What is the value of a UC degree for disadvantaged students? An evaluation of the 2001-2011 UC Eligibility in the Local Context Policy

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Executive summary

Beginning in 2001, the University of California's Eligibility in the Local Context (ELC) policy provided undergraduate admissions advantages to California high school students in the top four percent of their graduating classes. This brief analyzes two questions about the ELC policy:

1. How many applicants shifted their enrollments because of ELC, and how did ELC affect the composition of UC students?
2. Did ELC eligibility – and subsequent UC enrollment – benefit targeted applicants in the long run?

UC overhauled ELC in 2012, but this topic brief **analyzes the impact of the original policy, which was in place from 2001 to 2011**. The first section of the brief uses a causal-inference statistical methodology to estimate the effect of ELC eligibility on applicant outcomes. It shows that ELC-eligible applicants became **12 percentage points more likely to enroll at one of four "Absorbing" UC campuses** – San Diego, Davis, Irvine, and Santa Barbara – because of those campuses' significant ELC-friendly admissions policies. At least half of those students would have otherwise enrolled at a California State University; the rest would have gone to community college or three other UC campuses (Merced, Riverside, and Santa Cruz).

Two-thirds of these 'ELC participants' had family incomes below the California median, and about one-third were from unrepresented groups (URG). **Eighty percent came from below-average California high schools** (by SAT), making them more than twice as likely to come from those high schools as their freshman peers at the Absorbing UC campuses. The ELC participants also had far lower SAT scores than their peers – by about 150 points on average – though the two groups had similar high school grades.

What happened to these ELC participants in the years after they enrolled at Absorbing UC campuses? Enrolling at UC provided them with broad long-run benefits. On average, in return for enrolling at a university with a higher five-year graduation rate by 30 percentage points, they themselves **became 20 percentage points more likely to earn a college degree within five years**. Even more impressively, their **annual late-20s California wages – measured when they were 28 or 29 years old – were $20,000 higher than they would have been** if they'd chosen against Absorbing UC campus enrollment. Most ELC participants were relatively disadvantaged, but UC enrollment provided them a pipeline to economic mobility.

The last section of this topic brief employs a statistical model of university admissions and enrollment decisions to estimate how ELC impacted the composition of UC students. Model simulations show that **ELC had about 600 annual participants** – that is, students who only enrolled at the Absorbing UC campuses because of their ELC eligibility – and that **ELC increased net enrollment of lower-income students at those campuses by about 100 per year**. If the Absorbing UC campuses had provided the same admissions advantages to students in the top 6 or 8 percent of their high school class, the model implies that the policy's enrollment effects would have grown exponentially, though even a substantially-expanded ELC policy would be unlikely to increase the number of lower-income or URG UC students by more than 2.5 percentage points.

In short, the 2001-2011 ELC policy succeeded in annually benefitting hundreds of eligible students – especially lower-income and URG students – from across the state of California, and especially from California's lowest-opportunity high schools. ELC also incrementally expanded UC access to disadvantaged students, and UC enrollment provided those students with substantial socioeconomic benefits in the form of improved educational and labor market outcomes, highlighting the long-run value of a UC education.

Introduction

The University of California system has a higher graduation rate than most other public universities in the Association of American Universities (AAU), and UC undergraduate alumni have substantially-higher median earnings in the years following graduation than the average California college graduate.[2] But the UC system is also selective, admitting only 63.1 percent of freshman applicants (compared to 84.3 percent at the California State University system) and only available to the top 15.9 percent of California public high school graduates.[3] Are University of California students more likely to graduate and earn high wages because of the services – academic, professional, and support – provided by UC, or because those students were already promising young adults destined to success with or without a UC education? The statistical challenge in answering this question is to transparently estimate plausible *counterfactual* outcomes for those students: how would UC's students have fared if they *hadn't* had access to UC?

This topic brief presents a comprehensive analysis of student outcomes from UC's 2001-2011 Eligibility in the Local Context policy. ELC guaranteed admission to the top four percent of graduates (by GPA) from each participating California high school, and ELC-eligible students became much more likely to be admitted to many UC campuses. There are two central motivations for studying UC's pre-2012 ELC policy. First, ELC was an important undergraduate admissions policy that likely impacted the lives of thousands of young Californians, but relatively little information is publicly available about the program's magnitude or its contribution to the student composition of UC campuses. Second, the policy presents a compelling case study that can be employed to analyze the value of a UC degree. By comparing the long-run outcomes of students with GPAs just below and just above their high schools' ELC eligibility thresholds – with only the latter group getting a substantial bump in UC admissions as a result of their ELC eligibility – the brief directly estimates the impact of UC access on the lives of ELC participants.

The brief is organized into three sections. After providing details about how ELC was centrally administered, the first section explains how the 2001-2011 ELC policy worked in practice, focusing on how ELC eligibility shifted students' admissions and enrollment likelihoods at each UC campus. A companion brief, available here, shows that the ELC policy also encouraged thousands of high school seniors to newly apply to UC campuses, but this brief will focus on ELC's admissions effects. The second section links all of those UC applicants to longer-run outcomes like undergraduate degree attainment and late-20s California wages and shows how ELC affected the lives of impacted students. Finally, the third section presents a statistical model that illuminates ELC's effects on UC's socioeconomic and geographic diversity, and then extends the model to simulate how alternative ELC policies (e.g. extending ELC's admissions advantages to the top 6 or 8 percent of students from each high school) would be expected to shift the composition of each UC campus.

The findings presented below show that the 2001-2011 ELC policy was highly successful but somewhat incremental in magnitude. Because of ELC's admissions effects, about 600 new students annually enrolled at the four campuses that most actively participated in the policy – San Diego, Davis, Irvine, and Santa Barbara – and a small number of additional students enrolled at the more-selective Berkeley and UCLA campuses. Two-thirds of those students were from lower-income households, and 80 percent were from the bottom half of California high schools as ranked by SAT scores. Almost all of those students would have enrolled at less-selective public universities and colleges in California if not for ELC. Enrolling at those UC campuses provided striking benefits to ELC participants over the following years: their likelihood of earning a college degree within five years of graduating high school went from 50 to 65 percent, and their annual California wages in their late 20s increased by an extraordinary $20,000 per year. In total, ELC increased the number of lower-income and underrepresented (URG) students who enrolled at those four UC campuses by about 100 students per year, and would have had considerably larger effects had its admissions advantages been extended to more students.

In short, the evidence below shows that the 2001-2011 ELC policy substantially improved the lives of thousands of California youths, and provides important evidence of the value of University of California degrees in promoting economic mobility and growth for the state of California.

How did Eligibility in the Local Context work in practice?

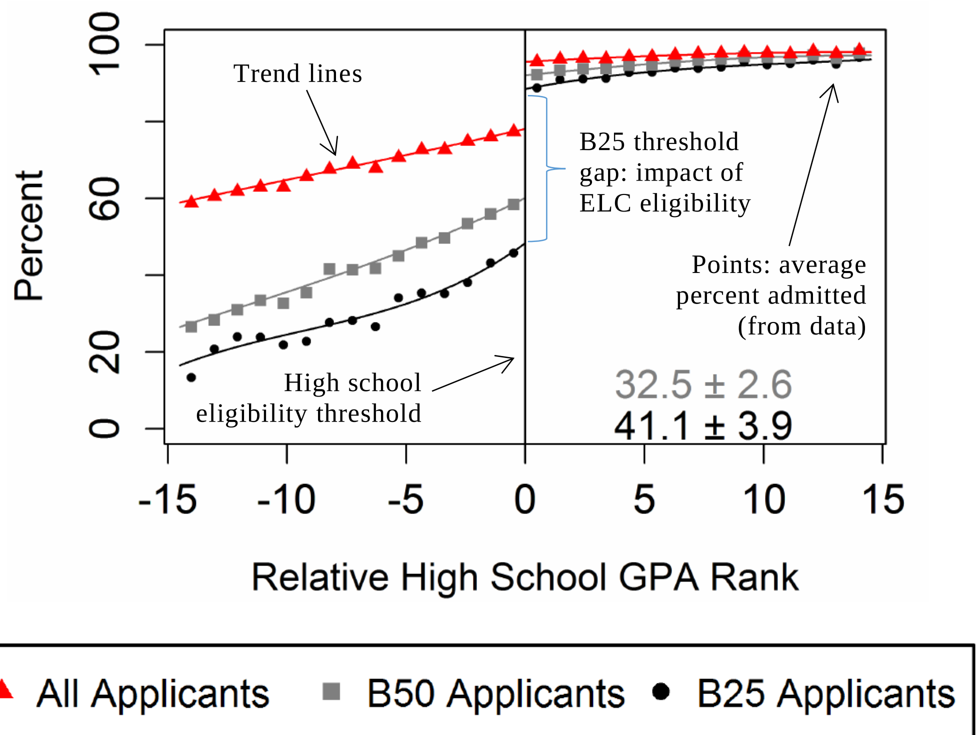
The University of California implemented the Eligibility in the Local Context policy in 2001. Students at participating California high schools—which by 2002 included 96 percent of public high schools and 80 percent of private high schools—were guaranteed admission to at least one UC campus if they were in the top four percent of their class.[4] Class rank was determined directly by UC; high schools submitted the top 10 percent of their students' transcripts to UCOP's Admissions Operations team, which calculated special 'ELC GPAs' using specific eligibility-relevant courses (omitting physical education and many elective courses) and informed students whose ELC GPAs satisfied the determined four percent threshold of their ELC eligibility. Below-threshold students with satisfactory grades also received letters encouraging their UC application.

While 'ELC-eligible' students with GPAs above their high schools' thresholds were guaranteed admission to at least one UC campus, campuses were not coerced to admit them; each campus chose whether to provide admissions advantages to ELC-eligible students. Some campuses provided them with large admissions advantages. Figure 1 shows how UC Irvine used ELC in undergraduate admissions. The x-axis shows each student's distance from their high school's ELC eligibility threshold that year, measuring distances by GPA ranks: for example, a student with a value of -2 was *not* ELC-eligible, but would have been eligible if their GPA had ranked two ranks higher in their high school class (bringing them just up to the eligibility threshold). The y-axis shows the proportion of applicants who were admitted to UC Irvine. There are three sets of dots, with trend lines through each of them below and above the threshold. The first set of dots includes all high-GPA 2002-2011 applicants to UC Irvine; the other two sets restrict the sample to just applicants from the bottom half ("B50") or bottom quarter ("B25") of California high schools, ranking the schools by their high-GPA students' average SAT scores.[5]

First consider the red triangles. You'll see that as students' GPA rank increases, their likelihood of admission increases; that would be true even without the ELC policy. But look at what happens when the below-threshold line hits 0: it jumps up to nearly 100 percent. In other words, ELC eligibility nearly guaranteed admission to UC Irvine; almost everyone above the threshold was admitted, whereas the admissions rate of students *just below* the threshold – students who would likely have been ELC-eligible if their GPA had been just 0.01 points higher – was only 80 percent.

Next, take a look at the B50 points. These are students from lower-opportunity high schools, so you will see that they are less likely to get in to UC Irvine than the average Califronia applicant. But B50 ELC-eligible students are nearly guaranteed admission to UC Irvine as well, as are the ELC-eligible B25 students from the bottom quartile of California high schools. The effect for this latter group is most striking: only about half of applicants with GPAs just below their school's threshold

Figure 1: UC admissions likelihood at UC Irvine by ELC GPA Rank



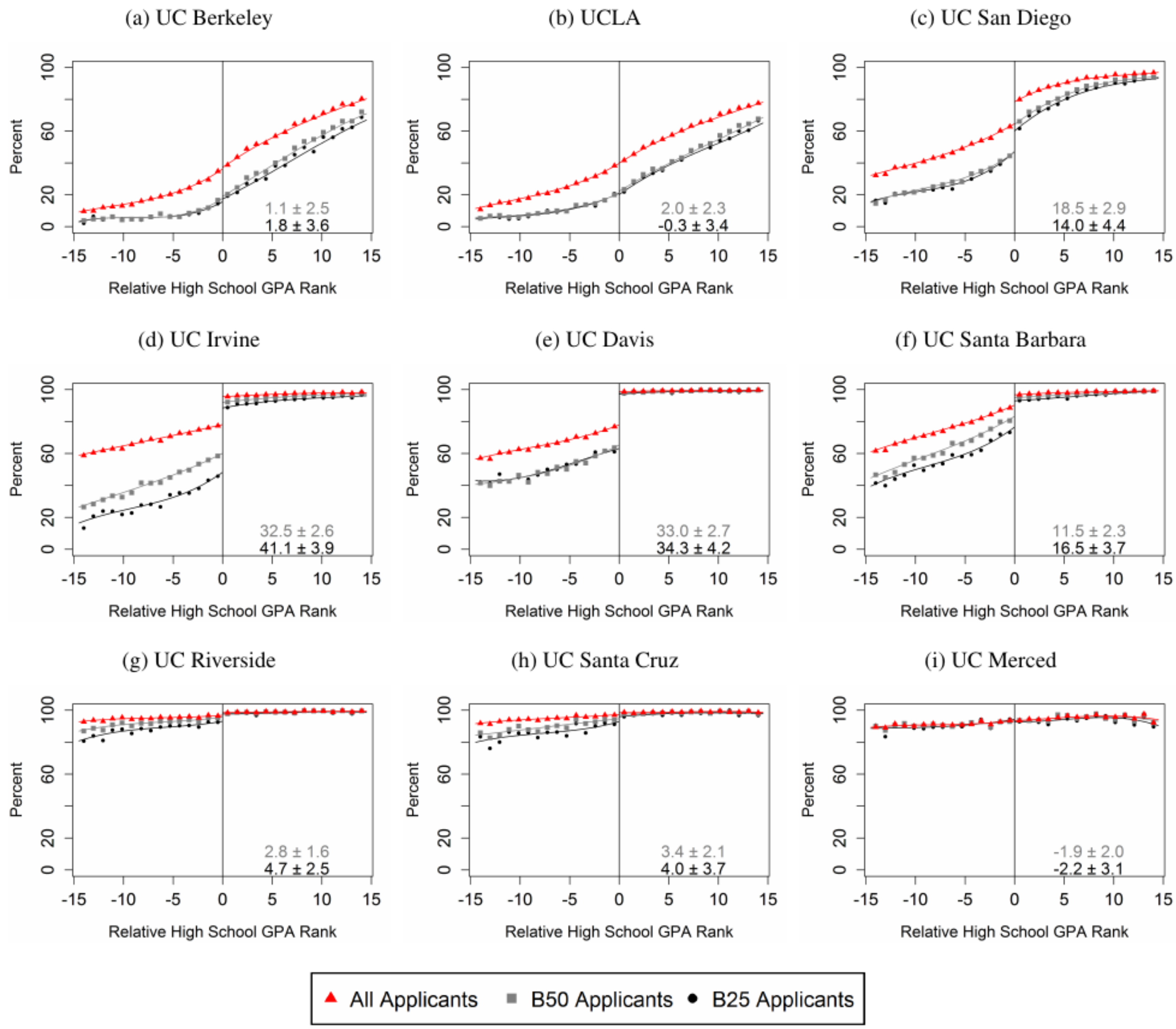
Note: This figure shows the proportion of 2002-2011 freshman applicants admitted to UC Irvine by ELC GPA rank distance to their high school's ELC eligibility threshold for all applicants and those from the bottom half (B50) and quarter (B25) of California high schools by SAT. Points are binned averages with third-order polynomial trend lines. The estimated B50 and B25 gaps at the eligibility threshold are included with 95% confidence intervals.

were admitted to UC Irvine, compared to about 90 percent of applicants with GPAs exactly at the threshold. This pattern reflects an important (and intentional) feature of the ELC policy: ELC was relatively much more impactful for students from lower-opportunity California high schools, since applicants from those schools were less likely to be able to get into UC campuses on the basis of other merits (like high SAT scores). The third section of the brief below will show that 80 percent of ELC participants came from the bottom half of CA high schools (B50) by SAT.

Figure 2 presents comparable figures for each of the nine undergraduate UC campuses. It shows that UC's campuses can be organized into three groups by the magnitude of the admissions advantage provided to ELC-eligible applicants just above their high schools' eligibility thresholds:

1. Berkeley and UCLA: These campuses have lower admissions rates than the other campuses, and they only provided small (if any) admissions advantages to barely ELC-eligible applicants.[6] You can see this in the figures: for all three visualized applicant groups, the trend lines are essentially unchanged across the eligibility threshold at both campuses.
2. San Diego, Irvine, Davis, and Santa Barbara: These campuses all provide large admissions advantages to ELC-eligible students, and all but San Diego near-guarantee admission to all

Figure 2: UC admission likelihood by ELC GPA at each campus



Note: This figure shows the proportion of 2002-2011 freshman applicants admitted to each UC campus by ELC GPA rank distance to their high school's ELC eligibility threshold for all applicants and those from the bottom half (B50) and quarter (B25) of California high schools by SAT. Points are binned averages with third-order polynomial trend lines. The estimated B50 and B25 gaps at the eligibility threshold are included with 95% confidence intervals.

ELC-eligible applicants. Applicants from B25 high schools become 14-41 percentage points more likely to be admitted to each of these campuses if they are ELC-eligible.

3. Riverside, Santa Cruz, and Merced: These campuses admit nearly all high-GPA applicants, even if those students have GPAs just below their schools' ELC eligibility thresholds. As a result, even if these campuses were to provide large admissions advantages to ELC-eligible applicants, it would hardly matter; after all, nearly all of them could have gotten into each of these campuses even without the ELC policy.

These admissions patterns at each UC campus suggest that the primary effect of ELC eligibility on eligible applicants' enrollment will likely be to increase enrollment at the four UC campuses that provided them large admissions advantages. Table 1 shows just that effect. The table partitions all possible postsecondary enrollment options into groups of institutions, like the CSU system and California private universities, and shows both the baseline proportion of (near-threshold) UC applicants who enroll at each group and the change in their enrollment likelihoods – estimated at the ELC eligibility threshold – caused by ELC eligibility.

The UC campuses are separated into the three groups discussed above. Berkeley and UCLA are categorized as the "more-selective" UC campuses: 13 percent of applicants enroll at those campuses, but ELC eligibility only increases that proportion by maybe one or two percentage points. The four "Absorbing" UC campuses, on the other hand, see an enrollment increase of over 11 percentage points – from 32 to 43 percent – among ELC-eligible students.

Where would those 12 percentage points of students have otherwise enrolled? About half of them (6 percentage points) would have otherwise enrolled at the CSU system. Three percentage points of them would have otherwise gone to the three "less-selective" UC campuses, which were unable to provide substantial admissions advantages to ELC-eligible students because of their high baseline admissions rates; ELC-eligible applicants choose to enroll at the Absorbing UC campuses instead. And most of the rest – about 1 percentage point – would have otherwise enrolled at California community colleges. ELC eligibility caused only negligible shifts in private and out-of-state enrollment and a small one percentage point decline in not enrolling at any college.

In sum, these results suggest that the net effect of ELC was to shift about 11 percent of near-threshold eligible applicants from less-selective California colleges and universities into enrollment at one of the four Absorbing UC campuses. The next section turns to the question of how ELC-eligible applicants' lives were changed by this shift in their undergraduate institution.

Table 1: Impact of ELC eligibility for barely-eligible B50 UC applicants

Outcome	More-Sel. UC	Abs. UC	Less-Sel. UC	CSU	CC	CA Priv.	Non-CA	No Coll.
Baseline Enroll. (%)	13.0	31.8	9.8	20.7	7.2	6.7	4.0	6.8
Change in Enroll. (%)	1.6	11.1	-3.3	-6.4	-1.1	-0.8	-0.3	-1.3
(St. Err.)	(0.8)	(1.1)	(0.7)	(0.9)	(0.6)	(0.6)	(0.5)	(0.6)

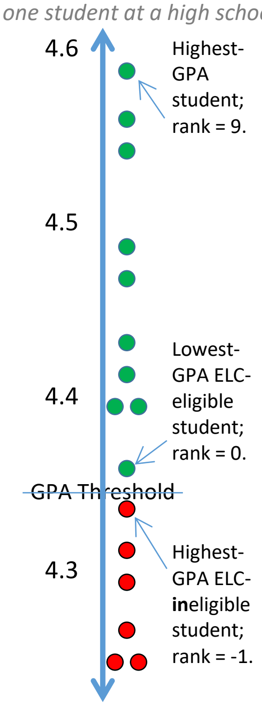
Note: This table shows the proportion of B50 UC applicants – that is, those from the bottom half of California high schools by SAT – just below their high schools' eligibility thresholds who enroll at each type of postsecondary institution (categories described in the text), and the change in those enrollment shares for applicants just above the eligibility threshold. Standard errors in parentheses. See technical appendix for methodological details.

How did UC enrollment impact ELC participants in the long run?

Take a look at Figure 3 to the right. The figure visualizes the top students at a hypothetical California high school, lined up by GPA from higher to lower. It also shows the school's ELC GPA eligibility threshold: all of the students with above-threshold GPAs are ELC-eligible, while those below the threshold are not.

Figure 3: ELC Eligibility

Note: Each circle represents one student at a high school



Consider the pair of students with GPAs just above and just below the school's threshold. The below-threshold student has a GPA around 4.34, which is a higher GPA than about 95 percent of other students at the high school. But that's not *quite* high enough to clear the school's eligibility threshold; the student just above it, with a GPA of about 4.36, has higher grades than *96* percent of the school's students, and thus is classified as ELC-eligible.

One of these students is ELC-eligible, and the other isn't, even though their high school performance was nearly identical. A single A- instead of a B+ in a single course would have been enough to make the difference. The Results Appendix shows that on average, students just above and just below their high schools' eligibility thresholds are observably very similar to each other; for example, they have the same average SAT scores and the same socioeconomic characteristics. But as the last section showed, these students have very different college admissions experiences; the barely ELC-eligible student would be admitted to most of the UC campuses where he or she applies, whereas the barely ELC-ineligible student would be much less likely to be admitted to many UC campuses. In the end, even though they had nearly identical high school grades, the barely-eligible student is about 11 percentage points more likely to enroll at one of the four Absorbing UC campuses than the barely-ineligible student.

This section of the topic brief links the UC applicants to educational and labor market outcomes from the National Student Clearinghouse and the CA Employment Development Department in order to ask how barely ELC-eligible students' lives were changed by their Absorbing UC campus enrollment.[7] It isn't obvious that outcomes like graduate school enrollment or early-career wages would be impacted by ELC eligibility; such outcomes may hardly depend on where students go to college. The results discussed below, however, suggest that ELC-eligible students' changed enrollment is very impactful, with UC enrollment providing them large long-run benefits.

Table 2 presents the key findings summarizing how Absorbing UC campus enrollment changes the lives of ELC-eligible students. For example, consider the top left-hand number. This number is estimated by comparing the graduation rates of the schools where barely ELC-ineligible applicants enrolled to the graduation rates of the schools where barely ELC-eligible students enrolled.[8] As it happens, the barely ELC-eligible applicants enrolled at universities with higher average graduation rates by about 2.8 percentage points. But remember: only 11.1 percentage points of ELC-eligible applicants switched into an Absorbing UC campus as a result of their ELC eligibility! This implies that just those applicants' switches (along with the switches into the more-selective UC campuses)

Table 2: Impact of ELC eligibility on the outcomes of Absorbing UC campus students

Effect on ELC Participants	B50 Sample	B25 Sample
Institution's five-year graduation rate (%)	**+22.4**	**+27.7**
(St. Err.)	(3.2)	(4.4)
Five-year degree attainment (%)	**+17.6**	**+10.3**
	(8.6)	(12.0)
Annual earnings 10-11 years after HS grad. ($)	**+20,300**	**+12,800**
	(8,900)	(10,200)

Note: This table shows the estimated effect of enrolling at an Absorbing UC campus on applicants' educational and wage outcomes, among applicants from the bottom half (B50) or quarter (B25) of California high schools (by SAT) who enrolled at Absorbing UC campuses as a result of being barely ELC-eligible. Standard errors are in parentheses. See the Technical appendix for methodological details.

caused the overall average to increase by 3.3 percentage points. In other words, each of those ELC participants must have enrolled at an institution with a higher graduation rate by $2.8/_{0.127} \approx 22.4$ in order to rationalize the observed effect. Table 2 presents scaled coefficients of this form.

The first row of Table 2, then, shows that ELC dramatically changed the kind of school where ELC participants enroll. On average, they were going to enroll at an institution with a five-year graduation rate of 53 percent, which is about the average rate of a CSU university; instead they enroll at an Absorbing UC campus with an average graduation rate of 76 percent. Among students from the bottom quarter of California high schools by SAT (B25) the effect was even larger; the average ELC participant ended up at a school with a higher graduation rate by almost 28 percentage points.

As a result of this enrollment change, **ELC participants became 18 percentage points more likely to earn a college degree within five years of graduating high school**. Interestingly, ELC's effect on students' own degree attainment is only slightly smaller than its effect on the graduation rate of the school where they enroll: ELC participants went to schools with higher graduation rates by 22 percent, and then their own likelihood of degree attainment increased by 18 percent.

Finally, the last row of Table 2 shows that **ELC participants earned about $20,000 higher average annual wages** between 10 and 11 years after high school graduation (when most of them were ages 28 or 29) **as a result of enrolling at an Absorbing UC campus**. This is an impressively large increase in average wages, and highlights the value of a UC degree for ELC-eligible students.

In summary, these findings suggest that ELC provided large long-run benefits to the applicants who enrolled at San Diego, Davis, Irvine, and Santa Barbara as a result of their ELC eligibility. They also provide clear evidence of the general value of a UC degree to prospective students. The next section turns to the question of how many students enrolled at UC because of their ELC eligibility, as well as how ELC impacted UC's socioeconomic composition.

What effects did ELC have on the composition of UC enrollment?

Up to this point, this brief has focused on the UC applicants near their high schools' ELC thresholds in order to carefully estimate how ELC eligibility shifted students' admissions, enrollments, and longer-run outcomes. This section takes a broader view of the ELC policy, estimating how ELC shifted the overall composition of UC enrollment between 2001 and 2011.

In order to better understand how ELC impacted UC enrollment, a Kapor model of admission and enrollment decisions is estimated over the population of 2010-2013 UC applicants who enrolled at public institutions in California.[9] A complete description of the resulting statistical model is presented in the Technical Appendix. In short, the model uses UC applicant records to jointly estimate applicants' decisions of where to go to college and universities decisions of which applicants to admit (the model assumes that ELC did not effect UC application decisions). ELC is built into the admissions component of the model, with each UC campus providing an estimated admissions advantage to ELC-eligible applicants in 2010 and 2011. Following estimation, the model can be used to conduct counterfactual policy 'simulations' like the elimination of ELC in order to quantify ELC's effect on which students enroll at each campus. The model assumes that ELC did not impact enrollment at non-California institutions (as shown above) and that ELC did not impact students' likelihood of applying to UC (as discussed in a previous brief).

Table 3: Characteristics of ELC participants compared to average Absorbing UC students

	ELC Particip.	All Abs. Students
Avg. Family Income	**$57,300**	$87,300
Below-Med. Family Inc.	**66%**	48%
URG	**35%**	19%
SAT Score	**1040**	1190
B50 HS	**78%**	31%
B25 HS	**38%**	14%

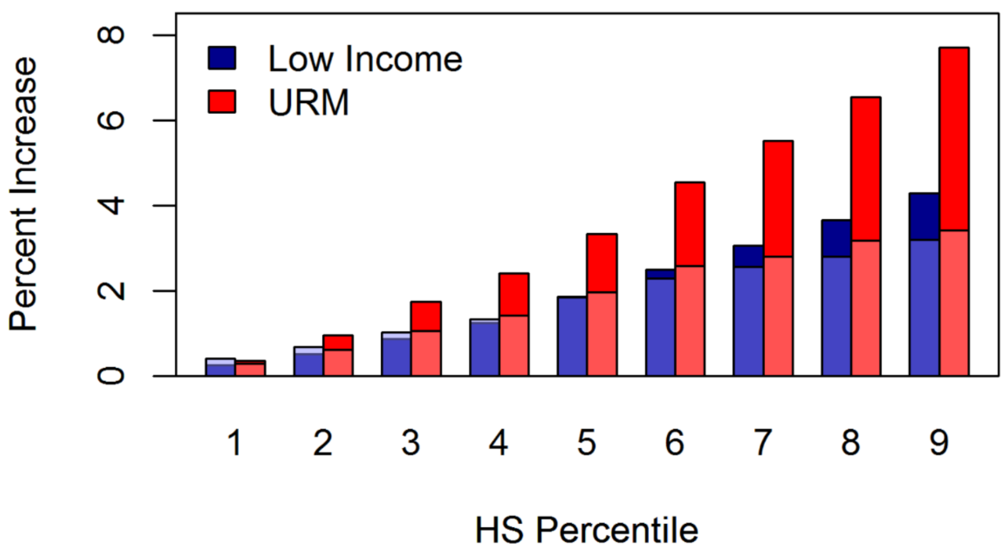
Note: This table shows the simulated characteristics of the students who enrolled at Absorbing UC campuses as a result of the ELC admissions policy, along with those of all freshman CA-resident Absorbing UC campus students. The bottom two rows show the proportion of students from the bottom half (B50) or quarter (B25) of California high schools, by SAT scores.

Three model simulations are conducted. The first directly estimates the effects of the ELC policy on UC enrollment.[10] It shows that **there were about 600 annual ELC participants between 2001 and 2011**; that is, there were about 600 Absorbing UC campus students each year who would not have enrolled at those campuses absent the ELC policy.[11] Table 3 compares the characteristics of those ELC participants with the other new freshman California-resident students who enrolled at Absorbing UC campuses in 2010 and 2011. It shows that **ELC participants came from families with average annual family incomes of $57,000, and that almost 70 percent came from families with incomes below the state median.**[12] As a result, ELC participants had substantially lower median family incomes than their Absorbing UC campus peers. **Over one-third of ELC participants were from underrepresented groups (URG)**, mostly Hispanic/Latinx students.

Table 3 also shows that **ELC participants had substantially lower SAT scores than their Absorbing UC peers, by about 150 points** on the 1600 point scale. In fact, their SAT scores were at the 14th percentile of Absorbing UC campus SATs, suggesting that one important feature of the ELC policy was to expand UC enrollment among low-testing (but high-GPA) California high school graduates. This is in line with the final two rows of Table 3, which show that **78 percent of ELC participants were from the bottom half of California high schools** (B50, ranked by SAT scores), and 38 **percent were from the bottom quarter of high schools** (B25). This compares with only 31 percent of Absorbing UC students coming from B50 schools, implying that ELC expanded UC access to high schools that had previously enrolled few students at UC campuses.

The second counterfactual simulation uses the Kapor model to ask a different question: how would the student composition of UC campuses have been impacted if they had provided admissions advantages to a different student percentile, instead of the top 4 percent? Counterfactual UC enrollment is simulated for hypothetical ELC policies in which each campus provides the same admissions advantage that it provided before 2012, but setting alternative ELC eligibility thresholds at each GPA percentile.[13]

Figure 4: Estimated effects of alternative ELC policies on Absorbing UC campuses' enrollment



Note: This figure shows the estimated changes in the number of lower-income and URG students enrolled at Absorbing UC campuses if ELC policies (with similar admissions advantages to pre-2012 ELC) were adopted at each percentile of applicants from each high school, from first to ninth, and (in lighter bars) if the same policy were adopted but students were ranked by SAT score instead of ELC GPA. Lower-income is defined as having a family income below the CA median. Estimates from Kapor model of UC enrollment; see the Technical appendix for details.

Figure 4 summarizes how those policies would be expected affect the proportion of lower-income (that is, having a family income below the California median) and URG students who enroll at the Absorbing UC campuses. It shows that the **original 4-percent ELC policy** had a relatively incremental effect on the number of disadvantaged students who enrolled at those campuses, **increasing the number of lower-income and URG students by about 1.5 and 3 percent, respectively**. Expanding ELC to a larger proportion of students, however, would have disproportionately magnified this effect, largely because high schools' slightly lower-GPA students are even more likely to be lower-income or URG than the very top cohort of students. As a result, an ELC policy that provided the same 2001-2011 admissions advantages to the top nine percent of each high school's graduates **would be expected to increase the net number of lower-income and URG students by almost 5 and 10 percent, respectively, or about 350 students per year (each).** Such a policy could actually have an even larger effect on UC's student composition if it also further encouraged new applications from ELC-eligible students.

Figure 4 also shows the results of a third counterfactual in which students are ranked within high schools by SAT score instead of GPA. The lighter-colored bars show that SAT ranking would have a much smaller effect on UC enrollment diversity than the GPA-based ELC policy, with an SAT-based 4% ELC policy only increasing URG enrollment by about half the magnitude as the GPA-based policy through ELC's admissions channel.

Further extensions of the Kapor model could facilitate additional simulations of alternative ELC policies, and may be discussed in future briefs.

Conclusion

This brief presents a comprehensive analysis of UC's 2001-2011 Eligibility in the Local Context undergraduate admissions policy. The brief shows that ELC eligibility provided substantial admissions advantages at four UC campuses – San Diego, Davis, Irvine, and Santa Barbara – and led about 600 new students each year to enroll at those campuses, all of whom would have otherwise enrolled at less-selective public colleges and universities in California. Two-thirds of those students came from families with below-median California incomes, and over one-third were from underrepresented groups. Almost 80 percent of them came from the bottom half of California high schools by SAT score, leading to a meaningful diversification of the student backgrounds of enrolled students at the four "Absorbing" UC campuses.

The ELC policy presents a useful case study in estimating the impact of UC enrollment on the lives of its undergraduate students. A comparison between the UC applicants who were barely ELC-*ineligible* and barely ELC-eligible – who were similar in every way except for the latter students' increased admissions likelihood at the Absorbing UC campuses – shows that UC enrollment provides substantial lifelong benefits to its students (compared to the other institutions where students could have enrolled): ELC participants became almost 20 percentage points more likely to earn a college degree within five years of graduating high school and had higher late-20s California wages by about $20,000 per year. While it remains unclear which UC services – academic, professional, support, or otherwise – were most important in generating these benefits, these statistics provide important new evidence on the value of a UC degree, both to the individuals who earn them and to the state of California where most of them work following graduation.

Technical appendix

This technical appendix discusses three estimation methods used in the report above: (1) the method used to estimate each high school's eligibility threshold, (2) the polynomial linear regressions used to estimate reduced-form and instrumental-variable regression discontinuity coefficients around each high school's eligibility threshold; (3) the two-stage least-squares technique used to measure the characteristics of near-threshold ELC participants; and (4) the statistical model of UC admission used to measure the number of annual ELC participants, the impact of ELC on campuses' student composition, and how alternatively-structured ELC policies would likely effect that composition.

1. Data construction

The primary dataset used in this analysis is the complete set of high-GPA high school students (about 10% from each school) whose transcripts are submitted to UC for potential ELC designation each year between 2002 and 2011, omitting 2009 due to data inavailability (and 2001 because of data anomalies). Records are linked to the universe of SAT-takers in California by all available shared information: high school, birth date, home address, and telephone number. A match requires birth date and at least two other features (or phone number) to match. Duplicate matches are excluded (which means, e.g., that no twins are matched). Names are available in the College Board records and a subset of years of the ELC high school records; in cases where names are available, each type of match generates matches with imperfectly-matched names less than 4% of the time, and visual inspection suggests that nearly all such matches are nevertheless accurate (e.g. yielding mismatches due to nicknames, misspellings, different punctuation, etc). SAT records -- including both scores and test-takers' survey responses, including self-reported race -- are matched for 77\% (81\%) of high school students. Records are also linked to UC application records by unique ID number.

High schools are assigned to quartiles by the leave-year-out average SAT score of students from that high school in the main high-GPA student database, with an equal number of such students in each quartile.

Below-median-income students are those with self-reported parental incomes below the 2016 California household median income of $65,000. For the 14 percent of freshman California-resident UC applicants who do not report parental incomes on their UC application, I approximate those incomes by estimating OLS models of parental income on year indicators interacted with SAT score, high school GPA, the interactions between father's and mother's education (64 categories), the interactions between father's and mother's occupation (319 categories), and race (16 categories) as well as high school and Zip code fixed effects. Models are estimated separately by five-year period from 1994 to 2021; the 2003-2007 model has an (adjusted) R^2 of 46 (44) percent. About 3% of UC applicants do not report their race on their application. Appendix D.1 of Bleemer (2022) shows that about 95 percent of those applicants are either white or Asian. As a result, rather than predicting race using other characteristics, I assume that all applicants who do not report race are non-URG.[14]

2. Regression discontinuity estimation

The first section of this topic brief presents a series of regression discontinuity model estimates of the effect of ELC eligibility on student outcomes. These estimates are produced using standard fuzzy regression discontinuity methodology. Let Y_{it} be some outcome observed for student student i who applied to the UC system in year t. We estimate the local average treatment effect of ELC eligibility using a linear regression:

$$Y_{it} = \beta ELC_i + f(GPA_i) + \delta X_i + \alpha_{h_i} + \gamma_t + \epsilon_{it} \quad (1)$$

where ELC_i indicates ELC eligibility and the GPA_i running variable is the difference between an applicant's ELC GPA and their school's ELC eligibility threshold. X_i includes gender-by-ethnicity indicators and quadratic in SAT scores to absorb spurious variation in Y_{it}; α_{h_i}, and γ_t are high school and application year (t) fixed effects. We estimate these models stacked across all participating high schools with the error terms ϵ_{it} clustered by school-year, the level of treatment assignment.

Because the running variable GPA_i is discrete, our preferred specification of this model is to include (third-order) polynomials of GPA_i on either side of the eligibility threshold estimated by ordinary least squares. We obtain highly statistically- and substantially-similar estimates by local linear regression with bias-corrected clustered standard errors following Calonico, Cattaneo, and Titiunik (2014). In both cases, we restrict the sample to freshman fall California-resident UC applicants within 0.3 GPA points of the eligibility threshold, resulting in a final sample of 171,411 applicants. Because the ELC threshold is slightly fuzzy, the baseline estimates instrument ELC_i with $\mathbf{1}_{GPA_i \geq 0}$.

Finding 1 in the topic brief shows that ELC eligibility strictly impacts UC applicants primarily by increasing their admissions likelihood at the four Absorbing UC campuses. As a result, there are four treatments at the ELC eligibility threshold: ELC-eligible students could switch into enrolling at any of those four campuses. Separate estimates of student outcomes caused by each of those treatment effects are available in the Results Appendix. However, under the further assumption that students' outcomes are largely unimpacted by switching *between* the Absorbing UC campuses, which finds some support in the finding that student treatment effects rarely differ across those campuses, the effect of ELC participation (that is, enrolling at an Absorbing UC campus as a result of near-threshold ELC eligibility) can be summarized by an instrumental variable regression version of the above equation, replacing ELC eligibility with Absorbing UC campus enrollment as the endogenous variable. Those results are described in further detail in the brief's text.

3. Complier analysis

Under the assumptions of quasi-random assignment to ELC eligibility near the eligibility threshold and a monotonicity assumption – that no student becomes less likely to enroll at a UC campus as a result of their ELC eligibility – we can characterize ELC participants using the two-stage least squares estimator of Abadie 2002. This involves replacing the endogenous variable in the equation above with an indicator for Absorbing UC campus enrollment and estimating the model for the outcome of the interaction between each fixed applicant characteristic (e.g. low-income indicator) with the Absorbing UC campus indicator. Results are presented in the text.

4. Statistical model of UC admissions and enrollment

The topic brief presents a series of results from an estimated model of UC admission and enrollment embedding the ELC policy. The model implements a version of the Kapor (2020) university decision-making model, ignoring the model's financial aid components. Full details about the model are available in Bleemer (2020); this section provides intuition for the model's functioning and explains how it is estimated.

The model proceeds in three steps: application, admission, and enrollment. The set of available universities are simplified into five: the Unimpacted, Absorbing, and Dispersing UC campuses, the CSU system, and the community college system. All applicants 'apply' to CSU and community college, but they choose which of the UC campuses to apply to. UC then conducts admissions and chooses who to admit. Finally, applicants observe their available enrollment options and choose where to enroll.

The model is primarily governed by two equations: a statement of applicant preferences over universities, and a statement of university preferences over applicants. Applicants choose where to enroll by maximizing:

$$U_{ij} = \delta_j + x_{ij}\beta_j^x + \nu_{ij} + \epsilon_{ij}$$

where x_{ij} are characteristics of student i that may differ by institution j, $\nu_{ij} \sim N(0, \sigma^2_{\nu_j})$ is an i.i.d. preference shock always observed by students, and ϵ_{ij} is a previously-unobserved preference shock modeled by Type I extreme value distribution. In other words, students choose at which university to enroll on the basis of their own characteristics (including school-specific characteristics like distance-to-campus) and preference shocks. Applicant characteristics also include log income, gender, ethnicity, SAT score, high school GPA, and the estimated quality of their nearest community college.

Universities in the model conduct comprehensive admission by choosing who to admit on the basis of student quality measures defined by:

$$\pi_{ij} = z_i \beta^z_j + q_i + \mu^{Admit}_{ij}$$

where z_i are student characteristics (including all of the same characteristics as above, but excluding distance-to-campus), q_i is a caliber characteristic of student i unobserved by the student, and μ^{Admit}_{ij} is a normally-distributed error term. ELC eligibility and the below- and above-threshold GPA running variable are included in z_i. Universities are limited by an enrollment constraint, so they choose admissions thresholds $\underline{\pi}_j$ and admit students with $\pi_{ij} \geq \underline{\pi}_j$. Students only observe a noisy signal s_i of q_i, with the two jointly normally-distributed with errors dependent on student socioeconomic characteristics, reflecting the fact that students do not know how universities value the non-quantitative components of their UC applications.

Table 4: Descriptive Statistics of 2002-2011 UC Applicants

	Top HS Students		Applicants to the University of California						
				Near ELC Thresh.		By High School SAT Quartile[1]			
	All	College Board SAT Match	All App.	All	Est. Sample	1st	2nd	3rd	4th
% Female	62.7	62.4	56.2	61.1	61.0	64.5	62.1	60.1	58.8
% White		35.3	33.9	35.1	34.9	10.0	31.2	44.4	45.6
% Asian		26.0	32.5	32.1	32.5	23.7	33.8	33.0	37.0
% Hispanic		22.6	21.3	22.2	22.3	55.4	24.9	12.8	6.9
% Black		2.9	5.0	3.4	3.2	6.9	3.9	2.3	1.1
% Decline		8.5	4.9	5.0	5.0	2.1	3.7	5.2	7.7
SAT Score		1150	1160	1208	1210	1018	1149	1240	1353
HS GPA	3.94	3.95	3.67	4.02	4.02	3.84	3.96	4.06	4.16
Urban Region	40.6	39.7	46.1	42.0	41.5	45.3	40.0	37.2	43.7
Suburban Region	47.7	48.5	48.7	48.3	49.1	44.4	47.7	49.9	52.8
Rural Region	11.6	11.8	5.2	9.7	9.3	10.3	12.3	12.9	3.5
Median Parent Income			70,000	69,200	69,700	32,000	57,500	80,000	110,000
Median Avg. ZIP Income	73,500	74,000	88,700	80,000	80,200	49,400	67,200	86,300	122,800
Enrollment Rates (%)									
UC Campuses	39.1	42.3	45.1	57.4	57.7	56.2	59.7	59.7	55.7
More-Selective	15.1	16.2	11.7	22.9	23.0	17.1	17.6	20.9	32.5
Absorbing	19.6	21.4	22.8	28.7	29.0	28.4	34.2	33.6	21.7
Less-Selective	4.4	4.7	10.6	5.8	5.8	10.7	7.8	5.3	1.5
CSU	12.8	13.2	17.6	12.1	12.1	19.2	15.7	12.0	5.0
Community Coll.	4.7	4.7	9.1	4.3	4.3	7.2	5.8	4.2	1.4
CA Private Univ.	9.7	9.1	9.1	9.9	9.7	5.9	7.9	10.2	13.2
Non-CA Univ.	9.8	9.2	10.9	10.0	9.8	3.7	5.8	8.7	17.7
No NSC Enrollment	6.6	6.2	8.3	6.5	6.3	7.8	5.2	5.1	7.1
Number of Observations	345,682	263,619	729,896	215,970	204,136	40,405	45,711	53,527	62,931

Note: Characteristics of 2002-2011 high-GPA high school seniors (first two columns) and California-resident freshman UC applicants (remaining columns) overall, among those matched to College Board standardized test data, among those within 15 GPA ranks of their high school's ELC eligibility threshold ('Near'), and among those in the study's main estimation sample (which requires the student's high-school-year to have at least 3 ELC GPA ranks above and below the eligibility threshold). SAT scores are out of 1600; high school GPAs are weighted out of 5. Average ZIP code income is the mean adjusted gross income in the student's home ZIP code in the year they graduated high school. Enrollment is measured in the fall semester following high school graduation; categories partition all applicants. See the Technical Appendix for details on data and linking. [1]High schools are divided into quartiles by the leave-year-out average SAT score of observed high-GPA seniors at that school, with an equal number of high-GPA seniors in each quartile; these columns are restricted to the main estimation sample.

Source: UC Corporate Student System, College Board, IRS SOI, NCES, and National Student Clearinghouse.

Table 5: Baseline Characteristic Balance at ELC GPA Threshold, 2003-2011

	Female (%)	URG (%)	HS GPA	Avg. ZIP Inc. ($)	Parent Inc. ($)	Parent Has BA (%)	Predicted Values[1] BA (%)	Predicted Values[1] Wages ($)	SAT Score	Months Since SAT	Apply to UC (%)
Panel A: All Top CA High School Students											
All	-0.1	0.5	-0.000	174			-0.11	-67	-3.1	0.09	6.4
	(0.6)	(0.5)	(0.002)	(282)			(0.11)	(162)	(1.9)	(0.05)	(0.5)
B50	-0.2	0.0	0.006	103			-0.08	48	-1.0	0.08	8.7
	(0.9)	(0.9)	(0.004)	(275)			(0.17)	(222)	(2.8)	(0.06)	(0.8)
B25	2.1	0.9	0.006	560			0.03	-354	-5.0	0.06	8.7
	(1.3)	(1.3)	(0.006)	(329)			(0.26)	(308)	(4.2)	(0.09)	(1.2)
B50 Mean[2]	62.0	41.9	3.81	61,100			67.0	72,800	1,042	4.24	59.1
Panel B: Only UC Applicants											
All	0.2	0.7	-0.004	-151.2	609	-1.1	-0.20	-279	-6.7	0.12	
	(0.7)	(0.5)	(0.003)	(349.1)	(1052)	(0.6)	(0.12)	(187)	(2.1)	(0.05)	
B50	0.4	-0.1	0.001	-197.8	800	-1.5	-0.16	-332	-7.2	0.17	
	(1.1)	(1.0)	(0.005)	(373.7)	(1050)	(1.0)	(0.20)	(272)	(3.4)	(0.07)	
B25	2.3	0.9	-0.005	259.0	329	-0.5	-0.18	-658	-9.7	0.16	
	(1.7)	(1.4)	(0.008)	(422.8)	(1180)	(1.3)	(0.31)	(383)	(5.1)	(0.10)	
B50 Mean[2]	60.6	46.0	3.89	62,300	55,900	67.1	67.2	73,500	1,076	4.02	

Note: Note: This table shows baseline sample balance across the ELC eligibility threshold on high school students' characteristics determined prior to being informed of their ELC eligibility, but shows that students responded to eligibility by being less likely to retake the SAT and more likely to apply to UC, leading to some evidence of negative selection among UC applicants. Reported coefficients are estimated changes in various applicant characteristics across the ELC eligibility threshold. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to all students or students from the bottom half (B50) or quarter (B25) of high schools by leave-year-out average SAT score. Models omit all covariates. See the Technical Appendix for details on data construction. [1]Dependent variable is the predicted values from an OLS regression (from a 25% hold-out training sample) of either five-year NSC graduation or Late-20s average California covered wages on gender-ethnicity indicators, parental income, first-generation indicator, and average ZIP income. [2]The estimated baseline (ELC-ineligible) mean characteristic of barely below-threshold UC applicants; namely, where the below-threshold polynomial intersects with the eligibility threshold.

Source: UC Corporate Student System, College Board, IRS SOI, and the California Employment Development Department.

Finally, students choose where to apply to college and face a small cost to each application. Model estimation is conducted by simulated maximum likelihood using Quasi-Newton gradient descent. Counterfactuals are estimated by changing university admission policies and then allowing the estimated $\underline{\pi}_j$ values to adjust in order to maintain unchanged enrollment at each UC campus; for example, when ELC is turned 'off', the Absorbing UC campuses lower their $\underline{\pi}_j$ in order to admit more students through their normal comprehensive admissions process.

Results appendix

This results appendix presents a series of additional statistics intended to more fully flesh out the findings discussed in the main text above. It begins with a table of summary statistics describing the empirical setting. Table 4 shows that among all of the high school students whose records were provided to the University of California in order to determine ELC eligibility (10% of each school's students, ranked by internal GPAs), almost two-thirds of them were female and forty percent of them ended up enrolling at a UC campus, with 15 percent enrolling at the more-selective Berkeley and UCLA campuses and 20 percent at the four Absorbing campuses that primarily participated in the ELC policy. The results above rely on a match between those students at the College Board's database of all SAT-takers in the state, where the match is conducted using students' home address, phone number, and date of birth. The match shows that of the 80 percent of high-GPA students who took the SAT (or at least who appeared in the match), they had an average SAT score of an 1150 out of 1600, almost a full standard deviation above the national average.

The subsequent columns summarize all UC applicants, UC applicants with ELC GPAs near their high school's eligibility threshold, and then separately describes students after splitting them into four sets of high schools, organized by the leave-year-out quartile of the average SAT scores of students from that high school. High-GPA students from higher-testing high schools are more likely to be white and Asian and tend to come from much higher-income backgrounds. They are also much more likely to enroll at Berkeley and UCLA. In sum, these statistics show that the high-GPA students targeted by the ELC policy tend to be reasonably advantaged and have relatively high test scores, but this is much less true of students from the bottom two quartiles of high school (ranked by SAT score), where even top students appear relatively disadvantaged.

Table 6: Impact of ELC on Admissions and Enrollment for Barely ELC-Eligible Applicants by Campus

	Application (%)				Conditional Admission (%)				Enrollment (%)			
	All Baseline	β	B50 Baseline	β	All Baseline	β	B50 Baseline	β	All Baseline	β	B50 Baseline	β
More-Selective Campuses												
Berkeley	42.4	2.2 (0.6)	28.7	3.6 (0.8)	36.3	0.8 (0.8)	17.9	0.8 (1.3)	8.1	0.7 (0.3)	3.3	1.1 (0.4)
UCLA	49.1	3.1 (0.6)	37.1	4.5 (0.8)	39.8	0.7 (0.8)	20.8	1.9 (1.2)	7.9	0.4 (0.3)	4.5	0.9 (0.4)
Absorbing Campuses												
Davis	32.4	4.5 (0.6)	25.8	5.8 (0.8)	78.0	21.4 (0.7)	65.4	32.6 (1.4)	4.9	3.2 (0.3)	5.0	4.0 (0.4)
San Diego	43.1	4.6 (0.6)	30.0	5.3 (0.8)	64.7	14.5 (0.8)	46.9	18.1 (1.5)	5.6	3.0 (0.3)	4.3	2.7 (0.4)
Santa Barbara	32.6	3.9 (0.6)	26.8	4.9 (0.8)	90.4	6.4 (0.6)	83.4	11.4 (1.2)	5.1	-0.2 (0.3)	5.2	0.3 (0.4)
Irvine	33.0	5.9 (0.6)	30.2	8.3 (0.8)	78.2	18.1 (0.7)	60.2	32.3 (1.3)	4.5	1.4 (0.3)	4.8	3.2 (0.4)
Less-Selective Campuses												
Riverside	16.2	-1.9 (0.4)	21.4	-1.7 (0.7)	96.9	2.1 (0.5)	95.8	2.7 (0.8)	2.1	-0.3 (0.2)	3.4	-0.3 (0.3)
Santa Cruz	15.6	-1.7 (0.4)	14.0	-0.8 (0.6)	97.4	1.5 (0.5)	94.7	3.3 (1.1)	1.5	-0.3 (0.2)	1.8	-0.7 (0.2)
Merced	7.1	-2.0 (0.3)	9.6	-2.3 (0.5)	94.0	-1.1 (0.7)	93.1	-1.8 (1.0)	0.4	-0.2 (0.1)	0.7	-0.3 (0.2)

Note: This table presents the impact of near-threshold ELC eligibility on each UC campus's admissions and enrollment, showing that the Absorbing UC campuses provided large admissions advantages to eligible students (especially those from less-competitive high schools) that translated into increased likelihood of enrollment, while the more-selective campuses may have slightly gained enrollment through both application and admission channels. Reported coefficients are the estimated baseline (ELC-ineligible) proportion of below-threshold students at their high school's ELC eligibility threshold admitted or enrolled at each UC campus 2003-2011, and the estimated change in admission or enrollment for barely ELC-eligible applicants (β), overall and for students from the bottom half of California high schools by leave-year-out SAT scores. Values in percentages. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year; baselines are estimated as where the below-threshold polynomial intersects with the eligibility threshold.

Source: UC Corporate Student System and National Student Clearinghouse.

Table 7: Local Effect of ELC Eligibility on First Enrollment Institution

	University of California Campuses Unimpacted	Absorbing	Dispersing	CSU	Comm. Coll.	CA Priv.	Non-CA	No Coll.
Panel A: Baseline Enrollment Likelihood (%)								
All	22.6	28.3	5.6	13.7	4.4	9.7	9.2	6.6
B50	13.0	31.8	9.8	20.7	7.2	6.7	4.0	6.8
B25	11.5	27.6	12.2	24.3	7.7	4.9	3.1	8.7
Panel B: Local Change in Enrollment Likelihood Caused by ELC Eligibility (p.p.)								
All	0.2 (0.6)	7.1 (0.7)	-1.6 (0.3)	-4.2 (0.5)	-0.5 (0.3)	-0.4 (0.4)	0.5 (0.4)	-1.1 (0.4)
B50	1.6 (0.8)	11.1 (1.1)	-3.3 (0.7)	-6.4 (0.9)	-1.1 (0.6)	-0.8 (0.6)	0.3 (0.5)	-1.3 (0.6)
B25	1.5 (1.1)	12.5 (1.6)	-3.8 (1.1)	-8.0 (1.4)	-1.0 (0.9)	-0.0 (0.8)	0.3 (0.6)	-1.6 (1.0)

Note: This table presents the share of immediately below-ELC-threshold applicants who enroll at each of a partition of higher education institutions in the fall semester following high school graduation, and the estimated change in enrollment at the ELC eligibility threshold (β). Values in percentage points; estimates overall and for students from the bottom half (B50) and quartile (B25) of CA high schools by leave-year-out average SAT. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year; baseline values are where the below-threshold polynomial intersects with the eligibility threshold (absent covariates).

Source: UC Corporate Student System and National Student Clearinghouse.

Table 5 shows that students who are just above their high schools' ELC eligibility thresholds have similar sociodemographic characteristics as those just below the threshold, which implies that the ELC policy effectively quasi-randomly provided UC access to above-threshold students. However, the table also shows that above-threshold students were substantially more likely to apply to UC and less likely to retake the SAT test in the fall of their senior year of high school, after learning about their ELC eligibility. Nevertheless, Panel B suggests that above- and below-threshold UC applicants appeared very similar to each other on observables prior to going to college.

Table 8: Change in Characteristics of ELC-Eligible Students' University of First Enrollment

Sample:	First Four-Year Inst.			First Two- or Four-Year Institution[1]				
	Admit Rate	Avg. SAT	Four-Year Grad. Rate	Five-Year Grad. Rate	Avg. SAT	Med. Fam. Income	Sticker Price	Est. Net Price[2]
B50 Sample								
Baseline	62.1	1068	29.1	53.2	1592	89,663	26,839	12,931
β	-2.0 (0.5)	18.5 (2.7)	3.5 (0.6)	2.8 (0.5)	27.5 (3.5)	1,635 (522)	250 (301)	-92 (247)
IV: Enr. Sel. UC	-12.9 (3.4)	136.6 (17.6)	25.5 (3.3)	22.2 (3.2)	217.5 (22.4)	12,919 (3,883)	1,572 (1,883)	-575 (1,550)
# of Obs.	49,489	78,320	65,538	96,319	96,318	85,049	31,619	31,581
B25 Sample								
Baseline	60.6	1044	22.7	50.7	1566	86,831	23,633	9,396
β	-2.2 (0.8)	22.4 (4.4)	5.2 (0.9)	3.8 (0.8)	32.8 (5.5)	1,864 (851)	935 (397)	200 (304)
IV: Enr. Sel. UC	-13.2 (4.6)	148.6 (23.7)	33.8 (4.6)	27.2 (4.4)	234.5 (29.5)	12,624 (5,270)	4,473 (1,896)	955 (1,440)
# of Obs.	22,978	36,351	30,283	45,899	45,898	39,914	15,096	15,087
Source:	IPEDS	IPEDS	IPEDS	NSC	NSC	OI	IPEDS	IPEDS/UC

Note: This table shows that ELC caused barely-eligible applicants to enroll at more-selective universities using a host of selectivity measures, and but those universities had similar net prices for students with their family incomes. Reported coefficients are the estimated characteristics of applicants' first-enrollment university or post-secondary institution at the barely ELC-ineligible baseline, the change in those characteristics across the ELC eligibility threshold (β), and the estimated change in those characteristics for Absorbing-UC-campus compliers estimated using ELC eligibility as an instrumental variable. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) or quarter (B25) of CA high schools by leave-year-out SAT score. Baseline estimates estimated for enrollment compliers following Abadie (2002). Enrollment measured as first four-year (columns 1-3) or two- or four-year (columns 4-8) college or university of enrollment between July following high school graduation and six years later. IPEDS and Opportunity Insights (OI) data linked by OPE ID (and year in IPEDS case) to NSC enrollment. NSC-measured average SAT scores and five-year graduation measured only for 2001-2011 leave-out UC applicants and are time-invariant; see the Technical Appendix for details on data construction. IPEDS Average SAT score calculated for each school as the sum of the mean of the 25th and 75th percentiles of each SAT section, converting scores from 1600 scale to 2400 scale when necessary. Sticker price is defined using on-campus residency unless unavailable, in which case it is defined using off-campus non-family residency. IPEDS admission rate unavailable prior to 2005, and price information unavailable prior to 2008. Applicants from high schools with ELC eligibility thresholds between 3.96 and 4.00 are omitted. [‡] Indicates reduced-form estimates with $p < 0.1$ for the null hypothesis such that $p \not< 0.05$ (*insignificant* at conventional levels) when estimated using a local linear model with bias-corrected and cluster-robust confidence intervals following Calonico et al. (2019). [1]If the applicant enrolls at a community college but then enrolls at a four-year university within 6 months, the latter is defined as her first institution of enrollment. [2]Net price includes tuition and fees, expected room and board, books and supplies, and other expenses net of federal, state, local, or institutional grant aid. Calculated as the IPEDS average net price for Title-IV-aid-awarded enrollees in the applicant's family income bin, where the observed bins are \$0-30,000, \$30,000-48,000, \$48,000-75,000, \$75,000-110,000, and above \$110,000.

Source: UC Corporate Student System, National Student Clearinghouse, the Integrated Postsecondary Education Data System (IPEDS), and Opportunity Insights (Chetty et al., 2020a).

Table 6 documents the effects of ELC eligibility on high-GPA high school students' UC application, admission, and enrollments. It shows that ELC-eligible students became more likely to apply to some of the more-selective campuses, but the big change caused by ELC eligibility was large admission advantages at the Absorbing UC campuses, especially for students from lower-performing high schools. As a result, enrollment substantially increased at Davis, San Diego, and Irvine, and there is also some evidence of small enrollment increases at Berkeley and UCLA (partly driven by changes in application behavior).

Table 7 shows how ELC shifted enrollments across all of US higher education. ELC had the effect of increasing enrollment at the Absorbing UC campuses (and slightly at the more-selective campuses). If those students hadn't enrolled at UC, most of them would have otherwise going to CSU campuses. Some of the targeted students would have otherwise attended the less-selective UC campuses or community college.

Table 9: Change in Characteristics of ELC-Eligible Students' Degree-Providing Universities

	Admit Rate	Avg. SAT	Four-Year Grad. Rate	Five-Year Grad. Rate	Avg. SAT	Med. Fam. Income	Sticker Price	Est. Net Price[2]
B50 Sample								
Baseline	60.7	1,056.6	27.7	57.2	1,604.5	89,696	25,887	12,750
β	-1.6 (0.6)	16.0 (3.1)	2.9 (0.6)	1.6 (0.4)	20.1 (3.9)	1,056 (537)	242 (316)	3 (266)
IV: Enr. Sel. UC	-11.1 (3.9)	132.1 (22.6)	23.4 (4.1)	13.6 (3.1)	166.3 (28.0)	8,872 (4,339)	1,581 (2,049)	20 (1,736)
# of Obs.	41,164	65,553	54,381	77,741	77,737	73,688	28,080	28,052
B25 Sample								
Baseline	59.1	1,022.0	23.6	51.5	1,569.6	83,862	24,011	9,889
β	-2.0 (0.9)	20.5 (5.0)	4.1 (1.0)	2.5 (0.7)	23.9 (6.3)	1,093 (896)	628 (432)	211 (322)
IV: Enr. Sel. UC	-12.0 (5.2)	151.3 (31.2)	27.6 (5.3)	17.4 (4.3)	168.0 (36.3)	7,868 (6,100)	3,207 (2,154)	1,075 (1,629)
# of Obs.	18,167	28,912	23,860	34,638	34,637	32,706	12,707	12,700
Source:	IPEDS	IPEDS	IPEDS	NSC	NSC	OI	IPEDS	IPEDS/UC

Note: This table shows that ELC caused barely-eligible applicants to earn degrees from more-selective institutions using a host of selectivity measures (conditional on degree attainment). Reported coefficients are the estimated characteristics of applicants' Bachelor's graduation university or post-secondary institution (conditional on BA graduation) at the barely ELC-ineligible baseline, the change in those characteristics across the ELC eligibility threshold (β), and the estimated change in those characteristics for Absorbing-UC-campus compliers using an IV estimator instrumenting with ELC eligibility. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) or quarter (B25) of CA high schools by leave-year-out SAT score. Baseline estimates estimated for enrollment compliers following Abadie (2002). Enrollment measured as first four-year (columns 1-3) or two- or four-year (columns 4-8) college or university of enrollment between July following high school graduation and six years later. IPEDS and Opportunity Insights (OI) data linked by OPE ID (and year in IPEDS case) to NSC enrollment. NSC-measured average SAT scores and five-year graduation measured only for 2001-2011 leave-out UC applicants and are time-invariant; see the Technical Appendix for details on data construction. IPEDS Average SAT score calculated for each school as the sum of the mean of the 25th and 75th percentiles of each SAT section, converting scores from 1600 scale to 2400 scale when necessary. Sticker price is defined using on-campus residency unless unavailable, in which case it is defined using off-campus non-family residency. IPEDS admission rate unavailable prior to 2005, and price information unavailable prior to 2008. Applicants from high schools with ELC eligibility thresholds between 3.96 and 4.00 are omitted. ‡ Indicates reduced-form estimates with $p < 0.1$ for the null hypothesis such that $p \not< 0.05$ (*insignificant* at conventional levels) when estimated using a local linear model with bias-corrected and cluster-robust confidence intervals following Calonico et al. (2019). [1]If the applicant enrolls at a community college but then enrolls at a four-year university within 6 months, the latter is defined as her first institution of enrollment. [2]Net price includes tuition and fees, expected room and board, books and supplies, and other expenses net of federal, state, local, or institutional grant aid. Calculated as the IPEDS average net price for Title-IV-aid-awarded enrollees in the applicant's family income bin, where the observed bins are $0-30,000, $30,000-48,000, $48,000-75,000, $75,000-110,000, and above $110,000.

Source: UC Corporate Student System, National Student Clearinghouse, the Integrated Postsecondary Education Data System (IPEDS), and Opportunity Insights (Chetty et al., 2020a).

Table 10: Characteristics of Near-Threshold ELC Application Compliers

Panel A: Student Characteristics	Female (%)	URG (%)	Rural (%)	SAT Score	HS GPA	Avg. ZIP Income ($)	Below-Med. ZIP Inc. (%)
All	64.8 (4.8)	32.1 (5.1)	20.2 (3.5)	1085 (19)	3.91 (0.03)	69,754.9 (3,008.5)	54.5 (4.5)
B50	67.1 (6.1)	38.0 (6.3)	21.6 (4.4)	1021 (20)	3.80 (0.03)	58,853.3 (2,185.0)	64.9 (5.2)
B25	54.6 (9.6)	57.6 (9.9)	16.1 (5.9)	957 (30)	3.70 (0.05)	48,692.3 (2,809.3)	85.6 (5.8)
Below-Thresh. Mean[1]	62.9	25.0	14.6	1156	3.98	85,200	39.3
App Mean[2]	56.2	26.6	4.9	1160	3.67	100,500	28.6

Panel B: High School SAT Quartiles

	1st	2nd	3rd	4th
All	31.0 (3.8)	36.2 (3.9)	18.0 (3.7)	14.8 (2.9)
Below-Thresh. Mean[1]	23.2	25.4	25.5	25.9
Abs. Mean[1]	15.8	16.6	22.4	43.4

Note: This table shows that the barely above-threshold high school seniors who applied to UC as a result of their ELC eligibility tended to be somewhat negatively selected relative to both the typical UC applicant and relative to the full pool of near-threshold students, implying that positive selection into UC application is an unlikely explanation for above-threshold students' improved educational and labor market outcomes. Estimated characteristics of near-threshold ELC application compliers, or the barely above-threshold high school seniors who only applied to any University of California campus as a result of their ELC eligibility, estimated following Abadie (2002) with Equation 1. Standard errors in parentheses are clustered by school-year. See the text for definition of high school quartiles and the Technical Appendix for data definitions. Median California household income defined at $65,000 in 2016 dollars. [1]The average characteristics of California high school seniors immediately below their schools' ELC eligibility threshold, estimated as where the below-threshold polynomial intersects with the threshold. [2]The average characteristic of all California-resident freshman UC applicants.

Source: UC Corporate Student System, NCES, and IRS SOI.

Table 11: Characteristics of Near-Threshold ELC Compliers

Panel A: Student Characteristics	Female (%)	URG (%)	Rural (%)	SAT Score	HS GPA	Family Income ($)	Below-Med. Fam. Inc. (%)
All	63.9 (7.4)	35.2 (6.4)	15.1 (3.9)	1044 (33)	3.87 (0.03)	57,300 (12,000)	66.0 (7.3)
B50	68.5 (6.6)	46.8 (6.3)	15.6 (3.6)	1021 (23)	3.82 (0.03)	52,400 (6,400)	76.3 (6.2)
B25	62.1 (9.2)	56.1 (8.4)	12.9 (4.5)	935 (32)	3.72 (0.04)	37,100 (6,700)	95.2 (7.4)
UC Mean[1]	55.9	19.0	4.9	1193	3.81	87,300	47.6

Panel B: High School SAT Quartiles

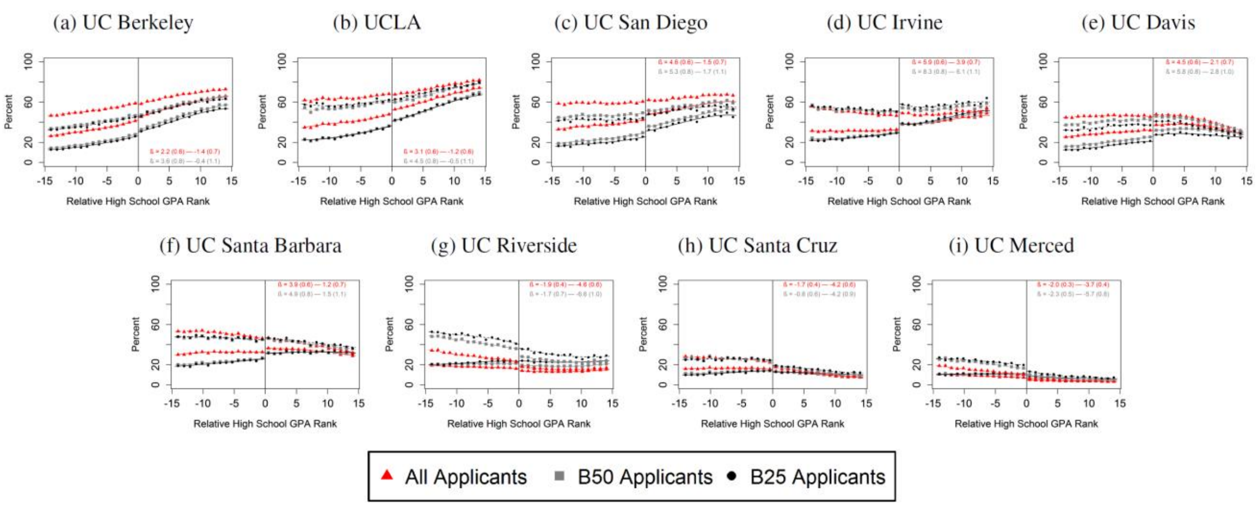
	1st	2nd	3rd	4th
All	37.6 (4.8)	40.1 (5.1)	22.7 (5.0)	-0.4 (6.0)
UC Mean[1]	13.6	17.7	24.2	44.6

Note: Estimated characteristics of near-threshold ELC enrollment compliers, or the barely above-threshold UC applicants who enroll at Absorbing or more-selective UC campuses as a result of their ELC eligibility, estimated following Abadie (2002) with Equation 1. Standard errors in parentheses are clustered by school-year. See the text for definition of high school quartiles and the Technical Appendix for data definitions. Median California household income defined at $65,000 in 2016 dollars. [1]The average characteristics of freshman CA-resident students who first enrolled at an Absorbing UC campus between 2002 and 2011.

Source: UC Corporate Student System and NCES.

Table 8 characterizes the changes in the institutions where ELC-eligible students enroll. Because of their eligibility, ELC-eligible students enroll at universities with lower admissions rates and higher average SAT scores and graduation rates. They also attend schools with much higher-income students, on average. Interestingly, though, while there is some evidence that they enroll at schools with higher sticker costs of tuition, those schools completely offset those higher costs with need-based financial aid; the average cost difference between UC and the schools that ELC-eligible students would have otherwise attended is approximately 0.

Figure 5: The Effect of ELC Eligibility on Application to Each UC Campus



This figure shows that barely ELC-eligible applicants responded to their Absorbing UC campus admissions advantages by becoming slightly more likely to apply to those campuses and slightly less likely to apply to the less-selective campuses, though the magnitudes are far smaller than the shifts in those applicants' admissions likelihoods. UC applicants' likelihood of application to each UC campus by ELC GPA distance from their high school's ELC eligibility threshold, among all high-GPA California high school students (solid lines) and among UC applicants (dotted lines), and among all students and those from the bottom half (B50) or quartile (B25) of California high schools by leave-year-out average SAT. Points are binned averages; lines are cubic fits. Beta estimates are from cubic regression discontinuity models following Equation 1 for all students (left) and UC applicants (right), with standard errors in parentheses clustered by high-school-year. Source: UC Corporate Student System.

Table 12: Characteristics of Near-Threshold ELC Compliers by Year

HS Grad. Year (%):	2002	2003	2004	2005	2006	2007	2008	2010	2011
Application Compliers	8.1 (2.9)	9.9 (2.7)	11.2 (3.0)	9.5 (2.9)	13.4 (2.8)	5.1 (2.9)	14.0 (2.9)	15.9 (2.9)	12.9 (3.0)
All Top HS Students	7.8	8.0	9.9	11.5	11.9	12.2	12.7	12.8	13.1
Enrollment Compliers	6.1 (3.8)	11.9 (3.9)	-1.8 (4.3)	5.1 (4.1)	2.1 (4.3)	11.0 (4.4)	15.9 (4.3)	24.4 (4.8)	25.3 (4.7)
UC Applicants	9.6	10.2	9.8	10.1	10.9	11.4	12.2	12.6	13.1

Note: This table shows that the share of ELC application and especially enrollment compliers grew over time, likely because of both enrollment growth and increased UC selectivity outside the ELC policy. Estimated high school graduation year shares of near-threshold application (and enrollment) ELC compliers, or the barely above-threshold high school seniors (UC applicants) who only applied to any University of California campus (enrolled at an Absorbing or more-selective UC campus) as a result of their ELC eligibility, estimated following Abadie (2002) with Equation 1. The table also shows the share of all top CA high school students and UC applicants (in the period) in each year. Standard errors in parentheses are clustered by school-year.

Source: UC Corporate Student System, NCES, and IRS SOI.

Table 9 provides a similar characterization of the schools that ELC-eligible students graduate from. It similarly shows that ELC leads students to earn degrees from generally more-selective (but not more expensive) institutions.

Tables 10 and 11 characterize the two key sets of 'participants' of the ELC policy: the students who would otherwise not have applied to UC, and the students who would otherwise not have enrolled at the Absorbing or more-selective UC campuses. Table 10 shows that the students who were pulled into applying to UC by the ELC policy tended to be somewhat lower-income than other students applying to UC, either among all applicants or among applicants with similar high school GPA rank. They had similar SAT scores and are otherwise broadly-similar to other similar-rank applicants. This provides further evidence that the new students pulled into UC application by the ELC policy are unlikely to substantially bias the estimated effects of the ELC policy on applicant outcomes. Figure 5 complements these findings by showing that the new applicants were most drawn to the Absorbing UC campuses, especially UC Irvine, while the less-selective campuses saw application declines. Table 11, however, shows that ELC's enrollment participants were much lower-income and lower-testing than the typical students who otherwise enrolled at UC. Among the 80 percent of participants who came from the bottom half of California high schools by SAT score, about half were URG. This suggests that ELC tended to admit students who would otherwise have had little likelihood of having access to selective university campuses like the Absorbing UC campuses. Table 12 further characterizes these students, showing that ELC was most impactful in increasing enrollment in its last years (2010-2011).

Table 13: Characteristics of Near-Threshold ELC Compliers by grades

	Pre-College		College GPA		
	HS GPA	SAT	Year 1	Year 2	Final
Panel A: B50 Sample					
ELC Compliers	3.82 (0.03)	1021 (23)	2.13 (0.22)	2.55 (0.20)	2.72 (0.22)
UC Percentile	47.8	14.1	9.8	20.5	18.1
Panel B: B25 Sample					
ELC Compliers	3.74 (0.04)	935 (32)	1.70 (0.29)	2.21 (0.26)	2.48 (0.25)
UC Percentile	37.6	5.9	3.3	7.1	7.2
UC Average	3.81	1193	2.92	2.99	3.14

Note: This table shows that ELC enrollment compliers had poor estimated academic performance at UC, matching their poor standardized test scores, though this apparently did not hinder their ability to derive large gains from UC enrollment. Estimated pre-college and college academic performance of near-threshold application (and enrollment) ELC compliers, or the barely below-threshold (for pre-college characteristics) or above-threshold (for college performance) UC applicants who only enrolled at an Absorbing or more-selective UC campus as a result of their ELC eligibility, estimated following Abadie (2002) with Equation 1. The college GPA samples are restricted to UC enrollees, for whom enrollment GPAs are observed at the end of the first year, the end of the second year, and at degree attainment (each conditional on students' still being enrolled at each period). The table also shows the compliers' characteristic as a percentile of all California-resident freshman Absorbing UC students in those years along with the mean characteristic among Absorbing UC students. Standard errors in parentheses are clustered by school-year. Estimates are restricted to students from the bottom half (B50) or quarter (B25) of high schools by leave-year-out average SAT score. See the text for definition of high school quartiles and the Technical Appendix for data definitions.

Source: UC Corporate Student System, NCES, and IRS SOI.

Table 14: Baseline Changes in Intended Major Selection

	Undec.	Art	Hum.	Soc. Sci.	Nat. Sci.	Engin.	Profess.	Bus.	STEM[1]
B50 Sample									
Baseline	19.8	3.2	8.7	19.4	35.5	18.9	7.4	7.0	55.5
β	-0.4	-0.3	-0.2	-0.1	0.4	0.0	-0.3	0.6	0.4
	(0.9)	(0.4)	(0.7)	(0.9)	(1.2)	(0.9)	(0.6)	(0.6)	(1.2)
B25 Sample									
Baseline	21.7	3.0	9.5	23.0	32.3	18.1	6.8	7.4	51.2
β	-1.5	-0.2	-0.4	0.2	-0.1	0.2	0.0	0.2	0.5
	(1.4)	(0.6)	(1.0)	(1.5)	(1.7)	(1.3)	(0.8)	(0.9)	(1.8)

Note: This table shows that barely ELC-eligible applicants' reported intended college majors were largely unimpacted by their ELC eligibility. Reported coefficients are the estimated distribution of intended majors reported on UC applications by barely-eligible ELC enrollment compliers (estimated following Abadie (2002) with Absorbing or more-selective UC campus enrollment as the endogenous variable), and the change in those characteristics across the ELC eligibility threshold ($\hat{\beta}$) estimated following Equation 1. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) or quarter (B25) of CA high schools by leave-year-out SAT score. [1]STEM includes all Natural Science and Engineering majors as well as some Professional majors (e.g. Agriculture and Architecture); see U.S. Department of Homeland Security (2016).

Source: UC Corporate Student System.

Table 15: ELC Impact on Intended Major to Earned Major Transitions, B50 Sample

	No Degree	Art	Human.	Soc. Sci.	Nat. Sci.	Engin.	Profess.	Bus.	STEM[1]	Non-STEM
Undecl.	-1.1	-0.2	-0.1	2.5	-2.6†	0.5	-3.0†	3.4*	-1.1	2.3
Art	1.2	-1.4	2.9	-2.6	4.8*	0.6	-8.1†	0.2	2.5	-5.7
Hum.	0.2	-1.8	1.2	2.9	0.6	0.2	-3.2	-0.9	0.9	-1.7
Soc. Sci.	-4.3†	-0.7	-0.8	9.9**	-0.2	0.2	-0.6	-1.2	0.3	4.6†
Nat. Sci.	-3.1	-0.1	-0.5	2.4	0.9	-0.2	-0.1	-0.0	0.4	2.4
Engin.	0.0	-0.1	-0.1	1.6	-1.6	-2.7	-0.2	2.3†	-3.2	2.6
Profess.	-5.2	-1.2	-4.2*	8.1**	-0.9	-0.5	3.2	-0.3	0.0	5.2
Bus.	-0.3	0.3	0.4	0.9	-0.7	-0.9	0.5	1.1	1.6	-0.8
STEM	-2.1	-0.1	-0.7	2.8*	-0.2	-1.2	-0.1	0.9	-1.2	2.9†

Note: This table shows that barely ELC-eligible intended STEM majors tended to switch into social science majors, though the estimates are too noisy to precisely estimate any direct evidence of intended STEM majors' transition out of STEM fields. Reported coefficients are the estimated change in likelihood for barely ELC-eligible applicants ($\hat{\beta}$) to earn a major by discipline conditional on their intended major's discipline, among applicants from the bottom half of California high schools by leave-year-out average SAT. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) of CA high schools by leave-year-out SAT score. Degree attainment measured five years after initial enrollment. Applicants from high schools with ELC eligibility thresholds between 3.96 and 4.00 are omitted. Statistical significance of hypothesis tests differing from 0: † 10 percent, * 5 percent, ** 1 percent. [1]STEM includes all Natural Science and Engineering majors as well as some Professional majors (e.g. Agriculture and Architecture); see U.S. Department of Homeland Security (2016).

Source: UC Corporate Student System and National Student Clearinghouse

Table 13 investigates the academic performance of ELC participants. It shows that ELC participants did not earn very high grades at UC, with final grades at about the 20th percentile of Absorbing UC campus students on average. This is about what would be expected given ELC students' SAT scores, which were at the 14th percentile of Absorbing UC campus students on average. This may make it all the more surprising that ELC students were able to derive such substantial value from their UC enrollment.

Tables 14 and 15 investigate the college major choices of ELC participants. Table 14 shows that ELC eligibility did not substantially change the reported intended majors that students reported on their UC applications. Table 15 provides somewhat-noisy evidence that ELC eligibility may have led some students who intended to earn STEM majors to earn other majors instead, though the primary reason for the rise in non-STEM degrees is that students became overall more likely to earn college degrees within five years of graduating high school because of ELC eligibility.

Table 16: Impact of ELC Eligibility on Schooling and Labor Market Outcomes

	B50 Sample					B25 Sample				
	Reduced Form	IV Estimates		Potential Outcomes		Reduced Form	IV Estimates		Potential Outcomes	
		Sel. UC	Grad Rate	Below	Above		Sel. UC	Grad Rate	Below	Above
Enroll at Sel.	12.63		4.46			13.95		3.61		
UC Campus (%)	(1.14)		(0.63)			(1.67)		(0.58)		
Univ. Five-Year	2.83	22.43		53.07	75.50	3.87	27.68		50.40	78.08
Grad. Rate (%)	(0.49)	(3.19)		(2.88)	(1.42)	(0.78)	(4.41)		(4.03)	(1.92)
Grad. within	2.22	17.57	0.78	48.63	66.19	1.44	10.30	0.37	45.35	55.65
Five Years (%)	(1.11)	(8.60)	(0.36)	(6.63)	(5.65)	(1.70)	(11.98)	(0.42)	(9.28)	(7.82)
Number of	-0.03	-0.20	-0.01	4.73	4.53	-0.02	-0.11	-0.00	4.70	4.59
Year Enrolled	(0.03)	(0.22)	(0.01)	(0.18)	(0.13)	(0.05)	(0.33)	(0.01)	(0.27)	(0.19)
Earn STEM	-0.42	-3.35	-0.15	26.88	23.53	-0.33	-2.38	-0.09	12.58	10.21
Degree (%)	(0.88)	(6.97)	(0.31)	(4.60)	(5.51)	(1.04)	(7.49)	(0.27)	(4.97)	(5.77)
# Late-20s	0.01	0.05	0.00	1.38	1.43	0.04	0.28	0.01	1.30	1.58
Years Employed	(0.02)	(0.17)	(0.01)	(0.13)	(0.12)	(0.03)	(0.23)	(0.01)	(0.18)	(0.15)
Average Late-20s	2,740	20,309	1,148	63,844	84,153	1,909	12,766	525	52,676	65,441
CA Wages ($)	(1,162)	(8,910)	(559)	(6,186)	(6,494)	(1,502)	(10,174)	(426)	(7,568)	(7,110)
Average Late-20s	0.027	0.203	0.011	10.908	11.112	0.019	0.126	0.005	10.766	10.892
Log CA Wages	(0.016)	(0.123)	(0.007)	(0.087)	(0.089)	(0.023)	(0.155)	(0.006)	(0.118)	(0.107)
Univ. Wage	905	6,751	287	59,825	66,576	1,033	6,883	260	58,806	65,689
Value-Added ($)	(199)	(1,425)	(54)	(1,336)	(599)	(280)	(1,689)	(56)	(1,574)	(730)

Note: This table presents OLS reduced-form, 2SLS instrumental variable, and potential outcome coefficient estimates of the relationship between ELC eligibility, selective UC campus enrollment, and student educational and labor market outcomes. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) or quarter (B25) of high schools by leave-year-out average SAT score. The 2SLS regressions report coefficients from a single instrument, either enrollment at an Absorbing of more-selective ('selective') UC campus or the five-year graduation rate of the students' first enrollment institution (see the Technical Appendix); potential outcomes are presented for the former instrument following Abadie (2002). Graduating within five years is measured in NSC; number of years enrolled counts the number of academic years within seven years of graduating high school in which postsecondary enrollment is observed; and STEM degree attainment follows the DHS designation of STEM fields by CIP code. 'Late-20s' employment outcomes are measured 10-11 years following high school graduation; average annual wage and log wage are conditional on having observed EDD wages. University wage value-added statistics (for the student's first enrollment institution) estimated for Late-20s wages over leave-out UC applicants following Chetty et al. (2020b). See the Technical Appendix for details on data construction.

Source: UC Corporate Student System, National Student Clearinghouse, and the California Employment Development Department (Bleemer, 2018).

Tables 16 to 19 present a series of robustness checks and extensions of the effects of ELC on students' educational and labor market outcomes. For each outcome and for the B50 and B25 samples, Table 16 shows the 'reduced form' estimate at the threshold – that is, the estimated average difference in outcomes below and above the threshold – using the main empirical specification. Then it shows the "Absorbing UC campus IV" estimate, which match the results presented in the topic brief's main text, along with an alterative instrumental variable strategy that presents the approximate change in student outcome per unit change in graduation rate of the institution where that student first enrolled. For example, it looks like ELC participants' late-20s wages increased by about $2,700 for each additional percentage point of graduation rate of the university that they attended after graduating high school. Finally, it shows the "potential outcomes" of students, or the estimated outcome levels of students who did not enroll at the Absorbing campuses (below) and those who did (above). Results are shown for a number of additional outcomes, including the number of years enrolled as an undergraduate (within the first 7 years after high school graduation), STEM degree attainment, number of years employed in California (7-9 years after graduating high school), and log wages in those years.

Table 17 shows estimates of the effects of ELC eligibility on the same set of outcomes, but for all students and for URG students instead of just focusing on students from the bottom half (B50) and quarter (B25) of California high schools by leave-year-out SAT score. It shows essentially similar patterns across each of these groups, though statistical significance differs for estimates from each group.

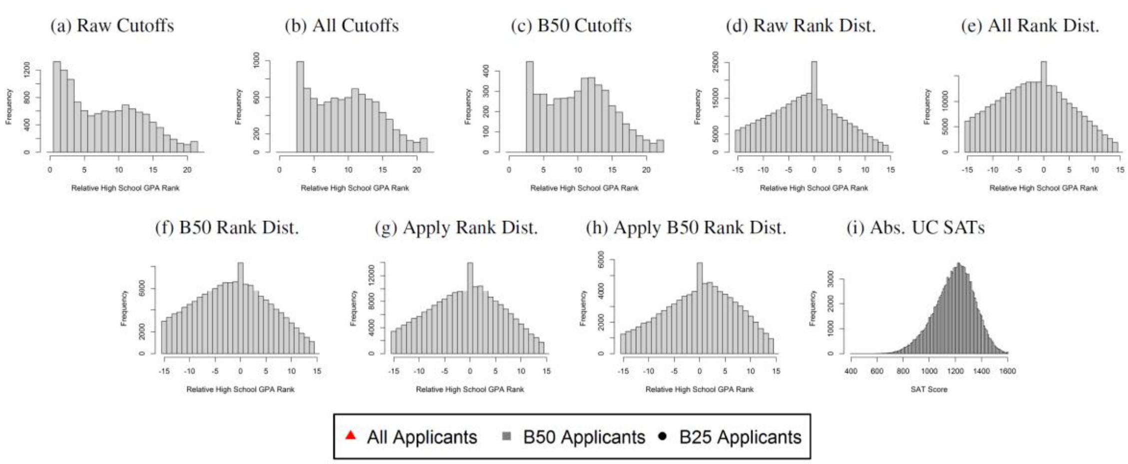
Table 17: Impact of ELC Eligibility on Schooling and Labor Market Outcomes, Overall and for URG Applicants

	All Applicants					URG Applicants				
	Reduced Form	IV Estimates Sel. UC	Grad Rate	Potential Outcomes Below	Above	Reduced Form	IV Estimates Sel. UC	Grad Rate	Potential Outcomes Below	Above
Enroll at Sel. UC Campus (%)	7.30		4.40			10.62		3.99		
	(0.73)		(0.70)			(1.46)		(0.84)		
Univ. Five-Year Grad. Rate (%)	1.66	22.74		53.26	76.00	2.65	25.06		50.76	75.82
	(0.29)	(3.63)		(3.39)	(1.47)	(0.65)	(5.26)		(4.96)	(2.04)
Grad. within Five Years (%)	1.17	16.06	0.70	55.31	71.38	0.65	6.12	0.25	49.46	55.58
	(0.62)	(8.42)	(0.35)	(6.67)	(5.67)	(1.38)	(12.87)	(0.50)	(10.33)	(8.45)
Number of Year Enrolled	-0.01	-0.13	-0.01	4.63	4.50	-0.04	-0.32	-0.01	4.78	4.46
	(0.02)	(0.21)	(0.01)	(0.16)	(0.13)	(0.04)	(0.35)	(0.01)	(0.29)	(0.19)
Earn STEM Degree (%)	-0.10	-1.31	-0.06	35.76	34.44	-1.38	-13.01	-0.51	24.97	11.96
	(0.63)	(8.68)	(0.38)	(5.75)	(6.97)	(1.02)	(9.95)	(0.42)	(7.02)	(7.13)
# Late-20s Years Employed	0.00	0.06	0.00	1.37	1.44	0.04	0.45	0.02	1.34	1.80
	(0.01)	(0.22)	(0.01)	(0.16)	(0.15)	(0.03)	(0.29)	(0.01)	(0.22)	(0.19)
Average Late-20s CA Wages ($)	1,368	17,355	950	66,356	83,711	2,714	24,376	913	47,235	71,612
	(979)	(12,634)	(716)	(8,919)	(9,329)	(1,493)	(14,142)	(544)	(11,034)	(8,967)
Average Late-20s Log CA Wages	0.009	0.115	0.006	10.936	11.051	0.030	0.270	0.010	10.750	11.020
	(0.012)	(0.149)	(0.008)	(0.105)	(0.111)	(0.021)	(0.196)	(0.007)	(0.149)	(0.128)
Univ. Wage Value-Added ($)	206	2,689	116	64,109	66,798	938	8,389	323	58,197	66,586
	(180)	(2,372)	(97)	(2,356)	(786)	(358)	(3,270)	(113)	(3,247)	(942)

Note: This table shows similar patterns to the main findings in Table 16 for all UC applicants (without excluding students from higher-quality high schools) and URG applicants. This table presents OLS reduced-form, 2SLS instrumental variable, and potential outcome coefficient estimates of the relationship between ELC eligibility, selective UC campus enrollment, and student educational and labor market outcomes. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to all UC applicants or URG applicants (defined as Black, Hispanic, or Native American). The 2SLS regressions report coefficients from a single instrument, either enrollment at an Absorbing of more-selective ('selective') UC campus or the five-year graduation rate of the students' first enrollment institution (see the Technical Appendix); potential outcomes are presented for the former instrument following Abadie (2002). Graduating within five years is measured in NSC; number of years enrolled counts the number of academic years within seven years of graduating high school in which postsecondary enrollment is observed; and STEM degree attainment follows the DHS designation of STEM fields by CIP code. 'Late-20s' employment outcomes are measured 10-11 years following high school graduation; average annual wage and log wage are conditional on having observed EDD wages. University wage value-added statistics (for the student's first enrollment institution) estimated for Late-20s wages over leave-out UC applicants following Chetty et al. (2020b). See the Technical Appendix for details on data construction.

Source: UC Corporate Student System, National Student Clearinghouse, and the California Employment Development Department (Bleemer, 2018).

Figure 6: The Effect of ELC Eligibility on Application to Each UC Campus



This figure visualizes the distribution of the ELC GPA ranks used in the main analyses' regression discontinuity analysis along with the distribution of SAT scores at the Absorbing UC campuses, showing that ELC participants have far lower SAT scores than most enrollees at those schools. **Panels (a-c)**: The distribution of high schools' ELC GPA rank eligibility threshold, where 1 is the highest-GPA student at the school and implies that only students with the highest GPA are eligible, for three groups (with each school-year only appearing once): all high schools, all high schools with at least three GPA ranks on either side of the threshold (the technical requirement to be included in the main analysis), and those schools which are in the B50 sample (that is, in the bottom half of California high schools by leave-year-out average SAT score). **Panels (d-f)**: The distribution of the running variable – that is, high-GPA students' GPA rank distance from their high school's eligibility threshold – for the same three groups. **Panels (g-h)**: The distribution of the running variable restricted to UC applicants. Panel (i): The distribution of SAT scores among 2002-2011 California-resident freshman Absorbing UC campus enrollees, for comparison with the ELC participants. Source: UC Corporate Student System.

Figure 6 visualizes an unusual pattern in the ELC GPA rank ‘running variable’ that undergirds the regression discontinuity design presented in this analysis: there is strong bunching at exactly the eligibility threshold, resulting from more-populated thresholds being more likely to be selected as the 96th percentile of grades at that high school. In order to be certain that this bunching does not get in the way of estimating the near-threshold effects of ELC eligibility, Table 18 replicates the presented analysis omitting at-threshold students. It shows that, if anything, the results are stronger when those students are omitted.

Table 18: Impact of ELC Eligibility on Schooling and Labor Market Outcomes, Dropping Immediately Above-Threshold Students

	B50 Sample					B25 Sample				
	Reduced Form	IV Estimates		Potential Outcomes		Reduced Form	IV Estimates		Potential Outcomes	
		Sel. UC	Grad Rate	Below	Above		Sel. UC	Grad Rate	Below	Above
Enroll at Sel. UC Campus (%)	12.70 (1.72)		4.50 (0.95)			13.18 (2.49)		3.55 (0.85)		
Univ. Five-Year Grad. Rate (%)	2.83 (0.72)	22.24 (4.71)		54.47 (4.26)	76.71 (2.18)	3.73 (1.11)	28.17 (6.74)		51.07 (6.09)	79.24 (3.20)
Grad. within Five Years (%)	4.41 (1.63)	34.75 (12.80)	1.56 (0.56)	39.20 (9.62)	73.96 (8.65)	4.29 (2.51)	32.57 (18.74)	1.16 (0.63)	27.71 (14.36)	60.28 (12.76)
Number of Year Enrolled	-0.03 (0.04)	-0.21 (0.32)	-0.01 (0.01)	4.56 (0.25)	4.35 (0.20)	-0.01 (0.06)	-0.11 (0.48)	-0.00 (0.02)	4.54 (0.39)	4.43 (0.29)
Earn STEM Degree (%)	1.90 (1.40)	14.97 (11.05)	0.68 (0.50)	21.00 (6.77)	35.97 (9.11)	2.23 (1.75)	16.90 (13.41)	0.60 (0.48)	5.78 (8.25)	22.68 (10.90)
# Late-20s Years Employed	-0.01 (0.03)	-0.10 (0.25)	-0.00 (0.01)	1.50 (0.17)	1.39 (0.18)	0.03 (0.05)	0.20 (0.32)	0.01 (0.01)	1.50 (0.24)	1.71 (0.23)
Average Late-20s CA Wages ($)	4,480 (1,844)	29,657 (13,083)	1,727 (912)	58,398 (8,461)	88,055 (9,645)	3,415 (2,345)	19,405 (13,811)	907 (689)	48,460 (9,775)	67,865 (9,824)
Average Late-20s Log CA Wages	0.060 (0.025)	0.398 (0.178)	0.023 (0.012)	10.843 (0.115)	11.241 (0.131)	0.059 (0.035)	0.338 (0.208)	0.016 (0.011)	10.678 (0.146)	11.016 (0.147)
Univ. Wage Value-Added ($)	1,256 (343)	9,628 (2,730)	458 (122)	57,204 (2,628)	66,831 (1,032)	1,176 (503)	8,309 (3,501)	346 (129)	57,501 (3,364)	65,809 (1,341)

Note: This table shows somewhat-stronger relationships between ELC eligiblility and student outcomes than those shown in Table 16 when immediately above-threshold students are omitted from the sample, out of concern that they may be unusually-selected due to their having unusually-common GPAs. This table presents OLS reduced-form, 2SLS instrumental variable, and potential outcome coefficient estimates of the relationship between ELC eligibility, selective UC campus enrollment, and student educational and labor market outcomes, **omitting students with GPAs exactly at their high school's ELC eligibility threshold**. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) or quarter (B25) of high schools by leave-year-out average SAT score. The 2SLS regressions report coefficients from a single instrument, either enrollment at an Absorbing of more-selective (‘selective’) UC campus or the five-year graduation rate of the students' first enrollment institution (see the Technical Appendix); potential outcomes are presented for the former instrument following Abadie (2002). Graduating within five years is measured in NSC; number of years enrolled counts the number of academic years within seven years of graduating high school in which postsecondary enrollment is observed; and STEM degree attainment follows the DHS designation of STEM fields by CIP code. ‘Late-20s’ employment outcomes are measured 10-11 years following high school graduation; average annual wage and log wage are conditional on having observed EDD wages. University wage value-added statistics (for the student's first enrollment institution) estimated for Late-20s wages over leave-out UC applicants following Chetty et al. (2020b). See the Technical Appendix for details on data construction.

Source: UC Corporate Student System, National Student Clearinghouse, and the California Employment Development Department (Bleemer, 2018).

Table 19 presents a further set of alternative empirical specifications to test whether the presented results are sensitive to the several parameterization decisions made in the main estimation. While there are some cases where the presented results' statistical significance is sensitive to specification, in general the presented findings do not appear very sensitive to these parameter decisions.

Table 20 presents a series of technical checks for the second instrumental variable strategy presented in Table 16, investigating whether it makes sense to index the effects of ELC to the graduation rate of the first institution where students enroll. While the tests are somewhat underpowered, it presents suggestive evidence supporting that indexing decision.

Table 21 breaks the wage effects of ELC down annually, showing the effect of eligibility on annual wages from age 24 to 29 (6 to 11 years following high school graduation). It shows that, if anything, annual wage returns to UC appear to grow (in dollars, though fixed in logs) as workers age, suggesting little reason to expect that the return to UC enrollment decreases as graduates age.

Table 19: Impact of ELC Eligibility on Schooling and Labor Market Outcomes, Alternative Specifications

	B50 Sample							B25 Sample						
	Main	(1)	(2)	(3)	(4)	(5)	(6)	Main	(1)	(2)	(3)	(4)	(5)	(6)
Enroll at Sel. UC Campus (%)	12.63	11.40	14.07	12.80	12.42	12.13	13.69	13.95	12.88	16.18	14.15	13.67	12.90	16.99
	(1.14)	(0.84)	(1.44)	(1.25)	(1.14)	(1.07)	(1.61)	(1.67)	(1.25)	(2.11)	(1.85)	(1.68)	(1.57)	(2.27)
Univ. Five-Year Grad. Rate (%)	2.83	2.76	3.15	3.06	2.75	2.94	3.07	3.87	3.48	4.33	4.26	3.71	3.72	4.04
	(0.49)	(0.37)	(0.63)	(0.54)	(0.49)	(0.46)	(0.61)	(0.78)	(0.57)	(0.98)	(0.85)	(0.78)	(0.72)	(0.82)
Grad. within Five Years (%)	2.22	1.98	1.66	2.66	2.10	2.38	1.47	1.44	1.79	1.17	1.71	1.32	1.25	-0.30
	(1.11)	(0.83)	(1.40)	(1.21)	(1.11)	(1.04)	(1.37)	(1.70)	(1.27)	(2.13)	(1.86)	(1.70)	(1.59)	(2.15)
Number of Year Enrolled	-0.03	-0.02	-0.04	-0.04	-0.03	-0.04	-0.02	-0.02	-0.01	-0.07	-0.03	-0.02	-0.03	-0.04
	(0.03)	(0.02)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)	(0.06)
Earn STEM Degree (%)	-0.42	-0.24	-1.56	-1.06	-0.55	0.08	-2.13	-0.33	-0.44	-1.77	-0.85	-0.70	-0.33	-1.92
	(0.88)	(0.65)	(1.11)	(0.96)	(0.88)	(0.81)	(1.14)	(1.04)	(0.79)	(1.31)	(1.14)	(1.05)	(0.96)	(1.21)
# Late-20s Years Employed	0.01	-0.00	0.01	0.01	0.01	0.01	-0.01	0.04	0.02	0.06	0.04	0.04	0.04	0.04
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
Average Late-20s CA Wages ($)	2,740	881	3,013	2,617	2,440	2,579	2,173	1,909	910	4,009	2,275	1,388	1,531	3,201
	(1,162)	(895)	(1,492)	(1,276)	(1,170)	(1,085)	(1,443)	(1,502)	(1,140)	(1,880)	(1,631)	(1,506)	(1,401)	(1,907)
Average Late-20s Log CA Wages	0.027	0.016	0.029	0.025	0.024	0.022	0.019	0.019	0.016	0.042	0.022	0.013	0.010	0.026
	(0.016)	(0.012)	(0.021)	(0.018)	(0.016)	(0.015)	(0.020)	(0.023)	(0.017)	(0.029)	(0.025)	(0.023)	(0.021)	(0.029)
Univ. Wage Value-Added ($)	905	933	712	963	858	1,077	724	1,033	1,336	1,082	1,229	977	1,180	923
	(199)	(154)	(253)	(215)	(199)	(196)	(248)	(280)	(218)	(349)	(298)	(280)	(279)	(311)

Note: This table shows general substantive consistency across alternative specifications of the results shown in Table 16, with some specifications providing statistically stronger and weaker estimates. This table presents OLS reduced-form estimates of the relationship between ELC eligibility and student educational and labor market outcomes, estimated using a number of alternative empirical strategies. 'Main' estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1. The specifications are: **(1)** allow only second-order polynomials in the running variable; **(2)** allow fourth-order polynomials in the running variable; **(3)** restrict the data to only 10 ranks on either side of the eligibility threshold; **(4)** omit all covariates; **(5)** omit the sample restriction to school-years with at least three GPA ranks on either side of the eligibility threshold; and **(6)** estimate local linear regressions with bias-corrected robust standard errors following Calonico et al. (2019). All standard errors are clustered by school-year, and the sample is restricted to students from the bottom half (B50) or quarter (B25) of high schools by leave-year-out average SAT score. Graduating within five years is measured in NSC; number of years enrolled counts the number of academic years within seven years of graduating high school in which postsecondary enrollment is observed; and STEM degree attainment follows the DHS designation of STEM fields by CIP code. 'Late-20s' employment outcomes are measured 10-11 years following high school graduation; average annual wage and log wage are conditional on having observed EDD wages. University wage value-added statistics (for the student's first enrollment institution) estimated for Late-20s wages over leave-out UC applicants following Chetty et al. (2020b). See the Technical Appendix for details on data construction.

Source: UC Corporate Student System, National Student Clearinghouse, and the California Employment Development Department

Table 20: Tests of Treatment Effect Linearity in University Graduation Rate

	Number of HS Quantiles				
	2	4	6	8	10
Panel A: 2SLS Over-ID Tests on Graduation Rate					
IV β	1,448	1,347	1,499	1,243	1,182
	(678)	(553)	(621)	(483)	(444)
Sargan's S	0.00	0.21	0.22	0.26	0.63
p	0.990	0.975	0.999	1.000	1.000
Panel B: LIML Estimates on Graduation Rate					
IV β	1,836	2,184	2,275	2,155	2,273
	(480)	(444)	(429)	(397)	(407)
Panel C: 2SLS Estimates of Quadratic in Grad. Rate					
GR^2 β	2,290	18,698	-1,368	3,007	1,456
	(59,115)	(25,661)	(8,295)	(5,068)	(3,164)

Note: This table reports the results of three series of potentially-underpowered tests of whether the changes in outcomes caused by barely ELC-eligible students' Absorbing UC campus enrollment could be usefully projected onto their change in university selectivity (indexed by five-year graduation rates). Interacting ELC eligibility and the running variable terms with applicants' high school quantiles, Panel A shows that over-id tests cannot reject linear returns to selectivity; Panel B shows that the LIML IV estimates do not shrink as the number of instruments increase; and Panel C shows that a quadratic term in graduation rate is not statistically significantly different from 0. Reported coefficients are coefficient estimates and test statistics from regressions of an indicator for applicants' Early-20s annual wages on their institution of first enrollment's NSC-calculated five-year graduation rate, instrumented by ELC eligibility interacted with high school SAT quantile indicators. Sample restricted to UC applicants in the bottom half (B50) of California high schools by near-threshold SAT score, and regressions include third-order polynomials in the ELC running variable interacted with quantile dummies along with high school and year fixed effects and standard covariates. Standard errors in parentheses clustered by high-school-year. **Panel A:** Coefficients and statistics from 2SLS regression estimation. Reported "IV β" is the second-stage term on five-year graduation rates; Sargan's S tests for over-identification and is distributed χ^2 with degrees of freedom equal to the number of high school quantiles minus 1 (p estimates model's likelihood under the null hypothesis). **Panel B:** Coefficients on graduation rate from Limited Information Maximum Likelihood estimation. **Panel C:** Coefficients on the square of graduation rate when both linear and squared rates are instrumented by ELC-interactions.

Source: UC Corporate Student System and the California Employment Development Department.

Table 21: Impact of ELC Eligibility on Observed Annual California Wages

	B50 Sample						B25 Sample					
Approximate Age:	24	25	26	27	28	29	24	25	26	27	28	29
Panel A: All UC Applicants												
Non-Zero Wage Indicator (%)	1.16 (1.15)	0.96 (1.14)	0.25 (1.12)	-0.04 (1.13)	-0.06 (1.11)	-0.05 (1.18)	2.49 (1.71)	1.39 (1.67)	0.33 (1.65)	-0.09 (1.63)	1.28 (1.62)	1.67 (1.70)
Average Wages ($)	585 (742)	691 (822)	1,064 (922)	989 (1,012)	1,905 (1,120)	2,712 (1,325)	681 (981)	384 (1,083)	1,085 (1,191)	1,804 (1,301)	946 (1,449)	1,507 (1,715)
Average Log Wages	0.017 (0.016)	0.011 (0.015)	0.016 (0.016)	0.014 (0.016)	0.016 (0.016)	0.020 (0.017)	0.019 (0.022)	0.009 (0.022)	0.024 (0.022)	0.022 (0.023)	0.001 (0.023)	0.010 (0.024)
# of Observations	48,632	51,648	54,199	55,059	56,681	50,119	23,295	25,022	26,318	26,537	27,240	23,998
Panel B: Omitting At-Threshold Eligible Students												
Non-Zero Wage Indicator (%)	-2.15 (1.75)	-1.27 (1.73)	-1.40 (1.70)	-2.11 (1.70)	-1.40 (1.67)	-1.02 (1.77)	-1.37 (2.56)	-0.88 (2.47)	-0.61 (2.41)	-1.10 (2.39)	0.83 (2.37)	1.31 (2.51)
Average Wages ($)	151 (1,152)	130 (1,296)	1,548 (1,405)	2,078 (1,588)	2,346 (1,749)	4,245 (2,110)	377 (1,507)	-126 (1,638)	2,247 (1,819)	4,336 (2,059)	1,229 (2,199)	2,397 (2,710)
Average Log Wages	0.019 (0.024)	0.008 (0.024)	0.040 (0.024)	0.039 (0.024)	0.031 (0.024)	0.042 (0.026)	0.024 (0.034)	0.010 (0.032)	0.063 (0.033)	0.073 (0.035)	0.025 (0.034)	0.032 (0.037)
# of Observations	45,263	48,066	50,467	51,271	52,826	46,695	21,711	23,343	24,574	24,789	25,469	22,439

Note: This table shows that ELC eligibility appears to persistently increase wages for barely-eligible applicants as they age (from age 24 to 29), suggesting that the main estimates are unlikely to be short-lived in applicants' very early careers. Estimated reduced-form changes ($\hat{\beta}$) in annual covered California employment and covered California wages and log wages 6-11 years after high school graduation caused by near-threshold ELC eligibility. Estimates are from cubic regression discontinuity models over UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold following Equation 1 with standard errors clustered by school-year, restricting the sample to students from the bottom half (B50) or quarter (B25) of high schools by leave-year-out average SAT score. Covered wages exclude wages not covered by California unemployment insurance, including federal and self-employment. See the Technical Appendix for details on data construction.

Source: UC Corporate Student System and the California Employment Development Department. (Bleemer, 2018).

Table 22: Estimated Relationship between Student 'Merit' and Return to University Selectivity

Var:	$\hat{Q}$			$\hat{Q}$			$\hat{q}$		SAT	
Y_i:	Five-Year Deg. Attain.			Early Wages (7-8 Yr.)			Deg.	Wages	Deg.	Wages
Inst. Grad. Rate	0.77 (0.01)	0.77 (0.01)	0.81 (0.01)	220 (15)	199 (17)	207 (20)	0.81 (0.01)	207 (20)	0.80 (0.01)	206 (20)
Var	15.68 (0.40)	-3.80 (1.63)	-0.39 (2.33)	9851 (789)	3060 (3337)	1788 (4936)	2.23 (0.47)	334 (985)	2.66 (0.49)	1423 (1033)
Var × Inst. Grad. Rate	-0.11 (0.01)	-0.10 (0.01)	-0.05 (0.01)	-116 (13)	-98 (14)	-63 (18)	-0.04 (0.01)	-6 (15)	-0.05 (0.01)	-29 (16)
HS GPA									9.73 (0.48)	6537 (1036)
HS GPA × Inst. Grad. Rate									-0.01 (0.01)	-40 (19)
Det. Covariates		X	X		X	X	X	X	X	X
Adm. Portfol.			X			X	X	X	X	X
Observations	110,114	107,300	107,300	51,144	49,339	49,339	107,300	49,339	107,300	49,339

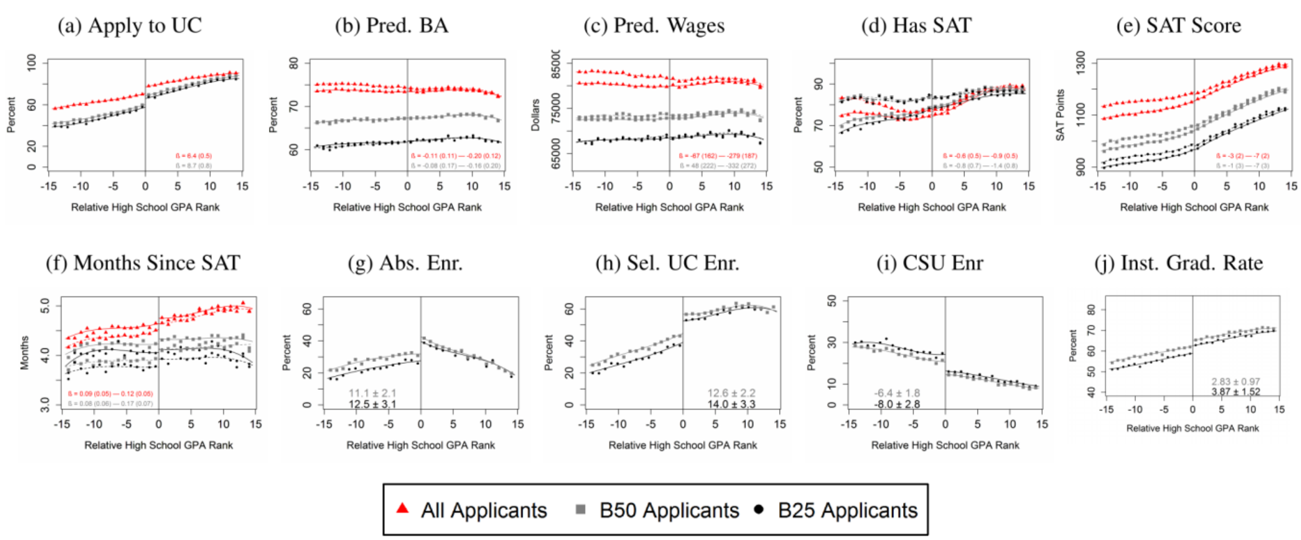
Note: Estimates of Equation 3 for 2010-2013 freshman California-resident UC applicants who first enroll at a public California institution. Institutions' graduation rates are defined for each applicant's institution of first enrollment (within six years after graduating high school); see the Technical Appendix for details. Applicants' university-observed caliber $\hat{q}_i$ — a latent index of universities' preferences for certain applicants on the basis of unobservables — is estimated using the posterior distribution of q_i's resulting from the structural model parameters described above, and applicant summed admissions merit $\hat{Q}_i$ is estimated by $z_i\hat{\beta}^z + \hat{q}_i$, excluding the ELC covariates. $\hat{q}_i$, $\hat{Q}_i$, SAT, and HSGPA are standardized. Detailed covariates include gender-ethnicity indicators, SAT score, HS GPA, log income, parental education and occupation indicators, ELC eligibility, and high school, zip code, and year fixed effects; admissions portfolios include indicators for every combination of UC campuses to which the applicant applies and UC campuses to which they are admitted. Five-year degree attainment indicates earning a college degree within five years of high school graduation. Early-career wages are measured as average observed wages 7-8 years after high school graduation; wages are winsorized at 5 percent and are unobserved for post-2011 applicants. Robust standard errors in parentheses assume that $\hat{q}_i$ and $\hat{Q}_i$ are accurately measured.

Source: UC Corporate Student System, the National Student Clearinghouse, and the California Employment Development Department (Bleemer, 2018).

The results up to this point have assumed that the only reason that near-threshold ELC-eligible students' outcomes shifted was a result of their Absorbing UC campus enrollment. Table 8 broadens this analysis by relating students' observed academic 'merit' – as defined by q_i or $Q_i = z_i\beta_j^z + q_i$ from the model equation at the top of page 15, or as defined by SAT score and high school GPA – to their return to university selectivity. It shows that among California-resident freshman UC applicants who enroll at public California colleges and universities, there is a sharp positive return (in terms of degree attainment and wages) for enrolling at more-selective universtiies (as measured by graduation rate), and that that return is not strongly mediated by students' observed 'merit'. This provides additional evidence that the low-testing students targeted by ELC can earn large and above-average returns to UC enrollment.

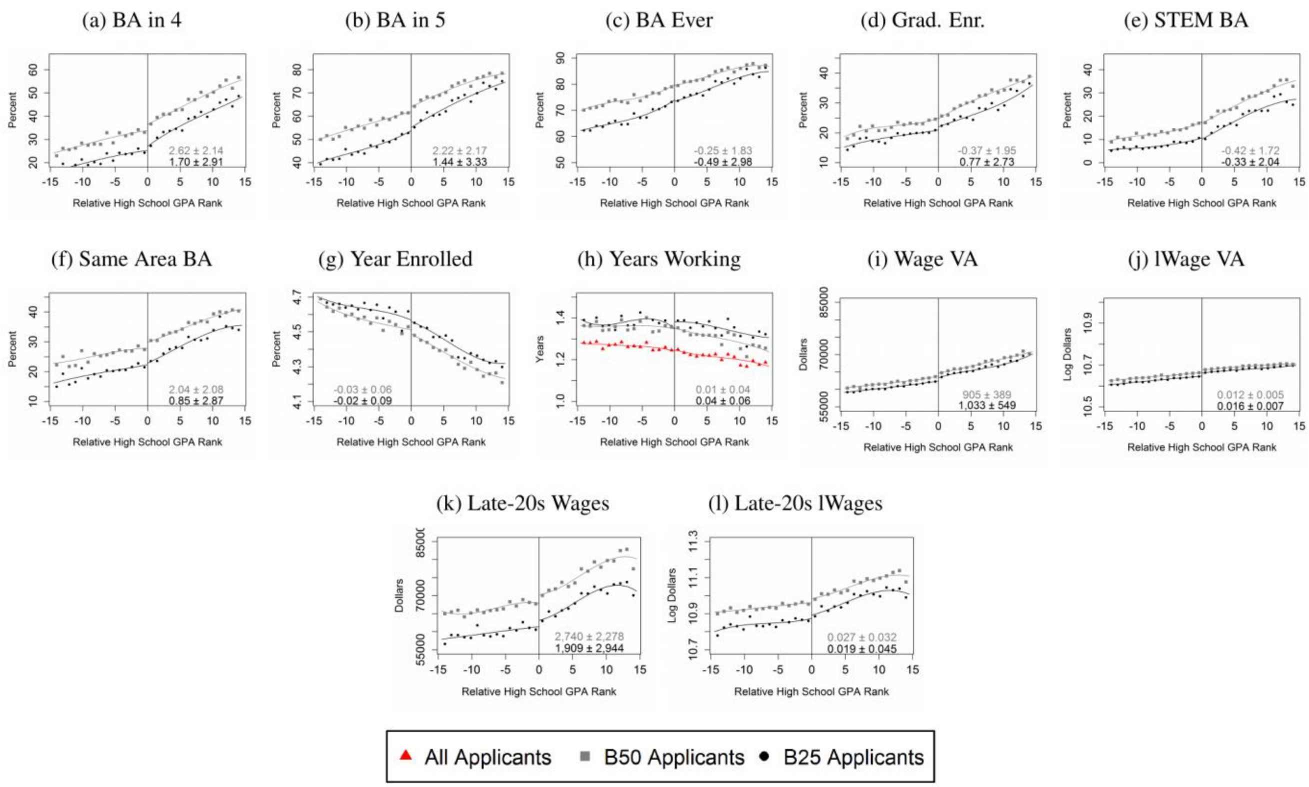
Figures 5 and 6 presents visualizations of many of the findings discussed above, particularly in Table 16. They provide more concrete evidence of a clear causal pathway: ELC eligibility increases Absorbing UC campus enrollment, which in turn improves students educational and labor market outcomes.

Figure 5: The Effect of ELC Eligibility on Students' UC Application and Enrollment



Note: This figure shows that ELC eligibility increased UC application rates among eligible students, but the encouraged students were (if anything) negatively selected on pre-college characteristics, so that cannot explain the rise in student outcomes above the eligibility threshold. Eligibility changed students' test-taking behavior and had a dramatic effect on where students enrolled, increasing enrollment primarily at the Absorbing UC campuses and decreasing enrollment especially at CSU. **Panels (a)-(f)**: High-GPA California high school students' likelihood of applying to UC by their ELC GPA rank distance from their high school's ELC eligibility threshold, those students' predicted likelihood of college degree attainment and California wages (10-11 years after graduating high school) on the basis of pre-college characteristics, those students likelihood of matching College Board records as having taken the SAT, their SAT score, and the number of months (counting since January of their high school graduation year) since taking the test, among all applicants and those from the bottom half (B50) or quartile (B25) of California high schools by leave-year-out average SAT. **Panels (g)-(j)**: Regression discontinuity plots of UC applicants' measured outcomes – enrollment at the Absorbing UC campuses, at the Absorbing or more-selective UC campuses, at the CSU campuses, or the five-year graduation rate of the institution where the student first enrolled – by ELC GPA rank distance from their high school's ELC eligibility threshold, among applicants from the bottom half (B50) or quartile (B25) of high schools by SAT. **All**: Points are rank-distance means; lines are cubic fits. Beta estimates are from cubic regression discontinuity models over all high-GPA high school students (a-f) and/or among UC applicants (g-j and the right sides of b, c, and f) within 15 ELC GPA ranks of their high school's ELC eligibility threshold, following Equation 1 with standard errors clustered by school-year. See Technical Appendix for details on data construction and definition of predicted graduation rate. Source: UC Corporate Student System, the National Student Clearinghouse, IRS SOI, and the California Employment Development Department.

Figure 6: The Effect of ELC Eligibility on Students' Predicted and Actual Early-Career Wages



Note: This figure shows that ELC eligibility increased five-year BA attainment and late-20s earnings among eligible students – to an even greater degree than would be expected given observed differences in wage value-added across institutions – without impacting STEM attainment, graduate degree enrollment, or California employment. Regression discontinuity plots of UC applicants' measured outcomes – BA attainment within 4, 5, or 7 academic years of graduating high school; graduate degree enrollment; STEM BA attainment; BA attainment in the same discipline as reported as the student's intended major on their UC application; academic years in which there was college enrollment within the first seven years following high school graduation; and years with employment, average annual wage, and average annual log wage (omitting missing years) in the years 10 and 11 years following high school graduation (measured in CA EDD) – by ELC GPA rank distance from their high school's ELC eligibility threshold, among applicants from the bottom half (B50) or quartile (B25) of high schools by SAT. Points are rank-distance means; lines are cubic fits. Beta estimates are from cubic regression discontinuity models over all UC applicants within 15 ELC GPA ranks of their high school's ELC eligibility threshold, following Equation 1 with standard errors clustered by school-year. See Technical Appendix for details on data construction and definitions. Source: UC Corporate Student System, the National Student Clearinghouse, IRS SOI, and the California Employment Development Department.

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[2] Graduation: See the [2017 UC Accountability Report, figure 3.1.1](). Earnings: compares 2015 wages of UC graduates from the Employment Development Department with 2015 wages of young college graduates reported in the American Community Survey; published in Douglass, John and Zachary Bleemer, 2018: *Approaching a Tipping Point? A History and Prospectus of Funding for the University of California*.

[3] See UC's *Annual Report on Undergraduate Admissions Requirements and Comprehensive Review, January 2017* and CSU's annual Applications and Admissions Report.

[4] Because ELC participation was somewhat lower in the first two years of its implementation, all data presented in this topic brief cover the years 2003-2011, when the policy was implemented in full force. See http://www.ucop.edu/news/cr/factsheet.pdf for more information.

[5] See the Technical Appendix for details on how high school quartiles are determined.

[6] Berkeley and UCLA *did* admit about 1,000 below-threshold B50 applicants per year, suggesting the potential for an ELC admissions advantage.. Both Berkeley and UCLA implemented holistic review of undergraduate applicants for most of the sample period, and these estimates cannot rule out very small admissions advantages provided to ELC-eligible students.

[7] EDD wages only include wages that are covered by California unemployment insurance, which excludes self-employment, federal employment, and out-of-state employment. Wages are winsorized above and below at 5 percent.

[8] Graduation rates are calculated for every U.S. institution as the proportion of UC applicants who enroll at that institution who earn a college degree within five years. These graduation rates have three advantages over the graduation rates made available from public sources like IPEDS. First, they can be calculated for every institution, even community colleges that do not offer Bachelor's degrees themselves; in that case, the graduation rate measures the proportion of applicants who end up transferring and earning a degree within five years. Second, they include students who transfer between four-year institutions and earn their degrees at the second institution, which is helpful since some ELC-eligible students may themselves choose to switch institutions before graduating. Third, they are calculated only among students 'like' the ELC-eligible students, in that they applied to at least one UC campus when they graduated high school; this makes the graduation rates more relevant to the sample population. The full set of institutional graduation rates is available in Bleemer (2021; citation below).

[9] See Kapor (2020) for a more-detailed description of the Kapor model, which builds on a number of previous academic studies modeling university admissions and enrollment decisions. Citation: Kapor, Adam. 2020. Distributional Effects of Race-Blind Affirmative Action. Manuscript.

[10] In fact, this simulation is conducted in two ways: by removing ELC from the 2010-2011 years (that is, setting the Absorbing UC campuses' ELC admissions advantage to 0) or by adding ELC to the 2012-2013 years (by allowing an Absorbing UC campus admissions advantage to students in the top four percent of their graduating high school classes in those years). The two provide very similar estimates; the reported estimates are the average between the two.

[11] This estimate is in line with an earlier estimate of the magnitude of the 2001-2011 ELC policy from an earlier UCOP report, which showed that the average number of of annual new URM ELC students was between 231 and 432.

[12] Family incomes are not reported by about 12 percent of UC applicants. For the purpose of this brief, those students' family incomes are predicted by linear regression on the remaining sample of applicants, on the basis of high school and Zip code fixed effects, parental occupation and education indicators, SAT scores and high school GPA, gender-ethnicity indicators, and year of application.

[13] I estimate these counterfactuals using 2012-2013 UC applicants, since UC determined which students were in the first through ninth percentiles of their high school classes in those years (but not earlier). These counterfactuals implicitly assume that no UC campuses (except for UC Merced) provided large admissions advantages to any specific percentile of student in those years. See: Bleemer, Zachary. 2021. Top Percent Policies and the Return to Postsecondary Selectivity. *CSHE ROPS* 1.21.

[14] Bleemer, Zachary. 2022. Affirmative Action, Mismatch, and Economic Mobility after California's Proposition 209. Quarterly Journal of Economics 137(1): 115-160.