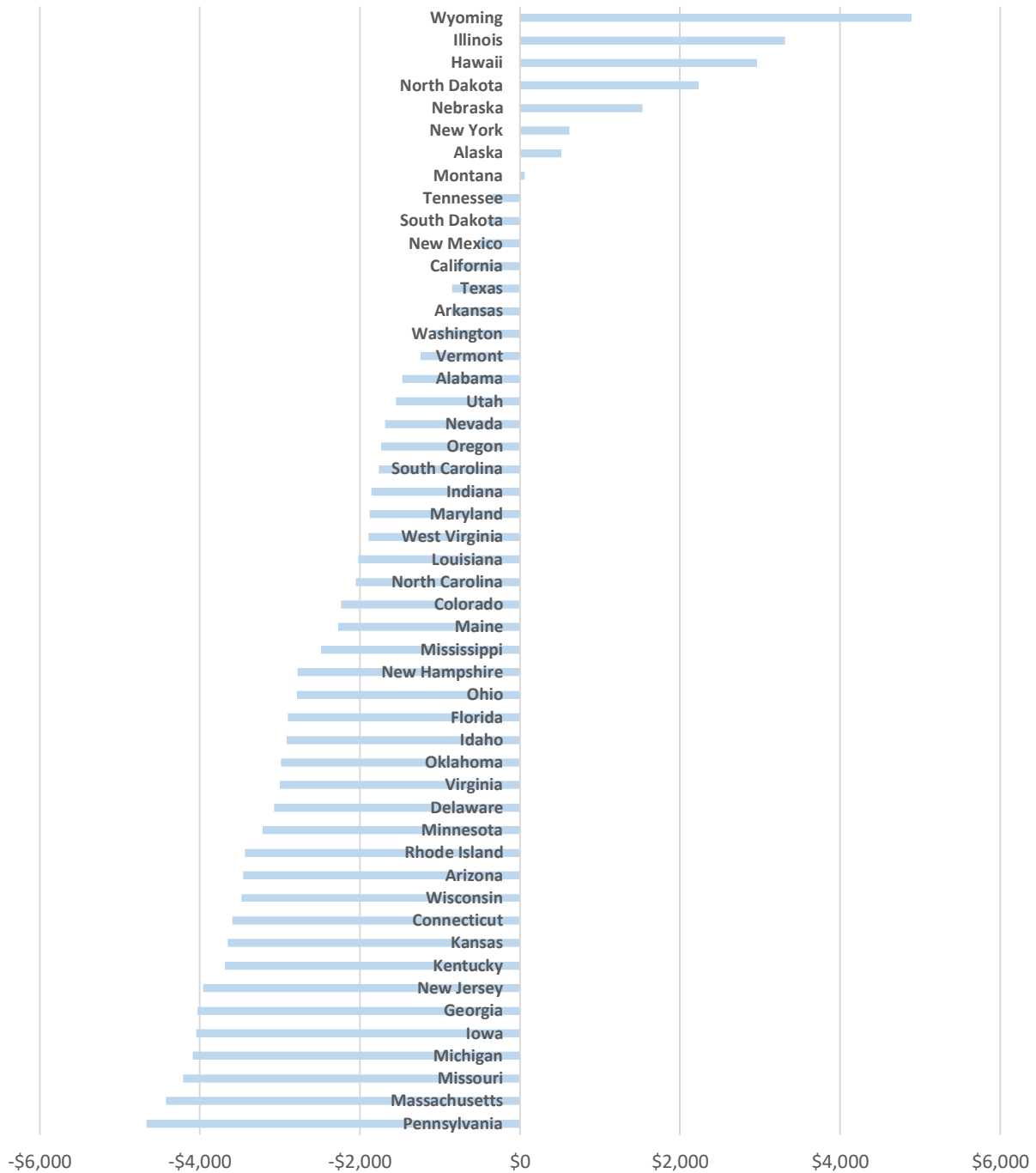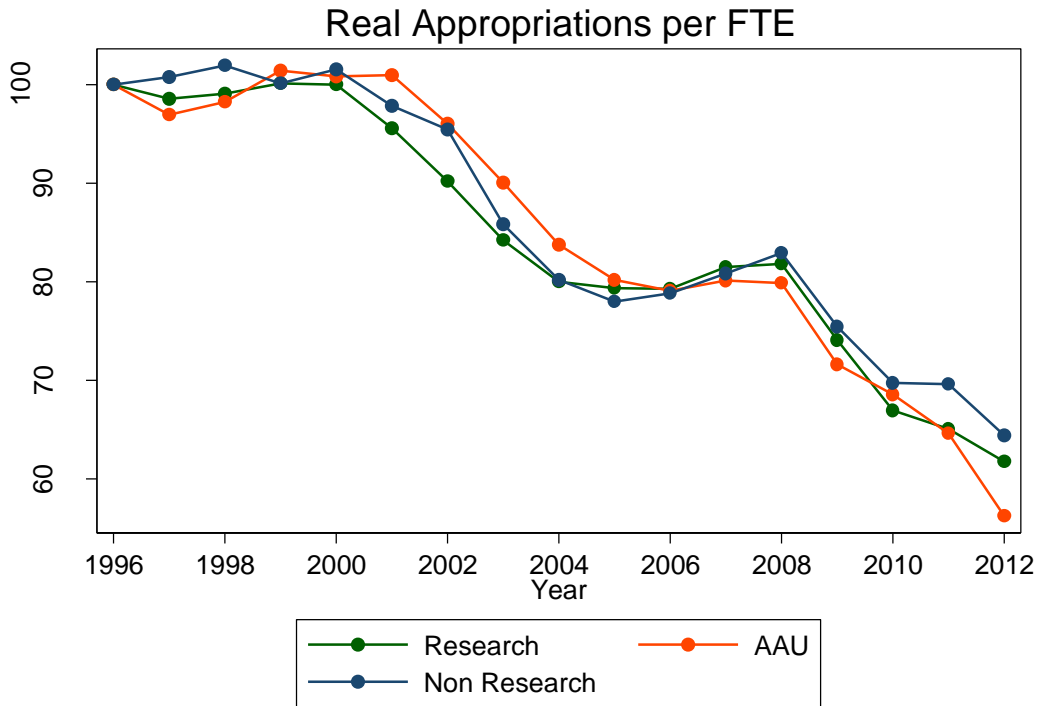**Additional Figures and Tables**

Figure A1. Changes in Higher Education Appropriations per FTE between 2001 and 2017 by State



Note: Appropriations by FTE is total appropriations in the a state divided by full-time equivalent enrollment net of medical students. All measures are in 2017 dollars using the HECA index. Years are fiscal years. For Illinois, a $1.25 billion back payment in FY 17 to their historically underfunded higher education pension program resulted in past legacy pension funds accounting for 37.8 percent of all educational appropriations. Source: State Higher Education Finance (SHEF).

Figure A2. Changes Appropriations per FTE between 1998 and 2012 by University type



Note: We create real appropriations (IPEDS data) per full-time equivalent student for each university after deflating by the higher education price index (HEPI) and dividing by the number of undergraduates enrolled. We then create the mean value by type of university, and normalize the values to the 1996 level.

Table A1 – Determinates of State Appropriations 1996-2012

| Dependent Variable | State Appropriations per capita | |
|---|---|---|
| State General Revenue per Capita | 0.013 | 0.014 |
| | (0.002) | (0.002) |
| Medicaid Expenditure per Capita | -0.026 | -0.026 |
| | (0.014) | (0.014) |
| Personal Income (Thousands) per Capita | 2.596 | 1.963 |
| | (1.058) | (1.092) |
| Governor is Democrat | -1.326 | -1.842 |
| | (3.132) | (3.040) |
| Lag Unemployment Rate | | -4.922 |
| | | (1.399) |
| Observations | 1,750 | 1,750 |

Notes: All regressions include year and state fixed effects. Standard errors clustered at the state level. Source: State Appropriations is from State Higher Education Finance (1980-2014). State General Revenue is from the Tax Policy Center. Medicaid Expenditure from the Center for Medicare and Medicaid Services. State population, personal income, and indicator whether the governor is Democrat is from the University of Kentucky Poverty Center. State unemployment rate is from the Bureau of Labor Statistics.

Table A2. Effects of Appropriations on Log (Tuition and Fees Rate) by category and Type of Public University 1996-2012

**Dependent Variable:** Log (In State Tuition and Fees Rate)

|  | AAU | | Research | | Non-Research | |
|---|---|---|---|---|---|---|
|  | OLS | IV | OLS | IV | OLS | IV |
| Log(State Appropriations) | -0.289 | -0.338 | -0.203 | -0.157 | -0.166 | -0.124 |
|  | (0.075) | (0.156) | (0.045) | (0.100) | (0.029) | (0.172) |
| Observations | 548 | 548 | 2,172 | 2,172 | 4,630 | 4,630 |
| Number of Universities | 34 | 34 | 136 | 136 | 293 | 293 |

**Dependent Variable:** Log (Out of State Tuition and Fees Rate)

|  | AAU | | Research | | Non-Research | |
|---|---|---|---|---|---|---|
|  | OLS | IV | OLS | IV | OLS | IV |
| Log(State Appropriations) | -0.116 | 0.405 | -0.080 | 0.193 | 0.001 | 0.130 |
|  | (0.075) | (0.227) | (0.050) | (0.134) | (0.031) | (0.141) |
| Observations | 548 | 548 | 2,172 | 2,172 | 4,630 | 4,630 |
| Number of Universities | 34 | 34 | 136 | 136 | 293 | 293 |
| Partial R-squared |  | 0.267 |  | 0.227 |  | 0.185 |
| F- Statistic |  | 46.16 |  | 76.16 |  | 50.64 |

Notes: Overall state appropriations to higher education used as an instrument are used as an instrument for institution-level state appropriations in the IV regressions. All regressions include year and university fixed effects, a control for the size of the cohort aged 18, and the unemployment rate. Regressions weighted by baseline (1996) enrollment. Standard errors clustered at the university level. Source: Tuition and fee charges from American Survey of Colleges (ASC) 1996-2012.

Table A3 - Effects of Appropriations on Academic Rankings 2003-2017

**Sample: AAU**

| Dependent Variable | Aggregate Score | | Components of the Score | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | HiCi | | N&S | | PUB | |
| | OLS | IV | OLS | IV | OLS | IV | OLS | IV |
| Log(State Appropriations) | 2.916 | 8.051 | 5.797 | 5.833 | 0.399 | 9.192 | 1.871 | 6.971 |
| | (2.831) | (2.621) | (2.821) | (2.510) | (4.341) | (6.067) | (2.196) | (4.901) |
| | | | | | | | | |
| Observations | 336 | 336 | 336 | 336 | 336 | 336 | 336 | 336 |
| Number of Universities | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| Partial R-squared | | 0.355 | | 0.355 | | 0.355 | | 0.355 |
| F- Statistic | | 26.24 | | 26.24 | | 26.24 | | 26.24 |

**Sample: Research Universities**

| Dependent Variable | Aggregate Score | | Components of the Score | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | HiCi | | N&S | | PUB | |
| | OLS | IV | OLS | IV | OLS | IV | OLS | IV |
| Log(State Appropriations) | 1.564 | 2.125 | 1.907 | 2.261 | 3.159 | 5.767 | 1.596 | 4.797 |
| | (1.483) | (1.342) | (1.597) | (1.791) | (2.541) | (2.868) | (1.933) | (2.178) |
| | | | | | | | | |
| Observations | 892 | 892 | 892 | 892 | 892 | 892 | 892 | 892 |
| Number of Universities | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 |
| Partial R-squared | | 0.401 | | 0.401 | | 0.401 | | 0.401 |
| F- Statistic | | 90.31 | | 90.31 | | 90.31 | | 90.31 |

Notes: Overall state appropriations to higher education used as an instrument are used as an instrument for institution-level state appropriations in the IV regressions. All regressions include year and university fixed effects, a control for the size of the cohort aged 18, and the unemployment rate. Source: Academic score data from Shanghai Ranking (2003 to 2017). Aggregated score is used to create the Academic Ranking of World Universities. HiCi score is based on the number of highly cited researchers in 21 broad subject categories; N&S score is based on the number of papers published in Nature and Science; and PUB score is based number of papers indexed in Science Citation Index-expanded and Social Science Citation Index.