Can you move to opportunity? Evidence from the Great Migration *

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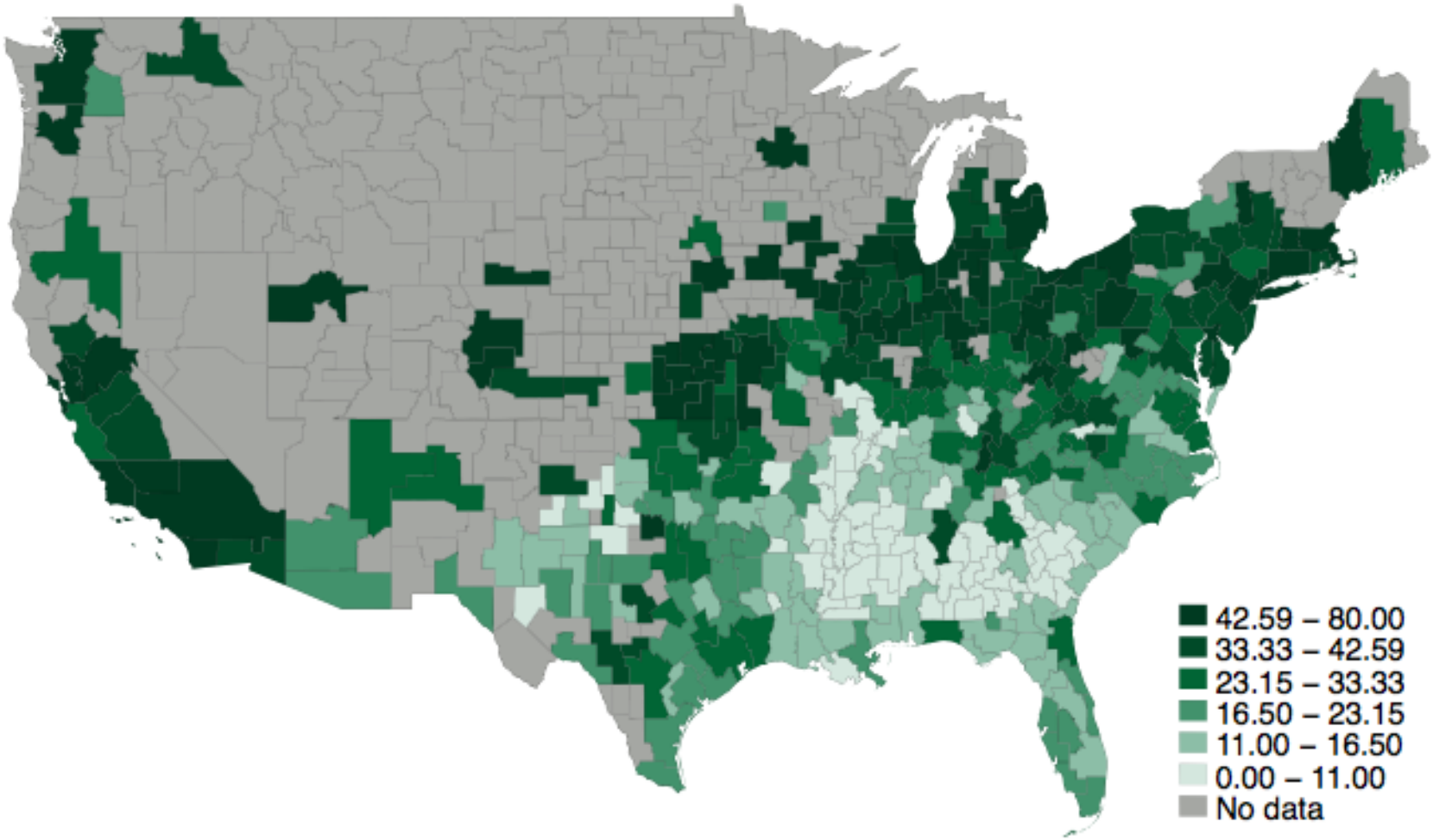
August 13, 2020

*This work has been generously supported by the Russell Sage Foundation and the Harvard University Lab for Economic Applications and Policy.

Geography of Black upward mobility: 1940



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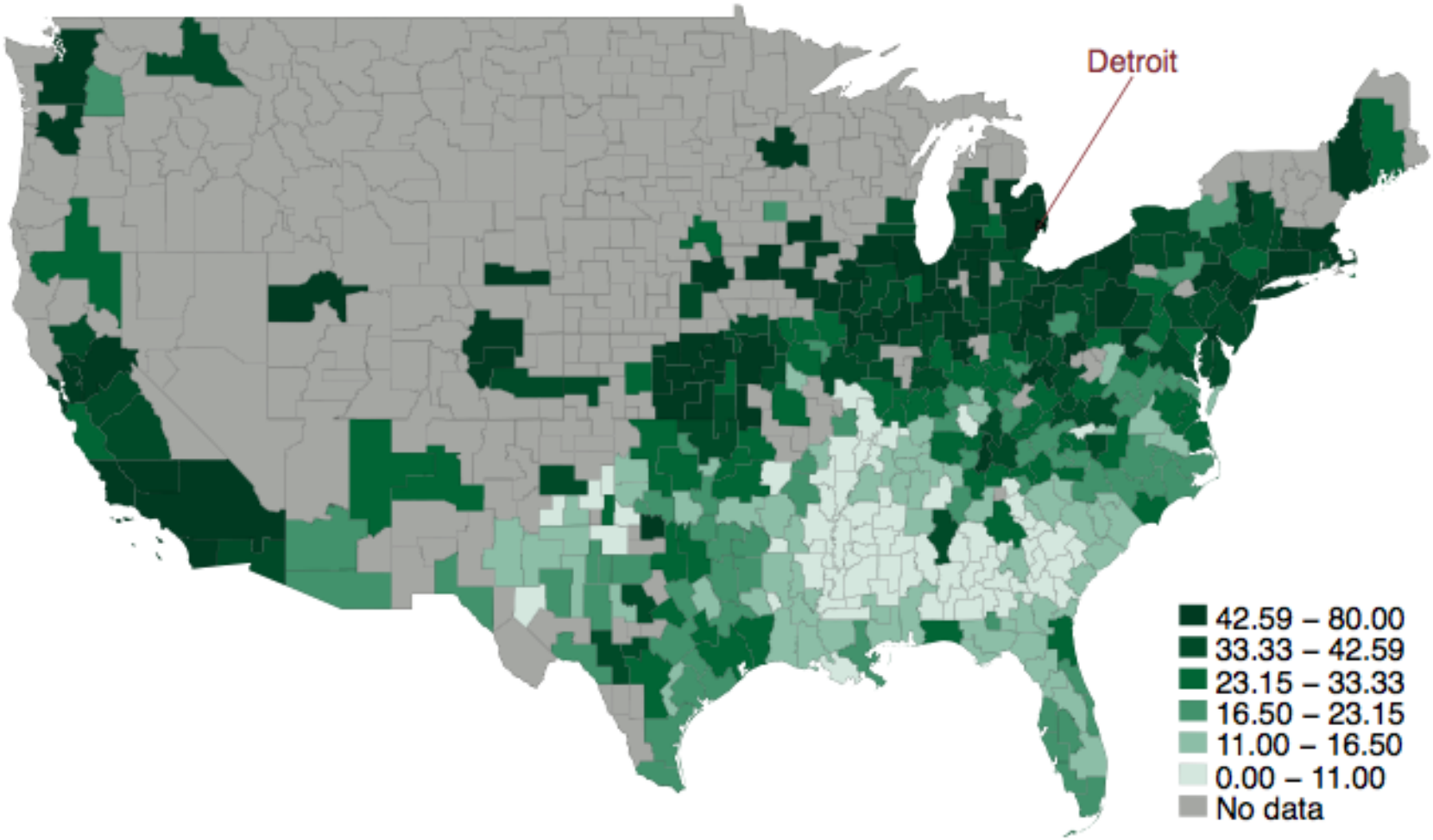

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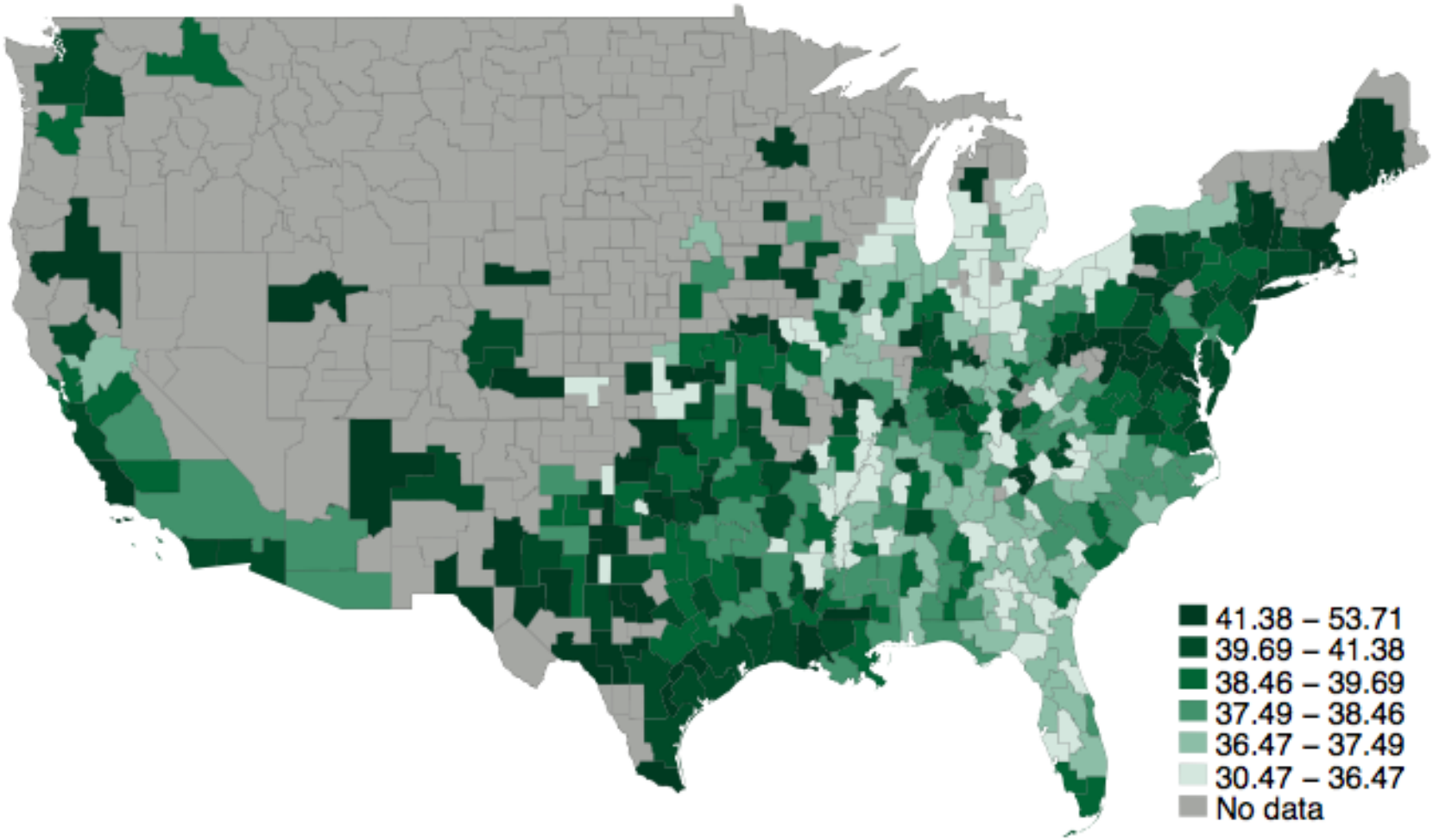

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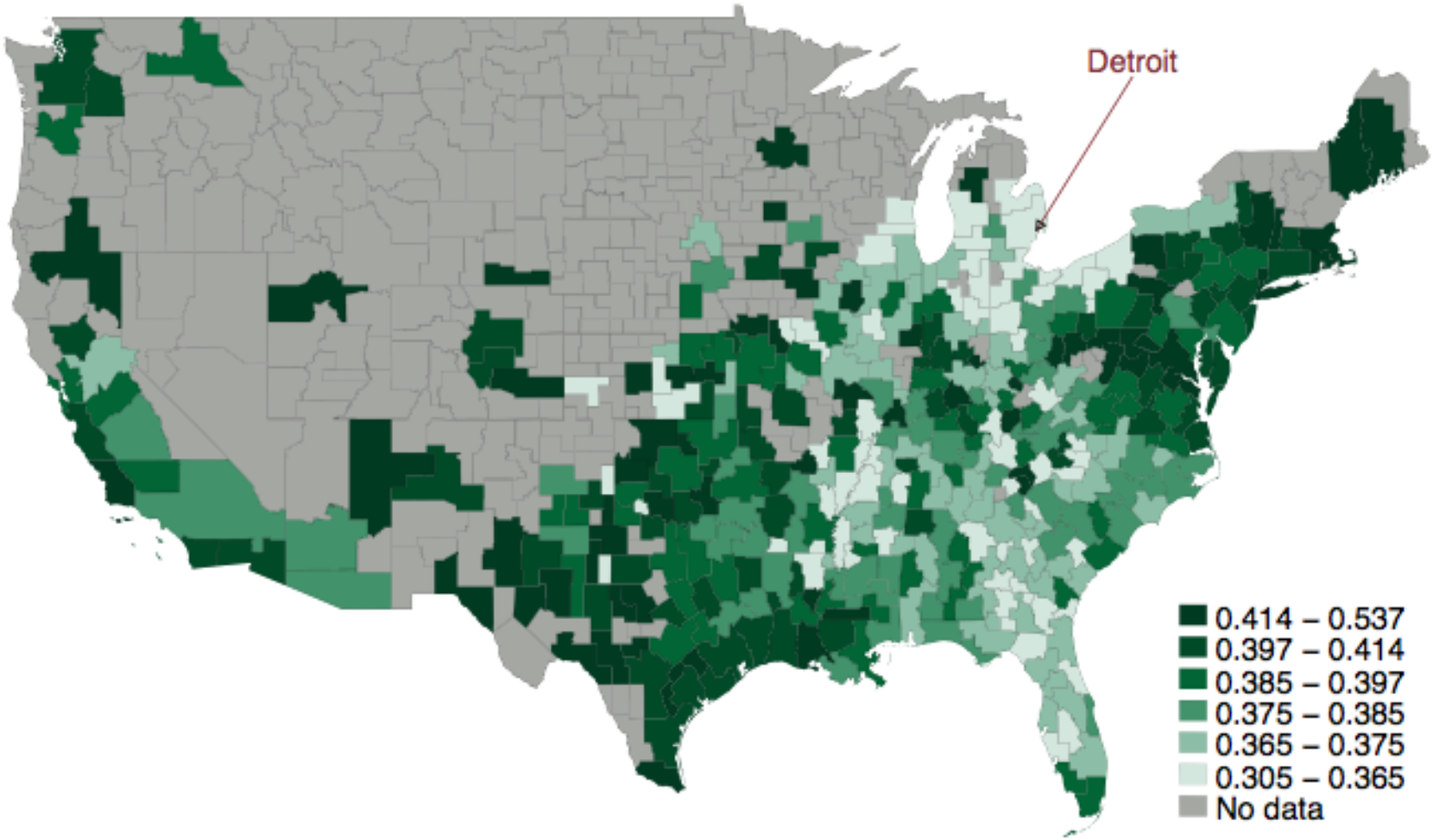

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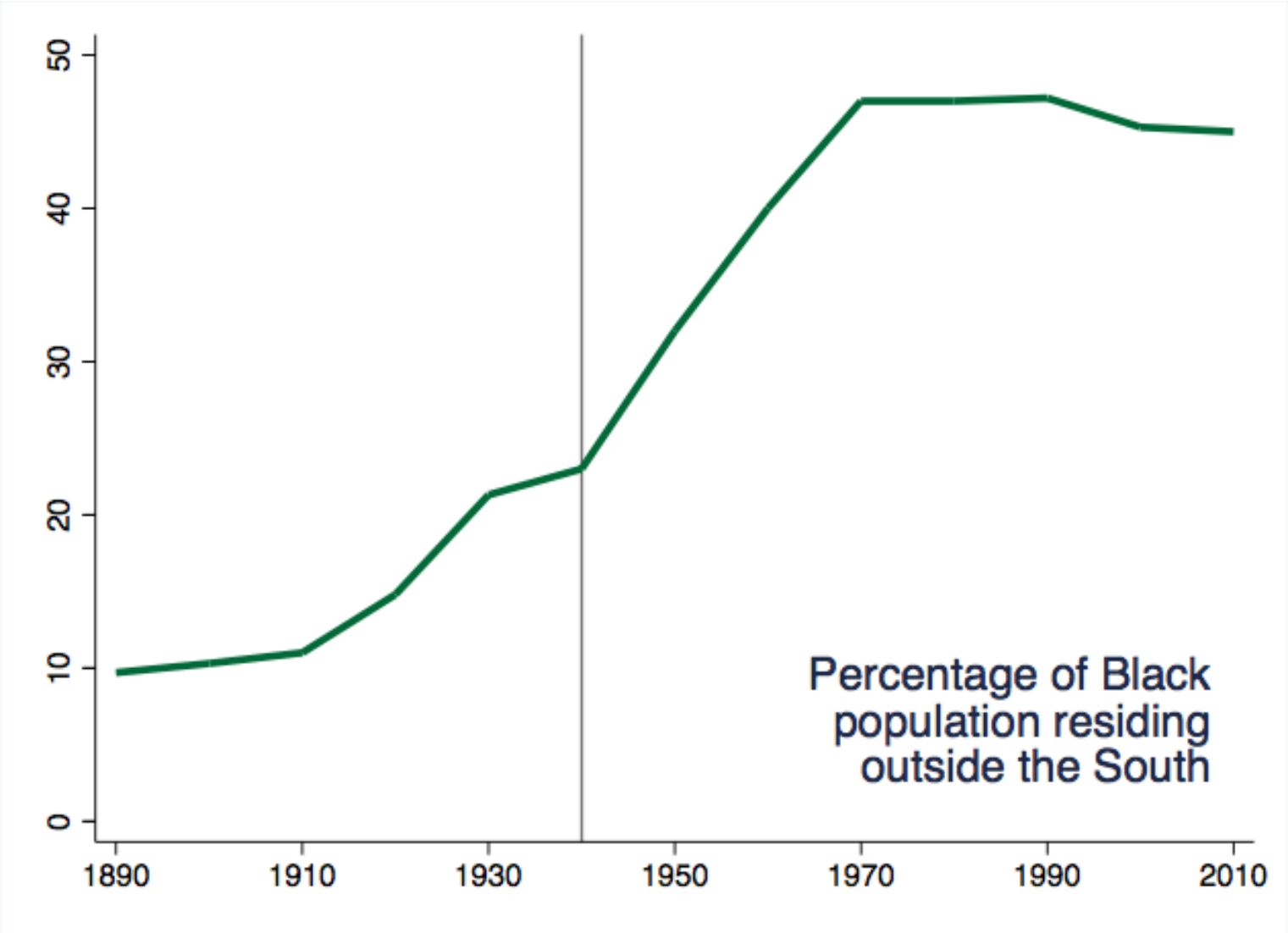

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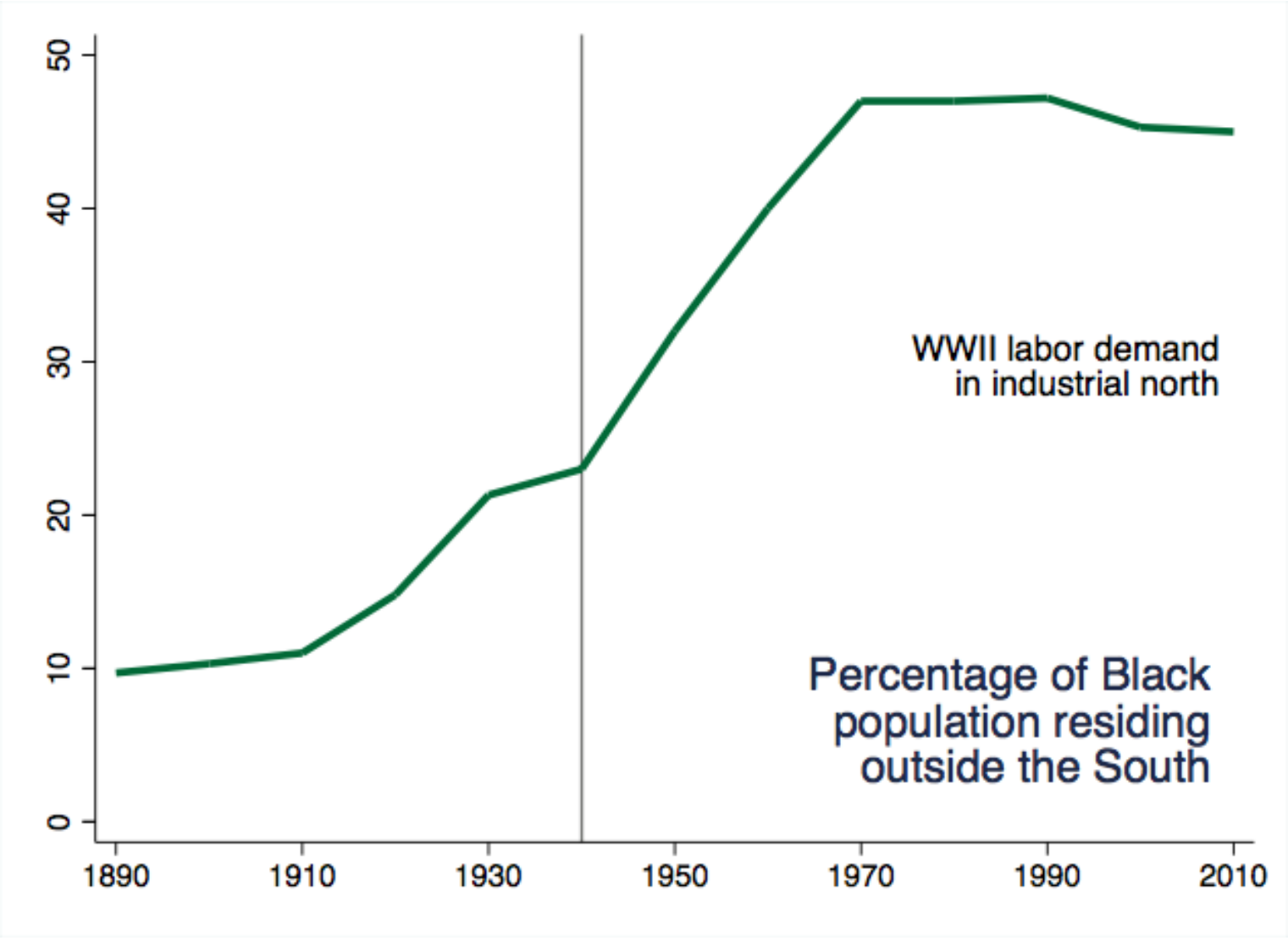

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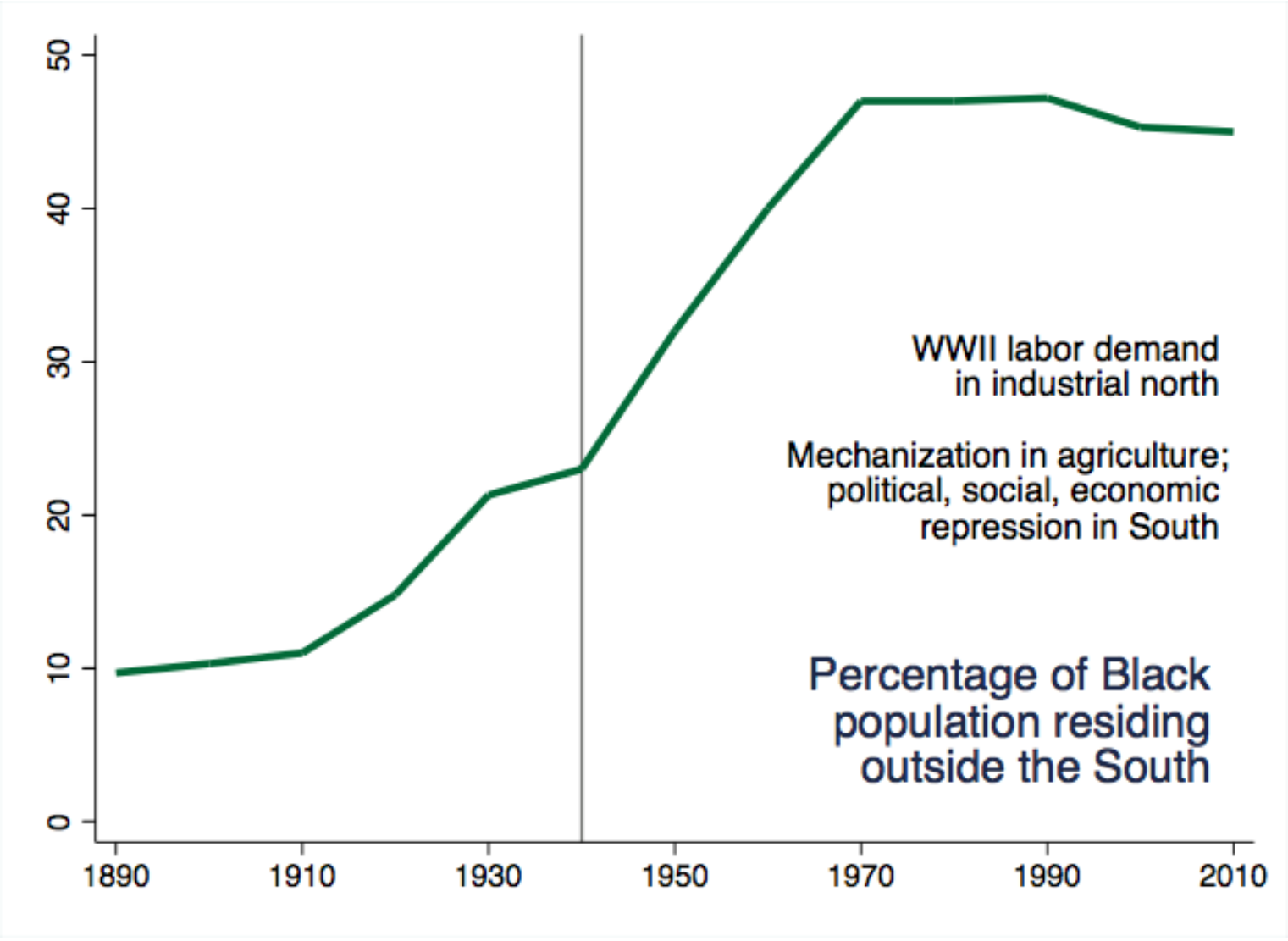

Data from US Census.

Reactions in the North

Riot against integrated federal housing project in Detroit, '42.

Source: LOC.

Question and empirical strategy

Context: Magnitude of post-1940 Black inflows transformed northern cities, plausibly altering upward mobility in the long run.

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Question: Did the Great Migration reduce the gains from growing up in northern destination cities?

Empirical strategy: Use within-North variation in Great Migration. Shift-share based instrument for 1940-1970 Black population changes in urban northern commuting zones:

- Pre-1940 Black southern migrant location choices
- Predicted county out-migration using LASSO-selected variables

Preview of findings

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   - White flight from public schools and urban neighborhoods
   - Increased investment in policing; higher crime and incarceration

Literature review

- Upward mobility, racial inequality, and neighborhood effects
  - Chetty, Hendren, Jones, and Porter (2018); Chetty and Hendren (2018a, 2018b); Ananat (2011); Andrews et al. (2017); Card et al. (2018); Chetty, Hendren, and Katz (2016); Cutler and Glaeser (1997); Graham (2016); Kasy (2015); Kling, Liebman, and Katz (2007); Massey and Denton (1990); Mazumder and Davis (2018); Ludwig et al (2012); Rothstein (2017); Wilson (1987).
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Outline

I. Historical context
II. Data on upward mobility and city demographics
III. Great Migration instrument
IV. Results
    i. Upward mobility
    ii. Local public goods and neighborhood quality
V. Conclusion

Outline

The Great Migration

Post-WWI Migrants to Chicago, on leaving the South:

- SOME OF MY PEOPLE WERE HERE.
- PERSUADED BY FRIENDS.
- FOR BETTER WAGES.
- TO BETTER MY CONDITIONS.
- BETTER CONDITIONS.
- BETTER LIVING.
- MORE WORK; CAME ON VISIT AND STAYED.
- WIFE PERSUADED ME.
- TIRED OF THE SOUTH.
- TO GET AWAY FROM THE SOUTH.

- From Isabel Wilkerson's *The Warmth of Other Suns: The Epic Story of America's Great Migration*

▸ 1940 wages

The Great Migration

"My mother was my inspiration... She was one of those 6,000,000 Black people who left the South so that her children wouldn't have to grow up and put up with what she had to grow up and put up with."

On Brown v. Board: "I was surprised. I didn't go to school in the South. I didn't know that they didn't even go to school together down there."

- *Helen Singleton, Civil Rights activist from Los Angeles*

▸ 1940 mobility

Regional patterns in Black economic progress today

"There is no region in the United States where it is better to be poor and Black compared to being equally poor and white."

- *Davis and Mazumder, 2018*

▸ Correlation White ▸ Correlation Black

Outline

Data on upward mobility

- Historical: IPUMS 1940 US Complete Count Census ("CC")
  - Universe of enumerated individuals ($N \approx 132$ million)
  - Education outcomes for teens and parents in same household
  - Location, race, and other demographics available

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  - Universe of enumerated individuals ($N \approx 132$ million)
  - Education outcomes for teens and parents in same household
  - Location, race, and other demographics available
- Modern: Chetty et al. (2018); Chetty and Hendren (2018b)
  - Income for parents and kids from US federal tax records
  - Parents and kids linked through dependent claiming
  - Upward mobility measures for 1980s birth cohorts
  - Linked to Census for information on race

Data on upward mobility

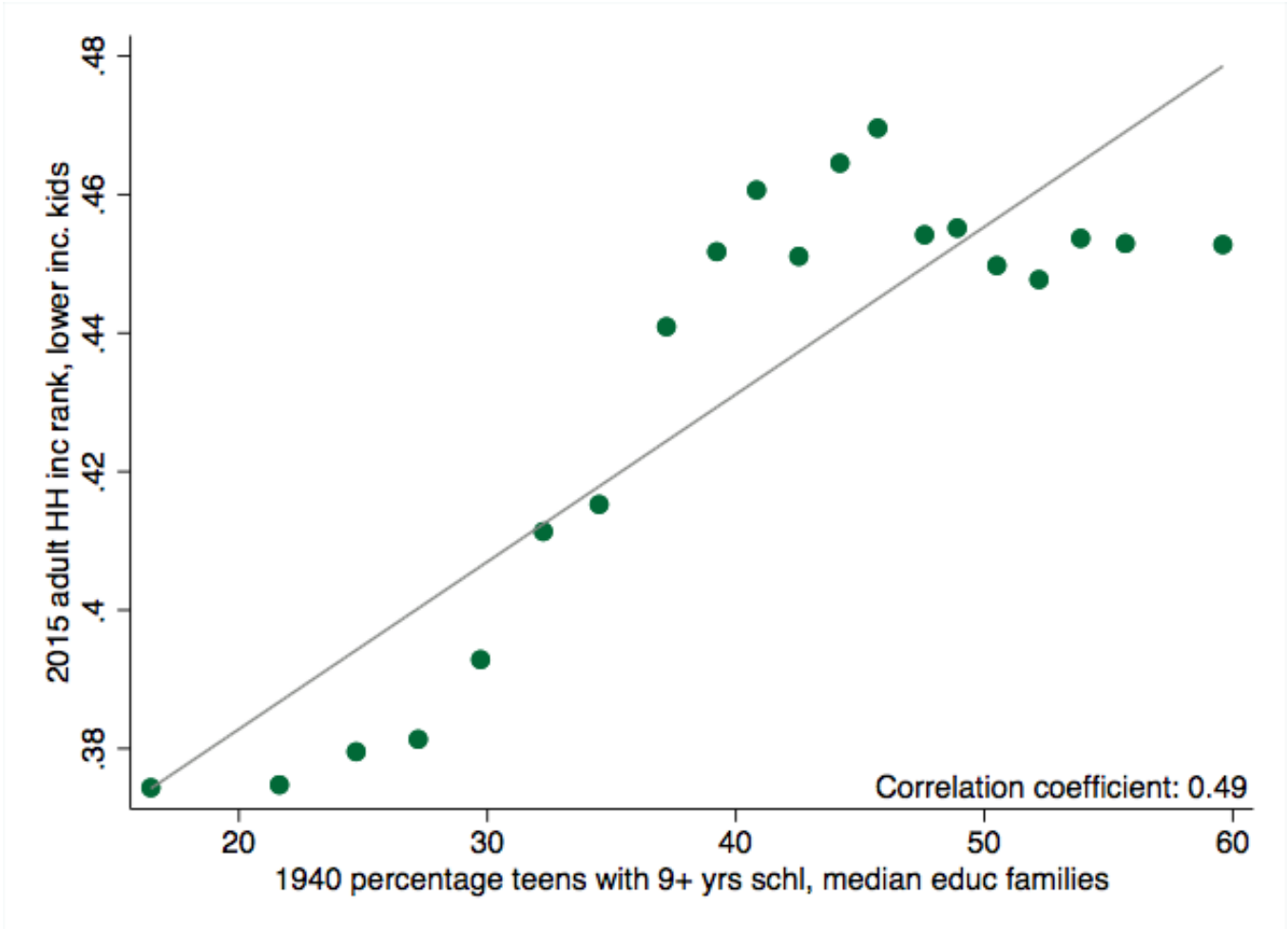
Measures:

- 1940: Fraction of teenagers in CZ with 9+ years of schooling; parent has 5-8 years of schooling

  [method similar to Card, Domnisoru, and Taylor (2018)]

- Pre-1940: School attendance of teens with low occupation score fathers
- 2000s: CZ-level estimated income rank (individual and household), for individuals from parent percentiles 25 and 75
  - Kids and parents ranked nationally within child birth cohort.
- Correlation coefficient: 0.49
  - Correlation between income upward mobility and high school graduation rates for low income families today: .65.

Relationship between 1940 and 2015 mobility measures



Sample is commuting zones in continental US. ▸ White only

Data on urban CZ demographics during Great Migration

- **Sample:** 130 non-southern, continental US commuting zones
- **Criteria:**
  1. Cities in CZ observed in City Data Books, 1944-1977
     - Includes cities with population 25,000 or more in survey year
     - 294 cities with Black population data in 1940 and 1970
  2. CZ in net-receiving state during Great Migration
     - Census division Northeast, Midwest, West plus Maryland, Delaware, and Washington, D.C.[†]
- **Coverage:** 85% of non-southern US pop (97% of non-southern Black); 58% of overall US pop (50% of Black)

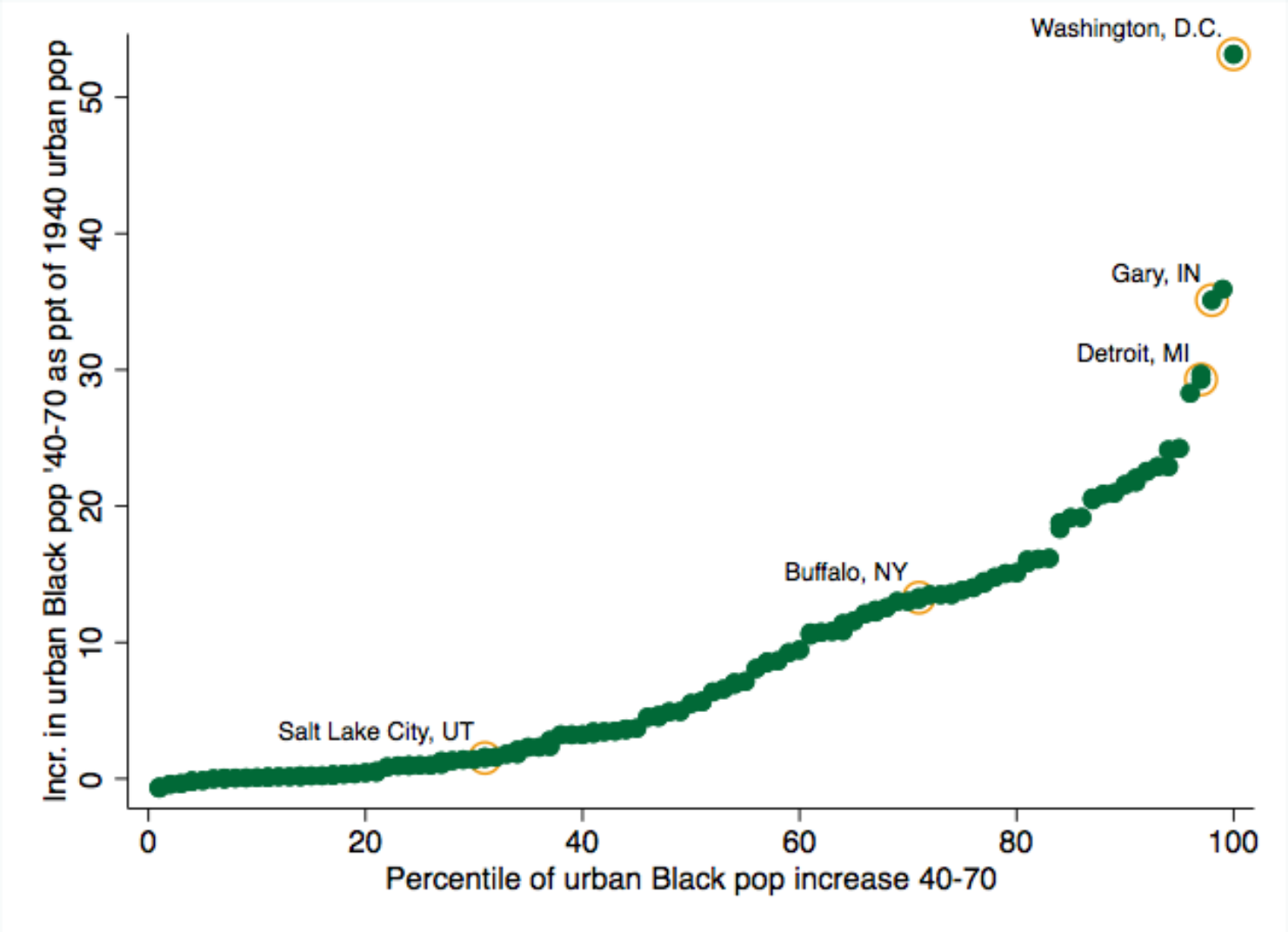
[†] DC, DE, and MD were net receivers. See Boustan (2016).

Measure of Black population change

$$\text{Black pop change}_{CZ} = \frac{b^{1970}_{\text{urban},CZ} - b^{1940}_{\text{urban},CZ}}{\text{pop}^{1940}_{\text{urban},CZ}}$$

- $b^{t}_{\text{urban},CZ}$ is the total Black population in all sample cities in commuting zone CZ in year t.
- GM_{CZ}, percentile of Black pop change is key regressor.

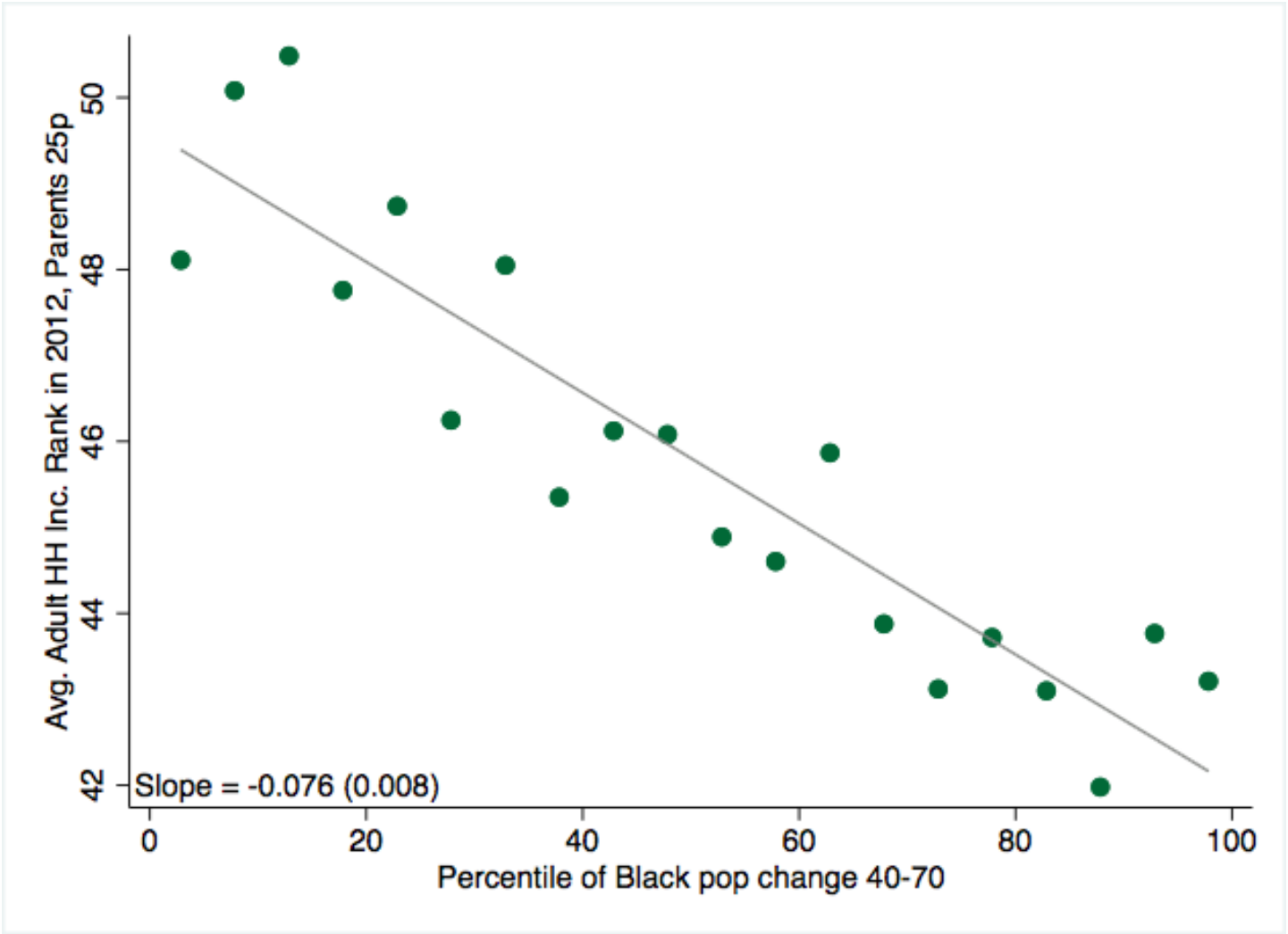
Quantile function of urban Black pop increases, 1940-1970



Northern urban CZs. *Data source*: 1940 Census and City and County Data Books 1944-1977.

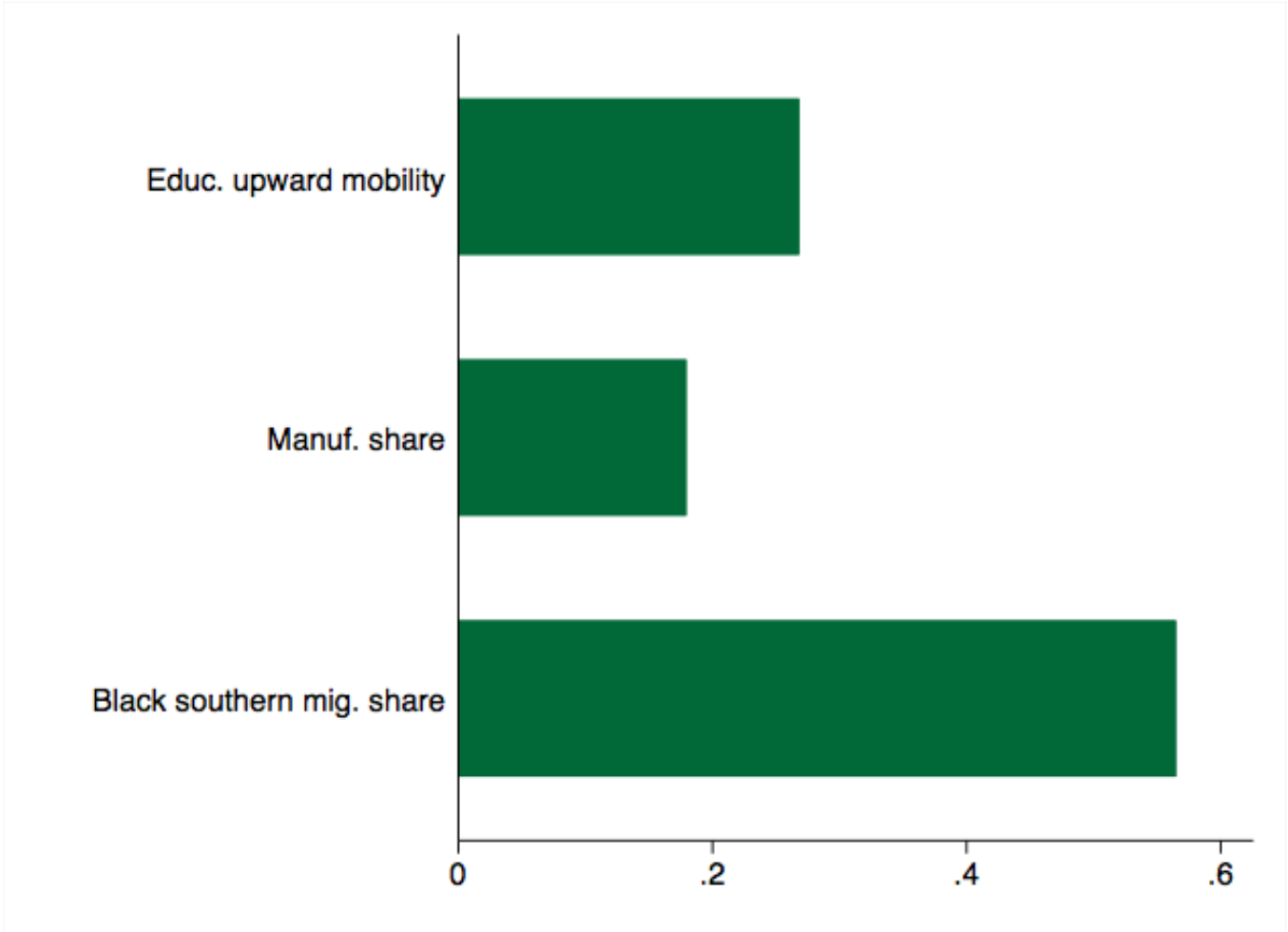
▸ Histogram

Black pop ↑ from 1940-1970 and upward mobility in 2012



Observations are northern commuting zones. Outcomes for Black and white families. *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; and City and County Data Books, 1944-1977.

1940 correlates of Black pop ↑ during Great Migration



Correlation between 1940-1970 Black population increases in sample CZs and baseline 1940 characteristics. *Data source*: IPUMS 1940 Census; City and County Data Books, 1944-1977.

Motivation for instrument

- Increases in the Black population during Great Migration not randomly assigned
- Omitted CZ characteristics may drive increases in Black population and changes in upward mobility

Outline

Heuristic definition of Great Migration shift-share instrument

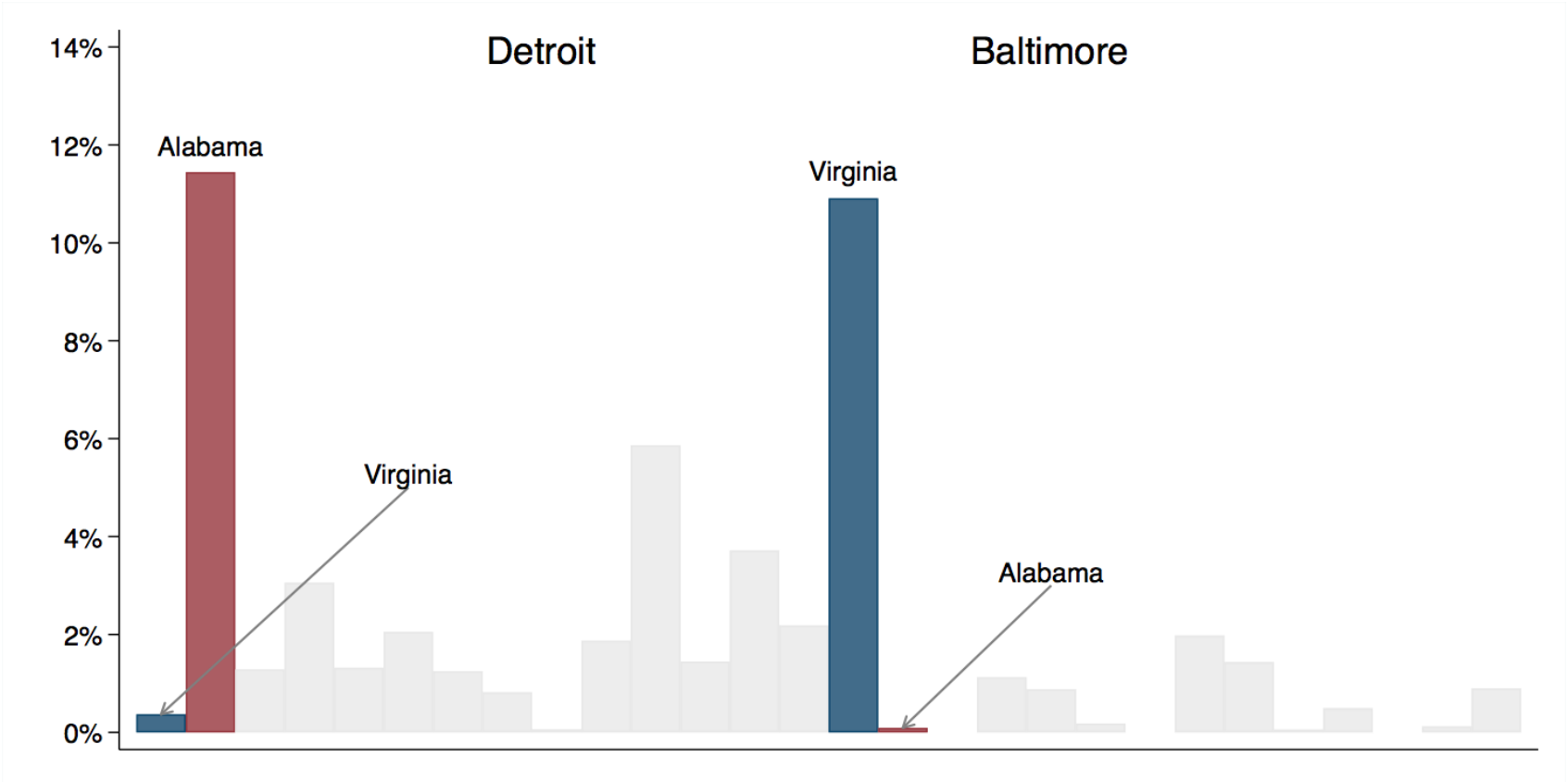
Boustan (2010) adapted shift-share instrument (Altonji and Card, 1991; Card 2001) to Great Migration context:

$$\text{Pred Black Pop} \uparrow = \overbrace{\text{Historical settlement}}^{\text{“Shares”}} \times \overbrace{\text{Predicted migration}}^{\text{“Shifters”}}$$

Instrument intuitively combines

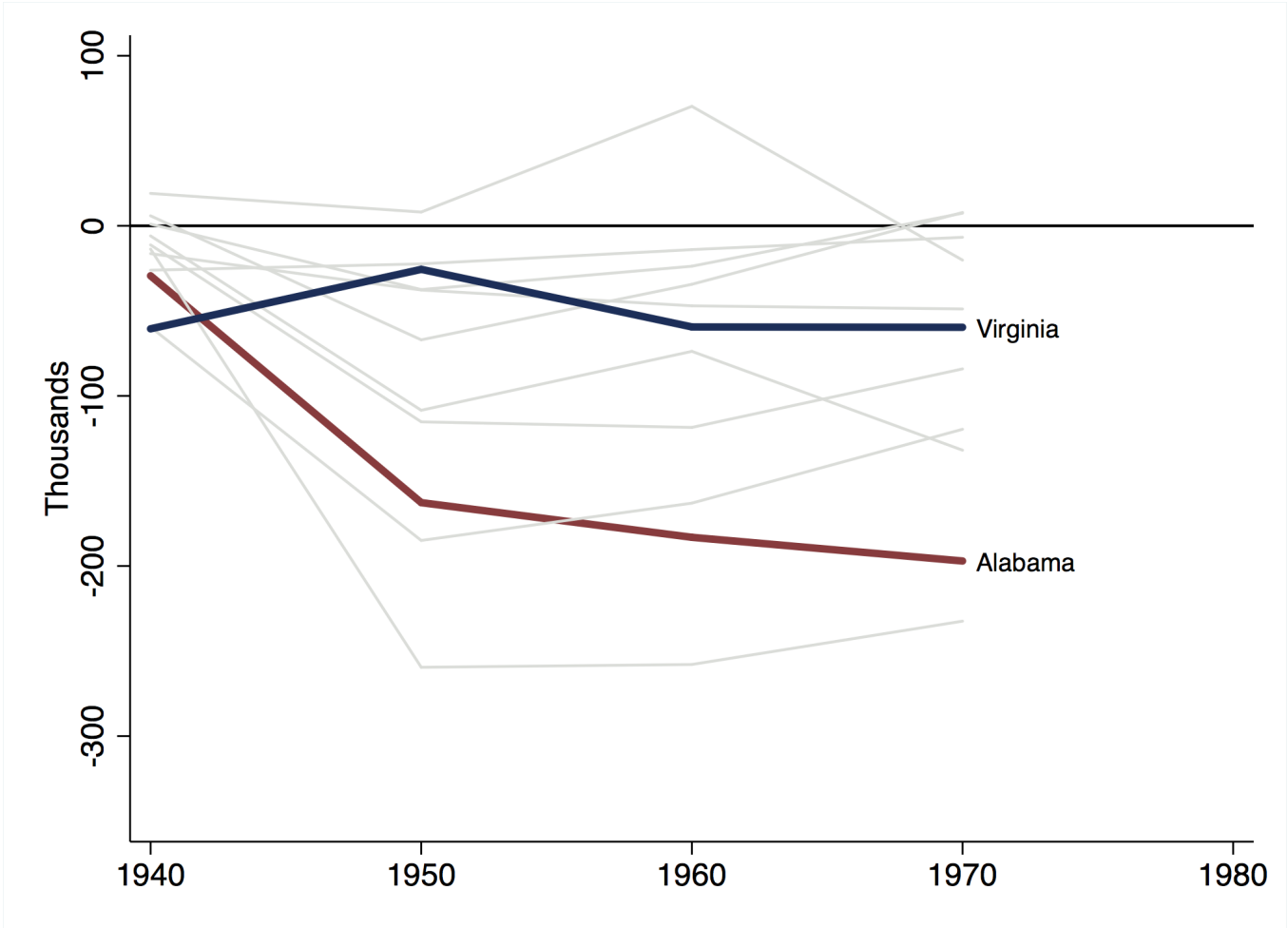
1. Distinctive southern migrant composition in northern cities
2. Variation in southern state net-migration flows

Distinctive southern migrant composition in northern cities



Migration weights for ∼320,000 Black respondents who list southern county of residence in 1935 ≠ current county. Weight shown for largest county by southern state (e.g., Jefferson County, AL and Richmond City County, VA). *Data source*: IPUMS 1940 complete count census.

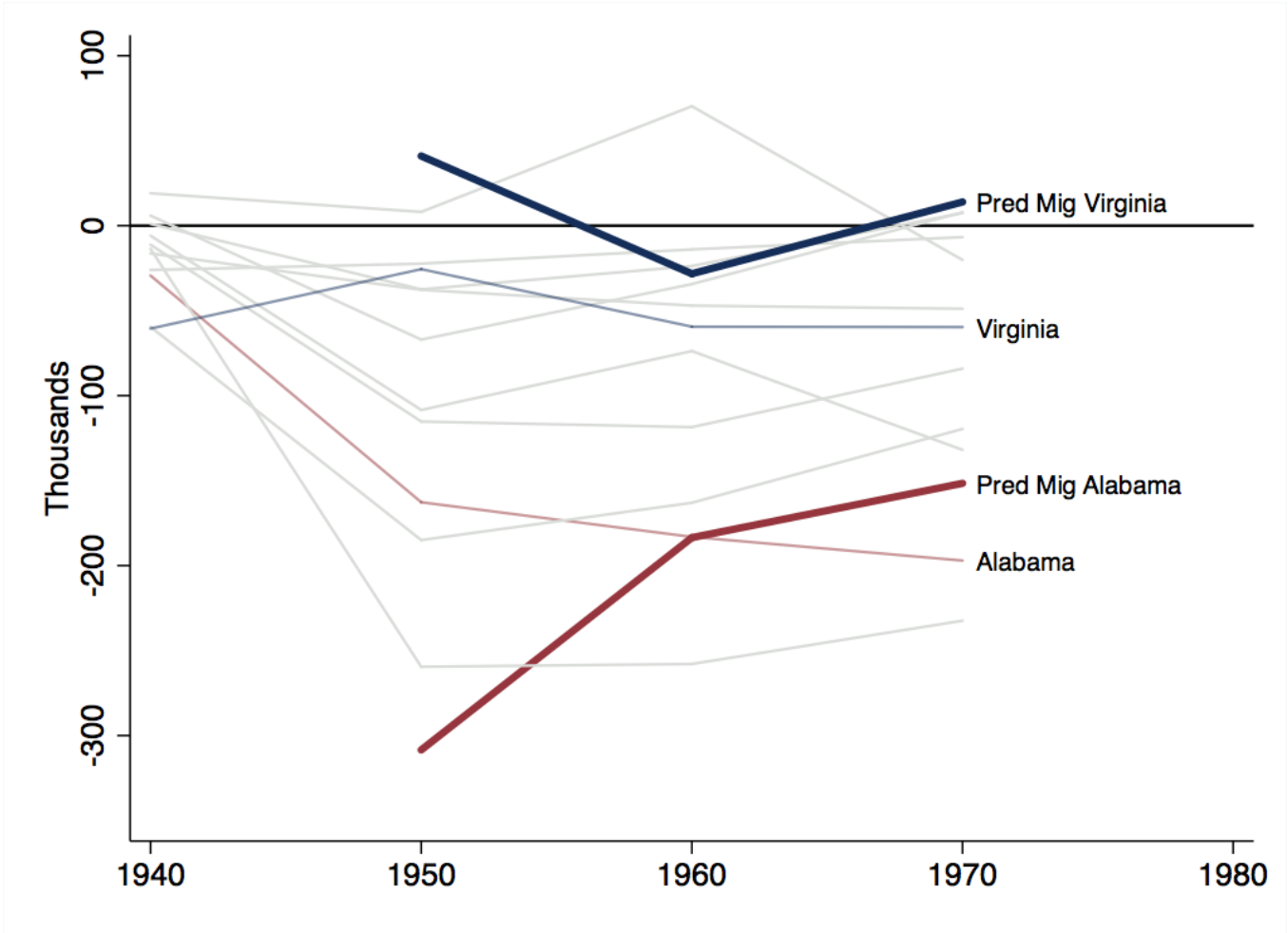
Variation in southern state net-migration flows



Southern net-migration estimates (1000s). *Data source*: Foukas et al. (2018); Boustan (2016).

Variation in southern state net-migration flows

Use "push" factors.



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New version of instrument for Black pop ↑ during GM

Percentile of predicted Black pop change from 1940 to 1970, where

$$\text{Pred Black Pop} \uparrow = \sum_{j \in S} \sum_{c \in CZ} \omega_{jc}^{1935-1940} \times \hat{m}_j^{1940-1970}$$

where

- $\omega_{jc}^{1935-1940}$ is share of recent Black migrants from southern county j living in northern city c in 1940
- $\hat{m}_j^{1940-1970}$ is total predicted 1940-1970 net-migration from j

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With following features:

1. Shares ω at southern county, not state, level ($|S| \sim 1200$): Universe of 1935-1940 Black southern migrants (1940 CC)
2. Predicted county migration $\hat{m}$ using Post-LASSO ▸ Details

Intuition:
Instrument modifies ranks using only southern variation in northern Black population change

Identification condition

Conditional on baseline upward mobility and other covariates, Great Migration shock ($\hat{GM}_{CZ}$) to location CZ must be orthogonal to omitted variables (ε_{CZ}) that also impact upward mobility in CZ:

$$\mathbb{E}[\hat{GM}_{CZ} \cdot \varepsilon_{CZ} | \mathbb{X}_{CZ}] = 0$$

Baseline 1940 covariates $\mathbb{X}_{CZ}$ include:

- Educational upward mobility
- Manufacturing share
- Demand for southern Black labor[‡]
- Census division fixed effects

Examples of ε_{CZ}: pre-1940 educational upward mobility; median education levels in 1940. ▸ Bartik Debate

[‡]Defined as 1935-40 Black southern migrant share of 1940 urban population.

Placebo test: No effect of Great Migration on pre-1940 upward mobility

Table: Regression of $\hat{GM}$ on pre-period outcomes

	Fraction of teens with low occ. score fathers attending school			Median adult education
	1920	1930	1940	1940
$\hat{GM}$	0.011	0.023	0.018	-0.013
	(0.024)	(0.029)	(0.015)	(0.009)
Baseline mean	65.477	74.912	80.676	27.355
Std Dev	7.425	8.674	5.710	2.863
Observations	130	130	130	130
Baseline Controls	Y	Y	Y	Y

Data from IPUMS Complete Count Censuses 1920-1940. Sample for school attendance is 14-17 year old boys and girls with fathers who have below median occupation scores. Last column is weighted county-average median educational attainment of adults at the CZ level.

Empirical specification

$$\bar{Y}_{p,CZ} = \alpha + \beta GM_{CZ} + \mathbb{X}'_{CZ}\Gamma + \varepsilon_{CZ}$$

$$\text{First Stage: } GM_{CZ} = \gamma + \delta \hat{GM}_{CZ} + \mathbb{X}'_{CZ}\mu + \epsilon_{CZ}$$

- $\bar{Y}_{p,CZ}$: Mean adult inc. rank for kids, parents at percentile p
- GM_{CZ}: Pctile of Black pop. $\uparrow$, 1940-1970 (30 pctile $\approx$ 1 s.d.)
- $\mathbb{X}_{CZ}$: Baseline 1940 controls (including 1940 upward mobility)

First stage F-stat $= 15$. ▸ Graph

Outline

Results on upward mobility

1. Did the Great Migration reduce upward mobility in the North?

Selection versus location

Children's outcomes conditional on parent income rank p are function of location and unobserved family characteristics:

$$y_{ipc} = \mu_{pc} + \theta_{ipc}$$

Average upward mobility in a commuting zone:

$$\bar{Y}_{p,cz} = \mu_{p,cz} + \bar{\theta}_{p,cz}$$

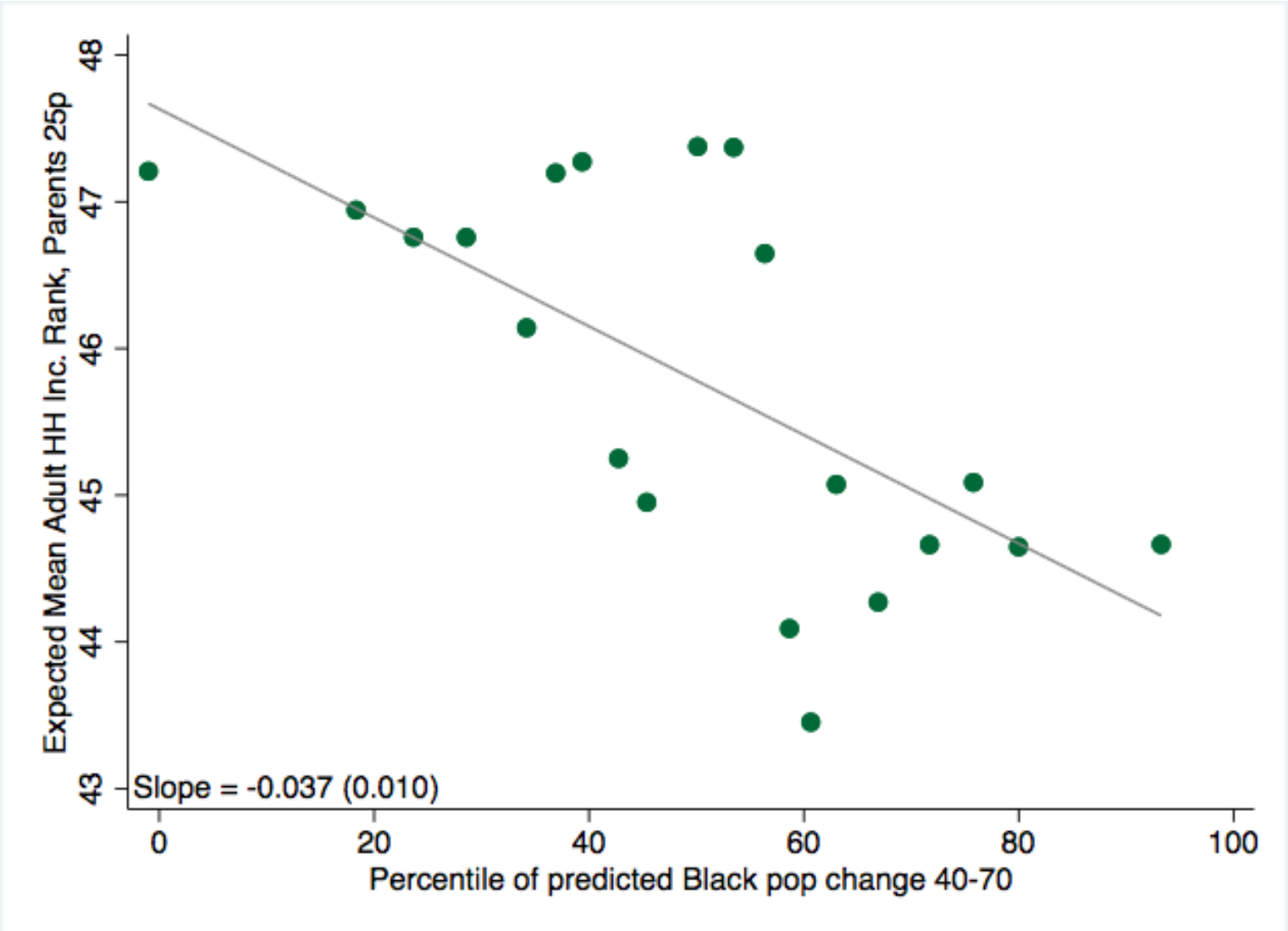
Examples of θ:

- Race: Black men from same census tract as white men have worse outcomes (Chetty, Hendren, Jones, and Porter, 2018)
- Differing propensity to invest in children's human capital

Examples of μ:

- Local public goods, schools, neighborhood quality, peer effects

Reduced upward mobility ($\bar{Y}_{p25}$) in Great Migration CZs



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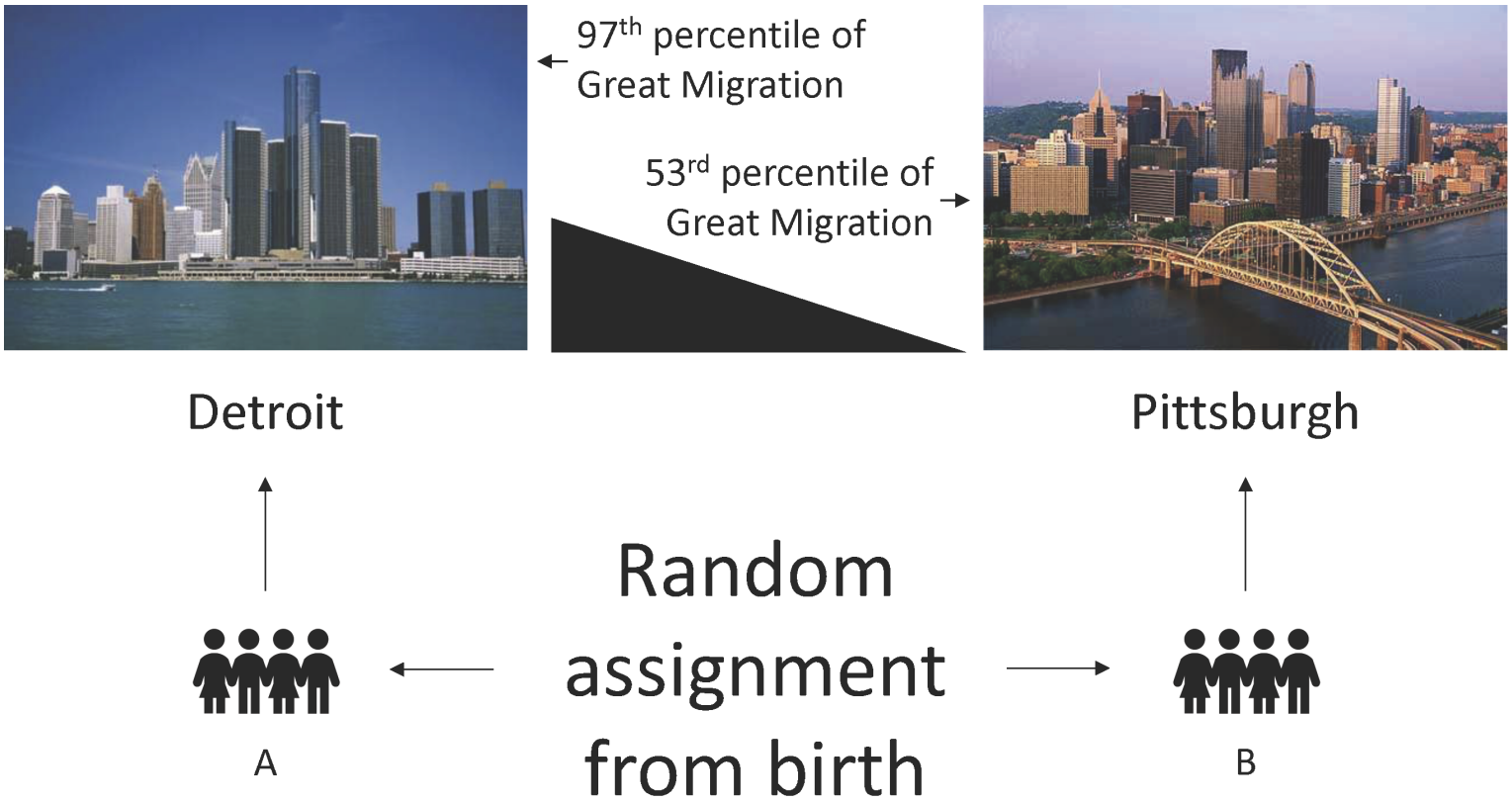
Isolating impact of Great Migration on locations

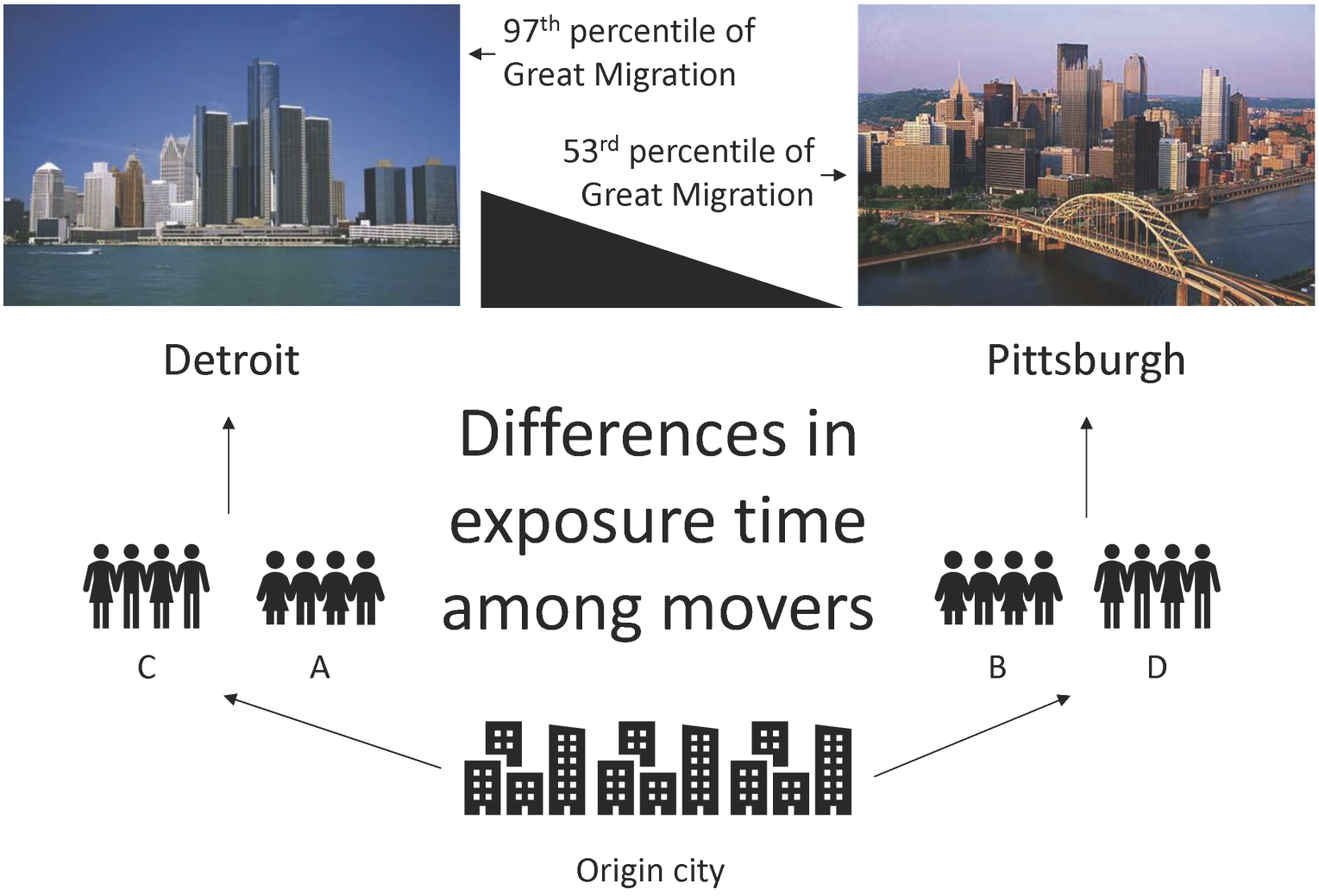
Ideal experiment:



- Prediction: Adult income A $<$ B.

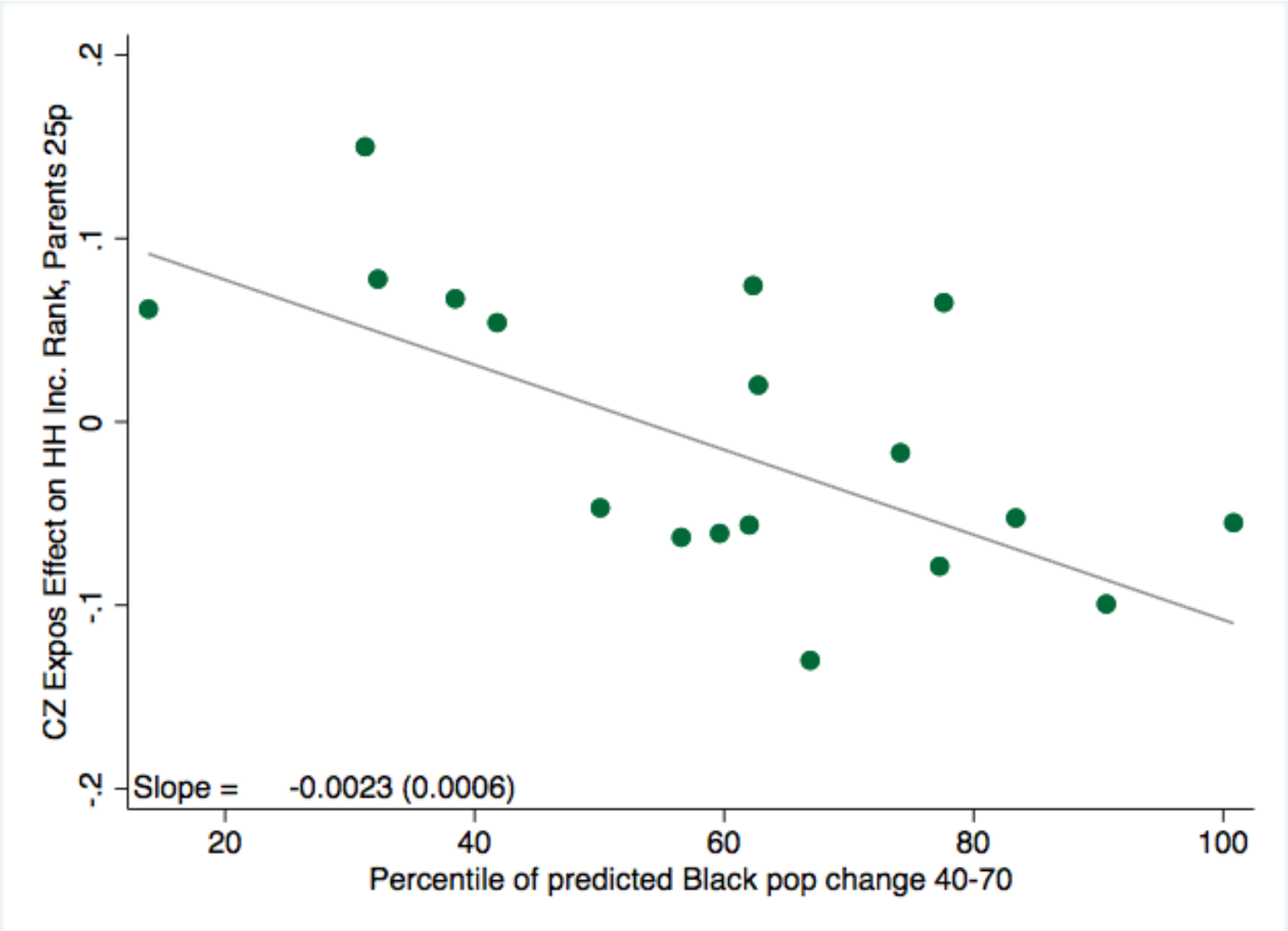
Isolating impact of Great Migration on locations

Approximating ideal experiment:



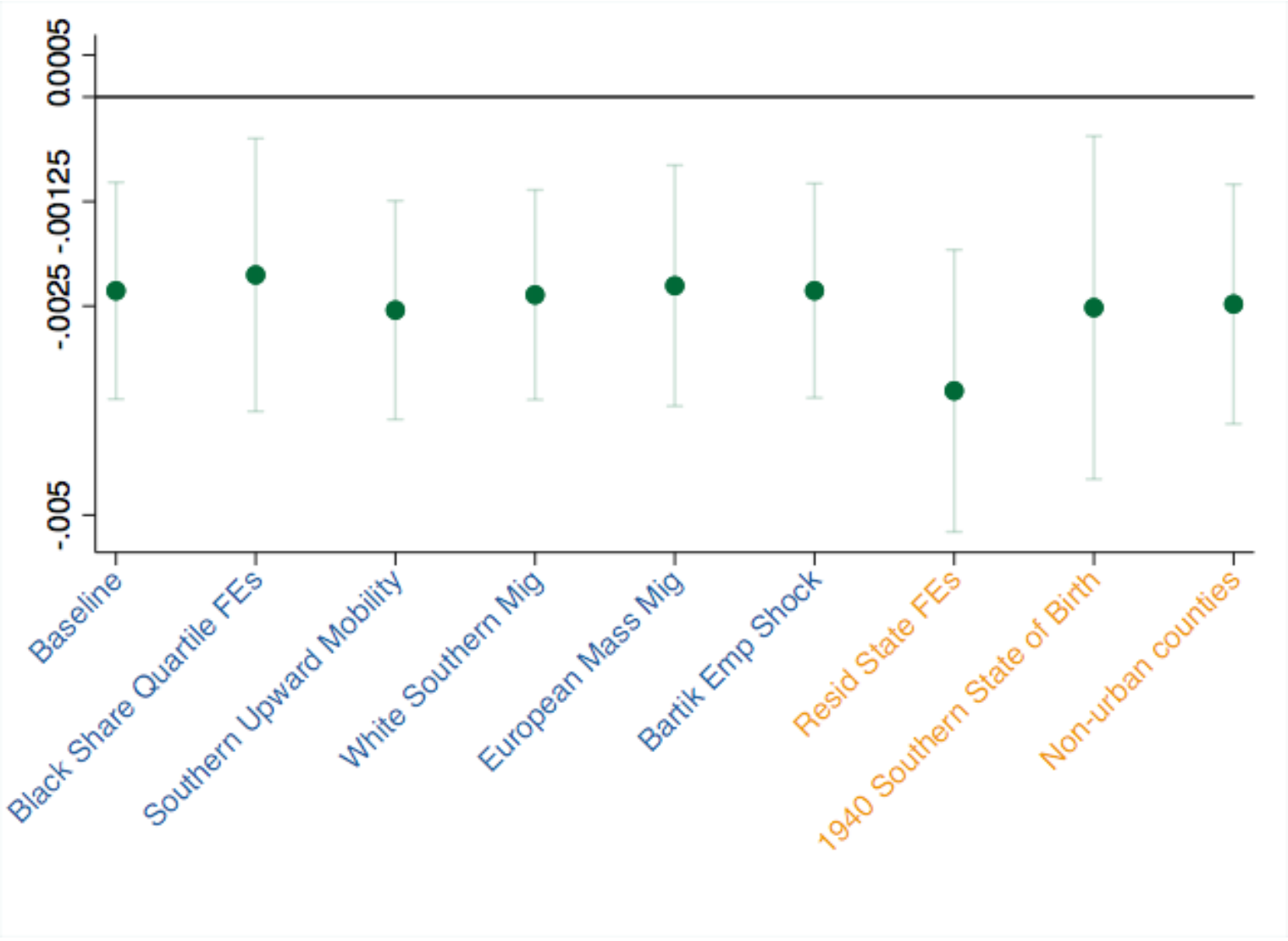
- (C-A) > (D-B): Exposure to Detroit worse than to Pittsburgh.

Reduced childhood exposure effects in Great Migration CZs



▸ Notes

Robustness



Alternative baseline controls Different versions of the instrument

Contribution of selection vs. location-based channels

Comparing GM impact (IV) on upward mobility for low income families using CZ exposure effects (μ) vs. average upward mobility ($\bar{Y} = \mu + \bar{\theta}$), assuming full childhood exposure.

Multiplier	μ	$\bar{Y}$
20	**-5.1**	-3.6
15.52	**-3.9**	-3.6

- Multiplier adjusts for cumulative effect of full childhood exposure to a location under different assumptions.

▸ Hockey Stick ▸ Visual

- No evidence that selection drives effect of Great Migration.

-3.9 percentile points $\sim$ 12% drop in income.

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   - 1 s.d. $\uparrow$ lowered average income rank of individuals from low income families by 3.6 percentiles ($\sim 11\% \downarrow$ income)
2. Is the channel selection (Δ average child) or changes in locations (e.g., local public goods and neighborhood quality)?
   - Random child growing up in Great Migration CZ has lower income as an adult. 1 s.d. $\uparrow$ shock $\implies$ 3.9 percentiles $\downarrow$ in income rank ($\sim 12\% \downarrow$ income)

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   - 1 s.d. $\uparrow$ lowered average income rank of individuals from low income families by 3.6 percentiles ($\sim 11\% \downarrow$ income)
2. Is the channel selection (Δ average child) or changes in locations (e.g., local public goods and neighborhood quality)?
   - Random child growing up in Great Migration CZ has lower income as an adult. 1 s.d. $\uparrow$ shock $\implies$ 3.9 percentiles $\downarrow$ in income rank ($\sim 12\% \downarrow$ income)
3. Whose upward mobility was affected by the Great Migration?

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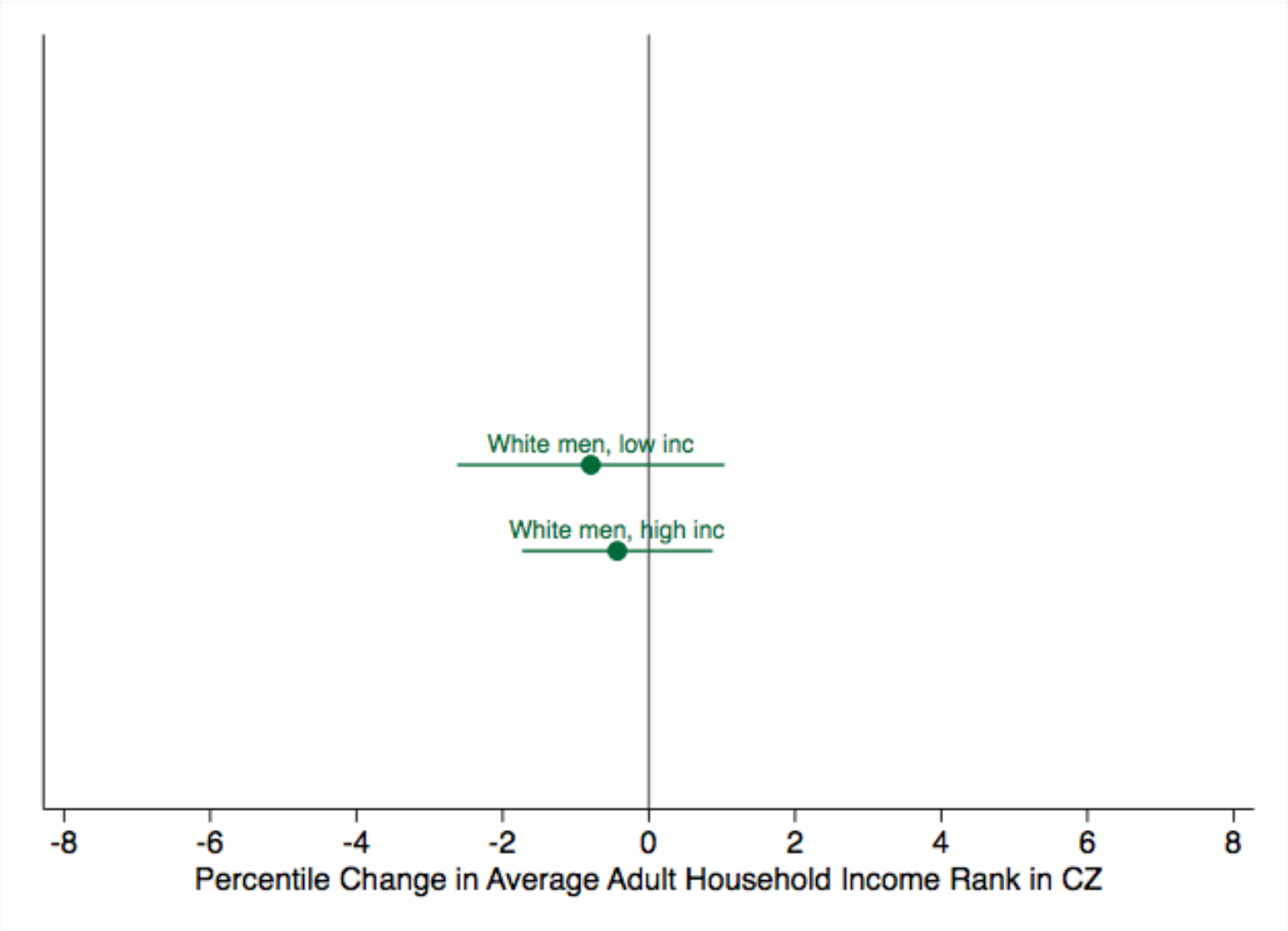
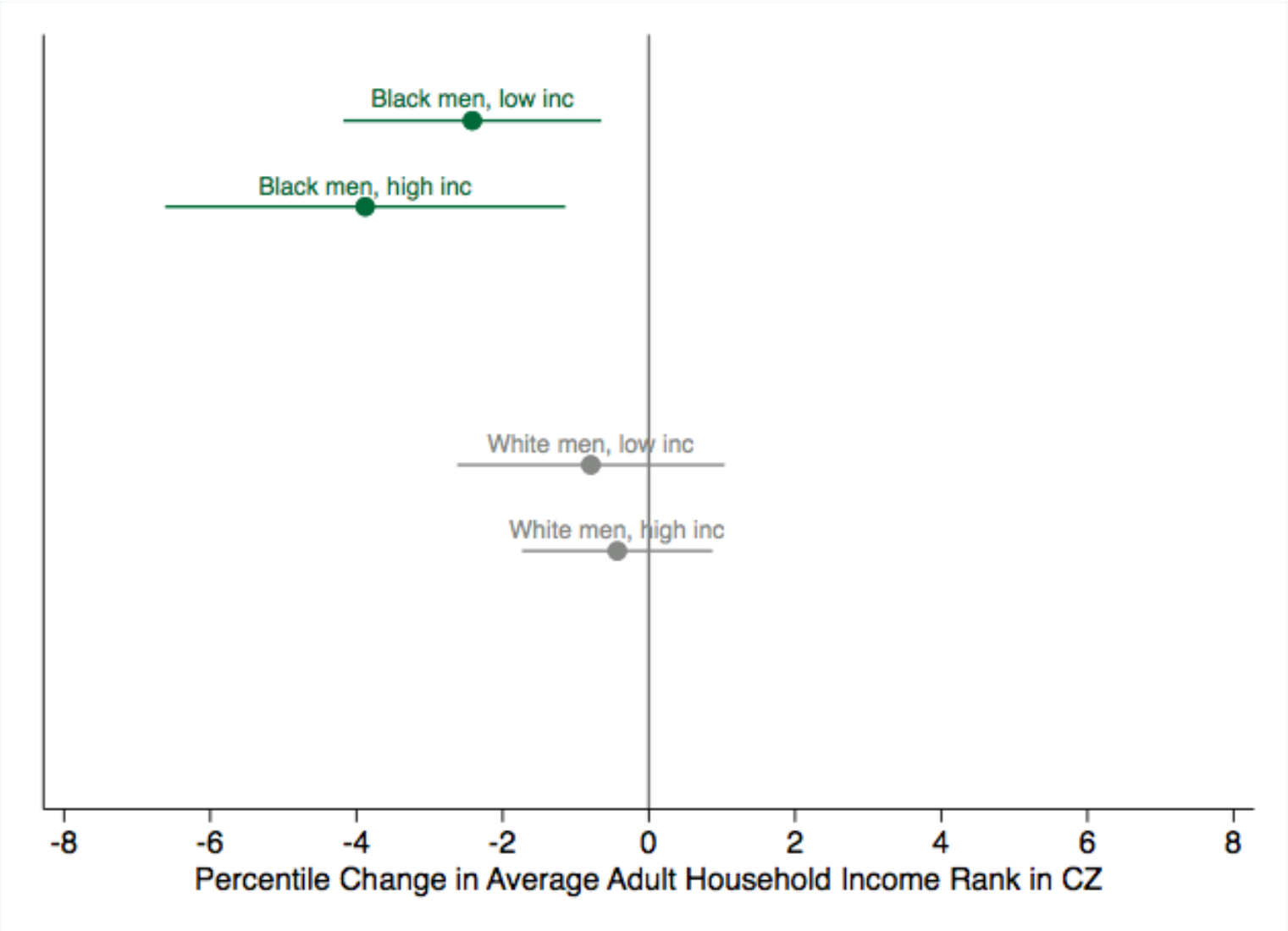


▸ Notes

Whose upward mobility was affected by Great Migration?



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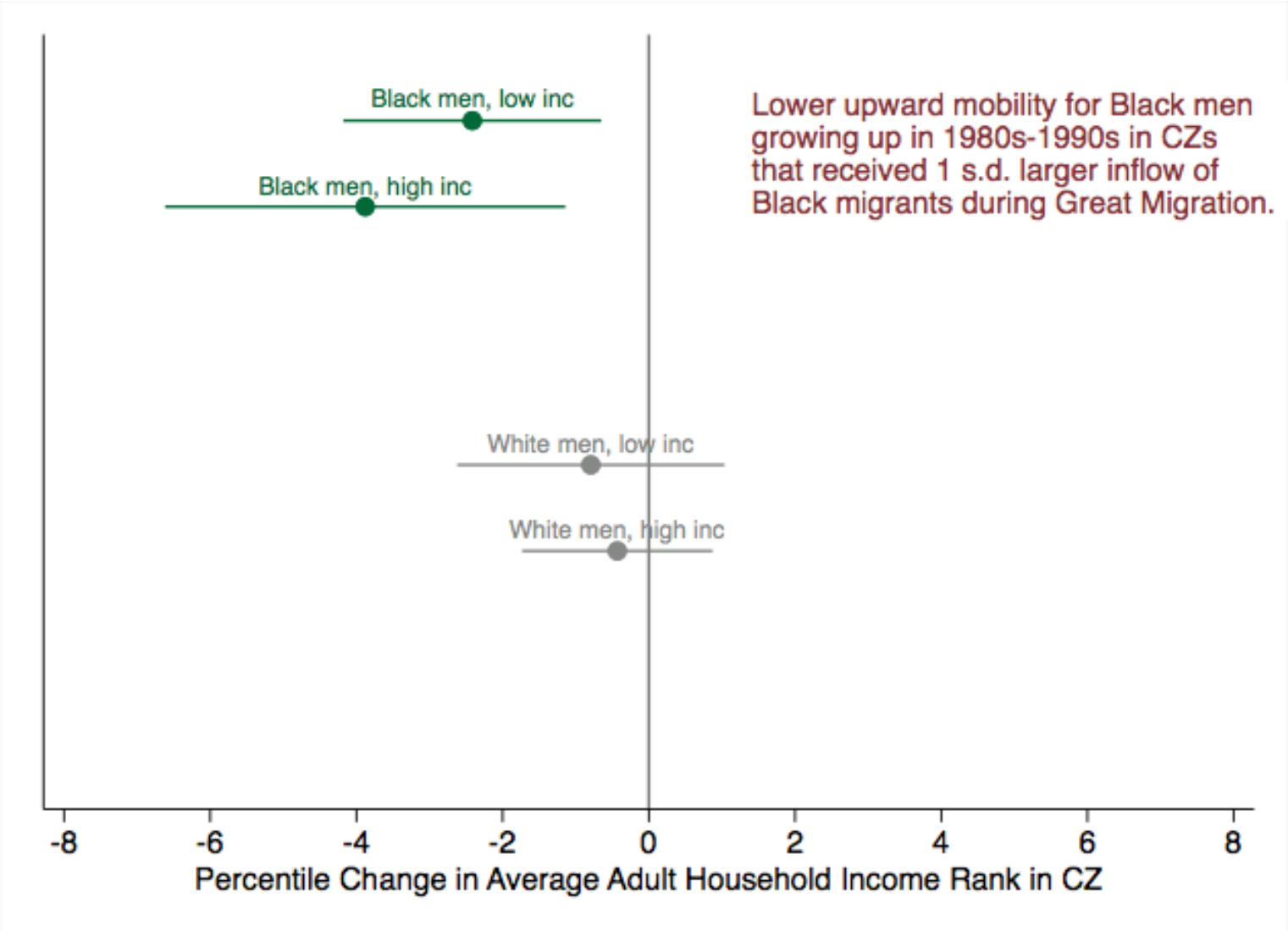

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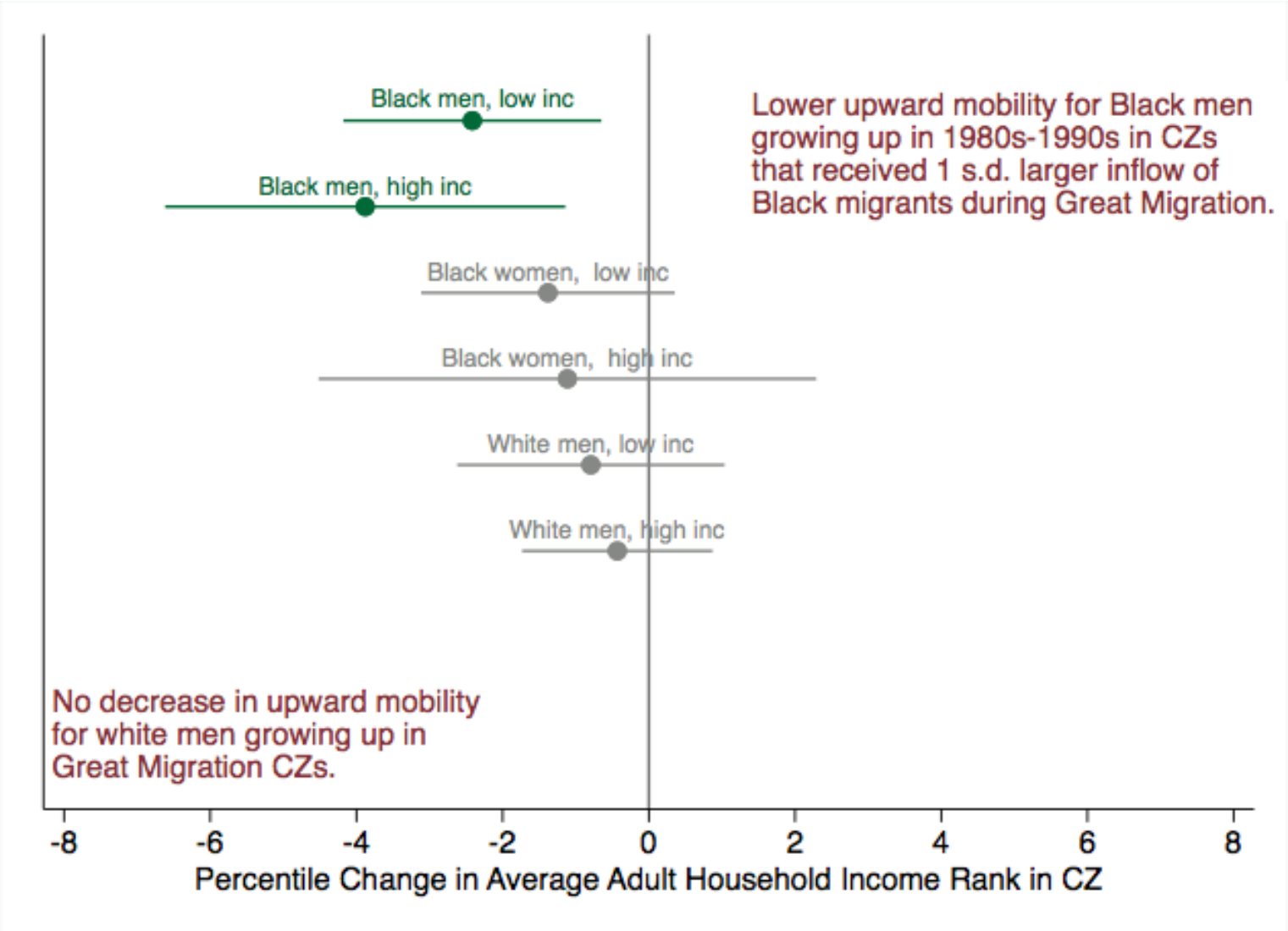
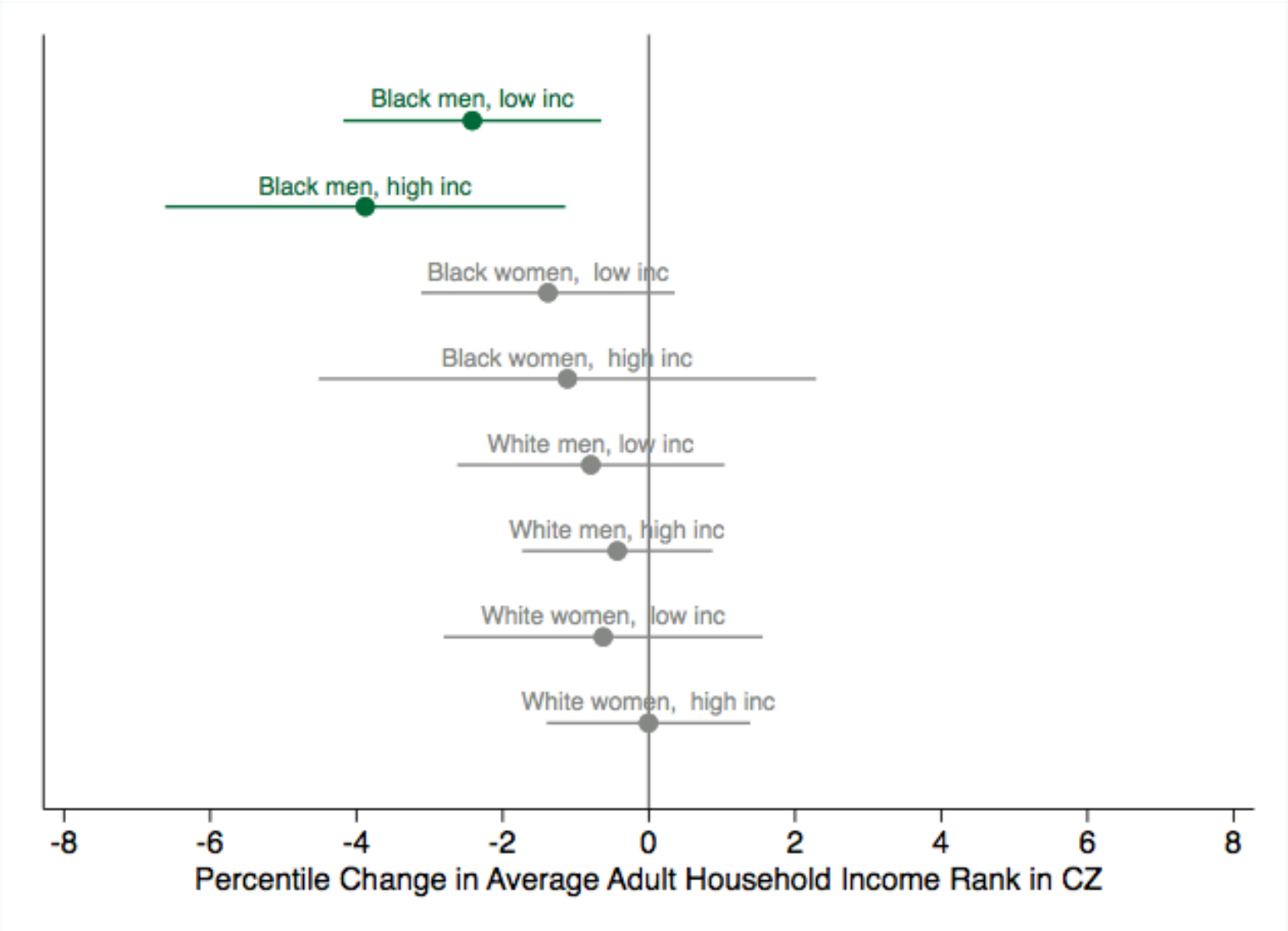


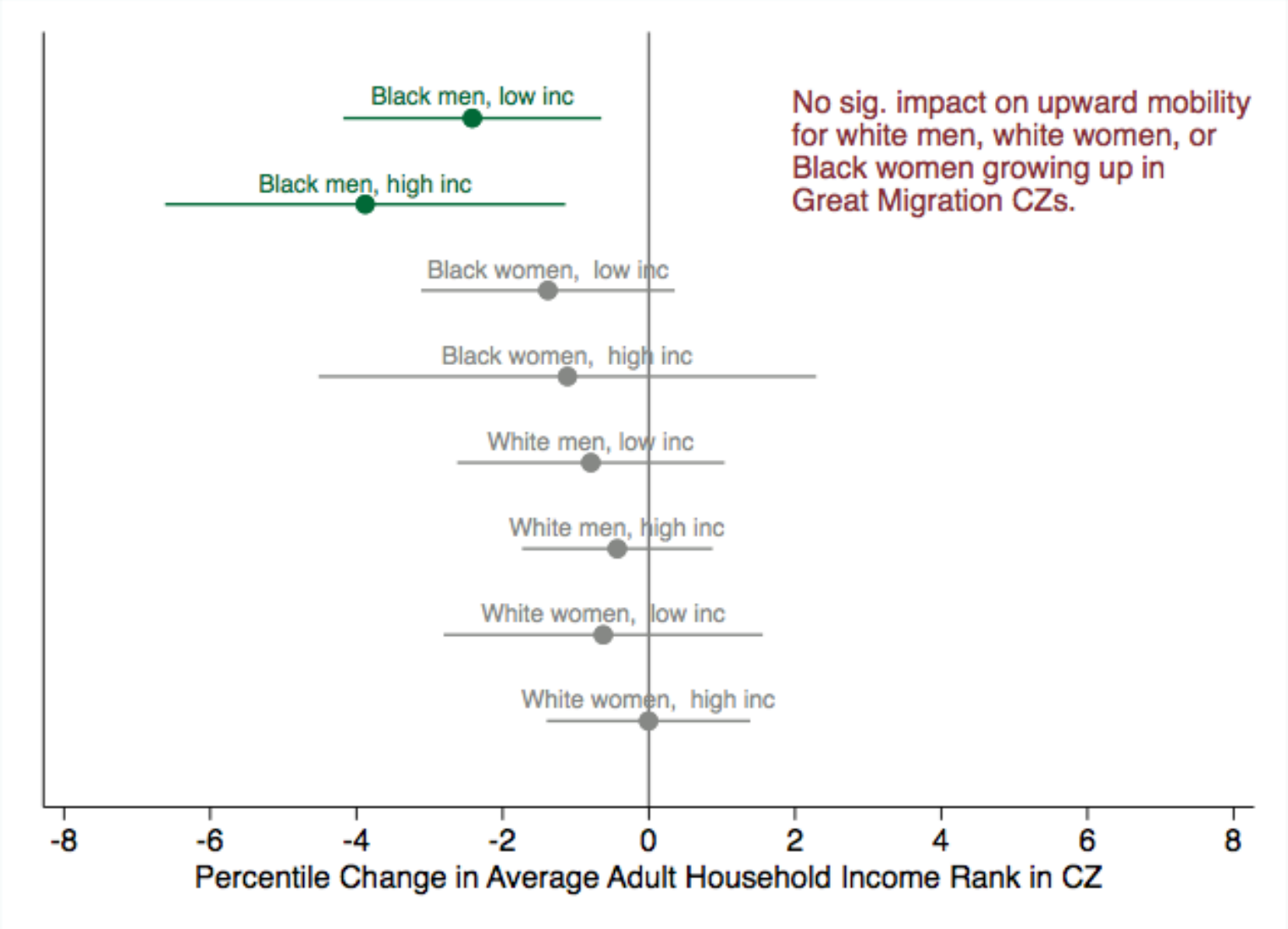
▸ Notes

Whose upward mobility was affected by Great Migration?



▸ Income effect on Black women ▸ Notes

Whose upward mobility was affected by Great Migration?



▸ Income effect on Black women ▸ Notes

Heterogeneity by gender

- Boys' outcomes more elastic to family and school inputs

  [Bertrand and Pan (2013); Autor et al. (2016); Autor et al. (forthcoming)]
- Chetty et al. (2018) find no white-Black gap among girls
- Results have implications for racial gap in upward mobility

Contribution of Great Migration to upward mobility gap between Black and white households

Question: What would the racial gap in upward mobility in North be without changes induced by Great Migration?

Contribution of Great Migration to upward mobility gap between Black and white households

Question: What would the racial gap in upward mobility in North be without changes induced by Great Migration?

Compare average racial gap across northern CZs to counterfactual racial gap with no GM (each CZ receives 1 pctile of shock):

	Parent Income		
	25th pctile	50th pctile	75th pctile
Observed	12.03	13.45	15.30
CF w/o GM (se)	9.1 (.13)	9.83 (.14)	11.01 (.20)
Pct Change	-24%	-27%	-28%

- Great Migration explains 27% of income gap between Black and white households from median income families.

Results on upward mobility

1. Did the Great Migration reduce upward mobility in the North?
   - 1 s.d. $\uparrow$ lowered average income rank of individuals from low income families by 3.6 percentiles ($\sim 11\% \downarrow$ income)
2. Is the channel selection (Δ average child) or changes in locations (e.g., local public goods and neighborhood quality)?
   - Random child growing up in Great Migration CZ has lower income as an adult. 1 s.d. $\uparrow$ shock $\implies$ 3.9 percentiles $\downarrow$ in income rank ($\sim 12\% \downarrow$ income)
3. Whose upward mobility was affected by the Great Migration?
   - Black men's income upward mobility reduced; possible income effect on Black women.

Alternative explanations for findings on upward mobility

- Increase in southern population and policy preferences
  - White southern migration placebo ▸ White Southerners
- Historical legacy of European immigration ▸ European Immigrants
- Correlated shocks to southern and northern locations
  - Residualize county net-migration on state FEs ▸ Resid
  - Dropping top urban counties ▸ Non-top-urban
  - Alternative instruments deliver similar estimates ▸ Over-ID
- Fixed characteristics of high Black share CZs ▸ Expos FX
- Other fixed characteristics of CZs: similar impact on first-differences in Black men's upward mobility ▸ Graph
- Results not driven by any particular CZ ▸ Leave One Out
- Inference: AKM (2019) placebo shifters ▸ Placebo Shocks

Outline

Results on local mechanisms

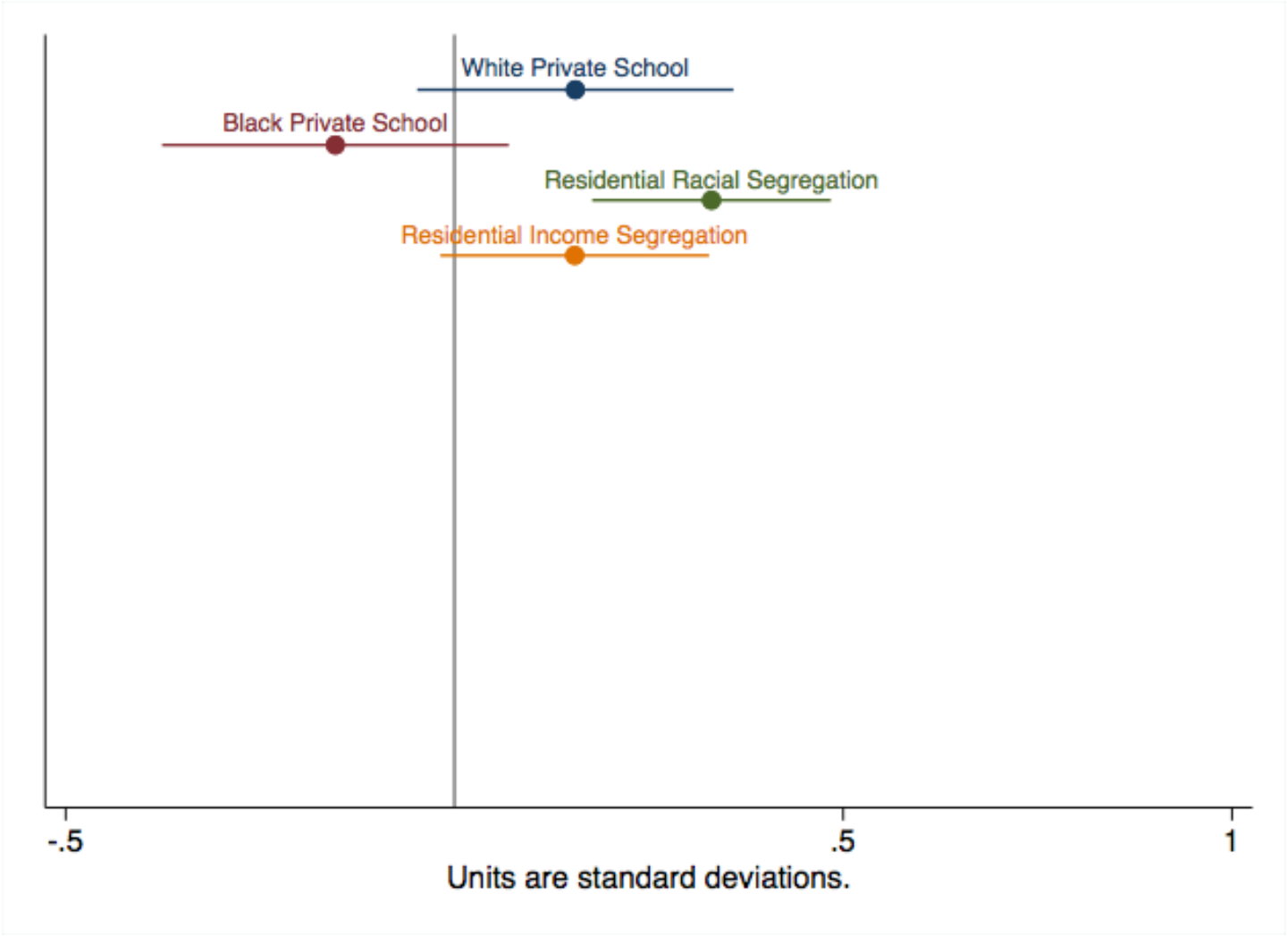
1. How did the urban environment change in response to the Great Migration?

Potential explanations

The Great Migration of poorer Black families from the South caused...

1. White flight and income segregation
2. Reduced urban economic opportunity $\rightarrow$ higher crime
3. Incarceration $\uparrow \rightarrow$ negative spillovers on Black men

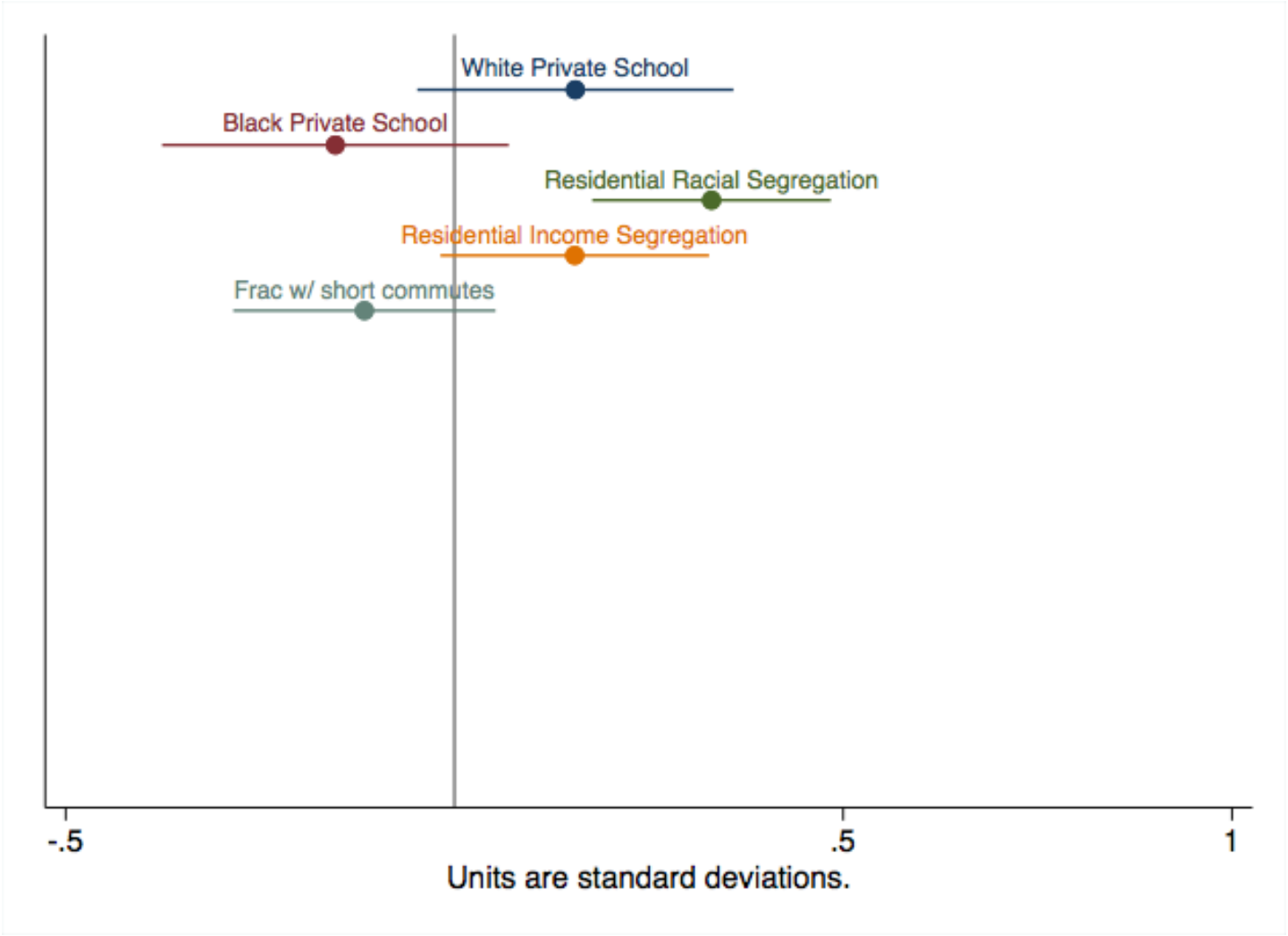
Great Migration increased white flight, crime, and policing



Data Source: PF-NBHDS database for CZs, 1920-2015.

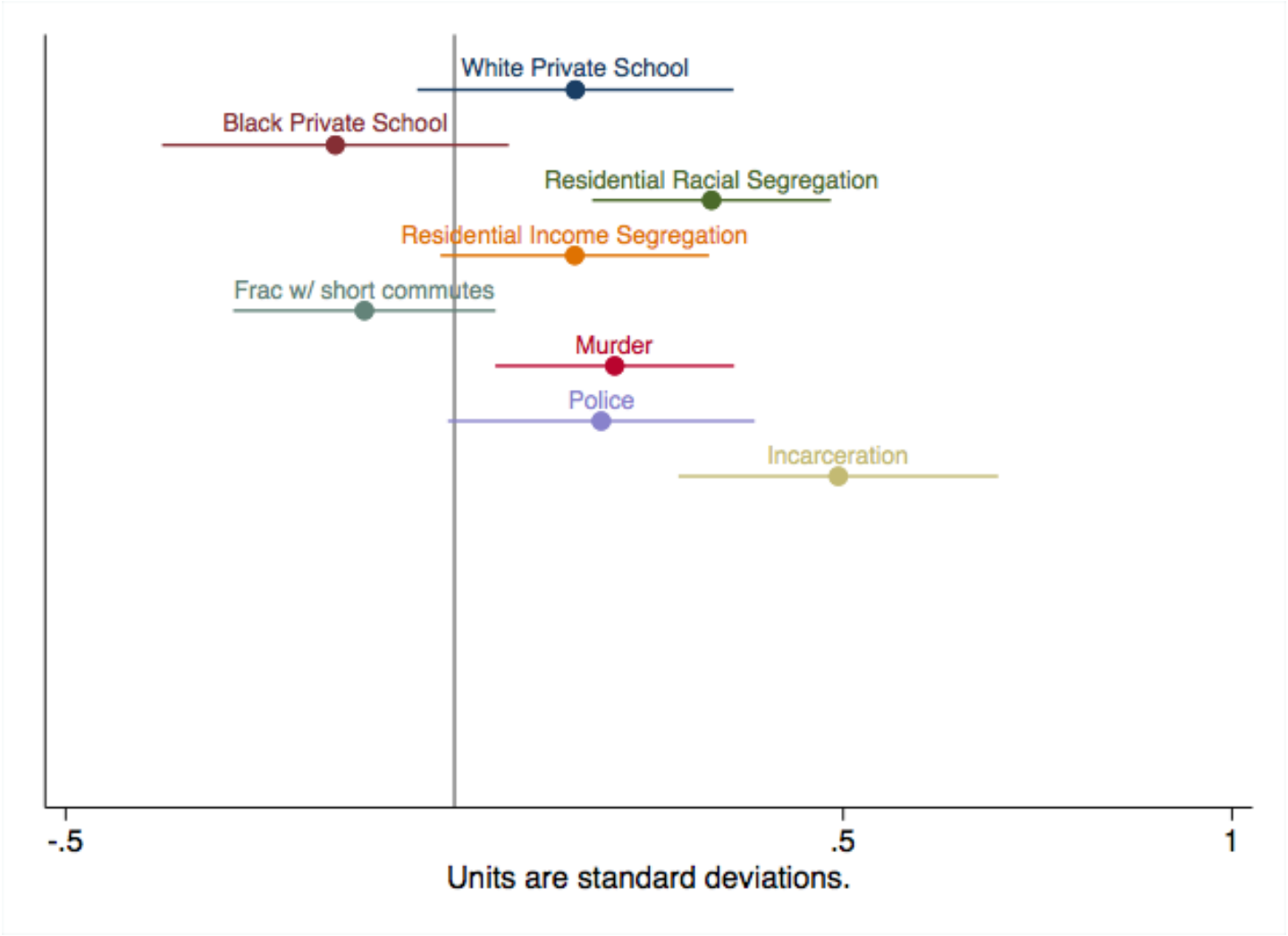
▸ Pretrends test ▸ Highways ▸ Notes

Great Migration increased white flight, crime, and policing



Data Source: PF-NBHDS database for CZs, 1920-2015. ▸ Pretrends test ▸ Highways ▸ Notes

Great Migration increased white flight, crime, and policing



Data Source: PF-NBHDS database for CZs, 1920-2015.

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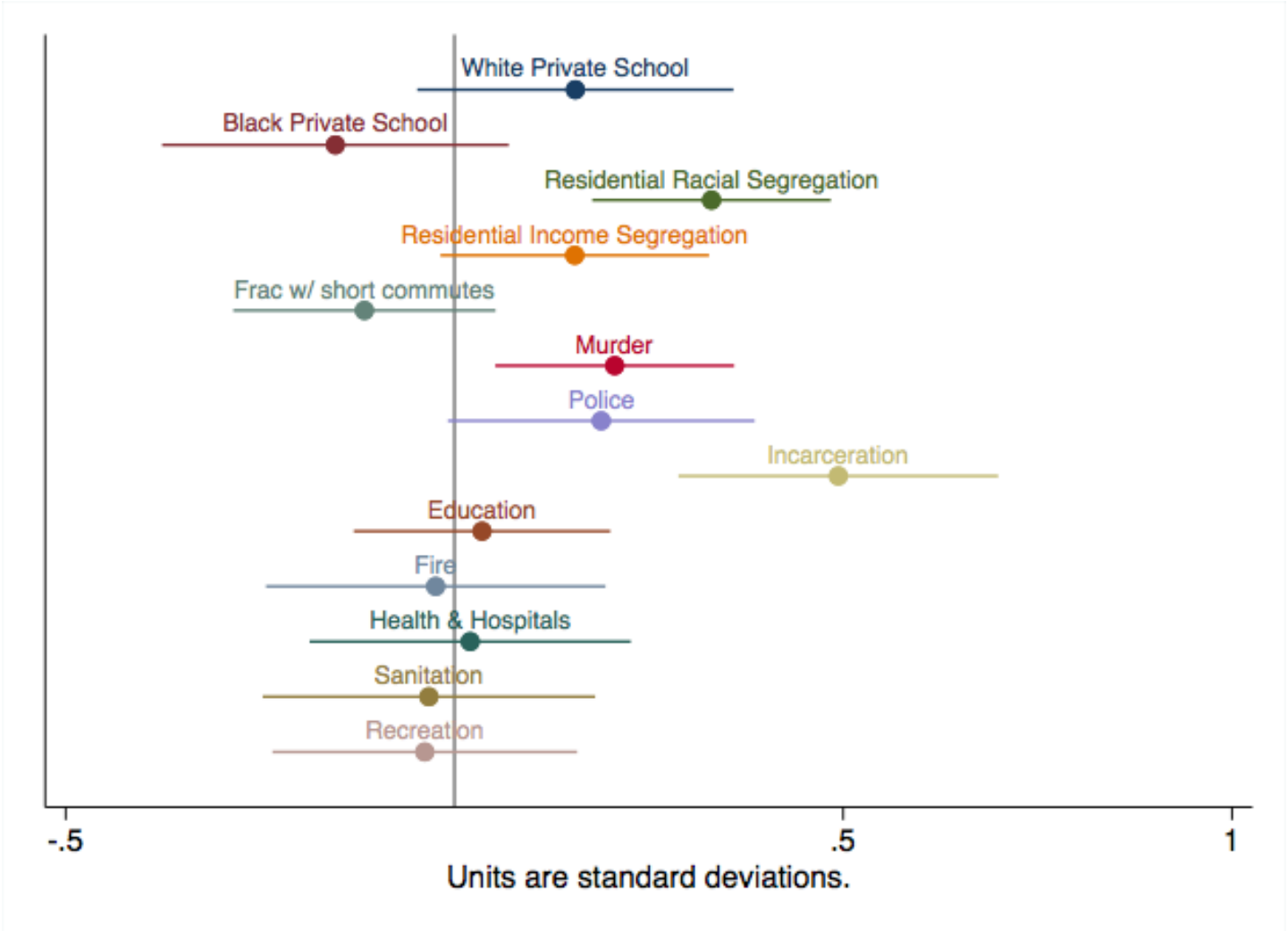

Data Source: PF-NBHDS database for CZs, 1920-2015.

▸ Pretrends test ▸ Highways ▸ Notes

Results on local mechanisms

1. How did the urban environment change in response to the Great Migration?
   - 1 s.d. ↑ Black inflows associated with 0.25 s.d ↑ police expenditures, murder rates, white private school enrollment; 0.52 s.d ↑ incarceration.
2. When did the changes occur?
   - ▸ Data
   - ▸ Private School
   - ▸ White Flight
   - ▸ Police
   - ▸ Incarceration
   - ▸ Murder

Results on local mechanisms

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2. When did the changes occur?
   - ▸ Data
   - ▸ Private School
   - ▸ White Flight
   - ▸ Police
   - ▸ Incarceration
   - ▸ Murder
   - 1960s are a turning point for Great Migration cities
   - Riots and racial attitudes ▸ Riots ▸ George Wallace

Interpretation of results on local mechanisms

Northern opportunity "meccas" declined especially for Black men.

- Direct negative impact of urban violence on outcomes
- Exposure to crime increases likelihood of committing crimes

  [Case and Katz, 1991; Damm and Dustmann, 2014; Heller et al., 2017; Sviatschi, 2018]
- Negative externalities of police for Black boys

  [Ang, 2018; Legewie and Fagan, 2018]
- Incarceration has long-term negative effects on outcomes

  [Johnson, 2009; Dobbie et al., 2018; Liu, 2018]
- Fewer public resources for education spending, which benefits low income families [Jackson et al., 2015]
- Suggestive evidence on likely mediators ▸ Low Inc ▸ High Inc
- It's not all sorting: GM ↑ census tract racial gap ▸ Graph

Outline

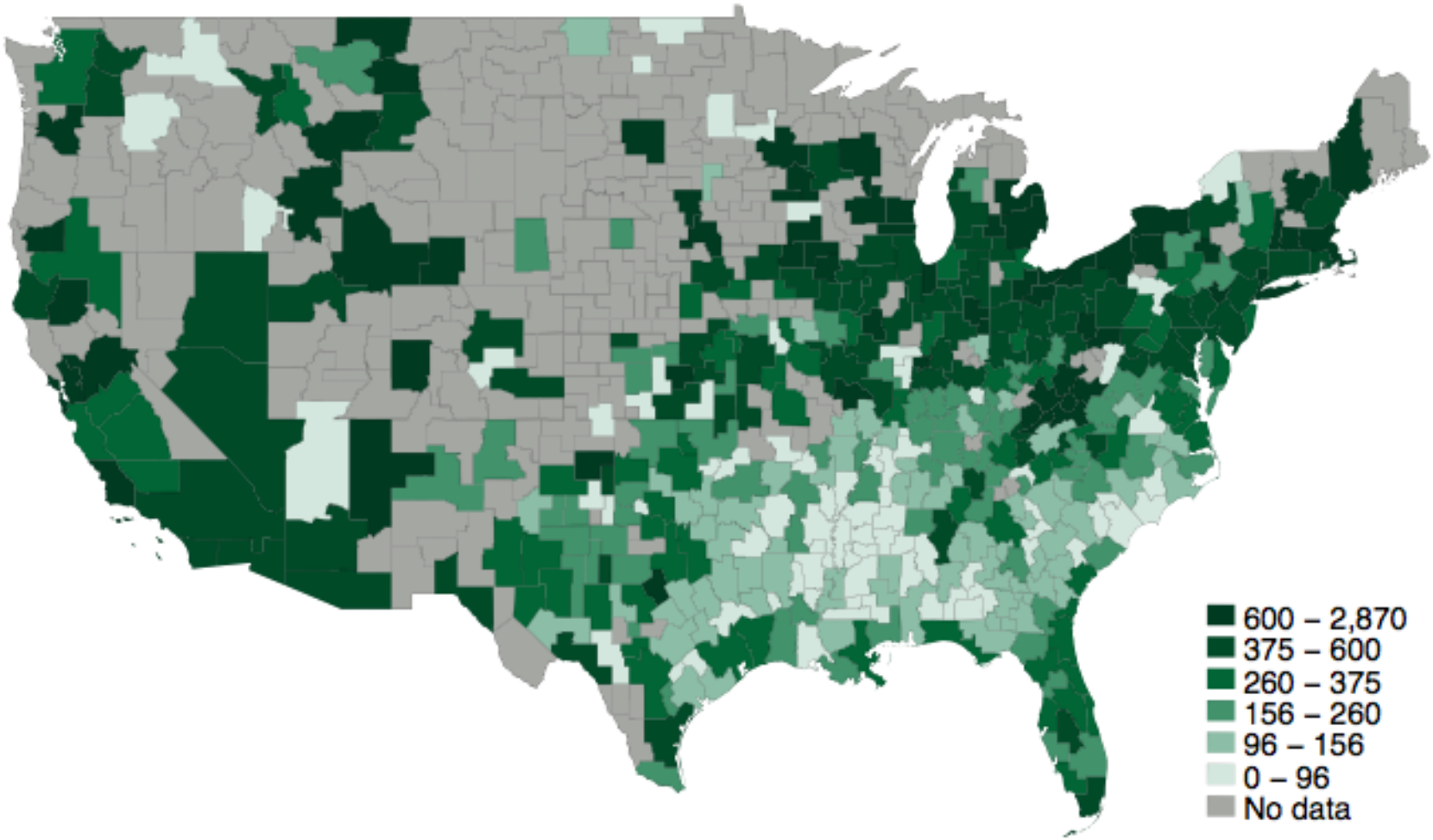
Conclusion

- High opportunity areas became opportunity "deserts" in response to Great Migration of Black families from the South.

  ▸ Aggregate Effects?

- Location effects are sensitive to shocks to racial composition
- The Migration led to white flight and urban decline post-1960
- 50 years of policing, incarceration, and persistent crime
- Do we need new policies to address racial inequality in cities?

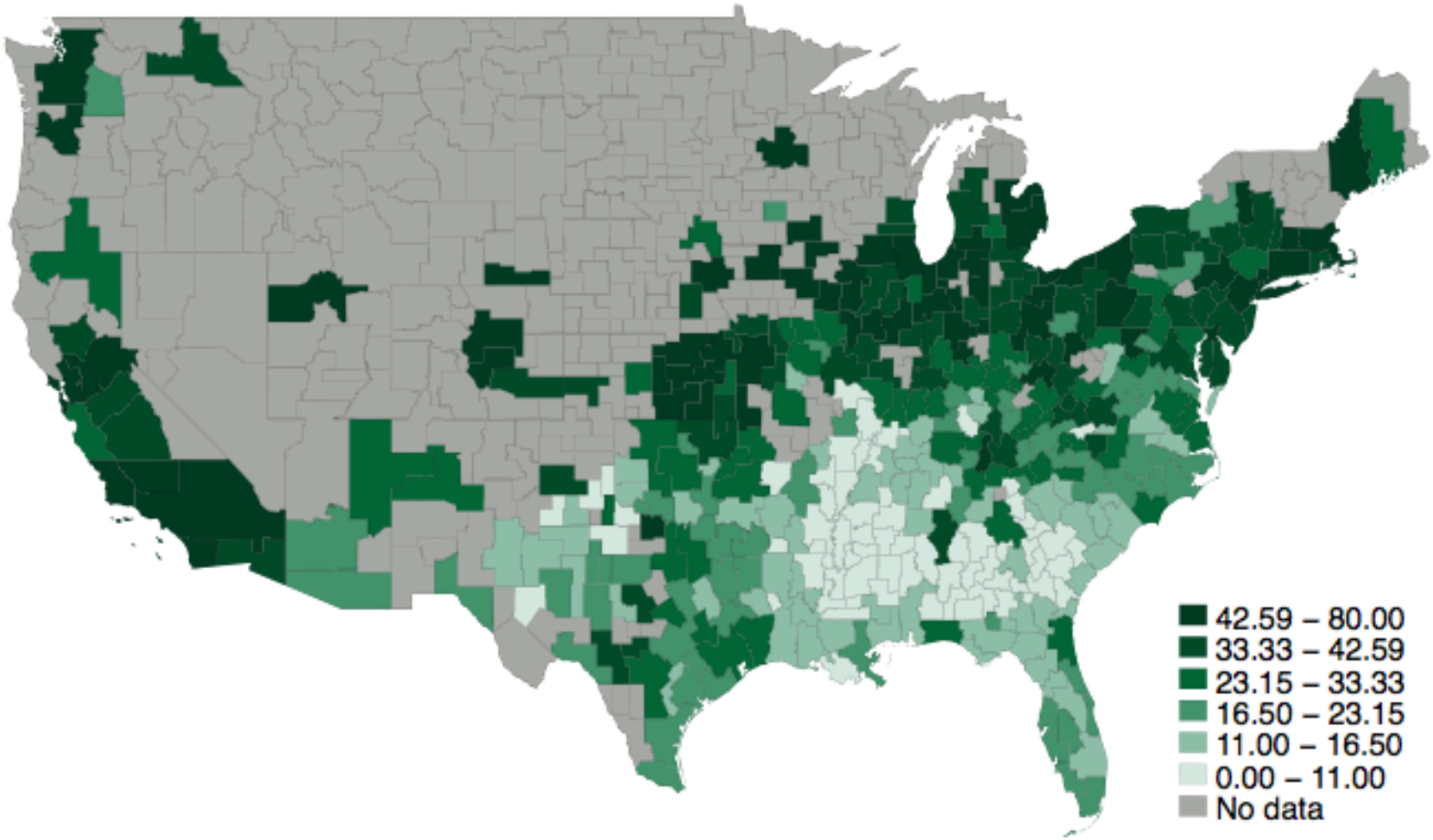
Median annual wages for Black men and women in 1940



Median annual wages of Black men and women by commuting zone in 1940.

Data from IPUMS 1940 Census. ▸ Back

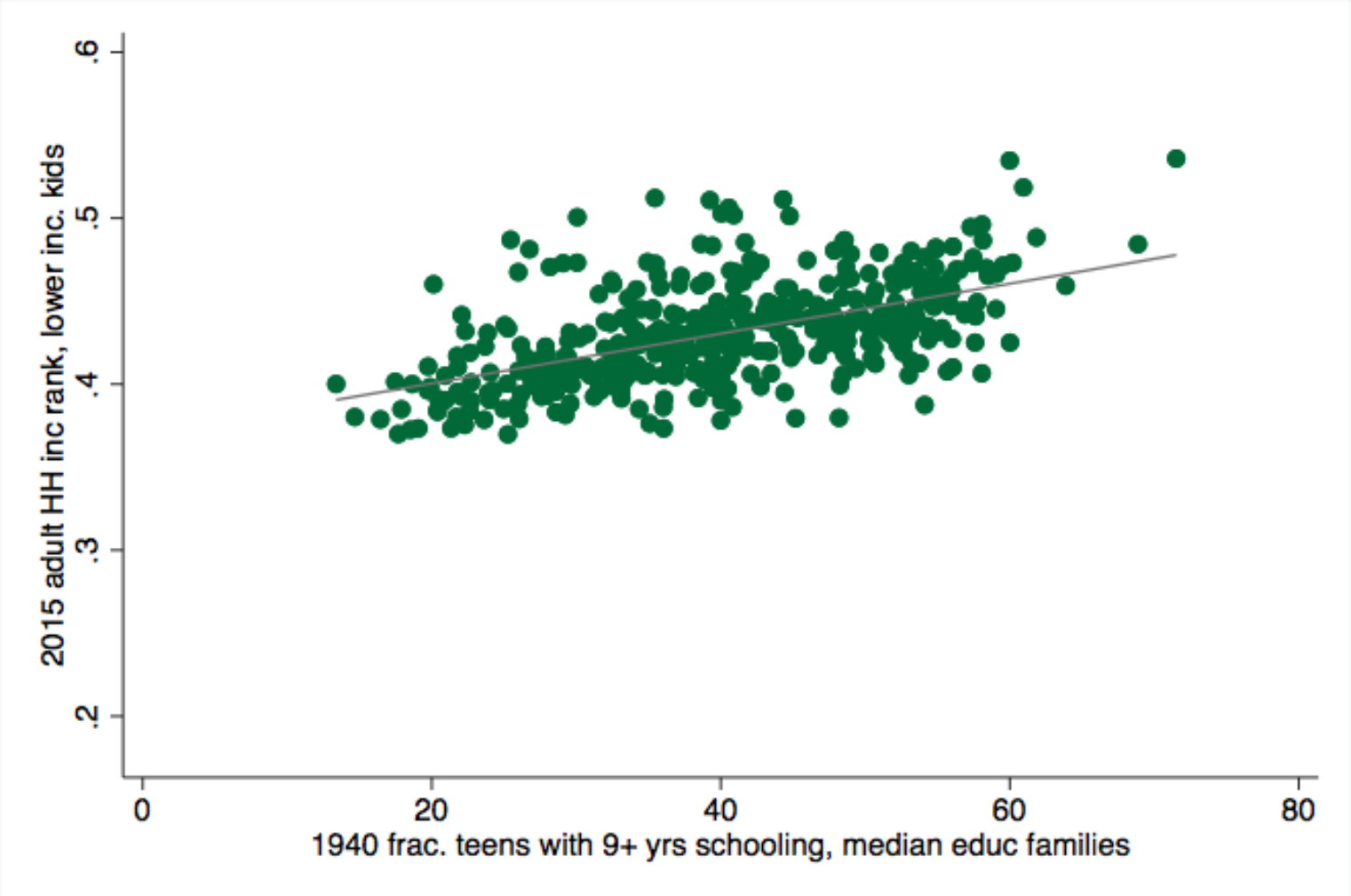
Geography of Black upward mobility: 1940



Frac. of 14-17 yo Black boys and girls from median educated families (5-8 yrs schl) who have 9-plus years of schooling.

Data from IPUMS, method via Card, Domnisoru, and Taylor (2018). ▸ Back

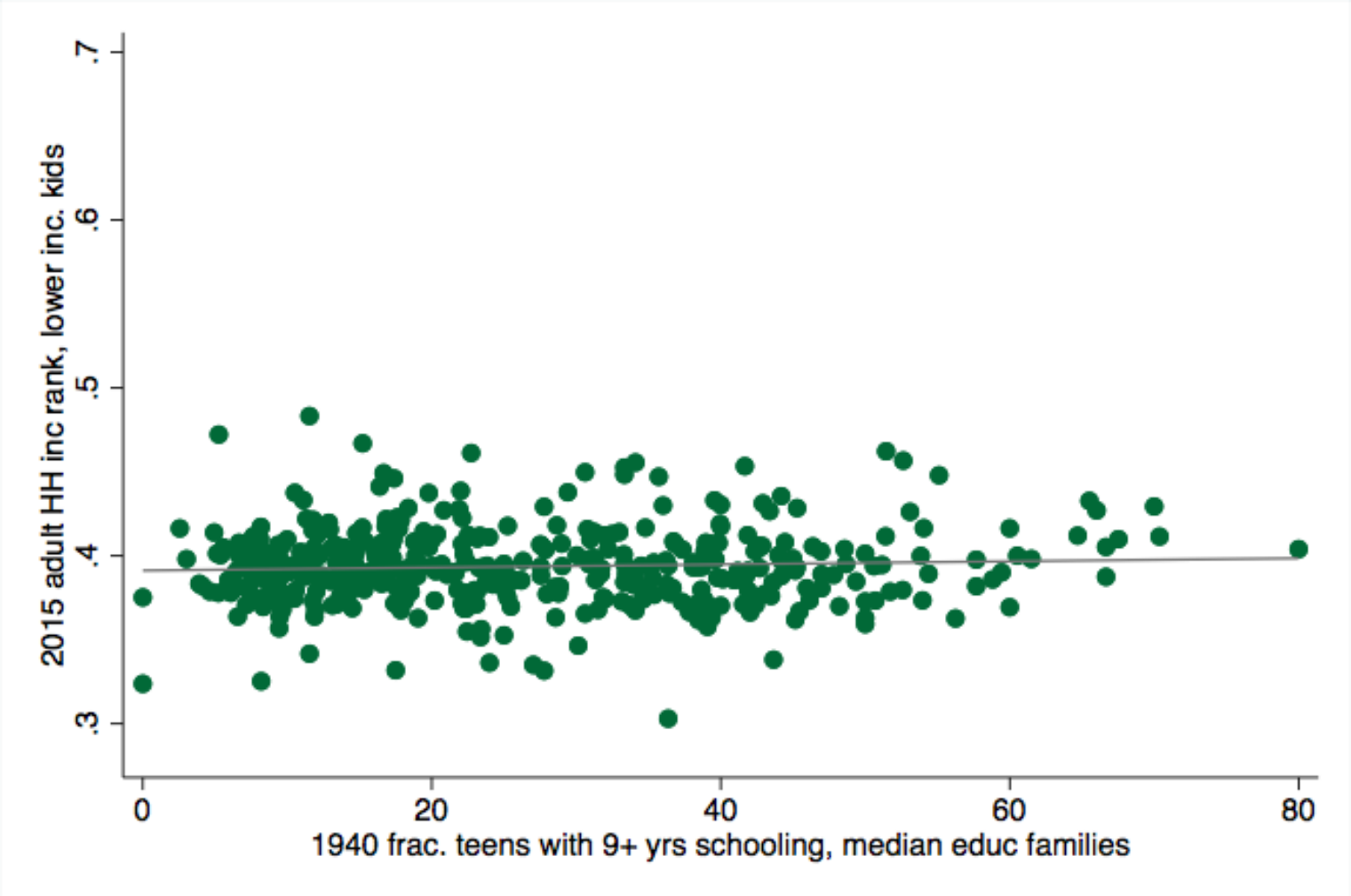
Correlation 1940 and 2015 upward mobility (white pop)



2015 measures for individuals from low income families. Data from Chetty et al. (2018).

Back

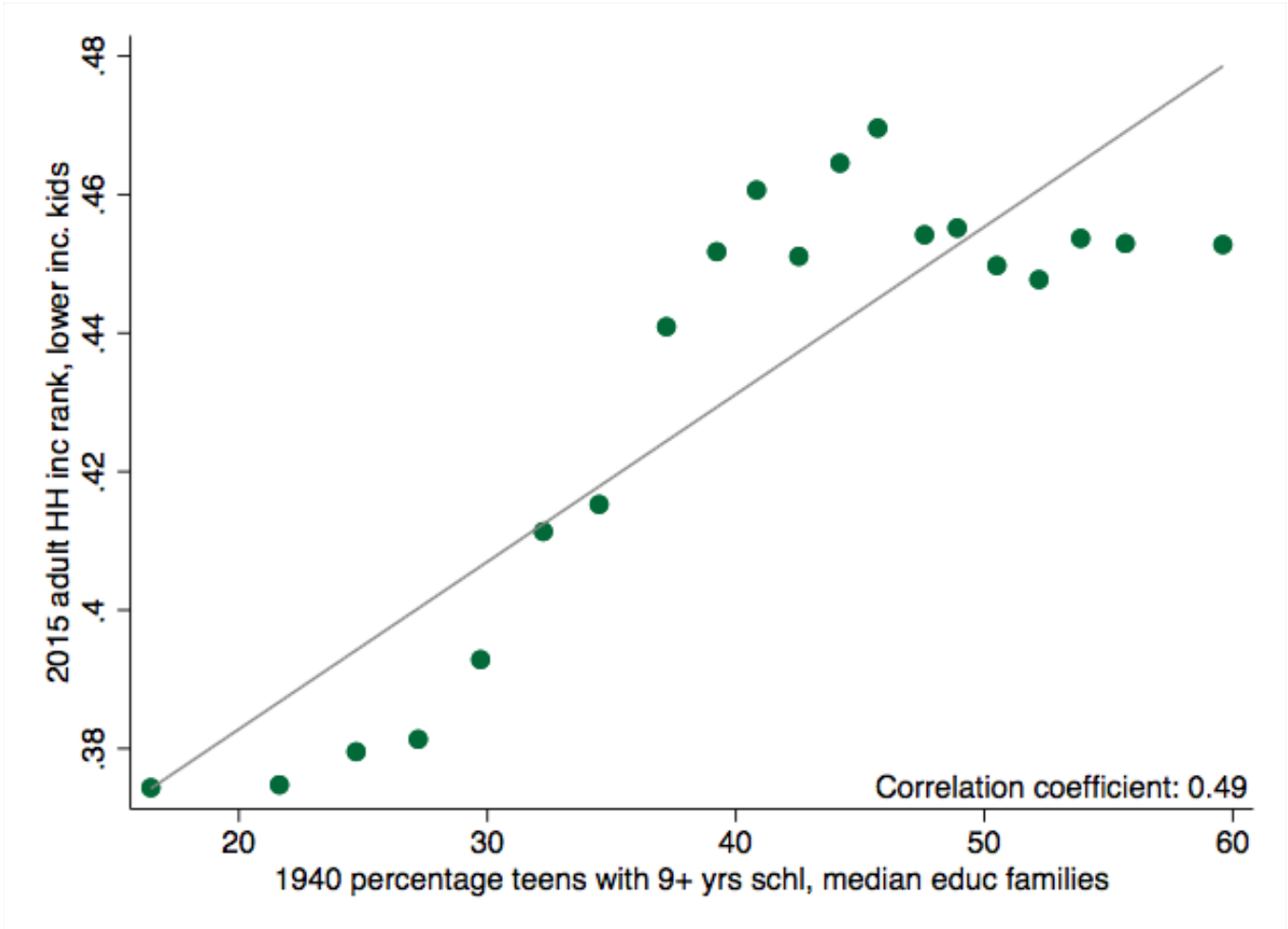
Correlation 1940 and 2015 upward mobility (Black pop)



2015 measures for individuals from low income families. Data from Chetty et al. (2018).

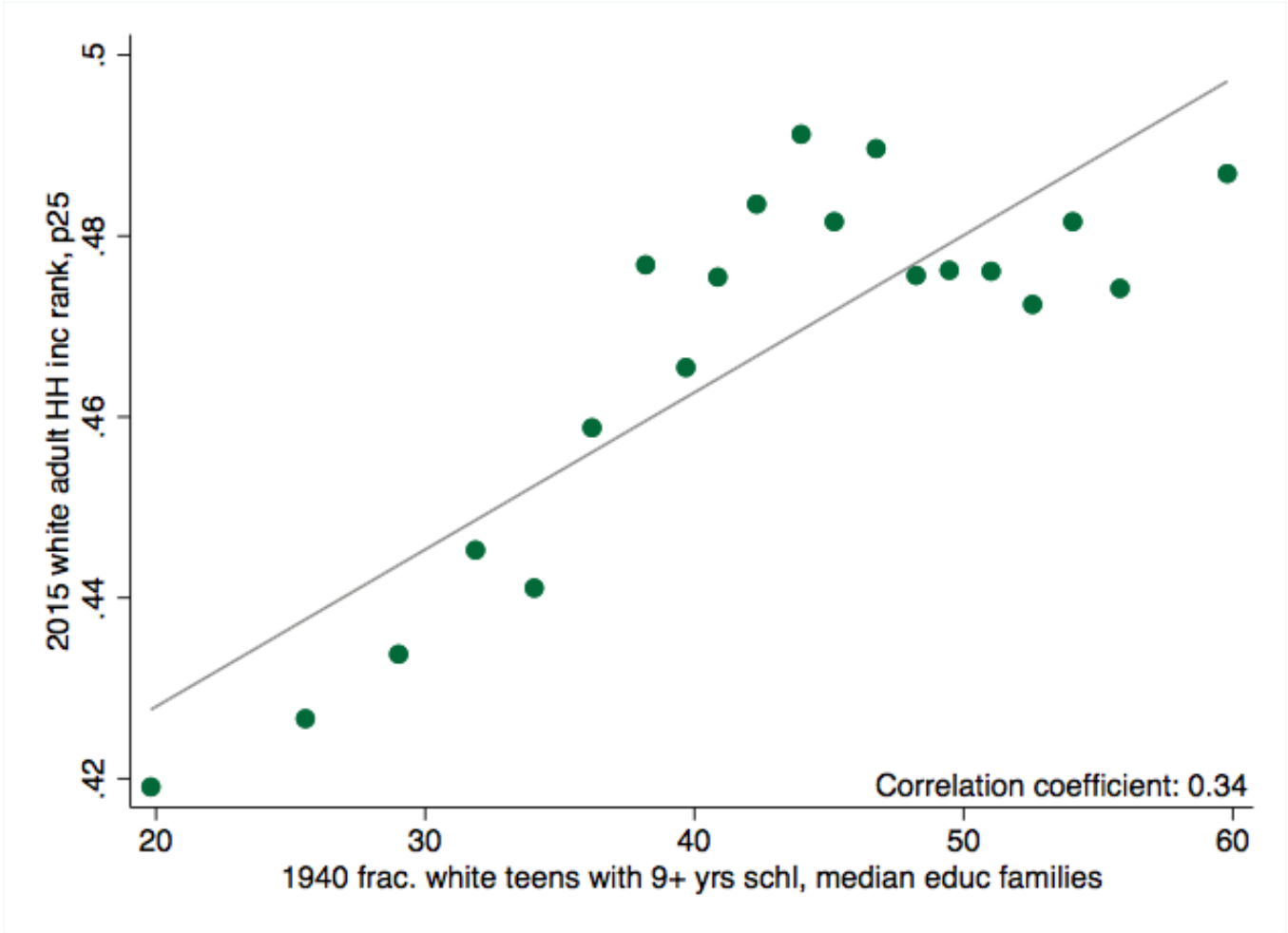
Back

Relationship between 1940 and 2015 mobility measures



Sample is commuting zones in continental US. ▸ Back

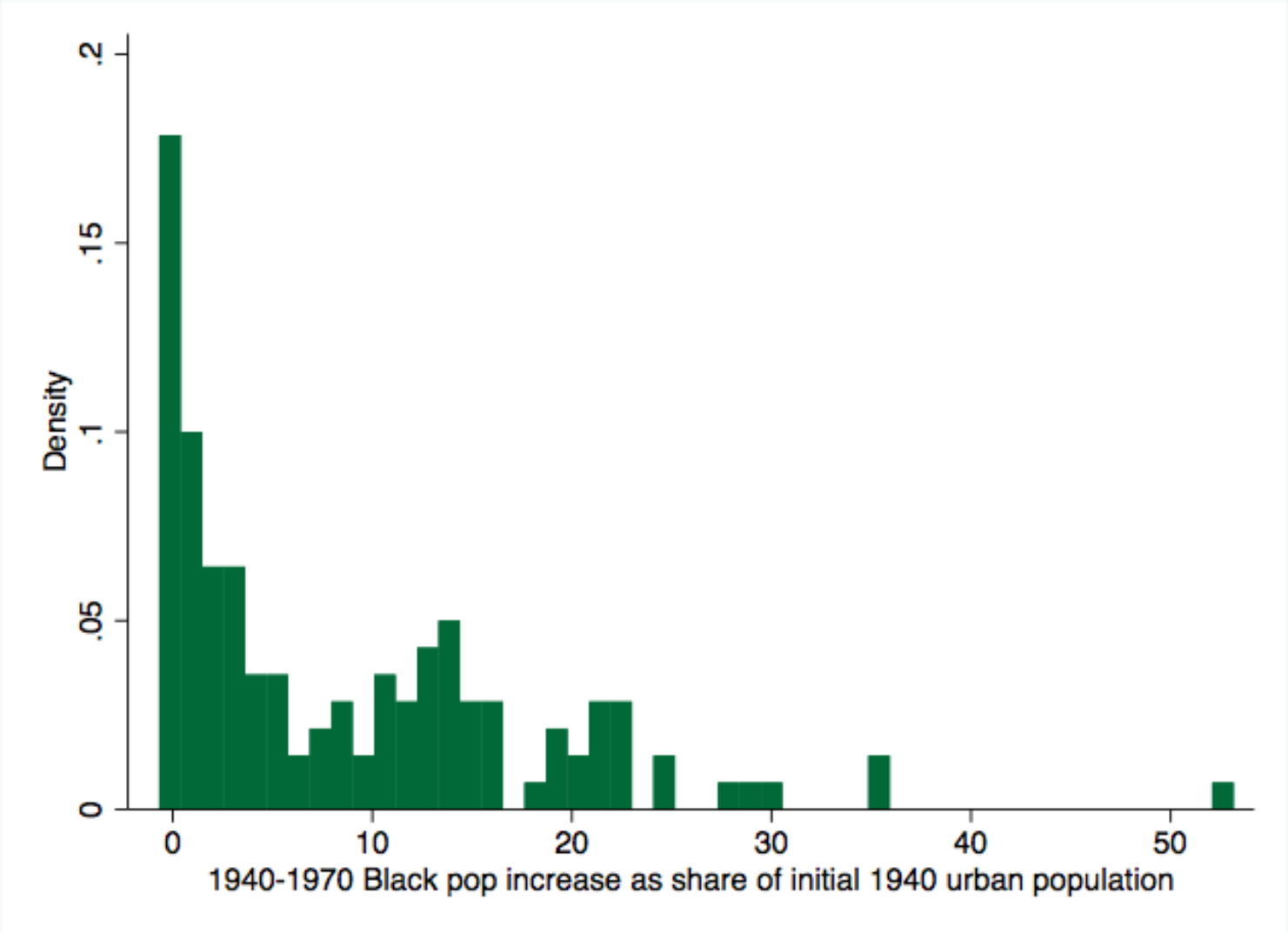
Relationship between 1940 and 2015 mobility measures for white families



Sample is commuting zones in continental US.

Back

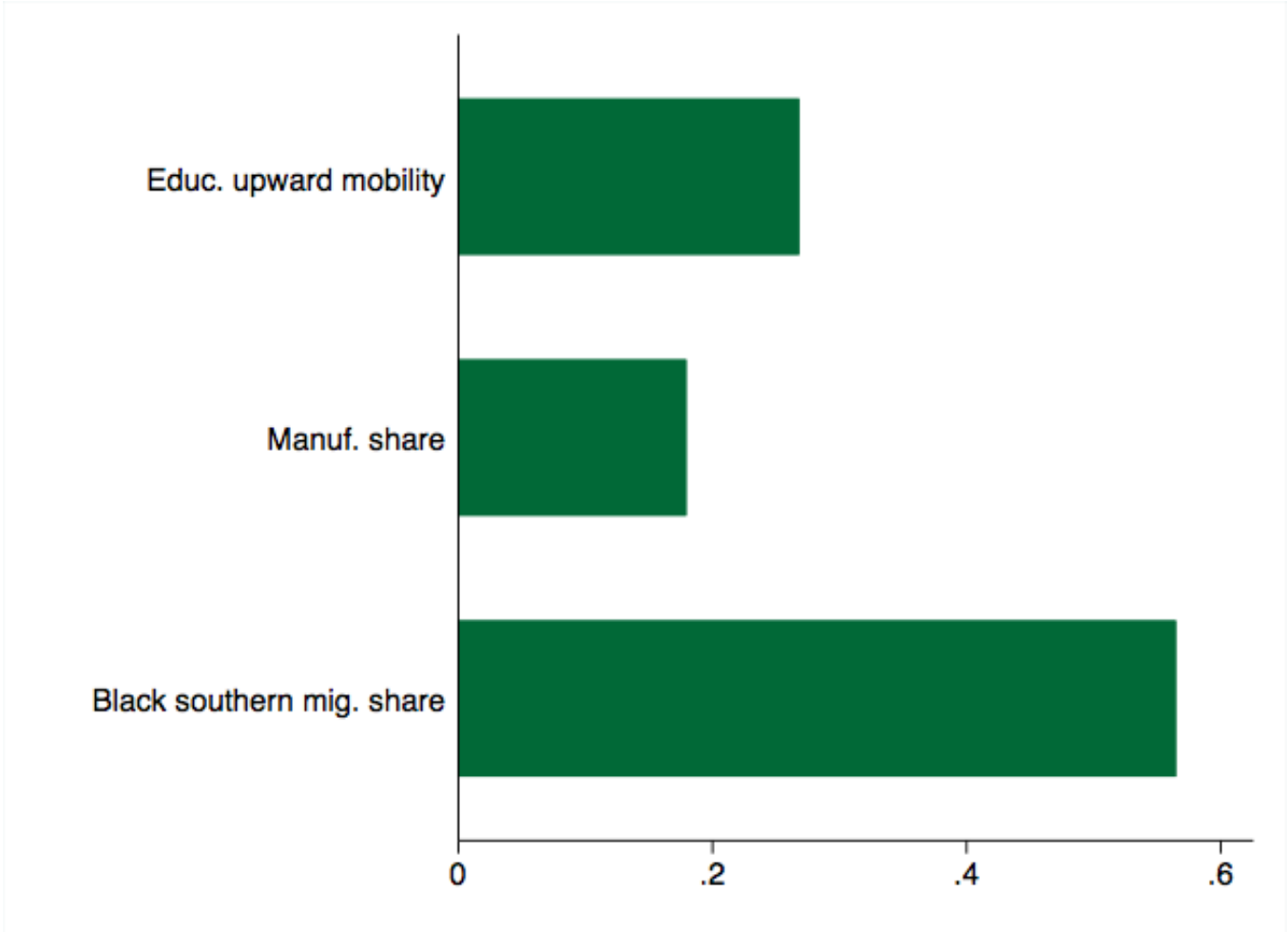
Histogram of urban Black pop increases, 1940-1970



Northern urban CZs. *Data source*: 1940 Census and City and County Data Books 1944-1977.

Back

Correlated 1940 characteristics



Correlation between 1940-1970 Black population increases in sample CZs and baseline 1940 characteristics. *Data source*: IPUMS 1940 Census; City and County Data Books, 1944-1977.

▸ Back

Using machine learning in "zero stage" of shift share IV

Estimating southern county net-migration rates for "zero stage" is pure prediction problem.

- Belloni et al. (2011): LASSO selection of variables for first stage in IV
- Initial set of predictors each decade: Boustan (2010) vars, incl. ag. vars and WWII $
- Tuning parameter chosen optimally through 5-fold CV
- Post-LASSO (OLS with LASSO selected var) prediction of net-migration

Back

Variables selected in 1940

- Percent tenant farms
- Share of the labor force in agriculture
- WWII spending per capita
- Percent acreage in cotton
- Share of the labor force in agriculture $\times$ Tobacco growing state
- Indicator for mining state
- Indicator for mining state $\times$ Share of the labor force in mining

Back

Variables selected in 1950

- Percent tenant farms
- Share of the labor force in agriculture
- WWII spending per capita
- Percent acreage in cotton
- Percent acreage in tobacco
- Indicator for mining state
- Indicator for mining state $\times$ Share of the labor force in mining
- Share of the labor force in mining

Back

Variables selected in 1960

- Percent tenant farms
- Share of the labor force in agriculture
- Indicator for tobacco growing state
- Share of the labor force in agriculture $\times$ Tobacco growing state
- Percent acreage in cotton
- Indicator for mining state
- Indicator for mining state $\times$ Share of the labor force in mining
- Share of the labor force in mining

Back

Where does ID come from in the Great Migration Bartik?

- Shares unlikely to be exogenous: $\mathbb{E}[\tilde{\omega}_{j,cz} \cdot \varepsilon_{cz} | \mathbb{X}_{cz}] \neq 0$.
- Exogenous shocks interacted with many invalid shares as instruments give rise to plausibly exogenous variation.

  [Goldsmith-Pinkham et al., 2018; Borusyak et al., 2018; Adao et al., 2018]

- Key threat to ID: correlated shocks to origins and destinations.
  - Results on upward mobility are robust to first residualizing county net-migration rates on southern state FEs.
  - Results robust to dropping top urban counties in the south.
  - Over-identification tests using different constructions of instrument fail to reject null of identical effects.

▸ Back ▸ Visual

Insufficient number of county types

3

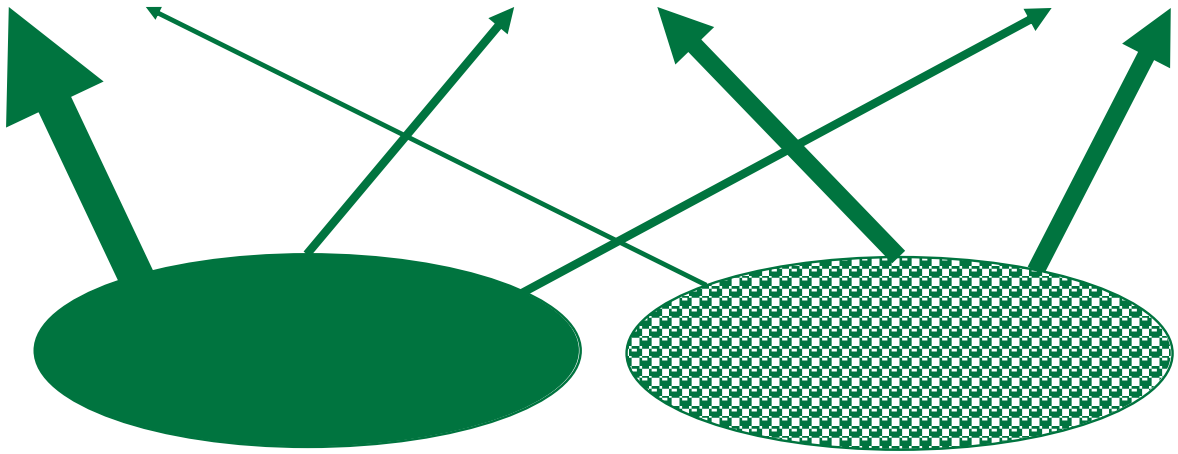
1

2

Madison, WI

Poughkeepsie, NY

Saginaw, MI



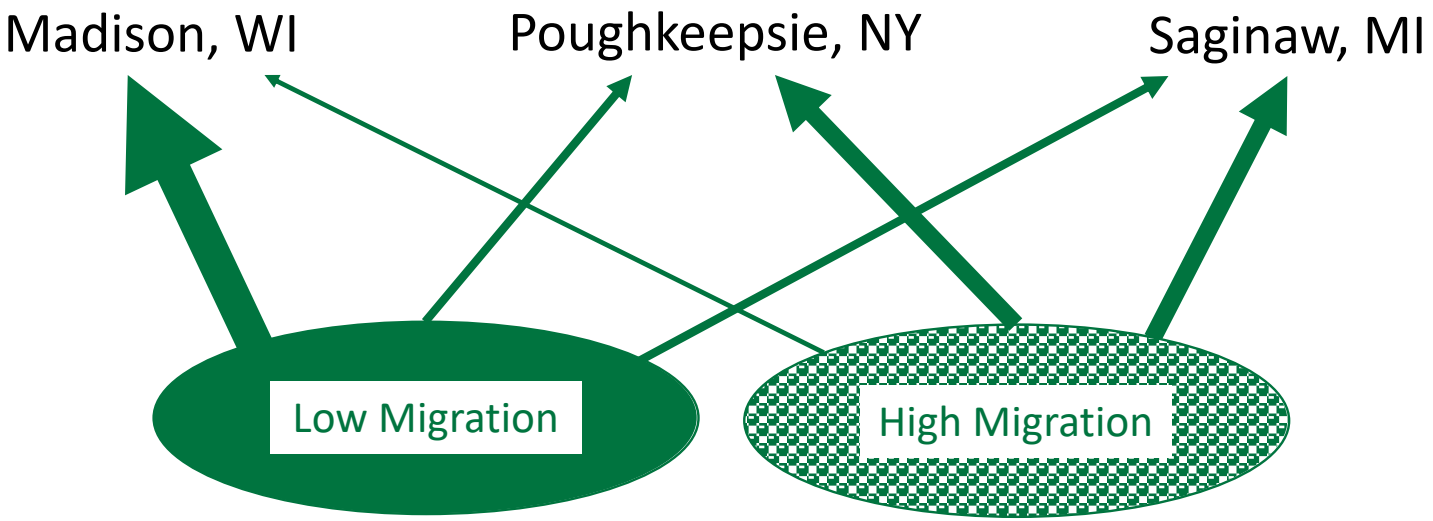
Back

Insufficient number of county types

Can't rule out correlated origin and destination shocks

3 1 2

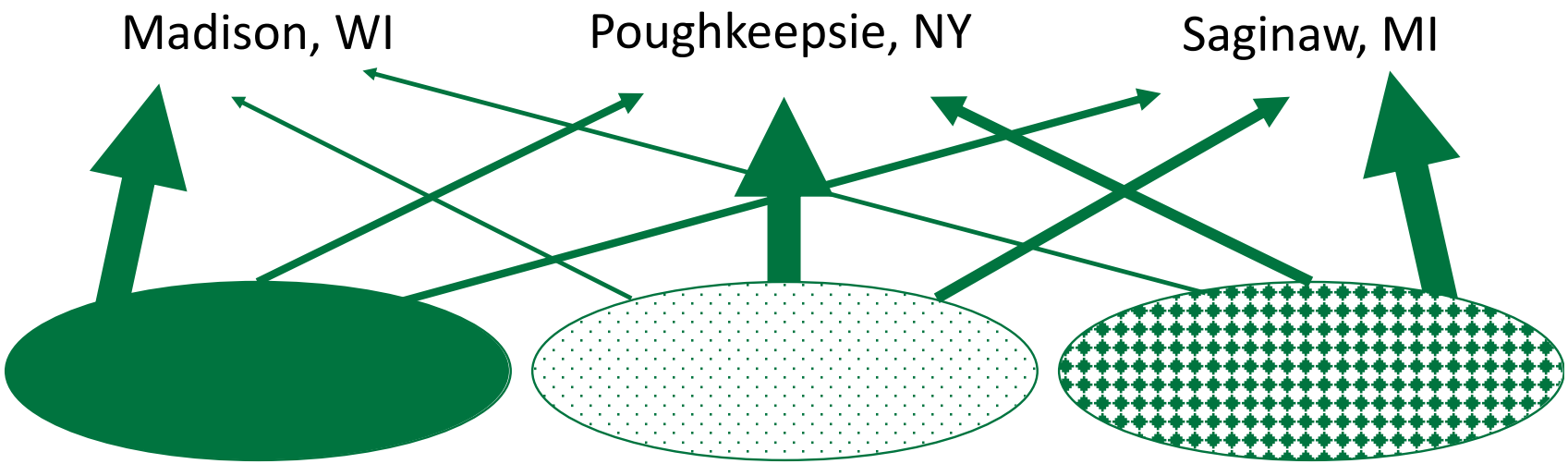




Back

Sufficient number of county types

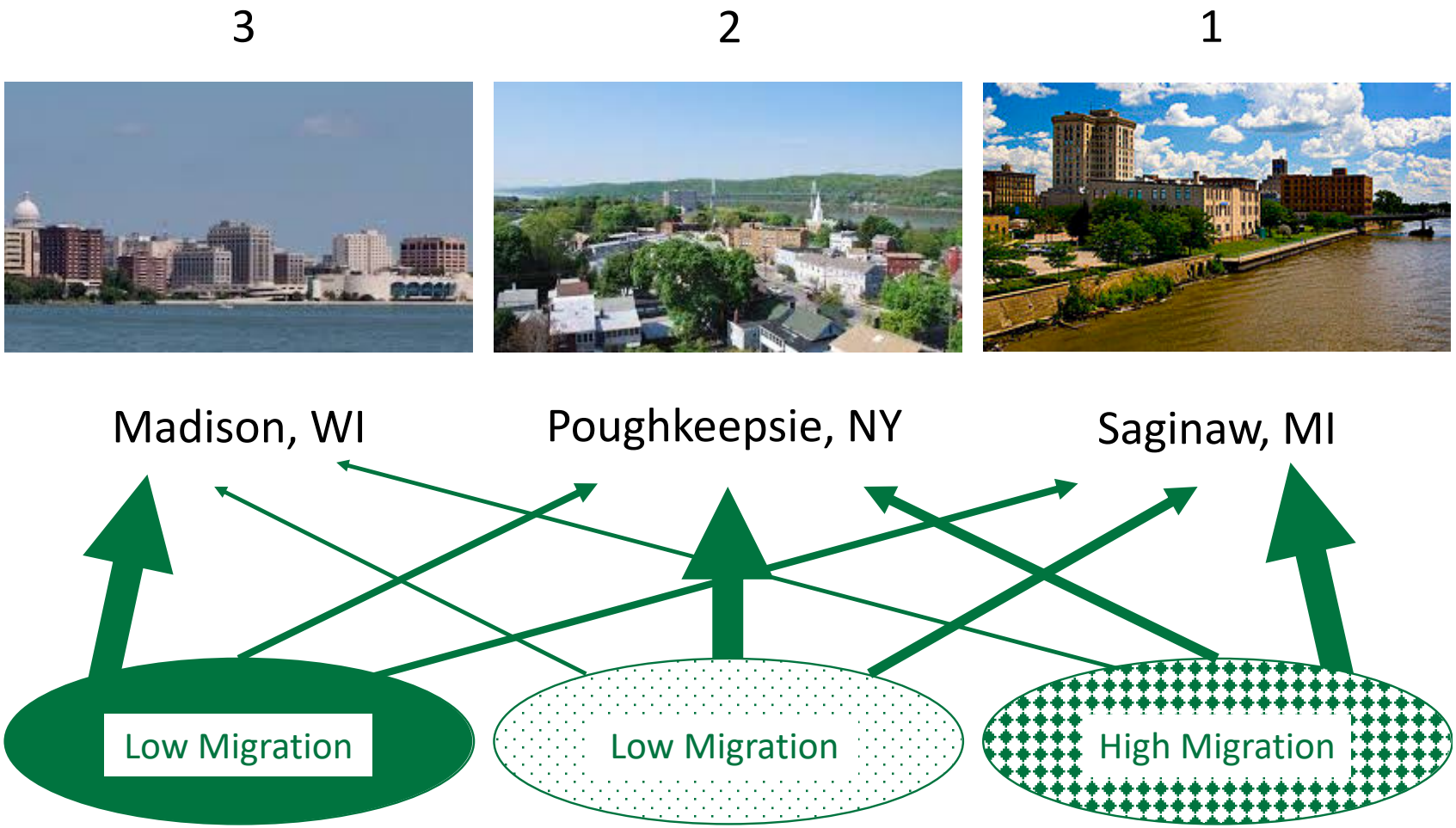
3 1 2



Back

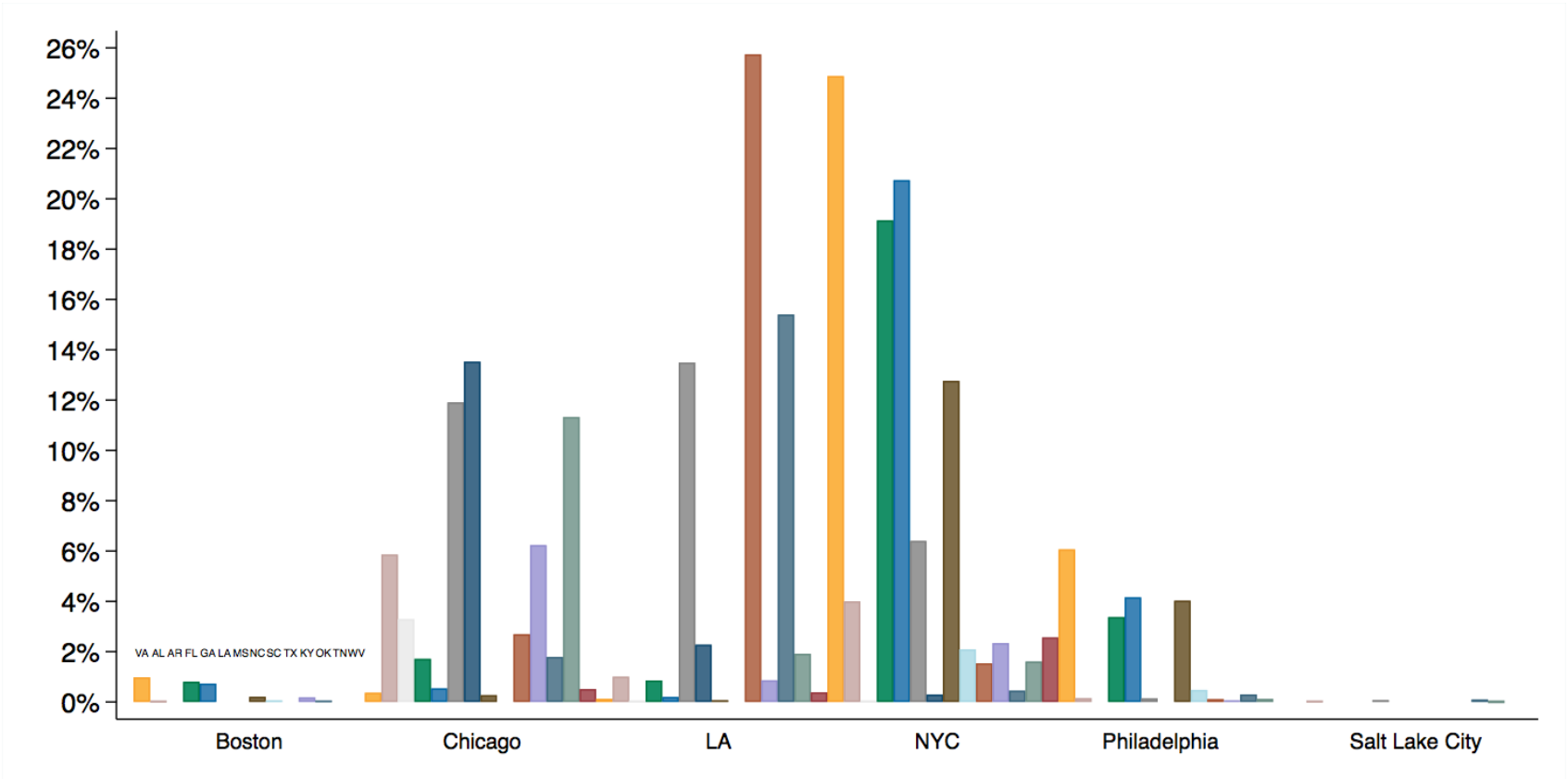
Sufficient number of county types

Idiosyncratic origin variation within destination



Back

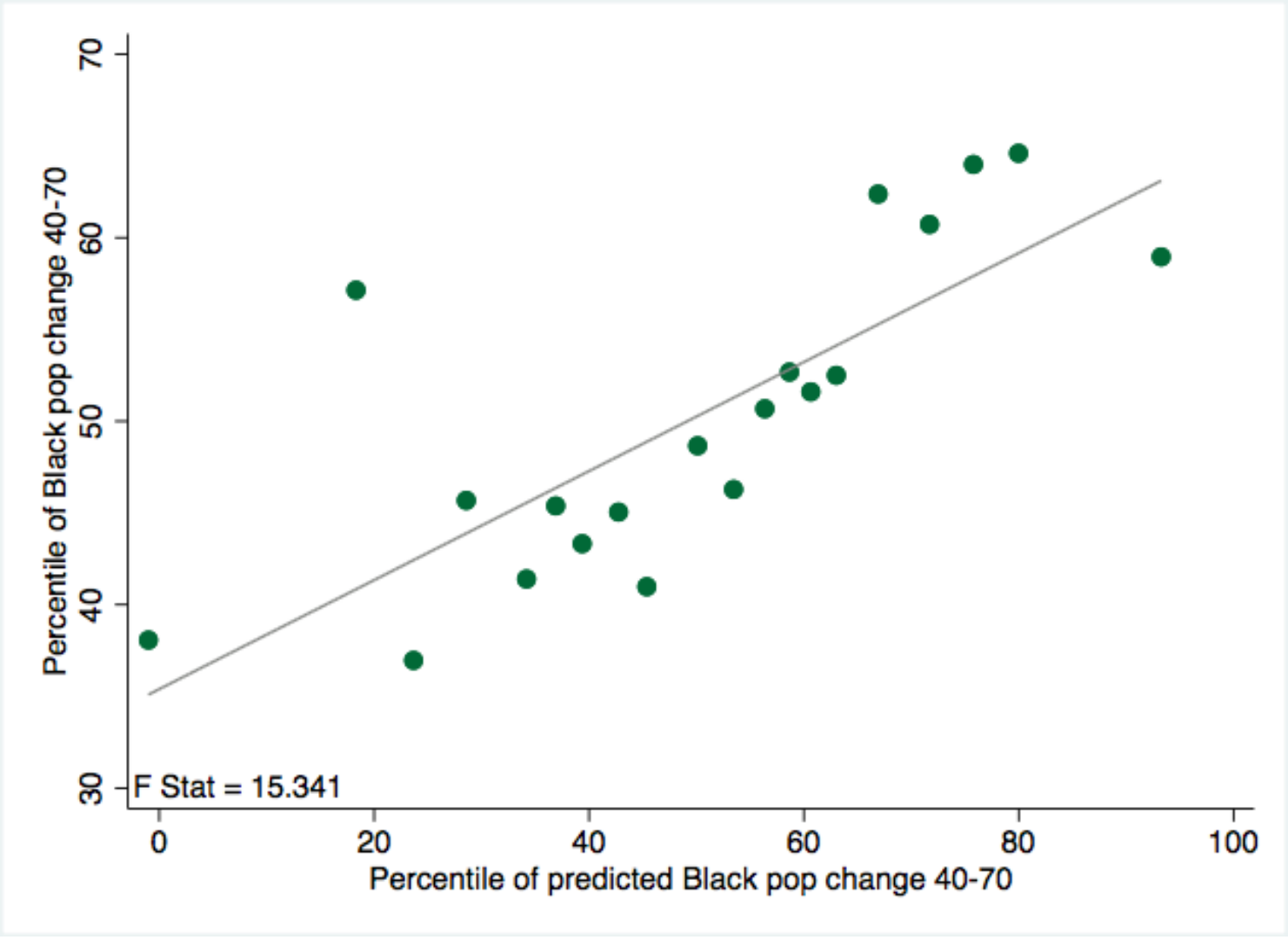
Southern Black migrant weights $\frac{m_{jc}^{'35\text{-}40}}{m_{j}^{'35\text{-}40}}$ for eight cities



Data from IPUMS 1940 complete count census. Migration weights for ∼320,000 Black respondents who list southern county of residence in 1935 $\neq$ current county.

▸ Back

First Stage



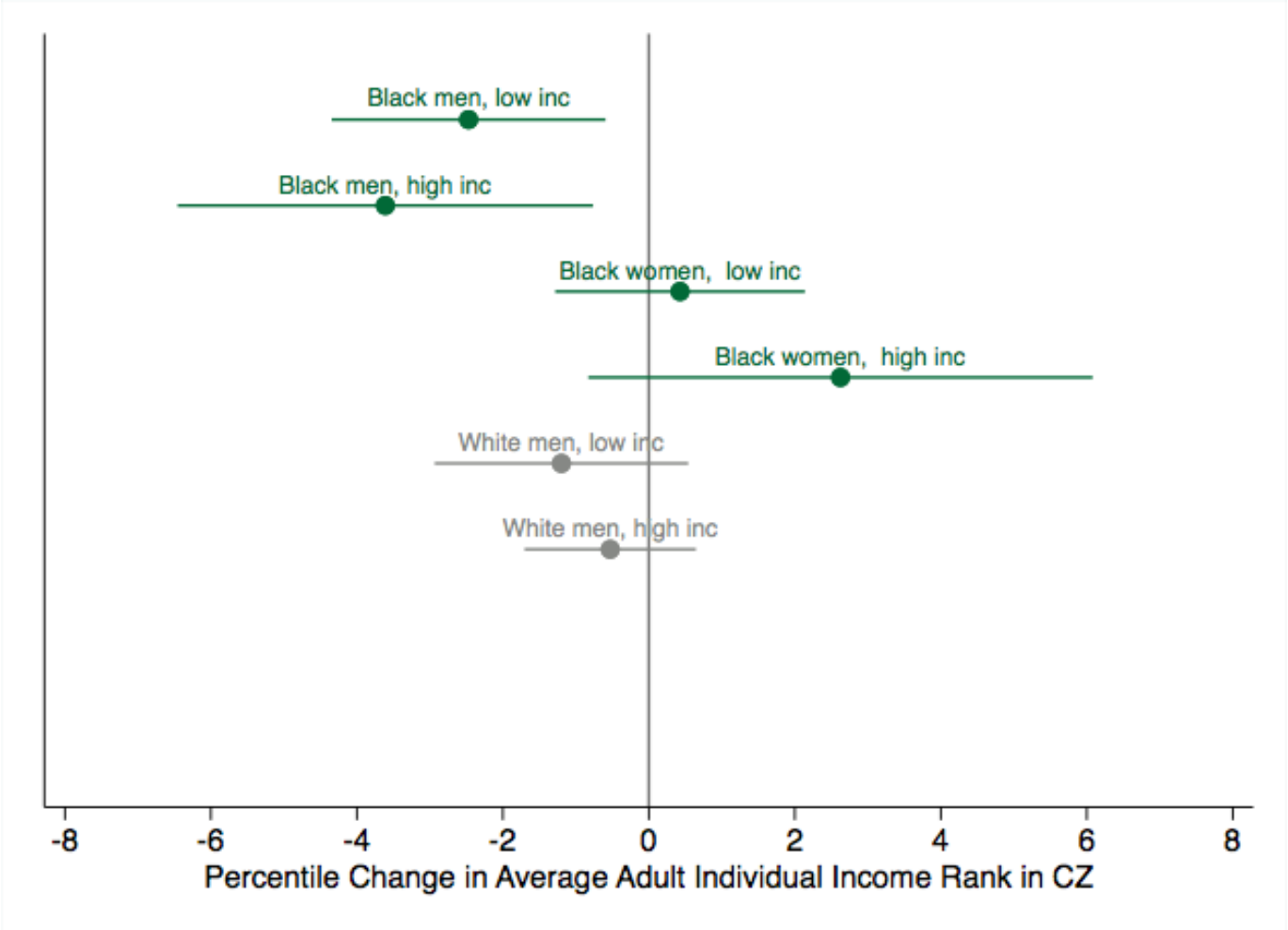
Back

Selection among Black migrants during GM

- Migrants both positively and negatively selected (Collins and Wanamaker, 2015; Eriksson, 2018)
- Grandparents of 1980s birth cohorts migrated.
- Migrants' children had higher upward mobility than non-migrants' in 1940

Back

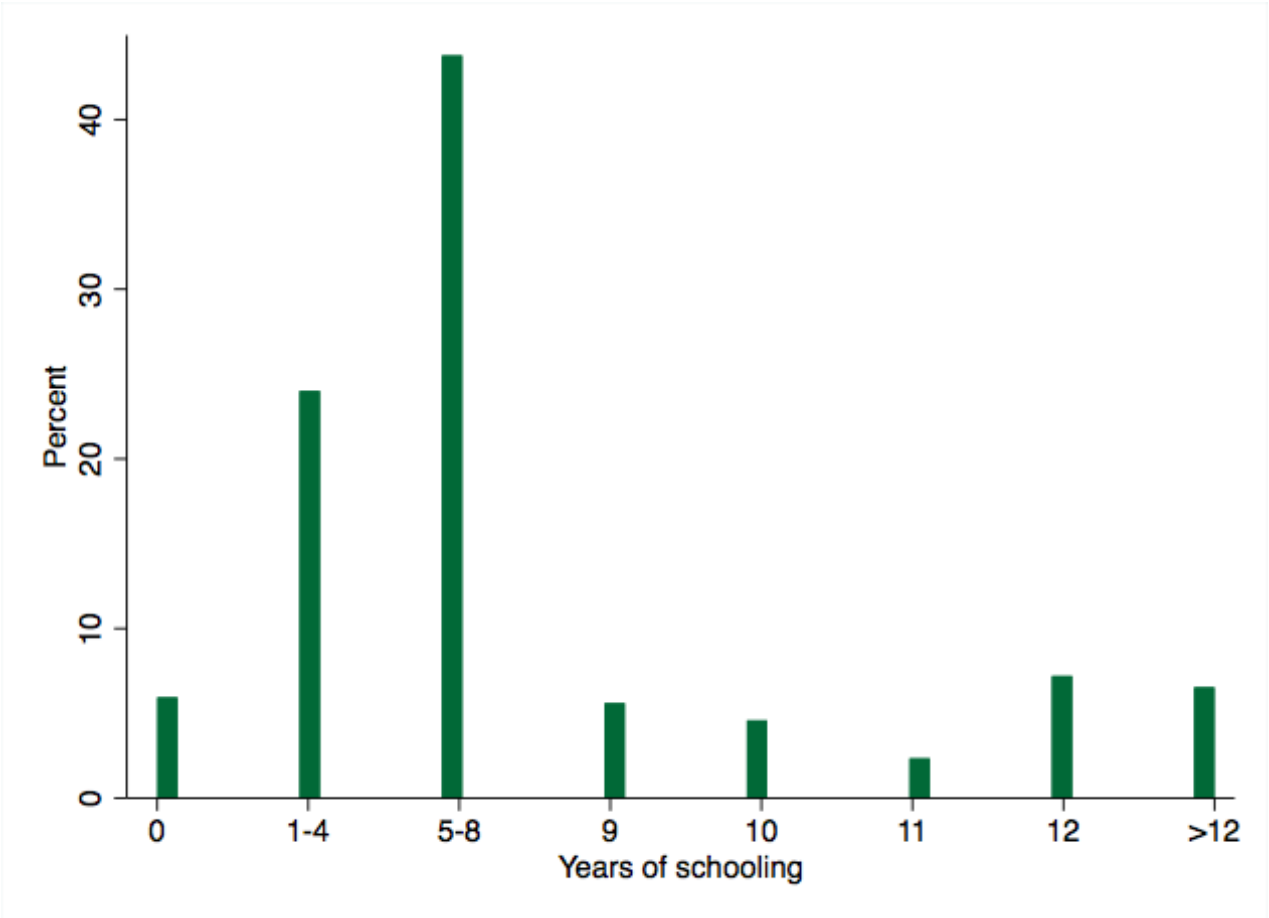
Whose upward mobility was affected by Great Migration?



Units of shock are 30 percentiles. Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty-Hendren et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016). ▸ Household income

Histogram of 1935-1940 Black southern migrant education

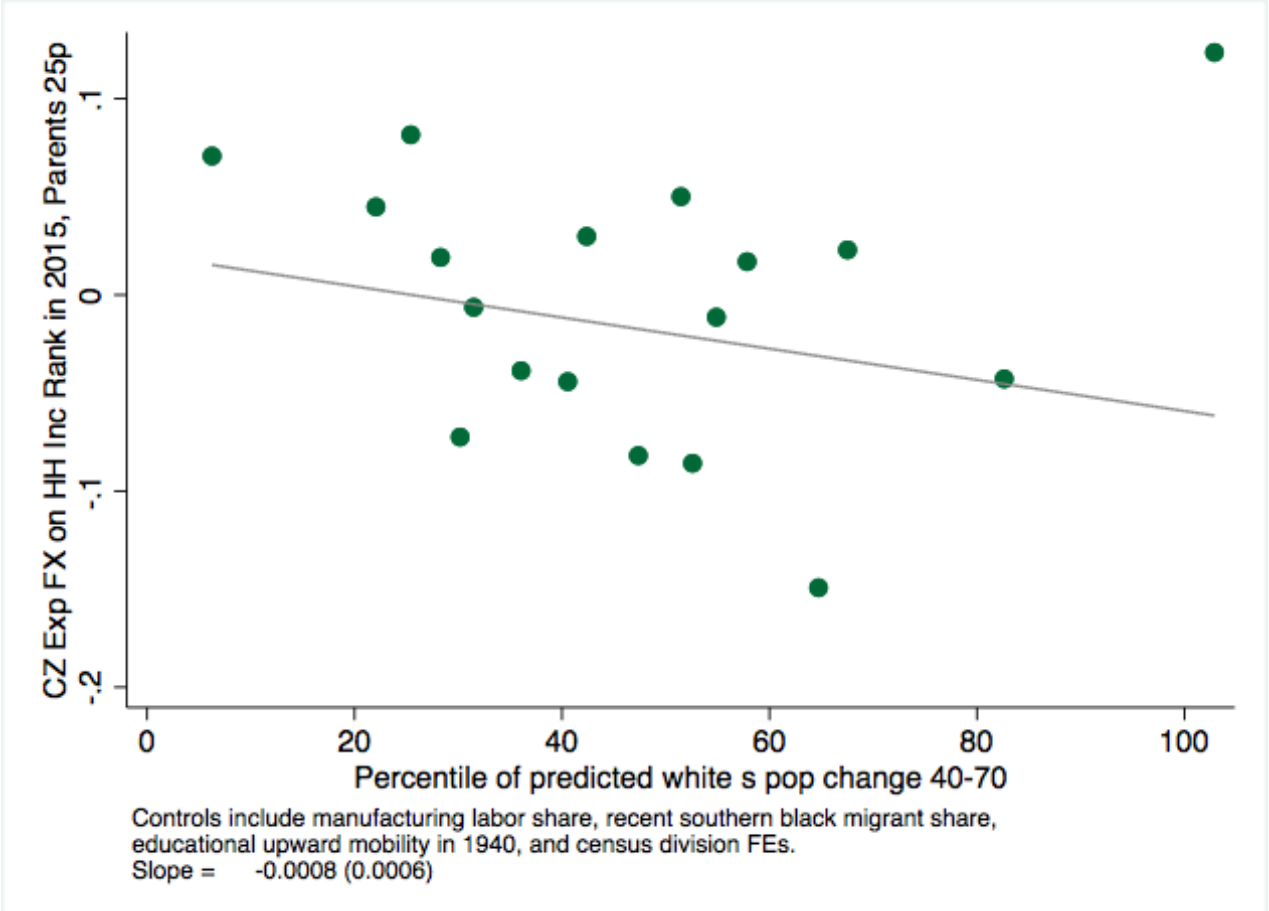
Black migrants were positively selected in 1940. Median education equivalent to national median (Card et al., 2018).



Histogram of years of schooling of 1935-1940 Black migrants aged 25 and older reporting a southern county of residence in 1935. *Data source*: IPUMS 1940 Census.

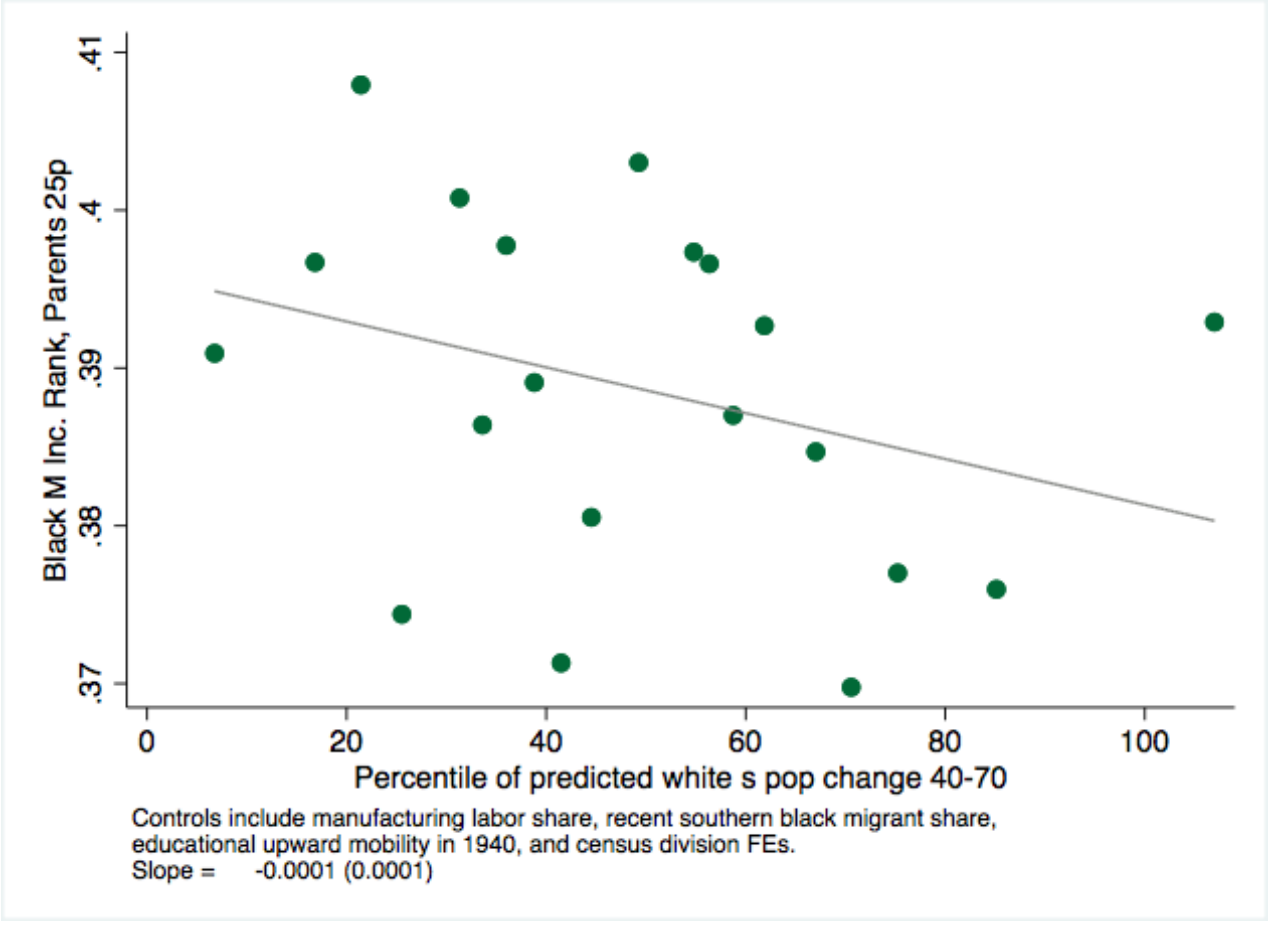
▸ Back

Foreign-born white share impact on CZ exposure effects



Baseline controls included. Observations are northern commuting zones. *Data source*: IPUMS 1910-1940 Census; City and County Data Books, 1944-1977; and Boustan (2016). ▸ Back

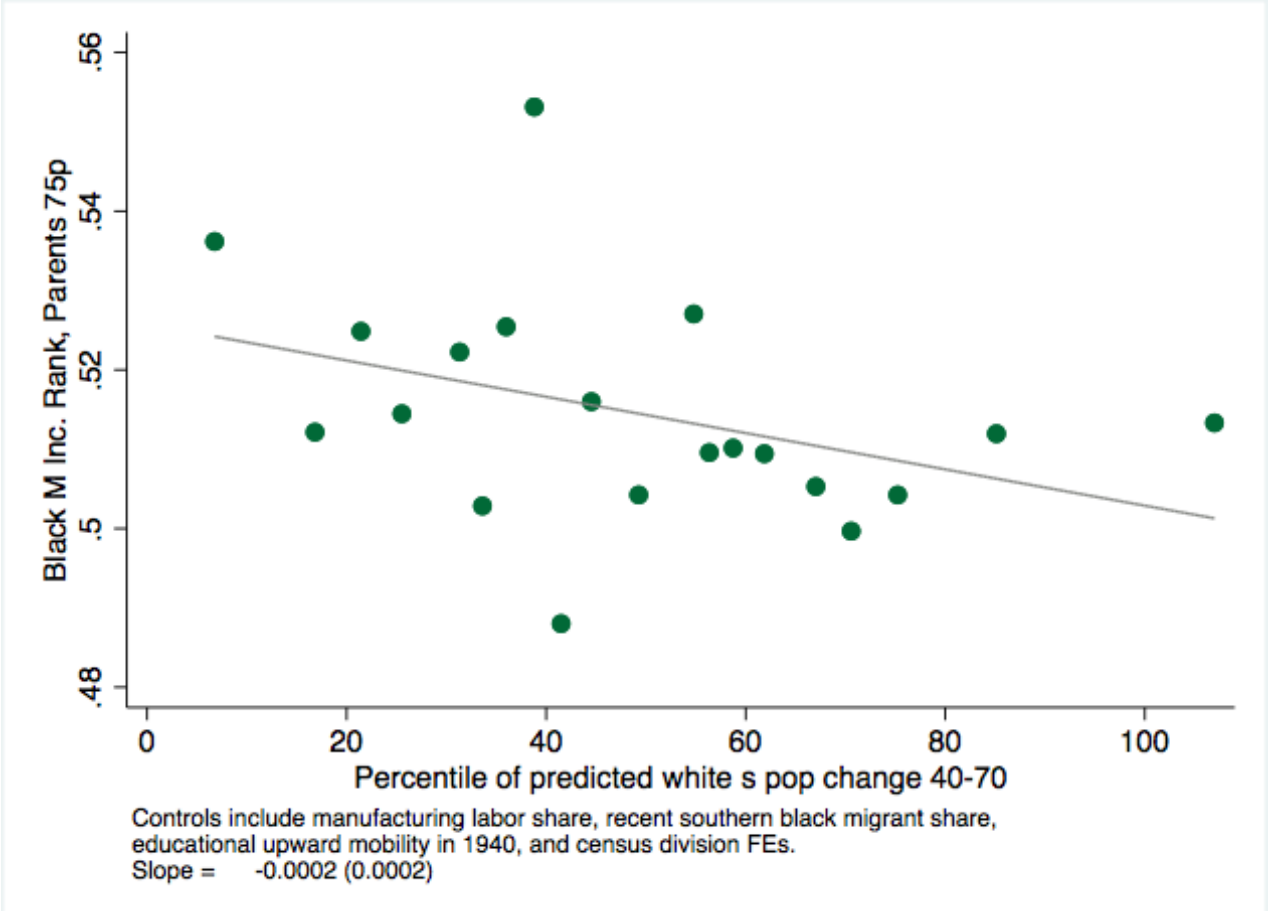
Foreign-born white share impact on Black m p25



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

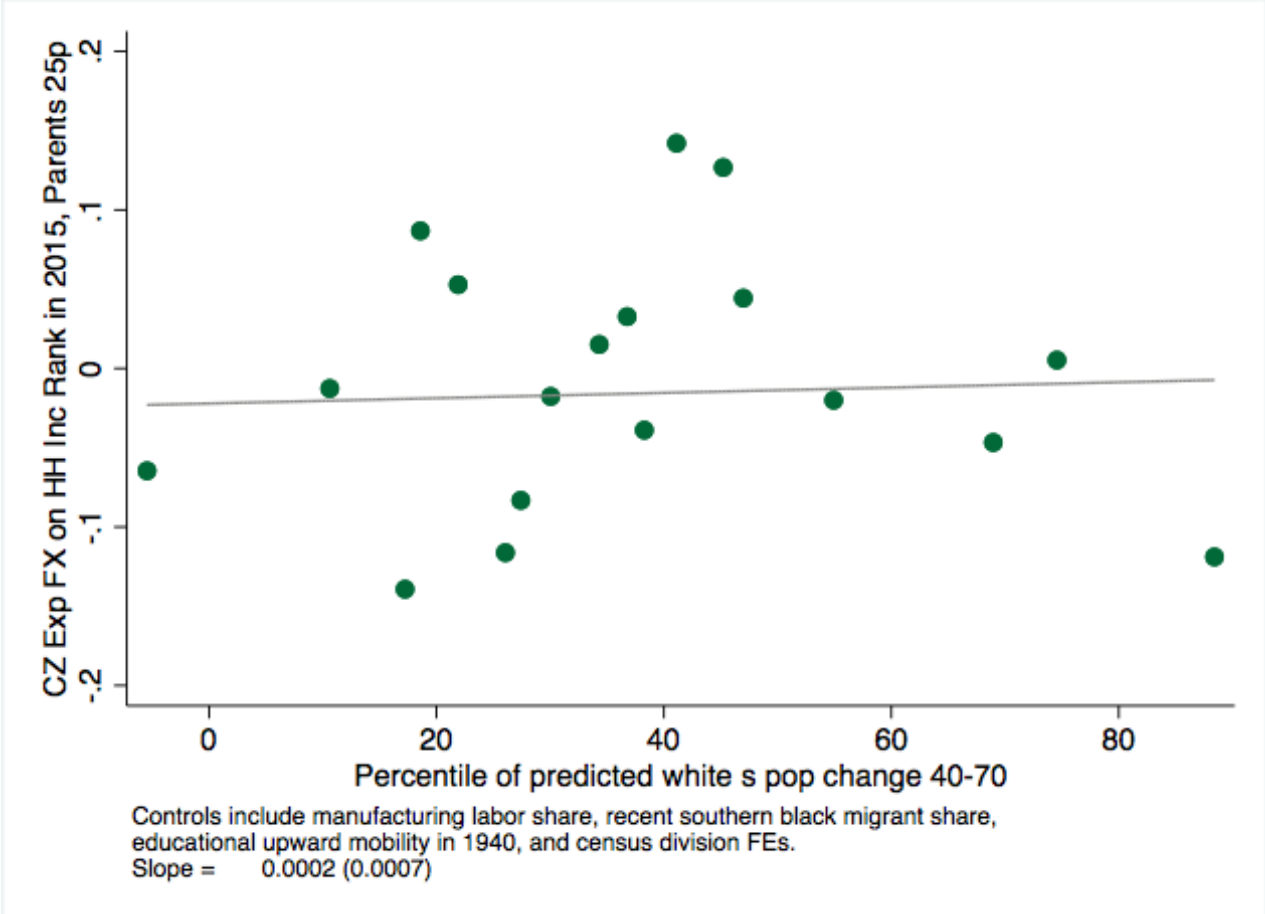
Foreign-born white share impact on Black m p75



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

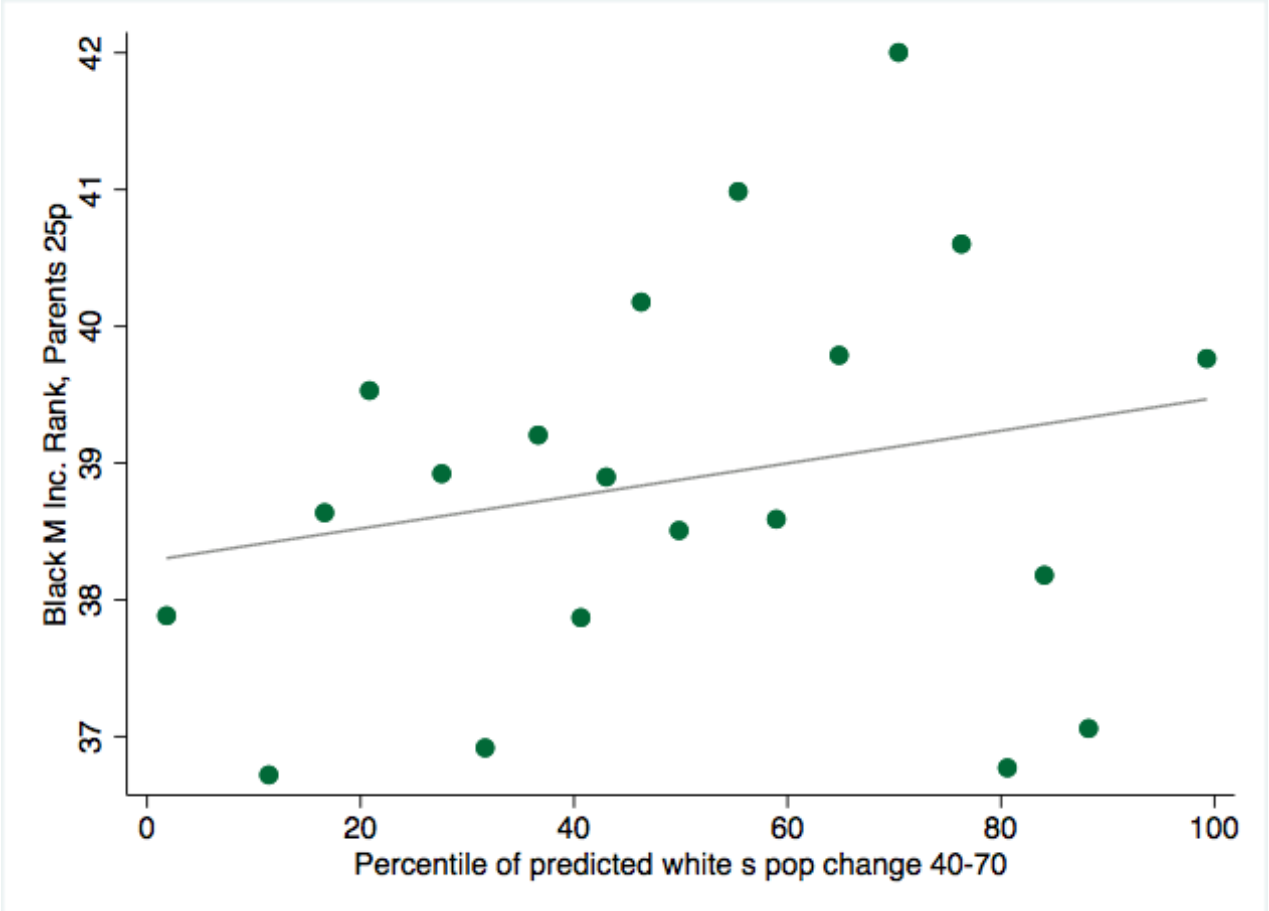
White southern mig impact on CZ exposure effects



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

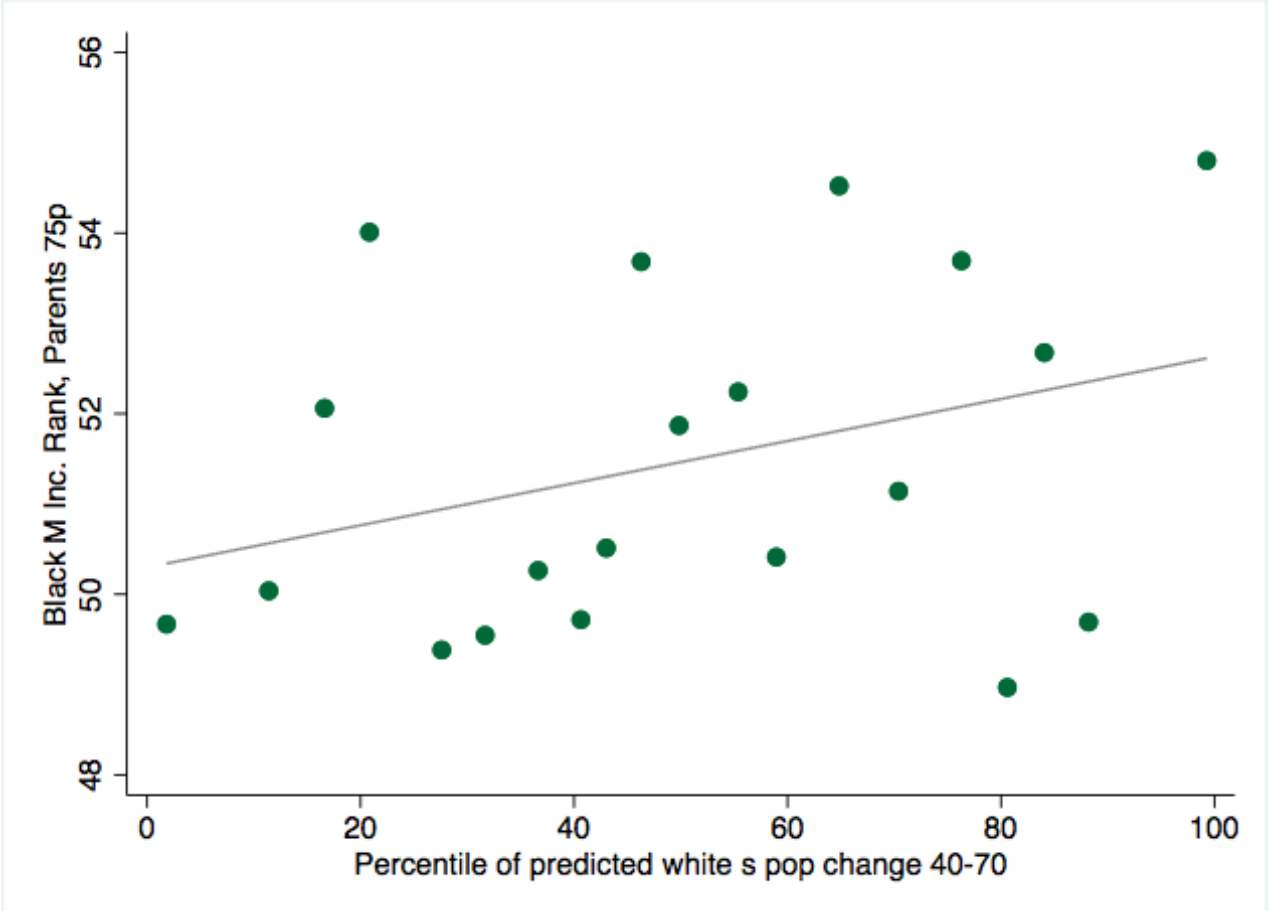
White southern mig impact on Black m p25



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

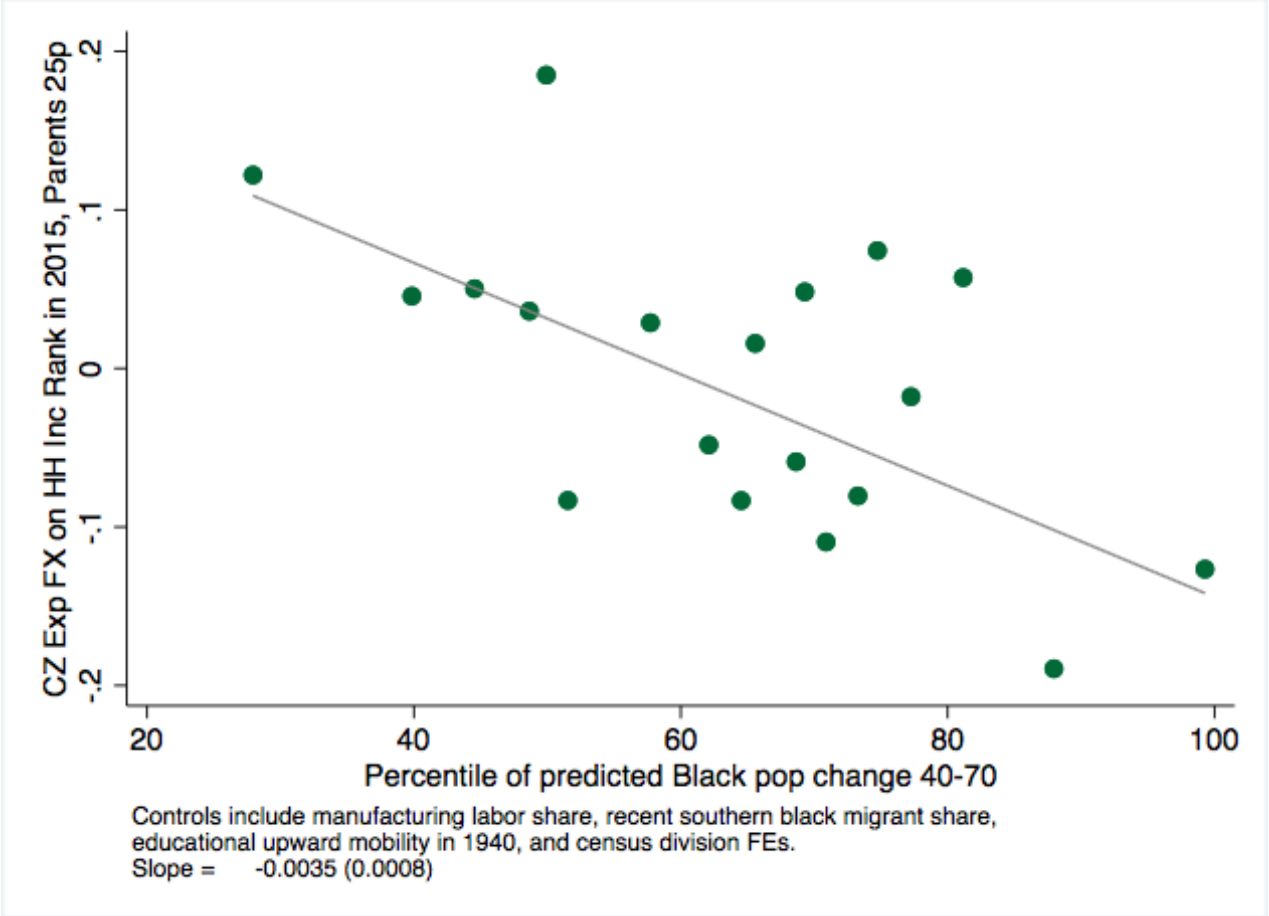
White southern mig impact on Black m p75



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

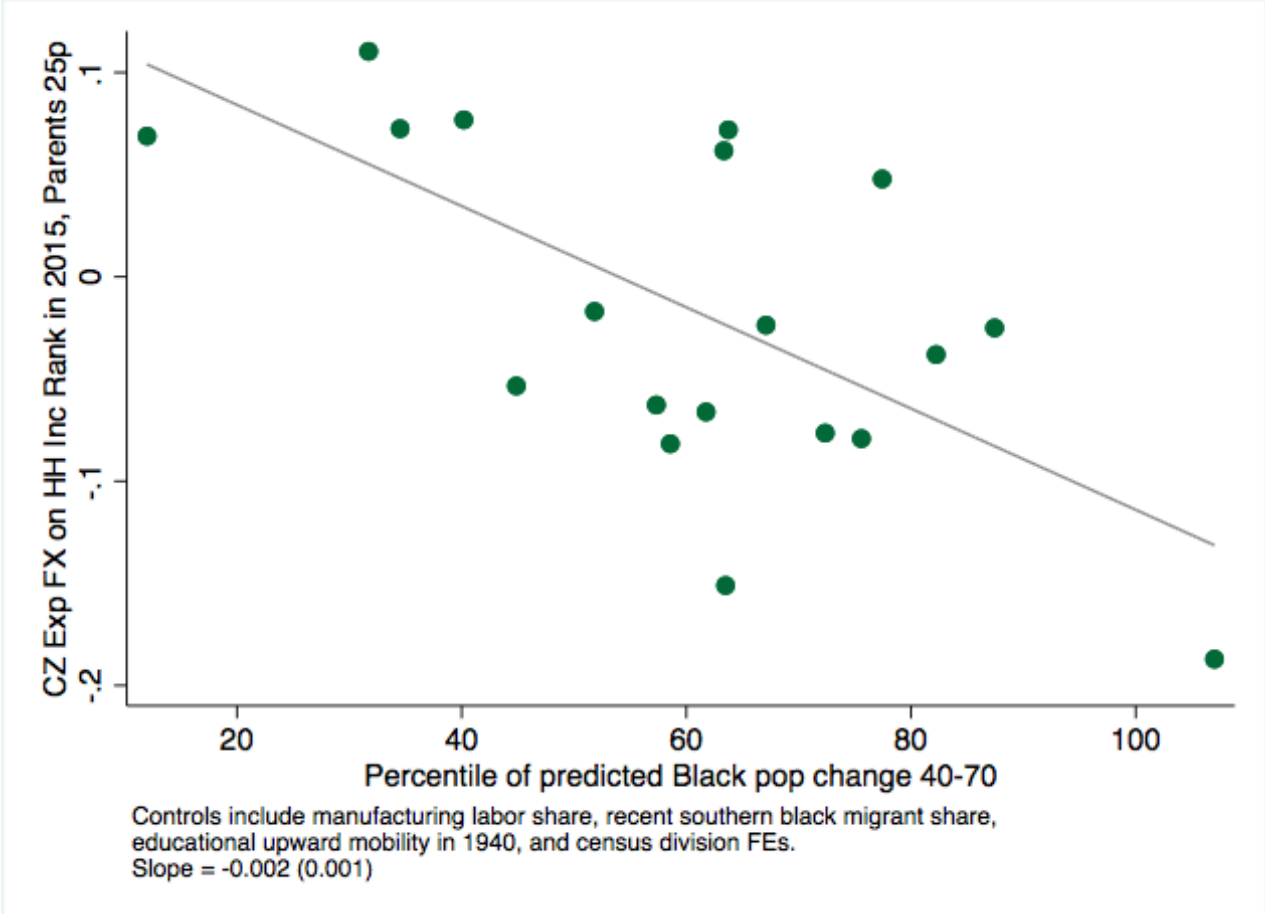
Black state resid mig impact on CZ exposure effects



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

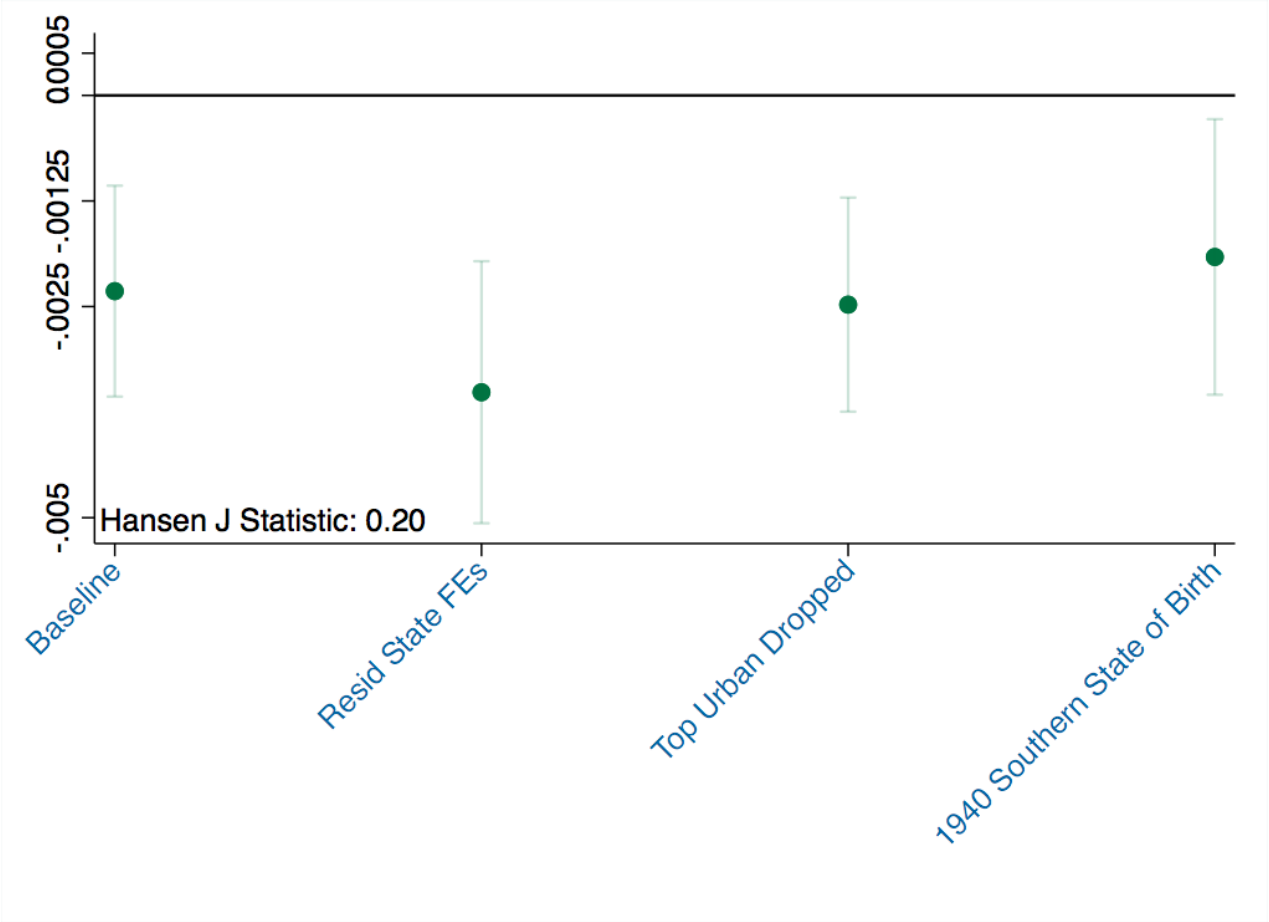
Black non-urban county mig impact on CZ exposure effects



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

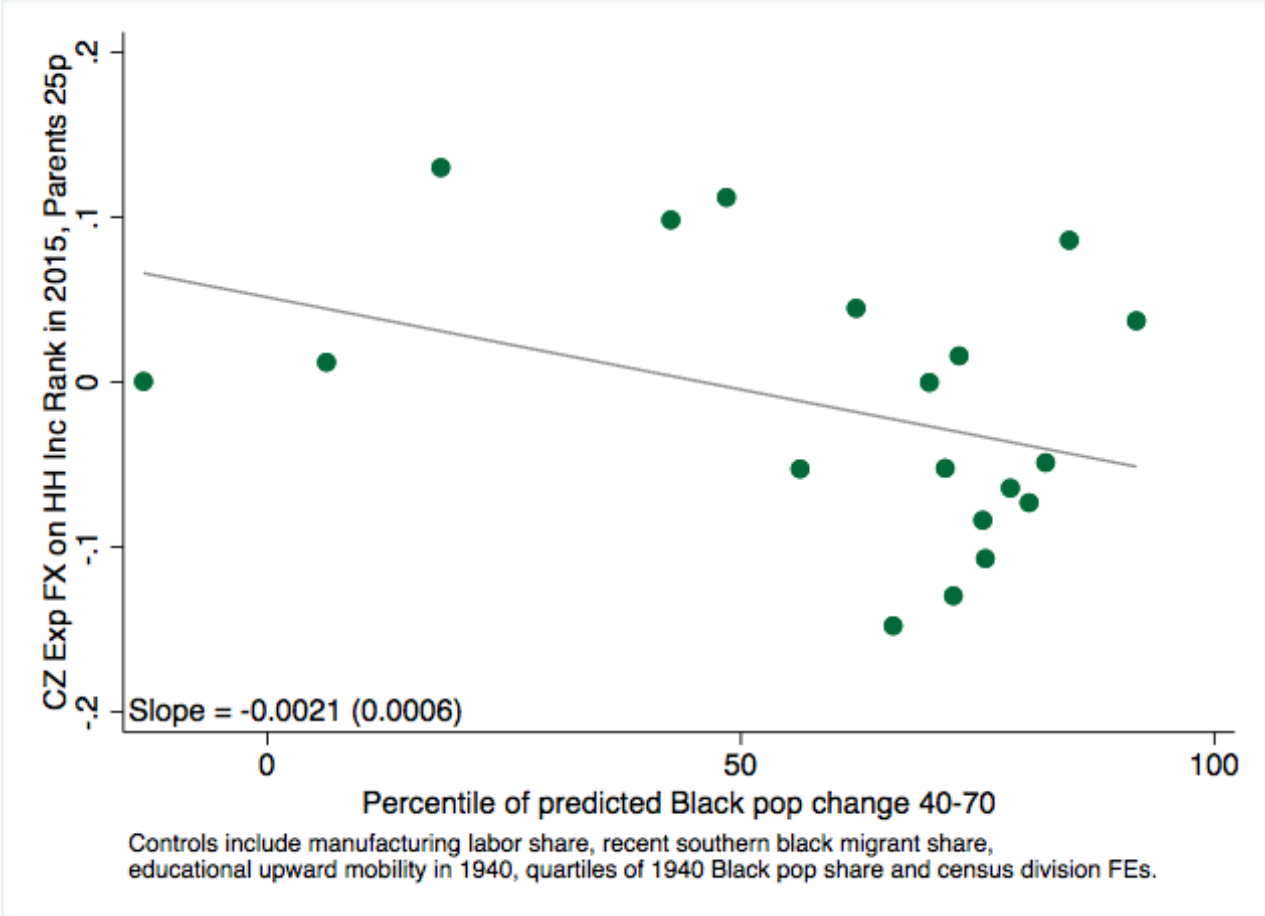
Alternative instruments and over-id test



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

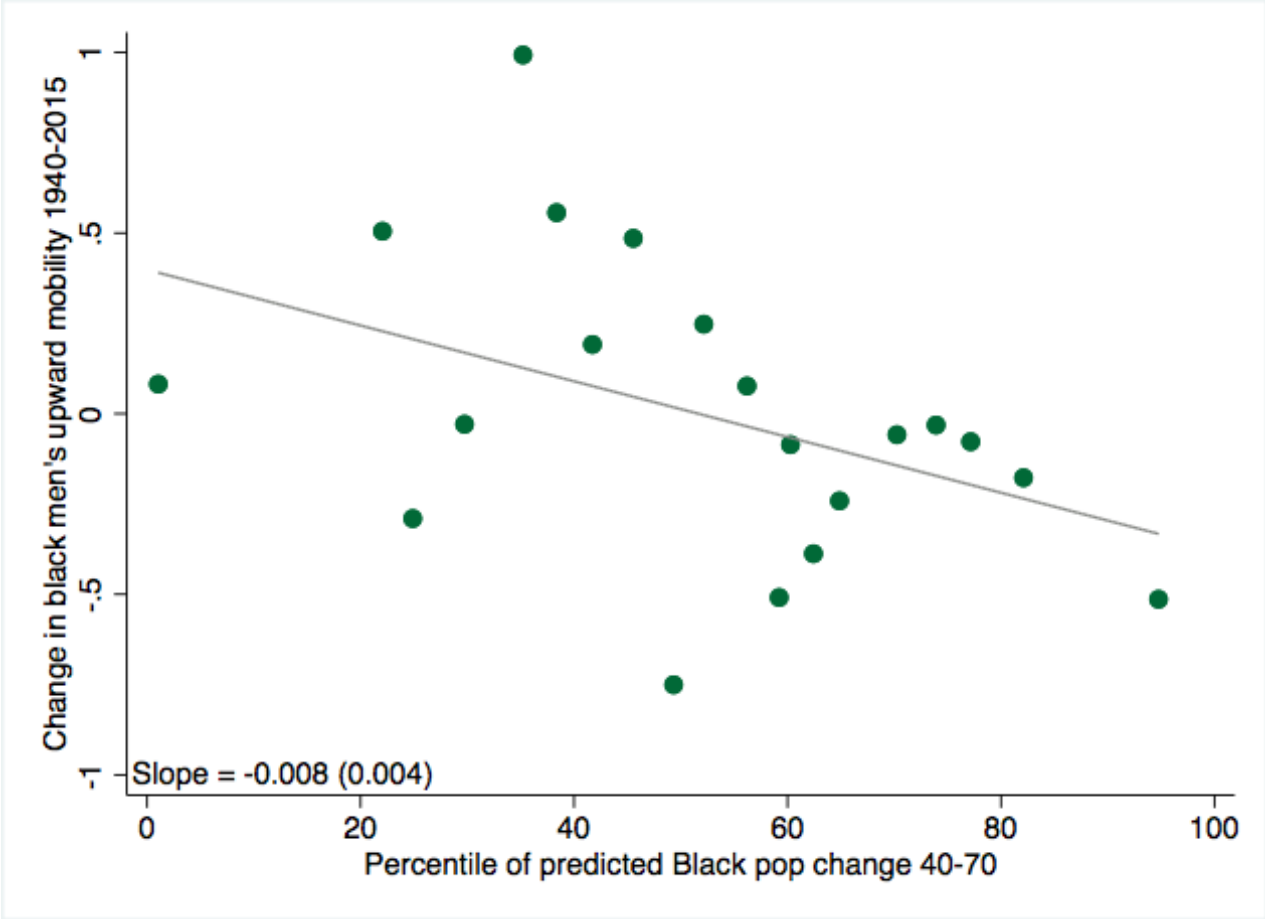
Great Migration impact on CZ exposure effects, flexible controls for fraction Black



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

Impact of Great Migration on change in Black men's upward mobility 1940-2015

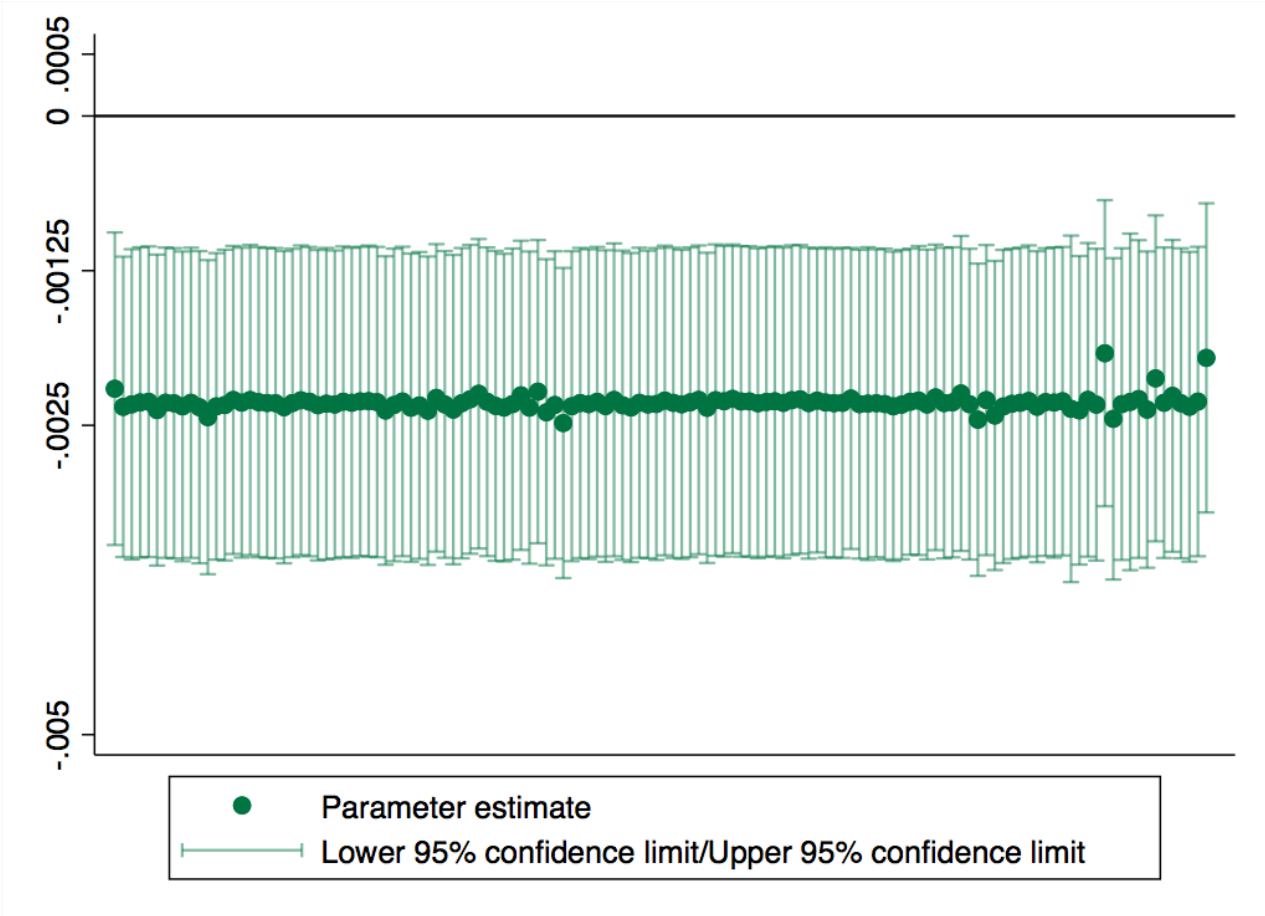


Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

Back

Results robust to dropping each CZ once from sample

Coefficient on $\hat{GM}$

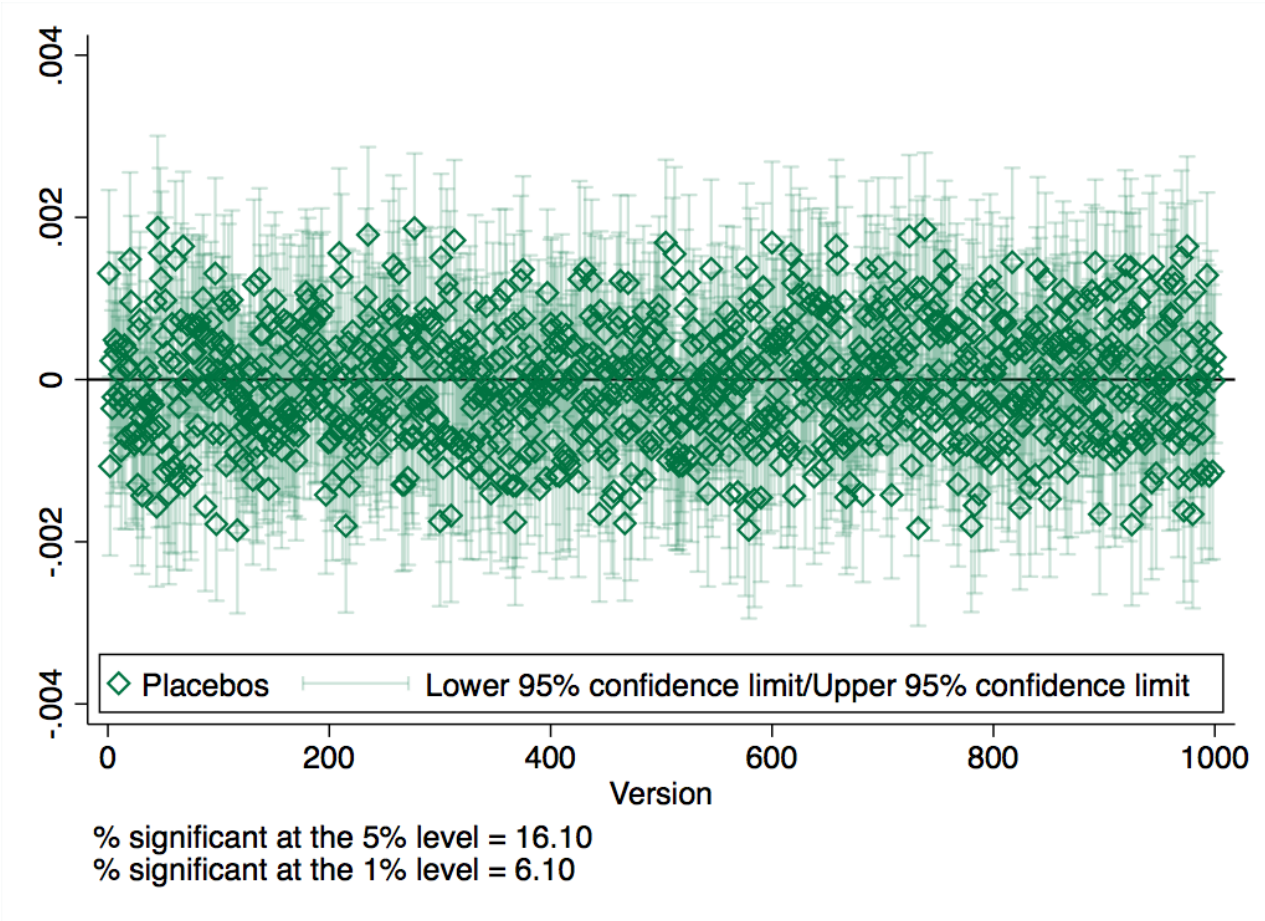


Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

▸ Back

Coef. on $\hat{GM}$ using random migration shocks

12% of random shocks generate non-zero effect compared to 45-55% in studies analyzed by AKM (2019).



Baseline controls included. Observations are northern commuting zones. *Data source*: Chetty et al. (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

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Causal effects of locations on upward mobility

Estimates from Chetty and Hendren (2018b): Exposure design purges place effect estimates of bias due to sorting on family unobservables, θ_i:

$$\begin{aligned} y_i &= \delta_c + \theta_i \\ &\downarrow \\ \Delta y_i &= \alpha_c \Delta t_i \end{aligned}$$

α_c is an unbiased estimate of effect of additional year of childhood exposure to location c on adult outcome y_i. Back

Details on Chetty-Hendren estimation procedure I

Data and sample definitions

- Universe of individual US tax records from 1996-2012
- 1980s birth cohort children linked to parents through dependent claiming
- Movers sample: $\sim$ 3 mil. families who move once across counties within commuting zones or once across commuting zones.

Back

Details on Chetty-Hendren estimation procedure II

Estimating equation:

$$y_i = \alpha_{od} + \vec{e_i}\vec{\mu} + \varepsilon_i$$

- $\vec{e_i}$ is a vector of exposure times to locations c and $\vec{\mu}$ is a vector of causal exposure effects $\mu_{pc} = \mu_0 + \mu_1 p$
- Assumption 1: Family selection effects constant with respect to child's age at time of move
- Assumption 2: Conditional on origin-destination fixed effects, timing of move is orthogonal to other unobserved factors determining children's outcomes
- Results robust to using displacement shocks and family fixed effects

▸ Back

Causal effects of locations on upward mobility

Let α_c^r be the potential outcome of a low-income child of race r randomly assigned to spend additional year in c, relative to an average place.

By construction,

$$\mathbb{E}[\alpha_c^r] = 0 \implies \mathbb{E}[\tilde{\Delta}_c^{bw}] = \mathbb{E}[\alpha_c^w - \alpha_c^b] = \mathbb{E}[\alpha_c^w] - \mathbb{E}[\alpha_c^b] = 0$$

Replace A_c with α_c. Back

Notes

- Individuals from 1980s birth cohorts from low income families (25th percentile)
- Household income measured at age 26
- Baseline controls included.
- Observations are northern commuting zones.
- *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

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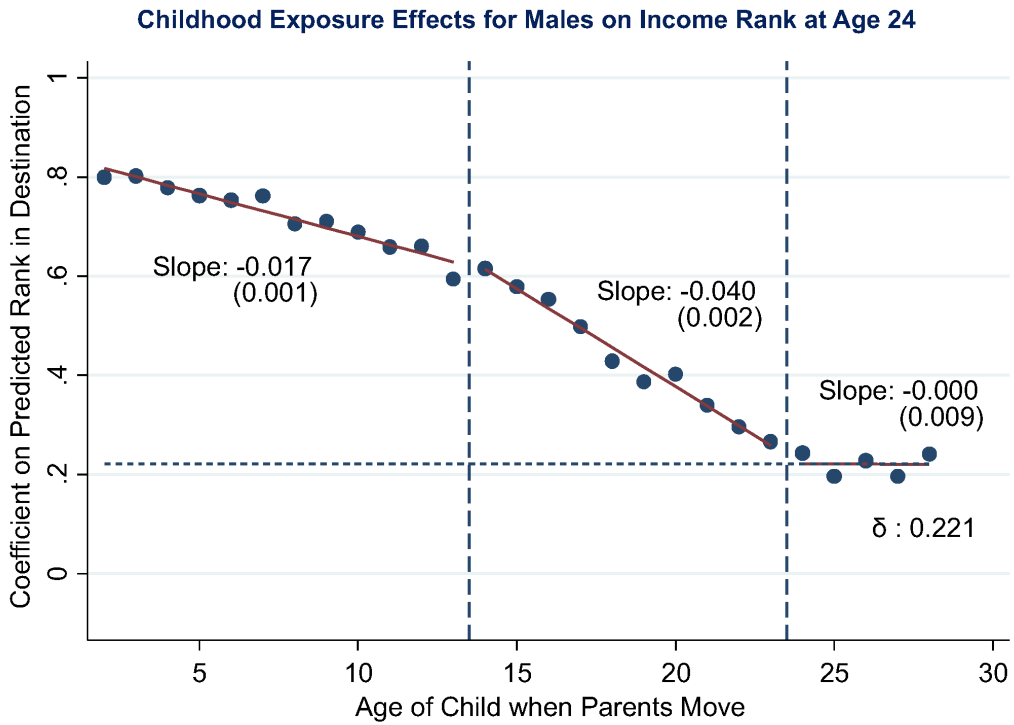
Back

Early exposure has smaller impact than teen years

$$\text{Multiplier} = (23 - 13) + (17/40) \cdot 13 = 15.525$$



Back

Calculating effect of full childhood exposure

Assume muted effect for early years:

$$\text{Years} = (23 - 13) + (17/40) * 13 = 15.525$$

Back

Notes

- Individuals from 1980s birth cohorts from low income families (25th percentile)
- Household income measured at ages 32-37.
- Baseline controls included.
- Observations are northern commuting zones.
- Units of shock ar 30 percentiles ($\approx$ 1 sd).
- *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

Back

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Back

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Back

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Back

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- Observations are northern commuting zones.
- *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

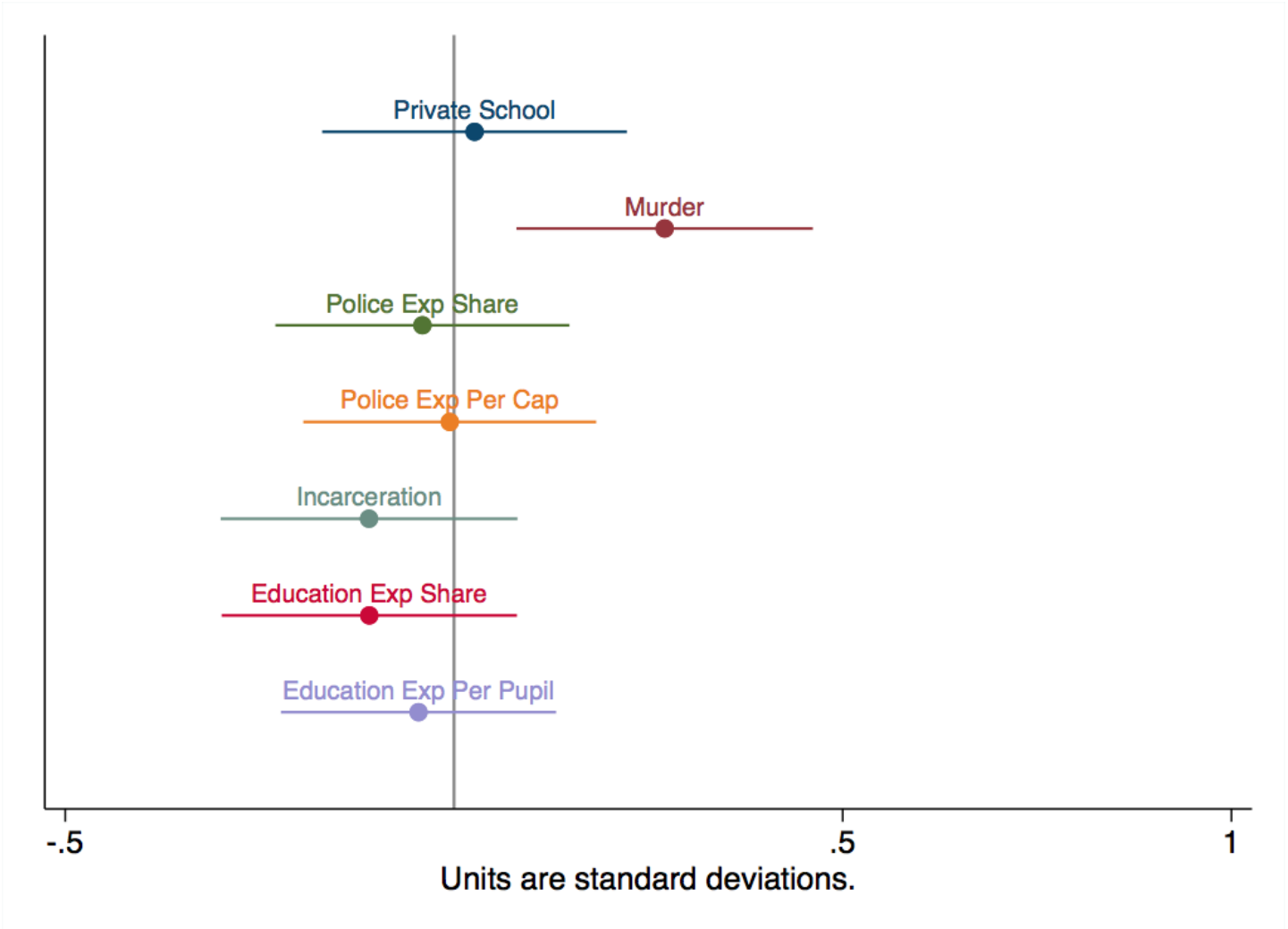
Back

Notes

- Outcome is gap in average adult household income rank between Black and white individuals from median income families.
- Individuals from 1980s birth cohorts
- Household income measured at ages 32-37
- Baseline controls included.
- Observations are northern commuting zones.
- *Data source*: Chetty and Hendren (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016).

Back

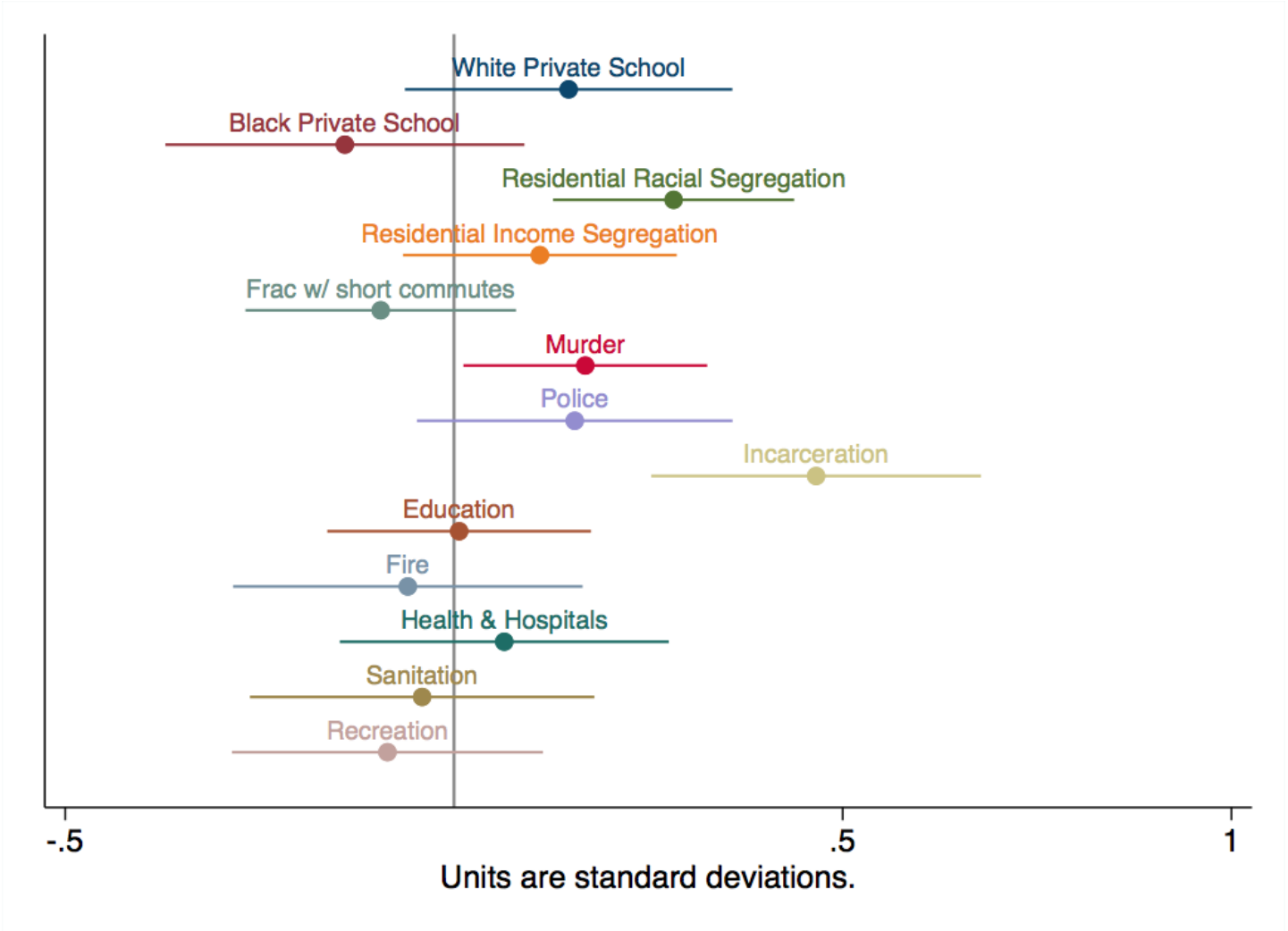
Great Migration largely not associated with pre-1940 mechanisms



Data Source: PF-NBHDS database for CZs, 1920-2015.

▸ Notes ▸ Back

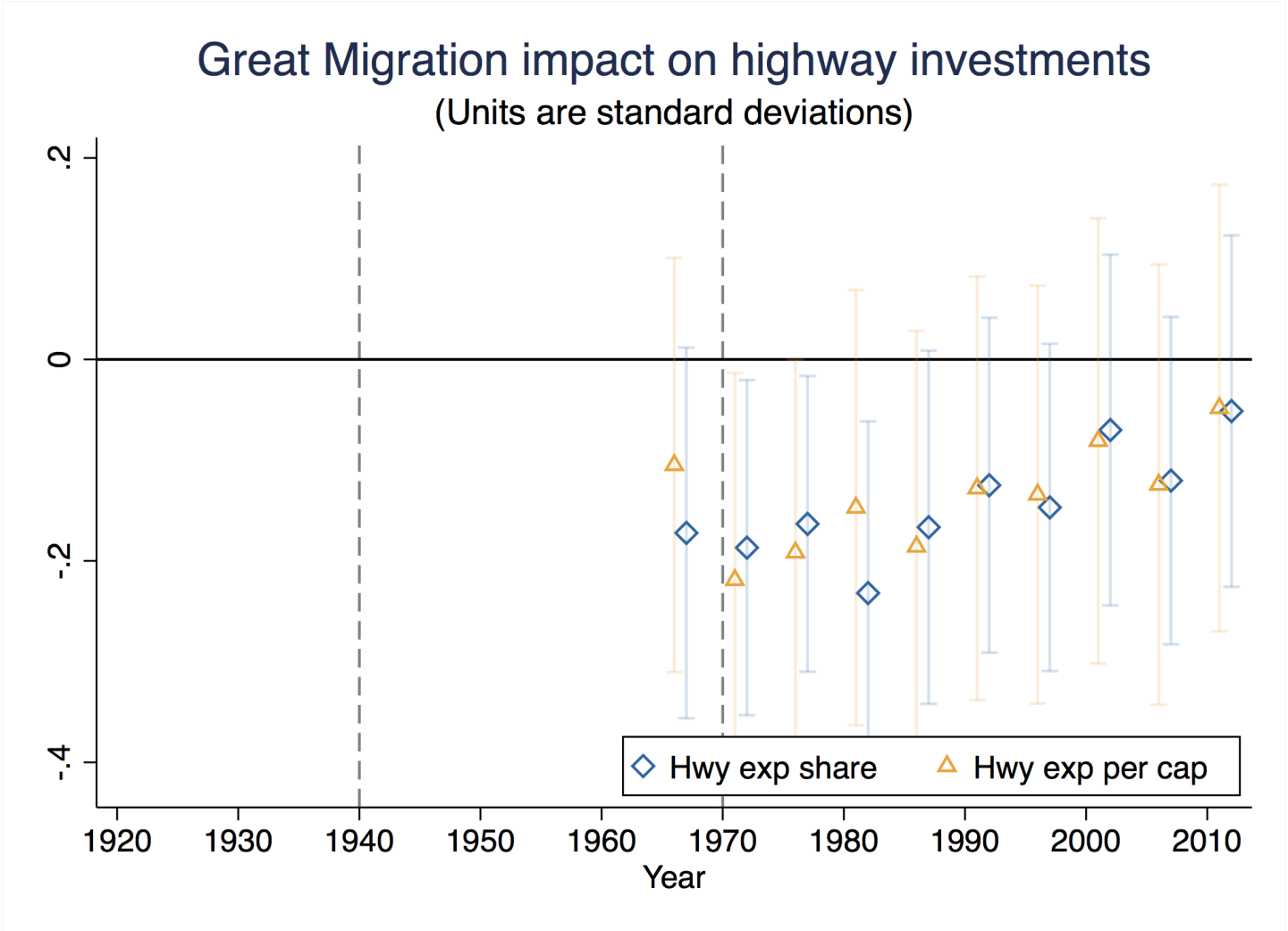
Controlling for pre-period murder rates



Data Source: PF-NBHDS database for CZs, 1920-2015.

▸ Back

Substitution out of highway expenditures



Data Source: PF-NBHDS database for CZs, 1920-2015.

▸ Back

Notes

- Coefficient on 1 s.d. (30 pctile) Great Migration shock
- Outcomes (years):
  - Average white private school rates (1970-2000)
  - Residential racial and income segregation (2000)
  - Average expenditure shares by government category (1972-2002)
  - Average Murders per 100k (1977-2002)
  - Average incarcerated per 100k (1983-2000)
  - Baseline 1940 controls included
  - Observations are northern commuting zones
  - *Data source*: PF-NBHDS database for CZs, 1920-2015; Chetty et al. (2014)

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Notes

- Coefficient on 1 s.d. (30 pctile) Great Migration shock
- Outcomes (years):
  - Private school rates (1920)
  - Average murders per 100k (1931-1943)
  - Average local jail rate per 100k (1920-1940)
  - Average expenditure shares and per cap/pupil by government category (1932)
  - Baseline 1940 controls included
  - Observations are northern commuting zones
  - *Data source*: PF-NBHDS database for CZs, 1920-2015

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PF-NBHDS database for CZs, 1920-2015 (1/2)

- Public finance
  - **Financial statistics of states and local governments, 1932**
  - City and County Data Books, 1944-1977
  - US Census Bureau Annual Survey of Local Governments, 1967-2012
  - Private school enrollment rates
    - **Biennial Statistics of Education, 1920-22**
    - NHGIS, 1960-2010

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PF-NBHDS database for CZs, 1920-2015 (2/2)

- Neighborhood quality (cont'd)
  - Murder rates
    - Johnson et al. (2007) city crime rates from Uniform Crime Reports ("UCR"), 1930-1940
    - **UCR 1931, 1936, 1943, and 1950**
    - ICPSR city crime rates from UCR 1958-1969
    - Vera Institute of Justice In Our Backyards Database
    - City and County Data Books, 1944-1977
  - Incarceration
    - IPUMS Complete Count 1920-1940 Censuses
    - **Inmates of Institutions, US Census 1960, Table 52**
    - **Vera Institute of Justice In Our Backyards Database**

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When did they change?

I estimate effect of Great Migration shock on mechanisms separately in each year.

$$\text{Mechanism}_{t,CZ} = \alpha + \beta \hat{GM}_{CZ} + \mathbb{X}'_{CZ}\Gamma + \varepsilon_{CZ}$$

- Pre-period years serve as placebo checks or controls
- Scaling: units of shock are 30 percentiles, $\sim$ 1 s.d.

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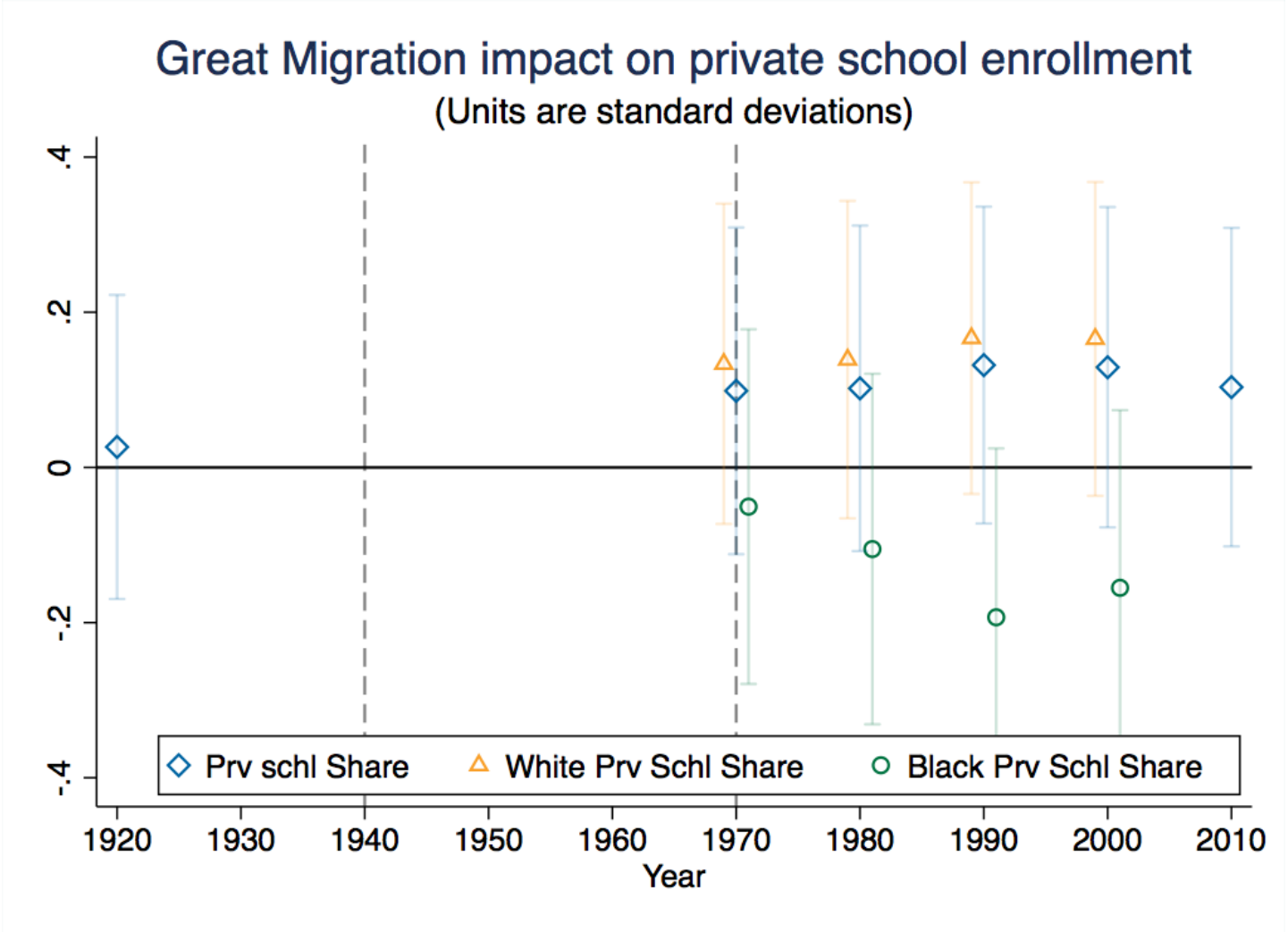
Great Migration impact on private school enrollment



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year.

Units of shock are 30 percentiles. *Data Source*: PF-NBHDS database for CZs, 1920-2015.

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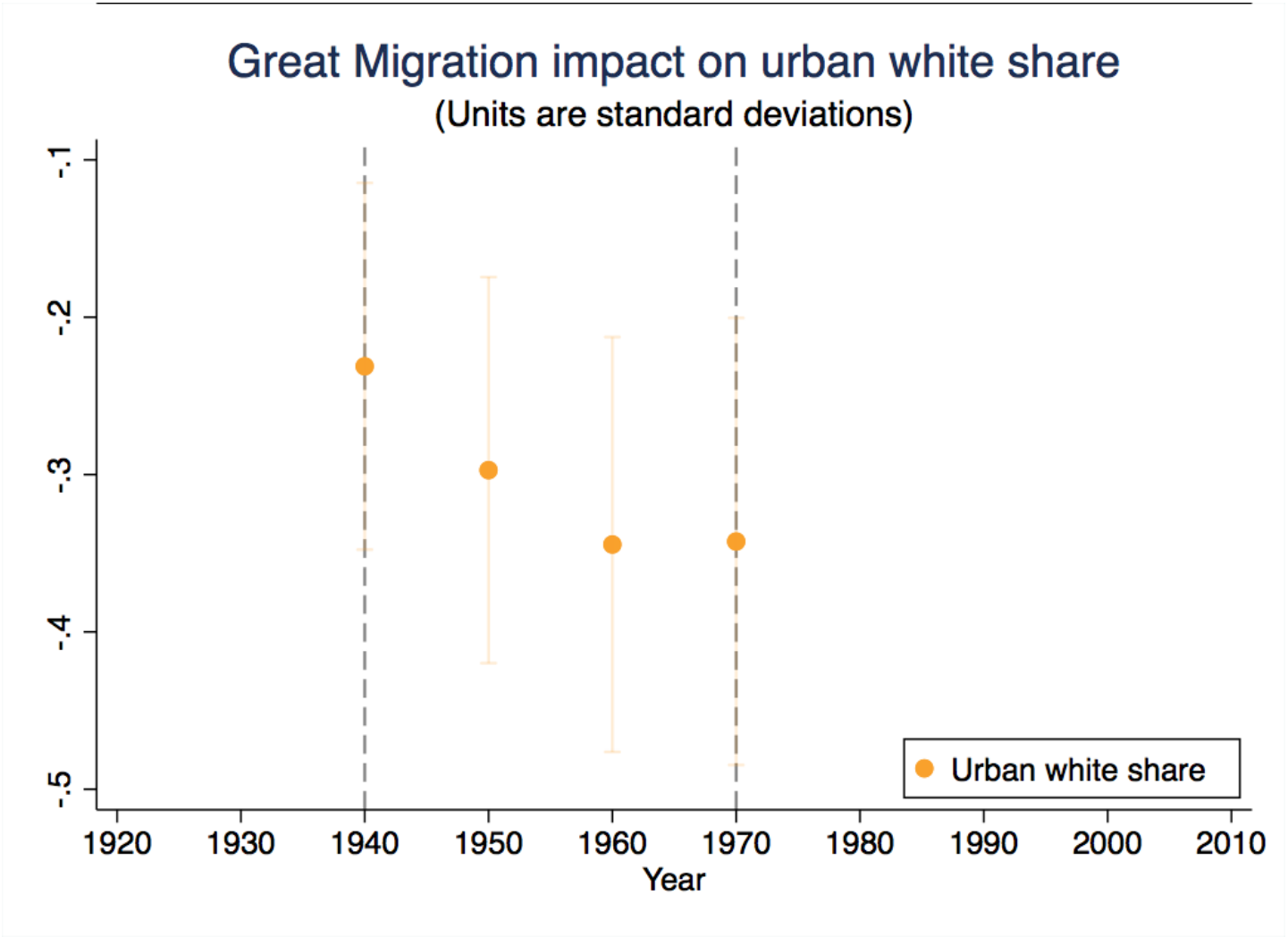
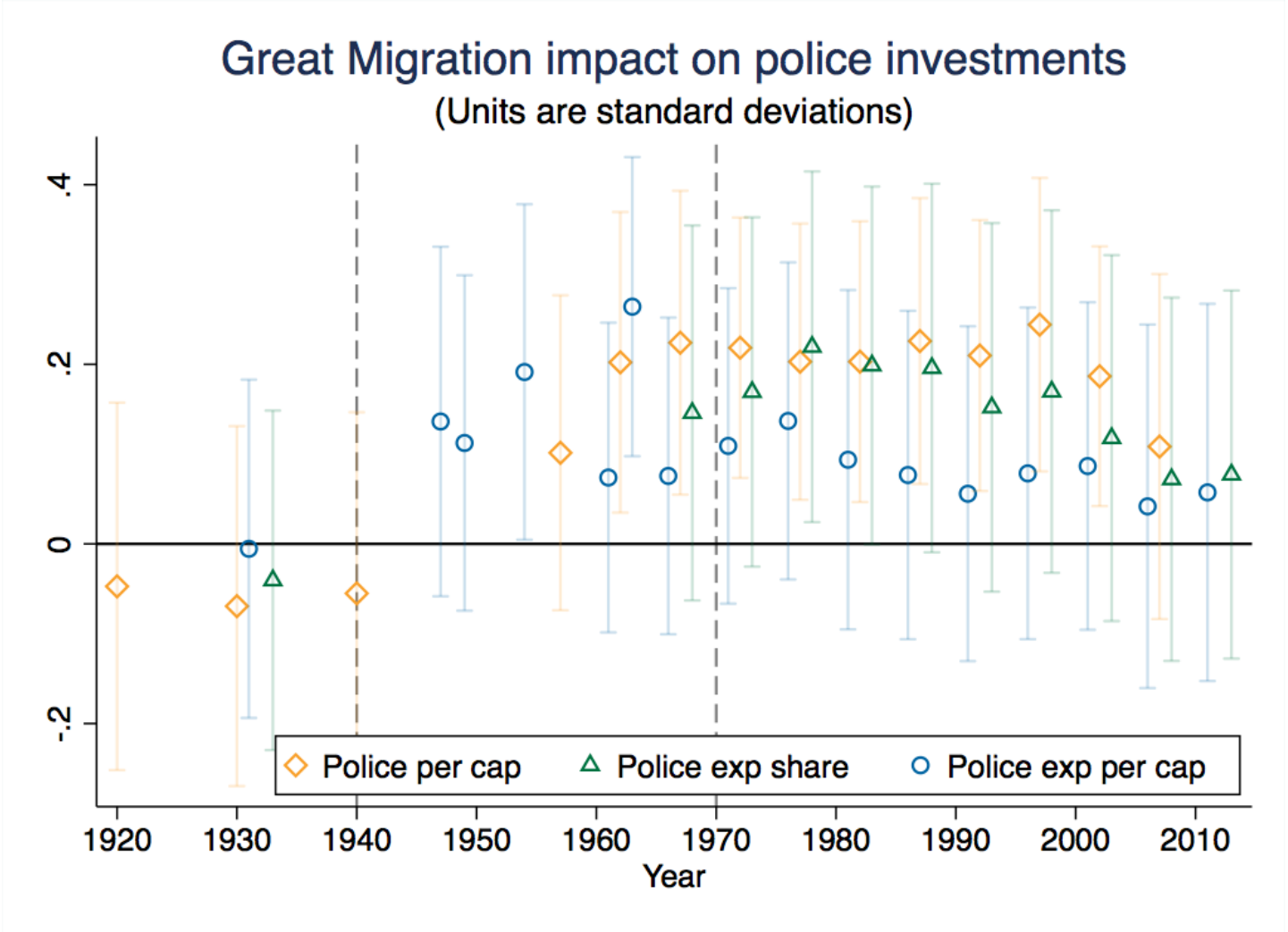
Great Migration impact on urban white share



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year. Units of shock are 30 percentiles. Controls included for total 1940 CZ population. *Data Source*: City and County Data Books.

▸ Back

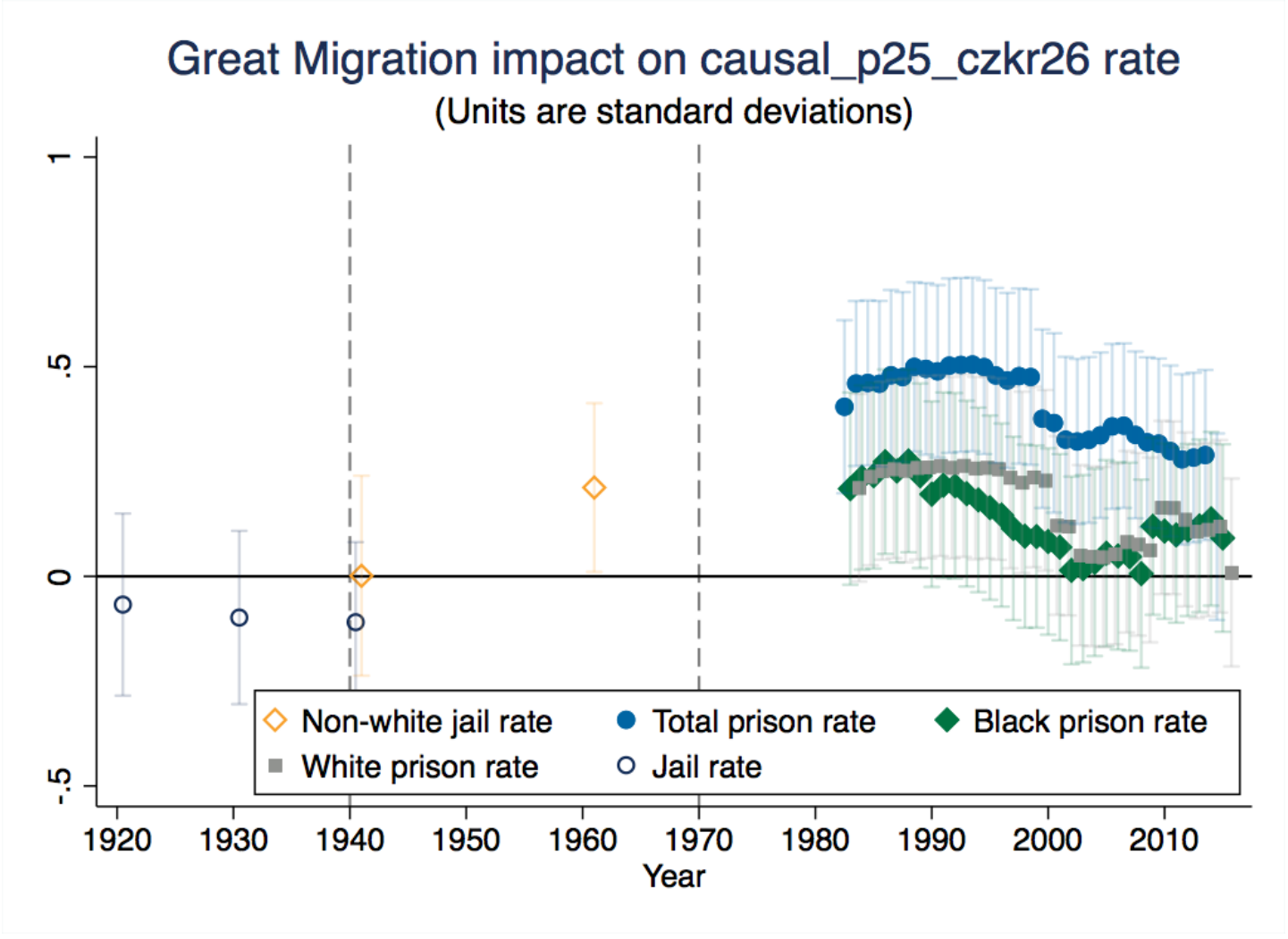
Great Migration impact on police expenditures



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year.

Units of shock are 30 percentiles. *Data Source*: PF-NBHDS, 1920-2015. ▸ Fire ▸ Back

Great Migration impact on incarceration rates



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year.

Units of shock are 30 percentiles. *Data Source*: PF-NBHDS, 1920-2015.

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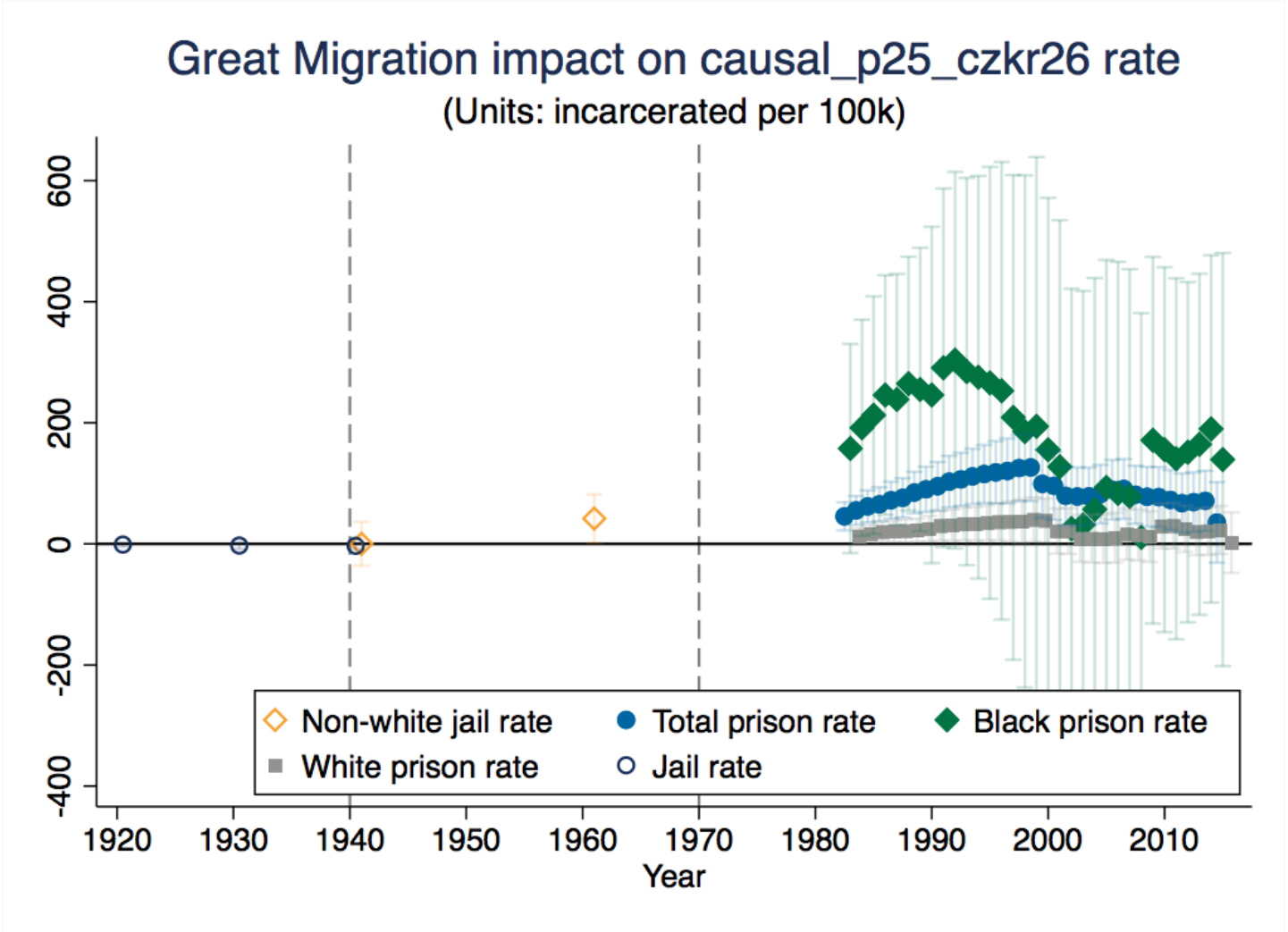
Great Migration impact on incarceration rates (levels)



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year.

Units of shock are 30 percentiles. *Data Source*: PF-NBHDS, 1920-2015.

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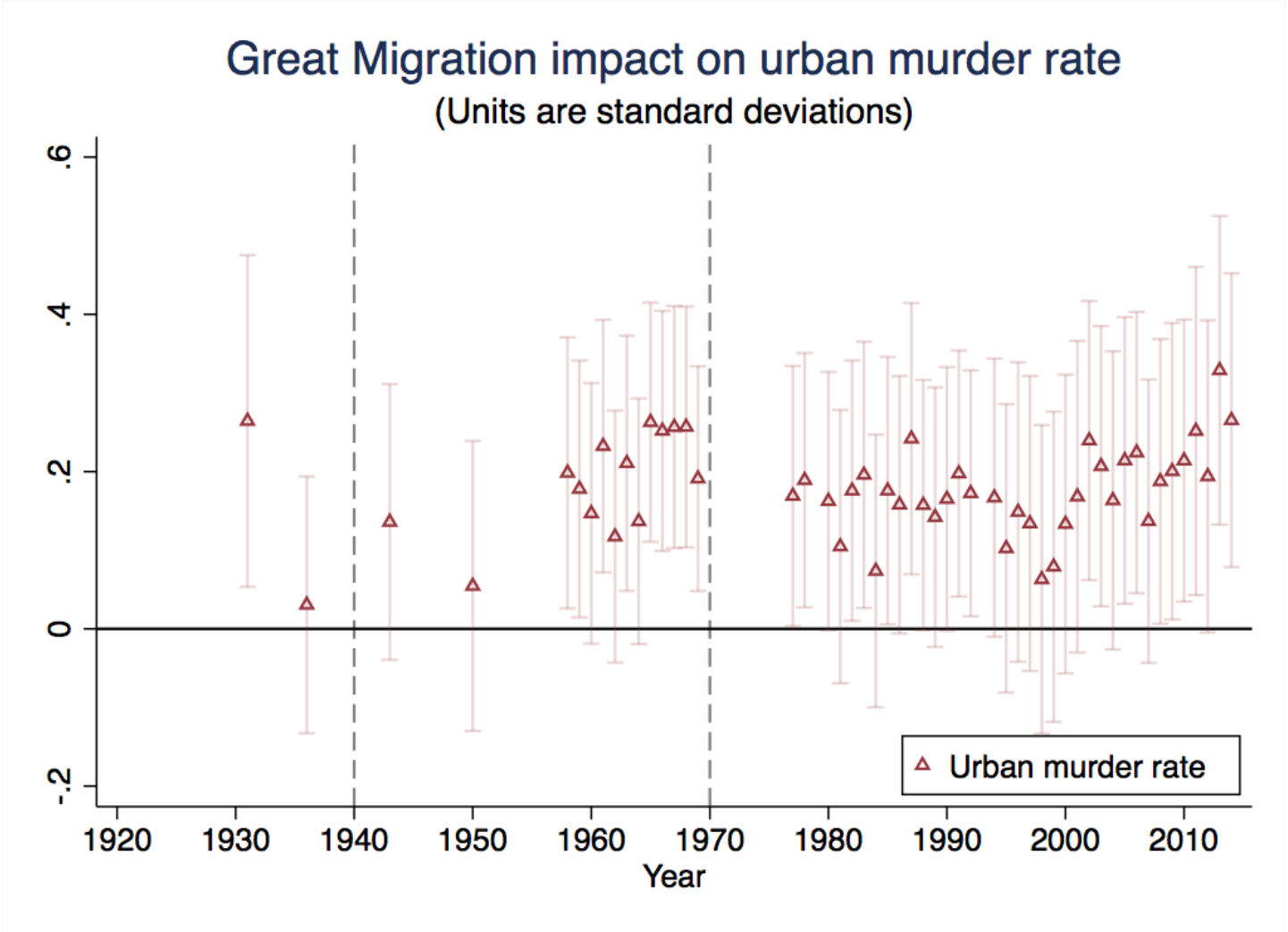
Great Migration impact on murder rates



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year.

Units of shock are 30 percentiles. *Data Source*: PF-NBHDS, 1920-2015.

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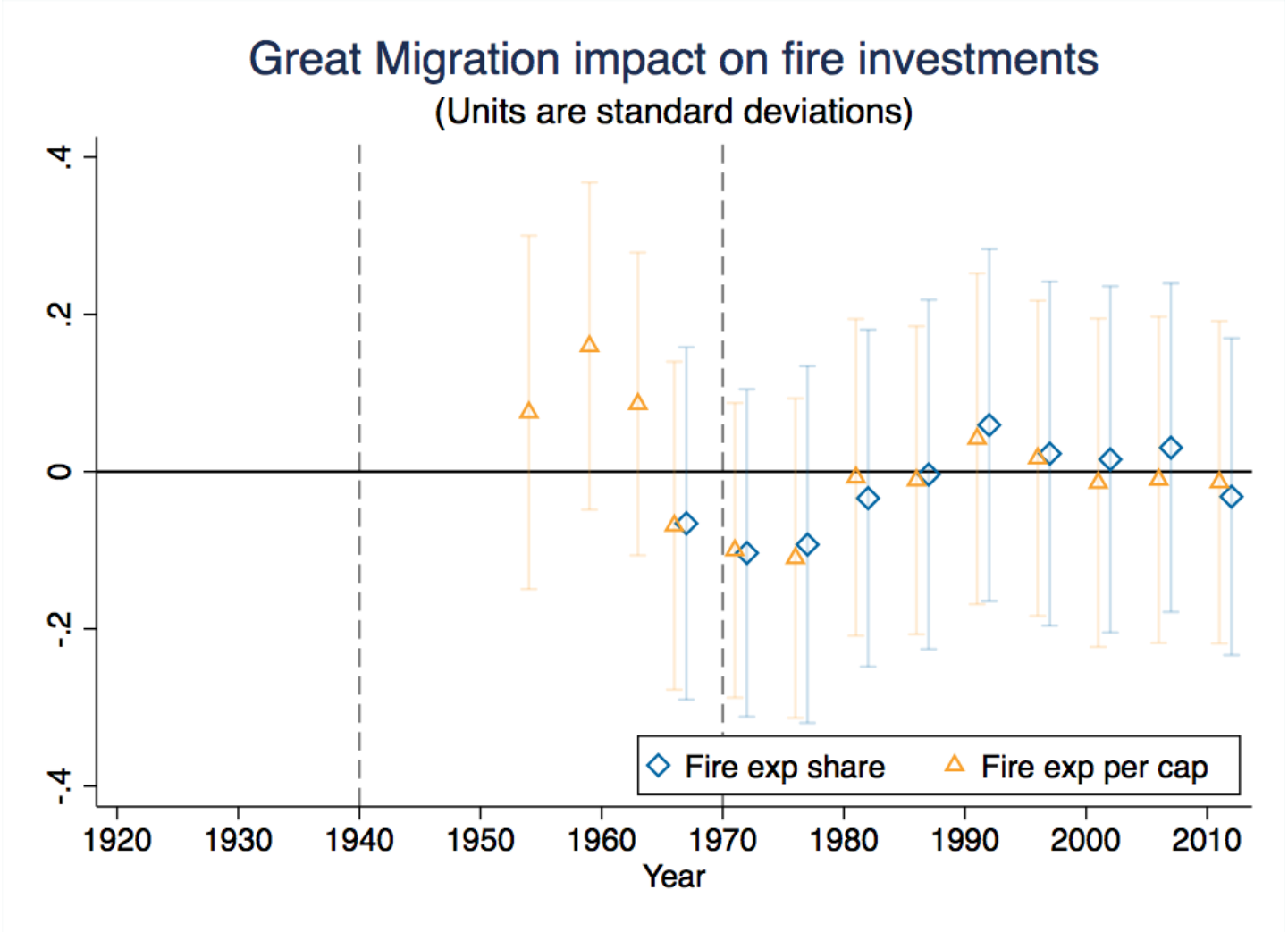
Great Migration impact on fire fighting $



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year.

Units of shock are 30 percentiles. *Data Source*: PF-NBHDS, 1920-2015.

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TABLE E1: GREAT MIGRATION CZS EXPERIENCED MORE SEVERE 1960S RIOTS

	Ordinary Least Squares					
	Killed Per 100k	Arson Per 100k	Arrests Per 100k	Days of Riots Per 100k	Injured Per 100k	Riots Per 100k
GM	0.00139	0.0755	0.464	0.0265	0.0967	0.0109
	(0.000605)	(0.0335)	(0.166)	(0.00544)	(0.0351)	(0.00214)
R-squared	0.308	0.440	0.605	0.292	0.461	0.311
	Reduced Form					
$\hat{GM}$	0.000815	0.0483	0.420	0.00987	0.0769	0.00406
	(0.000544)	(0.0301)	(0.148)	(0.00521)	(0.0314)	(0.00206)
R-squared	0.291	0.429	0.606	0.179	0.455	0.191
	Two-stage least squares					
GM	0.00274	0.163	1.415	0.0332	0.259	0.0137
	(0.00179)	(0.0997)	(0.543)	(0.0159)	(0.110)	(0.00624)
R-squared	0.279	0.409	0.499	0.283	0.368	0.301
N	130	130	130	130	130	130
Mean Dep Var	0.0589	4.697	24.91	0.950	4.474	0.413
SD Dep Var	0.162	9.952	58.87	1.437	10.65	0.572
SD GM	28.98	28.98	28.98	28.98	28.98	28.98

Notes: This table reports the estimated impact of the Great Migration on 1960s race riots and riot severity. Dependent variables in columns 1-5 are individual measures of the severity of riots, including number of individuals killed, number of arson incidents, number of arrests, the duration of the riot in days, and the number of injuries; the final column is total number of riots. All outcomes are normalized by the total CZ population in 1960 and multiplied by 100,000, so they are in per 100,000 of the population units. Independent variable is black population increase between 1940 and 1970. The instrument for black population increase is the predicted black population increase through variation in black southern migration alone. OLS, Reduced Form, and 2SLS estimates are reported. Baseline 1940 controls include share of urban population made up of 1935-1940 black southern migrants, educational upward mobility, share of labor force in manufacturing, and census division fixed effects. Standard errors are in parentheses. *Data sources*: Collins and Margo (2007); Carter (1986); CCDB; IPUMS complete count 1940 US census; Boustan (2016).

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TABLE E2: GREAT MIGRATION AND VOTES FOR GEORGE WALLACE, 1968

	Ordinary Least Squares	
	Wallace Vote Per 1k Voters	Wallace Votes Per 1k White Pop
GM	12.41	4.812
	(4.058)	(1.713)
R-squared	0.518	0.514
	Reduced Form	
$\hat{GM}$	12.20	4.840
	(3.642)	(1.536)
R-squared	0.525	0.521
	Two-stage least squares	
GM	40.39	16.03
	(13.87)	(5.771)
R-squared	0.331	0.343
N	130	130
Mean Dep Var	58.49	24.17
SD Dep Var	44.87	18.85
SD GM	1.000	1.000

Notes: This table reports the estimated impact of a one-standard deviation increase in Great Migration inflows on votes for George Wallace, pro-segregation former governor of Alabama and third-party presidential candidate in 1968. Dependent variables in columns 1 is votes for Wallace per 1000 voters, and column 2 is votes for Wallace per 1000 white population in the commuting zone. The unit of observation is a commuting zone. $\hat{GM}$ is the predicted black population increase through variation in black southern migration alone. A one standard deviation increase is approximately 30 percentiles. Baseline 1940 controls include share of urban population made up of 1935-1940 black southern migrants, educational upward mobility, share of labor force in manufacturing, and census division fixed effects. Standard errors are in parentheses. *Data sources*: Collins and Margo (2007). Great Migration data sources: CCDB; IPUMS complete count 1940 US census; Boustan (2016).

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Definition of CZ-area expenditures

CZ-area local government expenditure share is defined as

$$\text{Pol. Exp. Share}_{CZ} = \frac{\text{\$Spent on Police by All Local Governments}_{CZ}}{\text{\$Spent by All Local Governments}_{CZ}}$$

Per capita expenditures at the CZ-area level are defined as

$$\text{Per Cap Pol. Exp.}_{CZ} = \frac{\text{\$Spent on Police by All Local Governments}}{\text{Population}_{CZ}}$$

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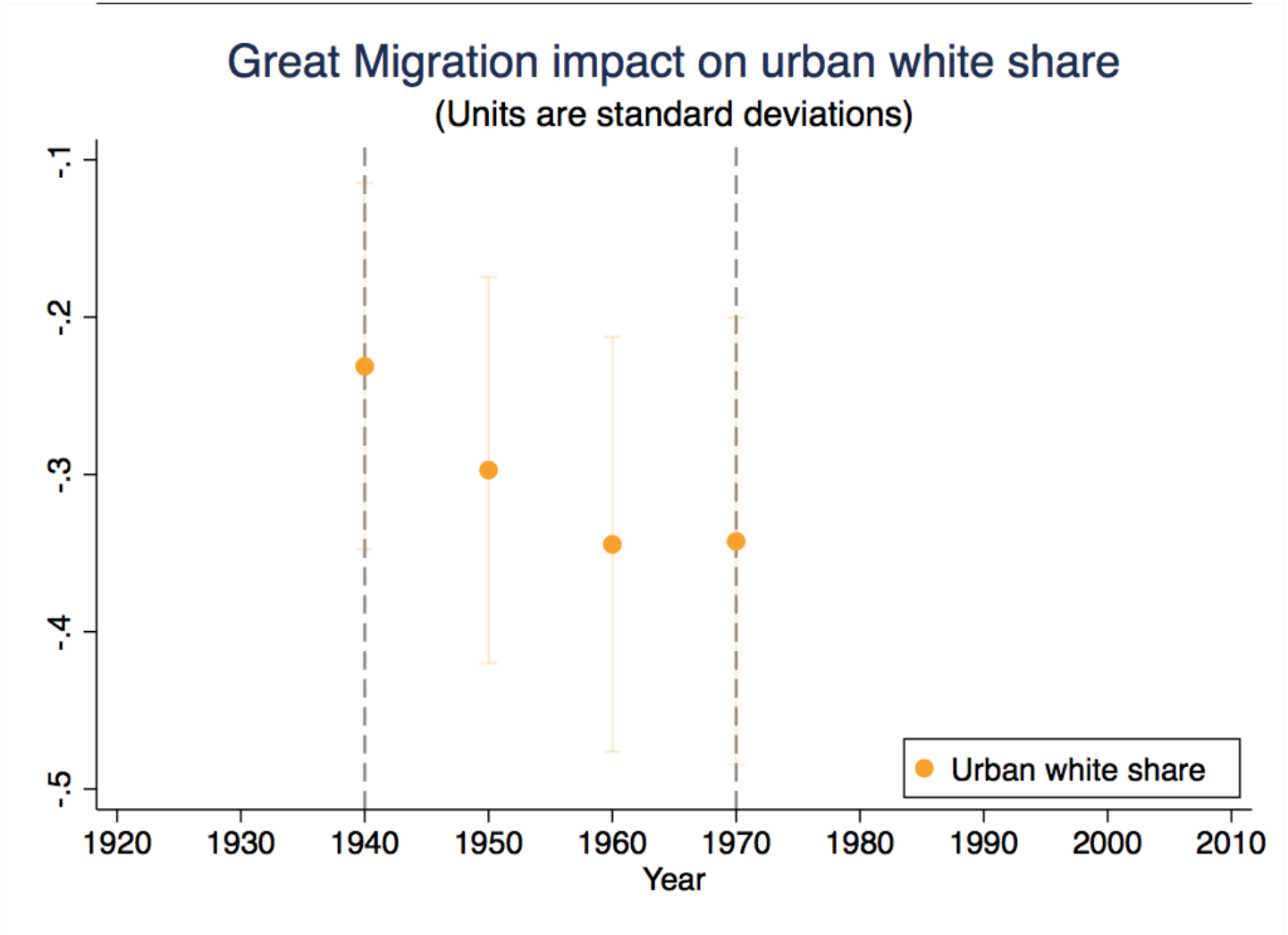
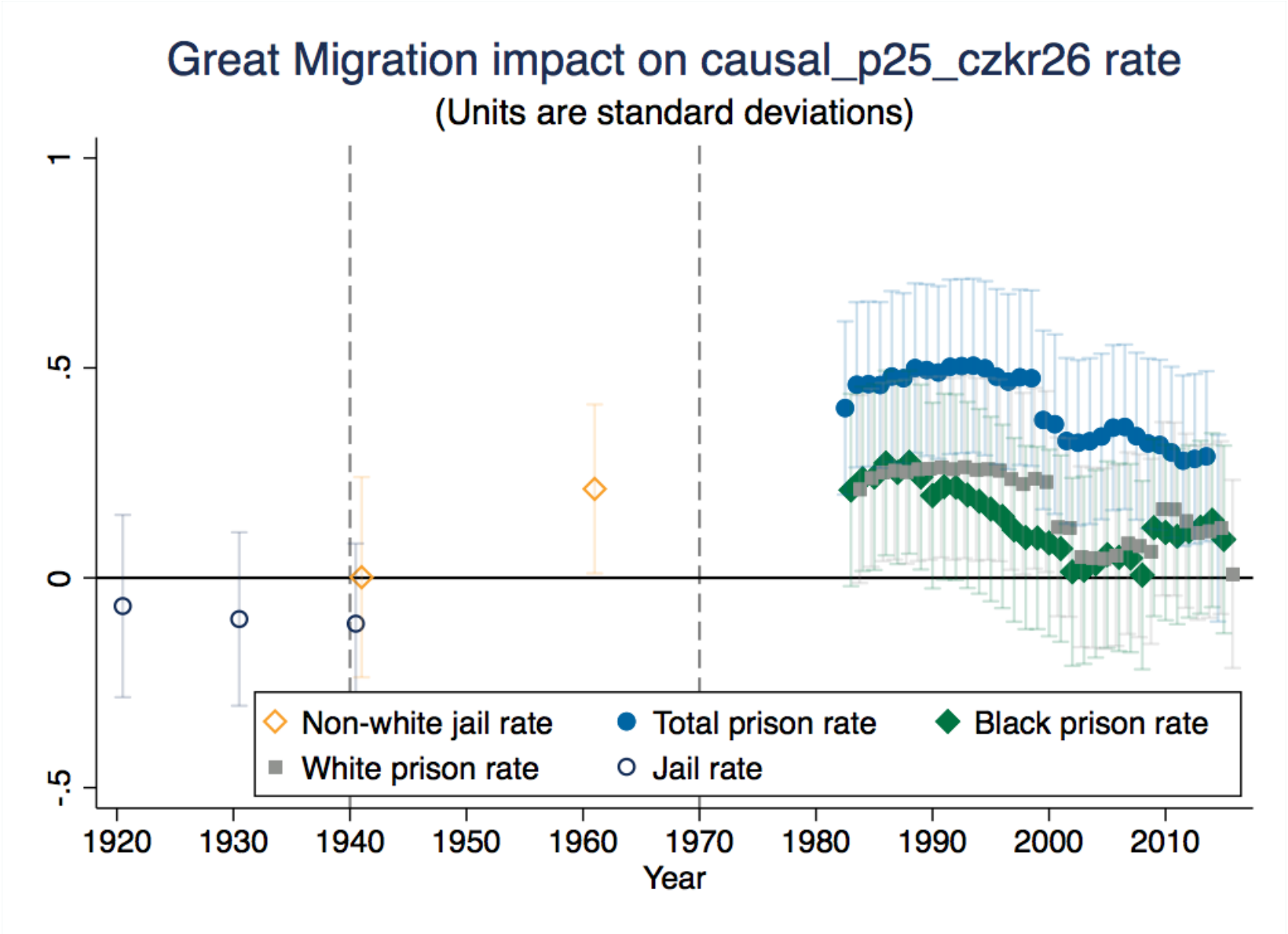
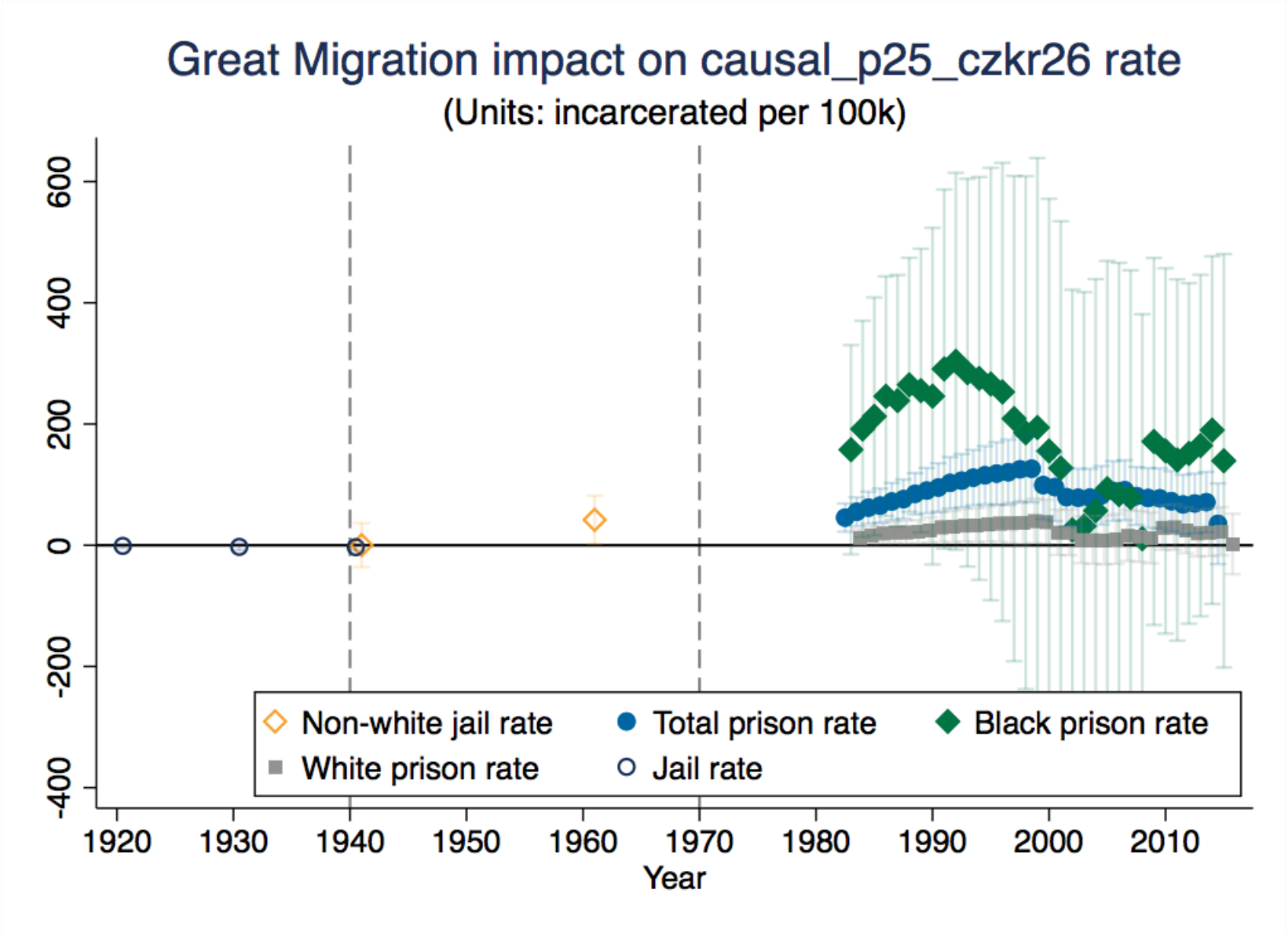


Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year. Units of shock are 30 percentiles. Controls included for total 1940 CZ population. *Data Source*: City and County Data Books. Back



Reduced form coefficients of mechanism on Great Migration shock, estimated separately each year. Units of shock are 30 percentiles. *Data Source*: PF-NBHDS, 1920-2015.

▸ Back



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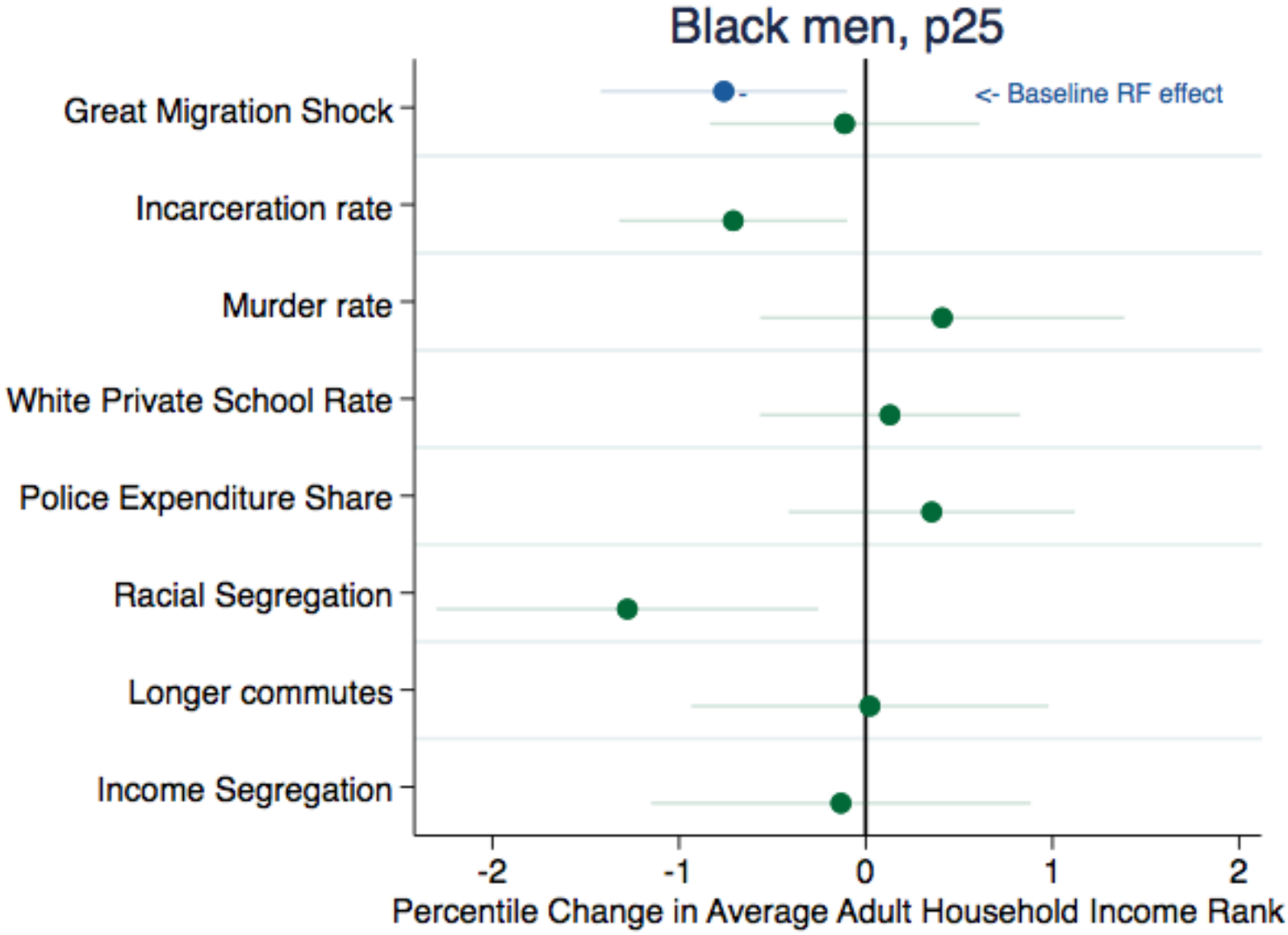

Sensitivity of coefficient on Great Migration shock to inclusion of intermediate local mechanisms.

Sample: Black men from low income families. Units of shock are 30 percentiles.

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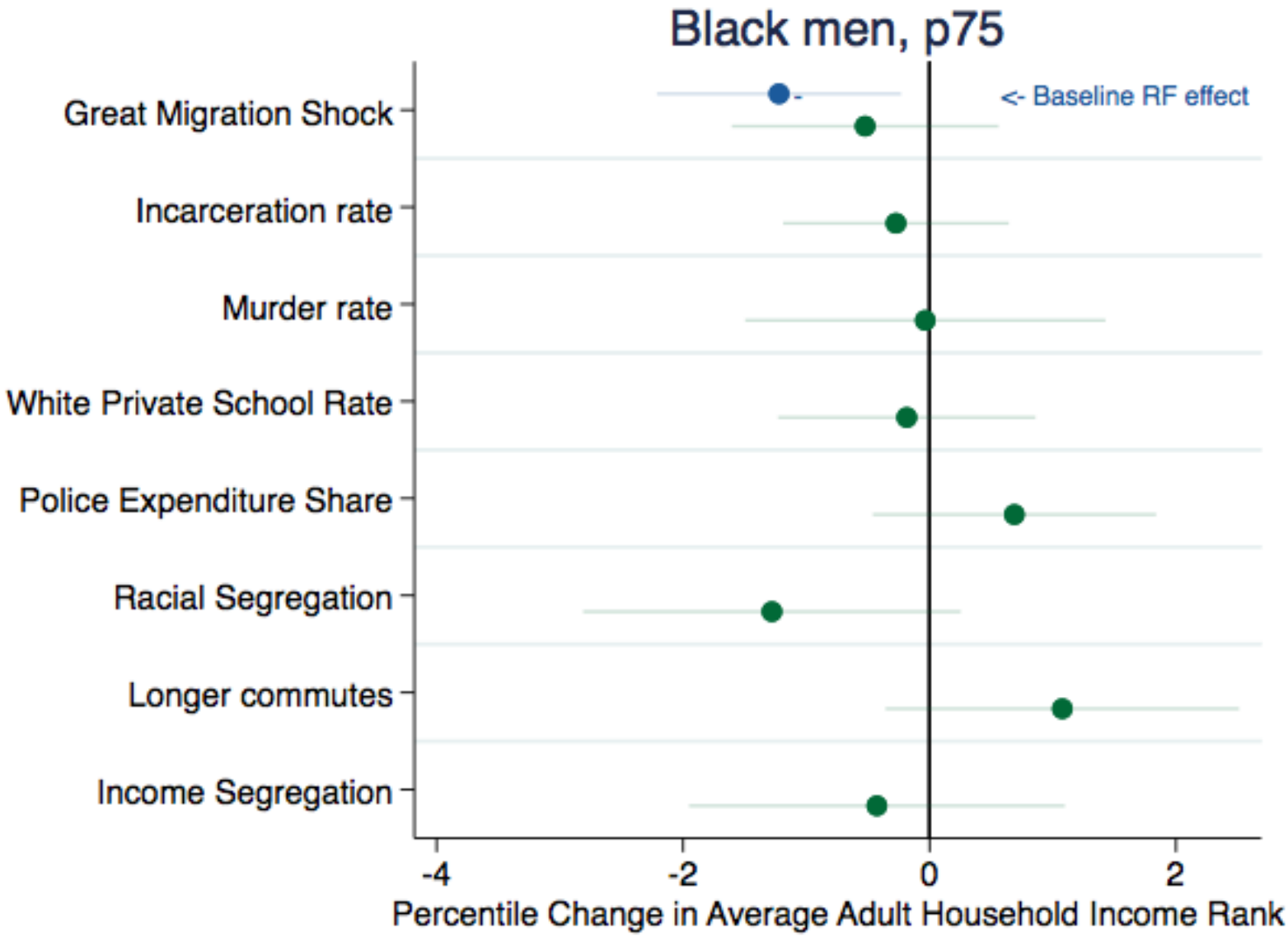
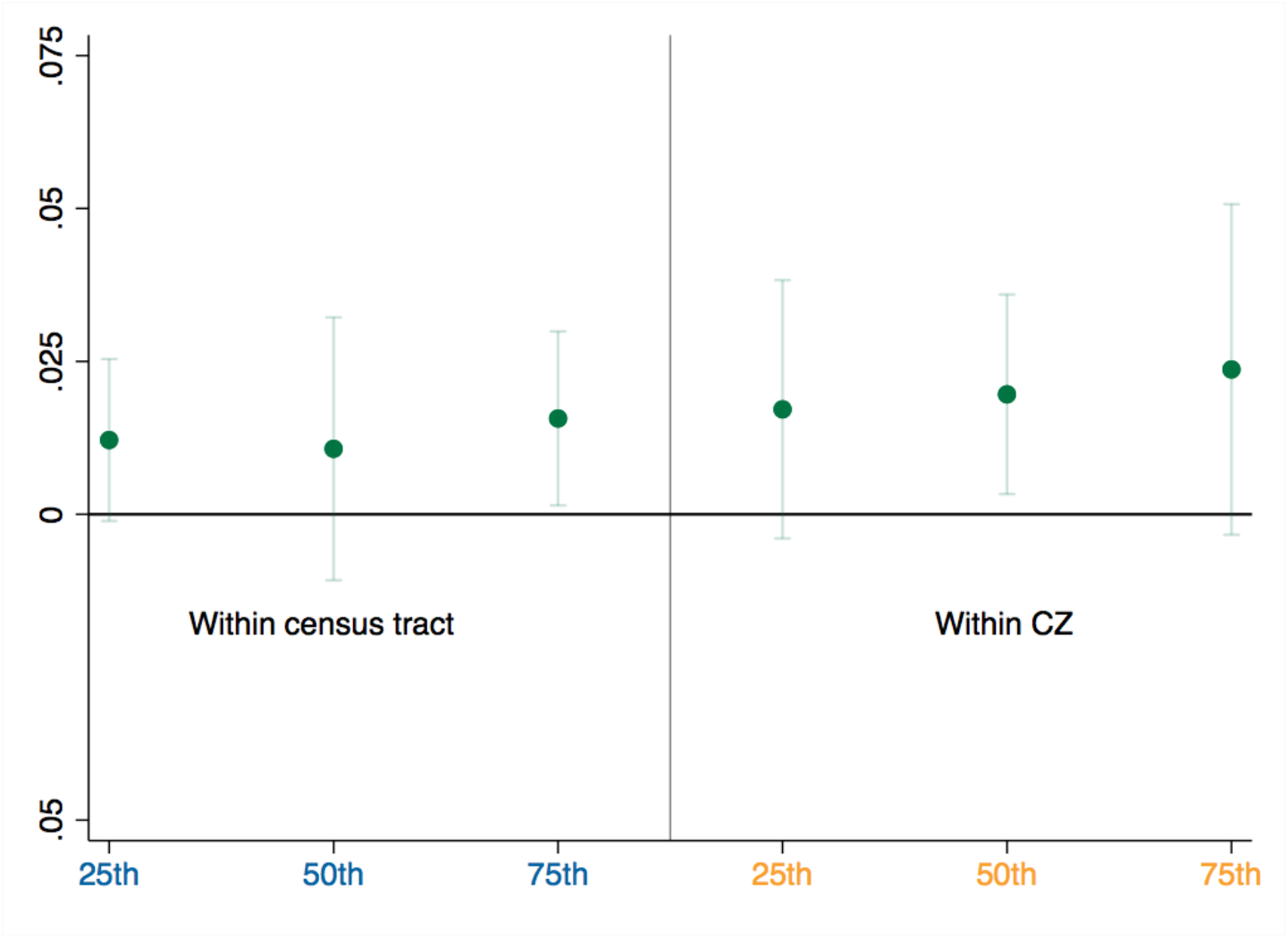


Sensitivity of coefficient on Great Migration shock to inclusion of intermediate local mechanisms.

Sample: Black men from high income families. Units of shock are 30 percentiles. Back

Great Migration increased within census tract racial gap



Census Tract Race Gap CZ Race Gap ▸ Notes ▸ Back

Notes

- Census tract results for 90 CZs for which tract-level gap data available
- Baseline controls included
- Observations are northern commuting zones
- *Data source*: Chetty et al (2018); IPUMS 1940 Census; City and County Data Books, 1944-1977; and Boustan (2016)

Back

What was the net effect of the Great Migration?

Things we would need to know:

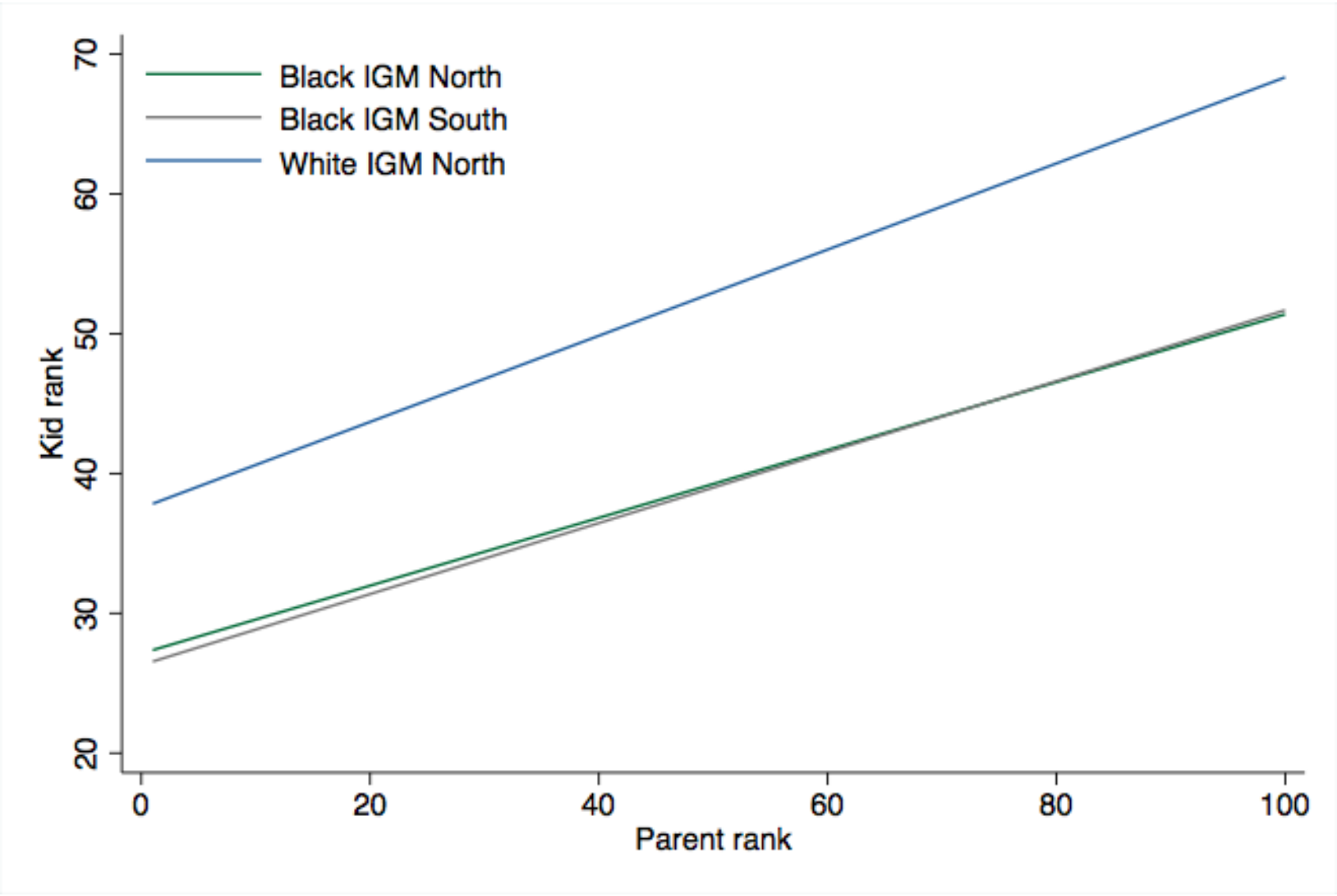
- Causal effect of Great Migration on upward mobility in South
- Causal effect of Great Migration on (grand)parent income
- Structural relationship between parent income and kid income
- Geographic distribution of Black population before and after

What was the net effect of the Great Migration?

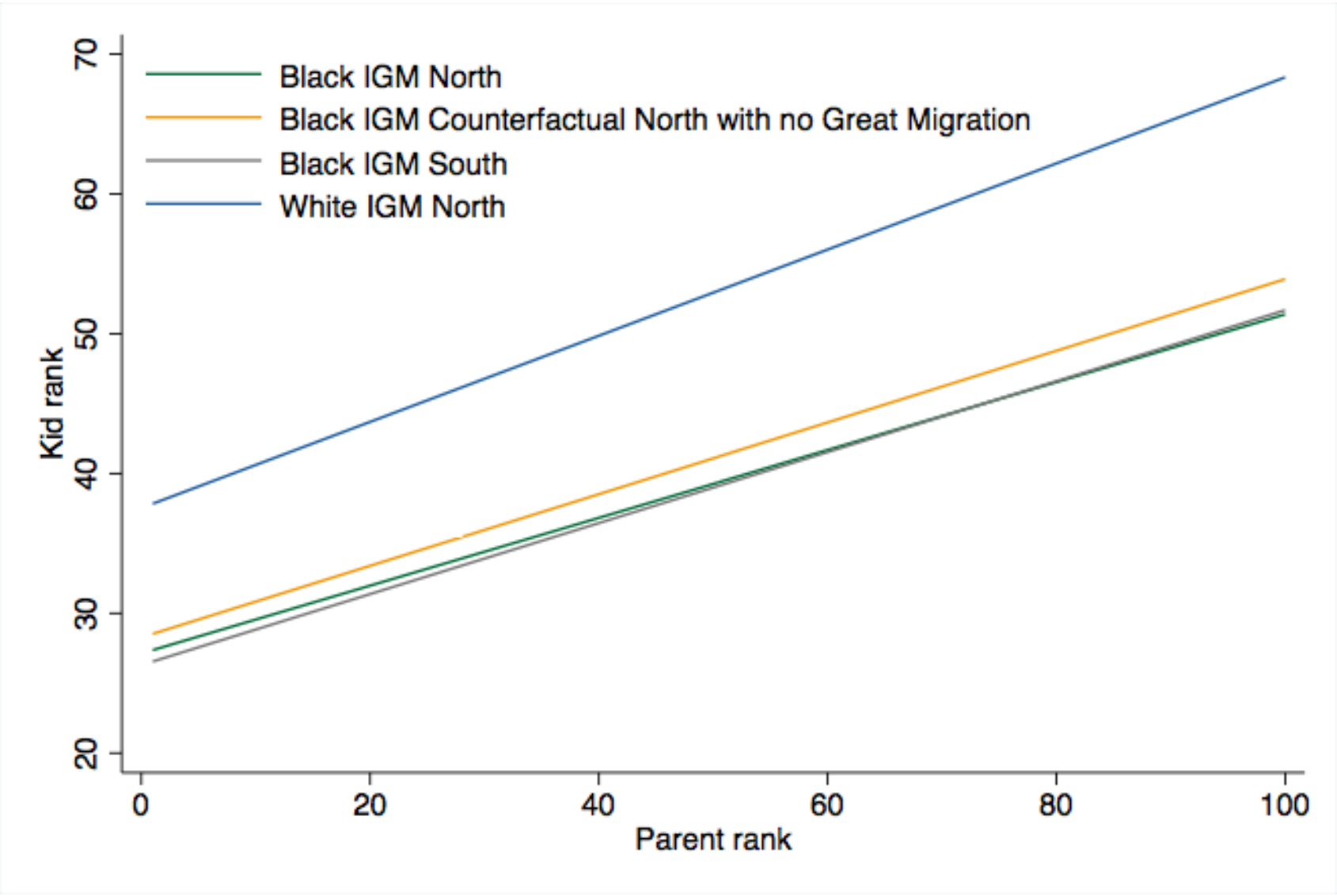
Conjecture: > 0

- Causal effect of Great Migration on upward mobility in South (≥ 0)
- Causal effect of Great Migration on (grand)parent income ($>> 0$)
- Structural relationship between parent income and kid income Assumed
- Geographic distribution of Black population before and after
  1940 $\rightarrow$ 23% N, 77% S
  2000 $\rightarrow$ 50% N, 50% S

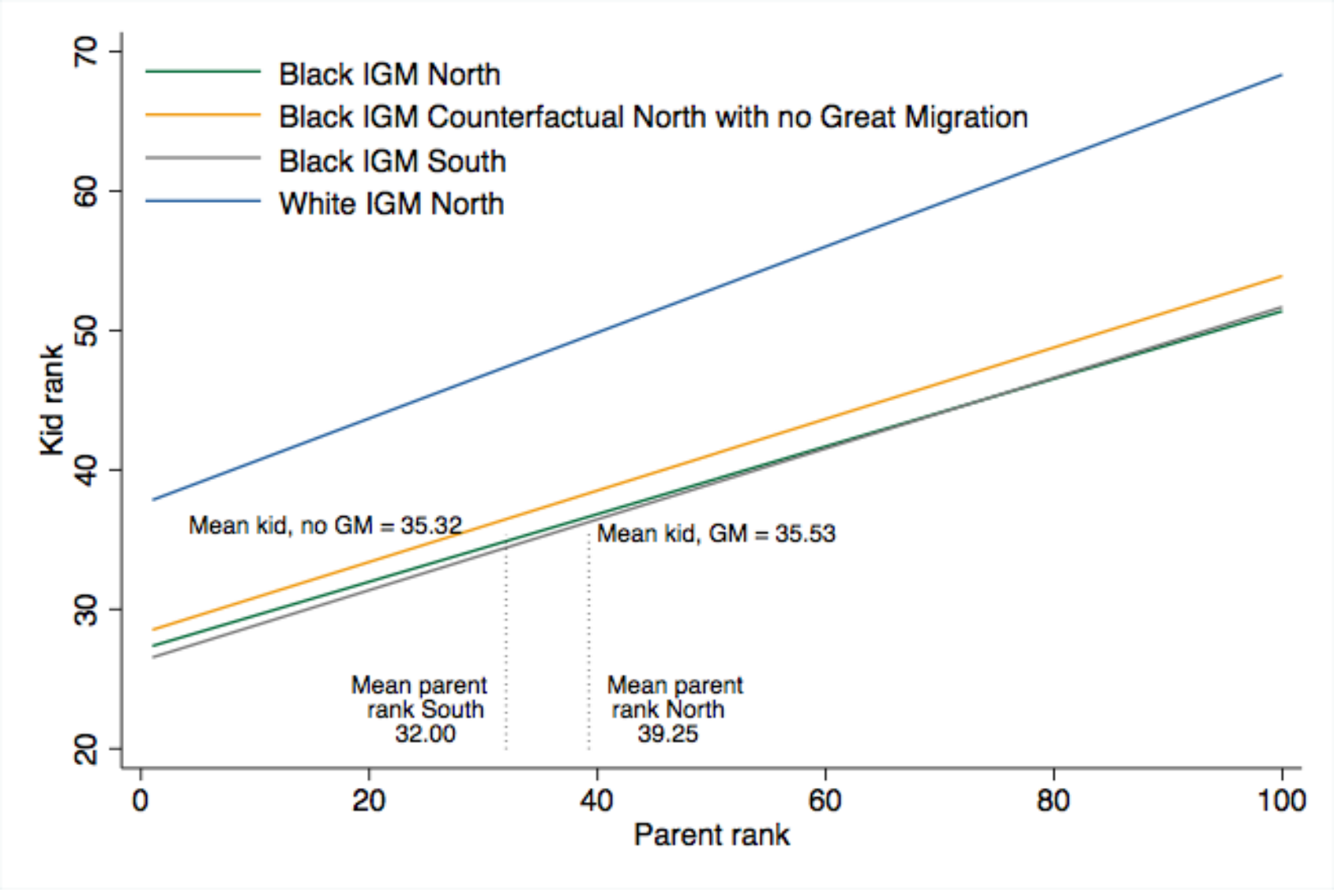
Intergenerational mobility by race and region



Intergenerational mobility by race and region



Intergenerational mobility by race and region



What was the net effect of the Great Migration?

Why 0.2 percentiles net gain is likely a lower bound:

- Great Migration impact on parent income $>>$ 4 pctiles
- "Voting with one's feet" may have improved the South

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