

# The Market for Institutions

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## SHARE

| ENVIRONMENTAL POLICY



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## The Clean Water Act actually cleans water

**Brad Wible**

+ See all authors and affiliations

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## SHARE

| ENVIRONMENTALISM



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## Measuring charity

**Caroline Ash**

+ See all authors and affiliations

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DOI: 10.1126/science.362.6413.416-d

# Motivation

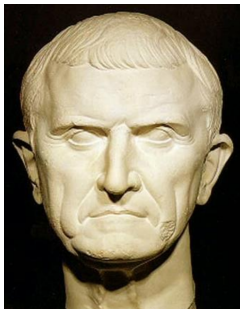


Figure: Ancient Rome



Figure: Bucket Brigades

# Motivation

Soon after the college openedm Frankling moved on to his next project, raising money for a hospital. The public appeal he published in the Gazette, which vividly described the moral duty people have to help the sick, contained the typical Frankin ringing refrain: "The good particular men may do separately in relieving the sick small compared with what they may do collectively." Raising money was difficul, so he concocted a clever scheme: he got the Assembly to agree that, if  $\text{\$}2,000$  could eb raised privately, it woud be matched by  $\text{\$}2,000$  from the public purse. The plan, Franklin recalled, gave people "an additional motive to give, since every man's donation would be doubled."... By coming up with what is now known as the matching grant, Franklin showed how government and private initiative could be woven together, which remains to this day a very American approach. He believe in volunteerism and limited government, but also that there was a ligimate role for government in fostering the common good. By working through public-private partnerships, he felt, governments could have the best impact while avoiding the imposition of too much authority from above.

# Motivation

*As a private citizen, he had proposed various civic improvement schemes, such as the library, fire corps, and police patrol. Now, as a member of the Assembly, he could do even more to be, as he put it, "a great promoter of useful projects." The quintessence of these was his effort to sweep, pave, and light the city streets. The endeavor began when he became bothered by the dust in front of his house, which faced the farmer's market. So he found "a poor industrious man" who was willing to sweep the block for a monthly fee and then wrote a paper that described all the benefits of hiring him. House on the block would remain cleaner, he noted, and shops would attract more customers. He sent the paper around to his neighbors, who all agreed to contribute a portion of the street sweeper's pay each month. The beauty of the scheme was that it opened the way for grander civic improvements. "This raised a general desire to have all the streets paved," Franklin recalled, "and made the people more willing to submit to a tax for that purpose." As a result, Frankling was able to draw up a bill in the Assembly to pay for the street paving, and he accompanied it with a*

# Research Questions

- **Does institutional substitution exist?**
  - ▶ Yes
- **If yes, what causes it?**
  - ▶ Household demand & inequality
- **Does this have welfare implications?**
  - ▶ Perhaps

# Main Findings

- **Conceptual Model** on inequality and institutional substitution
  - ▶ Wealth inequality  $\uparrow q_{firm} \uparrow q_{ngo} \uparrow$
  - ▶ Wealth inequality  $\downarrow q_{gov} \uparrow$
- Inequality is correlated with **higher levels of nonprofits**
- **Country and state level correlations on inequality, education, health care and fire fighting are in line with predictions**, e.g. higher inequality is correlated with higher levels of private hospitals
- **Case Study:** Fire Departments

# Conceptual Model

$$U = \left[ \underbrace{U(q_{firm})}_{ProductUtility} - \underbrace{C(q_{firm})}_{CostofPurchase} \right] + \left[ \underbrace{U(q_{gov})}_{Utility} - \underbrace{C(q_{gov})}_{Taxes} \right] \quad (1)$$

$$+ \left[ \underbrace{U(q_{ngo})}_{Utility} - \underbrace{C(q_{ngo})}_{Donation} \right]$$

$$s.t. \quad \underbrace{p_{firm} * q_{firm}}_{ProductPurchases} + \underbrace{p_{gov} * q_{gov}}_{Taxes} + \underbrace{p_{ngo} * q_{ngo}}_{Donations} = 1 \quad (2)$$

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<sup>1</sup>**1) Private** - 28 mil. businesses, 127 mil. employees and 1.5\$ tril. in sales **2) Public** - 22 mil. employees and 3.2\$ tril. in tax revenues **3) Non-profit** - 12 mil. volunteers and 0.4\$ trillion in donations



# Predictions

- 1)  $\max \Pi_{firm}(q_{firm}) = TR(q_{firm}) - TC(q_{firm})$
- 2)  $\max \Pi_{gov}(q_{gov}) = TR(q_{gov}) - TC(q_{gov})$
- 3)  $\max \Pi_{ngo}(q_{ngo}) = TR(q_{ngo}) - TC(q_{ngo})$

- With **high** wealth inequality<sup>2</sup>,  $\rightarrow q_{firm} \uparrow q_{ngo} \uparrow$
- With **low** wealth inequality,  $\rightarrow q_{gov} \uparrow$

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<sup>2</sup>i.e. when  $C(q_{firm}) < C(q_{gov})$  and  $C(q_{ngo}) < C(q_{gov})$

# Charities and Inequality

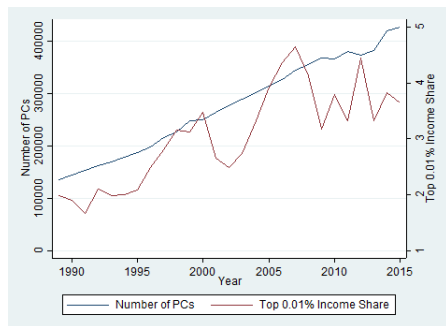


Figure: Public Charities

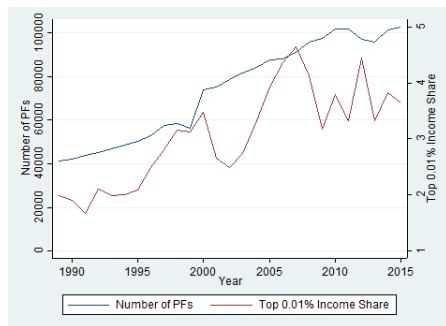


Figure: Private Foundations

# Public Charities

| VARIABLES                | (1)<br>Δ Number of PCs | (2)<br>Δ Number of PCs | (3)<br>Δ Number of PCs | (4)<br>Δ Number of PCs | (5)<br>Δ Number of PCs | (6)<br>Δ Number of PCs |
|--------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Income Share of Top .01% |                        |                        |                        |                        |                        | 0.310***<br>(0.119)    |
| Income Share of Top .1%  |                        |                        |                        |                        | 0.261***<br>(0.083)    |                        |
| Income Share of Top .5%  |                        |                        |                        | 0.258***<br>(0.070)    |                        |                        |
| Income Share of Top 1%   |                        |                        | 0.242***<br>(0.071)    |                        |                        |                        |
| Income Share of Top 5%   |                        | 0.243***<br>(0.062)    |                        |                        |                        |                        |
| Income Share of Top 10%  | 0.223***<br>(0.050)    |                        |                        |                        |                        |                        |
| Observations             | 78,932                 | 78,932                 | 78,932                 | 78,932                 | 78,932                 | 78,932                 |
| R-squared                | 0.099                  | 0.099                  | 0.099                  | 0.099                  | 0.099                  | 0.098                  |
| State FE                 | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    |
| Year FE                  | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Private Foundations

| VARIABLES                | (1)<br>Δ Number of PFs | (2)<br>Δ Number of PFs | (3)<br>Δ Number of PFs | (4)<br>Δ Number of PFs | (5)<br>Δ Number of PFs | (6)<br>Δ Number of PFs |
|--------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Income Share of Top .01% |                        |                        |                        |                        |                        | 0.306**<br>(0.145)     |
| Income Share of Top .1%  |                        |                        |                        |                        | 0.280***<br>(0.101)    |                        |
| Income Share of Top .5%  |                        |                        |                        | 0.260***<br>(0.084)    |                        |                        |
| Income Share of Top 1%   |                        |                        | 0.226***<br>(0.083)    |                        |                        |                        |
| Income Share of Top 5%   |                        | 0.193***<br>(0.066)    |                        |                        |                        |                        |
| Income Share of Top 10%  | 0.248***<br>(0.063)    |                        |                        |                        |                        |                        |
| Observations             | 55,167                 | 55,167                 | 55,167                 | 55,167                 | 55,167                 | 55,167                 |
| R-squared                | 0.015                  | 0.015                  | 0.015                  | 0.015                  | 0.015                  | 0.014                  |
| State FE                 | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    |
| Year FE                  | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    | Yes                    |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Cross-Country Correlations

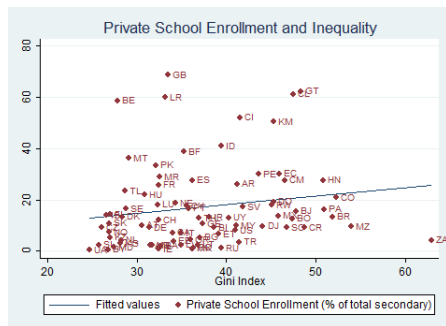


Figure: Private Schools

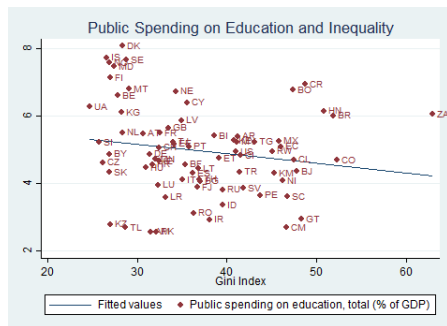


Figure: Public Schools

# Cross-Country Correlations

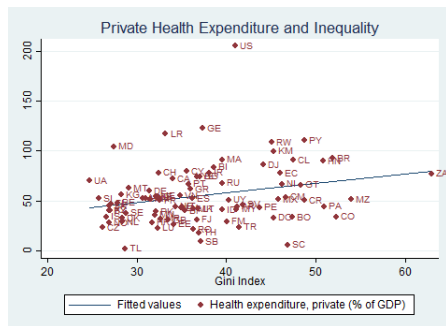


Figure: Private Health Care

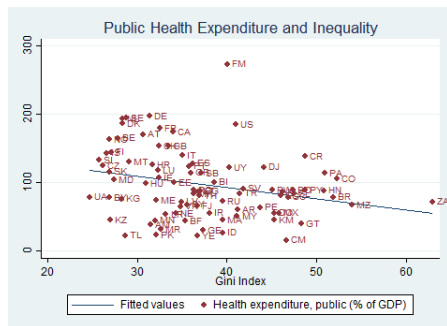


Figure: Public Health Care

# State Correlations

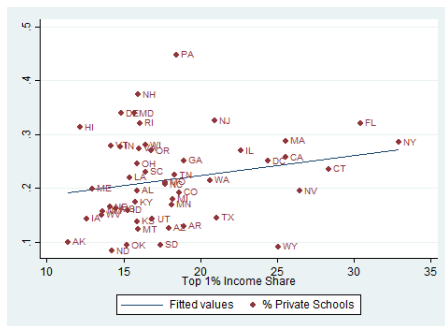


Figure: Private Schools

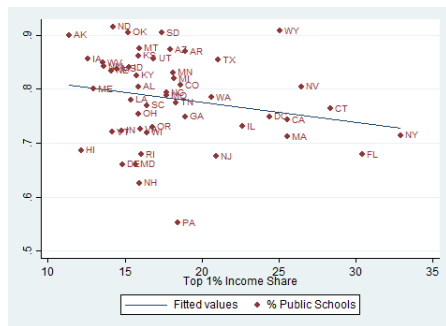


Figure: Public Schools

# State Correlations

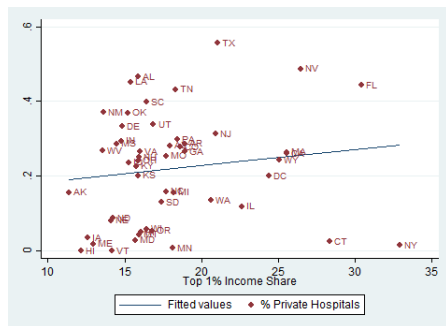


Figure: Private Hospitals

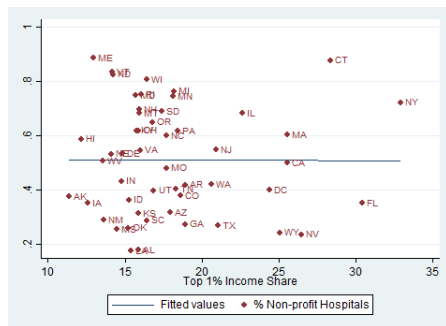


Figure: Nonprofit Hospitals



# State Correlations

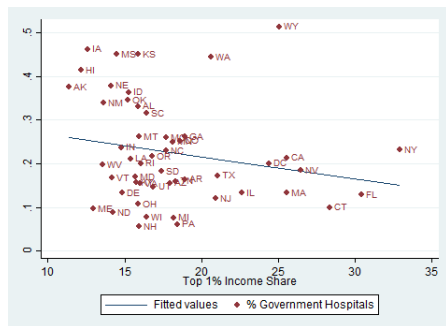


Figure: Government Hospitals

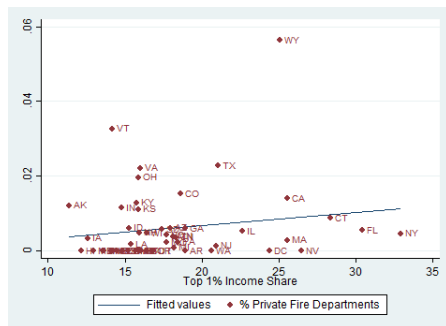


Figure: Private Fire Departments

# State Correlations

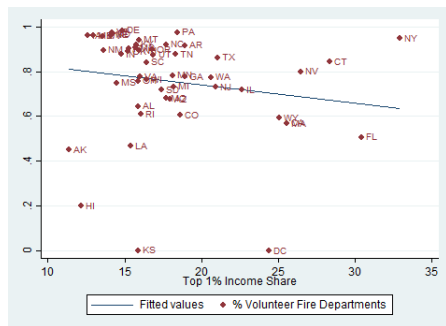


Figure: Volunteer Fire Departments

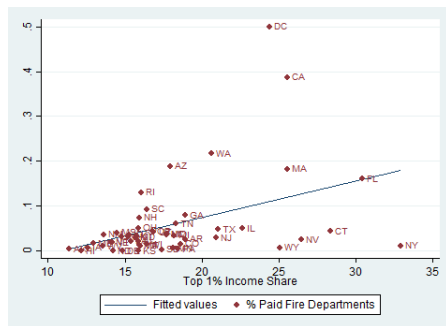


Figure: Paid Fire Departments

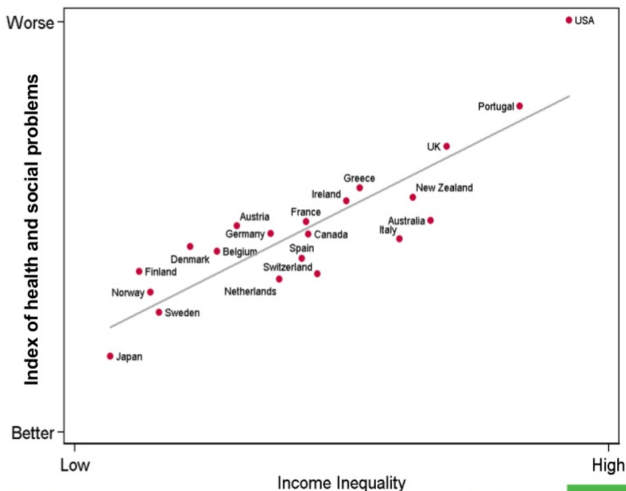
# Welfare Connection?

## Health and social problems are worse in more unequal countries

Index of:

- Life expectancy
- Math & Literacy

- Infant mortality
- Homicides
- Imprisonment
- Teenage births
- Trust
- Obesity
- Mental illness  
– incl. drug & alcohol  
addiction
- Social mobility



Wilkinson & Pickett, *The Spirit Level*

[www.equalitytrust.org.uk](http://www.equalitytrust.org.uk)

Equality Trust

# Fire Fighting



Photo by Sandy Huffaker/Getty Images

NOVEMBER 19, 2018

## Kanye West Hired Private Fire Fighters To Save His \$60 Million Mansion

# Fire Fighting

| VARIABLES                | (1)<br>%Private FDs | (2)<br>%Private FDs | (3)<br>%Private FDs | (4)<br>%Private FDs | (5)<br>%Private FDs | (6)<br>%Private FDs |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Income Share of Top .01% |                     |                     |                     |                     |                     | 0.006***<br>(0.000) |
| Income Share of Top .1%  |                     |                     |                     |                     | 0.004***<br>(0.000) |                     |
| Income Share of Top .5%  |                     |                     |                     | 0.003***<br>(0.000) |                     |                     |
| Income Share of Top 1%   |                     |                     | 0.003***<br>(0.000) |                     |                     |                     |
| Income Share of Top 5%   |                     | 0.004***<br>(0.000) |                     |                     |                     |                     |
| Income Share of Top 10%  | 0.004***<br>(0.000) |                     |                     |                     |                     |                     |
| Population               | 0.000***<br>(0.000) | 0.000***<br>(0.000) | 0.000***<br>(0.000) | 0.000***<br>(0.000) | 0.000***<br>(0.000) | 0.000***<br>(0.000) |
| Observations             | 3,050               | 3,050               | 3,050               | 3,050               | 3,050               | 3,050               |
| R-squared                | 0.032               | 0.032               | 0.032               | 0.032               | 0.032               | 0.032               |
| State FE                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Fire Fighting

| VARIABLES                | (1)<br>%Volunteer FDs | (2)<br>%Volunteer FDs | (3)<br>%Volunteer FDs | (4)<br>%Volunteer FDs | (5)<br>%Volunteer FDs | (6)<br>%Volunteer FDs |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Income Share of Top .01% |                       |                       |                       |                       |                       | 0.016***<br>(0.000)   |
| Income Share of Top .1%  |                       |                       |                       |                       | 0.011***<br>(0.000)   |                       |
| Income Share of Top .5%  |                       |                       |                       | 0.009***<br>(0.000)   |                       |                       |
| Income Share of Top 1%   |                       |                       | 0.009***<br>(0.000)   |                       |                       |                       |
| Income Share of Top 5%   |                       | 0.010***<br>(0.000)   |                       |                       |                       |                       |
| Income Share of Top 10%  | 0.010***<br>(0.000)   |                       |                       |                       |                       |                       |
| Population               | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  |
| Observations             | 3,050                 | 3,050                 | 3,050                 | 3,050                 | 3,050                 | 3,050                 |
| R-squared                | 0.508                 | 0.508                 | 0.508                 | 0.508                 | 0.508                 | 0.508                 |
| State FE                 | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

# Fire Fighting

| VARIABLES                | (1)<br>Ln(Fires) | (2)<br>Ln(Fires)  | (3)<br>Ln(Fires)   | (4)<br>Ln(Fires)   | (5)<br>Ln(Fires)   | (6)<br>Ln(Fires)   |
|--------------------------|------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
| Income Share of Top .01% |                  |                   |                    |                    |                    | 0.485**<br>(0.219) |
| Income Share of Top .1%  |                  |                   |                    |                    | 0.343**<br>(0.146) |                    |
| Income Share of Top .5%  |                  |                   |                    | 0.283**<br>(0.119) |                    |                    |
| Income Share of Top 1%   |                  |                   | 0.242**<br>(0.109) |                    |                    |                    |
| Income Share of Top 5%   |                  | 0.169*<br>(0.094) |                    |                    |                    |                    |
| Income Share of Top 10%  | 0.111<br>(0.077) |                   |                    |                    |                    |                    |
| Observations             | 3,264            | 3,264             | 3,264              | 3,264              | 3,264              | 3,264              |
| R-squared                | 0.100            | 0.101             | 0.102              | 0.102              | 0.102              | 0.101              |
| Year FE                  | Yes              | Yes               | Yes                | Yes                | Yes                | Yes                |
| State FE                 | Yes              | Yes               | Yes                | Yes                | Yes                | Yes                |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Fire Fighting

| VARIABLES                          | (1)<br>Reported Fires | (2)<br>Reported Fires | (3)<br>Reported Fires | (4)<br>Reported Fires | (5)<br>Reported Fires | (6)<br>Reported Fires |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Change in Income Share of Top .01% |                       |                       |                       |                       |                       | 0.001**<br>(0.001)    |
| Change in Income Share of Top .1%  |                       |                       |                       |                       | 0.002**<br>(0.001)    |                       |
| Change in Income Share of Top .5%  |                       |                       |                       | 0.004**<br>(0.002)    |                       |                       |
| Change in Income Share of Top 1%   |                       |                       | 0.006**<br>(0.003)    |                       |                       |                       |
| Change in Income Share of Top 5%   |                       | 0.018**<br>(0.009)    |                       |                       |                       |                       |
| Change in Income Share of Top 10%  | 0.044**<br>(0.022)    |                       |                       |                       |                       |                       |
| 2014 County Level Population       | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  | -0.000***<br>(0.000)  |
| Observations                       | 3,073                 | 3,073                 | 3,073                 | 3,073                 | 3,073                 | 3,073                 |
| R-squared                          | 0.345                 | 0.345                 | 0.345                 | 0.345                 | 0.345                 | 0.345                 |
| State FE                           | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$



# Fire Fighting

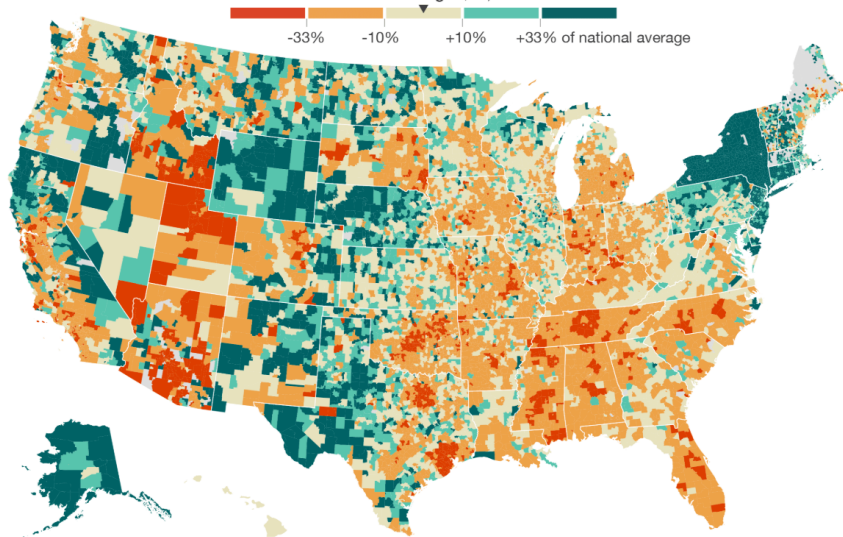
| VARIABLES                | (1)<br>RFs           | (2)<br>RFs           | (3)<br>RFs          | (4)<br>RFs          | (5)<br>RFs          | (6)<br>RFs          | (7)<br>RFs           | (8)<br>RFs          | (9)<br>RFs        | (10)<br>RFs       | (11)<br>RFs       | (12)<br>RFs        |
|--------------------------|----------------------|----------------------|---------------------|---------------------|---------------------|---------------------|----------------------|---------------------|-------------------|-------------------|-------------------|--------------------|
| c.Top001_adj#c.volunteer |                      |                      |                     |                     |                     |                     |                      |                     |                   |                   |                   | 0.002**<br>(0.001) |
| c.Top01_adj#c.volunteer  |                      |                      |                     |                     |                     |                     |                      |                     |                   |                   | 0.001*<br>(0.001) |                    |
| c.Top05_adj#c.volunteer  |                      |                      |                     |                     |                     |                     |                      |                     |                   | 0.001<br>(0.000)  |                   |                    |
| c.Top1_adj#c.volunteer   |                      |                      |                     |                     |                     |                     |                      |                     | 0.001<br>(0.000)  |                   |                   |                    |
| c.Top5_adj#c.volunteer   |                      |                      |                     |                     |                     |                     |                      | 0.000<br>(0.000)    |                   |                   |                   |                    |
| c.Top10_adj#c.volunteer  |                      |                      |                     |                     |                     |                     | 0.000<br>(0.000)     |                     |                   |                   |                   |                    |
| c.Top001_adj#c.private   |                      |                      |                     |                     |                     | -0.002<br>(0.005)   |                      |                     |                   |                   |                   |                    |
| c.Top01_adj#c.private    |                      |                      |                     |                     | -0.003<br>(0.003)   |                     |                      |                     |                   |                   |                   |                    |
| c.Top05_adj#c.private    |                      |                      |                     | -0.003<br>(0.003)   |                     |                     |                      |                     |                   |                   |                   |                    |
| c.Top1_adj#c.private     |                      |                      | -0.003<br>(0.002)   |                     |                     |                     |                      |                     |                   |                   |                   |                    |
| c.Top5_adj#c.private     |                      | -0.004***<br>(0.001) |                     |                     |                     |                     |                      |                     |                   |                   |                   |                    |
| c.Top10_adj#c.private    | -0.004***<br>(0.001) |                      |                     |                     |                     |                     |                      |                     |                   |                   |                   |                    |
| Income Share of Top 10%  | -0.004***<br>(0.000) |                      |                     |                     |                     |                     | -0.004***<br>(0.000) |                     |                   |                   |                   |                    |
| %Private FDs             | 0.157***<br>(0.051)  | 0.129***<br>(0.039)  | 0.055<br>(0.035)    | 0.038<br>(0.035)    | 0.018<br>(0.027)    | 0.003<br>(0.017)    |                      |                     |                   |                   |                   |                    |
| Income Share of Top 5%   |                      | 0.002***<br>(0.000)  |                     |                     |                     |                     |                      | 0.001***<br>(0.000) |                   |                   |                   |                    |
| Income Share of Top 1%   |                      |                      | 0.001***<br>(0.000) |                     |                     |                     |                      |                     | 0.000<br>(0.000)  |                   |                   |                    |
| Income Share of Top .5%  |                      |                      |                     | 0.001***<br>(0.000) |                     |                     |                      |                     |                   | 0.000<br>(0.000)  |                   |                    |
| Income Share of Top .1%  |                      |                      |                     |                     | 0.001***<br>(0.000) |                     |                      |                     |                   |                   | 0.000<br>(0.000)  |                    |
| Income Share of Top .01% |                      |                      |                     |                     |                     | 0.001***<br>(0.000) |                      |                     |                   |                   |                   | -0.000<br>(0.001)  |
| %Volunteer FDs           |                      |                      |                     |                     |                     |                     | -0.007<br>(0.022)    | -0.008<br>(0.015)   | -0.007<br>(0.008) | -0.006<br>(0.008) | -0.004<br>(0.006) | -0.003<br>(0.006)  |
| Observations             | 3,013                | 3,013                | 3,013               | 3,013               | 3,013               | 3,013               | 3,013                | 3,013               | 3,013             | 3,013             | 3,013             | 3,013              |
| R-squared                | 0.350                | 0.350                | 0.350               | 0.350               | 0.350               | 0.350               | 0.352                | 0.352               | 0.353             | 0.353             | 0.353             | 0.353              |
| State FE                 | Yes                  | Yes                  | Yes                 | Yes                 | Yes                 | Yes                 | Yes                  | Yes                 | Yes               | Yes               | Yes               | Yes                |

# School Financing

## SPENDING PER STUDENT, BY SCHOOL DISTRICT

Adjusted for regional differences, for primary and unified school districts

National average: \$11,841



Thank You