



# Measuring the Effects of State-Level Appropriations for Higher Education on Graduation Rates

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## Purpose

In recent years the amount of funding that postsecondary institutions receive from state governments has drastically been reduced. As a result institutions are implementing cost preventive and revenue generating measures, which could have an impact on overall student success.

## Introduction

- i. State-level funding for higher education has long been volatile, and two aspects of state-level funding for higher education are responsible for this volatility:
  - i. State-level funding is categorized as discretionary
  - ii. State budgets are tied to the larger national and international economies
- ii. Many institutions' level of state funding was greatly impacted by the Great Recession of 2007-2009
- iii. As more students enroll in higher education, there is less funding available per student at an institution, leaving students with reduced financial aid, academic support services, and student services

## Research Question

Do changes to state appropriations for higher education, have a direct impact on the graduation rates of that state?

## Research Design

- i. Theoretical framework by McLendon, Tandberg, & Hillman (2014) defining four conditions that can explain changes to state funding of higher education (economic conditions, demographic pressures, features of state political systems, and postsecondary education policy climate)
- ii. Driscoll-Kay Fixed Effects model was chosen to help account for violations of OLS Regression assumptions (i.e. Homoscedasticity, Serial Correlation, and Cross-Sectional dependence)
- iii. Fixed-effects were included to account for the yearly change in state appropriations

## Variables

600 Observations

- 50 States
- 12 Years (2002-2013)

Dependent Variable (DV):

Graduation Rates (*The Chronicle of Higher Education* College Completion Project)

- 4-Year Public Institutions
- Average 6-Year Cohort Graduation Rates
- *The Chronicle of Higher Education* College Completion Project

Primary Independent Variable (IV):

State Appropriations (Delta Cost Project)

- 2002-2013 Appropriations for States

Control Variables:

- Median Household Income (U.S. Census Bureau)
- State Population (U.S. Census Bureau)

Interaction Variable:

- Examined the effect that State Median Household Income has on the relationship between DV and IV

## Results

Variables	Observations	Mean	SD	Range	Beta-Coefficient
Graduation Rate	600	52.79%	9.08%	21.3%-73.6%	-
State Appropriations	600	\$941,000,000	\$100,000,000	\$3,250,000-\$6,120,000,000	-0.410*
Median Household Income	600	\$48,517	\$8,222	\$29,359-\$72,472	-0.768*
State Population	600	6,034,060	\$6,658,138	126,300-38,300,000	-0.0344***
Interaction Variable (Median Household Income on State Appropriations)	600	217.61	11.49	165.25-246.78	0.0372*
Year Fixed-Effects	-	-	-	-	Yes

\* p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001

## Discussion

State appropriations are one small factor in the complicated process, and future research must include more aspects implicated in the framework. Additionally, the time period in which this study examined was heavily influenced by The Great Recession, and therefore tuition and fees, as well as financial aid were most likely major factors in this relationship as well. The results observed when looking at the interaction term support this interest, as states with lower incomes were more heavily influenced by the drop in appropriations. Therefore, future studies should examine a broader time period, and include the impact of both financial aid, and the rise in tuition and fees.

## Key Findings

State appropriations are not the most important variable to weigh when examining changes to graduation rates.

When examining the relationship between median household income and state appropriations, and how it affected the overall graduation rate, it became evident that there are other variables affecting graduation rates. Furthermore, these variables were most likely having a stronger effect on the graduation rate of students, indicating other more important factors to consider.

Financial aid packages could be a large factor in examining graduation rates.

Throughout the Great Recession financial aid programs, both federal and state-level, were cut to help alleviate some of the budgetary issues faced by governments. As students heavily rely on such programs to attend college, the effects these cuts have could likely be very strong.

Tuition and fees can greatly impact students' ability to graduate from college.

The cycle that institutions face during economic recessions typically ends with a sustained increase in tuition and fees. If the students are being given less aid, and then are faced with an increased price, they may face more boundaries to succeed.

## References

Barr, A., & Turner, S. E. (2013). Expanding enrollments and contracting state budgets. *The Annals of the American Academy of Political and Social Science*, 650, 146-192.

Bureau of Labor Statistics (2012). The recession of 2007-2009. BLS Spotlight on Statistics (Report). Retrieved on October 14, 2017 from: <https://www.bls.gov/sp/spotlight/2012/recession> (pdf/recession\_bls\_spotlight.pdf).

The Chronicle of Higher Education (2014). 25 years of declining state support for public colleges (Data File). Retrieved on October 14, 2017 from: <http://www.chronicle.com/interactives/statesupport>

Dayle, W. (2013). Playing the numbers: state funding for higher education: situation normal? *Change: The Magazine of Higher Learning*, 45 (4), 58-61.

Gershenson, S., Ward Hood, D., & Zhan, M. (2016). The role of first-semester GPA in predicting graduation rates of underrepresented students. *Journal of College Student Retention: Research, Theory & Practice*, 17(4), 469-488. doi:10.1177/1521025115579251

Grillo, M. C., & Leist, C. W. (2013). Academic support as a predictor of retention to graduation: New insights on the role of tutoring, learning assistance, and supplemental instruction. *Journal of College Student Retention: Research, Theory & Practice*, 15(3), 387-408. doi:10.2190/CS.15.3.a

Hoeckle, 2007. Robust standard errors for panel regressions with cross-sectional dependence. *Stata Journal*, StataCorp LP, vol. 7(3), pages 281-312, September.

Hoffman, J. P. (2016). Regression models for categorical, count, and related variables: an applied approach. Oakland, California: University of California Press.

Levy, T. A., Fowles, J., Tandberg, D. A., & Hillman, N. W. (2017). U.S. state higher education appropriations: Assessing the relationships between agency politicization, centralization, and volatility. *Policy and Society*, 34(1), 16-33. doi:10.1080/14464025.2017.1290201

Li, A. Y. (2017). Dramatic declines in higher education appropriations: state conditions for budget punctuations. *Research in Higher Education*, 59(4), 395-429.

McLendon, M. K., Tandberg, D. A., Hillman, N. W. (2014). Financing college: opportunity factors influencing state spending on student financial aid and campus appropriations, 1990 through 2010. *The ANNALS of the American Academy of Political and Social Science*, 655(1), 143-162.

National Center for Education Statistics. (2016). (Percentage of first-time, full-time degree-seeking undergraduates retained at 2- and 4-year degree-granting institutions, by institution level, control of institution, and acceptance rate: 2014 to 2015). *The Condition of Education*. Retrieved from [https://nces.ed.gov/ipeds/data/indicators\\_ctr.asp](https://nces.ed.gov/ipeds/data/indicators_ctr.asp).

Pattan, W., & Roberts, H. (2015). Higher education in Ohio: high tuition, low aid, too little state investment. *Policy Matters Ohio*. Cleveland, OH. Retrieved on October 14, 2017 from: <http://files.eric.ed.gov/fulltext/E0573634.pdf>.

Rizzo, M. (2004). State preferences for higher education spending: a panel data analysis, 1977-2001. In Ehrenberg, Ronald G. (Ed.). (2004). *What's happening to public higher education?* (2-36) Westport, CT: Praeger Publishers.

Ryan, J. F. (2004). The relationship between institutional expenditures and degree attainment at baccalaureate colleges. *Research in Higher Education*, 45(2), 97-114.

Shireman, R. (2009). College affordability and student success. *Change*, 41(2), 54-56.

State Higher Education Executive Officers (2009). *State Higher Education Finance FY 2008*. State Higher Education Executive Officers. Retrieved on October 14, 2017 from: <http://files.eric.ed.gov/fulltext/E0586259.pdf>.

Texas Higher Education Coordinating Board. (1996). *Baccalaureate graduation rates*. Retrieved on December 1, 2017 from: <https://eric.ed.gov/?id=E0401802>

The College Board. (2016). *Trends in college prices 2016*. Retrieved on November 29, 2017 from: [https://trends.collegeboard.org/sites/default/files/2016-trends-college-pricing-web\\_0.pdf](https://trends.collegeboard.org/sites/default/files/2016-trends-college-pricing-web_0.pdf)

Ulrich-Schad, J. D., Henry, M., & Safford, T. G. (2013). The role of community assessments, place, and the great recession in the migration intentions of rural Americans. *Rural Sociology*, 78(3), 371-398. doi:10.1111/ruso.12016

Zhang, L. (2009). Does state funding affect graduation rates at public four-year colleges and universities? *Educational Policy*, 23 (5), 714-731.