



Budget Model

Student Ability and Post-Secondary Outcomes

***Series on community colleges:** The Biden-Harris Administration has advocated for providing free community college. This series of briefs takes a deeper dive into the world of community colleges: who attends, who transfers, who graduates, who achieves high marks, and what factors seem to matter for each. In doing so, we hope to shed light on how some students may benefit from this policy, others may not, and what factors form this partition. More briefs can be found [here](#).*

Summary: Student performance in high school is a strong predictor of future success at college, including performance at two-year and four-year colleges, the likelihood of transferring from two-year colleges to four-year colleges, and eventually obtaining degrees.

Key Points

- For students who attend a two-year college, a student with a one-standard deviation larger high school GPA will, on average, achieve a 0.33 standard deviation larger GPA at the two-year college and is 10 percentage points more likely to earn an associate degree above the 32 percent average.
- For students who attend a two-year college, a student with a one-standard deviation higher grade point average in high school: (i) is 14 percent more likely to transfer to a four-year institution, (ii) conditional on transferring, achieves a 0.33 standard deviation higher GPA at four-year college, and (iii) conditional on transferring, is 10 percentage points more likely to earn a bachelor's degrees above the 62 percent average.
- For students who attend a four-year college, a student with a one-standard deviation greater high school GPA, on average, achieves a 0.56 standard deviation greater GPA at four-year college and earns a bachelor's degree with probability 17 percentage points above the 66 percent average. This student is also 3 percentage points less likely than the 25 percent average to take coursework at a two-year institution.

Introduction

A common metric used for gauging student ability is the grade point average (GPA)---the culmination of all coursework. But just how relevant is GPA for college success? Using data from the National Longitudinal Survey of Youth, we can investigate differences in post-secondary education outcomes, including performance in college, likelihood to transfer between two-year and four-year college and graduation rates.

Radunzel and Noble (2012) found, using a non-representative sample of community college enrollees, that students with higher GPAs in high school more often receive better grades, transfer to four-year institutions, and earn associate or bachelor's degrees. Belfield and Crosta (2012) estimated that student GPA in high school explains 21 percent of the variation in community college GPAs. Feldman (1993) found that a one-point increase in high school GPA was associated with a 0.46 factor decrease in community college dropout rate. The analysis presented in this brief contributes to this literature by highlighting the importance of high school performance using a representative sample of high school students (NLSY97) as well as controlling for observable characteristics of students that may be correlated with GPA.

Using the NLSY97 dataset, we track each respondent's academic pathway after high school. We identify whether a student first enrolls in a two-year institution, a four-year institution, or neither. Additionally, we observe whether that same student enrolls in a second university, or a third, etc. Beyond enrollment information, we see what degrees each respondent earned and for a subset of students, their grade point averages at each institution. From this information, we can construct our measures of student success: grade point averages, transfers/enrollment in other colleges, and graduating with degrees. Our main variable of interest is students' grade point averages in high school, which we convert to standardized z-scores (with a mean of zero and a standard deviation of one).

High School GPA and Two-Year Performance

First, we focus on outcomes related to two-year institutions and their correlation with high school GPAs. The first column of Table 1 reveals that students with one-standard-deviation---equivalent to 0.59 units---greater GPAs are nearly 10 percentage points less likely than the 35 percent sample average to start at a two-year institution, highlighting that probabilistically lower-GPA students are more likely to attend community college. The second and third columns examine students' performance conditional on first enrolling in community college. Higher achieving high school graduates receive higher marks in college---with one-standard-deviation greater GPAs translating into 0.46-standard-deviation greater community college GPAs. Additionally, high-performing high school graduates are the ones most likely to attain a degree. While about one-third of students who first attend community college earn an associate degree, students with one-standard-deviation lower GPAs in high school are 10 percentage points less likely than the 32 percent average to do so, a substantively large disparity.

Not only do high-achieving high school graduates perform at a high level in community colleges, but they also are the ones most likely to funnel upward to four-year institutions. The fourth column reveals that, while 37 percent of students who start at community college enroll in a four-year institution, the probability differs greatly by high-school performance---with one-standard-deviation greater GPAs in high school being associated with a 14-percentage-points greater probability of doing so. As Lee and Frank (1990) posit, in researching the likelihood that students transfer from two- to four-year institutions, "The most able, most academically advantaged, and

least socially disadvantaged students are the ones who use these institutions as a passageway to continued higher education, not those with fewer resources or fewer skills or both.”

The last two columns of Table 1 reveal the persistence of student ability---as proxied for by high school GPA--- among students who do to transfer from community college to four-year programs. Within this group of students, those with one-standard-deviation greater high school GPAs achieve 0.33-standard-deviation greater GPAs at these four-year institutions and are 10 percentage points more likely than the 62 percent average to complete their degree. Though 62 percent of transfers end up completing a bachelor’s, highlighting the overall success community college students whom do transfer have.

Table 1: Correlation between High School GPA and Two-Year Outcomes

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	First enroll two-year institution					
	First enroll two-year institution	Z-score GPA two-year institution	Earn Associates degree	Enroll in four-year institution	Enroll in four-year institution	
					Z-score GPA four-year institution	Earn Bachelors degree
Z-score high school GPA	-0.097***	0.461***	0.100***	0.143***	0.329***	0.102***
	(0.010)	(0.049)	(0.018)	(0.019)	(0.097)	(0.032)
Sample mean	0.35	0.00	0.32	0.37	-0.01	0.62
Respondents	3575	689	1294	1294	238	438
Sampling weight (millions)	9.89	1.88	3.42	3.42	0.72	1.26
Adjusted R-squared	0.07	0.19	0.05	0.07	0.17	0.04

Notes: Data are from the publicly available National Longitudinal Survey of Youth 1997. Dependent variables in columns 1, 3, 4, and 6 reflect indicator variables. Each regression includes the logarithm of household income in 1996 along with fixed effects for gender–ethnicity, gender–birthyear, ethnicity–birthyear, and census region interacted with relative location with a metropolitan statistical area. Regressions are weighted according to representative panel sampling weights. Coefficients are presented with robust Huber–White standard errors in parentheses immediately below.

High School GPA and Four-Year Performance

For completeness, we repeat the same exercise relating high school performance to outcomes related to four-year institutions. We find that students with one-standard-deviation, or 0.59 units, greater GPAs in high school are roughly 23 percentage points more likely than the 47 percent average to first enroll in a four-year college

(Column 1). Conditional on enrolling in a four-year college, these students enjoy on average 0.56-standard-deviations higher college GPAs (Column 2) and are 17 percentage points more likely than the 66 percent average to receive a bachelor's degree (Column 3), a large effect relative to the average graduation rate of 66 percent.

We also see that the students who start out in a four-year program but later take classes at or transfer to a community college on average performed worse in high school, though such an event is not uncommon among four-year students (25 percent probability). Students who first enroll in four-year college but with one-standard-deviation lower high school GPAs are roughly 3 percentage points above the 25 percent average to enroll in a community college (Column 4). Such students perform markedly better in community college, with 0.53-standard-deviation higher GPAs (Column 5), but interestingly, are not more likely to complete an associate degree. This could, for instance, reflect the tapping of community college as a resource for access to cheaper---and potentially more obtainable---credits for completing a bachelor's degree, rather than pursuing a community college degree.

Table 2: Correlation between High School GPA and Four-Year Outcomes

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	First enroll four-year institution					
	First enroll four-year institution	Z-score GPA four- year institution	Earn Bachelors degree	Enroll in two-year institution	Enroll in two-year institution	
					Z-score GPA two-year institution	Earn Associates degree
Z-score high school GPA	0.235*** (0.008)	0.553*** (0.043)	0.170*** (0.016)	-0.033** (0.016)	0.532*** (0.106)	-0.006 (0.030)
Sample mean	0.47	0.00	0.66	0.25	0.01	0.19
Respondents	3575	926	1541	1541	218	385
Sampling weight (millions)	9.89	2.88	4.63	4.63	0.67	1.16
Adjusted R-squared	0.26	0.24	0.11	0.01	0.19	0.01

Notes: Data are from the publicly available National Longitudinal Survey of Youth 1997. Dependent variables in columns 1, 3, 4, and 6 reflect indicator variables. Each regression includes the logarithm of household income in 1996 along with fixed effects for gender–ethnicity, gender–birthyear, ethnicity–birthyear, and census region interacted with relative location with a metropolitan statistical area. Regressions are weighted according to representative panel sampling weights. Coefficients are presented with robust Huber–White standard errors in parentheses immediately below.

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