In this case, things will be very inelastic at high prices, but very elastic near the price, and then unresponsive at very low prices
- Thinking about consumer choice in this way will be helpful for evaluating how effective sales can be

◂ Back