Research Question:

Do State-level Tax Credits for donors Increase Contributions to Targeted Nonprofits?
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Do State-level Tax Credits for donors Increase Contributions to Targeted Nonprofits?

Sometimes?

I perform two case studies using Synthetic Control Methods

- Endow Iowa $\Rightarrow$ increase in contributions to community foundations $> 100$
- No evidence of any impact from Arizona’s Working Poor Tax Credit (WPTC)
Motivation

Charitable Tax Credits a WIN-WIN?

- **WIN:** More money for Public Goods
- **WIN:** Lower Taxes for Donors

33 states have CTC programs (2013)
Motivation

Charitable Tax Credits a WIN-WIN?
- **WIN:** More money for Public Goods
- **WIN:** Lower Taxes for Donors

33 states have CTC programs (2013)

BUT CTCs:
- Reduce Tax Revenue
- Impact on Public Good Provision Unknown
The effectiveness of tax credits (in general) is interesting:

- R&D Credits (Bloom et al., 2002; Lokshin and Mohnen, 2012).
- retirement savings (Ramnath, 2013), employment (Faulk, 2002), and Innovation Clusters (Moretti and Wilson, 2014).

Research on the relationship between taxes and charity has focused on the federal tax deduction

- (Randolph, 1995; Auten et al., 2002; Duquette, forthcoming)

Or variance between states in the after-tax price of charity.

- (Bakija and Heim, 2011)
Novelty

Prior work:
- focused on tax deductions rather than credits
  - exception: non-causal research by National Council of Nonprofits, Johnson Center for Philanthropy
- focused on tax-payers rather than on nonprofit
  - exception: Duquette, forthcoming

CTC policies are not designed to reward donors, they are designed to support nonprofits.
Novelty

Prior work:
- focused on tax deductions rather than credits
  - exception: non-causal research by National Council of Nonprofits, Johnson Center for Philanthropy
- focused on tax-payers rather than on nonprofit
  - exception: Duquette, forthcoming

CTC policies are not designed to reward donors, they are designed to support nonprofits.

NOTE:
- Similar work estimates price-elasticity
- I estimate a general equilibrium effect of credits *in practice.*
Outline

1. Background
2. Methodology
3. Results
4. Extensions
5. Wrap Up
Study 2 very different programs in Iowa and Arizona

- Discuss CTCs generally
- Provide background for Iowa and Arizona
- Sketch out the differences by comparing budget constraints
- Propose some hypotheses
CTC Heterogeneity

Figure: Every CTC program is different
# CTC Heterogeneity

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Education Tax Credit</td>
<td>AK</td>
<td>1987</td>
<td>–</td>
<td>$3.8 million</td>
<td>Nonprofit or public schools and colleges</td>
<td>Yes</td>
<td>No</td>
<td>Business 50%*</td>
<td>$5 million</td>
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<td>Working Poor Tax Credit</td>
<td>AZ</td>
<td>1998</td>
<td>–</td>
<td>$21.8 million</td>
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<td>Yes</td>
<td>No</td>
<td>Personal 100%</td>
<td>$200/$400</td>
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<td>Neighborhood Assistance Tax Credit</td>
<td>CT</td>
<td>1982</td>
<td>–</td>
<td>$5 million</td>
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<td>Yes</td>
<td>Business 60%**</td>
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<td>Neighborhood Assistance Tax Credit</td>
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<td>2000</td>
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<td>$200,000-$300,000</td>
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<td>Yes</td>
<td>Business 50%</td>
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<td>Endow Iowa Tax Credit</td>
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<td>2003</td>
<td>–</td>
<td>$5.8 million</td>
<td>Community Foundations</td>
<td>Yes</td>
<td>No</td>
<td>Both 25%</td>
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<td>Community Service Tax Credit Program</td>
<td>KS</td>
<td>1994</td>
<td>–</td>
<td>$4.1 million</td>
<td>Community Service, Crime Prevention, and Health Care Nonprofits</td>
<td>Yes</td>
<td>Yes</td>
<td>Both 50%***</td>
<td>$250,000 per Organization</td>
<td>Yes</td>
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<td>Endow Kentucky</td>
<td>KY</td>
<td>2011</td>
<td>–</td>
<td>$200,000</td>
<td>Community Foundations</td>
<td>Yes****</td>
<td>No</td>
<td>Both 20%</td>
<td>$10,000</td>
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<td>Donations to Resource and Referral Agencies</td>
<td>LA</td>
<td>2008</td>
<td>–</td>
<td>$218,539</td>
<td>Private Agencies with contracts through the Department of Social Services</td>
<td>Yes</td>
<td>No</td>
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<td>$5,000</td>
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<td>Homeless Shelter / Food Bank Credit</td>
<td>MI</td>
<td>1992</td>
<td>2011</td>
<td>$20.0 million (2011)</td>
<td>Homeless Shelters and Food Banks</td>
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<td>$100/$200 (Individuals) $5,000 (Businesses)</td>
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<td>1989</td>
<td>2011</td>
<td>$3.8 million (2011)</td>
<td>Community and Education Foundations</td>
<td>Both</td>
<td>50%</td>
<td>$100/$200 (Individuals) $5,000 (Businesses)</td>
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<td>Youth Opportunities Program</td>
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<td>–</td>
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<td>Food Pantry Tax Credit</td>
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<td>2007</td>
<td>2011</td>
<td>$793,794 (2010)</td>
<td>Food Pantries</td>
<td>No</td>
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<td>Qualified Endowment Credit</td>
<td>NE</td>
<td>2006</td>
<td>2009</td>
<td>$150,000 (2008)</td>
<td>Any 501(c)(3) with an endowment</td>
<td>No</td>
<td>No</td>
<td>Both 15%****</td>
<td>$5,000</td>
<td>No</td>
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<tr>
<td>Qualified Endowment Credit</td>
<td>OK</td>
<td>2005</td>
<td>–</td>
<td>$514,000</td>
<td>Medical Research Institutes</td>
<td>No</td>
<td>No</td>
<td>Both 50%</td>
<td>$1,000</td>
<td>No</td>
</tr>
</tbody>
</table>
CTCs in Iowa and Arizona

1 “Big”
   - WPTC: largest program, $21.8 million in 2012.
   - Endow Iowa: $5.8 million in 2012 — nearly 6% of total contributions to community foundations.

2 Well documented.
   - Plausible treatment and control groups.

3 Very different from each other.
   - WPTC: Broad program, many credits (49,915 in 2009), low cap ($200).
   - Endow Iowa: Specific to community foundations, fewer credits (3,074 in 2012), high cap ($300,000).
Endow Iowa

What Qualifies:

- Any donation by an Iowa taxpayer (individual or business)...
- ... made to a permanent endowment fund ...
- ... established for the benefit of an Iowa charitable cause ...
- ...at a qualified community foundation.
Time-line:
- Begins January 1, 2003 as a 20% credit on top of income tax deduction. ($100,000 Cap)
- Followed in 2004 by the County Endowment Fund Program (funds distributed in 2005)
- Beginning in 2010: a 25% credit without deduction.
- 2008-2012: Cap increased to $300,000
Arizona’s WPTC

What Qualifies:

- Donations by **individuals** to **qualifying nonprofit organizations** who ...
- ...spend at 50 percent of their budget on Arizona residents who either:
  1. receive Temporary Assistance for Needy Families (TANF) benefits,
  2. have household income less than 150% of the poverty level, or
  3. are chronically ill or disabled children.
Arizona’s WPTC

Time-line:

- Begins in 1998 as a 100% credit for the first $200 in “excess donations” (beyond the amount donated in 1997 for regular itemizers).
- 2009: Extended to non-itemizers and first $200 donated.
- 2013: Expanded to include credit up to $400 for donations to foster care organizations
- 2013: Renamed “Credit for Donations made to Qualifying Charitable Organizations”
Budget Constraints for CTCs

Arizona WPTC

Donation to $g_2$

Donation to $g_1$

Endow Iowa

Donation to $g_2$

Donation to $g_1$

NOT TO SCALE
Hypotheses

1. Charitable Tax Credit programs increase the level of contributions received by targeted nonprofit organizations.
Hypotheses

1. Charitable Tax Credit programs increase the level of contributions received by targeted nonprofit organizations.

2. Arizona’s WPTC led to positive spillover, increasing donations to untargeted nonprofits.

3. The Endow Iowa tax credit should produce a large substitution effect *between charities* and reduce donations to untargeted charities.

4. Endow Iowa led to an increase in charitable giving to targeted nonprofits that is greater than the value of credits disbursed.
Data

- Financial data for nonprofit firms are reported to the IRS and compiled by the National Center for Charitable Statistics (NCCS).
- Individual information on tax credit policies from various sources including tax forms, tax expenditure reports, evaluation studies, and legislation.
Estimation Framework

Difference in Differences Estimate:

\[
DD = (\bar{Y}_{\text{treated post}} - \bar{Y}_{\text{control post}}) - (\bar{Y}_{\text{treated pre}} - \bar{Y}_{\text{control pre}})
\]

Implicit Assumptions:

- CTC implementation is an exogenous policy shock
- CTCs are the only exogenous shock to contribution levels

Create a counterfactual using Synthetic Control Methods (SCM)

- Following Abadie and Gardeazabal (2003); Abadie, Diamond, and Hainmueller (2010); Abadie, Diamond, and Hainmueller (2014).
Deriving the Synthetic Control

The synthetic control is a weighted average of “donor states”

A weighting matrix is selected to minimize the distance between the treated state and its synthetic control during the pretreatment period.

\[
W^* = \arg\min_W \sqrt{(X_1 - X_0 W)' V (X_1 - X_0 W)}
\]

s.t. \( W' i = 1, \ w_j \geq 0, \ \text{for} \ j = (2, \ldots, J + 1) \)

\( X_1 \) = vector of predictor variables for the treated state
\( X_0 \) = matrix of vectors of predictor variables donor states
\( V \) = diagonal matrix that weights the predictor variables
Deriving the Synthetic Control

Potential Predictor Variables ($X_0$):

- Contributions
- Program Revenue
- Fundraising Expenditures
- State Population
- State Income Per Capita Income
- State Income Inequality Gini
- State Share of Income to Top 1%

Calibration using the period before intervention:

Placebo Tests (Inference)

1. Derive a synthetic control for each donor state
2. Calculate difference between placebo and synthetic control
3. Compare to estimated treatment effect.
Placebo Tests (Inference)

1. Derive a synthetic control for each donor state
2. Calculate difference between placebo and synthetic control
3. Compare to estimated treatment effect.

Two (pseudo) P-Values:
1. based on the DD estimates.
2. based on pre vs. post goodness of fit measure

\[
RMSPE = \left( \frac{1}{T_0} \sum_{t=1}^{T_0} (Y_{t}^{treated} - Y_{t}^{synth})^2 \right)^{\frac{1}{2}}
\]

\[
Ratio_p = \frac{RMSPE_{post}}{RMSPE_{pre}}
\]
Placebo Tests (Inference)

p-value(DD)=0.175  \quad p-value(Ratio)=0.475
Treatment and Control Groups for Endow Iowa

Compare aggregate contributions to community foundations in Iowa to a synthetic control.

- Exclude from the donor pool states with credits for similar donations (AZ, KY, MT, ND, MI, KS, NE).
- Compare contributions in Iowa to both the synthetic Iowa and an “expected Iowa” that received additional funds directly.

Caveat

Unable to differentiate between Tax Credit and Endowment Grant Program.
Contributions to Community Foundations

![Graph showing contributions to community foundations over time for different categories: Iowa, US excluding Iowa, Iowa excluding outlier, and Donor Pool. The graph displays per capita contributions from 1993 to 2011 with distinct lines for each category.](image)
Treatment and Control Groups for Arizona’s WPTC

Treatment group is somewhat difficult to define.

→ Focus on an upper bound based on 6 top credit recipients who are part of national networks.

- I exclude states with similarly broad credit programs or a variety of targeted programs (KS, MI, MO, NC, VA, WV.).
- For lower bound: (which I won’t bother showing) I include all nonprofit sectors and find no evidence of a change in contribution levels.
Contributions to Six National Nonprofits

Figure

Daniel Teles
Charitable Tax Credits
April 22, 2016
Preview of Results

- ≈125% increase in donations to community foundations in Iowa
- No increase in donations to “Highly Treated” nonprofits in Arizona.
- Mixed results on Hypotheses 2 and 3.
- Cannot reject the alternative to Hypothesis 4.
Donor Weights for Iowa

<table>
<thead>
<tr>
<th>State</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkanas</td>
<td>0.027</td>
</tr>
<tr>
<td>Indiana</td>
<td>0.121</td>
</tr>
<tr>
<td>Louisiana</td>
<td>0.059</td>
</tr>
<tr>
<td>Maryland</td>
<td>0.108</td>
</tr>
<tr>
<td>Ohio</td>
<td>0.179</td>
</tr>
<tr>
<td>Vermont</td>
<td>0.267</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>0.029</td>
</tr>
<tr>
<td>West Virginia</td>
<td>0.210</td>
</tr>
</tbody>
</table>
SCM Results for Endow Iowa

\[ DD = 0.81 \approx 125\% \text{ increase} \]
Inference (Placebo Tests) for Endow Iowa

\[ p\text{-value}(DD) = 0.05 \quad p\text{-value}(Ratio) = 0.13 \]
Threats to Causality (Endow Iowa)

Could there have been some shock to contributions in either Iowa or the control group other than Endow Iowa and the County Endowment Program?

- Look for evidence of a shock by exploring the time series of “related” outcomes.
  - Fundraising Expenditure
  - State Unemployment Rate
  - State Per Capita Income
  - State Top 1% Income Share
  - State and Municipal Expenditure
  - State and Municipal Revenue
Contributions in Iowa and a control fitted to fundraising expenditure

$\rightarrow DD = 0.72$ (compared to 0.81)
### Other Robustness Checks

<table>
<thead>
<tr>
<th>Conditional on &amp; p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBCBF not dropped</td>
</tr>
<tr>
<td>Indiana Excluded From Donor Pool</td>
</tr>
<tr>
<td>Maryland Excluded</td>
</tr>
<tr>
<td>Ohio Excluded</td>
</tr>
<tr>
<td>Vermont Excluded</td>
</tr>
<tr>
<td>West Virginia Excluded</td>
</tr>
<tr>
<td>Excluding Population as a Predictor</td>
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<tr>
<td>Restriction to Neighboring States</td>
</tr>
<tr>
<td>vs. Average of Neighboring States</td>
</tr>
<tr>
<td>vs. National Average</td>
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</table>
## Donor Weights for Arizona

<table>
<thead>
<tr>
<th>State</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>0.016</td>
</tr>
<tr>
<td>Florida</td>
<td>0.005</td>
</tr>
<tr>
<td>Georgia</td>
<td>0.493</td>
</tr>
<tr>
<td>Idaho</td>
<td>0.038</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>0.092</td>
</tr>
<tr>
<td>South Carolina</td>
<td>0.039</td>
</tr>
<tr>
<td>Texas</td>
<td>0.039</td>
</tr>
<tr>
<td>Utah</td>
<td>0.277</td>
</tr>
</tbody>
</table>
$DD = -0.10 \approx 10\%$ decline
Inference (Placebo Tests) for Arizona

\[ p\text{-value}(\text{DD})=0.36 \quad p\text{-value}(\text{Ratio})=0.36 \]
Hypothesis 2

Arizona’s WPTC led to positive spillover, increasing donations to untargeted nonprofits.

<table>
<thead>
<tr>
<th></th>
<th>untreated nonprofits in Arizona</th>
<th>affiliates in California</th>
<th>affiliates in Nevada</th>
<th>affiliates in Utah</th>
<th>affiliates in Colorado</th>
<th>affiliates in New Mexico</th>
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</thead>
<tbody>
<tr>
<td>treatment DD</td>
<td>-0.05</td>
<td>0.40</td>
<td>-0.13</td>
<td>-0.25</td>
<td>0.06</td>
<td>-0.03</td>
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<tr>
<td>p-values</td>
<td>0.42</td>
<td>0.09</td>
<td>0.29</td>
<td>0.13</td>
<td>0.42</td>
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<tr>
<td>Ratio</td>
<td>0.16</td>
<td>0.93</td>
<td>0.58</td>
<td>0.09</td>
<td>0.89</td>
<td>0.78</td>
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Hypothesis 3

The Endow Iowa tax credit should produce a large substitution effect *between charities* and reduce donations to untargeted charities.

<table>
<thead>
<tr>
<th></th>
<th>DD</th>
<th>DID</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>Similar Nonprofits in Iowa</td>
<td>-0.11</td>
<td>0.38</td>
<td>0.55</td>
</tr>
<tr>
<td>Public Benefit Nonprofits in Iowa</td>
<td>0.09</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>Untargeted Nonprofits in Iowa</td>
<td>-0.21</td>
<td>0.08</td>
<td>0.30</td>
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<tr>
<td>CFs in South Dakota</td>
<td>0.63</td>
<td>0.08</td>
<td>0.25</td>
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<td>CFs in Minnesota</td>
<td>-0.33</td>
<td>0.22</td>
<td>0.30</td>
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<tr>
<td>CFs in Wisconsin</td>
<td>0.00</td>
<td>0.45</td>
<td>0.38</td>
</tr>
<tr>
<td>CFs in Illinois</td>
<td>0.09</td>
<td>0.43</td>
<td>0.98</td>
</tr>
<tr>
<td>CFs in Missouri</td>
<td>0.61</td>
<td>0.10</td>
<td>0.90</td>
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</table>
Hypothesis 4

Endow Iowa led to an increase in charitable giving to targeted nonprofits that is greater than the value of credits disbursed.

\[ DD=0.49 \quad p\text{-value}(DD)=0.18 \quad p\text{-value}(Ratio)=0.28 \]
## Growth in Contributions Per Foundation

<table>
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<th>Year FE</th>
<th>Foundation FE</th>
<th>Observations</th>
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<td><strong>DD</strong></td>
<td>no</td>
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<td>2650</td>
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<tr>
<td></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>2650</td>
</tr>
<tr>
<td>Fundraising Expenditure</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>2650</td>
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<tr>
<td><strong>Iowa</strong></td>
<td>-1.439***</td>
<td>(0.111)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fundraising Expenditure</strong></td>
<td>0.022**</td>
<td>(0.008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program Revenue</td>
<td>-0.006</td>
<td>(0.005)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 10 year balanced panel (1998-2007), standard errors clustered at the state level
Growth in the Number of Community Foundations

\[ DD = 0.25 \approx 28\% \text{ increase} \]
Growth in the Number of Community Foundations

\[ p\text{-value}(\text{DD})=0.17 \quad p\text{-value}(\text{Ratio})=0.15 \]
# Disentangling Grants and Credits

<table>
<thead>
<tr>
<th></th>
<th>Estimate 1</th>
<th>Estimate 2</th>
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<tbody>
<tr>
<td>Endow Iowa</td>
<td>0.339**</td>
<td>0.378**</td>
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<tr>
<td></td>
<td>(0.114)</td>
<td>(0.113)</td>
</tr>
<tr>
<td>Community Endowment Fund</td>
<td>-0.146**</td>
<td>-0.155**</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.050)</td>
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<tr>
<td>Fundraising Expenditure</td>
<td>0.022**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
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<td>Program Revenue</td>
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<td>-0.006</td>
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<tr>
<td></td>
<td></td>
<td>(0.005)</td>
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<tr>
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<td>yes</td>
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<tr>
<td>Year FE</td>
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<td>yes</td>
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<tr>
<td>Foundation FE</td>
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<td>yes</td>
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<tr>
<td>Observations</td>
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<td>2650</td>
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</table>

NOTE: 10 year balanced panel (1998-2007), standard errors clustered at the state level
Summary of Results

- \( \approx 125\% \) increase in donations to community foundations in Iowa
- No increase in donations to “Highly Treated” nonprofits in Arizona.
- Mixed results on Hypotheses 2 and 3.
- Cannot reject the alternative to Hypothesis 4.
- Endow Iowa followed by increases in both the number of community foundations and contributions per foundation.
Why Iowa ≠ Arizona

Potential Reasons for differing results:

- **Structure of the credits:**
  - Iowa: 25% up to $300,000
  - Arizona: 100% up to $200
- Endow Iowa applies to a smaller group of nonprofits
- Businesses are eligible for Endow Iowa but not WPTC
- Iowa 1-2 punch with County Endowment Program
Thank You!
Leave One Out Tests

Figure: Contributions to ALL nonprofits, Iowa and Synthetic Control
Figure: Contributions to ALL nonprofits, Iowa and Synthetic Control
Figure: Contributions to ALL nonprofits, Arizona and Synthetic Control
Missouri Youth Opportunities Program

![Graph showing the gap in ln(Per Capita Contributions) from 1990 to 2012.](image)

The graph displays the gap in ln(Per Capita Contributions) over the years from 1990 to 2012. The x-axis represents the years, while the y-axis shows the gap in ln(Per Capita Contributions). The data fluctuates over time, with notable peaks and troughs.
Oklahoma Biomedical Organizations

![Graph showing the gap in ln(Per Capita Contributions) over years from 1995 to 2011. The graph indicates a general decrease in the gap over time.]