Appendix A: Sources for Impacts of Policies on College Enrollment

Susan Dynarski (2000)
"Hope for Whom? Financial Aid for the Middle Class and its Impact on College Attendance"
Cites: 692
This paper studies the impact of financial aid on the college attendance of middle and upper-income youth by looking specifically at the Georgia HOPE Scholarship, which has been used as a basis and inspiration for the new federal Hope Scholarship. This type of scholarship is unique because it is targeted towards middle and high-income families by allowing them to use educational offsets to off-set taxes, thus meaning the policy is not need-based. By looking at data from the Current Population Survey, and using neighboring states as a control, Dynarski finds that the HOPE Scholarship has a significant impact on the attendance rate of these youth - Georgia's program has increased college attendance rate of all 18-19 year olds by 7-7.9 percentage points. However, due to differences between the state program and the intended federal program, these estimates would be a best-case scenario for the federal program. Further, there is evidence that the HOPE Scholarship (and likely any future federal programs) will widen already large racial and income gaps in college attendance in the US.

Susan Dynarski (2003)
"Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion"
Cites: 1032
This paper looks at the impact of the elimination of the Social Security Student Benefit Program in 1982, under which 18-22 year old children of Social Security beneficiaries received monthly payments while enrolled full-time in college, on college attendance. Dynarski acknowledges that the correlation between aid and enrollment is hard to pinpoint, as aid eligibility is correlated with many (un)observed factors that affect schooling decisions, so she makes sure to use an exogenous source of variation in which a shift in aid policy affects some students but not others. Using data from the National Longitudinal Survey of Youth, and a difference-in-differences methodology, proxying for aid eligibility with the death of a parent during an individual's childhood, Dynarski ultimately finds that the elimination of this program reduced college enrollments by more than 1.3 – strong evidence that aid is positively correlated with college attendance. She uses the high-school classes of 1979, 80 and 81 as her "before" cohorts, while she looks at the classes of 1982 and 83 as her "after" cohorts. **Each 1000 in aid increases enrollment by 4 percentage points.

Eric Bettinger (2004)
"How Financial Aid Affects Persistence"
Cites: 463
This paper looks at the Pell Grant, the largest financial assistance available to postsecondary students across the US and more specifically, its effects on student outcomes in college. Thus, it focuses not on initial enrollment, where there has been a lot of research already, but rather on persistence and graduation rates – the effect of the grant conditional on initial enrollment. Bettinger uses data collected by the OBR since 1998 on college enrollment in Ohio's public two and four-year colleges, tracking students within and across schools (accounting for students who transfer as opposed to completely withdraw), as well as their ACT scores and FAFSA application data. Using time series, panel and cross-sectional variation, this paper finds that the Pell Grant reduces dropout rates amongst students – but those who are eligible for Pell Grants continue to have higher withdrawal rates than those who are not eligible. Thus, while so papers (Kane 1999, Leslie and Brinkman 1987) have found that some of these aid programs have no effect on enrollment (i.e. student access to college) – need-based programs continue to be important as they have positive effects on student retention.

Neil Seftor and Sarah Turner (2002)
"Back to School, Federal Student Aid Policy and Adult College Enrollment"
Cites: 330
This study focuses on the effect of the means-tested federal Pell Grant program affects the enrollment decisions of potential students in their twenties and thirties – i.e. people who did not just graduate from high school. The effect is likely to be a little bit different because it shifts the focus away from students who would still be dependent on their parents towards those who are independent. It is interesting to note that the median age of Pell Grant recipients is a student in his/her twenties, not a teenager. Seftor and Turner look at data from the October Current Population Survey – October because it is the traditional juncture for entry into postsecondary educational programs, and use a difference-in-differences approach to ultimately find that these federal financial aid programs have an even greater effect on the enrollment behavior of older, nontraditional students. Studies in the past have found that the effect on traditional college-aged students is modest, but the effect these older students is marked. The authors attribute this effect to psychological factors such as decrease intimidation of the Pell application due to prior filing of taxes and other forms, or smaller forgone earnings due to ability to simultaneously hold-down a full or part-time job. They found that increasing the amount of aid via the Pell Grant by $1,000 increased college enrollment of adults by 0.7 percentage points – greater than what Kane (1999) found for the younger population, which showed no evidence that there was any effect.

Stella M. Flores (2010)
"State Dream Acts: The Effect of In-State Resident Tuition Policies and Undocumented Latino Students"
Cites: 306
This study looks at the effects of in-state resident tuition legislation on the college enrollment of individuals likely to be undocumented Latino immigrants. It looks at data from the Current Population Survey's Merged Outgoing Rotation Groups (MORG), and employs a difference-in-differences strategy to ultimately find that foreign-born noncitizen Latinos living in states with a tuition policy were 1.54 times more likely to have enrolled in college after the policy's implementation than students in states without such legislation. The authors make particular note that these results do not transfer to other minority ethnic groups, nor do they transfer to US-born and naturalized Latinos students. The MORG data includes a measure for students who are classified as foreign-born noncitizens (FBNCs), which is deemed an official citizenship category of the CPS – thus, FBNCs is used as a proxy for undocumented.

Susan Dynarski and Judith Scott-Clayton (2013)
"Financial Aid Policy: Lessons from Research"
Cites: 277
This study looks at the more specific impacts of policy that vary depending on how each individual piece of legislation is structured. Generally, studies have shown that lowering the cost of acquiring postsecondary education improves college access as well as retention and completion, but this rule can have some unique exceptions. The study finds that the complexity of program eligibility and delivery moderates the impact of aid, and that conditional on students already deciding to enroll in college, grants that are tied to academic achievement tend to boost college retention/completion more than grants without any strings attached.

Larry Leslie and Paul Brinkman (1987)
Student Price Response in Higher Education: The Student Demand Studies
Cites: 716
This paper gives a brief overview of many other studies that have looked at the effects of lowering/raising commute costs, tuition, and/or financial aid on college enrollment numbers. By individually evaluating each one of these studies, Leslie and Brinkman find that generally, policies have focused more on affecting aid rather than tuition, but students actually tend to be more responsive to changes in tuition than changes in financial aid. Regardless, their estimated effect of increasing aid by $1000, is between 3-5 percentage points.

Additionally: Donald Heller (1997), Student Price Response in Higher Education: An Update to Leslie and Brinkman

Thomas Kane (1984)
"College Entry by Blacks since 1970: The Role of College Costs, Family Background, and the Returns to Education"
Cites: 789
This paper was motivated by unusual trends in the college enrollment of black 18-19-year-old high school graduates throughout the early/mid 1980s, where enrollment declined from 198-84, but began increasing again after 1984. This paper looks at data from a time series of cross sections of 18-19-year-old youths from 1973 to 1988 to test the role of different factors in determining the likelihood of a child to enroll in college – factors including family background, college cost, local economic conditions, etc. The ultimate findings of their paper are more general than the scope of simply tuition, but they do find that increases in tuition were driving enrollment down throughout the 80's, while dramatic increases in average parental education started driving enrollment up again in the mid/late 80's. Together, these caused the observed effect. Kane's study determined that it terms of measuring the cost of college, the enrollment effect from increasing tuition by a given amount, and that from increasing financial aid/grants by that same amount, were equal in magnitude, but opposite in sign – meaning that it is more so about the net cost of college rather than solely tuition or financial aid. Further, Kane's study focuses on enrollment of black students, but he does hypothesize and finds evidence (by analyzing the majority of white students) that these numbers can for the most part be generalized to the general demographic.

Michael McPherson and Morton Owen Schapiro (1991)
"Does Student Aid Affect College Enrollment? New Evidence on a Persistent Controversy"
Cites: 351
This paper provides an econometric analysis of time-series evidence on US higher-education enrollment and net costs over the 1974-1984 period – 1974 because that was the year that the Pell, then named the Basic Educational Opportunity Grant program, was introduced. Data is taken from this time period from the Current Population Survey, and the American Freshman survey (which provides information on tuition and financial aid for a given year's incoming freshman class). The data is further limited to whites only because there was inadequate data to conduct a time-series analysis over the time period for other races. They separate their educational enrollment into numbers at private-institutions and those at public institutions, and find that there is a lowered-enrollment effect when net cost of college attendance is increased in each.

Cecilia Rouse (1994)
"What to Do After High School? The Two-year vs. Four-year College Enrollment Decision."
Cites: 203
I couldn't find this article online, but it apparently discusses the substitution effect between 2-year and 4-year institutions, so I imagine it would be helpful if we could track it down.

Edward P. St. John
"Price Response in Enrollment Decisions: An Analysis of the High School and Beyond Sophomore Cohort"
Cites: 355
This paper looks more so to analyze the impact of various factors that would reduce the net cost of college on the enrollment decisions of students. These factors included tuition, grants, work-study offerings, and student loans. St. John uses the High School and Beyond Sophomore cohort (High School Class of 1982) – as this is post-introduction of the Pell Grant, and he ultimately finds that all forms of financial aid ultimately did have a statistically significant impact on enrollment decisions, though to a different magnitude, that an amount of any type of aid has a stronger influence than an equal amount in tuition reduction, that low-income students were more responsive to increases in grant aid than to increases in loans or work study, and that somewhat intuitively, high-income students were not responsive to change in aid amounts.

Sarah R. Cohodes and Joshua S. Goodman (2009, 2014)
"Merit Aid, College Quality, and College Completion: Massachusetts' Adams Scholarship as an In-Kind Subsidy"
Cites: 201
The Massachusetts Adams Scholarship is a merit-aid program that gives high-scoring students tuition waivers at in-state public colleges with lower graduation rates than available alternative colleges, and that are thought to be of generally lower quality. Cohodes and Goodman use data from ____ to ultimately find that students are generally remarkably willing to forgo college quality for relatively little money, and that marginal students lowered their college completion rates by using the scholarship, as college completion rates decreased only for those students forgoing the opportunity to attend higher quality colleges when accepting the scholarship. This result is particularly shocking because the value of the scholarship is of little magnitude when compared to estimates of the forgone earnings of attending a lower quality college or entirely failing to graduate. This scholarship ultimately increased college enrollment (though not graduation rates) for the most disadvantaged students, but such students comprised an extremely small fraction of the total pool of those eligible for this merit-based scholarship.

Title	Author(s)	Year	Sample	Source of Variation	Estimated Coefficient	2 vs. 4 year?	Coefficient in 2019 $
Hope for Whom? Financial Aid for the Middle Class and its Impact on College Attendance	Susan Dynarski	2000	October Current Population Survey and the Integrated Postsecondary Education Data System. Uses Alabama, Delaware, DC, Florida, Kentucky, etc. as controls	Georgia HOPE Scholarship	Each $1,000 (1998$) in aid increased the college attendance rate in Georgia by 3.7 to 4.2 percentage points.	Both – a student must incur at least $2,000 in eligible costs to get full HOPE credit, and many community colleges are under this	(3.7 to 4.2) * (1000/1559.52) = 2.37 to 2.69
Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion	Susan Dynarski	2003	National Longitudinal Survey of Youth, high-school classes of 1979, 80 and 81 as "before" cohorts, while classes of 1982 and 83 as "after" cohorts	Social Security Student Benefit Program (elimination of program in 1982)	An offer of $1,000 (1998$) in grant aid increases the probability of attending college by about 3.6 percentage points.	Both	3.6 * (1000/1559.52) = 2.31
	Susan Dynarski	2008	GA and AK Merit Aid Programs				
How Financial Aid Affects Persistence	Eric Bettinger	2004	Data from the Ohio Board of Regents (OBR), which tracks enrollment in Ohio's public two and four-year colleges. Tracks students entering in the 1999-2000 school year.	Pell Grant	Conditional on deciding to enroll in college already, a $1,000 (1999$) increase in a student's grant leads to a 9.2 percentage point decrease that the student withdraws.	Both	9.2 * (1000/1525.82) = 6.01
College Entry by Blacks since 1970: The Role of	Thomas Kane	1994	Uses numbers from the October CPS – a sample of 560 black and 3,610 white 18-	Tuition and Pell Grant	$1,000 (1988$) increase in the net direct cost of college was associated with a	4-year	5 * (1000/2148.79) = 2.33

College Costs, Family Background, and the Returns to Education"			19 year olds who are dependent members of households. Data was drawn from 1973-1988. Additionally, supplemented data by using in-state public tuition data for four-year comprehensive universities by state and year.		5-percentage point decline in the likelihood of college enrollment		
Rising Public College Tuition and College Entry: How Well do Public Subsidies Promote Access to College?	Thomas Kane	1995	Uses both administrative data and the October CPS from 1977-1993. Enrollment data from IPEDS survey conducted by the National Center for Education Statistics.	Tuition and Pell Grant	Using Administrative Enrollment Data, the study finds that increasing tuition by $1000 at a 2-year institution reduces enrollment by 3.5 percentage points, while at a 4-year institution, the same $1000 increase in tuition would decrease enrollment by only 1.4 percentage points. Kane also did analysis also separating the community and 4-year colleges; increasing tuition by $1,000 at community college dropped enrollment at community colleges by 4.7 percentage points while enrollment at 4-year universities increased 0.5	Both, but separately.	3.5 * (1000/1866.39) = 1.875 1.4 * (1000/1866.39) = 0.75 4.7 * (1000/1866.39) = 2.518 0.5 * (1000/1866.39) = 0.268 (assumed 1991$)

					percentage points (comments on the substitution effect)		
Student Price Response in Higher Education: The Student Demand Studies	Leslie and Brinkman	1987	25 studies published between 1967 and 1983, including both cross-sectional and time-series analyses.	Varies	The mean price response to a $100 (1982$) increase in tuition price, was 0.7 percentage points. However, numbers calculated within each study they analyze ranged from 0.2 to 2.4.	Both	(0.7*10) * (1000/2634.22) = 2.66
The Impact of Student Financial Aid: A Review of Recent Research	St. John	1990	Same as Leslie and Brinkman	Same as Leslie and Brinkman, but included other factors, such as financial aid – not just college tuition.	$1,000 (1982$) increase in tuition decreased enrollment rates by 2.8 percentage points.	Both	(2.8) * (1000/2634.22) = 1.06
Financial Aid and Student Enrollment	Gregory A. Jackson	1978	Random subsample of 5,220 from the National Longitudinal Study of the high school class of 1972.	All aid	$100 (1972$) of aid increases the likelihood an applicant will enroll by 0.76 percentage points.	Both	(0.76 * 10) * (1000/6081.39) = 1.25

The Effects of Tuition and State Financial Aid on Public Enrollment	Donald E. Heller	1999	1998 IPEDS Survey, Grant expenditure data from 1994 survey conducted by National Association of State Scholarship and Grant Programs	Per-state grant spending	When looking at all public universities increase in tuition of $1,00 (1994$) decreases enrollment by 2.1 percentage points, but an increase of $100 in state grant per-18-24-year-old spending leads to a 1.3 percentage point increase in enrollment. When separating this by 4- and 2-year institutions, the numbers are (0.05, 0.94) percentage points and (2.1, 0.26) respectively.	Both & separately	2.1 * (1000/1715.26) = 1.22 * can convert other numbers similarly
Does Student Aid Affect College Enrollment? New Evidence on a Persistent Controversy	Michael McPherson and Morton Owen Schapiro	1991	1974-1984 CPS and American Freshman Survey	Net college cost	At public institutions, a $100 (1982$) increase in net cost reduced enrollment by low-income students about 1.6 percentage points.	Both	1.6 * 10 * (1000/2632.22) = 6.08

Price Response in Enrollment Decisions: An Analysis of the High School and Beyond Sophomore Cohort	Edward P. St. John	1990	High School and Beyond Sophomore cohort, the HS Class of 1982.	Tuition, Overall Financial Aid (including type of aid)	If tuition / grants / loans / work-study increased by $100 (1982$) , likelihood of enrolling in college would increase by -0.28 / 0.43 / 0.38 / 0.46 percentage points.	Both	0.43 * 10 * (1000/2632.22) = 1.63 (for grants)
Expansion of Stafford Loan eligibility	Susan Dynarski	2005	October CPS 1984-2000 and the Survey of Income and Program Participation (SIPP)	Before/after 1992 legal change – home equity no longer "taxed" in the federal student aid formula	CPS data showed that $1000 in loan would increase enrollment likelihood by 5.1 percentage points, but there was no significant effect in the SIPP data.	Both	5.1 * (1000/1811.85) = 2.815 (assumed 1992$)
Evaluating the Impact of the D.C. Tuition Assistance Grant Program	Thomas Kane	2007	IPEDS, Department of Ed. FAFSA data; DCTAG administrative records, SAT data	DC Tuition Assistance Grant Program – allowed DC residents to attend public schools in other states and pay in-state tuition	Reduction in effective tuition by $1000 (2001$) caused a ~3-4 percentage point enrollment increase.	Both	3 to 4 * (1000/1435.36) = 2.09 to 2.79

Do Public Tuition Subsidies Promote College Enrollment? Evidence From Community College Taxing Districts in Texas	Paco Martorell, Brian McCall, and Isaac McFarlin	2014 *** only cited 7 times	Enrollment data in Texas from the 1990 and 2000 Censuses, and the 2004-2010 American Community Surveys (ACS) and geographical data on Community College Taxing Districts	Differences in tuition paid based on district-specific taxing rules	A $1000 (2000$) increase in tuition is estimated to decrease enrollment rates of 18-24 year olds by 5.4 percentage points (from 2000 Census Sample – other (1990 + ACS) results were small, imprecise, negative numbers). For all adults 18+, these numbers were 3.3 and 2.1 percentage points for the 1990/2000 Census respectively, and not significant for the ACS sample.	Two	5.4 * (1000/1476.20) = 3.66
The Long Run Impacts of Merit Aid: Evidence From California's Cal Grant	Eric Bettinger, Oded Gurantz, Laura Kawano, Bruce Sacerdote	2016 / Revised 2018	High school graduating cohorts who enter college from 1998-1999 through 2000-01. Information is drawn from administrative, population-level U.S. federal tax filings.	California's Cal Grant Program	Attendance at a four-year private institution increased by 5.6 percentage points, with a significant offsetting reductions in attendance rates at public two and four-year colleges	Both, separately.	5.6 * (1000/1525.82) = 3.67 (assumed 1999$)

On Money and Motivation: A Quasi-Experimental Analysis of Financial Incentives for College Achievement	Judith Scott-Clayton	2009	Drew data from the West Virginia Higher Education Policy Commission, on four cohorts (2000-01 to 2003-04).	West Virginia PROMISE – free tuition at any state public institution offered to students who maintain minimum GPA and course load	Four-year BA completion rate rose by 9.4 percentage points.	Four	
Looking Beyond Enrollment: The Causal Effect of Need-Based Grants on College Access, Persistence, and Graduation	Benjamin Castleman, Bridget Terry Long	2013	Focus on Florida high school seniors class of 2001. Data from the Florida Department of Education K-20 Data Warehouse	Florida Student Access Grant (FSAG) – covered students below a certain level of expected family contribution at a public four-year university in Florida.	An additional $1,300 in grant aid eligibility (2000$) increased the probability of immediate enrollment at a public, four-year university by 3.2 percentage points.	Four	3.2 * (1000/1300) * (1000/1476.20) = 1.67

Appendix B: Sources for Impacts of Policies on Graduation

Title	Author(s)	Year	Sample	Source of Variation	Estimated Coefficient	2 vs. 4 year?	Coefficient in 2019 $
On Money and Motivation: A Quasi-Experimental Analysis of Financial Incentives for College Achievement	Judith Scott-Clayton	2009	Drew data from the West Virginia Higher Education Policy Commission, on four cohorts (2000-01 to 2003-04).	West Virginia PROMISE – free tuition at any state public institution offered to students who maintain minimum GPA and course load	Four-year BA completion rate rose by 9.4 percentage points. Effect is more pronounced for those near GPA thresholds. Five-year completion rate rose by 4.5 percentage points.	Four	Average initial award: $2,900 Average award over 4 years: $10,000 9.4 * (1000/2900) * (1000/1413.02) = 2.294 4.5 * (1000/2900) * (1000/1413.02) = 1.098
The Long Run Impacts of Merit Aid: Evidence From California's Cal Grant	Eric Bettinger, Oded Gurantz, Laura Kawano, Bruce Sacerdote	2016 / Revised 2018	High school graduating cohorts who enter college from 1998-1999 through 2000-01. Information is drawn from administrative, population-level U.S. federal tax filings.	California's Cal Grant Program	At the GPA discontinuity, Cal grant eligibility increased the probability of earning a bachelor's degree by 4.6 percentage points.	Both, separately.	4.6 * (1000/1759) * (1000/1525.82) = 1.71 (assumed 1991$)
Looking Beyond Enrollment: The Causal Effect of	Benjamin Castleman, Bridget Terry Long	2013	Focus on Florida high school seniors class of 2001. Data from the Florida	Florida Student Access Grant (FSAG) –	An additional $1,300 in aid eligibility (2000$) increased the probability of	Four	4.6 * (1000/1300) * (1000/1476.20) = 2.40

Need-Based Grants on College Access, Persistence, and Graduation			Department of Education K-20 Data Warehouse.	covered students below a certain level of expected family contribution at a public four-year university in Florida.	earning a bachelor's degree within six years by 4.6 percentage points.		
Leveling Up: Early Results from a Randomized Evaluation of Post-Secondary Aid	Joshua Angrist, David Autor, Sally Hudson, Amanda Pallais	2014	Data primarily come from the STBF scholarship application, the administrative records of Nebraska's public colleges, and the National Student Clearinghouse (NSC).	Susan Thompson Buffet Foundation, self-designed random assignment of scholarship to middle group of applicants.	STBF increased year-two enrollment by more than seven percentage points.	Both	N/A
Towards the Education Nation? Revisiting the Impact of Financial Aid, College Experience, and Institutional Context on Baccalaureate Degree	Ray Franke	2014	Data is drawn from The Beginning Postsecondary Students and IPEDS/Delta Cost Project. Limited to full-time, dependent studies enrolled in bachelor's granting degree programs at 4-	Amount of various federal aid received by students.	Every $1,000 (2003$) in additional aid received increased the chances of a low-income student graduating within six years by 2.42-2.82 percent. State need-based aid had an impact of 2.4-2.59 percentage points	Four	(2.42 to 2.82) * (1000/1381.53) = 1.75 to 2.04 (2.4 to 2.59) * (1000/1381.53) = 1.74 to 1.87 (1.31 to 1.62) * (1000/1381.53) = 0.95 to 1.17

Attainment for Low-Income Students			year institutions in 2003-2004.		for every $1,000. Institutional based needs had an effect of 1.31-1.62%.		
Who Benefits Most from Financial Aid? The Heterogeneous Effect of Need-Based Grants on Students' College Persistence.	Sigal Alon	2011	Uses a nationally-representative data set from the National Postsecondary Student Aid Survey, which is linked to the Beginning Postsecondary Students Longitudinal Study.	Looking at variation in first-year need-based; the total need-based grants received from all sources in the 1995-96 school year.	Each $100 (1995$) in need-based grants received in the first-year increased the probability of graduating in 6 years by 0.1/0.2/0.1 percentage points for the lowest, lower middle, and upper middle income groups respectively.	Four	0.1 * 10 * (1000/1667.99) = 0.60 0.2 * 10 * (1000/1667.99) = 1.20
Reducing Income Inequality in Educational Attainment: Experimental Evidence on the Impact of Financial Aid on College Completion	Sara Goldrick-Rab, Robert Kelchen, Douglas Harris, James Benson	2015	Data is from the University of Wisconsin System record enrollments, and the National Student Clearinghouse.	Wisconsin Scholars Grant that offers students $3,500 per year.	The WSG offer ($3,500 in 2008$) boosted retention rates among university students by one to three percentage points per term.	Four	1 to 3 * (1000/3500) * (1000/1180.67) = 0.24 to 0.73.

	Susan Dynarski	2008	GA and AK Merit Aid Programs		Merit Aid Programs Boosted BA Graduation by 3 to 4 percentage points		
	Scott-Clayton, Judy	2009	WV Promise		WV Promise Boosted Graduation by 4 percentage points1.2		

Appendix C

This is a reference doc intended to explain the sources for the parameters we use in the college policies paper

Returns to a year of college & years of college implied by persisting to BA or AA

* here we set the return to a year of education
* it will be used relative to the chetty median for given institution
* and we have to set the average additional years of educ contained in an additional BA

global return_educ ".09"
global yrresponse_addtl_ba "2"
global yrresponse_addtl_assoc "1"

We set returns to education at 9% per year. This is justified using the recent Oreoupolous review of returns to education studies. The "right" number is going to vary between 6 and 10 and this is not a critical parameter to comparisons across our simulations; we use the same number across simulations.

Slightly more controversial is our guess about how many more years of education are implied when a student persists to complete a BA or an AA. This impacts both the ultimate years of education (which get the return) but also the cost since additional years cost more money. We currently set additional years at 2 to persist and complete a BA (for enrollees who were not completing previously) and 1 year for community college enrollees who were enrolling in community college but not completing their associates.

Free community college policy. How much non enrollee and four year enrollees respond to a Free Community college policy

We are combining the TN and OR policy experiments. We take the midpoints between the Gurantz paper and the Caruthers Attridge (2019) and the Caruthers 2019 policy brief. The consensus is that the policy boosts the fraction of a given cohort that is in community college by 5 percentage points. 2.5 percentage points (or a total cohort) comes from nonenrollees moving to community college and 2.5 percentage points comes from students moving from 4 year to 2. We include all four year enrollees and we do not have different elasticities for students who were previously at four year privates versus four year publics.

Elasticity computations for two-year vs four-year enrollment

Gurantz paper for Oregon

Baseline 20% attend two-year 27% attend four-year
Estimated Effect 5.3 pp increase in two-year attendance
1.6 pp decrease in public four-year, 1.1 pp decrease in private four-year
We don't have the baseline values for public vs. private four-year attendance.

The Digest of Education Statistics Table 303.5 suggests that for 18-21 years old there are 2.5 students in public four-year colleges per student in private four-year college. So we might estimate that 7.7% of high school grads attend four-year private college and 19.3 percent attend four-year public college.

Elasticity estimates: 4-year private to 2-year public is -.011 / .077 = .143
4-year public to 2-year public is -.016/.193 = .083
General estimate 4-year to 2-year is .027/.27 = .1
No college to 2-year is (.053 - .011 - .016)/.2 = .027/.2 = .135.

Tennessee Data – We used pure enrollment numbers from the State DOE website rather than Carruthers-Fox.

	2-year	4-year college	4-year univ
2015	11795	8808	5729
2016	16136	7853	5212
2017	15182	8621	5483
2018	15538	8874	5491
2016-18 avg	15619	8449	5395

Total initial enrollment in 4 year is 8808 + 5729 = 14,537
Total reduction in 4-year = 14,537 – (8,449 + 5,395) = 693
Total increase in 2-year = (15619 – 11,795) = 3,824, so 3824-693 = 3,127 who weren't in college before.
Elasticity: (Can't estimate 4-year private to 2-year public from these numbers).
4-year public to 2-year public = 693 / 14,537 = -.05
No enrollment to 2-year public = 3,127 / 11,795 = .265.

Free Community College Policy: how free tuition impacts (boosts) Associates attainment AND BA attainment by students in community college

We pull the associates response to free cc tuition from the 2018 Caruthers and Fox on Knox Achieves * this is their ITT impact of 1% on associates. Table 3 col 1

Impact of BA attainment of lower (zero) cc tuition. Currently we plug in the Cal Grant overall impact that a 100% subsidy raises BA attainment by 4.6 percentage points. We could instead plug in the impact of the Cal Grant subsidy on BA attainment for just students who indicated they would attend community college. This is an appendix table. This would actually be a larger elasticity of 5.6% at the GPA threshold…or we could average .7 from the income threshold and 5.6 at the GPA threshold. In the attached doc on graduation elasticities, there are a lot of papers on the responsiveness of BAs to prices, but not for community college students. If we took a midpoint from these elasticities we would get something close to the Cal Grant number.

***2018 Caruthurs and Fox have a negative ITT impact of Knox Achieves on BA attainment. -.9 percent. Presumably this is coming mostly from sector changes (out of Four Year schools) and not from price effect for people already within the two year sector. This does make me wonder if even our 1% price response of AA attainment above from Caruthers and Fox is overstated since it contains both the price effect and the effect of more people attending community college. Luckily it's a small number so its not ruining the simulation.*

Responses to a Tuition Cut at Four Year Publics

For two year public to four year public
We will take reverse of two_year_response to free community college.

Four year priv to 4 year public: Try the Goodman and Cohodes estimate
Adams scholarship was 20% reduction. 6.9 percent of people moved on a base of 23 so 29%. This implies an elasticity of **1.45**. Cal Grant: it's a 100% reduction in tuition for privates and publics, though it's a large relative price reduction in which privates get relatively much cheaper. We find a response of either 0 (GPA estimate) or 5.6 percent of people move to privates on a base of 13 percent. So you could say its an elasticity of ((0+5.6)/2)/13 / 1 = **.22** We take a number below the midpoint so call it **.50**

Nonenrollee_response_tuition4 yr. Use Dynarski SS, Castleman FSAG, Cal Grant and Deming Walters 0.

FSAG: grant is 57% of tuition and fees. It boosted enrollment by 3.2 percentage points relative to mean of 61% . Implies elasticity of (3.2/61) / .57 = .09

Social Security: the SS program covered more than all of tuition and fees for a 4 year public and nearly all for a four year private. So call it a reduction of 100%. Mean of college going was .56 and change after program elimination is estimated at .032. Implies elasticity of .032/.56 / 1 =.057.

Combine these two and use **.07**

gradresponse_tuition4yr Cal Grant is a 100% cut. Cal Grant response is .046 or .03 on a mean of .46. This implies an elasticity of ((.046 +.03)/(2*.46)) / 1 **=.08**

The grad response to a tuition cut at four years is taken directly from the Cal Grant paper , averaging the two estimates. This estimate could be taken elsewhere from the papers listed in Graduation Coefficients 2.doc. The Cal Grant estimate may be on the conservative end of the various paper if we scale it in terms of the additional graduation probability for a $1000 price cut.

Responses to Spending Increases at A Four Year or Two year

global assocresponse_spend2yr "1.459"
global gradresponse_spend2yr "1.459*.2"
global gradresponse_spend4yr ".46"

global enrollresponse_spend2yr "not_enrolled_to2yr*1.052"
global enrollresponse_spend4yr ".662"

The enrollee response to four year spending is Deming and Walters Table 3 col 3 panel c. The enrollee response to two year spending is Table 3 col 3 panel B

The associate response to spending is Deming and Walters Table 4 panel B col 4. The BA response to spending Table 4 panel C col 3.