Financial Aid, Debt Management, and Socioeconomic Outcomes
The Post-college Effects of Merit-based Aid

Judith Scott-Clayton (co-authored with Basit Zafar, FRBNY)
Teachers College, Columbia University & CCRC

The authors gratefully acknowledge the West Virginia Higher Education Policy Commission and Equifax, Inc. for facilitating this project and providing essential data. We also thank the Spencer Foundation and FRBNY for financial support. All conclusions are our own.
Motivation

• Broad-based financial aid increasingly central to US higher ed finance, as states reduce direct subsidies and sticker prices rise

• Research shows that broad based state merit aid programs can increase college enrollment and completion, but questions remain about whether benefits justify the costs

• Policy conversation increasingly focused on post-college implications, but limited research
What do we know about impacts of state merit aid?

- Broad-based merit aid in general: positive effects on enrollment and completion
  - Dynarski (2004, 2008); Cornwall, Mustard & Sridhar (2006); Pallais (2009); Zhang & Ness (2010); Bruce & Carruthers (2014)

- Caveats and conflicting findings
  - Fitzpatrick & Jones (2012); Sjoquist & Winters (2012); Cohodes & Goodman (2014); Dynarski (2000); Cornwell, Lee & Mustard (2005); Carruthers & Ozek (2013)

- WV PROMISE (Scott-Clayton 2011)
  - Increased GPAs, credits, and BA completion after 5 years, particularly large effects on on-time grad
  - Renewal reqs key to success – may not generalize

- Post-college: only one other rigorous study, by Bettinger, Gurantz, Kawano, & Sacerdote (2016)
Our study

- Examines the WV PROMISE Scholarship
  - Beginning in 2002, provided full tuition & fees for up to four years of in-state college attendance
  - Required HS GPA of 3.0+ (overall and in set of core courses) and 21+ on ACT (or 1000+ SAT)
  - Compared to other state programs, has stringent annual renewal criteria (requires 30 credits + 3.0 GPA to renew)
- Use RD & DD strategies to identify effects
- Merge multiple data sources – academic, employment, and credit to create unique dataset
- Examine outcomes up to 11 years post college entry
Data, Sample, Outcomes

• WVHEPC data:
  – Four cohorts of degree-seeking first-time entrants
  – ~52,000 overall; limited to ~20,000 age 19 or under, WV resident, HSGPA 3.0+
  – Transcripts, financial aid, employment for 10 yrs

• Equifax data:
  – 85% ever match (no program effect on match rate)
  – Can observe zipcode of residence (matched to IRS data on income), homeownership & max mortgage value, credit delinquencies and credit scores
Source of identification: RD and DD

Actual PROMISE Receipt

ACT (or equivalent)
Visual Overview of RD and DD

Mean Zipcode Income

ACT Score Equivalent

- After PROMISE
- Before PROMISE
Causal Identification

\[ P_i = \lambda + \psi(\text{above}_i) + \gamma(\text{ACTdist}_i \times \text{below}_i) + \phi(\text{ACTdist}_i \times \text{above}_i) + X_i \phi + \varepsilon_i \]

\[ P_{it} = \lambda + \gamma(\text{ABOVE}_i \times \text{AFTER}_t) + \theta(\text{ACTFE}_i) + \vartheta(\text{COHORTFE}_t) + X_i \phi + u_{it} \]

- Two complementary strategies
  - Primary: RD for eligible cohorts with 3.0+ HSGPA
  - Secondary: Diff-in-diff comparing before vs. after, above vs. below ACT cutoff (limited to those with 3.0+ GPA)

- IV is layered on top of this to account for mismeasurement in our eligibility variable
  - First stage: 75-80pp; resulting estimates tell us the impact per student actually receiving the award
Main threat to validity:
Program effects on enrollment

**ACT Distribution Among HSGPA-Elg Enrollees**

- Substantial additional mass above the cut-off suggests about 25% of treatment group is “marginal”
- Low rates of out-of-state enrollment, limited “missing” density below cutoff imply that at least 75% of this is new enrollment.
- Note this will affect identification in both the RD and the DD.
## Main Results: Regression Discontinuity

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Mean at ACT=20</th>
<th>(2) IV-RD ACT: 16-25</th>
<th>(3) No covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earned BA within 4 years</td>
<td>0.154</td>
<td>0.096 (0.022) ***</td>
<td>0.103 (0.021) ***</td>
</tr>
<tr>
<td>Earned a BA within 10 years</td>
<td>0.543</td>
<td>0.019 (0.028)</td>
<td>0.038 (0.028)</td>
</tr>
<tr>
<td>Graduate degree w/in 10 years</td>
<td>0.106</td>
<td>0.042 (0.019) **</td>
<td>0.050 (0.018) ***</td>
</tr>
</tbody>
</table>

| Sample size                          | 974                | 8,578                | 8,800              |
## Main Results: Regression Discontinuity

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Mean at ACT=20</th>
<th>(2) IV-RD ACT: 16-25</th>
<th>(3) No covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earned BA within 4 years</td>
<td>0.154</td>
<td>0.096 (0.022) **</td>
<td>0.103 (0.021) ***</td>
</tr>
<tr>
<td>Earned a BA within 10 years</td>
<td>0.543</td>
<td>0.019 (0.028)</td>
<td>0.038 (0.028)</td>
</tr>
<tr>
<td>Graduate degree w/in 10 years</td>
<td>0.106</td>
<td>0.042 (0.019) **</td>
<td>0.050 (0.018) ***</td>
</tr>
<tr>
<td>Employed year round (in Year 10)</td>
<td>0.511</td>
<td>-0.014 (0.029)</td>
<td>-0.012 (0.029)</td>
</tr>
<tr>
<td>Annual earnings</td>
<td>empl. yr-round</td>
<td>$40,086</td>
<td>$2,724 (1809)</td>
</tr>
<tr>
<td>Earn year 10</td>
<td>Living in WV</td>
<td>$27,607</td>
<td>$1,150 (1786.14)</td>
</tr>
<tr>
<td>Matched to Equifax</td>
<td>0.923</td>
<td>-0.002 (0.015)</td>
<td>0.000 (0.016)</td>
</tr>
<tr>
<td>Ever living outside WV</td>
<td>0.228</td>
<td>-0.003 (0.025)</td>
<td>-0.002 (0.025)</td>
</tr>
<tr>
<td>Zipcode: mean income</td>
<td>$49,556</td>
<td>$2,409 (1193) **</td>
<td>$2,576 (1208) **</td>
</tr>
</tbody>
</table>

| Sample size                                  | 974                 | 8,578                 | 8,800              |
## Main Results: Regression Discontinuity

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Mean at ACT=20</th>
<th>(2) IV-RD ACT: 16-25</th>
<th>(3) No covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earned BA within 4 years</td>
<td>0.154</td>
<td>0.096 (0.022) ***</td>
<td>0.103 (0.021) ***</td>
</tr>
<tr>
<td>Earned a BA within 10 years</td>
<td>0.543</td>
<td>0.019 (0.028)</td>
<td>0.038 (0.028)</td>
</tr>
<tr>
<td>Graduate degree w/in 10 years</td>
<td>0.106</td>
<td>0.042 (0.019) **</td>
<td>0.050 (0.018) ***</td>
</tr>
<tr>
<td>Employed year round (in Year 10)</td>
<td>0.511</td>
<td>-0.014 (0.029)</td>
<td>-0.012 (0.029)</td>
</tr>
<tr>
<td>Annual earnings</td>
<td>empl. yr-round</td>
<td>$40,086</td>
<td>$2,724 (1809)</td>
</tr>
<tr>
<td>Earn year 10</td>
<td>Living in WV</td>
<td>$27,607</td>
<td>$1,150 (1786.14)</td>
</tr>
<tr>
<td>Matched to Equifax</td>
<td>0.923</td>
<td>-0.002 (0.015)</td>
<td>0.000 (0.016)</td>
</tr>
<tr>
<td>Ever living outside WV</td>
<td>0.228</td>
<td>-0.003 (0.025)</td>
<td>-0.002 (0.025)</td>
</tr>
<tr>
<td>Zipcode: mean income</td>
<td>$49,556</td>
<td>$2,409 (1193) **</td>
<td>$2,576 (1208) **</td>
</tr>
<tr>
<td>Ever owned a home</td>
<td>0.361</td>
<td>0.060 (0.029) **</td>
<td>0.054 (0.029) *</td>
</tr>
<tr>
<td>Ever take out a student loan</td>
<td>0.622</td>
<td>-0.052 (.027) **</td>
<td>-0.049 (.027) *</td>
</tr>
<tr>
<td>Student loan balance (incl. 0s)</td>
<td>$15,931</td>
<td>$2,805 (1739) **</td>
<td>$3,321 (1734) *</td>
</tr>
<tr>
<td>Ever past due: stud/auto/home loan</td>
<td>0.367</td>
<td>-0.026 (0.029)</td>
<td>-0.029 (0.029)</td>
</tr>
<tr>
<td>Ever had account in collections</td>
<td>0.479</td>
<td>-0.047 (0.029)</td>
<td>-0.051 (0.030) *</td>
</tr>
<tr>
<td>Credit score</td>
<td>665.3</td>
<td>3.863 (5.838)</td>
<td>4.998 (5.954)</td>
</tr>
<tr>
<td>Index</td>
<td>-0.044</td>
<td>0.179 (0.122)</td>
<td>0.185 (0.124)</td>
</tr>
<tr>
<td>Sample size</td>
<td>974</td>
<td>8,578</td>
<td>8,800</td>
</tr>
</tbody>
</table>
## RD falsification test

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(2) IV-RD ACT: 16-25</th>
<th>(7) Falsification: RD Before 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earned BA within 4 years</td>
<td>0.096 (0.022) ***</td>
<td>0.012 (0.015)</td>
</tr>
<tr>
<td>Earned a BA within 10 years</td>
<td>0.019 (0.028)</td>
<td>-0.024 (0.020)</td>
</tr>
<tr>
<td>Graduate degree w/in 10 years</td>
<td>0.042 (0.019) **</td>
<td>0.016 (0.014)</td>
</tr>
<tr>
<td>Earned a BA within 10 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed year round (in Year 10)</td>
<td>-0.014 (0.029)</td>
<td>0.014 (0.021)</td>
</tr>
<tr>
<td>Annual earnings</td>
<td>empl. yr-round</td>
<td>$2,724 (1809)</td>
</tr>
<tr>
<td>Earned year 10</td>
<td>Living in WV</td>
<td>$1,150 (1786.14)</td>
</tr>
<tr>
<td>Employed year round (in Year 10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched to Equifax</td>
<td>-0.002 (0.015)</td>
<td>0.013 (0.013)</td>
</tr>
<tr>
<td>Ever living outside WV</td>
<td>-0.003 (0.025)</td>
<td>0.012 (0.019)</td>
</tr>
<tr>
<td>Zipcode: mean income</td>
<td>$2,409 (1193) **</td>
<td>-$39.72 (895)</td>
</tr>
<tr>
<td>Ever owned a home</td>
<td>0.060 (0.029) **</td>
<td>0.011 (0.022)</td>
</tr>
<tr>
<td>Ever take out a student loan</td>
<td>-0.052 (.027) **</td>
<td>-0.018 (0.020)</td>
</tr>
<tr>
<td>Student loan balance (incl. 0s)</td>
<td>$2,805 (1739)</td>
<td>-$1,038 (1178)</td>
</tr>
<tr>
<td>Ever past due: stud/auto/home loan</td>
<td>-0.026 (0.029)</td>
<td>-0.005 (0.021)</td>
</tr>
<tr>
<td>Ever had account in collections</td>
<td>-0.047 (0.029)</td>
<td>-0.006 (0.022)</td>
</tr>
<tr>
<td>Credit score</td>
<td>3.863 (5.838)</td>
<td>3.393 (4.283)</td>
</tr>
<tr>
<td>Index</td>
<td>0.179 (0.122)</td>
<td>0.081 (0.091)</td>
</tr>
</tbody>
</table>

| Sample size                                       | 8,578                 | 7,830                           |
Other robustness checks

• Diff-in-diff results are broadly consistent, but generally more muted – suggesting impacts may be smaller for those further above score cutoff

• Results generally robust to alternate bandwidths, including using methods of optimal bandwidth selection

• Multiple hypothesis testing: All outcomes robust w/ false discovery rate of 0.20 or below

• We also utilize bounding analyses to explore the possible role of selection bias: our results are robust to reasonable assumptions, but not to the most extreme assumptions
What could drive these post-college effects?

• Improved human capital acquisition during college
• Reductions in undergraduate debt may facilitate graduate enrollment and homeownership by relaxing credit constraints
• Acceleration of time to degree could give students a head start on whatever next phase of life holds (graduate school, career, homeownership)
## Controlling for intermediate outcomes

### Table: (2) IV-RD Controlling for intermediate outcome:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>ACT: 16-25</th>
<th>On-time BA completion</th>
<th>Cum. Undergraduate borrowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earned BA within 4 years</td>
<td>0.096 (0.022) ***</td>
<td>n/a</td>
<td>0.086 (0.012) ***</td>
</tr>
<tr>
<td>Earned a BA within 10 years</td>
<td>0.019 (0.028)</td>
<td>-0.028 (0.026)</td>
<td>0.036 (0.027)</td>
</tr>
<tr>
<td>Graduate degree w/in 10 years</td>
<td>0.042 (0.019) **</td>
<td>0.023 (0.018)</td>
<td>0.045 (0.019) **</td>
</tr>
<tr>
<td>Employed year round (in Yr 10)</td>
<td>-0.014 (0.029)</td>
<td>-0.012 (0.029)</td>
<td>-0.014 (0.029)</td>
</tr>
<tr>
<td>Annual earnings</td>
<td>empl. yr-round</td>
<td>$2,724 (1809)</td>
<td>$1,958 (1814)</td>
</tr>
<tr>
<td>Earn year 10</td>
<td>Living in WV</td>
<td>$1,150 (1786)</td>
<td>$444 (1790)</td>
</tr>
<tr>
<td>Matched to Equifax</td>
<td>-0.002 (0.015)</td>
<td>-0.005 (0.015)</td>
<td>-0.000 (0.015)</td>
</tr>
<tr>
<td>Ever living outside WV</td>
<td>-0.003 (0.025)</td>
<td>-0.013 (0.025)</td>
<td>0.000 (0.025)</td>
</tr>
<tr>
<td>Zipcode: mean income</td>
<td>$2,409 (1193) **</td>
<td>$1,873 (1183)</td>
<td>$2,459 (1193) **</td>
</tr>
<tr>
<td>Ever owned a home</td>
<td>0.060 (.029) **</td>
<td>0.042 (0.029)</td>
<td>0.055 (0.029) *</td>
</tr>
<tr>
<td>Ever take out a student loan</td>
<td>-0.052 (.027) **</td>
<td>-0.061 (0.029) **</td>
<td>-0.029 (0.026)</td>
</tr>
<tr>
<td>Student loan balance (incl. 0s)</td>
<td>$2,805 (1739)</td>
<td>$2,324 (1748)</td>
<td>$4,467 (1616) ***</td>
</tr>
<tr>
<td>Ever past due: stud/auto/home loan</td>
<td>-0.026 (0.029)</td>
<td>-0.006 (0.027)</td>
<td>-0.017 (0.027)</td>
</tr>
<tr>
<td>Ever had account in collections</td>
<td>-0.047 (0.029)</td>
<td>-0.023 (0.029)</td>
<td>-0.039 (0.029)</td>
</tr>
<tr>
<td>Credit score</td>
<td>3.863 (5.838)</td>
<td>-1.483 (5.745)</td>
<td>2.363 (5.819)</td>
</tr>
<tr>
<td>Index</td>
<td>0.179 (0.122)</td>
<td>0.056 (0.120)</td>
<td>0.152 (0.121)</td>
</tr>
</tbody>
</table>

Sample size: 8,578
Summary & Implications

• Students who just barely qualified for PROMISE:
  – More likely to graduation on-time, earn graduate degrees
  – No more likely to live or work out of state
  – Live in higher-income zipcodes and are more likely to own a home
  – Earnings, credit impacts are noisy but in good direction

• Generally consistent, but somewhat muted pattern for students higher up ACT score distribution

• Reduction in time-to-degree appears more plausible mechanism than reductions in undergraduate debt

• Results here would easily pass a cost-benefit test – but not clear how generalizable to other aid programs
Visit our website at capseecenter.org

You can also follow us on Twitter at @capsee and like us on Facebook.

Center for Analysis of Postsecondary Education and Employment
Teachers College, Columbia University

525 West 120th Street, Box 174, New York, NY 10027

TEL: 212.678.3091 | capsee@columbia.edu

CAPSEE is funded through a grant (R305C110011) from the Institute of Education Sciences, U.S. Department of Education.
<table>
<thead>
<tr>
<th>Outcome</th>
<th>BPS Sample, 2003</th>
<th>Full WV Analysis Sample</th>
<th>Promise Eligible Sample</th>
<th>Main RD Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0.575</td>
<td>0.546</td>
<td>0.561</td>
<td>0.604</td>
</tr>
<tr>
<td>White</td>
<td>0.615</td>
<td>0.951</td>
<td>0.968</td>
<td>0.959</td>
</tr>
<tr>
<td>Black, non-hispanic</td>
<td>0.138</td>
<td>0.033</td>
<td>0.014</td>
<td>0.024</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.149</td>
<td>0.006</td>
<td>0.005</td>
<td>0.005</td>
</tr>
<tr>
<td>Other race/ethnicity</td>
<td>0.097</td>
<td>0.011</td>
<td>0.012</td>
<td>0.011</td>
</tr>
<tr>
<td>Age at entry</td>
<td>22.1</td>
<td>18.6</td>
<td>18.3</td>
<td>18.6</td>
</tr>
<tr>
<td>Graduated from private HS</td>
<td>0.082</td>
<td>0.031</td>
<td>0.034</td>
<td>0.026</td>
</tr>
<tr>
<td>HS GPA</td>
<td>2.82</td>
<td>3.23</td>
<td>3.63</td>
<td>3.50</td>
</tr>
<tr>
<td>Took SAT</td>
<td>0.640</td>
<td>0.105</td>
<td>0.127</td>
<td>0.106</td>
</tr>
<tr>
<td>Took ACT</td>
<td>0.926</td>
<td>0.907</td>
<td>0.907</td>
<td>0.942</td>
</tr>
<tr>
<td>ACT (or equivalent score)</td>
<td>21.0</td>
<td>20.8</td>
<td>24.2</td>
<td>21.0</td>
</tr>
<tr>
<td>Had 3.0+ HSGPA and 20+ ACT</td>
<td>n/a</td>
<td>0.429</td>
<td>1.000</td>
<td>0.595</td>
</tr>
<tr>
<td>Pell Recip. in 1st year</td>
<td>0.357</td>
<td>0.370</td>
<td>0.323</td>
<td>0.367</td>
</tr>
<tr>
<td>Enrolled full-time at entry</td>
<td>0.714</td>
<td>0.929</td>
<td>0.985</td>
<td>0.985</td>
</tr>
<tr>
<td>Enrolled in four-year college</td>
<td>0.407</td>
<td>0.697</td>
<td>0.868</td>
<td>0.788</td>
</tr>
<tr>
<td>Sample size</td>
<td>16,500</td>
<td>30,107</td>
<td>13,636</td>
<td>8,578</td>
</tr>
</tbody>
</table>
RD Robustness – complete results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(2) IV-RD ACT: 16-25</th>
<th>(4) ACT: 18-23</th>
<th>(5) ACT: 11-30</th>
<th>(6) Full sample, local quadratic</th>
<th>(7) Falsification: RD Before 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Earned BA within 4 years</strong></td>
<td>0.096 (0.022) ***</td>
<td>0.099 (0.029) ***</td>
<td>0.080 (0.017) ***</td>
<td>0.085 (0.025) ***</td>
<td>0.012 (0.015) ***</td>
</tr>
<tr>
<td><strong>Earned a BA within 10 years</strong></td>
<td>0.019 (0.028)</td>
<td>-0.013 (0.037)</td>
<td>-0.006 (0.023)</td>
<td>0.018 (0.033)</td>
<td>-0.024 (0.020)</td>
</tr>
<tr>
<td><strong>Graduate degree w/in 10 years</strong></td>
<td>0.042 (0.019) **</td>
<td>0.045 (0.024) *</td>
<td>0.023 (0.015)</td>
<td>0.032 (0.022)</td>
<td>0.016 (0.014)</td>
</tr>
<tr>
<td><strong>Employed year round (in Year 10)</strong></td>
<td>-0.014 (0.029)</td>
<td>-0.026 (0.037)</td>
<td>0.017 (0.024)</td>
<td>-0.029 (0.034)</td>
<td>0.014 (0.021)</td>
</tr>
<tr>
<td><strong>Annual earnings\empl. yr-round</strong></td>
<td>$2,724 (1809)</td>
<td>$4,438 (2270) *</td>
<td>$1,769 (1518)</td>
<td>$2,838 (2169)</td>
<td>$1,297 (1364)</td>
</tr>
<tr>
<td>**Earn year 10</td>
<td>Living in WV**</td>
<td>$1,150 (1786.14)</td>
<td>$2,737 (2297.34)</td>
<td>$2,555 (1478.40) *</td>
<td>$1,064 (2120.83)</td>
</tr>
<tr>
<td><strong>Matched to Equifax</strong></td>
<td>-0.002 (0.015)</td>
<td>-0.001 (0.019)</td>
<td>0.004 (0.012)</td>
<td>-0.000 (0.017)</td>
<td>0.013 (0.013)</td>
</tr>
<tr>
<td><strong>Ever living outside WV</strong></td>
<td>-0.003 (0.025)</td>
<td>0.023 (0.032)</td>
<td>-0.002 (0.025)</td>
<td>0.009 (0.029)</td>
<td>0.012 (0.019)</td>
</tr>
<tr>
<td><strong>Zipcode: mean income</strong></td>
<td>$2,409 (1193) **</td>
<td>$3,714 (1540) **</td>
<td>$1,796 (1011) *</td>
<td>$2,739 (1346) **</td>
<td>-$39.72 (895)</td>
</tr>
<tr>
<td><strong>Ever owned a home</strong></td>
<td>0.060 (0.029) **</td>
<td>0.046 (0.037)</td>
<td>0.054 (0.029) *</td>
<td>0.068 (0.034) **</td>
<td>0.011 (0.022)</td>
</tr>
<tr>
<td><strong>Ever take out a student loan</strong></td>
<td>-0.052 (.027) **</td>
<td>-0.029 (.034)</td>
<td>-0.034 (.022)</td>
<td>-0.036 (.0316)</td>
<td>-0.018 (0.020)</td>
</tr>
<tr>
<td><strong>Student loan balance (incl. 0s)</strong></td>
<td>$2,805 (1739)</td>
<td>$1,946 (2201)</td>
<td>$1,440 (1445)</td>
<td>$3,066 (2032)</td>
<td>-$1,038 (1178)</td>
</tr>
<tr>
<td><strong>Ever past due: stud/auto/home loan</strong></td>
<td>-0.026 (0.029)</td>
<td>-0.029 (0.037)</td>
<td>-0.010 (0.024)</td>
<td>-0.029 (0.034)</td>
<td>-0.005 (0.021)</td>
</tr>
<tr>
<td><strong>Ever had account in collections</strong></td>
<td>-0.047 (0.029)</td>
<td>-0.073 (0.038)</td>
<td>-0.003 (0.024)</td>
<td>-0.066 (0.034) *</td>
<td>-0.006 (0.022)</td>
</tr>
<tr>
<td><strong>Credit score</strong></td>
<td>3.863 (5.838)</td>
<td>7.486 (7.554)</td>
<td>-1.739 (4.851)</td>
<td>8.131 (6.899)</td>
<td>3.393 (4.283)</td>
</tr>
<tr>
<td><strong>Index</strong></td>
<td>0.179 (0.122)</td>
<td>0.248 (0.155)</td>
<td>-0.026 (0.100)</td>
<td>0.231 (0.143) *</td>
<td>0.081 (0.091)</td>
</tr>
</tbody>
</table>

Sample size | 8,578 | 6,096 | 10,732 | 10,953 | 7,830 |
## Alternative RD: Using first year GPA

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earned BA within 4 Years</td>
<td>0.208</td>
<td>(0.016)</td>
<td>***</td>
</tr>
<tr>
<td>Earned BA within 10 Years</td>
<td>0.234</td>
<td>(0.023)</td>
<td>***</td>
</tr>
<tr>
<td>Any grad degree w/in 10 years</td>
<td>0.103</td>
<td>(0.014)</td>
<td>***</td>
</tr>
<tr>
<td>Employed year round (in Year 10)</td>
<td>0.005</td>
<td>(0.023)</td>
<td></td>
</tr>
<tr>
<td>Earnings/year round emp, Yr 10</td>
<td>$3,471</td>
<td>(1569)</td>
<td>**</td>
</tr>
<tr>
<td>Earn year 10</td>
<td>Living in WV</td>
<td>$7,437</td>
<td>(1726.51)</td>
</tr>
<tr>
<td>Matched to Equifax</td>
<td>0.014</td>
<td>(0.012)</td>
<td></td>
</tr>
<tr>
<td>Ever living outside WV</td>
<td>0.062</td>
<td>(0.020)</td>
<td>***</td>
</tr>
<tr>
<td>Zipcode: mean income</td>
<td>$4,057</td>
<td>(974)</td>
<td>***</td>
</tr>
<tr>
<td>Ever owned a home</td>
<td>0.09</td>
<td>(0.023)</td>
<td>***</td>
</tr>
<tr>
<td>Ever take out a student loan</td>
<td>-0.089</td>
<td>(0.023)</td>
<td>***</td>
</tr>
<tr>
<td>Student loan balance (inc. 0s)</td>
<td>$2,452</td>
<td>(1574)</td>
<td></td>
</tr>
<tr>
<td>Ever past due: stud/auto/home loan</td>
<td>-0.156</td>
<td>(0.023)</td>
<td>***</td>
</tr>
<tr>
<td>Ever had account in collections</td>
<td>-0.179</td>
<td>(0.024)</td>
<td>***</td>
</tr>
<tr>
<td>Credit score</td>
<td>35.69</td>
<td>(4.54)</td>
<td>***</td>
</tr>
<tr>
<td>Index</td>
<td>0.977</td>
<td>(0.112)</td>
<td>***</td>
</tr>
</tbody>
</table>

Sample Size 2,791
Impacts over time

Zipcode: mean income

Annual earnings|empl. yr-round

Ever owned a home

Years Since College Entry

PROMISE Impact
Proposed Structure of Data Flow
for Scott-Clayton & Zafar Project on Later-Life Outcomes of Education

**WVHEPC**
Master Data (Identifiable education records)

Data agreements (for de-identified education data):
- WVHEPC-ScottClayton (O)
- WVHEPC-Zafar (O)

Data agreement (to share ID file, no other data):
- WVHEPC and Equifax (O)

**RESEARCH TEAM [SCOTT-CLAYTON AND ZAFAR]**
Research team receives DE-IDENTIFIED WVHEPC EDUCATION DATA FILES with a scrambled ID for linking across files. Scott-Clayton already has the necessary data (except for one file which was incomplete) from a prior project with WVHEPC. Because Zafar and Scott-Clayton are at different institutions, two separate (but identical) data agreements are needed.

Data agreement (to merge de-identified WVHEPC and Equifax data):
- ScottClayton-FBNY (X)

**EQUIFAX**
Equifax receives single CROSSWALK FILE with only scrambled ID, SSN, and possibly name/DOB (no education data). Merges on credit report variables, then removes all identifiers other than the scrambled ID from merged file, to create the DE-IDENTIFIED CREDIT DATA FILE. Crosswalk file with identifiers can then be destroyed.

Data agreement (for de-identified credit data):
- Equifax-FBNY (X)

**RESEARCH TEAM - SECURE FBNY SERVER**
Research team merges the de-identified credit data file to the de-identified WVHEPC education data files to create a DE-IDENTIFIED, MERGED ANALYSIS FILE. File will be stored and analyzed only by the research team and only on-site at the FBNY using their secure server. Data can be analyzed only for the agreed-upon purpose, and will be destroyed at the end of the project.

Research report(s) and policy brief(s) produced by research team. In addition to the formal project deliverables, research team is happy to run additional sub-analyses of interest to WVHEPC, as long as they fall within the approved project agreements.

**NOTES:** (O) indicates data agreements still under development/review. (X) indicates data agreements in place or ready to sign.
Who are the marginal enrollees?

Fall Enrollment Rates of Recent WV HS Grads

Out of 20 eligible enrollees...

WV Pub-incl
WV Pub-elg
WV PRI
OOS

Year of HS Grad

Percent of WV HS Grads

0.0%
2.5%
5.0%
7.5%
10.0%
12.5%
15.0%
17.5%
20.0%
22.5%
25.0%
27.5%
30.0%

2000 2001 2002 2003 2004

3

15

2