Complementary Investments Over the Life Course and the Black-White Earnings Gap

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Motivation

• The Black-White earnings gap among men today is the same as in 1950, despite efforts to address discrimination in labor markets (Bailey and Danzinger 2013; Bayer and Charles 2018)

• Sustained gaps speak to importance of systemic discrimination (Darity et al 2005; Powell 2007; Phelani and Link, 2015; Bohren et al 2022)

• Models of systemic discrimination imply that reducing racial disparities requires investing in multiple domains in a sustained manner (Johnson 2018; Johnson and Jackson 2019; Derenoncourt 2022)

• Investments of this type are rare (Alesina et al 1999; Michener 2018; Darity 2022)
This study

• Identifies a set of *de facto* life cycle investments
  • Early life exposure to first antibiotics, 1937 (Jayachandran et al 2010; Bhalotra and Venkataramani 2015)
  • Early career exposure to FLSA 1966 (Derenoncourt and Montialoux 2021; Bailey et al 2021)

• Assesses collective impacts of these interventions on racial disparities in earnings in a quasi-experimental setup

• Finds complementarities between the two investments:
  • Reduced racial gaps in earnings
  • FLSA helped Black workers achieve the full potential of a healthier start
Interventions

**Sulfa drugs:**
- Sulfa drugs (mid 1930s) found to be effective in reducing pneumonia morbidity and mortality in young children (Lesch 2007, Jayachandran et al 2010)
- Infancy exposure → greater human capital accumulation and earnings in adulthood for Black and White men (Bhalotra and Venkataramani 2015)

**1966 FLSA**
- Raised national hourly min. wage to highest real rate in 20th century (Bailey et al 2021)
- Extended min. wage to a range of industries in which Black workers were overrepresented
- Large declines in B-W wage gap (Derenoncourt and Montialoux 2021)
Potential interactions

• Substitutes: workers with better health endowments → less likely to work in low-wage industries → benefit less from min. wages hikes

• Complements: workers with better health endowments → able to find better opportunities when frictions in labor market are addressed by min. wage hikes

• For Black workers, we argue complementarity more likely:
  • Black workers benefitted more from early life shock (because of worse baseline) but constrained in labor market due to systemic discrimination (Bhalotra and Venkataramani 2015)
  • Min. wage hikes can address occupational segregation, high search costs (Derenoncourt and Montialoux 2021; Wursten and Reich 2023)
Data and design

• Interactive 2 X 2 design combining pre-post birth year exposure to sulfa and pre-post exposure to FLSA using 1960 and 1970 Censuses
  • Focus on 1930-1943 male birth cohorts
  • Sulfa-affected cohorts were 23-30 y.o. at time of FLSA

• Identification for sulfa shock: Post-1937 birth X pre-sulfa burden of disease (Bhalotra and Venkataramani 2015; Chuard et al 2022)

• Identification for FLSA: Post-1966 census enumeration X pre-FLSA lack of state min wage laws (e.g. Derenoncourt and Montialoux 2021)
Identifying variation

Baseline pneumonia mortality rates

States with no minimum wage laws in 1966 ("strongly treated")
Model

\[ Y_{isbtc} = \beta_0 + \beta_1 (\text{Post Sulfac} \times \text{Base Pneumonia}_b) + \beta_2 (\text{Strongly Treated State}_s \times \text{Post FLSA}_t) + \beta_3 (\text{Post Sulfac} \times \text{Base Pneumonia}_b) \times \text{Post FLSA}_t + \tau [(\text{Post Sulfac} \times \text{Base Pneumonia}_b) \times (\text{Strongly Treated State}_s \times \text{Post FLSA}_t)] + \mu_b + \lambda_c + \phi_s + \psi_i + X'_{stbc} \Gamma + \eta_{istc}. \] (3)

\[ i = \text{individual} \]
\[ s = \text{state at enumeration} \]
\[ b = \text{birth state} \]
\[ t = \text{census wave} \]
\[ c = \text{birth cohort} \]

Include birth state, birth year, enumeration state, enumeration year, birth state X enumeration year, and birth year X enumeration state FEs
## Single policy effects

<table>
<thead>
<tr>
<th></th>
<th>log(Wage Income)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Black (1)</td>
<td>White (2)</td>
<td></td>
</tr>
<tr>
<td><strong>Panel A: Sulfa</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post Sulfa × Base Pneumonia</td>
<td>0.0459</td>
<td>0.121***</td>
<td></td>
</tr>
<tr>
<td>(0.0755)</td>
<td>(0.0350)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean of Dep. Var.</td>
<td>9.25</td>
<td>9.73</td>
<td></td>
</tr>
<tr>
<td>Scaled effect size</td>
<td>0.007</td>
<td>0.019</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>80,974</td>
<td>772,267</td>
<td></td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.368</td>
<td>0.505</td>
<td></td>
</tr>
</tbody>
</table>

| **Panel B: FLSA** | | |
| Strongly Treated Stata × Post FLSA | 0.200*** | 0.0328* |
| (0.0589) | (0.0167) | |
| Mean of Dep. Var. | 9.25 | 9.73 |
| Observations | 82,088 | 776,130 |
| R-Squared | 0.255 | 0.208 |
### Interaction Effects and Earnings Gaps

Sulfa X FLSA effect equivalent to a 13.4% reduction in BW wage gap.

FLSA effectively undid widening of BW gap induced by sulfa exposure alone.

<table>
<thead>
<tr>
<th></th>
<th>Sulfa Arrival (1)</th>
<th>FLSA Reform (2)</th>
<th>Interactive Reform (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reform</td>
<td>0.121*** (0.0350)</td>
<td>0.0328* (0.0167)</td>
<td>0.0269*** (0.00675)</td>
</tr>
<tr>
<td>Reform × Black</td>
<td>-0.0749 (0.0732)</td>
<td>0.167*** (0.0536)</td>
<td>0.0470** (0.0214)</td>
</tr>
<tr>
<td>Observations</td>
<td>853,241</td>
<td>858,218</td>
<td>853,241</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.499</td>
<td>0.225</td>
<td>0.508</td>
</tr>
<tr>
<td>White (control)</td>
<td>10.53</td>
<td>10.54</td>
<td>10.57</td>
</tr>
<tr>
<td>Black (control)</td>
<td>10.04</td>
<td>10.20</td>
<td>10.22</td>
</tr>
<tr>
<td>Δ WB (control)</td>
<td>0.491</td>
<td>0.347</td>
<td>0.350</td>
</tr>
<tr>
<td>Scaled Estimate</td>
<td>-0.152</td>
<td>0.481</td>
<td>0.134</td>
</tr>
</tbody>
</table>
Event studies for interaction effects

Black men: -0.074 (0.029)
White men: -0.027 (0.007)
Why complementarity?

• Sulfa-led selection into FLSA-covered industries/states:
  • Sulfa exposed workers more likely to stay in birth state (which for Black workers were more likely FLSA-treated) and sort into FLSA industries

• FLSA helped better endowed workers surmount labor market barriers
  • Sulfa exposed workers were more likely to exit FLSA covered industries after FLSA

• However, migration and industry choice explain little of the complementarity found, suggesting role of within industry mobility
Impacts on income distribution
Discussion and next steps

• Findings consistent with need for sustained, multi-dimensional investments to address racial disparities in economic outcomes

• Current interpretation: FLSA addressed frictions faced by Black workers, potentiating prospects of those with better health endowments

• Next steps:
  • Effects across income distribution
Thank you.

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Returns to early exposure to sulfa drugs are shaped by institutional racism.

Impacts of early exposure to sulfa drugs in 1980-2000 censuses (Bhalotra and Venkataramani 2015)

<table>
<thead>
<tr>
<th>Panel A: Black Men</th>
<th>Schooling</th>
<th>log(Family Income)</th>
<th>Cognitive Disability</th>
<th>Work Limiting Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post × Base Pneumonia Influenza</td>
<td>1.005***</td>
<td>0.494***</td>
<td>-0.0858</td>
<td>-0.168***</td>
</tr>
<tr>
<td>(0.267)</td>
<td>(0.0910)</td>
<td>(0.0649)</td>
<td>(0.0256)</td>
<td></td>
</tr>
<tr>
<td>FWER p-value</td>
<td>[0.176]</td>
<td>[0.054]</td>
<td>[0.448]</td>
<td>[0.024]</td>
</tr>
<tr>
<td>Post × Base Pneumonia Influenza × Slave Fraction</td>
<td>-1.978***</td>
<td>-0.877***</td>
<td>0.0686</td>
<td>0.368***</td>
</tr>
<tr>
<td>(0.619)</td>
<td>(0.207)</td>
<td>(0.123)</td>
<td>(0.0615)</td>
<td></td>
</tr>
<tr>
<td>FWER p-value</td>
<td>[0.153]</td>
<td>[0.079]</td>
<td>[0.817]</td>
<td>[0.025]</td>
</tr>
<tr>
<td>Post × Slave Fraction</td>
<td>1.111**</td>
<td>0.285*</td>
<td>-0.168**</td>
<td>-0.250***</td>
</tr>
<tr>
<td>(0.474)</td>
<td>(0.162)</td>
<td>(0.0819)</td>
<td>(0.0500)</td>
<td></td>
</tr>
</tbody>
</table>

Effect size at slave fraction = 0
0.191 years 0.0938 % -1.630 pp -3.196 pp

Effect size at slave fraction = 0.2 (Median)
0.116 years 0.0605 % -1.369 pp -1.799 pp

Effect size at slave fraction = 0.5 (Max)
0.00299 years 0.0105 % -0.978 pp 0.297 pp

N 66,533 162,696 51,486 171,865
Selection into FLSA Industries

Opposite pattern for white workers.

Sulfa-shock $\rightarrow$ reduced migration from birth state for Black $>$ white men $\rightarrow$ more exposure to FLSA (though birth state and enumeration state FE control for this).
Sulfa X FLSA led exit from FLSA-covered industries.

Estimated interaction effects on log(wage earnings) remain after including industry FE, suggesting the importance of within industry mobility.
Impacts on occupational choice