Creating the Out-of-State University
State Funding and Enrollment Management at Public Research Universities

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University of Arizona
Educational Policy Studies & Practice

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Outline

1. Introduction: Overview of research program

2. Paper 1: Do public universities increase nonresident freshman enrollment in response to declining state funding?

3. Paper 2: Nonresident enrollment growth and the socioeconomic and racial composition of public flagships

4. Future research: Using “data science” to study marketing and recruiting

5. Appendix
Introduction: Overview of research program
Introduction
Why study enrollment management behavior of colleges and universities?

Growing importance of EM to organizations
- Growing tuition reliance, preoccupation with rankings
- EM ate the offices of admissions, recruiting, financial aid

What enrollment goals do orgs pursue?
- The “Iron triangle” of EM: access, academic prestige, tuition revenue

My research program
- How do colleges and universities change behavior to generate enrollment from desired student populations?
- Tensions and synergies between enrollment goals
- Are commitments to access real or symbolic?
Mean tuition revenue as a percent of total revenue
2003-04 to 2013-14

Note: For publics, tuition revenue excludes external student grant aid (e.g., Pell)
Use 2000 Carnegie to classify public and private non-profit
Percent of undergraduates receiving Pell grant aid
2003-04 to 2013-14

Note: Enrollment based on 12-month headcount; Pell data from Office of Federal Student Aid
Use 2000 Carnegie to classify public and private non-profit
Paper 1: Do public universities increase nonresident freshman enrollment in response to declining state funding?
Creating the out-of-state university
Do public universities increase nonresident freshman enrollment in response to declining state appropriations?

Freshman migration data available every other year
Net tuition revenue excludes student grant aid from external sources (e.g., Pell)
Conceptual framework
Resource dependence theory (Pfeffer & Salancik)

Basic assumptions
- Survival depends on resources from external environment
- Orgs can be controlled by important resource providers

Menu of strategies to manage reliance on declining resource
- Compliance
  - Acquiesce, show value to resource provider
- Resource diversification
  - Reduce reliance on uncertain resource
  - Change in mission, towards demands of new providers

Incentive to increase nonres after prolonged state cuts
- **H1**: state appropriations have a negative relationship with nonresident freshman enrollment
Conceptual framework continued

Actualizing desire for nonresidents depends on student demand

Nonresident students attracted to “high quality,” public research universities (e.g., Zhang, 2007)

- We define “quality” using 2000 Carnegie Classification
- Results similar when quality defined using U.S. News and World Report Rankings

**H2**: Negative relationship between state appropriations and nonresident freshman enrollment is stronger at research universities than at masters and bachelors universities
Data and sample

Data
- Organization-level data from IPEDS
- State-level data from various sources (e.g., Census, BLS)

Sample
- 440 public 4-year institutions, defined by 2000 Carnegie

Analysis period
- 2002–03 to 2012–13 academic years

Variables (logged)
- $Y_{it}$, nonresident freshman enrollment, from IPEDS fall migration
- $X_{i,t-1}$, state appropriations, from IPEDS Finance
Model results
State appropriations (X) and nonresident freshman enrollment (Y)

A 10% decline in state appropriations is associated with:
- (All public universities) 2.7% increase in nonres freshman
- (Research I universities) 5.0% increase in nonres freshman
- (Master’s universities) 2.1% increase in nonres freshman

Implications
- When state approps decline, public universities focus on attracting paying customers
- “Mathew effect”: only research universities have strong nonres demand
Paper 2: Nonresident enrollment growth and the socioeconomic and racial composition of public flagships
### Tuition rich, mission poor

**Nonresident freshman enrollment growth and the socioeconomic and racial composition of public research universities**

<table>
<thead>
<tr>
<th>Tuition</th>
<th>All public research(^a)</th>
<th>In US News top 100(^b)</th>
<th>Not in top 100(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resident</td>
<td>Nonresident</td>
<td>Resident</td>
</tr>
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<td>Sticker price(^d)</td>
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</tr>
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<td>Institutional aid(^d)</td>
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<tr>
<td>2,160</td>
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<td>Net tuition revenue(^d)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6,616</td>
<td>20,696</td>
<td>7,982</td>
<td>23,303</td>
</tr>
</tbody>
</table>

| High school academic            |          |             |          |             |          |             |          |             |
| SAT score\(^e\)                 |          |             |          |             |          |             |          |             |
| 1,074                           | 1,150    | 1,131       | 1,176    | 1,024       | 1,079    |             |          |             |
| GPA                             |          |             |          |             |          |             |          |             |
| 0.5-3.4 (D- to A-)              | 44%      | 44%         | 33%      | 39%         | 54%      | 57%         |          |             |
| 3.5-4.0 (A- to A)               | 56%      | 56%         | 67%      | 61%         | 46%      | 43%         |          |             |

| Socioeconomic                   |          |             |          |             |          |             |          |             |
| Income ($ thousands)\(^d\)      | 91       | 116         | 101      | 119         | 81       | 106         |          |             |
| Percent Pell                    | 37.6%    | 14.2%       | 33.1%    | 11.1%       | 41.4%    | 22.4%       |          |             |
| Parents have BA                 | 56.5%    | 76.1%       | 66.2%    | 79.5%       | 48.3%    | 66.8%       |          |             |

| Race                             |          |             |          |             |          |             |          |             |
| White                            | 61.4%    | 65.4%       | 67.3%    | 64.3%       | 56.4%    | 68.5%       |          |             |
| Asian                            | 7.9%     | 15.3%       | 8.9%     | 17.9%       | 7.1%     | 8.2%        |          |             |
| Black                            | 13.0%    | 5.3%        | 7.3%     | 4.3%        | 17.9%    | 8.0%        |          |             |
| Hispanic                         | 13.3%    | 8.7%        | 12.4%    | 8.9%        | 14.0%    | 8.3%        |          |             |
| Native/Other                     | 4.3%     | 5.3%        | 4.1%     | 4.6%        | 4.6%     | 7.2%        |          |             |

| Sample size (unweighted)        | 1,166    | 728         | 596      | 582         | 570      | 146         |          |             |

Notes: Calculations based on 2011-12 freshmen from NPSAS; \(^a\)public research-extensive, 2000 Carnegie; \(^b\)public research-extensive in tiers 1 & 2 of USNWR 2000 National University Rankings; \(^c\)public research-extensive in tiers 3 & 4 of USNWR Rankings; \(^d\)2012 CPI; \(^e\)ACT converted to SAT scale
Enrollment management goals associated with nonres

- Academic profile; tuition revenue

Behaviors associated with these enrollment goals

- Recruiting in affluent communities
- Emphasizing standardized test scores
- Shift towards “merit” aid
- Expenditure on “consumption amenities,” e.g.:
  - Luxury dorms and facilities; “big time” athletics

Alternative explanation:

- Use revenue from nonres to subsidize access mission (e.g., “no loan” policies)
Hypotheses

Relationship between nonres enrollment and racial/socioeconomic composition

**H1:** Growth in % of nonresident students is associated with a decline in % low-income students

- Predict stronger relationship at prestigious universities
- Predict stronger relationship in high-poverty states

**H2:** Growth in % nonresident students is associated with a decline in % underrepresented minority students (URM)

- Stronger relationship at prestigious universities
- Stronger relationship in states with higher percent URM
- Stronger relationship in states with affirmative action bans
Data, sample, variables

Data
- Organization-level data from IPEDS
- State-level data from various sources (e.g., Census, BLS)

Sample (N=105)
- Public research-extensive (2000 Carnegie)

Analysis period
- 2002–03 to 2012–13 academic years

Measures
- $X_{it}$: % full-time freshman paying nonres tuition
- $Y_{it}$: % full-time freshman receiving federal grant aid
- $Y_{it}$: % full-time freshman who identify as Black, Hispanic, Native American or Alaskan Native, or multi-racial
Model results
Relationship between percent nonresident (X) and student composition (Y)

Dependent variable = % full-time freshman receiving Pell
- Increase in % nonres associated with decline in % Pell
- Relationship stronger at prestigious universities

Dependent variable = % full-time freshman who are URM
- Increase in % nonres associated with decline in % URM
- Relationship stronger at prestigious universities
- Relationship stronger affirmative action ban states

Ongoing research
- Does increasing the number of nonresident students “crowd-out” the number of resident students?
Research significance, contributions

Media coverage

Institutional practice

State policy
Future research: Using “data science” to study marketing and recruiting
Future research
Using “data science” to study marketing and recruiting

Marketing and recruiting
- Marketing and recruiting are central components of enrollment management
- Scholarly research on EM focuses on financial aid leveraging

How committed are public universities to access?
- Real effort or public relations effort?

Problem
- Researchers don’t have data on university recruiting efforts
Future research
Using “data science” to study marketing and recruiting

Enrollment management at the University of Alabama

<table>
<thead>
<tr>
<th>Year</th>
<th>Freshman enroll</th>
<th>Revenue ($ mil)</th>
<th>Select expenditures ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resident</td>
<td>Nonres</td>
<td>Pct Pell</td>
</tr>
<tr>
<td>2002-03</td>
<td>2,028</td>
<td>626</td>
<td>17.9</td>
</tr>
<tr>
<td>2003-04</td>
<td>2,278</td>
<td>799</td>
<td>18.0</td>
</tr>
<tr>
<td>2004-05</td>
<td>2,441</td>
<td>926</td>
<td>23.6</td>
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<tr>
<td>2005-06</td>
<td>2,592</td>
<td>1,143</td>
<td>15.9</td>
</tr>
<tr>
<td>2006-07</td>
<td>2,898</td>
<td>1,480</td>
<td>13.9</td>
</tr>
<tr>
<td>2007-08</td>
<td>3,040</td>
<td>1,498</td>
<td>12.9</td>
</tr>
<tr>
<td>2008-09</td>
<td>3,221</td>
<td>1,895</td>
<td>14.2</td>
</tr>
<tr>
<td>2009-10</td>
<td>3,103</td>
<td>2,013</td>
<td>19.3</td>
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<tr>
<td>2010-11</td>
<td>3,121</td>
<td>2,398</td>
<td>21.2</td>
</tr>
<tr>
<td>2011-12</td>
<td>2,825</td>
<td>2,903</td>
<td>19.9</td>
</tr>
<tr>
<td>2012-13</td>
<td>2,846</td>
<td>3,525</td>
<td>19.7</td>
</tr>
<tr>
<td>2013-14</td>
<td>2,578</td>
<td>3,876</td>
<td>18.1</td>
</tr>
<tr>
<td>2014-15</td>
<td>2,462</td>
<td>4,362</td>
<td></td>
</tr>
</tbody>
</table>

Author calculations. 2014 CPI. Expenditure data from University of Alabama. Enrollment and revenue data from IPEDS. Enrollment by residency based on total freshman headcount. Pct Pell based on full-time freshman headcount.
"Data science" revolution

- Growing volume and variety of data (e.g., websites, social media, Google search histories, transactions)
- Integrate diverse data sources to solve a problem

Biggest application of data science is marketing

- How can I get you to buy these shoes?
- In higher education, growth in EM/marketing firms

"The Chegg Cloud reaches over 1.5 million visitors each month, including popular sites like:

- Chegg Admissions
- Chegg Cloud
- NICHE
- U.S. News
- YouVersionTV

"The Chegg Cloud reaches 8/10 students researching schools online."
Future research
Mining social media to understand where regional recruiters recruit

@Bama_Southwest

Derek Faasse @BAMA_Southwest · 4 Dec 2015
Heading to @PBhighschool today to talk with students about academics and scholarships at The University of Alabama! #UA20 #BAMABOUND

Derek Faasse @BAMA_Southwest · 2 Dec 2015
I’m at @GilbertHSTigers now to talk about opportunities at Alabama! @GHSCOUNSELING #BamaBound #UA20

@UA_Houston

UA_Houston @UA_Houston · 15 Oct 2015
Check out Big AI and talk all things UA at Pearland High School College Fair! #heybigal #bamabound
Future research
How do universities interact with prospective students on social media

@UA_Admissions

UA Admissions @UA_Admissions · 17 Dec 2015
Roll Tide Shelby!

Shelby Brodie @Shelby_Brodie
Next fall can't come soon enough 🐘❤️ #RollTide 𝚃𝚎𝚗𝚜𝚎
#UA20

UA Admissions @UA_Admissions · 17 Dec 2015
Congrats on the Honors College, Lily!

Lily Stadler @lilstadler22
Accepted to the University of Alabama Honors College and got a cute holiday card 🐘❤️ roll tide!!!!!!
Appendix
Creating the out-of-state university
Do public universities increase nonresident freshman enrollment in response to declining state appropriations?

Freshman migration data available every other year
Net tuition revenue excludes student grant aid from external sources (e.g., Pell)
Entrepreneurial responses to declining state support
- Research commercialization; donations and endowment
- But tuition is largest source of revenue growth

Research on nonresident students
- Focuses on demand side, less on supply side
  - But state funding cuts make nonres attractive to orgs
- Rizzo and Ehrenberg (2004): No relationship between state funding and ratio of nonresident to resident
  - Analysis period of 1979-1998
Conceptual framework
Resource dependence theory (Pfeffer & Salancik)

Basic assumptions

- Survival depends on resources from external environment
- Orgs can be controlled by important resource providers

Menu of strategies to manage reliance on declining resource

- Compliance
  - Acquiesce, show value to resource provider
- Resource diversification
  - Reduce reliance on uncertain resource
  - Change in mission, towards demands of new providers

Incentive to increase nonres after prolonged state cuts

- **H1**: state appropriations have a negative relationship with nonresident freshman enrollment
Conceptual framework continued

Actualizing desire for nonresidents depends on student demand

Nonresident students attracted to “high quality,” public research universities (e.g., Zhang, 2007)

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H2: Negative relationship between state appropriations and nonresident freshman enrollment is stronger at research universities than at masters and bachelors universities
Empirical model

What is the relationship between state appropriations and nonresident freshman enrollment?

Linear panel model

\[ Y_{it} = \beta X_{i,t-1} + W_{i,t-1}' \gamma + \delta_t + \alpha_i + \epsilon_{i,t} \]

- \( Y_{it} \) is nonresident freshman enrollment
- \( X_{i,t-1} \) is revenue from state appropriations
- \( W_{i,t-1} \) is institution- and state-level covariates
- \( \delta_t \) institution fixed effects
- \( \alpha_i \) year fixed effects
- \( \epsilon_{i,t} \) unit-varying, time-varying error

Assumptions

- Random effects assumption
  - Relax using fixed-effects (within) estimator
- Strict exogeneity assumption
  - Time-varying covariates
Data and sample

Data
- Organization-level data from IPEDS
- State-level data from various sources (e.g., Census, BLS)

Sample
- 440 public 4-year institutions, defined by 2000 Carnegie

Analysis period
- 2002–03 to 2012–13 academic years

Variables (logged)
- $Y_{it}$, nonresident freshman enrollment, from IPEDS fall migration
- $X_{i,t-1}$, state appropriations, from IPEDS Finance
Assumptions for time lags [SKIP]
Use example of 2011-12 state appropriations

Assume institutions know 2011-12 state approps by June 2011

- Too late for institutions to increase 2011-12 nonresident freshman enrollment
- Increase recruitment of 2011-12 out-of-state high school seniors in late-search and choice stages
- Leads to increase in 2012-13 nonresident freshman enrollment

Therefore, we apply one-year lag to state appropriations
Include covariates that plausibly satisfy both conditions:

1. Affect on nonresident freshman enrollment, $Y_{it}$, and
2. Conditionally correlated with state appropriations, $X_{i,t-1}$

Nonresident enrollment demand

- Institutional quality; expenditure by category; tuition price; grant aid; state economy

Institutional supply (willingness to enroll nonres)

- State need and merit aid funding; state population by age and race; state politics; enrollment size
## Results

State appropriations and nonresident freshman enrollment

\[ Y = \text{logged nonresident freshman enrollment (IPEDS Fall Enrollment)} \]

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State appropriations (logged, lagged)</td>
<td>-0.274***</td>
<td>-0.456***</td>
<td>-0.499***</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
<td>(0.145)</td>
<td>(0.166)</td>
</tr>
<tr>
<td>Reference: research (extensive/intensive)</td>
<td></td>
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<tr>
<td>State approps X MA/BA</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>0.250*</td>
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<td></td>
<td>(0.146)</td>
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<tr>
<td>Reference: research-extensive</td>
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<td></td>
<td>(0.146)</td>
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<tr>
<td>State approps X MA</td>
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<td>0.291*</td>
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<td></td>
<td>(0.173)</td>
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<tr>
<td>State approps X BA</td>
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<td></td>
<td>0.301</td>
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<td></td>
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<tr>
<td></td>
<td>(0.222)</td>
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<tr>
<td>Observations</td>
<td>4,429</td>
<td>4,429</td>
<td>4,429</td>
</tr>
<tr>
<td>R-squared (within)</td>
<td>0.121</td>
<td>0.124</td>
<td>0.124</td>
</tr>
<tr>
<td>Number of institutions</td>
<td>440</td>
<td>440</td>
<td>440</td>
</tr>
</tbody>
</table>

Cluster-robust (state-level) standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
## Results

State appropriations and resident freshman enrollment

\[ Y = \text{logged nonresident freshman enrollment (IPEDS Fall Enrollment)} \]

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>State appropriations</td>
<td>0.019</td>
<td>0.045</td>
<td>0.039</td>
</tr>
<tr>
<td>(logged, lagged)</td>
<td>(0.025)</td>
<td>(0.049)</td>
<td>(0.054)</td>
</tr>
<tr>
<td>Reference: research</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(extensive/intensive)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State approps X MA/BA</td>
<td>-0.036</td>
<td></td>
<td></td>
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<td>(0.071)</td>
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<tr>
<td>State approps X</td>
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<td></td>
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<tr>
<td>research-intensive</td>
<td>0.017</td>
<td></td>
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<tr>
<td>(0.065)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>State approps X MA</td>
<td>-0.061</td>
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<tr>
<td>(0.075)</td>
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<td></td>
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<tr>
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<td>0.138</td>
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Observations 4,429 4,429 4,429
R-squared (within) 0.228 0.228 0.232
Number of institutions 440 440 440

Cluster-robust (state-level) standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Results robust to sensitivity analyses
State appropriations and nonresident freshman enrollment

- Only model years when fall migration survey mandatory
- Alternative dependent var (IPEDS Student Financial Aid)
- State appropriations lagged two years instead of one
- Inclusion of revenue covariates
Significance

Scholarship on “privatization”

- Resource dependence theory says orgs change mission when resource providers change
  - When state approps decline, public universities focus on attracting paying customers
- “Mathew effect”: only research universities have strong nonres demand

Racial and socioeconomic composition

- Racial and socioeconomic isolation leads to bad outcomes
- Is growth in share of nonres freshmen associated with declining share of low-income and underrepresented minority students?
### Tuition rich, mission poor

Nonresident freshman enrollment growth and the socioeconomic and racial composition of public research universities

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<td><strong>High school academic</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SAT score&lt;sup&gt;e&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA 0.5-3.4 (D- to A-)</td>
<td>44%</td>
<td>44%</td>
<td>33%</td>
</tr>
<tr>
<td>GPA 3.5-4.0 (A- to A)</td>
<td>56%</td>
<td>56%</td>
<td>67%</td>
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<tr>
<td><strong>Socioeconomic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income ($ thousands)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>91</td>
<td>116</td>
<td>101</td>
</tr>
<tr>
<td>Percent Pell</td>
<td>37.6%</td>
<td>14.2%</td>
<td>33.1%</td>
</tr>
<tr>
<td>Parents have BA</td>
<td>56.5%</td>
<td>76.1%</td>
<td>66.2%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>61.4%</td>
<td>65.4%</td>
<td>67.3%</td>
</tr>
<tr>
<td>Asian</td>
<td>7.9%</td>
<td>15.3%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Black</td>
<td>13.0%</td>
<td>5.3%</td>
<td>7.3%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>13.3%</td>
<td>8.7%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Native/Other</td>
<td>4.3%</td>
<td>5.3%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Sample size (unweighted)</td>
<td>1,166</td>
<td>728</td>
<td>596</td>
</tr>
</tbody>
</table>

Notes: Calculations based on 2011-12 freshmen from NPSAS; <sup>a</sup>public research-extensive, 2000 Carnegie; <sup>b</sup>public research-extensive in tiers 1 & 2 of USNWR 2000 National University Rankings; <sup>c</sup>public research-extensive in tiers 3 & 4 of USNWR Rankings; <sup>d</sup>2012 CPI; <sup>d</sup>ACT converted to SAT scale
Conceptual framework
Relationship between nonres enrollment and racial/socioeconomic composition

Rationale actor theory
- Actors have idiosyncratic preferences; allocate scarce resources to maximize utility

Iron triangle of enrollment management
- Access; academic profile; and tuition revenue
- Goal commitment depends on mission and resources
- Synergies and trade-offs between goals
Conceptual framework
Relationship between nonres enrollment and racial/socioeconomic composition

Enrollment management goals associated with nonres
- Academic profile; tuition revenue

Behaviors associated with these enrollment goals
- Recruiting in affluent communities
- Emphasizing standardized test scores
- Shift towards “merit” aid
- Expenditure on “consumption amenities,” e.g.:
  - Luxury dorms and facilities; “big time” athletics

Alternative explanation:
- Use revenue from nonres to subsidize access mission (e.g., “no loan” policies)
Hypotheses

Relationship between nonres enrollment and racial/socioeconomic composition

**H1**: Growth in % of nonresident students is associated with a decline in % low-income students
- Predict stronger relationship at prestigious universities
- Predict stronger relationship in high-poverty states

**H2**: Growth in % nonresident students is associated with a decline in % underrepresented minority students (URM)
- Stronger relationship at prestigious universities
- Stronger relationship in states with higher percent URM
- Stronger relationship in states with affirmative action bans
Methods
Linear panel model

\[ Y_{it} = \beta X_{i,t-1} + W_{i,t-1}' \gamma + \delta_t + \alpha_i + \epsilon_{i,t} \]

- \( Y_{it} \) is proportion low-income (or URM)
- \( X_{i,t-1} \) is proportion nonresident freshman
- \( W_{i,t-1} \) state-level covariates
- \( \delta_t \) institution fixed effects; \( \alpha_i \) year fixed effects
- \( \epsilon_{i,t} \) unit-varying, time-varying error

Estimate causal or correlational relationship?

- Relationship between % nonres and % low-income/URM, allowing enrollment management behaviors to vary
- Control for state-level, not institution-level covariates
Data
- Organization-level data from IPEDS
- State-level data from various sources (e.g., Census, BLS)

Sample (N=105)
- Public research-extensive (2000 Carnegie)

Analysis period
- 2002–03 to 2012–13 academic years

Measures
- \( X_{it} \): % full-time freshman paying nonres tuition
- \( Y_{it} \): % full-time freshman receiving federal grant aid
- \( Y_{it} \): % full-time freshman who identify as Black, Hispanic, Native American or Alaskan Native, or multi-racial
Descriptive statistics
Composition of full-time freshmen, 2002-03 to 2012-13

Note: See Jaquette, Curs, and Posselt (forthcoming) for details on analysis sample
**Modeling**

**Relationship between percent nonresident and percent low-income enrollment**

<table>
<thead>
<tr>
<th>Y = Percentage of federal grant recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full sample</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Panel A: Base model</td>
</tr>
<tr>
<td>Percentage of nonresident students</td>
</tr>
<tr>
<td>(0.0722)</td>
</tr>
<tr>
<td>R-squared (within)</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>Number of institutions</td>
</tr>
<tr>
<td>Panel B: State poverty rate as moderator</td>
</tr>
<tr>
<td>Percentage of nonresident students</td>
</tr>
<tr>
<td>(0.125)</td>
</tr>
<tr>
<td>Pct nonres X pct state poverty</td>
</tr>
<tr>
<td>(0.0085)</td>
</tr>
<tr>
<td>R-squared (within)</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>Number of institutions</td>
</tr>
</tbody>
</table>

Cluster-robust (institution-level) standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
### Relationship between pct nonresident and pct URM

**Y=** Percent of fulltime freshmen who are underrepresented minority (URM)

<table>
<thead>
<tr>
<th>Panel</th>
<th>Base model</th>
<th>State affirmative action ban as moderator</th>
<th>State percent URM as moderator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Full sample</td>
<td>USNWR 1&amp;2</td>
</tr>
<tr>
<td>Percentage of nonresident students</td>
<td>-0.0815*</td>
<td>-0.115*</td>
<td>-0.0181</td>
</tr>
<tr>
<td></td>
<td>(0.0431)</td>
<td>(0.0639)</td>
<td>(0.0464)</td>
</tr>
<tr>
<td>R-squared (within)</td>
<td>0.625</td>
<td>0.750</td>
<td>0.613</td>
</tr>
<tr>
<td>Observations</td>
<td>1,033</td>
<td>522</td>
<td>511</td>
</tr>
<tr>
<td>Number of institutions</td>
<td>105</td>
<td>52</td>
<td>53</td>
</tr>
<tr>
<td>Pct nonres X State affirmative action ban</td>
<td>-0.181***</td>
<td>-0.231***</td>
<td>-0.00018</td>
</tr>
<tr>
<td></td>
<td>(0.0675)</td>
<td>(0.0787)</td>
<td>(0.218)</td>
</tr>
</tbody>
</table>

Cluster-robust (institution-level) standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Results robust to sensitivity analyses

- Inclusion of institution-level controls
- Include observations with nonzero “unknown residency”
- Exclude years with new race/ethnicity definitions from analysis sample
Significance

Research significance, contributions
- Media coverage
- Institutional practice
- State policy

Ongoing research
- Do nonresident students crowd-out resident students

Student research
- Public university admissions preferences for res vs. nonres
- Do nonresident students receive more institutional aid than residents?
- Does revenue from nonresident students lower net price for resident students?
Underrepresented minority (URM) as percent of freshman headcount
2010-11 to 2014-15

Institution-level URM measure includes Black, Hispanic, Native American, Alaskan Native, multi-racial
National population URM measure includes Black, Hispanic, Native American, Alaskan Native
Use 2000 Carnegie to classify public and private non-profit