PPIC | PUBLIC POLICY INSTITUTE OF CALIFORNIA

30 YEARS

The Future of Higher Education Enrollment in California

Technical Appendix

CONTENTS

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Appendix A. Projection Models

Our approach relies on multiple sources of data and multiple models. We select a preferred projection based on our analytical and subjective assessment of the underlying historic and projected trends in college enrollment. We adjust the parameters of our preferred model to estimate its sensitivity to alternative scenarios. Below we describe the data, methods, and results of our projection models.

Data

We use multiple data sets to develop our projection models. Data sources include:

- College enrollment: Integrated Postsecondary Education Data System (IPEDS), and the institutional research offices of UC, CSU, CCC, and CDE.
- Base populations: American Community Survey (ACS), Department of Finance (DOF)
- Population projections: DOF, US Census Bureau
- K-12 and high school graduate projections: DOF (including high school graduate projections).

Each of these data sets is available on an annual basis, and most also include demographic characteristics, including age, gender, and race/ethnicity. Our focus on higher education enrollment is on fall term headcounts. In two cases we modified the data. First, we adjusted the DOF population projections to be consistent with the latest counts from the Census Bureau. Second, we extended the DOF high school graduate projections (as described below).

Methods

We use two primary models for enrollment projections:

- Participation rate model
- Grade progression model [Note to reviewers: the results of this model are similar to those of the participation model, and will be included in this appendix – not yet completed]

A critical input in any projection is the estimation of past trends and a determination of whether those trends will persist into the future. The ideal scenario is one in which past trends are unchanging or are changing in a consistent manner. In that scenario, forecasters will generally continue those trends into the future, with perhaps some moderation. The pandemic has thrown a wrench into recent trends, rendering the current moment one of great uncertainty. Our primary assumption in all our models is that the pandemic introduced a one-time shock to college enrollment and that future changes will return to pre-pandemic patterns.

Participation rate model

In a participation rate model, temporal trends in past participation rates (college enrollment rates) by age, gender, and race/ethnicity are used to project future enrollment. We develop separate models for each college system (UC, CSU, CCC, and private non-profits). We focus on undergraduate fall enrollment. Specifically, participation rates p for year t for demographic group x are measured by:

$$p_{t,x} = \frac{e_{t,x}}{n_{t,x}}$$

where $e_{t,x}$ is the number of students from demographic group x enrolled in year t, and $n_{t,x}$ is the number of students from demographic group x enrolled in year t.

The first step is to develop past trends in participation rates by system and demographic group. We develop rates for fall terms from 2010 to the latest year available.

The second step is to project future participation rates based on past trends. There is some subjectivity to the projection of trends. For example, UC did not experience a pandemic decline in participation rates, while CCC had sharp declines. UC has had consistent increases in participation rates over the past 15 years (with some variation from year to year), whereas CCC has had uneven participation rates with declines pre-dating the pandemic and a sharp decline during the pandemic. For UC, our projection model continues average annual changes in participation rates of the past. For CCC, our projections use trends through fall 2019 (prior to the pandemic) to develop projected annual changes in future trends. Those projected changes are applied to fall 2022 participation rates. In essence, for CCC our projection assumes that the pandemic was a one-time phenomenon.

The final step is to multiply the participation rates by DOF population forecasts (by age, gender, race/ethnicity, and year). The product is projected fall enrollment.

Grade progression model

In a grade progression model, trends in past progression rates across time and grades are used to project future enrollment. Total enrollment for a school or college (or system) is the sum of each grade's enrollment at a point in time. For each college system (UC, CSU, the community colleges, and private non-profits), we focus on undergraduate fall enrollment only. Progression rates are related to persistence rates, but differ in that new students may enter at any point (and are counted in the numerator). Specifically, progression rates p for year t for grade x are measured by:

$$p_{t,x} = \frac{n_{t,x}}{n_{t+1,x+1}}$$

where $n_{t,x}$ is the number of students enrolled in year t and grade x.

Progression rates are a function of changes in enrollment from one grade to the next, which occurs as students leave or enter school or college. They are not strictly a cohort measure; for example, students in grade x+1 could include students who moved into the system from elsewhere and were not present in grade x.

We employ the following steps to estimate and project higher education enrollment:

1. We develop progression rates for first-time first-year college enrollment as the ratio of first-time first-year college students in fall of year t to public high school graduates in academic year t-1 to t. Again, this is not strictly a cohort measure, as the numerator includes students from out-of-state or from private institutions as well as those who might have not gone to college immediately after high school. Notably, it also at four-year colleges it also includes transfer students. Progression rates from sophomore to junior year can exceed 1.0 for this reason.
2. Progression rates are projected into the future based on trends in past progression rates. In general, progression rates have been increasing and our projections allow for continued but moderated increases.
3. Projected cohorts of public high school graduates are developed from DOF's K-12 projections of high school graduates. The second relies on population projections. We use DOF's 2023 series.

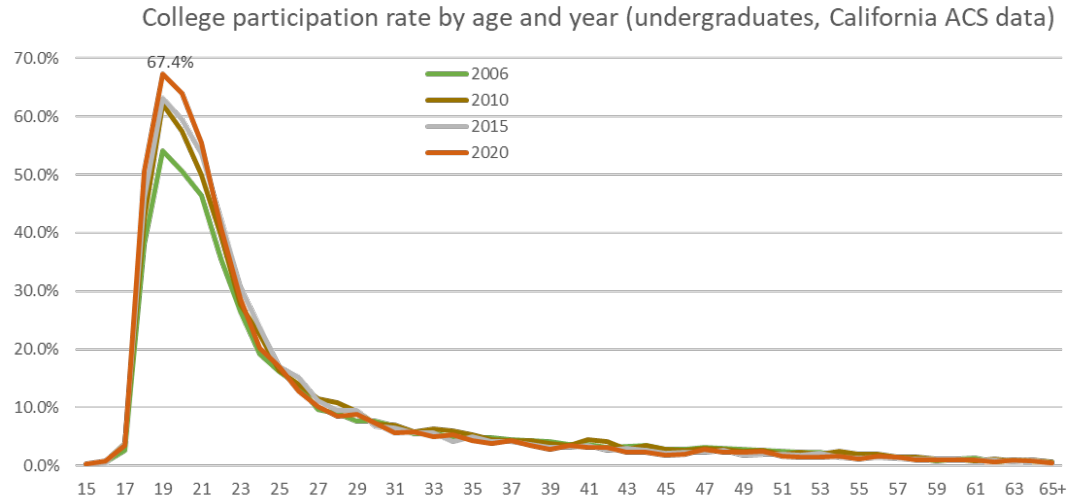
The results of the progression rate model are similar to those of the participation rate model. One advantage of the progression rate model is that we can continue it to college completion (earning a bachelor's degree).

Appendix B. Additional Charts and Tables

The vast majority of students are less than 30 years old. College participation rates have increased the most at these young ages (Figure B1). The young age of college students is also true across systems (Table B1).

FIGURE B1

Most college students are 18 to 24 years of age



SOURCE: PPIC based on ACS data accessed via IPUMS

NOTE: The participation rate is the share of the population enrolled in college as an undergraduate.

TABLE B1.

Across higher education systems, the vast majority of students are young

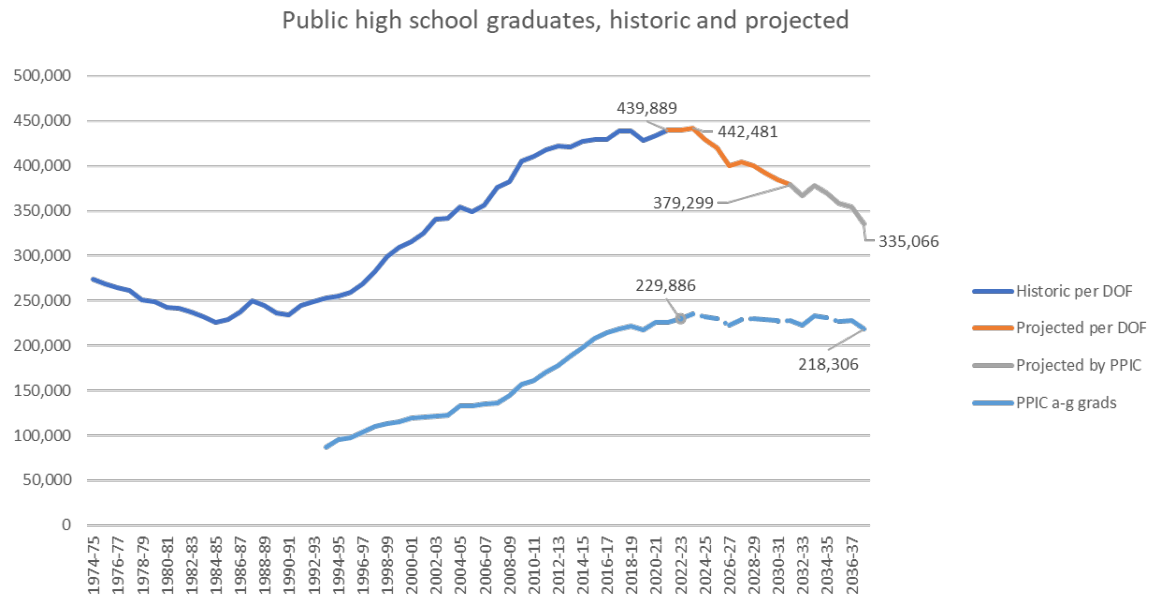
	Percent of students aged 29 or less
UC	99%
CSU	92%
PNP	82%
CCC	77%

SOURCE: IPEDS, Fall 2021

Most students who go to college do so soon after graduating from high school. Thus, the number of high school graduates is of great importance in determining incoming college enrollment. As shown in Figure B1, projections suggest a decline in the number of high school graduates. But our own projections of A–G graduates, those who have completed the college prep courses required by UC and CSU, suggest a relatively stable supply of those graduates.

FIGURE B2

Education projections suggest little or no growth among high school graduates



SOURCE: CDE, DOF and PPIC.

NOTE: See appendix for details.

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