

An Analysis of College Graduation Rates

Daniel Johnson

I. Abstract

Not only is an institution's graduation rate closely looked at by prospective students, it also can have an impact on the amount of public funding the school receives. Because of this, institutions are always looking for ways to improve the rate at which their students graduate. The purpose of this presentation is to estimate a model that will evaluate which factors have the greatest effect on graduation rates among private, baccalaureate institutions in the United States. The explanatory variables will be grouped into three categories: cohort characteristics, institutional characteristics, and institutional actions. Using panel data, the effects of each of these variables were tested and the results suggest that while some influential factors are outside of the institutions control, there are actions that schools can take to improve their graduation rates.

II. Empirical Model and Variables

Graduation Rate = $f(\text{Cohort characteristics}_{it}, \text{institutional characteristics}_{it}, \text{institutional actions}_{it})$

- Cohort Characteristics

- Race

- Measured as the percentage of non-white students in the 2010/11, 2011/12 and 2012/13 cohorts
 - Denoted as $RACE_{it}$

- Gender

- Measured as the percentage of female students in the 2010/11, 2011/12 and 2012/13 cohorts
 - Denoted as $GENDER_{it}$

- Socioeconomic Group

- Calculated as the percentage of students receiving Pell grants in the 2010/11, 2011/12 and 2012/13 cohorts
 - Denoted as $PELL_{it}$

- Prior Economic Achievement

- Calculated as the 75th percentile ACT score among students in the 2010/11, 2011/12 and 2012/13 cohorts
 - Denoted as ACT_{it}

II. Empirical Model and Variables cont.

- Institutional Characteristics

- Enrollment

- Measured as the average number of full-time equivalent students at each institution between the 2010/11 and 2016/17 academic years
 - Denoted as $ENROLL_{it}$

- Location

- Dummy variable accounting for the location of the institution – 1 for urban areas, 0 for rural areas
 - Denoted as $URBAN_{it}$

- Graduate Programs

- Dummy variable accounting for whether or not a graduate program is offered – 1 if yes, 0 if no
 - Denoted as $GRAD_PRGM_{it}$

- Institutional Actions

- Instructional Expenditures

- Defined as the expenses related directly to instruction, such as Professor salaries
 - Denoted as $INST_EX$

- Academic Support Expenditures

- Defined as the expenses that support the missions of the institution, such as libraries, museums, and media services
 - Denoted as $SUPP_EX$

- Student Service Expenditures

- Defined as the expenses that contribute to student's well-being, as well as their development outside the classroom
 - Denoted as $SERV_EX$

III. Hypotheses

- Cohort Characteristics

- RACE_{it} (-)
- GENDER_{it} (+/-)
- PELL_{it} (-)
- ACT_{it} (+)

- Institutional Characteristics

- ENROLL_{it} (+)
- URBAN_{it} (+)
- GRAD_PRGM_{it} (+/-)

- Institutional Actions

- INST_Ex_{it} (+)
- SUPP_Ex_{it} (+)
- SERV_Ex_{it} (+)

IV. Data

- Panel data was found for the graduating classes of 204 private, arts & science focused baccalaureate institutions for the years of 2015, 2016, and 2017
- All data was collected from the integrated postsecondary education data system, or IPEDS.
 - [The Integrated Postsecondary Education Data System](#)

V. Empirical Results

Variable	Coefficient (T-stat)
Constant	-4.883 (-0.661)
RACE _{it}	0.023 (0.797)
GENDER _{it}	0.023 (0.877)
PELL _{it}	-0.234 (-5.298)*
ACT _{it}	2.391 (9.655)*
ENROLL _{it}	0.520 (8.6403)*

Variable	Coefficient (T-stat)
URBAN _{it}	-0.925 (-1.337)
GRAD_PRGM _{it}	-1.603 (-2.394)*
INST_EX _{it}	0.372 (3.730)*
SUPP_EX _{it}	0.065 (0.245)
SERV_EX _{it}	-0.047 (-0.234)
Adjusted R-Squared	0.833

* Indicates statistical significance

V. Empirical Results cont.

Variable	Coefficient (T-stat)
Constant	-3.176 (-0.445)
PELL _{it}	-0.217 (-5.622)*
ACT _{it}	2.321 (9.630)*
ENROLL _{it}	0.527 (9.275)*
GRAD_PRGM _{it}	-1.682 (-2.458)*
INST_EX _{it}	0.439 (5.491)*
Adjusted R-Squared	0.835

* Indicates statistical significance

VI. Conclusion

It can be concluded that the prior academic achievement of the entering cohort has the greatest impact on postsecondary graduation rates, while the institutions size and number of students that receive Pell grants also has an effect. Surprisingly, the implementation of graduate programs actually has a negative effect on undergraduate graduation rates. On top of this, we can see that institutions can influence their own graduation rates in the short term by increasing their expenditures on instruction.