The Great Migration and Educational Opportunity

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Motivation

- The Great Migration had profound impacts on the US economy and society
  - Over 6 million African Americans moved out of the South from 1915–70
- Mixed consequences for adult migrants: higher earnings, mortality, and incarceration
  [Collins and Wanamaker 2014; Black et al. 2015; Boustan 2017; Eriksson 2019]
- Less evidence on consequences for children
  - Derenoncourt (2019): 1940–70 migration lowered mobility of Black kids born in 1980s
  - Tabellini (2019): 1915–30 migration reduced public expenditures
  - Boustan (2010) and Shertzer and Walsh (2019): migration led to white flight
  - *Did migration ever yield benefits for children?*

This paper

- Examine effects of migration from 1915–1940 on Black children's education
  - Estimate county-level place effects for all destinations chosen by Southern-born migrants
  - Using complete count records from 1940 Census
- Empirical strategy addresses selection on observed and unobserved variables
  - Control for observed characteristics of children and families
  - Adjust for selection on unobservables using model + selection on observed variables
    [Altonji, Elder, and Taber 2005; Oster 2019; Finkelstein, Gentzkow, and Williams 2019]

Results: Place effects in 1940

- On average, moving North increased schooling of Black children by 0.8 years (12%)
  - 84 of best 100 counties are in North, and 96 of 100 worst counties are in South
  - Adjusting for selection on unobservables lowers impact on moving North by 39%
- Large intraregional variation in place effects
  - Gap between 90th and 10th percentiles is 1.2 years in North and 1.6 years in South
  - Some areas in South (such as Birmingham, AL and Harris, TX) are among the best places
- Place effects are larger in counties with better schools, better labor market opportunities for Black adults, fewer homicides, and stronger social capital

Results: Changes in place effects over time

- Many of the best places in 1940 offer limited opportunities today
  - Chicago, Detroit, Cleveland, and St. Louis among best places for Black children in 1940
  - Correlation with contemporary place effects is 0.2 [Chetty et al. 2020]
- Same factors that explain cross-sectional variation explain time-series variation
  - Changes in place effects are larger in counties with better schools, better labor market opportunities for Black adults, fewer homicides, and *lower incarceration rates*

Historical Background

Historical background

- Wide variation in opportunities for African Americans in the early 20th century
  - Median household income in 1940: $370 in South vs. $690 in North ($6,900 vs. $12,800 in 2019$)
  - Poverty rate twice as large in South, and homicide rate three times as large in South
- Differences in opportunities motivated Great Migration
  - 1.5M moved from 1915–1940 and 4.5M moved from 1940–1970
  - Key pull factor: Manufacturing employment during World War I

Possible impacts of moving on children

- Higher parental income in North
  - Black migrants saw income gains of 80–130% [Collins and Wanamaker 2014; Boustan 2017]
- Higher school quality in North
  - All Southern schools and some Northern schools were segregated by law
  - Black schools had lower funding, teacher-pupil ratios, teacher salaries, and term length [Margo 1990, Card and Krueger 1992]
- Possibly offsetting factors:
  - Residential segregation and crowding in the North
  - White flight, hostility, and violence in the North

Empirical Strategy and Data

Econometric model

- Goal: Estimate causal impact of each county on Black children's educational attainment
- Model for years of education of individual *i* if they lived in location *j*:
  [Finkelstein, Gentzkow, and Williams 2019]

$$Y_i = \underbrace{\gamma_j}_{\text{place effect}} + \underbrace{\theta_i}_{\text{schooling capital}}$$

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$$Y_i = \underbrace{\gamma_j}_{\text{place effect}} + \underbrace{\theta_i}_{\text{schooling capital}}$$

- Decompose schooling capital:

$$\theta_i = \underbrace{X_i\psi}_{\substack{\text{child}\\ \text{demographics}}} + \underbrace{H_i\lambda}_{\substack{\text{household}\\ \text{characteristics}}} + \underbrace{\eta_o^{\text{orig}} + \eta_j^{\text{dest}}}_{\substack{\text{FEs for migrant}\\ \text{origin and destination}}} + \underbrace{\eta_j^{\text{nm}}}_{\substack{\text{FEs for}\\ \text{non-migrant}\\ \text{location}}} + \underbrace{\tilde{\eta}_i}_{\substack{\text{orthogonal}\\ \text{residual}}}$$

Estimation

- Combining prior equations yields potential estimating equation:

$$Y_i = X_i\psi + H_i\lambda + \tau_o^{\text{orig}} + \underbrace{\tau_j^{\text{dest}}}_{\gamma_j + \eta_j^{\text{dest}}} + \tau_j^{\text{nm}} + \tilde{\eta}_i$$

- Key challenge: Identifying place effect γ_j (due to the confound η_j^{dest})
  - Want to allow correlation between place of residence and unobserved characteristics
- Solution: Use selection on observables to adjust for selection on unobservables

Overview of identifying assumptions

- Assumption 1: *Equal selection*
  - Parents' location choices are equally correlated with observable and unobservable components of children's schooling capital
  - Identifies *direction* of bias due to selection on unobservables

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  - Relative variance of observable and unobservable components of schooling capital is equal across destinations and origins
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  - Relative variance of observable and unobservable components of schooling capital is equal across destinations and origins
  - Identifies *magnitude* of bias due to selection on unobservables
- Similar to Oster (2019) and Altonji, Elder, and Taber (2005)
  - This approach uses variance of unobservable component of schooling capital to weaken R^2 assumption in Oster (2019)

Understanding identifying assumptions

- Assumptions 1 and 2 hold if parents' location decision is related to children's *overall* schooling capital
  - Allows for selection on unobservables and utility-maximizing location choices
- These assumptions are violated if parents respond *differently* to observable and unobservable components of schooling capital
  - Example: Greater selection on observed schooling capital, because this is correlated with parents' education
  - Robustness tests consider violations of these assumptions (more on this later)

Summary of selection adjustment

- Outcome:

$$Y_i = X_i\psi + H_i\lambda + \tau_o^{\text{orig}} + \underbrace{\tau_j^{\text{dest}}}_{\gamma_j + \eta_j^{\text{dest}}} + \tau_j^{\text{nm}} + \tilde{\eta}_i$$

- Observed schooling capital ($h_i = H_i\lambda$) for children of migrants:

$$h_i = X_i\psi^h + h_o^{\text{orig}} + h_j^{\text{dest}} + \tilde{h}_i$$

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- Selection-adjusted place effect (invoking assumptions 1 and 2):

$$\hat{\gamma}_j = \hat{\tau}_j^{\text{dest}} - \hat{\eta}_j^{\text{dest}} = \hat{\tau}_j^{\text{dest}} - \frac{\widehat{SD}(\hat{\tau}_o^{\text{orig}})}{\widehat{SD}(\hat{h}_o^{\text{orig}})}\hat{h}_j^{\text{dest}}$$

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- Relative variance of unobserved schooling capital across origins pins down the magnitude of bias
  - This weakens the R^2 assumption in Oster (2019)

Additional estimation details

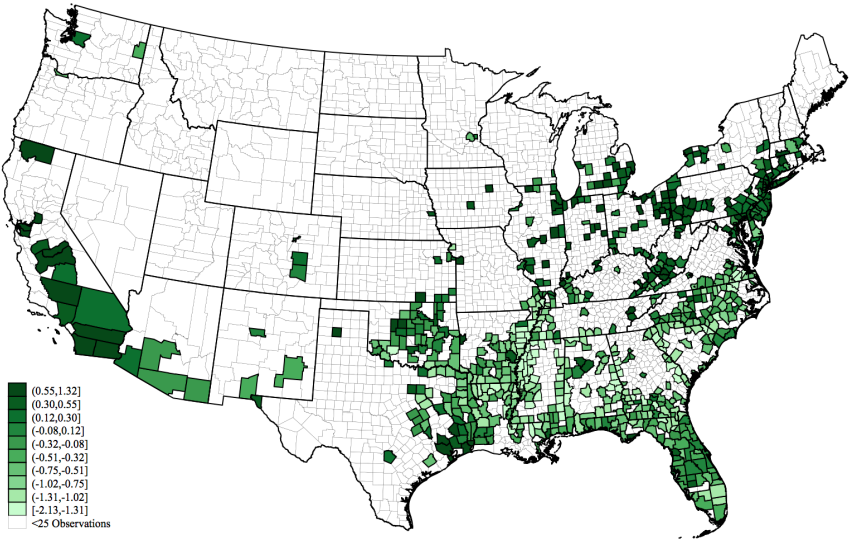
- Child demographics X_i: age and sex
- Household characteristics in observed schooling capital H_i: parents' education
  - We use many more variables in robustness checks
- Conduct inference using Bayesian bootstrap
- When reporting individual place effects, use empirical Bayes shrinkage

Data

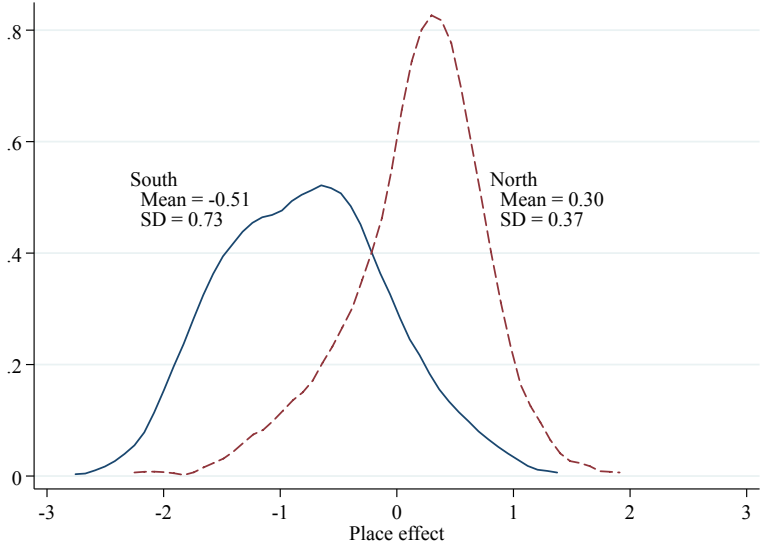
- Complete count 1940 Census
- Sample: African Americans age 14–18 who live with at least one parent
  - Allows us to observe parent characteristics
  - Limited sample selection, as most children completed schooling while living with parents [Card, Domnisoru, and Taylor 2018]
- Sample contains children of migrants and non-migrants
  - Migrant: Born in former Confederacy, living outside of birth state in 1940
  - Non-migrant: Living in birth state in 1940
- 650,040 children, 33% of whom are children of migrants
  - Children of migrants lived in 728 destination counties in 1940

Estimates of Place Effects

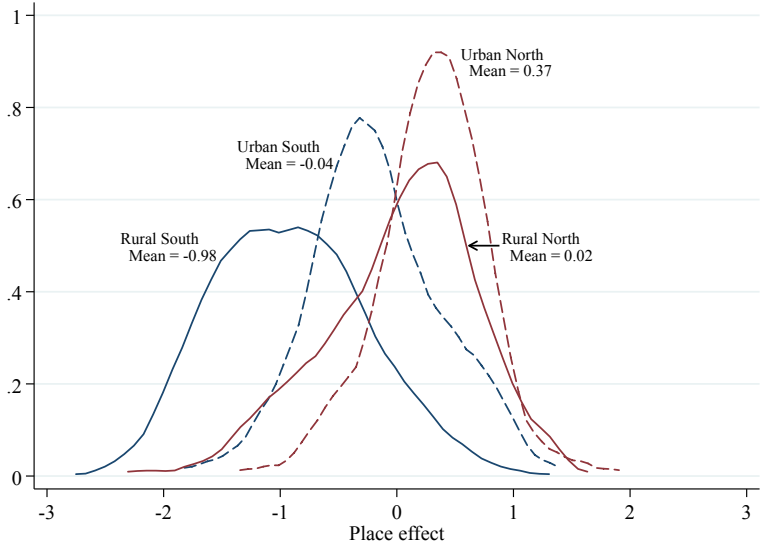
Place effects on years of schooling in 1940, Black children age 14–18



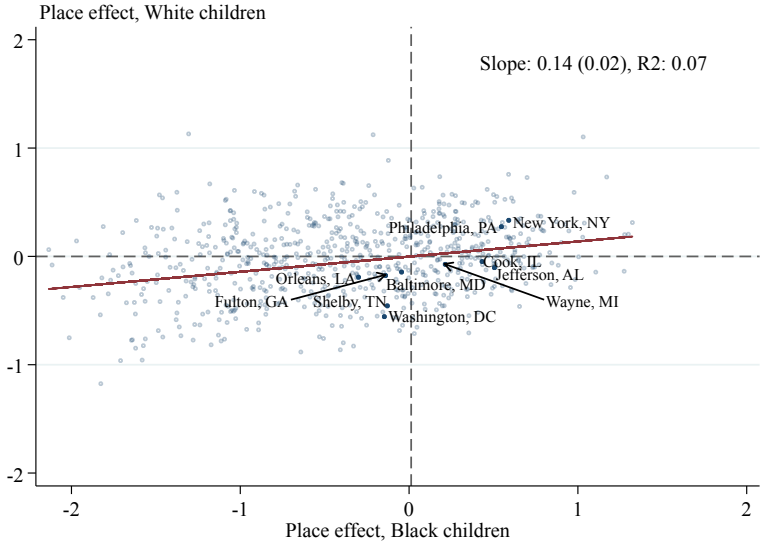
Distribution of place effects on years of schooling in South and North



Distribution of place effects by region and rural/urban status



Place effects for white versus Black children



Mechanisms

Understanding mechanisms

- What explains the variation in place effects?
- We constructed a county-level dataset to explore the role of
  - School quality
  - Parents' labor market opportunities
  - Crime
  - Incarceration
  - Social capital (NAACP chapter)

Correlates of place effects, 1940

	DV: Place effect, children's education (1)	(2)
Teachers per pupil	0.157***	
	(0.031)	
Median Black household income	0.501***	
	(0.035)	
Homicide rate	-0.110***	
	(0.037)	
Incarceration rate	-0.013	
	(0.025)	
NAACP chapter	0.132***	
	(0.031)	
Observations (counties)	728	
R-squared	0.496	

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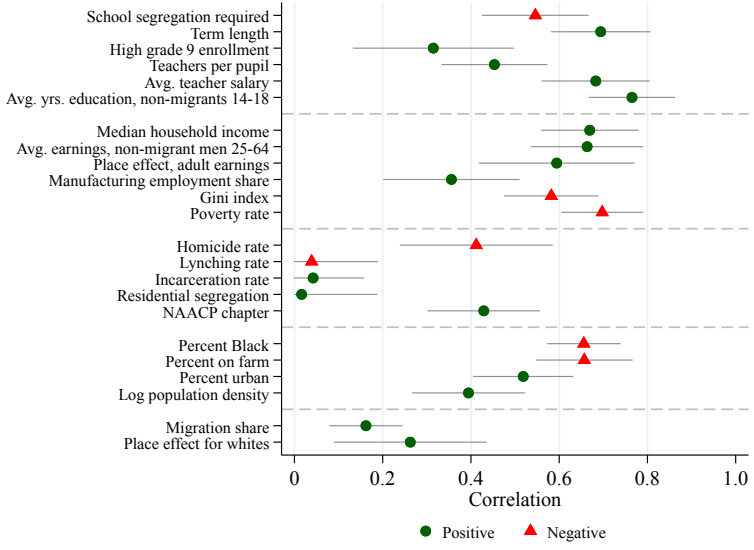
	(1)	(2)
Teachers per pupil	0.157***	0.116***
	(0.031)	(0.031)
Median Black household income	0.501***	0.434***
	(0.035)	(0.035)
Homicide rate	-0.110***	-0.051
	(0.037)	(0.035)
Incarceration rate	-0.013	-0.016
	(0.025)	(0.025)
NAACP chapter	0.132***	0.102***
	(0.031)	(0.031)
South indicator		-0.410***
		(0.078)
Observations (counties)	728	728
R-squared	0.496	0.516

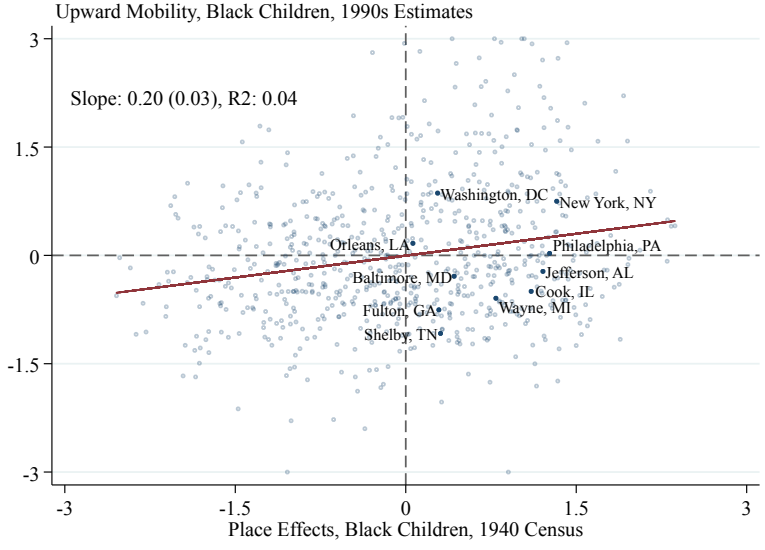
Cross-sectional correlates of 1940 place effects on years of schooling



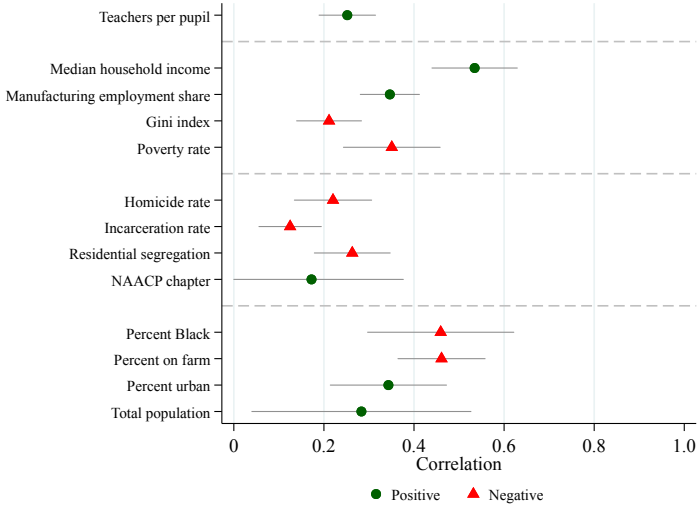
Changes in place effects over time

- How did the land of opportunity for Black children change over the 20th century?
  - Derenoncourt (2019): effect of changes in Black population on upward mobility
- Compare our place effects with upward mobility estimates from Chetty et al. (2020)
  - Upward mobility: mean household income rank for Black children whose parents were at the 25th percentile of the national income distribution, for 1978–1983 cohorts
  - We standardize both sets of estimates for comparability

Relationship between 1940 place effects and 1990s upward mobility



Correlation between **changes** in Black children's opportunity and **changes** in explanatory variables



Robustness

Overview of robustness tests

- Results are robust to:
  - Adding more household characteristics to the selection correction vector H_i (e.g., obtain nearly identical results in a matched sample that includes 1920 and 1940 covariates)
  - Using different samples and education measures (e.g., 8th grade attainment) to limit sample selection and censoring
  - Bounding place effects to account for differential mortality
  - Relaxing Assumption 1 (equal selection) and 2 (equal relative importance)

Robustness: Potential violations of identifying assumptions

- Assumptions 1 and 2 are violated if parents respond *differently* to observable and unobservable components of schooling capital
- Example of violation:
  - Parents' location decision depends more on parent human capital than children's schooling capital
  - Intuition: better information about earnings opportunities for parents than schooling opportunities for children
- How would this violation change our results?

Details on identifying assumptions

- Assumption 1 (Equal selection):

$$\underbrace{\text{Corr}\left(T_{ij}, h_{j(i)}^{\text{dest}}\right)}_{\substack{\text{Selection on observed component of schooling capital}}} = \underbrace{\text{Corr}\left(T_{ij}, \eta_{j(i)}^{\text{dest}}\right)}_{\substack{\text{Selection on unobserved component of schooling capital}}} \text{ in the sample of migrants for all } j$$

- Assumption 2 (Equal relative importance):

$$\underbrace{\frac{SD\left(\eta_j^{\text{dest}}\right)}{SD\left(h_j^{\text{dest}}\right)}}_{\substack{\text{Relative SD, unobs. to obs. schooling capital, destinations}}} = \underbrace{\frac{SD\left(\eta_o^{\text{orig}}\right)}{SD\left(h_o^{\text{orig}}\right)}}_{\substack{\text{Relative SD, unobs. to obs. schooling capital, origins}}} \text{ in the sample of migrants}$$

Robustness: Consequences of greater selection on parent human capital

- Greater relative selection of parent human capital has two potential implications:
  - Location choices depend more on parents' education than unobserved school capital $\rightarrow$ violation of Assumption 1

$$\underbrace{\text{Corr}(T_{ij}, h_{j(i)}^{\text{dest}})}_{\substack{\text{Obs. schooling capital} \\ \sim \text{ parent education}}} > \underbrace{\text{Corr}(T_{ij}, \eta_{j(i)}^{\text{dest}})}_{\text{Unobs. schooling capital}}$$

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  - Less cross-county variation in unobserved component of schooling capital $\rightarrow$ violation of Assumption 2

$$\underbrace{SD(\eta^{\text{dest}}_{j})}_{\substack{\text{Cross-county SD} \\ \text{unobs. schooling capital}}} < \underbrace{SD(h^{\text{dest}}_{j}) \frac{SD(\eta^{\text{orig}}_{o})}{SD(h^{\text{orig}}_{o})}}_{\text{Assumption 2}}$$

Relaxed assumptions

- Assumption 3 (Relaxed equal selection):

$$C_1 \text{Corr}\left(T_{ij}, h_{j(i)}^{\text{dest}}\right) = \text{Corr}\left(T_{ij}, \eta_{j(i)}^{\text{dest}}\right)$$

- Assumption 4 (Relaxed equal relative importance):

$$\frac{SD\left(\eta_j^{\text{dest}}\right)}{SD\left(h_j^{\text{dest}}\right)} = C_2 \frac{SD\left(\eta_o^{\text{orig}}\right)}{SD\left(h_o^{\text{orig}}\right)}$$

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- Modified estimate of the confounding variable $\hat{\eta}_j^{\text{dest}}$:

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- Greater selection on parent human capital implies $C_1 < 1$ and $C_2 < 1$

Robustness to different proportionality constants

$C \equiv C_1 C_2$	Corr. with baseline place effects (1)	SD of place effects (2)	North-South difference (3)
0.8	0.997	0.882	0.918
0.9	0.999	0.864	0.868
1.0 (Baseline)	1.000	0.847	0.818
1.1	0.999	0.831	0.768
1.2	0.996	0.818	0.718

- Results are robust to range of violations of key identifying assumptions

Conclusion

Conclusion

- Great Migration yielded substantial benefits for children's education
  - On average, 0.8 year (12%) increase in schooling from moving North
  - Equals 25% of the decrease in Black-white schooling gap across 1900–1970 cohorts
- Mechanisms: Place effects are higher in areas with
  - Better schools and labor market opportunities for Black adults
  - Lower homicide rates and incarceration rates
  - Stronger social capital
- Black economic progress in early 20th century depended on local factors that can be shaped by policy
  - Highlights potential role for place-specific factors in future progress

Thank you!

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Additional Slides

Initial patterns of education and migration

	Migrant		Non-Migrant	
Location in 1940:	South	North	South	North
Mean years of schooling	6.5	8.4	6.1	8.1

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	Migrant		Non-Migrant	
Location in 1940:	South	North	South	North
Mean years of schooling	6.5	8.4	6.1	8.1
Mean father's years of schooling	4.3	6.0	4.1	6.6

Selection correction inputs

	Standard Deviation
Origin components	
Observed schooling capital (h_o^{orig})	0.043
Unobserved schooling capital (η_o^{orig})	0.044

- Implies that place effect estimate is $\hat{\gamma}_j \approx \hat{\tau}_j^{\text{dest}} - 1 \times \hat{h}_j^{\text{dest}}$

Selection correction inputs

	Standard Deviation
Origin components	
Observed schooling capital (h_o^{orig})	0.043
Unobserved schooling capital (η_o^{orig})	0.044
Destination components	
Observed schooling capital (h_j^{dest})	0.392
Unobserved schooling capital (η_j^{dest})	0.400

- Implies that place effect estimate is $\hat{\gamma}_j \approx \hat{\tau}_j^{\text{dest}} - 1 \times \hat{h}_j^{\text{dest}}$
- Variation in destination components highlights potential role for selection