

# Dividing Lines: Racial Segregation between Local Governments in U.S. Metropolitan Areas

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## Segregation and Inequality

- **Motivation:** Racial segregation of cities is an important cause of inequality in outcomes
- **Question:** Do local political boundaries in cities impact racial segregation and inequality?
  - We study racial segregation between jurisdictions (cities and school districts), i.e. “between segregation”
- **Result 1:** More between-segregated metro areas have higher achievement gaps by race and lower intergenerational mobility

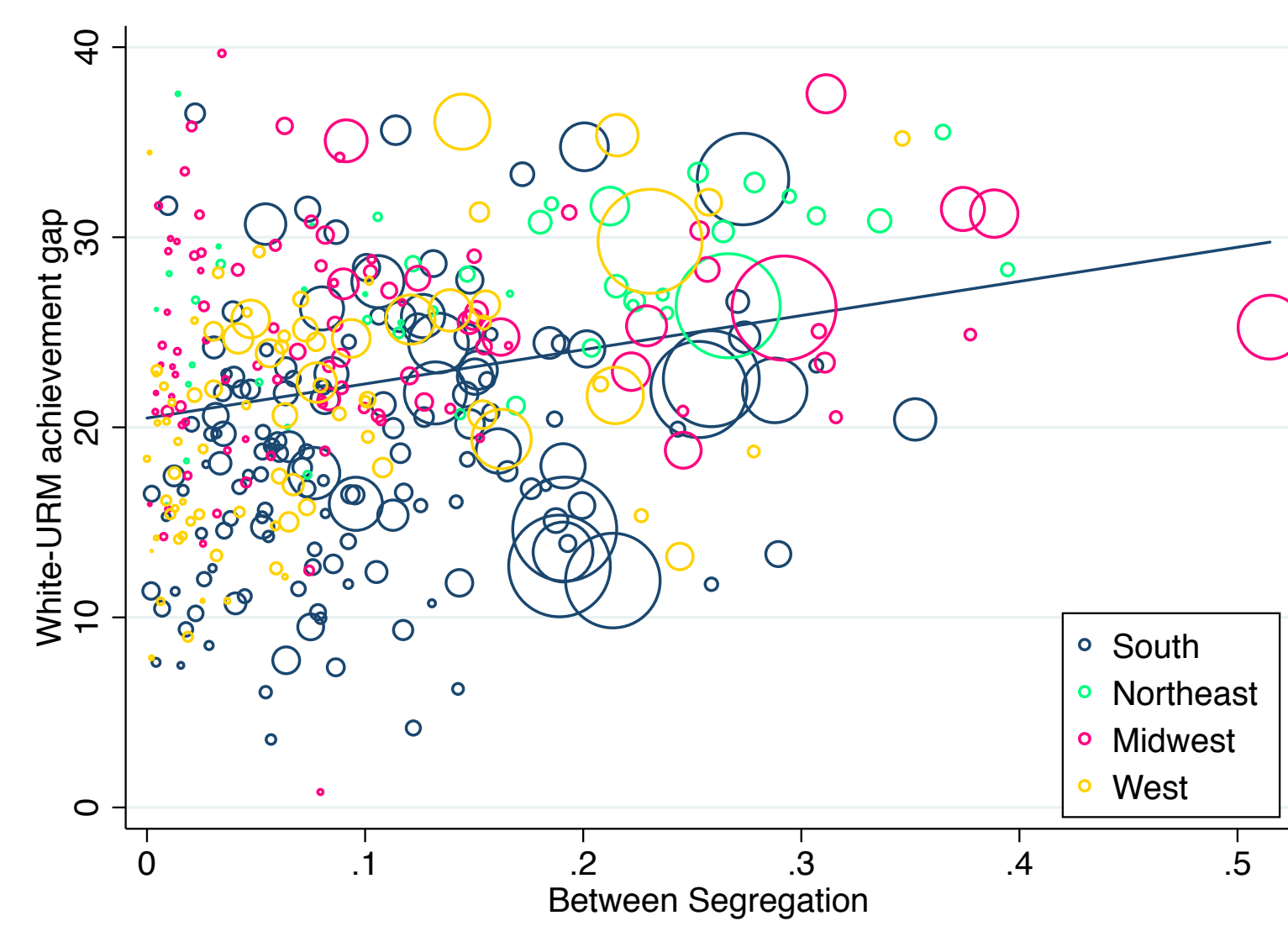


Figure 1: Between-segregation and achievement gap between white and under-represented minority (URM, black and Latino) students.

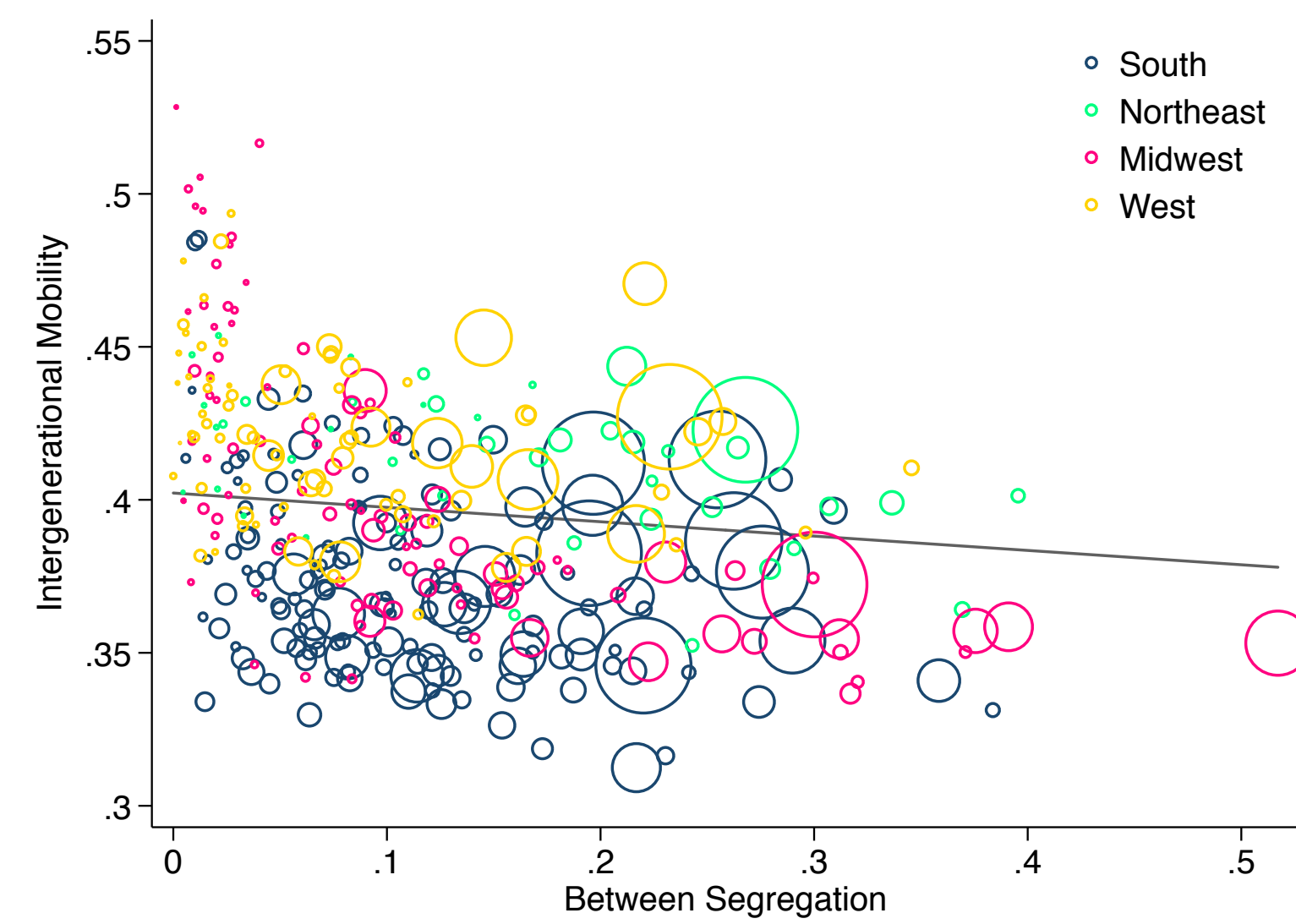


Figure 2: Between-Segregation and intergenerational mobility (Chetty et al. 2018).

## Measuring Between-Segregation

- Let  $T \in \{0, 1\}$  be indicator for minority from random draw:
  - Let  $Z$  be a  $n \times 1$  “neighborhood selector”
  - Minority neighborhood isolation is then  $E[E[T|Z]|T = 1]$
  - And segregation is

$$\eta^2 = \frac{E[E[T|Z]|T = 1] - E[T]}{1 - E[T]}$$

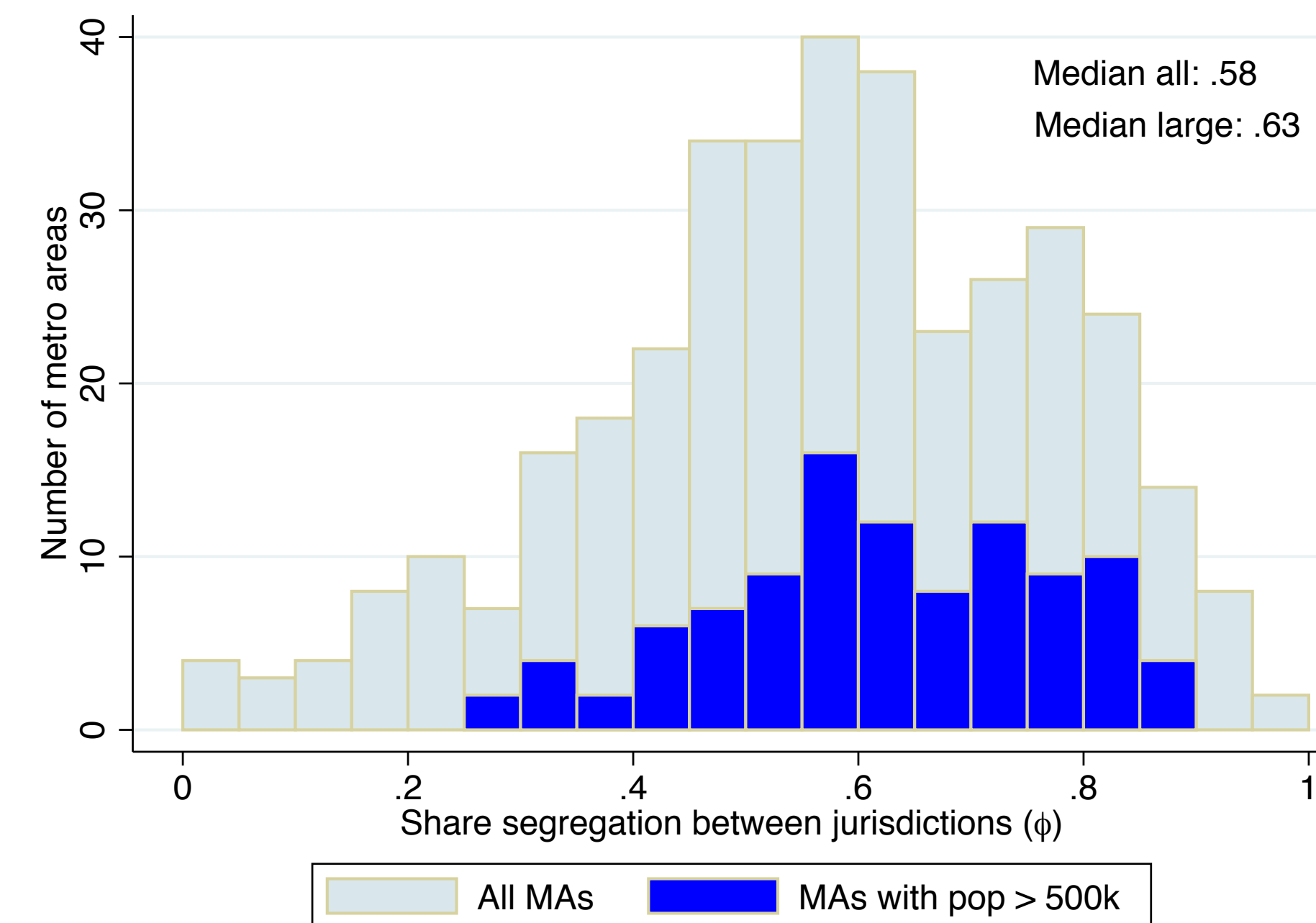
- Let  $W$  be a  $n \times 1$  “jurisdiction selector”
  - And  $E[T|W]$  is the share minority in jurisdiction  $j$
  - Jurisdictional (“between”) segregation is

$$\eta_b^2 = \frac{E[E[T|W]|T = 1] - E[T]}{1 - E[T]}$$

- Define the share of between segregation:

$$\phi = \frac{\eta_b^2}{\eta^2}$$

## Share of Total Segregation Explained by Between-Jurisdiction Segregation



## Estimating Demographic Discontinuities at Local Government Boundaries

- One of the starkest **racial borders** is in the Detroit MI metro, the boundary between the City of Detroit and Grosse Pointe Park City
- We can quantify this inequality by estimating a boundary regression discontinuity on block demographic composition
- To interpret the RD coefficient  $\alpha$ , we can use the following formula:

$$\eta_{RD}^2 = \frac{D(1-D)}{Var(T)} \alpha^2,$$

- where  $D$  is the population share on one side of the discontinuity
- The rescaled RD coefficient squared is thus a measure of segregation between the two sides

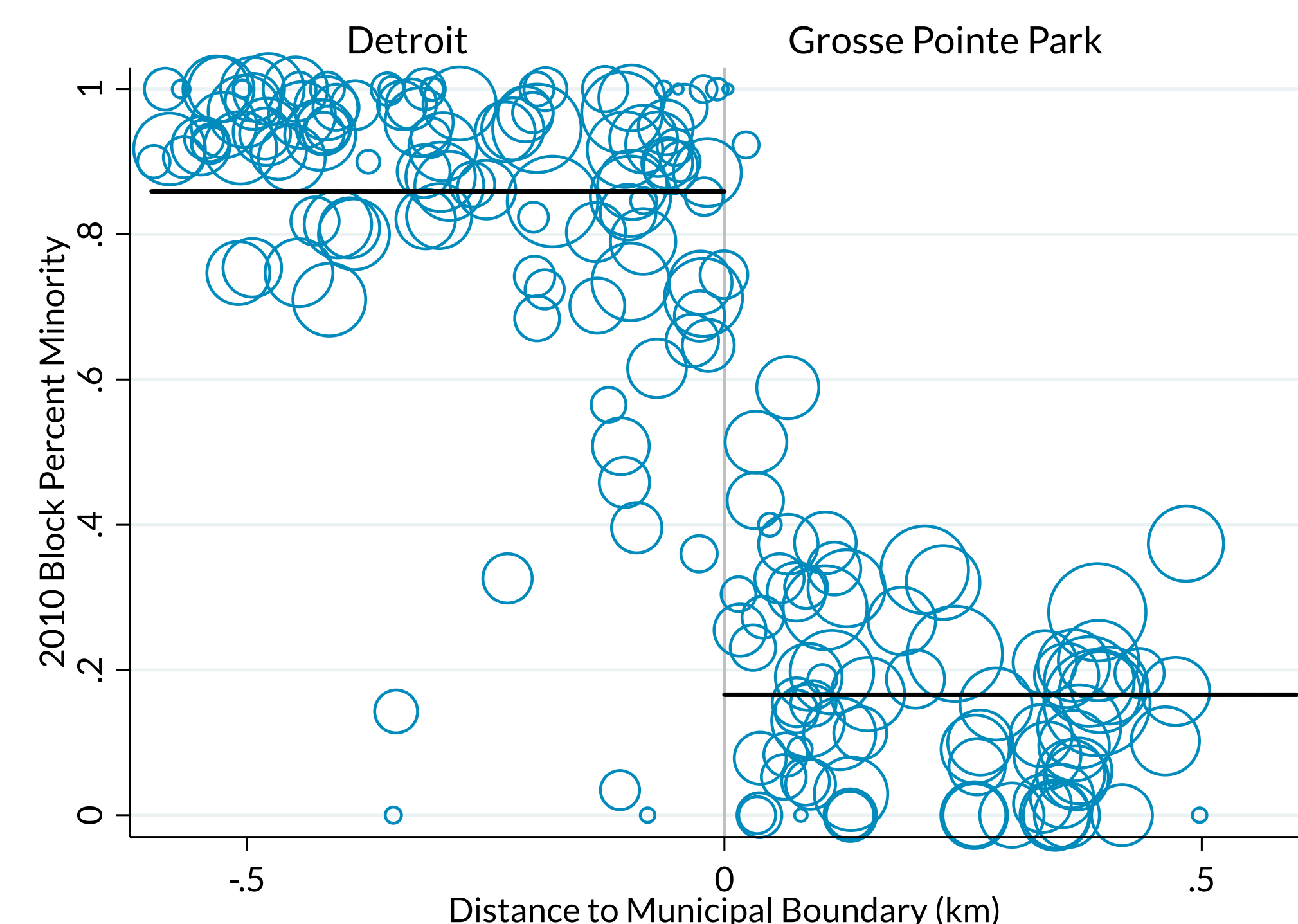


Figure 3: Discontinuity in Demographics at Local Government Boundary

## Do Local Government Boundaries Change?

- YES. While relatively rare, residential areas change **local education agency (LEA)** jurisdictions when school district mergers, secessions or annexations take place
- Between 2000-2010, AL MO, TX and TN saw substantial changes to LEA geographic jurisdictions
- Some prominent examples
  - 2006 Wilmer-Hutchins Independent School District (ISD) is shuttered by the Texas Education Agency, merged with Dallas ISD
  - 2007 Independence Public School District in MO annexes part of Kansas City Public Schools’ jurisdiction
  - 2009 Memphis City School District partial merger with Shelby County Schools territory in TN (reversed in 2011)
  - 2006 Saraland residents in AL voted to secede from Mobile County Public Schools, creating Saraland City Schools.
- We leverage these jurisdictional changes to study the impact of local boundaries on residential segregation

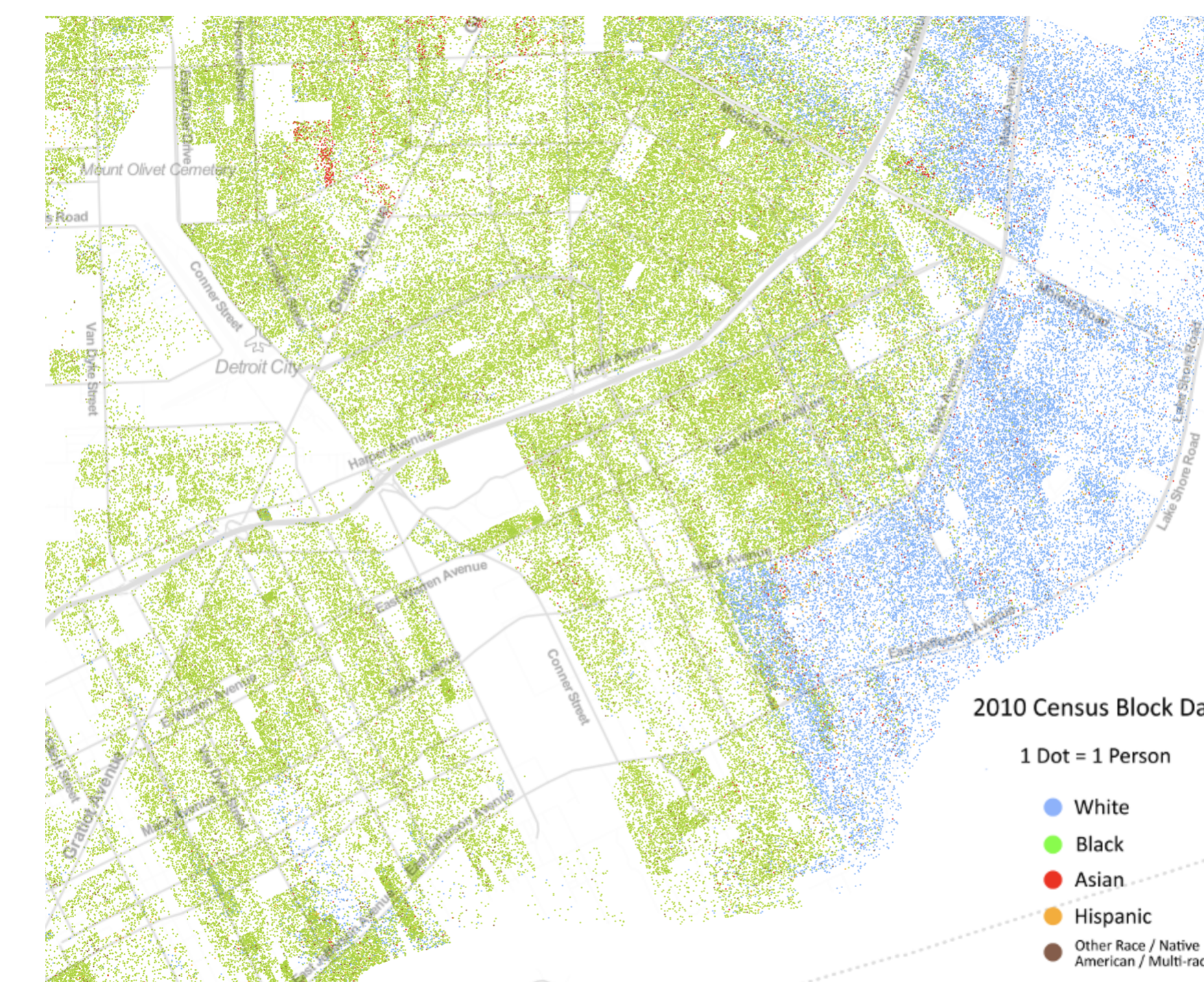


Figure 4: Racial Dot Map of Detroit (left) and Grosse Pointe Park (right)

- We estimate boundary discontinuities in demographics across all adjacent local government pairs in US metropolitan areas ( $N > 20,000$ )
- Allows us to make statistical statements about the most racially unequal “dividing lines” in the country
- In some cities, particular dividing lines seem to be key drivers of segregation, akin to “racial borders”, raising important policy considerations
- The most unequal racial borders are also linked with local discontinuities in outcomes, such as student achievement by race
- *More on this coming soon!*

## Effect of Boundary Changes on Sorting

### Data

- Using GIS software and crosswalks from NHGIS, we construct a novel panel of census blocks for the years 1990, 2000, and 2010
- Data include identifiers for the school district (LEA) that the block was part of in each time period
- Define a geographic **partition of blocks in a given LEA**:
  - (1) those near a boundary (within 500 m), categorized separately based on which adjacent district they neighbor
  - (2) those not near a boundary – the “center” of the district

### Empirical Framework

- We are interested in the impact of school district changes associated with meaningful shifts in demographics

$$Y_{ijkz} = \beta PctMinority_k^0 + X_i' \Gamma + \delta_{p(j)} + \eta_z + \epsilon_{ijkz}, \quad (1)$$

- $Y_{ijkz}$  is a 2010 demographic outcome in block  $i$  located in 2000 LEA  $j$  and partition  $p(j)$ , 2010 LEA  $k$ , and neighborhood  $z$
- $X_i$  are block demographics in 1990 and 2000

- The treatment variable of interest is  $PctMinority_j^0$ , the intended percent minority of the 2010 LEA
  - what the district’s composition would have been in 2010, had no demographic changes taken place since 2000
- FE’s ( $\delta_{p(j)}, \eta_z$ ) ensure that  $\beta$  is identified off of LEA jurisdictional changes and within-small-neighborhood comparisons

### Impact of District Composition on Block Population by Race

	(1)	(2)	(3)	(4)
<b>White</b>				
$PctMinority_j^0$	-8.715 (5.441)	-3.124** (1.257)	-3.061** (1.211)	-2.249** (1.104)
<b>Black</b>				
$PctMinority_j^0$	5.033 (3.094)	2.014*** (0.692)	1.692* (0.877)	1.627** (0.755)
<b>Hispanic</b>				
$PctMinority_j^0$	4.344* (2.491)	3.788*** (0.904)	3.297*** (1.095)	2.400** (1.069)
<b>Other</b>				
$PctMinority_j^0$	-0.074 (0.564)	-2.196*** (0.507)	-1.383** (0.552)	-1.177*** (0.447)
2000 LEA FE	X			
2000 LEA Partition FE		X	X	X
Tract FE			X	
Block-Group FE				X
R <sup>2</sup>	0.779	0.782	0.812	0.828
N	947,667	947,457	947,384	947,133

*Note:* Standard errors are clustered at the 2010 LEA level in all models. Covariates include: total population in 1990, 2000, and 2010, and lagged outcomes for 1990 and 2000. Mean demographic breakdown of blocks in sample: 35 white residents, 8 black, 24 hispanic, and 8 from other groups.

- **Interpretation:** A 50 p.p. increase in LEA exposure to minorities causes a loss of 1.1 white residents per census block, a gain of 0.8 black residents, a gain of 1.2 hispanic residents, and a loss of 0.5 residents from other groups