
LANDSCAPES OF PLAUSIBLE FUTURES

So far we have discussed the implications of trends, assumptions, and levers, considered one at a time. This chapter discusses the “landscapes of plausible futures” that we created to show how the interaction of these factors will affect the future of California higher education.

FUNDING AND PRODUCTIVITY TRENDS ARE KEY

A key conclusion of our study is that California’s ability to provide widespread access to a college education over the next 15 years is dominated by three key questions: How much funding will the state provide for higher education? How feasible are significant improvements in productivity? Can a high-fee/high-aid system of public education preserve access for California’s diverse population? We present the first part of our argument here, showing that any future access deficits depend strongly on what happens to allocations from the state general fund and on the level of improvements in efficiency. For simplicity, we focus on UC first, then broaden the discussion to include CSU and the CCs.

Figure 9 shows the UC access deficit in 2014 for 25 scenarios, each with its own set of assumptions about future levels of state funding for higher education in California and about feasible improvements in efficiency, the first of the two types of productivity improvements we considered. This figure represents each scenario with a colored box that shows the degree of access deficit in 2014 for a particular pair of assumptions about funding and efficiency improvements.

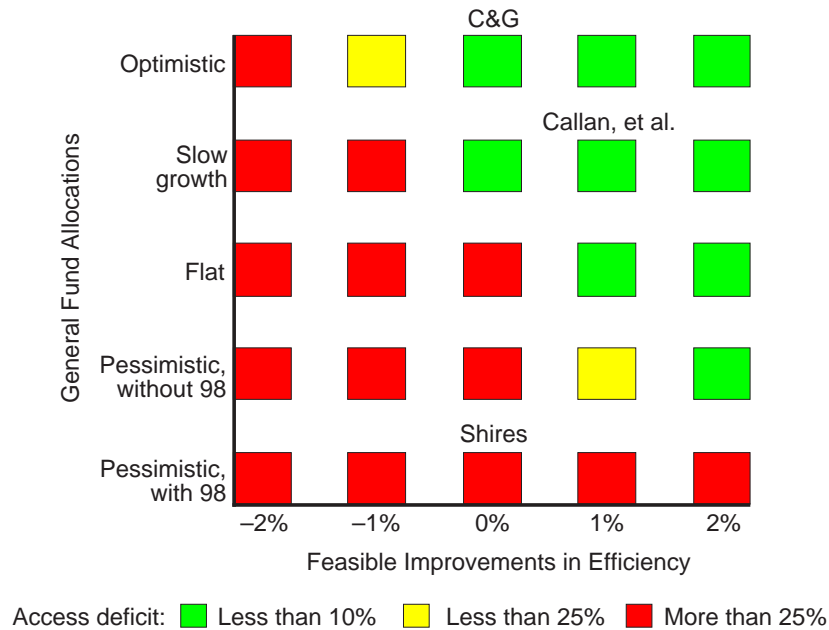


Figure 9—UC Access Deficits in 2014 for 25 Scenarios with Different Assumptions About State Funding and Feasible Efficiency Improvements

What is shown is a summarization of many line graphs of the type presented in Chapter 2. For instance, the boxes labeled “C&G” and “Shires” in Figure 9 correspond, respectively, to the “optimistic” and “pessimistic” lines in Figure 4.

It is clear from Figure 9 that UC cannot maintain current levels of access through 2014 if allocations from the state general fund decrease or if efficiency improvements do not offset cost increases for the inputs to higher education (i.e., if efficiency does not increase by 1% or 2% annually). With the pessimistic allocation of state funds, UC can maintain its performance only with very large increases in efficiency, and then only if the allocation of state funds is not subject to Proposition 98 constraints. With Proposition 98 constraints, UC can make up the funding shortfall in none of our scenarios. On the other hand, if efficiency improvements are insufficient for offsetting cost

increases for the inputs to higher education, even the most optimistic general fund scenarios cannot prevent an access deficit and maintain current levels of degree production at UC.

It is useful to compare our results with projections made by others looking at the future of California higher education: (1) Shires (1996) of the California Policy Institute, (2) Cooperud and Geiser (1996) of the UC Research and Planning Department, and (3) Callan, et al. (1996) of the California Higher Education Policy Center. We use these comparisons to make two important points. First, the comparisons help validate our model of the California higher education system. Since we can reproduce the results of these other studies, our model must be reasonably consistent with those currently in use. Second, we show that these different projections are not primarily caused by differences in data and analytic methodology. Rather, the different projections embody fundamentally different assumptions about the future. It is not currently possible (nor may it ever be possible) to resolve these differences with available data and models. Thus, the divergent projections found in today's debate are to be expected and are not likely to be resolved anytime soon.

Shires projects a pessimistic future for California higher education. He assumes that real costs will remain constant with inflation, that state funding for higher education will drop by roughly 1% per year, and that student demand will grow by about 25% over the next 10 years. As shown in Figure 9, the Shires projections correspond to our scenario with “pessimistic, with 98” funding and no change in efficiency. Shires bases his pessimistic assumptions about state funding for higher education on an analysis of future demands on the state budget. He notes that 82% of the state budget currently goes to K-14 education (K-12 plus the CCs), corrections, and health and welfare—all areas that are increasing (and in some cases are mandated by the state constitution or federal government).¹ As shown in Figure 9, our analysis agrees with that of Shires: if these trends continue, they will cause very severe access deficits at UC.

¹In 1996, federal welfare reform legislation replaced federally mandated welfare entitlements with block grants to the states. It is unclear how this change will affect California's overall welfare spending over the next 20 years.

Copperud and Geiser (1996) prepared enrollment estimates based on what they see as the best, worst, and most likely case allocations from the state general fund. The worst-case projections are similar to those of Shires. The most likely case assumes undergraduate enrollments based on 1995 participation rates, productivity improvements that keep up with inflation, and the state adhering to its intent (expressed in the Supplemental Report of the 1994 Budget Act) to increase annual funding to UC and CSU by the marginal cost of educating additional enrolled students. These projections correspond to our scenario with an optimistic general fund allocation and no change in efficiency. As shown in Figure 9, our analysis agrees with the analyses of Copperud and Geiser: these trends, if they continue, will allow UC to avoid serious access deficits.

Callan, et al. (1996) propose a “new compact for shared responsibility” to enhance opportunity in California higher education. They advocate increasing state allocations to higher education as the number of students grows, but argue that productivity improvements can be used to keep this funding from rising as fast as the student population. They suggest a combination of strategies that UC, CSU, and the CCs could use to provide the same or higher levels of educational opportunity while reducing operating costs by about 1% annually. Their projections thus suggest that state funding needs to increase 1.5% annually to accommodate their projected 2.5% annual growth in student population. Overall, their projections correspond to our scenario with slow growth in general fund allocations and 1% annual improvements in efficiency. As shown in Figure 9, our estimates agree with those of Callan, et al.: in this particular scenario, UC avoids serious access deficits.

LEVEL OF DEMAND IS LESS IMPORTANT TO ACCESS

We have argued that access to California higher education in 2014 depends strongly on state funding and feasible levels of efficiency improvements. We now show that access is relatively insensitive to uncertainty about another factor often at the center of recent policy debates—the growing demand for higher education among students. In particular, the results of our analysis suggest that (1) whether or not the precise level of student demand is important depends strongly on trends in state funding and efficiency improvements, and

(2) no plausible assumptions about student demand can save the situation if either funding or efficiency trends are adverse.

Figure 10 shows the UC access deficit in 2014 for 100 scenarios. As in Figure 9, each scenario has a different set of assumptions about future state funding and feasible efficiency improvements, but this time an additional dimension—student demand for higher education—has been added in order to examine the effect of three exogenous trends. As in Figure 9, the lower left-hand corner shows scenarios with low efficiency improvements and pessimistic general fund allocations, and the upper right-hand corner shows scenarios with large efficiency improvements and optimistic general fund allocations. What has been added is how the access deficit varies with the

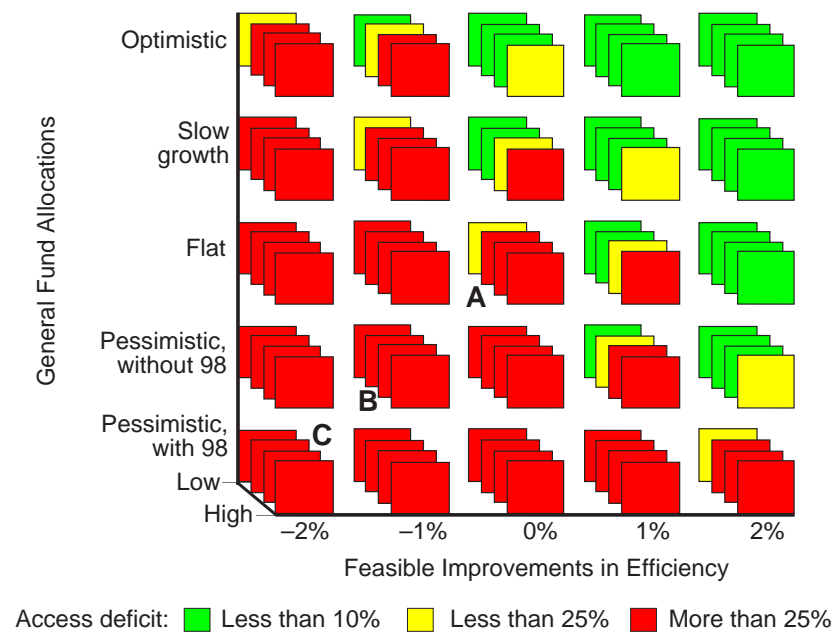


Figure 10—UC Access Deficits in 2014 for 100 Scenarios with Different Assumptions About State Funding, Feasible Efficiency Improvements, and Student Demand

level of student demand, which can be seen by looking at the “stacks” of four boxes within each column. The boxes at the front of the stacks (i.e., the boxes closest to the reader) show scenarios with high student demand; the boxes at the back of the stacks (i.e., those furthest from the reader) show scenarios with low student demand. The boxes second from the back represent the scenarios of Figure 9.

Fourteen of the 25 stacks in Figure 10 are either all red or all green. In these 56 scenarios, the level of student demand makes little difference to the ultimate outcome.² Bad situations remain bad and good situations remain good, independent of assumptions about how many students seek admission to UC. However, in four stacks, the access deficit goes from small (green) to large (red) as student demand increases. In these cases, student demand significantly impacts the access deficit.

We assert that the uncertainty in student demand has less impact on access deficit than does the uncertainty in state funding and in potential productivity changes. The reason for this is that demand is constrained by demographics (virtually all the members of the class of 2014 have already been born), whereas (1) state funding of higher education, which has dropped significantly over the past 20 years, will only avoid continuing to drop over the next 15 years if other long-standing trends are broken, and (2) productivity, which has improved significantly over the last decades in numerous sectors of the economy, might also improve in higher education.

EFFECTIVENESS TRENDS ARE IMPORTANT TO MAINTAIN

We also found that access to CSU and the CCs in 2014, like access to UC, depends strongly on assumptions about future state funding and feasible increases in efficiency and is relatively less sensitive to assumptions about student demand. Figure 11 shows the importance of state funding and efficiency improvements for CSU. However, its third dimension differs from the one used in Figure 10. Rather than display the effects of student demand on access deficits, it shows the

²The level of student demand does change our estimates of the access deficit in these cases, but not by enough for the numeric thresholds represented by the colors to be crossed.

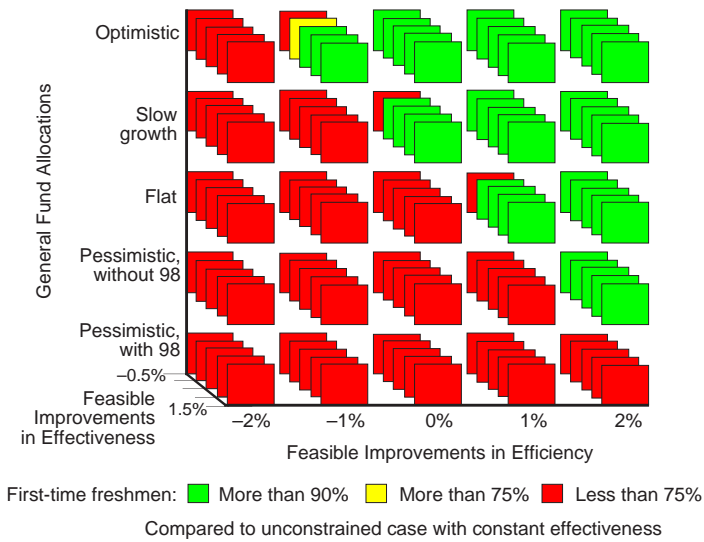
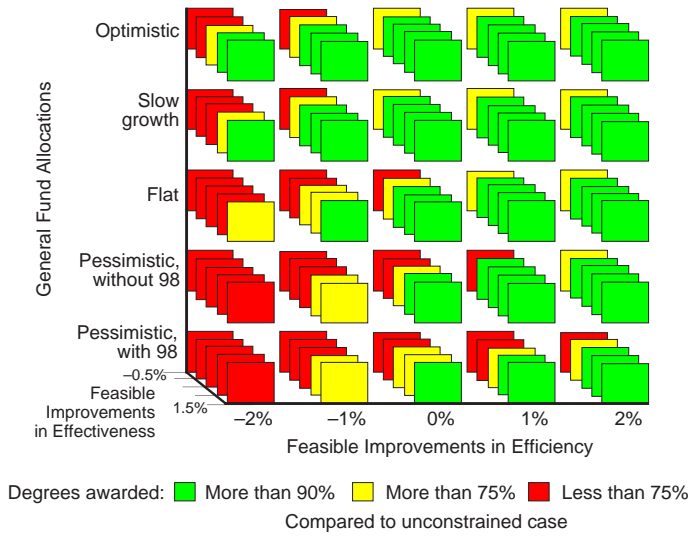


Figure 11—CSU Bachelor’s Degrees Awarded and First-Time Freshmen in 2014 for 125 Scenarios with Different Assumptions About State Funding, Feasible Efficiency Improvements, and Feasible Effectiveness Improvements

effects of feasible improvements in effectiveness, our second measure of productivity. What it demonstrates is that improvements in effectiveness (1) can significantly affect the number of CSU graduates, but (2) cannot maintain access when trends in funding and efficiency improvements are adverse.

Figure 11 consists of two panels. The upper panel shows the number of degrees awarded in 2014 at CSU for 125 scenarios, each with a different set of assumptions about future allocations of state funding for higher education, feasible improvements in efficiency, and feasible improvements in effectiveness. The lower panel shows the number of first-time freshmen admitted to CSU in 2014 for the same 125 scenarios. One can see how the number of degrees awarded and the number of first-time freshmen vary with improvements in effectiveness by looking at the 25 stacks of boxes in the upper and lower panels, respectively. The boxes at the front of the stacks show scenarios with significant improvements in effectiveness; the boxes at the back show scenarios with annual decreases in effectiveness. The boxes second from the back in the stacks show a scenario with no change in effectiveness, similar to the scenarios we showed in Figure 10.

Figure 11 shows that the number of degrees awarded by CSU in 2014 depends strongly on the level of feasible improvements in effectiveness, as well as on state funding allocations and improvements in efficiency. For instance, CSU cannot maintain its production of degrees, even in the most optimistic funding and efficiency improvement scenarios, if its advancement and graduation rates drop by 0.5% annually, as seen in the upper right-hand corner of the top panel in Figure 11. This suggests that any increases in efficiency cannot come at the expense of the effectiveness of the institution.

Conversely, CSU can maintain its production of degrees in scenarios with flat state funding and no efficiency improvements (0%) if it can increase its advancement and graduation rates by 0.5% to 1.5% annually, as seen in the middle of the top panel.

Effectiveness improvements do not, however, significantly impact access, as measured by the number of first-time freshmen shown in

the bottom panel of Figure 11.³ Twenty-two of the 25 stacks in this panel are all red or green. In these scenarios, effectiveness improvements make little difference to the ultimate outcome. In only three stacks do improvements in effectiveness change the number of freshmen admitted from red to green. Thus, Figure 11 demonstrates that effectiveness improvements can maintain the number of graduates produced by CSU even in scenarios where trends in state funding and efficiency are unfavorable, but that they cannot, by themselves, maintain access when these trends are adverse. We found similar results for UC and the CCs.

DIFFERENCES AMONG SYSTEMS

Until now, we have emphasized the similarities among the UC, CSU, and CC systems because all three respond fundamentally the same way to trends in state funding, productivity, and student demand. Nonetheless, there are important differences, particularly between the CCs and the other two systems. Figure 12 shows the access deficit in 2014 at the CCs for 100 scenarios, each with a different set of assumptions about state funding, efficiency improvements, and student demand. This figure is analogous to Figure 10 for UC.

Figure 12 demonstrates that access to the CCs, like access to UC and CSU, depends strongly on feasible improvements in efficiency. However, access to the CCs depends somewhat less strongly on state funding allocations and more strongly on student demand than does access to UC or CSU. The CCs are more sensitive to demand because they draw from a much larger spectrum of potential students (both part and full time), many of whom technically repeat grades more frequently than their UC and CSU counterparts. Figure 12 shows this enhanced dependence on demand—in eight of the 25 stacks (compared to four in Figure 10), increased demand changes the access deficit from small (green) to large (red).

³We used first-time freshmen rather than CSU access deficit as our measure of access in Figure 11 because improvements in efficiency actually increase the access deficit. This result stems from the fact that access deficit is a measure of total enrollment, which drops as students move more quickly through the system, as shown in Figure 7. However, as fewer upperclassmen linger in the system, space becomes available to admit more freshmen. These relationships emphasize the importance of looking at several metrics when examining the performance of a complicated system.

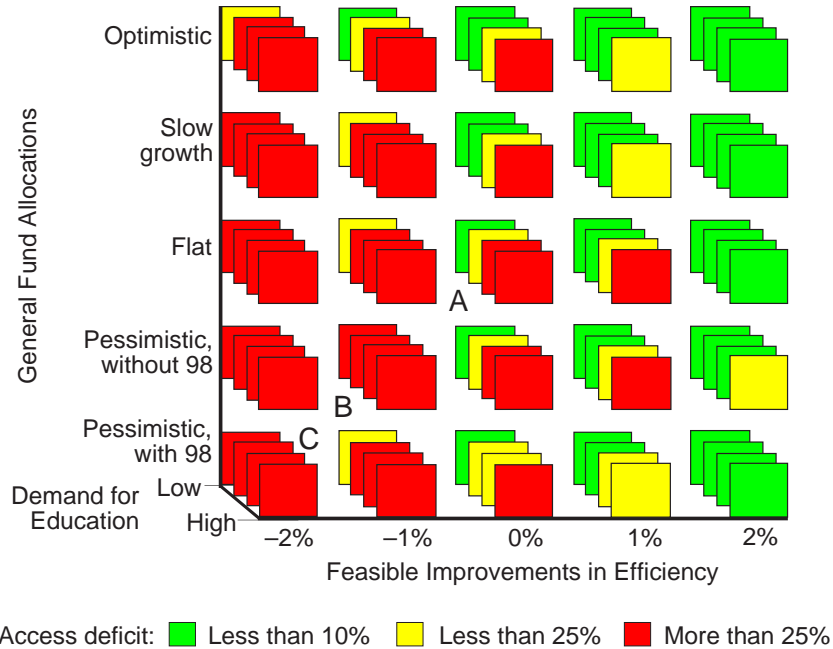


Figure 12—CC Access Deficits in 2014 for 100 Scenarios with Different Assumptions About State Funding, Feasible Efficiency Improvements, and Student Demand

The CCs are less sensitive than UC and CSU to state general fund allocation because nearly half of their revenue comes from local property taxes. Figure 12 shows this relative insensitivity—in scenarios with no change in efficiency and baseline student demand, the CCs can maintain access deficits smaller than 25% even in the most pessimistic funding scenarios. In contrast, UC and CSU have access deficits greater than 25% in these scenarios. In addition, note that the CCs fare better with the “pessimistic, with 98” funding allocation than with the “pessimistic, without 98” allocation, whereas the two other systems fare significantly better with the latter. This result stems from the fact that Proposition 98 mandates a certain percentage of the state general fund to K–14 education, thus diverting funds to the CCs at the expense of UC and CSU.

LARGE FEE INCREASES MIGHT PRESERVE ACCESS

So far in the 1990s, fees for California public higher education have risen significantly. California retains, however, low tuition and fees compared to other states, and further fee hikes remain a widely discussed policy option for addressing future access deficits. We found that large fee increases, at a rate that would roughly triple current fees by 2014, might preserve California's historic levels of access, but only if the sensitivity of students' enrollment decisions to the price of education is lower than currently estimated (Kane, 1995). If this sensitivity to price is the same as or greater than the current best estimates in the academic literature, fee increases cannot save the situation if funding and efficiency trends are adverse.

Figure 13 shows the annual fee increases needed to preserve access at each of the three systems—UC, CSU, and the CCs—for three different sets of assumptions (labeled A, B, and C in Figures 10 and 12) about future state funding, feasible efficiency improvements, and student demand for education. Set A assumes no growth in state funding, 0% efficiency improvements, and the basecase level of student demand for higher education. Set B assumes pessimistic funding without Proposition 98 constraints, -1% efficiency improvements, and basecase demand; set C assumes pessimistic funding with Proposition 98 constraints, -2% efficiency improvements, and basecase demand. For current fee levels, all three sets of assumptions produce large access deficits for UC, CSU, and the CCs in 2014, as seen also in Figures 10, 11, and 12.

The top panel in Figure 13 shows the fee increases needed to preserve access at UC (i.e., to reduce the access deficit to 10% or less) for each of the three sets of assumptions about funding and efficiency improvement as a function of different assumptions about the sensitivity of student enrollment decisions to price (elasticity). One can see that annual fee increases of less than 2% do not generate enough revenue to preserve access in even the least pessimistic of our three sets of assumptions. Annual increases greater than 2% can relieve access deficits in scenario A (no growth funding, 0% efficiency improvement) as long as elasticity is not too large, but cannot do so in the more adverse scenarios. If elasticity is small—about 30% below that estimated by Kane (1995)—fee increases greater than 5% can

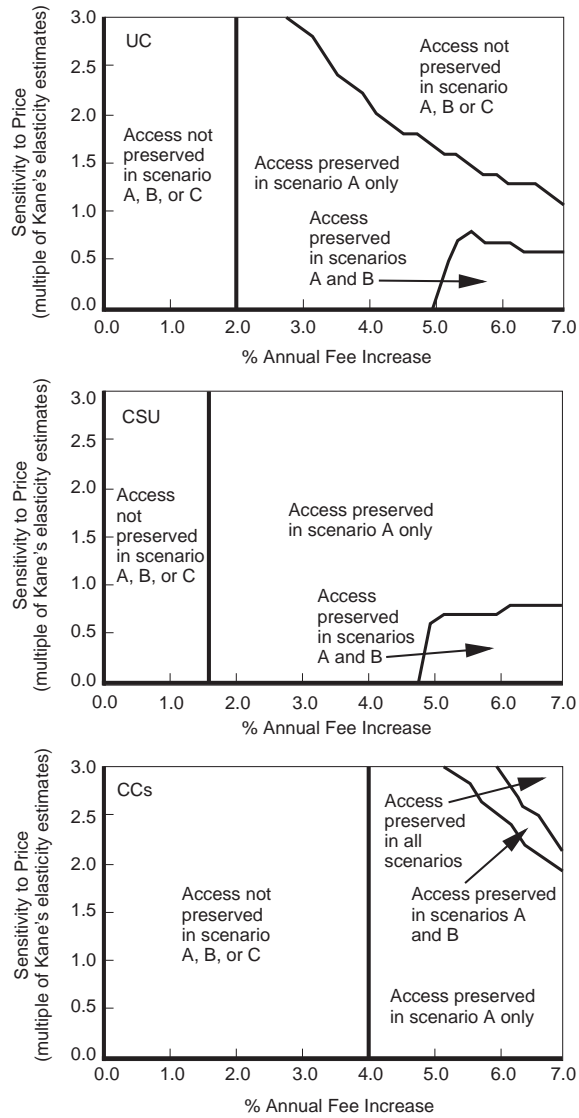


Figure 13—Effect of Fees on UC, CSU, and CC Access Deficits in 2014 as a Function of Student Sensitivity to Price of Education for Three Sets of Assumptions About Future State Funding, Feasible Efficiency Improvements, and Student Demand

also preserve access in scenario B (pessimistic funding without Proposition 98 constraints, -1% efficiency improvement). No level of fee increases that we considered can preserve access in scenario C (pessimistic funding with Proposition 98, -2% efficiency improvement).

Fee increases have a similar effect at CSU, as shown in the middle graph of Figure 13. Increases greater than 2% preserve access in scenario A, increases greater than 5% preserve access in scenario B if elasticity is low, and no increases we considered preserve access in scenario C. In contrast to the UC case, however, large fee increases with large elasticities also preserve access in scenario A, because of the “cascade” effect: many students who choose not to enroll in UC under these conditions enroll in CSU instead.

The results for the CCs, shown in the bottom graph of Figure 13, exhibit an even stronger dependence on this cascade effect. Much larger fee increases are needed to preserve access because fees are a much smaller fraction of the CCs’ budgets than they are of the UC and CSU budgets. In addition, high elasticities preserve access to the CCs because more students decide not to enroll in the more expensive UC and CSU systems. It is important to note, however, that although in these high-fee/high-elasticity scenarios the CCs continue to serve over 90% of the total number of students they would under ideal conditions, these high enrollments may be achieved by serving a considerably different student population than the CCs serve today.

With the largest fee increases shown in Figure 13, students in 2014 would pay three times as much as they did in the early 1990s for an education in California’s public colleges and universities. Tuition and fees would average \$13,500, \$6,500, and \$700 at UC, CSU, and the CCs, respectively. We assumed that a fraction of the revenues derived from these increased fees would be recycled into need-based institutional financial aid so that actual fees would be higher for wealthier students and lower for poorer ones. The analysis we present in Figure 13 is thus quite crude, because we used a single elasticity for students across a wide range of socioeconomic backgrounds and have not explicitly considered aid separately from fees. Nonetheless, our analysis is sufficient for drawing two conclusions.

First, California would need very large fee increases to maintain current levels of access if allocations from the state general fund decrease or if efficiency improvements do not offset cost increases for the inputs to higher education. The necessary fee increases would push California well into the ranks of high-fee/high-aid public universities by 2014; the CCs would become average-cost institutions compared to similar institutions in other states.

Second, whether California could maintain its historic high levels of access in such a high-fee/high-aid environment is very much an open question, the answer to which depends on factors such as the elasticity of student demand. No one currently knows whether students' sensitivity to price is such that high-fee/high-aid policies could be crafted to preserve access.