Impact of Carnegie's Community Engagement Classification: A Synthetic Control Approach

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Overview

I. Purpose of the study
II. Conceptual and theoretical frameworks
III. Relevant literature
IV. Methods
V. Findings
VI. Discussion and implications
Purpose of the Study

• Examine the impact of the Carnegie Community Engagement classification on a sample of the first cohort of institutions to receive the designation
The Carnegie Foundation’s Community Engagement Classification

• Original classification system designed to assist higher education researchers

• Tendency to use Carnegie classification as a ranking system led to efforts to “fill some gaps in the national data” (McCormick & Zhao, 2005)

• Elective classification system was established to more fully describe the work on institutions
The Carnegie Foundation’s Community Engagement Classification

- First cohort of Community Engagement classified institutions awarded in 2006
  - Originally could be classified as Curricular Engagement, Outreach and Partnerships, or both
- Subsequent classifications were awarded in 2008 and 2010
- Currently 300+ institutions are classified
- Next (re)classification will be in 2015
Conceptual and Theoretical Frameworks

• Scholarship of Engagement
• Signaling Theory
• Prestige Maximization
The Scholarship of Engagement

• Boyer’s model of scholarship (1990, 1996)
• “Connecting the rich resources of the university to our most pressing social, civic, and ethical problems…”
• “Collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity” (Carnegie Foundation)
Signaling Theory (Spence, 1974)

- Explains how individuals and organizations behave in markets with asymmetrical information
- Transmitting information through signals
- Organizations are aware of the quality, but consumers are not, thus necessitating the need to send signals of quality
Prestige Maximization

• Higher education institutions are more complex than businesses – the “awkward economics of higher education (Winston, 1999)

• Institutions operate in a market-like environment, but seek to maximize prestige rather than profit (Bowen, 1981; Brenneman, 1970; Garvin, 1980; James, 1990)

• “Prestige game” in higher education is an attempt to “maintain or enhance institutional status, reputation, and prestige” (Conrad & Eagan, 1989)
Relevant Literature

• Issue of *New Directions for Higher Education* dedicated to the first wave of Carnegie Community Engagement classified institutions (Sandmann, Jaeger, Thornton, 2009)

• Examined application forms of participating institutions to learn about:
  
  o Leadership, rewarding engagement, service-learning, partnerships, advancement, assessment, etc.
Relevant Literature

- Adoption of engagement in higher education
- Institutional characteristics and control
- External evaluation
- Tenure and promotion policies
- Recommendations for future research
  - Including the need for longitudinal assessments that measure progress

(Saltmarsh et al., 2009; Ward et al., 2013; Weerts & Sandmann, 2008)
Research Question

- For public, land-grant institutions that received the full Carnegie Community Engagement classification in 2006, what has the institutional impact been since receiving the designation?
  - Specifically, we examine the institutional measures of (1) state appropriations, and (2) federal appropriations, grants, and contracts.
Methods

- Data Sources
- Sample
- Variables
- Synthetic Control Method
Data Sources

• Integrated Postsecondary Education Data System (IPEDS)
• Delta Cost Project
• WebCASPAR
Sample

• Land-grant universities (1862)
  o 5 received Community Engagement classification in 2006
    • Michigan State, University of Minnesota, NC State, University of Vermont, VA Tech
  o These were compared against a synthetically-derived counterfactual from non-treated land-grant institutions
  o Some institutions removed due to partial classification, having received the 2008 designation, institutional control, or incomplete data
  o 58 institutions $\rightarrow$ 37 institutions
Dependent Variables

• State appropriations
• Federal appropriations, grants, and contracts (less Pell grants)
State Appropriations

• From signaling theory:
  o What effect does earning the Community Engagement classification (the signal) have on state appropriations for land-grant institutions?
Federal Appropriations, Grants, and Contracts

• From prestige maximization:
  o Prestige is often tied to research productivity and the traditional idea of scholarship. What is the impact of receiving the Carnegie Community Engagement classification on a traditional indicator of prestige (federal appropriations, grants, and contracts)?
Control Variables

- Total Enrollment (1996-2010)
- Total Institutional Expenditures (1996-2010)
- Percentage of Institution’s Expenditures – Instruction, Research, Public Services, Support Services (Student, Academic, Institutional) (1996-2010)
- Total Certificates/Degrees (1996-2010)
- Percentage of Certificates/Degrees above Bachelor’s level (1996-2010)
- Invest return (1996-2010)
- Undergraduate tuition and fees (1996-2010)
- Full-time instructional faculty, equated 9-month contract (2001-2010)
- In-state residency of high school graduates (1996-2010, every 2 years)
Policy Evaluation in Statistics

• Quasi-experimental
  o We can’t relive the past
  o Difficulties in randomization

• But we’re interested in the effects of policies and interventions
  o Leverage what data we have to make assumptions about our sample
Current Methods

• Difference-in-difference estimator
  o Examine pre- and post-treatment outcomes
  o Critical to select the right case for control
    • Otherwise you end up with biased estimates. How do you define how one institution is similar to another?
  o This assumes that the treatment is linear
  o Extremely useful technique, but requires great care
    • Involves subjectivity on the part of the researcher
Difference-in-Difference Example

- Treatment group
- Control group
- Effect of the treatment
Addressing these issues

• How do we select an appropriate control group?
• How do we best use the available data?
• How do we adjust for heterogeneity over time, and for unobservables?

• We present a new way of examining these estimators
Synthetic Control Method

• Non-parametric form of the difference-in-difference approach
  o Graphically-based, not based on traditional idea of statistical significance

• Data-driven approach to selecting control groups

• Allows for heterogeneity across time and institutions
Mechanics

• Uses data from “donor” institutions to create a single synthetic control group
• We scoop out the most relevant information to construct the synthetic control group
• This allows us to generate a non-treated version of our institution of interest
  o As if the institution never received the Community Engagement classification in 2006
• Minimizing your error, or loss of data
  o Converging to an optimal point
Benefits

- Removes arbitrary choice of control groups
- No extrapolation beyond the data
- Allows you to account for time and unobservables
- Sample size is not critical, because we are only looking at relevant statistical information
Considerations

• Computationally demanding
• Not without diagnostics
• Flexible
Hypothesis

• After receiving the designation, what do you expect the impact to be for the Carnegie classified institutions?
# Weights for the synthetic control

## State Appropriations

<table>
<thead>
<tr>
<th>Institution</th>
<th>W. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Arizona</td>
<td>0.041</td>
</tr>
<tr>
<td>University of California - Davis</td>
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</tr>
<tr>
<td>University of Delaware</td>
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</tr>
<tr>
<td>University of Florida</td>
<td>0.095</td>
</tr>
<tr>
<td>University of Georgia</td>
<td>0.173</td>
</tr>
<tr>
<td>University of Maryland - College Park</td>
<td>0.198</td>
</tr>
<tr>
<td>Texas A &amp; M University - College Station</td>
<td>0.075</td>
</tr>
<tr>
<td>West Virginia University</td>
<td>0.041</td>
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</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>V. Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Enrollment (＃)</td>
<td>0.024</td>
</tr>
<tr>
<td>Instruction (%)</td>
<td>0.027</td>
</tr>
<tr>
<td>Public Service (%)</td>
<td>0.354</td>
</tr>
<tr>
<td>Support Service (%)</td>
<td>0.177</td>
</tr>
<tr>
<td>Total Expenditures ($)</td>
<td>0.006</td>
</tr>
<tr>
<td>Total Degrees &amp; Cert. (%)</td>
<td>0.272</td>
</tr>
<tr>
<td>Investment Return ($)</td>
<td>0.140</td>
</tr>
<tr>
<td>In-State Student (＃)</td>
<td>0.001</td>
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</table>
### Synthetic vs. Sample Mean State Appropriations

<table>
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<tr>
<th>Variable</th>
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<th>Synthetic</th>
<th>Sample Mean</th>
</tr>
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<tbody>
<tr>
<td>Total Enrollment (#)</td>
<td>32575.95</td>
<td>31546.4</td>
<td>21250.871</td>
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<tr>
<td>Instruction (%)</td>
<td>0.265</td>
<td>0.263</td>
<td>0.265</td>
</tr>
<tr>
<td>Research (%)</td>
<td>0.179</td>
<td>0.205</td>
<td>0.212</td>
</tr>
<tr>
<td>Public Service (%)</td>
<td>0.068</td>
<td>0.068</td>
<td>0.072</td>
</tr>
<tr>
<td>Support Service (%)</td>
<td>0.155</td>
<td>0.155</td>
<td>0.167</td>
</tr>
<tr>
<td>Total Expenditures ($)</td>
<td>1592.737</td>
<td>1414.114</td>
<td>806.415</td>
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<tr>
<td>Graduate Completions (%)</td>
<td>0.319</td>
<td>0.258</td>
<td>0.257</td>
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<tr>
<td>Total Degrees &amp; Certificates (#)</td>
<td>7547.65</td>
<td>7575.674</td>
<td>4780.984</td>
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<tr>
<td>In-State Undergraduate Tuition &amp; Fees ($)</td>
<td>6787.829</td>
<td>5496.675</td>
<td>4876.061</td>
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<tr>
<td>Investment Return ($)</td>
<td>20.346</td>
<td>20.409</td>
<td>10.608</td>
</tr>
<tr>
<td>In-State Student (#)</td>
<td>0.717</td>
<td>0.766</td>
<td>0.778</td>
</tr>
<tr>
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<td>1465.600</td>
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## Weights for the synthetic control

### Federal Appropriations, Grants, and Contracts

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<td>0.055</td>
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<tr>
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Findings:
State Appropriations – Path Plot
Findings:
State Appropriations – Gap Plot

[Graph showing state appropriations over time with a significant gap between 2006 and 2008]
Findings:
Federal Grants and Contracts – Path Plot
Findings:
Federal Grants and Contracts – Gap Plot
Placebo Test

• How do we know whether our results are not driven by chance?

• How often would we obtain these results if we randomly selected an institution for testing rather than the treated aggregate? (Abadie, Diamond, & Hainmueller, 2010)
Placebo test mechanics

- A series of placebo studies is conducted by iteratively applying the synthetic control method to every other institution in the donor pool.
- In each iteration we reassign the intervention and shift the treated institutions to the donor pool. That is, we proceed as if one of the institutions in the donor pool would have received the classification instead of our treatment group. We then compute the estimated effect associated with each placebo run.
- If the gap plots of the placebo tests mirror the gap plots of our original test, then something else is at play, and the effect may be due to other factors. (Abadie et al., 2010)
Placebo test results
State appropriations

![Graph showing state appropriations over years.](image-url)
Placebo test results
Federal grants, contracts, and appropriations
Discussion and Implications

• Are you surprised by the results?

• Two primary areas of impact
  1. Methodological
  2. Community Engagement
Impact: Synthetic Control Method

• First application of the synthetic control method in higher education
• A new way to examine the impact of interventions
  o Without the ability to provide a true counterfactual, synthetic control method creates one
• Critical to know how policies are impacting institutions
• Data-driven process, we are letting the data speak
• Once completed, code will be annotated and open-source
Impact: Community Engagement

• What could account for the findings?
  o Did non-classified institutions seek other strategies that were more attractive to decision makers?
  o Is diversifying the products of the university weakening those products?
  o Which actors are defining the institution’s identity? What products lead to the most utility?
  o In this cohort, what is the risk of early adoption?
  o Do these results signal a new emerging market for prestige?
What does this mean for the 2015 Community Engagement Classification?

• The goal of the Community Engagement classification is to celebrate engagement in higher education
  - Institutions (as a whole) will not emphasize engagement unless it increases prestige
• Carnegie’s support helps to legitimize community engagement
2015 Community Engagement Classification

• Opportunity for first-time classification
• Those designated in 2006 or 2008 must re-apply for classification
  o Institutions designated in 2010 re-apply in 2020
• Important dates:
  o April 15, 2014: Applications due/reviewing begins
  o December 2014: Campuses are notified
  o January 2015: Official announcement of designees
Discussion Questions

• What impact do you think receiving the Carnegie Community classification has had on your campus?
• For those who applied for the designation, what impact did you hope to see?
• What areas would you be interested in seeing put into a synthetic control model?
• Will it last? (Holland, 2009)
Other Questions?

For more information:
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