

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:
 - 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)
 - 5 received Community Engagement classification in 2006
 - Michigan State, University of Minnesota, NC State, University of Vermont, VA Tech
 - These were compared against a synthetically-derived counterfactual from non-treated land-grant institutions
 - Some institutions removed due to partial classification, having received the 2008 designation, institutional control, or incomplete data
 - 58 institutions → 37 institutions

Dependent Variables

- State appropriations
- Federal appropriations, grants, and contracts (less Pell grants)

State Appropriations

- From signaling theory:
 - 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:
 - 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)

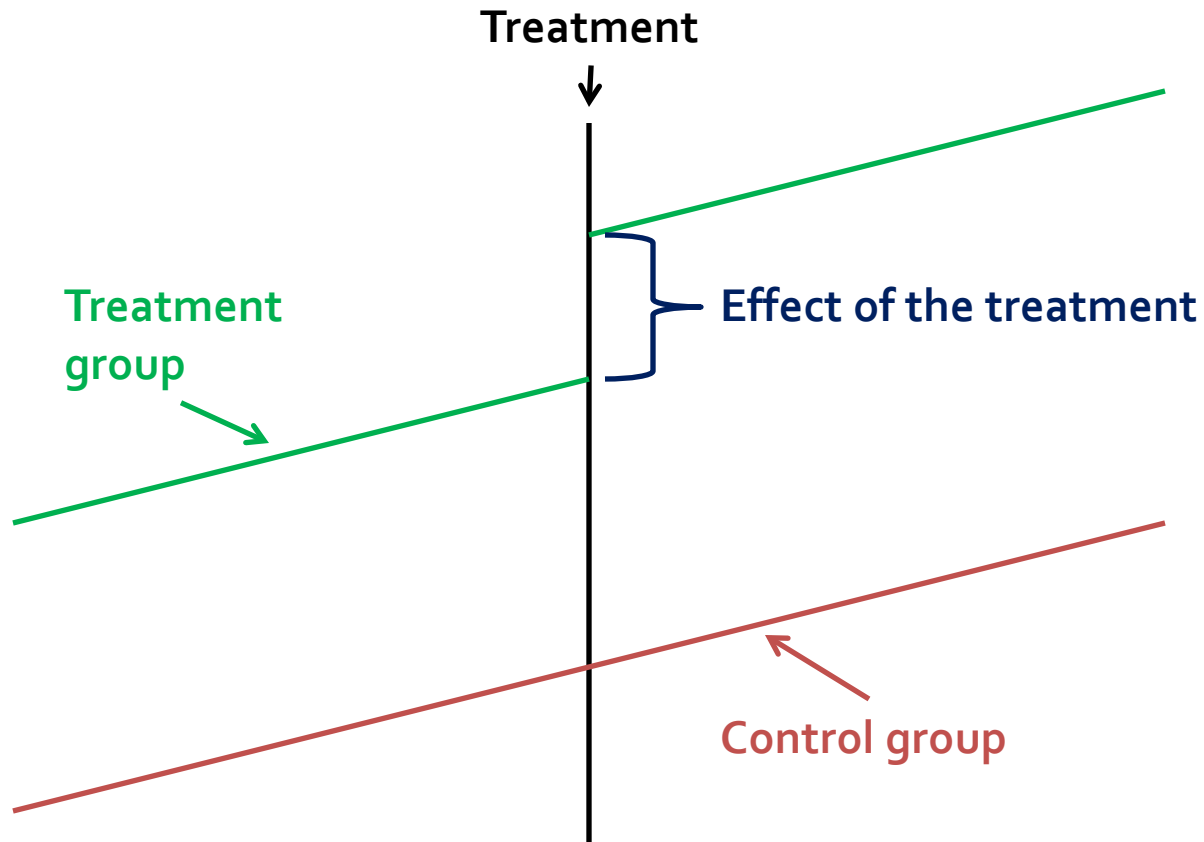
Policy Evaluation in Statistics

- Quasi-experimental
 - We can't relive the past
 - Difficulties in randomization
- But we're interested in the effects of policies and interventions
 - Leverage what data we have to make assumptions about our sample

Current Methods

- Difference-in-difference estimator
 - Examine pre- and post-treatment outcomes
 - 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?
 - This assumes that the treatment is linear
 - Extremely useful technique, but requires great care
 - Involves subjectivity on the part of the researcher

Difference-in-Difference Example



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
 - 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
 - As if the institution never received the Community Engagement classification in 2006
- Minimizing your error, or loss of data
 - 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

Institution	W. Weight	Variable	V. Weights
University of Arizona	0.041	Total Enrollment (#)	0.024
University of California - Davis	0.246	Instruction (%)	0.027
University of Delaware	0.131	Public Service (%)	0.354
University of Florida	0.095	Support Service (%)	0.177
University of Georgia	0.173	Total Expenditures (\$)	0.006
University of Maryland - College Park	0.198	Total Degrees & Cert. (%)	0.272
Texas A & M University - College Station	0.075	Investment Return (\$)	0.140
West Virginia University	0.041	In-State Student (#)	0.001

Synthetic vs. Sample Mean State Appropriations

Variable	Treated	Synthetic	Sample Mean
Total Enrollment (#)	32575.95	31546.4	21250.871
Instruction (%)	0.265	0.263	0.265
Research (%)	0.179	0.205	0.212
Public Service (%)	0.068	0.068	0.072
Support Service (%)	0.155	0.155	0.167
Total Expenditures (\$)	1592.737	1414.114	806.415
Graduate Completions (%)	0.319	0.258	0.257
Total Degrees & Certificates (#)	7547.65	7575.674	4780.984
In-State Undergraduate Tuition & Fees (\$)	6787.829	5496.675	4876.061
Investment Return (\$)	20.346	20.409	10.608
In-State Student (#)	0.717	0.766	0.778
Full-Time Instructional Faculty (#)	1465.600	1467.039	965.535

Weights for the synthetic control Federal Appropriations, Grants, and Contracts

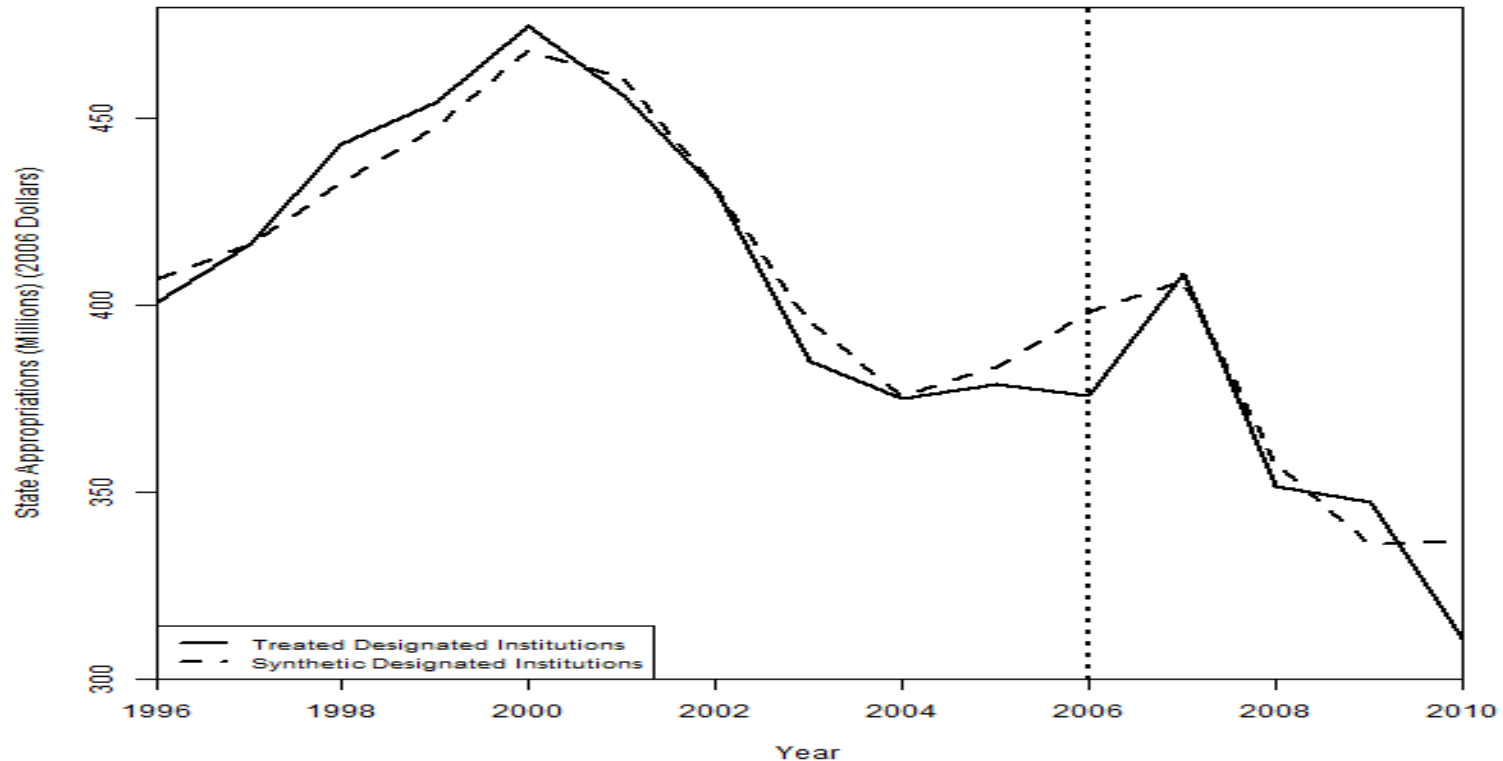
Institution	W. Weights	Variable	V. Weights
University of California - Berkeley	0.269	Total Enrollment (#)	0.013
		Instruction (%)	0.002
University of California - Davis	0.262	Public Service (%)	0.228
		Support Service (%)	0.352
University of Connecticut	0.055	Total Expenditures (\$)	0.005
University of Maryland - College Park	0.306	Total Degrees & Cert (%)	0.120
		Investment Return (\$)	0.003
University of Tennessee - Knoxville	0.108	Full-Time Instructional Faculty (#)	0.276

Synthetic Mean vs. Sample Mean

Federal Appropriations, Grants, and Contracts

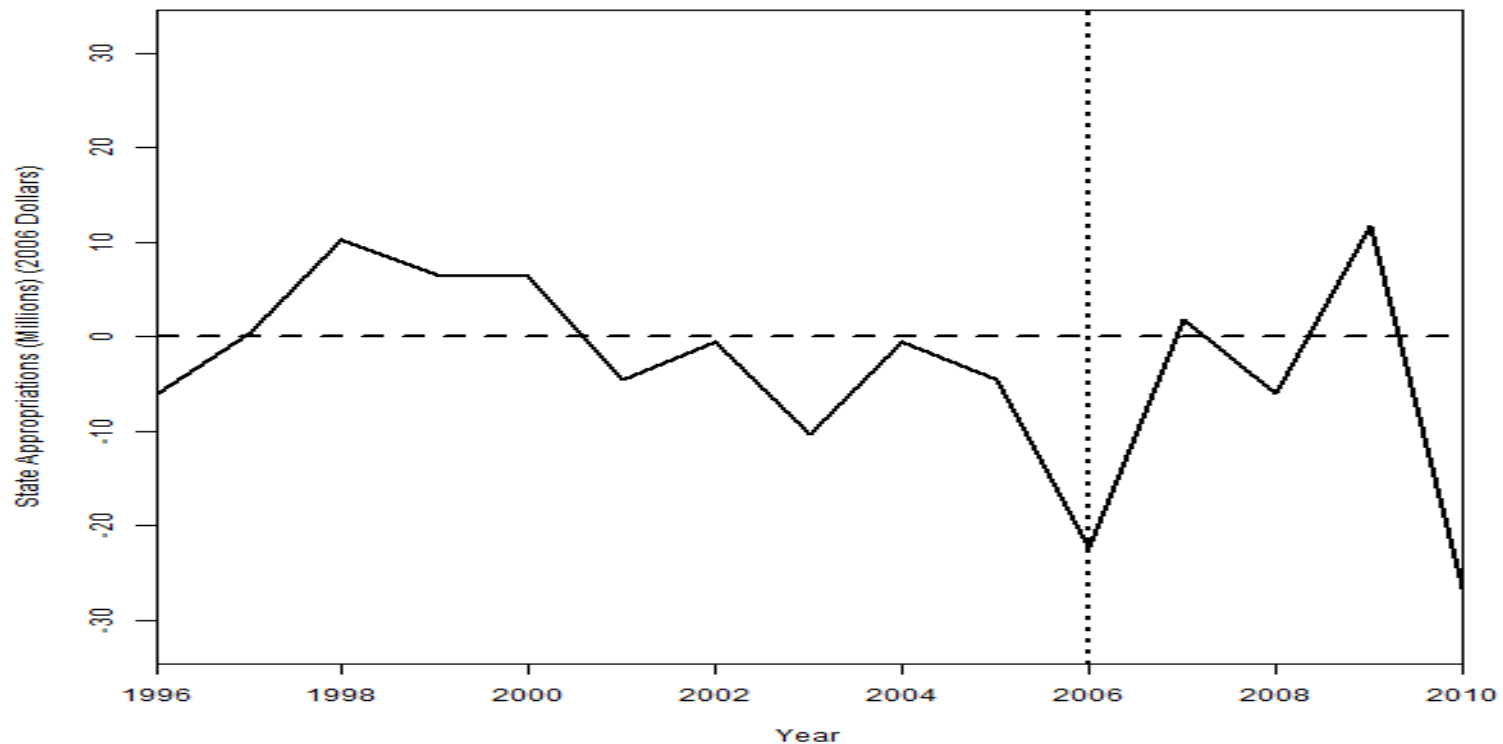
Variable	Treated	Synthetic	Sample Mean
Total Enrollment (#)	32575.95	30022.11	21250.871
Instruction (%)	0.265	0.255	0.265
Research (%)	0.179	0.204	0.212
Public Service (%)	0.068	0.046	0.072
Support Service (%)	0.155	0.165	0.167
Total Expenditures (\$)	1592.737	1563.12	806.415
Graduate Completions (%)	0.319	0.289	0.257
Total Degrees & Certificates (#)	7547.65	7730.82	4780.984
In-State Undergraduate Tuition & Fees (\$)	6787.829	6272.488	4876.061
Investment Return (\$)	20.346	19.109	10.608
In-State Student (#)	0.717	0.815	0.778
Full-Time Instructional Faculty (#)	1465.600	1446.371	965.535

Findings: State Appropriations – Path Plot

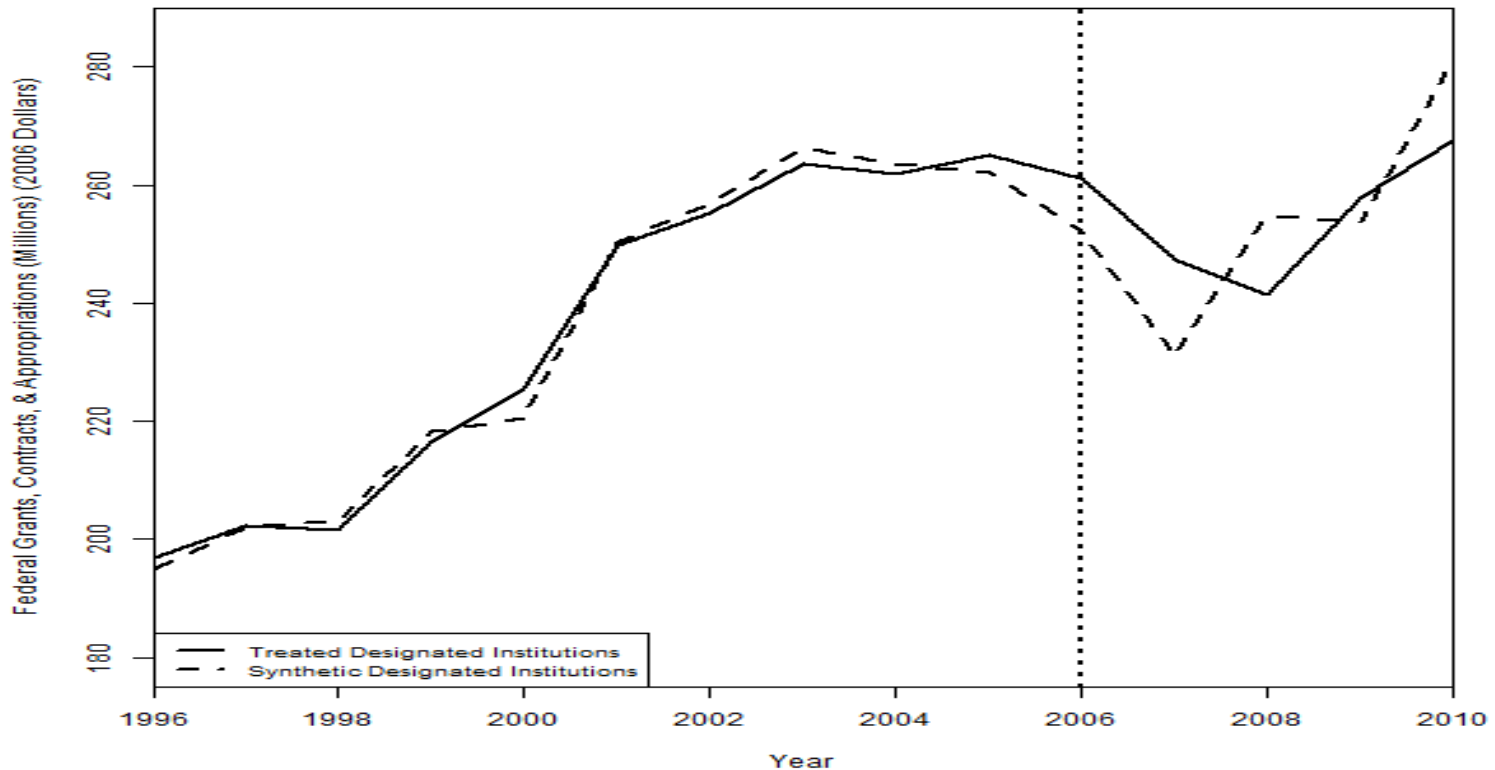




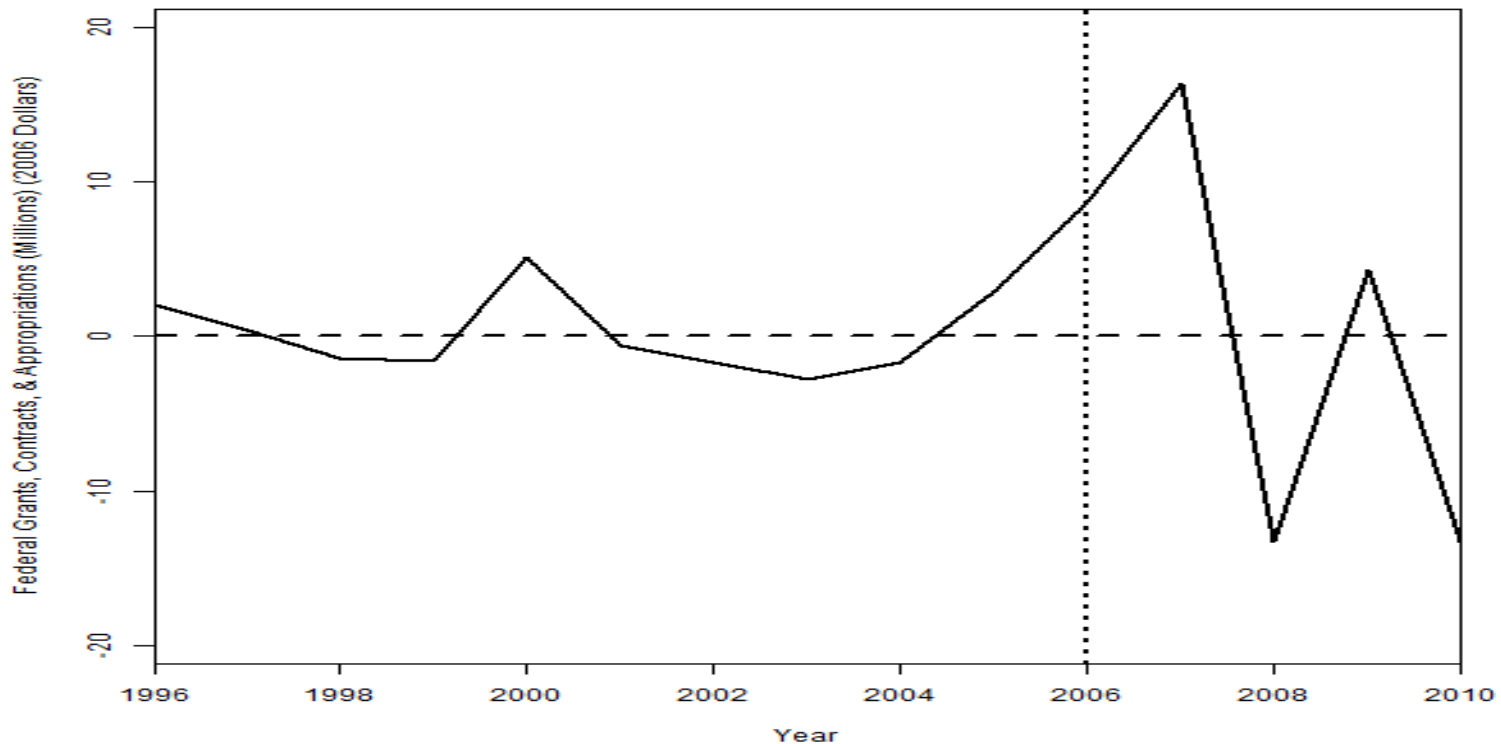
Findings: State Appropriations – Gap Plot



Findings: Federal Grants and Contracts – Path Plot



Findings: Federal Grants and Contracts – Gap Plot



Placebo Test

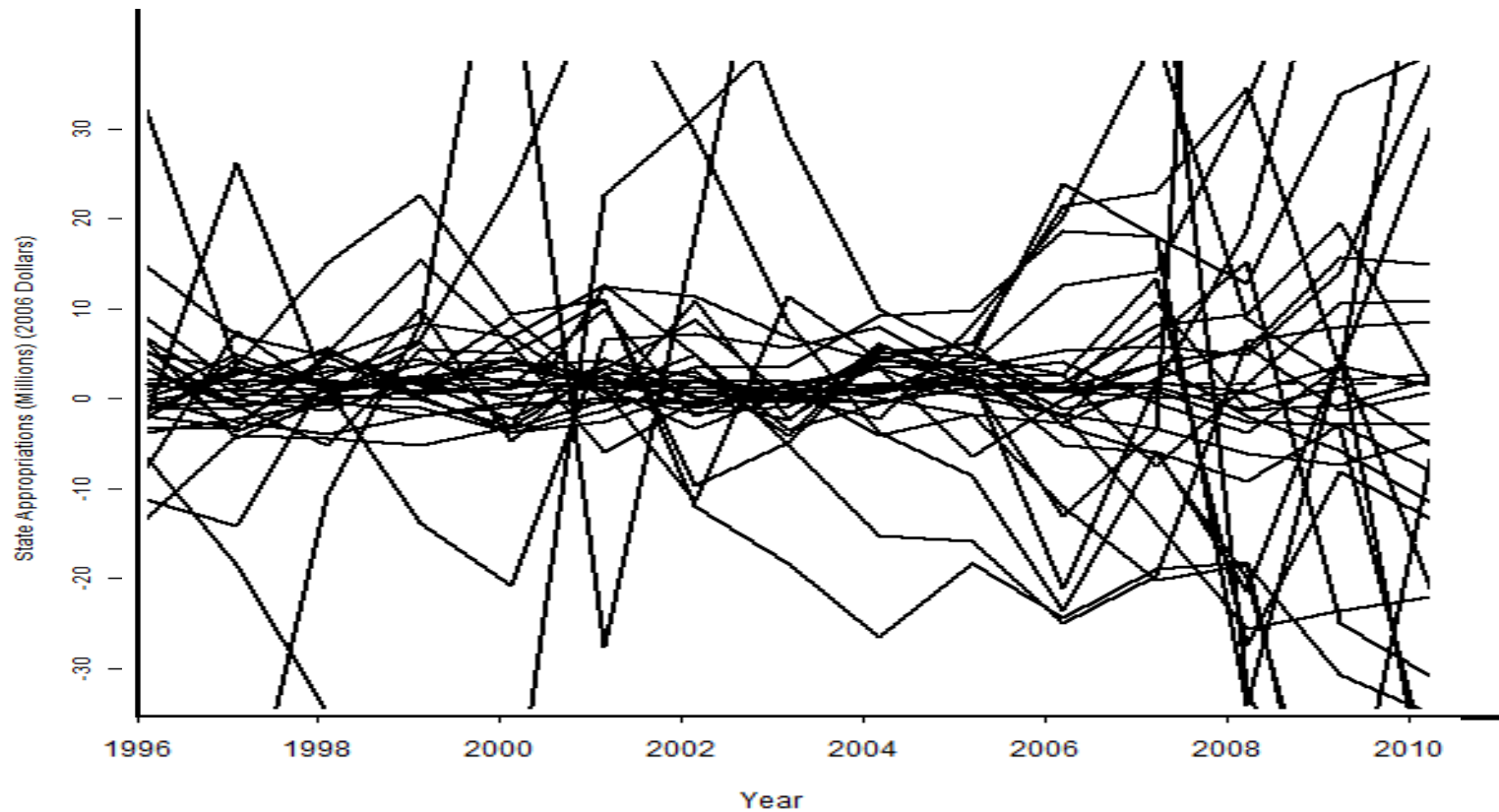
- How do we know whether our results are not driven by chance?
- How often would we obtain these results if we randomly selected an institution for testing rather than the treated aggregate? (Abadie, Diamond, & Hainmueller, 2010)

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)



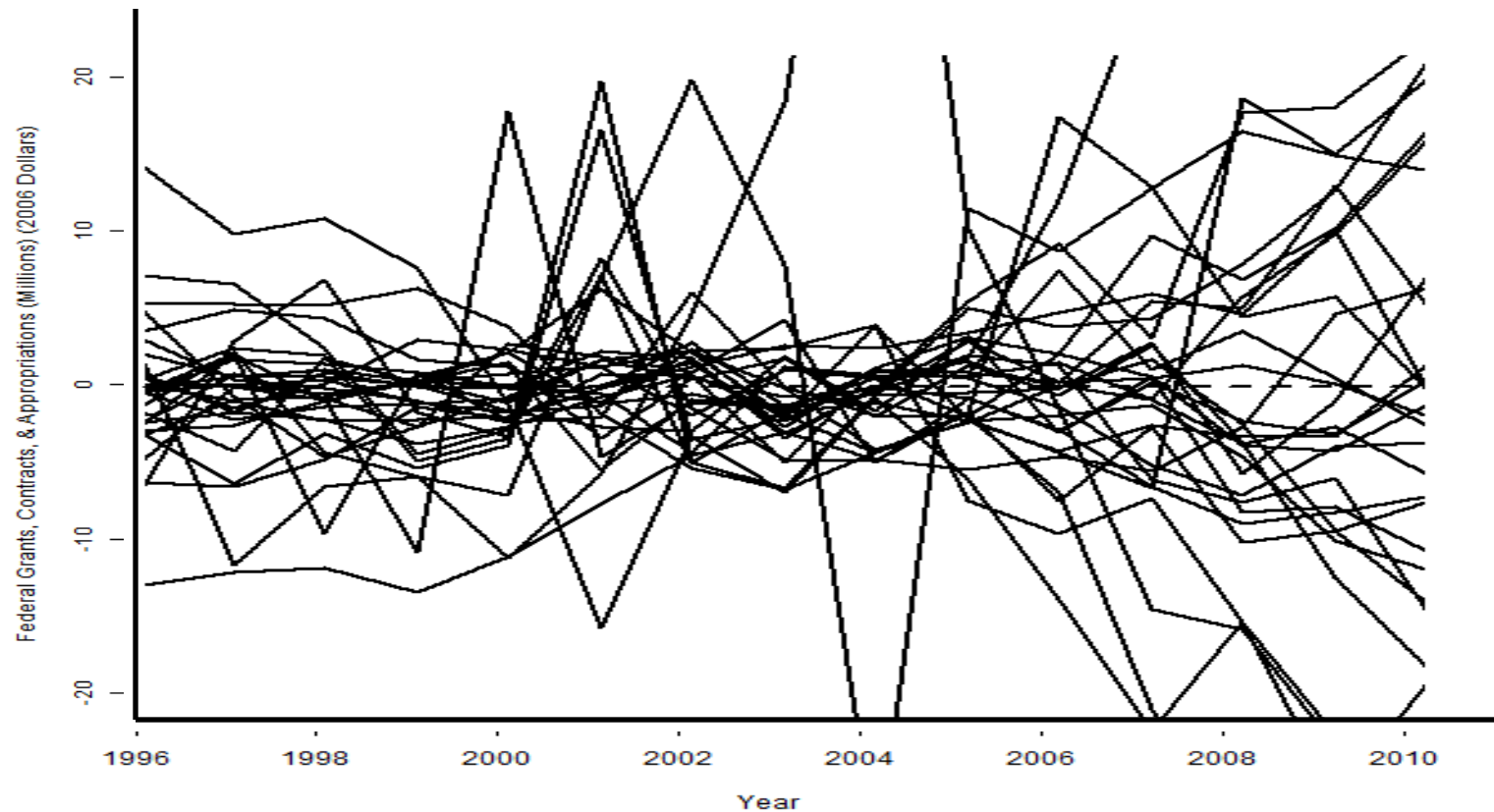
Placebo test results State appropriations





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
 - 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?
 - Did non-classified institutions seek other strategies that were more attractive to decision makers?
 - Is diversifying the products of the university weakening those products?
 - Which actors are defining the institution's identity? What products lead to the most utility?
 - In this cohort, what is the risk of early adoption?
 - 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
 - Institutions designated in 2010 re-apply in 2020
- Important dates:
 - April 15, 2014: Applications due/reviewing begins
 - December 2014: Campuses are notified
 - 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?

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