Actual versus Predicted Institutional Graduation Rates at California’s Four-Year Colleges and Universities

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Problem Statement

• Various stakeholders are interested in graduation rates (GRs);
• GRs often used as sole/primary indicator of institutional effectiveness
• GRs do not account for the characteristics of the institution or entering students;
• Value-added approach
Background

• College graduation rates are associated with student characteristics
  – (NCES studies include Adelman 2006, Berkner, He, and Cataldi 2002, Choy 2002, looking at academic preparation and SES)

• Graduation rates are related to size of low-income population in freshman cohort

• Implications
  – Compare institutions that have similar student characteristics
  – Some institutions outperform comparable institutions enrolling higher-income students
Research Question(s)

1. How do graduation rates vary by characteristics of postsecondary institutions?
2. What institutional and student characteristics are most strongly related to graduation rates?
3. What institutions have significantly different graduation rates than predicted given their characteristics?
Methodology

**Data Source:**
- 1,449 institutions from IPEDS database (IC & GR surveys)
- Size Larger than 1,000 students
- Bachelor’s degree granting and above

**Method:**
- Descriptive statistics
- Linear regression w/ 150% GR as outcome

**Predictor Variables:**
- Demographics (ethnicity/race, Pell recipients, women)
- Selectivity (admissions rates, standardized test scores)
- Institutional type (control)
- Institutional resources (student-to-faculty ratio)
150% GR by Sector

- Public 4-year
- Private, not-profit 4-year
- Private, for-profit 4-year
150% GR by Percent Nonwhite
150% GR by Pell Recipients
# Regression Model of Institutional GRs

<table>
<thead>
<tr>
<th>Significant Variables</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-1.683</td>
<td>6.397</td>
<td>-0.263</td>
<td>-19.927</td>
<td>.793</td>
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<tr>
<td>ACT Composite 75th Percent</td>
<td>2.994</td>
<td>.150</td>
<td>0.548</td>
<td>19.927</td>
<td>.000</td>
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<tr>
<td>Percent Pell Grant Recipients</td>
<td>-0.446</td>
<td>.037</td>
<td>-0.334</td>
<td>-12.128</td>
<td>.000</td>
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<tr>
<td>Percent Admitted</td>
<td>-0.083</td>
<td>.020</td>
<td>-0.084</td>
<td>-4.154</td>
<td>.000</td>
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<tr>
<td>Private Non-Profit</td>
<td>3.735</td>
<td>.769</td>
<td>0.102</td>
<td>4.857</td>
<td>.000</td>
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<tr>
<td>Student-to-Faculty Ratio</td>
<td>-0.241</td>
<td>.084</td>
<td>-0.064</td>
<td>-2.862</td>
<td>.004</td>
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<tr>
<td>Percent Black</td>
<td>0.076</td>
<td>.035</td>
<td>0.078</td>
<td>2.139</td>
<td>.033</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-Significant Variables</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Percent Women</td>
<td>0.051</td>
<td>.028</td>
<td>0.033</td>
<td>1.811</td>
<td>.070</td>
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<td>Percent Hispanic/Latino</td>
<td>0.055</td>
<td>.048</td>
<td>0.029</td>
<td>1.143</td>
<td>.253</td>
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<tr>
<td>Percent White</td>
<td>-0.006</td>
<td>.029</td>
<td>-0.007</td>
<td>-0.211</td>
<td>.833</td>
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<tr>
<td>Percent 2 or More Races</td>
<td>-0.265</td>
<td>.184</td>
<td>-0.026</td>
<td>-1.443</td>
<td>.149</td>
</tr>
<tr>
<td>Private For-Profit</td>
<td>5.509</td>
<td>5.208</td>
<td>0.019</td>
<td>1.058</td>
<td>.290</td>
</tr>
</tbody>
</table>
Predicted vs. Actual GRs

Scatterplot

Dependent Variable: BachelorsGR_6year

$R^2$ Linear = 0.692
Outlier Institutions

• “Overachievers”
  – Warner-Pacific College = +42
  – Ashford University = +37
  – Livingstone College = +31

• “Underachievers”
  – Hodges University = -41
  – Newman University = -34
  – Louisiana State University (LSU) at Alexandria = -31
CA Public Institutions’ % Change: Actual vs Predicted GRs

Public Institutions' % Change: Actual vs Predicted GRs

- UC-San Diego: 24
- UC-Davis: 22
- CSU-Chico: 21
- CSU-Bakersfield: 19
- UC-Santa Cruz: 18
- CSU-Fresno: 18
- CSU-Northridge: 15
- CSU-Los Angeles: 14
- CalState Polytech-Pomona: 14
- CSU-Fullerton: 14
- Sonoma State: 11
- CalPolytechState Un-San Luis Obispo: 11
- CSU-Dominguez Hills: 9
- CSU-Fresno: 9
- UC-Santa Cruz: 9
- CSU-Fullerton: 7
- CalPolytechState Un-San Luis Obispo: 6
- CSU-Fresno: 6
- CalState Polytech-Pomona: 5
- Sonoma State: 5
- CalPolytechState Un-San Luis Obispo: 4
- CSU-Dominguez Hills: 3
- CSU-Fresno: 3
- UC-Santa Cruz: 2
- CSU-Fresno: 2
- UC-Santa Cruz: 1
- CSU-Fresno: 1
- UC-Santa Cruz: 0
- CSU-Fresno: 0
- UC-Santa Cruz: -1
- CSU-Fresno: -1
CA Private, Nonprofit Institutions’ % Change: Actual vs Predicted GRs
Over- and Under-Achievers

Pacific Union College

-23

Hope International University

-20

La Sierra University

-19

California Institute of Technology

-18

Woodbury University

-18

Holy Names University

-17

Humboldt State University

-17

Concordia University

-16

Azusa Pacific University

-16

Simpson University

-15

University of California-Berkeley

-15

Fresno Pacific University

-14

California State University-Chico

-13

University of California-Irvine

-13

University of La Verne

-12

University of California-Davis

-12

Mount St. Mary's College

-11

University of California-Irvine

-10

University of California-Los Angeles

-9

California State University-Chico

-9

Simpson University

-8

University of California-Berkeley

-7

Fresno Pacific University

-6

California State University-Chico

-5

University of California-Irvine

-5

Mount St. Mary's College

-4

University of California-Davis

-3

University of California-Irvine

-2

University of California-Los Angeles

-1

California State University-Chico

0

University of California-Berkeley

1

Fresno Pacific University

2

California State University-Chico

3

University of California-Irvine

4

Mount St. Mary's College

5

University of California-Davis

6

University of California-Irvine

7

Mount St. Mary's College

8

University of California-Davis

Limitations

• Restricted sample of students (first-time, full-time, degree seeking)
• Limited number of for-profits may prevent accurate estimates
• Assumed institutional characteristics are static
• 2010 may have been an unusual year given the economic recession
• Institutional data are self-reported and may be inaccurate at time
• Omitted variable bias
• Missing values
Findings & Implications

• Analyses confirmed that institutional characteristics are highly significant in influencing GR
• ACT scores, selectivity, percentage Pell grant recipients, and student-to-faculty ratios are influential in determining GR
• For-profits do not perform significantly different than publics when controlling for institutional characteristics
• Judging institutions simply on GR rates may provide a biased perspective of institutional performance
Directions for Future Research

• Future research should examine more closely
  – How and why some institutions are outperforming expectations
  – For-profit graduation rates
  – Nested models of student and institutional characteristics (HLM) should be examined
Questions?