

The Impact of a National Program of Free Tuition at
Public Community Colleges and Free Tuition for Most Students at
Public Four-Year Colleges and Universities
on College Enrollments, Graduations, and the Economy

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Executive Summary

The study analyzes the likely effects of enacting President Biden’s proposal for the government to cover all in-state students' tuition, full-time or part-time, who enroll in a two-year public community college or have a household income of up to \$125,000 and enroll in a four-year public college or university.

- Large disparities based on a student’s race and ethnicity persist in Americans’ access to a college education.
 - Relative to their share of the college-age population (18 to 24), whites are 16% more likely to attend college than blacks and 18% more likely than Hispanics.
 - Relative to their share of the college-age population, white students are 40% more likely to attend a four-year institution than black students and nearly 30% more likely than Hispanic students.
 - Among students enrolled in public four-year institutions, white students are 50% more likely to graduate and earn a bachelor’s degree than black students and 15% more likely than Hispanic students.
- Large disparities based on income also persist in higher education.
 - 28% of young people (18 to 24) from households in the bottom income quintile attend college, compared to 40% of young people from households in the middle income-quintile and 78% from households in the top income quintile.
 - Among students who attended four-year colleges and universities, 32% of those from households in the bottom income quintile graduated with a bachelor’s degree, compared to 51% of those from households in the middle income-quintile and 78% from households in the top income quintile.
- The high costs to attend college are a major factor in the income-based disparities in college enrollments and graduations, and which also are linked to the race and ethnicity-based disparities.
 - In 2019, the personal costs for tuition and living expenses – after grants and scholarships – borne by students and their families in households earning less than \$32,000 averaged \$9,700 at community colleges and \$15,500 at public four-year colleges and universities.
 - For students from households earning \$32,000 to \$64,000, the net costs that they and their families bore averaged \$10,000 at community colleges and \$15,800 at four-year public institutions.
 - For students from households earning \$64,000 to \$115,000, those net costs averaged \$11,500 at community colleges and \$15,200 for four-year public institutions.

- Numerous studies have established that providing additional financial support to students from low, moderate, and middle-income households raises their college attendance rates. Using those findings, we analyzed the impact of the Biden plan on college attendance. After the Biden plan has been in place for a few years,
 - The number of students enrolled at two-year community colleges would increase by an estimated 1.23 million or 18.3%.
 - The number of students enrolled at four-year public colleges and universities would increase by an estimated 1.0 million or 17.7%
 - Enrollments at four-year private not-for-profit colleges and universities would decline by an estimated 270,000 or 12.3%.
 - All told, the plan would raise total college enrollments, including two-year and four-year institutions, by an estimated 1.96 million or 13.4%.
 - The enrollment increases in public colleges and universities would vary by state, with attendance increasing by 20.0% or more in 15 states, by 15.0% to 19.9% in 22 states, by 10.0% to 14.9% in 8 states, and by up to 10.0% in 4 states.

- Numerous studies also have established that providing additional financial support to students from low, moderate, and middle-income households also raises their college graduation rates. Using those findings, we analyzed the impact of the Biden plan on college graduations.
 - Graduations from community colleges would increase substantially; and after the plan had been in place for several years, the four-year graduation rates at two-year community colleges would be 42.7% higher, with 776,000 more associate degrees awarded annually than expected for current students without a free tuition program.
 - Graduations from four-year institutions would also increase substantially: After the plan had been in place for several years, the six-year graduation rates at four-year colleges and universities would be 15.3% higher, with 558,000 more bachelor's degrees awarded annually than expected for current students without the free tuition program.

- These increases in college attendance and graduations would have significant effects on the incomes earned by millions of students.
 - In 2019, among people ages 25 to 34, the income of college graduates with bachelor's degrees averaged \$68,000, compared to \$47,200 for graduates with associate degree, \$45,300 for those who attended college and left before graduating, and \$40,800 for high school graduates.
 - As a result, graduates with associate degrees earned on average 16% more than high school graduates and 4% more than those who attended college without graduating.
 - Further, graduates with a bachelor's degree earned on average 67% more than high school graduates, 50% more than those who attended college without graduating, and 44% more than graduates with an associate degree.

- The Biden plan also would increase the disposable incomes of millions of families and stimulate the overall economy during the current period of slow and fragile growth.
 - As a first-dollar program covering the tuitions and academic fee for most students attending public two-year community colleges and public four-year colleges and universities, the policy would increase the total disposable incomes of those students and their families by \$61 billion.
 - Based on findings from previous forms of stimulus, the increase in disposable incomes would raise the nation's GDP by \$139.4 billion over 2021 and 2022.
 - Based on the Federal Reserve Board's current economic forecast, we estimate that the Biden plan would increase GDP growth by 0.32% over two years, raising real growth from 4.2% to 4.53% in 2021 and from 3.2% to 3.52% in 2022.
 - This stimulus would be equivalent to three-quarters of the estimated average annual impact on GDP growth from the 2017 tax cuts over ten years, which analysts projected would raise GDP growth by 0.4% per-year from 2018 to 2027.
 - These two-year GDP gains would vary across the states: State GDP gains would exceed \$5 billion in eight states and would range from \$2 billion to \$5 billion in 14 states, from \$1 billion to \$2 billion in 11 states, and from \$280 million to \$1 billion in 17 states (and only incomplete data were available for 12 of those 17 states.)

The Impact of a National Program of Free Tuition at Public Community Colleges And Free Tuition for Most Students at Public Four-Year Colleges and Universities On College Enrollments, Graduations, and the Economy

I. Introduction¹

This study examines the social and economic effects of enacting the Biden administration's proposal to cover the tuition and academic fees of in-state students who enroll in a two-year public community college and in-state students from households earning up to \$125,000 who attend a four-year public college or university. First, we review the recent levels and rates of college attendance and graduations: Enrollments are down but graduations are up. Over the last decade, college enrollments declined 22 percent at public two-year colleges, 53 percent at private two-year institutions, and 8 percent at private four-year colleges and universities. These losses were offset in part by a 20 percent rise in enrollments at public four-year universities. Further, over the same period, the number of students graduating rose substantially at two-year public colleges and at four-year public and private institutions.

Next, we examined the impact of a student's race, ethnicity, and family income on the likelihood of attending and graduating college. Relative to their shares of the college-age population, white and Asian students account for disproportionately large shares of college enrollments; and black, Hispanic, American Indian, and Alaskan native students account for disproportionately small shares, especially at four-year institutions. Race and ethnicity-based disparities in graduation rates are greater. For example, white students are 50 percent more likely to earn a bachelor's degree than black students and 15 percent more likely than Hispanic students.

We also determined that the income-based disparities in college enrollments and graduations are even larger. Nearly 68 percent of young people from households in the upper 40 percent of incomes attend college, compared to 31 percent of those from households in the lower 40 percent. Family income also affects whether students enroll in two-year or four-year institutions. Among students attending public colleges and universities, those from households in the upper 40 percent of incomes are 50 percent more likely to attend a four-year institution and 53 percent less likely to attend a two-year institution, than students from households in the lower 40 percent of incomes. Students from higher income households also are more likely to graduate college, especially with a bachelor's degree. Among students at public institutions, 69 percent from households in the top two income quintiles earn bachelor's degrees, versus 51 percent from households with median incomes and 36 percent from households in the bottom two quintiles.

The costs to attend college help explain these disparities. In 2019, Pell grants and other tuition supports covered the average tuition costs at four-year public institutions for students from households with incomes of less than \$32,000 and the average tuition costs at community colleges for most students from households earning less than \$64,000. However, students from low and moderate-income households receive at best modest support for their living expenses.

¹ The authors gratefully acknowledge the support for this study provided by the Rise Free organization. The analysis and conclusions are solely those of the authors.

In 2019, community college students from households earning less than \$32,000 faced living costs that averaged \$9,700, after accounting for all grants; and those net costs to attend college rose to \$15,500 for those at that income level enrolled a four-year public institution. Students from households at the next income level -- incomes of \$32,000 to \$64,000 -- faced significant tuition costs and received little help with living expenses: They and their families bore total net costs that averaged \$10,000 for community colleges and \$18,400 at four-year public institutions. The Biden plan, paired with reprogramming current tuition grants to living expenses, would provide much more equal access to college and increase total attendance and graduations.

Next, we examined how covering the college tuition and fees for in-state students at public institutions would affect college enrollments and graduations, the disparities associated with a student’s household income, and the nation’s economy. Previous researchers have found that increases in federal and states grants to cover all or some tuition costs have raised college attendance by students from households across income levels. We created a meta-analysis of those findings to estimate the impact of the Biden proposal on college enrollments.² Using 2019 enrollments as the baseline, we found that after several years, the plan would have raised attendance at public community colleges by 1.23 million or 18.3 percent and attendance at four-year public institutions by 1.0 million or 17.7 percent. (Table 1A below) Some of these increases in enrollments would be offset by reduced enrollments at private colleges and universities. All told, no cost tuition would have raised total college enrollments by 1.96 million or 13.4 percent. Across the states, enrollments in public institutions should increase by more than 100,000 students in three states, by 50,000 to 100,000 students in nine states, by 25,000 to 50,000 students in 12 states, by 10,000 to 25,000 in 11 states, and by up to 10,000 students in 15 states. The data were insufficient to estimates these expected changes in the District of Columbia.

Table 1A: Impact of Free Tuition and Fees at Public Institutions on College Enrollments

	Change	Percent Change
Community Colleges (all ages)	1,229,000	+18.3%
Four-Year Public Institutions (all ages)	1,000,000	+17.7%
Four-Year Private Institutions (all ages)	-271,700	-12.3%
Total Net Change in Enrolled Students	1,957,000	+13.4%

Previous researchers also report that increases in grants to cover all or some tuition costs raise college graduation rates for students across income levels, especially at community colleges. Again, we used degrees granted in 2019 as a baseline and applied a synthesis of previous findings to estimate the impact of the Biden plan on graduations and degrees: After being in place for several years, the plan would increase associate degrees earned within four years by 776,000 or 42.7 percent and bachelor’s degrees earned within six years by 558,000 or 15.3 percent.

² We especially relied on data from the 2016 National Postsecondary Student Aid Study (NPSAS:16), the Integrated Postsecondary Education Data System (IPEDS), the Oregon and Tennessee community college policy experiments, and the microsimulation results from Avery et al 2019 drawn from National Student Clearinghouse data.

Table 1B: Impact of Free Tuition and Fees at Public Institutions on College Graduations

	Completion Rate	Additional Degrees	Percentage Increase
Two-Year Institutions	+1.2%	776,000	+42.7%
Four-Year Institutions	+1.0%	558,000	+15.3%

We also examined the impact of a college education on people’s earnings and the impact of the Biden plan on the economy. The data show close link between people’s educational attainment and income. Among Americans ages 25 to 34 in 2019, those with a bachelor’s degree earned nearly 67 percent more than high school graduates, 50 percent more than those who attended college and left before graduating, and 44 percent more than those who earned an associate degree at a community college. Further, people with associate degrees earned 16 percent more than those with high school diplomas in 2019. As Biden’s plan would increase college attendance and graduations, especially by lowering costs for students from low, modest, and middle-income backgrounds, it would help restore opportunities for social mobility regardless of family income.

This is now a vital instrument to advance social equity in the United States. Over the last 30 to 40 years, people’s income prospects have been linked increasingly to their educational attainment; and over the same period, the costs of college rose sharply. College costs, therefore, have become a daunting barrier to upward mobility for millions of young Americans, and a free tuition program can restore those opportunities across incomes and across race and ethnicity.

A new federal program to cover the current costs for college tuition and fees borne by millions of students and their families also would increase their disposable incomes and thereby help stimulate the economy, especially in the current period of substandard growth. Previous researchers have found that increases in government spending, including direct transfer payments and educational grants, have led to higher consumer spending and economic growth. These effects intensify when the stimulus occurs while the economy contracts or expands only slowly, because under those conditions the Federal Reserve does not raise interest rates in response to the prospect of higher deficits. Those conditions prevail today, as the COVID-19 pandemic continues to constrain the economy, and the Federal Reserve has announced its intention to maintain near-zero interest rates through at least 2022.

Using appropriate multipliers, we estimate that the plan should raise GDP by \$139.4 billion over the next two years, 2021 and 2022. For lower-income households we applied the findings of a recent Federal Reserve study of the stimulative effects of higher Pell grants, and for middle income households we employed multipliers estimated from middle-income families’ response to the tax provisions of the Obama stimulus (American Recovery and Reinvestment Act of 2009). Based on current Federal Reserve data and forecasts, we estimate that the Gross Domestic Product (GDP) will come in at \$21,158.2 billion in 2020, and the plan would increase disposable incomes by \$60.8 billion. Across all income levels and types of institutions, we applied an average two-year transfer multiplier of 2.29.³ High-income families benefiting from a free tuition program

³ This is higher than the average multiplier of 2.1 from a cross-sectional analysis of fiscal spending in Chodorow-Reich (2019) and within the range of the multiplier for military spending found by Nakamura and Sieinsos (2014).

have far lower multipliers than lower-income families, and the multipliers for benefits derived from students enrolled in two-year colleges is higher than those enrolled in four-year institutions.⁴

Using the Federal Reserve’s current GDP forecasts of 4.2 percent growth in 2021 and 3.2 percent growth in 2022, a program of free tuition at community colleges and for students from households earning up to \$125,000 at four-year public institutions should raise real GDP growth by 0.326 percent (\$139.4 billion) over the two years. As a result, the plan should raise annual real GDP growth from 4.2 percent to 4.53 percent in 2021 and from 3.2 percent to 3.52 percent in 2022. This would be equivalent to three-quarters of the expected annual boost to GDP from Trump’s 2017 tax cuts, which were projected to raise growth by 0.4 percent per-year from 2018 to 2027.⁵

II. College Enrollments and Graduations Since 2009

College enrollments in the United States rose steadily over several decades, but that progress has slowed or halted stopped over the past decade. The National Center for Education Statistics (NCES) reports that from 2009 to 2019, college enrollment declined by 792,179 students or 4.5 percent.⁶ This decline occurred at public community colleges, two-year private colleges, and private four-year institutions – offset in part by enrollment gains at four-year public institutions (Table 2A below). Population changes explain part of the overall net decline, but the share of high school graduates attending two-year institutions fell nearly 8 percent from 2009 to 2018, offset in part by a nearly 3 percent increase in the share attending four-year institutions.

Table 2A. Enrollments at Public and Private Two-Year Colleges and Public and Private Four-Year Colleges and Universities, 2009 and 2019

	Two-Year Institutions			Four-Year Institutions		
	Public	Private	Total	Public	Private	Total
2009	7,101,569	421,012	7,522,581	6,284,806	3,656,792	9,941,598
2019	5,571,000	199,000	5,770,000	7,528,000	3,374,000	10,902,000
Change	- 1,530,569	- 222,012	- 1,752,581	1,243,194	- 282,792	960,402
Percent Change	- 21.6%	- 52.7%	- 23.3%	19.8%	- 7.7%	9.7%

⁴ The multipliers applied here estimate the output response from transfers to students at both for-profit and not-for-profit institutions; when disaggregated, the non-profit multipliers are significantly higher. Therefore, our multipliers are conservative.

⁵ Barro and Furman (2018).

⁶ National Center for Education Statistics (2020-A). Total college attendance peaked in 2010 at 18,482,500 or 1,404,000 greater than 2019.

Table 2B. Enrollments at Two-Year Colleges and Four-Year Institutions
As a Percentage of Recent High School Graduates, 2009 and 2018⁷

	Total	Two-Year Institutions	Four-Year Institutions
2009	70.1%	27.7%	42.4%
2018	69.1%	25.5%	43.6%
Change	- 1.0 pts	- 2.2 pts	+1.2 pts
Percent Change	- 1.4%	- 7.9%	+ 2.8%

While total college enrollment has fallen, the numbers of students graduating with an associate or bachelor’s degree rose over the same period (Table 3 below). Graduation rates at public community colleges increased by nearly 50 percent, offset in part by a sharp decline in degrees earned at private two-year institutions. Further, degrees granted by both public and private four-year colleges and universities increased substantially.

Table 3: Degrees Conferred by Public and Private Two-Year Colleges (Associate Degrees)
And Four-Year Institutions (Bachelor’s Degrees), 2009 and 2018⁸

	Two-Year Institutions			Four-Year Institutions		
	Public	Private	Total	Public	Private	Total
2009	596,391	190,852	787,243	1,020,521	580,878	1,601,399
2018	885,870	126,075	1,011,945	1,210,988	669,656	1,880,644
Change	289,479	- 64,777	224,702	190,467	88,778	279,245
Percent Change	48.5%	- 33.9%	28.5%	18.7%	15.2%	17.4%

The diverging paths of college enrollments and graduations likely reflect in part shifting conditions in the economy. At the beginning of this period, the 2008-2009 recession left many recent high school graduates unable to find employment, and some of those young people enrolled in college instead. As the economy improved in 2011 and 2012, some of those students left college for jobs before earning their degrees. As the economy continued to grow through the later years of the past decade, more new high school graduates found jobs instead of enrolling in college. Over that period, however, the number of college graduates increased, in part because fewer marginal students had enrolled in college and those who had enrolled had better prospects of landing a well-paid job if they persevered and earned a degree.

Based on this analysis, and the economy’s current problems, a program based on the Biden proposal for free tuition for in-state students at public community colleges and in-state students from households earning up to \$125,000 who attend four-year public institutions should expand college enrollments and, by supporting stronger economic growth, also expand subsequent graduation numbers.

⁷ National Center for Education Statistics (2020-B).

⁸ National Center for Education Statistics (2020-C).

Disparities in College Enrollment Based on Income, Race and Ethnicity

A free tuition program for in-state students at community colleges and those from households earning up to \$125,000 who enroll in four-year public institutions also could help reduce disparities in college enrollment rates associated with a student’s race, ethnicity, and household income. The most recent data on college and university attendance by race and ethnicity clearly show that relative to their shares of all people ages 18 to 24, young whites are nearly 16 percent more likely to attend college than young blacks and more than 18 percent more likely than young Hispanics (Table 4 below). These disparities expand for enrollments at four-year institutions: Relative to their shares of the college-age population, young whites are 40 percent more likely to attend a four-year college or university than young blacks and nearly 30 percent more likely than young Hispanics.

**Table 4: Enrollment in Two-Year and Four-Year Public Colleges and Universities
By Students Ages 18 to 24, By Race and Ethnicity, 2019⁹**

	Share of Population	Share of 2-Year College Enrollment	Share of 4-Year College Enrollment	Share of Total College Enrollment
White Non-Hispanic	54.1%	50.5%	59.9%	55.2%
Black Non-Hispanic	15.2%	14.1%	12.0%	13.4%
Hispanic	22.6%	27.7%	19.3%	19.5%
Asian Non-Hispanic	6.6%	6.8%	8.3%	7.0%
Multi-Race	3.9%	3.7%	4.0%	3.9%
Amer Indian/Alaskan Native	1.5%	1.0%	0.6%	0.7%

A student’s household income is associated with even greater disparities in college attendance. In 2009, NCES surveyors determined the household incomes of thousands of ninth-grade students and then tracked whether they went on to attend a college or university. The reported results show that the likelihood of attending college fell steadily and sharply with the income of a student’s household.¹⁰ (Table 5 below) Some 78 percent of students from households in the top income quintile enroll in college, compared to barely 28 percent from households in the lowest income group and 41 percent of those from households in the middle-income quintile.

**Table 5: Percentage of Students Attending College or University
Based on Their Households’ Income Quintile (Quintiles in 2018 \$)¹¹**

Quintile	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Average Household Income	\$13,775	\$35,293	\$63,572	\$101,570	\$233,895
Share Enrolled in College	28.2%	34.6%	41.4%	57.6%	77.8%

Based on these data, students from households in the top income quintile were 176 percent more likely to attend college than students from households in the lowest income quintile and

⁹National Center for Education Statics (2020-D).

¹⁰ National Center for Education Statistics (2019-A).

¹¹ *Ibid.*

88 percent more likely than students the middle-income quintile. Similarly, students from households in the middle income-quintile were 57 percent more likely to attend college than students from households in the lowest quintile and 20 percent more likely than students from households in the second quintile. These income-based disparities persist independent of academic ability: High-achieving students from low and modest income households are much less likely to attend college than low-achieving students from high-income households.¹²

Household income also dramatically affects whether students attend a two-year or a four-year public institution, which can have significant implications for their future income prospects. The NCES data show that among students enrolled at public colleges and universities, the share who attend a four-year institution rises sharply as household income increases, and the share who attend a two-year institution falls sharply as that income declines (Table 6).

Table 6: Percentage of Students Enrolled in a Public College and University Who Attend a Public Two-Year or Four-Year Institution, by Income Quintile¹³

	Bottom Quintile	Quintile 2	Middle Quintile	Quintile 4	Top Quintile
Public Two-Year	51.2%	47.6%	38.4%	34.6%	18.1%
Public Four-year	27.8%	36.1%	41.9%	42.7%	53.8%
Total	79.0%	83.7%	80.3%	77.3%	71.9%

Based on these data covering students attending public colleges and universities, those from households in the bottom income quintile were 183 percent more likely to attend a community college than those from households in the top income quintile, and those from households in the middle-income quintile were 112 percent more likely to attend a community college than those from households in the top quintile. Similarly, among the students enrolled in public colleges and universities, those from households in the top income quintile were 94 percent more likely to attend four-year institutions than those from households in the lowest income quintile and 28 percent more likely than those from households in the middle-income quintile.

Since a student’s household income is associated with decisions to enroll in college and to attend a two-year or a four-year institution, the Biden program of free tuition for in-state students at community colleges and in-state students from households earning up to \$125,000 who attend public four-year colleges or universities should promote more equal access to a four-year college education for students from lower and middle-income households. Since household income is also linked to race and ethnicity, the Biden program for two-year and four-year public colleges and universities also should also promote more equal access to a four-year college education for Black, Hispanic, American Indian, and Alaskan Native students.

Disparities in College Graduation Rates Based on Race, Ethnicity, and Income

The Biden proposal also could reduce disparities in college graduation rates associated with a student’s race, ethnicity, and household income. Recent data on graduation rates at public

¹² Dynarski, Libassi, Micheltmore, and Owen (2018).

¹³ National Center for Education Statistics (2019-A).

colleges and universities show that among students attending two-year community colleges, the graduation rate of white students is 21 percent higher than that rate for Hispanic students, 40 percent higher than the rate for multi-race students, 106 percent higher than the rate for black students – and 15 percent less than the rate Asian students.¹⁴ (Table 7 below) Race and ethnicity-based disparities in graduation rates are also substantial among students enrolled at four-year public colleges and universities. Among students enrolled in four-year public institutions, white students are 15 percent more likely to earn a bachelor’s degree than Hispanic students, 50 percent more likely than black students, and 55 percent more likely than American Indian and Alaskan native students – and 17.5 percent less likely than Asian students.

Table 7: Three-Year Graduation Rates from Two-Year Public Institutions and Six-Year Graduation Rates from Four-Year Public Institutions, By Race and Ethnicity, 2017

Race and Ethnicity	Associate Degree ¹⁵	Bachelor’s Degree ¹⁶
Asian Non-Hispanic	31.6%	71.2%
White Non-Hispanic	27.4%	60.6%
Hispanic	20.7%	52.8%
Multi-Race	19.6%	54.4%
Black Non-Hispanic	13.3%	40.4%
American Indian/Alaskan Native	17.3%	39.1%

Again, disparities in graduation rates associated with household income are even larger than those tied to race and ethnicity. The NCES data on the educational attainments of students who were 9th graders in 2009 show that among those who eventually attended college, their likelihood of earning a four-year degree increased steadily and sharply with household income. (Table 8 below) Among such students, those from households in the top income quintile were 146 percent more likely to earn a bachelor’s degree than those from households in the lowest income quintile, and 52 more likely than those from households in the middle-income quintile.¹⁷

Table 8: Percentage of Students Graduating from Two-Year Colleges or Four-Year Universities, By Their Households’ Income Quintiles (2018 dollars)¹⁸

Income Quintile	Bottom Quintile	Quintile 2	Middle Quintile	Quintile 4	Top Quintile
Average Income	\$13,775	\$35,293	\$63,572	\$101,570	\$233,895
Associate Degree	41.1%	40.5%	33.0%	25.4%	13.2%
Bachelor’s Degree	31.6%	39.3%	51.1%	59.8%	77.6%

¹⁴ The graduation rate of Asian students is 53 percent higher than Hispanic students, 61 percent higher than multi-race students, and 138 percent higher than Black students.

¹⁵ National Center for Education Statistics (2018-A).

¹⁶ National Center for Education Statistics (2018-B).

¹⁷ Researchers have also explored disparities in graduation rates based on household income among students who enrolled in college. In this regard, a 2012 study reported that more than 75 percent of college students from households in the top income quartile eventually received a bachelor’s degree compared to less than 50 percent of those from households in lowest income quartile. (Millet, Saunders, Kanter, and Hiestand (2020).

¹⁸ National Center for Education Statistics (2019-A).

At the same time, the likelihoods of those students earning a two-year degree declined steadily with household income. Based on these data, the disparities in graduation rates at two-year and four-year institutions associated with income reflect in part the cost differences to attend a two-year or four-year institution. In the 2017-2018 academic year, tuition, fees, and room and board at a public community college cost students and their families an average of \$10,281, compared to \$20,050 at a four-year public college or university.¹⁹ Over the minimum two years to earn an associate degree, a degree from a community college cost \$20,562 as compared to \$80,200 for the first two years at a four-year public institution (based on 2017-2018 costs). To be sure, these disparities also reflect substantial numbers of community college students who transfer to four-year institutions, including many who subsequently earn bachelor's degrees.

As we see below, tuition grants and scholarships for students from households with low and moderate incomes ameliorate these cost differences. Nevertheless, substantial cost differences remain after netting out those grants and scholarships, and likely play a significant role in the decisions by many students from households in the first three income-quintiles about which college to attend, whether to transfer from a two-year to four-year institution, and the ability to stay in school until graduation. As such, the Biden program of free tuition for in-state students at community colleges and most in-state students at four-year public colleges and universities should also promote more equal access to four-year and two-year college degrees.

III. The Costs of a College Education, Based on Household Income

Next, we examine the financial burdens that students and their families personally bear to attend college and hopefully graduate, based on household income. On this basis, we can evaluate and estimate the impact on household incomes of the Biden proposal for free tuition at public colleges and universities for students from households earning less than \$125,000.

First, we review the tuition and fee costs at two-year and four-year public institutions that students and their families bear, based on their household incomes. Under numerous federal and state programs, most college students receive tuition grants, scholarship and loans related to their family or household income. Some of these financial supports also cover some of those students' costs for room, board, and other living expenses. To establish the effects of eliminating tuition at community colleges and for most students at public four-year colleges and universities, we start by exploring how much student grants and scholarships defray the full tuition and fees charges by these institutions.

The Urban Institute conducted the most recent analysis of this issue for the 2015-2016 academic year. We adjusted those data to account for increases in tuition and living expenses from 2016 to 2019.²⁰ Their data show that the published undergraduate tuition and fee charges for in-state students in the 2018-2019 academic year averaged \$11,806 at four-year public research universities, \$8,600 at other four-year public institutions, and \$3,700 at two-year public

¹⁹ National Center for Education Statistics (2019-B).

²⁰ Living expenses and grants are adjusted using the GDP deflators for personal expenditures issued by the Bureau of Economic Analysis (2020); tuition costs and grants are adjusted using the increases in tuition costs from Ma, Baum, Pender, and Libassi (2019).

colleges.²¹ (See Table 9 below) The data further show that grants and scholarships, on average, cover all tuition and fee charges for students from households in the lowest income quartile who attend public two-year or four-year public colleges and universities. However, students from households in the second income quartile, including many households with near-poverty level incomes, bear significant tuition and fee costs to attend four-year public institutions. Those costs are also substantial for students and their families from middle class households in the third income quartile.

At every level of household income, including poverty and near-poverty levels, students and their families also bear large costs for their living expenses while attending college.²² (Table 9) Those living costs preclude college for some students from poor families, because while attending college they cannot work the hours required to cover the costs at the wages earned by high school graduates. For other students from lower-income households, the costs of living away at college dramatically narrow their ability to attend an institution not within commuting distance from their family's homes.

Table 9. Support from Grants and Scholarships, Net Tuition Costs, and Net Living Expenses for Students and their Families, Two-Year and Four-Year Public Institutions, By Household Income Quartiles, 2019²³

Income Level ²⁴	Quartile 1	Quartile 2	Quartile 3	Quartile 4 to \$125,000
Income Range (2019)	\$0 - \$31,727	\$31,728 - \$64,093	\$64,095 - \$114,917	\$114,916 - \$124,363
Four Year Public Institutions				
Tuition Grants	\$11,806	\$9,489	\$5,075	\$3,972
Net Tuition	0	\$2,648	\$8,054	\$11,585
Living Cost Grants	\$1,054	0	0	0
Net Living Costs	\$15,508	\$15,719	\$15,192	\$16,036
Two-Year Public Institutions				
Tuition Grants	\$4,303	\$4,193	\$2,317	\$2,207
Net Tuition	0	0	\$2,207	\$2,317
Living Cost Grants	\$2,743	\$2,004	\$1,054	0
Net Living Costs	\$9,706	\$10,022	\$11,499	\$12,343

All told, students from households earning less than \$31,700 faced net costs for tuition and living expenses in 2019 that averaged about \$9,700 for community college and \$15,500 for public four-

²¹ Urban Institute (2020). Tuition and fees at private not-for-profit colleges and universities are much higher, averaging \$44,000 at private research universities and \$34,900 at other private four-year institutions.

²² The Urban Institute data also show differences in gross or published tuition and fee costs and in the costs of living across the income quintiles. These differences reflect the use of national income quintiles while income levels, living costs and published tuition charges vary significantly from state to state.

²³ Urban Institute (2020). The Urban Institute data cover 2015-2016; the table adjust those data to account for increases in tuition and living expenses to 2019. Living expenses and grants are adjusted using the GDP deflators for personal expenditures issued by the Bureau of Economic Analysis (2020); tuition costs and grants are adjusted using the increases in tuition costs from Ma, Baum, Pender, and Libassi (2019).

²⁴ DQYDJ (2020).

year institutions. Those total net costs for students from households earning \$31,700 to \$64,100 increased to some \$10,000 for community college and \$18,400 for public four-year colleges and universities. Finally, middle-class families that earned \$64,100 to \$115,000 in 2019 faced total net costs averaging \$13,700 to send a student to community college and \$23,250 for a student attending a public four-year institution.

The Biden proposal would end the personal net burden of tuition and fees at public community college and at public four-year colleges and universities for students from households earning less than \$125,000. To further promote equitable access to a college education and degree, the proposal also could preserve current federal tuition grants and shift them to cover living expenses for eligible students.

This analysis does not take account of another large personal cost borne by those who attend college, namely the income they forgo by being a student instead of working fulltime. In 2019, high school graduates ages 25 and older who worked fulltime had median earnings of \$34,880.²⁵ Assuming that college students can work fulltime for three months during summers and earn 80 percent of the median wage for high school graduates, we estimate that students who attended college in 2019 gave up \$20,928 in foregone annual income, on top of the net costs of their tuitions and academic fees.

Finally, these costs have risen substantially over recent years. Tuition at four-year public colleges and universities increased at an average annual rate of 3.5 percent above inflation from the academic year 2003-2004 to 2008-2009; those annual increases accelerated to 4.9 percent above inflation from 2008-2009 to 2013-2014, and then slowed to 1.3 percent per-year above inflation from 2013-2014 to 2018-2019.²⁶ Based on this recent record, tuition increases at public institutions have accelerated during economic downturns. This should be unsurprising. Recessions and slowdowns lead to lower state and local tax revenues, which may result in less appropriations for public colleges and universities — and those institutions may raise tuition and fee charges to offset part of their shortfalls. Based on this pattern, tuition charges could increase significantly in 2021 and 2022, in response to the economy's current problems. Such increases would worsen the current disparities in college attendance and graduations associated with a student's income, race, and ethnicity.

IV. The Impact of a Free Tuition Program on College Enrollments

Based on the above analysis, the program examined here -- covering the tuition and fees for in-state students at community colleges and in-state students from households earning up to \$125,000 who attend public four-year colleges and universities -- should increase college enrollments. Many researchers have shown that reducing those direct tuition costs has had significant effects on college attendance. Until the benefit was phased out in the early years of the Reagan administration, a provision of Social Security provided college grants of up to \$6,700 per year -- equivalent to \$22,200 in 2020 dollars -- to children of deceased, disabled, or retired Social Security beneficiaries. A definitive study of the program found that it helped more than

²⁵ National Center for Education Statistics (2020-E).

²⁶ Ma, Baum, Pender, and Libassi (2019).

12 percent of all college students, more than half black students or those from low-income households, and it raised the enrollment rates of eligible students by 18.2 percentage points.²⁷

Studies of other programs to reduce the tuition costs borne by students and their families also found large effects on college attendance rates. A 2003 analysis by Susan Dynarski, a leading expert, found that a \$1,000 reduction in college costs (\$1,528 in 2020 dollars) increased college enrollments by three-to-four percentage points.²⁸ Since students from low-income families normally pay sharply reduced tuition or no tuition at all, the analysis suggested that the reduction had the largest impact on enrollments by students from middle-income families. An early study of the Georgia state HOPE Scholarship program that covered tuition and fees at Georgia public institutions for in-state high school graduates meeting certain academic requirements found that its impact on college attendance was greatest among students from middle and higher-income households.²⁹

More recent studies of programs covering some or all tuition and fee costs at public colleges and universities have found substantial effects on college attendance by students from households at all income levels. An analysis of six state Promise programs providing no cost tuition for in-state students at public community colleges found substantial increases in enrollments by low-income and minority students.³⁰ Similarly, a study of 33 state Promise programs for two-year community colleges also found large increases in enrollments by black and Hispanic students as well as white students.³¹

These effects are not limited to community colleges. An analysis of the HAIL Scholarship program at the University of Michigan found that a targeted free tuition program had large effects on the college attendance rates of talented students from low-income families. The HAIL program guarantees no tuition for four years for any in-state student who had qualified for subsidized school meals in high school and who met the University of Michigan's strict academic criteria. Notably, those students would have qualified for total tuition abatement before and apart from the HAIL program. Yet, the outreach for the program and its guarantee of four years of no tuition charges raised application rates by low-income students from 26 percent to 58 percent and increased their enrollment rates from 13 percent to 28 percent.³² The study further found that more than one-quarter of that enrollment increase represented young people from low-income families who otherwise would not have attended college at all, and the balance were students who otherwise would have attended a community college or a less selective four-year institution.

Finally, a recent comprehensive study of the impact of tuition abatement on enrollments at public colleges and universities, based on the authors' analytic review of the published results of most such programs, confirmed that additional tuition support raised enrollments by students

²⁷ Dynarski (2001).

²⁸ Dynarski (2003)

²⁹ Dynarski (2000)

³⁰ Castillo, Collins, and Maynard (2020).

³¹ Gandara and Li (2020). An analysis of the Tennessee state Promise program of free tuition for in-state students at two-year community colleges found that it increased total enrollments by 40.0 percent, offset in part by lower enrollments at four-year state public institutions. See Nguyen (2020).

³² Dynarski, Libassi, Michelmore, and Owen (2018).

from low, moderate and middle income households.³³ The authors used those results to simulate the impact of each \$1,000 in tuition reductions at four-year public institutions and free tuition at community colleges on college enrollments by students from households earning less than \$60,000. They found that each \$1,000 reduction in tuition at four-year public colleges and universities raised their enrollments by an average of 2.0 to 3.0 percentage points, and free tuition at two-year colleges increased their enrollments by 6.5 percentage points.

We applied those modal findings, with econometric adjustments, to estimate the impact on college attendance of the Biden plan for a nationwide program of free tuition for in-state students at public community colleges and in-state students from households earning up to \$125,000 at four-year public colleges and universities. To estimate those effects, we draw on NCES data and the simulations that produced the modal findings described above. Both sources required certain modifications. The enrollment baseline is derived by adjusting 2016 NCES data on high school graduates and college attendees to produce new baseline enrollments for 2019. We also analyzed the assumptions and inputs for the above modal findings and applied appropriate inputs and adjustments derived from other studies to estimate the enrollment impact at both four-year and two-year public institutions under the Biden plan. The results, presented in the Introduction (Table 1A), are presented again in Table 10 below.

Table 10: Estimated Impact of Free Tuition and Fees at Public Institutions on College Enrollments

	Change	Percent Change
Community Colleges (all ages)	1,228,700	+18.3%
Four-Year Public Institutions (all ages)	1,000,000	+17.7%
Four-Year Private Institutions (all ages)	-271,700	-12.3%
Total Net Change in Enrolled Students	1,957,000	+13.4%

The effects on college enrollments are substantial, with the largest initial impact on community college enrollments. Under the proposal, we estimate that total college enrollments in 2019 would have been 1,957,000 higher, an increase of 13.4 percent, if the plan had been in place long enough for students and their families to learn about it and about how and where they could use its benefits. Most of the increase in community college enrollments would be students who otherwise would not have attended college at all. Since the policy limits the benefits to those eligible students attending public colleges and universities, it also would provide financial incentives for people to enroll in public institutions instead of private colleges and universities, and so it substantially affects enrollments at private institutions. Further, since cost considerations compel some young people to attend community colleges instead of four-year institutions, a share of the additional 1,000,000 students enrolled at public four-year institutions would be young people enrolling there instead of at community colleges.

Since college enrollments rates are associated strongly with household income, charging no tuition at public institutions would narrow the current disparities in enrollments based on

³³ Avery, Howell, Pender, and Sacerdote (2019).

income: While the college enrollments rise across income levels, we would expect to see the largest gains among students from households with low or moderate incomes.

Impact State by State

The impact on enrollments will also vary state by state. (Table 11, below) To begin, the impact of free tuition varies by household income, and the distribution of household income varies across the states. Further, the current tuition costs to attend public institutions also vary by state, and the differences between those costs and zero costs affects the expected responses. In addition, some of the increase in public enrollments reflects students transferring from private to public two and four-year institutions, and the share of college students currently enrolled in private institutions varies by state.

Taking account of these and other factors, we should expect to see public college and university enrollments increase by 20.0 percent or more in two states (Texas and North Carolina), by 10.0 percent to 19.9 percent in 27 states, by up to 10.0 percent in 8 states. By the numbers, public college enrollments should increase by more than 100,000 students in three states (California, New York, and Illinois), by 50,000 to 99,999 students in nine states, by 25,000 to 49,999 students in 12 states, by 10,000 to 24,999 students in 10 states, and by up to 10,000 students in 11 states. Data were insufficient to estimate those effects for the District of Columbia. Available data were insufficient to estimate enrollment increases in four states and the District of Columbia.

We also provide estimates of the net percentage increases in enrollments at four year public and private colleges and universities. In many states, the estimates closely follow percentage increases in total enrollments at two-year and four-year public institutions. In other states, the percentage increases in four-year public and private enrollments are considerably larger, suggesting a larger than average share of community college students shifting to four-year public institutions and/or a smaller than average share of private college students shifting to public institutions. Finally, the percentage increases in four-year public and private enrollments are smaller in some states, suggesting smaller than average shifts from private to public institutions.

Table 11: Impact of Free Tuition on Student Enrollments in Public College and Universities, by State³⁴

State	Increase in 2-Year and 4-Year Public College Enrollments	Increase in 2-Year and 4-Year Public College Students	Increase in 4-Year Public and Private College Enrollments
Iowa	24.31%	15,200	9.75%
Connecticut	22.82%	31,200	9.98%
California	22.54%	442,600	22.74%
Illinois	22.14%	109,600	12.70%
Rhode Island	21.32%	7,500	10.62%
Arizona	21.10%	63,600	21.59%
New Jersey	20.69%	76,900	11.31%

³⁴ Student's state of legal or permanent residence.

Massachusetts	20.45%	40,000	5.99%
North Carolina	20.19%	97,300	11.71%
Michigan	20.05%	68,800	8.53%
Oregon	20.00%	29,400	12.81%
Virginia	19.90%	77,400	11.65%
Texas	19.81%	216,400	15.14%
Nebraska	19.81%	15,000	12.79%
New Mexico	19.71%	26,000	20.43%
Minnesota	19.67%	40,300	10.45%
Maryland	19.25%	28,900	8.89%
Missouri	18.94%	34,400	6.62%
Mississippi	18.48%	23,600	11.12%
South Carolina	18.36%	18,700	7.36%
Tennessee	18.26%	32,900	6.15%
Kansas	17.66%	23,900	11.41%
Hawaii	17.47%	8,800	8.24%
New York	17.30%	122,600	6.38%
Pennsylvania	17.26%	66,200	6.22%
Colorado	17.13%	37,000	9.42%
Ohio	17.00%	72,900	7.67%
Oklahoma	16.64%	31,200	11.88%
Louisiana	16.09%	26,400	8.60%
Kentucky	15.43%	22,400	6.04%
Indiana	15.31%	40,500	5.49%
Idaho	15.05%	7,000	2.31%
Wisconsin	14.93%	30,500	6.52%
North Dakota	14.66%	4,600	7.28%
Alabama	14.06%	21,300	6.31%
Georgia	13.96%	50,900	6.71%
Montana	13.08%	5,700	6.43%
Washington	11.78%	37,200	5.09%
Utah	10.36%	15,600	3.75%
Nevada	5.38%	4,700	3.39%
Florida	4.96%	40,300	2.38%
<i>States Estimates that Include Inadequate or Unreliable Data</i>			
Alaska*	3.85%	1,200	1.65%
Arkansas**	17.70%	17,700	11.83%

Delaware**	26.48%	7,000	9.11%
Maine**	30.65%	6,000	6.26%
New Hampshire**	25.10%	4,500	2.14%
South Dakota*	9.95%	1,600	3.07%
Vermont**	25.57%	8,200	21.01%
West Virginia**	14.40%	7,600	6.87%
Wyoming**	NA	NA	NA

* No two-year public college data. **Inadequate or unreliable data for critical inputs.

V. The Impact of a Free Tuition Program on Graduation Rates

The proposal also would significantly increase the numbers of students graduating overall and graduating from public colleges and universities. Many researchers have found that financial assistance raises students' graduation rates.³⁵ The study of the Social Security program found that the large educational grants provided to children of beneficiaries raised their graduation rates by 15 percentage points.³⁶ Similarly, studies of federal Pell grants, which by law are directed to students from lower-income households, show that those grants raised graduation rates.³⁷ In Texas, for example, recipients of Pell grants were 13 percent more likely to earn a bachelor's degree than comparable students who were non-recipients.³⁸ More than 20 states also provide large state tuition grants for in-state students who meet income and academic requirements to attend a public college or university. In that regard, a study of state tuition assistance provided under California's Cal Grant program found that it increased the likelihood of a student earning a bachelor's degree by 4.6 percentage-points or 10 percent.³⁹

Again, the recent comprehensive review and analysis of most tuition abatement programs, described above, simulated the impact on graduation rates for students from low and moderate income household (incomes of less than \$60,000) of each \$1,000 in tuition assistance at four-year public universities and of eliminating tuition charges at two-year colleges.⁴⁰ The researchers found that largest effects occurred at community colleges: Eliminating tuition and fees raised graduation rates at two-year colleges by 6.5 percentage points or 23.6 percent, including a significant number of graduates who otherwise would not have enrolled in college at all. They also found that eliminating tuition charges at four-year public universities for students in households earning less than \$60,000 produced a net increase of 1.0 percentage-point in bachelor's degrees, after taking account of the negative 3.3 percentage-point drop in enrollments at four-year private institutions. The analysis further found that a free tuition program would have the greatest effects on the graduation rates of students from lower-income households:

³⁵ For example, Dynarski, Susan (2003); Castleman, and Long (2016); Page and Scott-Clayton (2016); Cornwell, Mustard and Sridhar (2006); and Dynarski (2008).

³⁶ Dynarski 2001.

³⁷ Denning, Marx, and Turner (2019).

³⁸ *Ibid.*

³⁹ Bettinger, Gurantz, Kawano, Sacerdote, and Stevens (2019).

⁴⁰ Avery, Howell, Pender, and Sacerdote (2019).

Eliminating tuition charges raised the graduation rate at four-year public universities of students from households with incomes of less than \$40,000 by 2.9 percentage points.⁴¹

We used the study’s modal findings to help estimate the impact on college graduation rates of eliminating tuition for all in-state students at two-year public colleges and for those in-state students from households earning up to \$125,000 attending four-year public colleges and universities. As described above for enrollments, we analyzed the assumptions and inputs for the modal findings on the graduation rates of community college students within four years of enrolling and the graduation rates for students at four-year institutions within six years of enrolling, and we used appropriate inputs from other studies and additional adjustments to estimate the Biden plan’s impact at two-year and four-year institutions. The results are presented again in Table 12:

Table 12: Impact of Free Tuition and Fees at Public Institutions on College Graduation Rates

	Completion Rate	Additional Degrees	Percentage Increase
Two-Year Institutions	+1.2 percentage points	776,000	+42.7%
Four-Year Institutions	+1.0% percentage points	558,000	+15.3%

After a free tuition plan has been in place for several years, the effects on college graduations would be substantial, especially on degrees granted by community colleges. Additional graduates from community colleges are students who otherwise would not have earned degrees, including many who would not have attended college at all. These effects take a few years to emerge as the impact on enrollments takes hold and institutions adjust to accommodate additional students. Since these completion rates are four-year rates for community colleges and six-year rates for four-year institutions – how many students in an entering class at two-year institutions graduate within four years, and how many students in the entering class at four-year institutions graduate within six years – the numbers of additional degrees each year include students from several entering classes. Graduation rates are measured in this way, because many students leave and return, and those numbers vary by economic conditions. Finally, since the policy limits its benefits to those attending public colleges and universities, it should be expected to reduce the numbers of students graduating from private not-for-profit colleges and universities.

Since college graduation rates are associated strongly with household income, the Biden plan for public institutions also should narrow the current disparities in graduations based on income: While the college graduations rise across income levels, we would expect to see the largest gains among students from households with low or moderate incomes.

VI. The Impact of a Free Tuition Program on Incomes and the Economy

The Impact of a College Education on Earnings

The large costs required to attend and graduate college, especially a four-year institution, are economic investments in a student’s human capital that generate meaningful returns. Census

⁴¹ *Ibid.* Table 4b.

Bureau data document how people’s incomes increase based on their educational attainment.⁴² Among people ages 25 to 34 in 2019, those who attended college and left before graduating earned on average \$4,534 more (10.1 percent) than the average high school graduate. (Tables 13A and 13B below) Those who attended a two-year college and graduated with an associate degree earned on average \$6,444 more (15.8 percent) than a high school graduate. Finally, those who graduated from a four-year college or university with a bachelor’s degree earned \$27,234 more (66.8 percent) than a high school graduate, \$20,790 more than those with an associate degree (44.0 percent), and \$22,700 more than those who attended college and left before graduating (50.1 percent). The income benefits associated with education increase further for people who earn a Masters’ degree or a professional degree, on top of their bachelor’s degree.

Table 13A: Differences in Average Income by Education, Ages 25-34 (2019)

Education	Mean Income	HS Grad	Some College	Associate	BA	MA	Prof. degree
HS Grad	\$40,778	--	\$4,534	\$6,444	\$27,234	\$41,484	\$70,813
Some College	\$45,312	\$4,534	--	\$1,910	\$22,700	\$36,950	\$66,279
Associate	\$47,222	\$6,444	\$1,910	--	\$20,790	\$35,040	\$64,369
Bachelor	\$68,012	\$27,234	\$22,700	\$20,790	--	\$14,250	\$43,579
Master	\$82,262	\$41,484	\$36,950	\$35,040	\$14,250	--	\$29,329
Prof. degree	\$111,591	\$70,813	\$66,279	\$64,369	\$43,579	\$29,329	--

Table 13B: Percentage Increases in Average Income with Rising Education, Ages 25-34 (2019)

Education	Some College	Associate	BA	MA	Prof. degree
HS Grad	10.1%	15.8%	66.8%	101.7%	173.7%
Some College	--	4.2%	50.1%	81.5%	146.3%
Associate	--	--	44.0%	74.2%	136.3%
Bachelor	--	--	--	21.0%	64.1%
Masters	--	--	--	--	35.6%

The income disparities among people who earn a bachelor’s degree, those who earn an associate degree, and those who leave college before graduating help explain why large numbers of community college students transfer or subsequently attend four-year institutions, despite the higher costs. One study found that 24.0 percent of community college students transferred or subsequently attended four-year institutions; and 45.8 percent of those students later graduated with a bachelor’s degree.⁴³ Those findings are consistent with other research showing that 14.7 percent of students who enroll in community colleges eventually complete a bachelor’s degree.⁴⁴

We also established that the substantial financial burdens placed on students and their families to order to remain in college and graduate, especially at a four-year institution, affect the likelihood of completing a bachelor’s degree for millions of people. As noted earlier (see Table 7 above), NCES data show that students at four-year institutions in households in the top income

⁴² U.S. Census Bureau (2020-A).

⁴³ Miller, Clery, and Topper (2018).

⁴⁴ Avery, Howell, Pender, and Sacerdote (2019).

quintile are 52 percent more likely to graduate than those from households in the middle-income quintile and 146 percent more likely to earn a bachelor's degree than their counterparts from households in the lowest income quintile. Similarly, among students attending four-year institutions, those from households in the middle-income quintile are 62 percent more likely to graduate than those from households in the lowest income quintile.

Taken together, the data on the costs of attending college, on college enrollments and graduations by household income, and on the income benefits of an associate or bachelor's degree support a sobering conclusion: The financial burdens entailed in attending and graduating college have impaired social mobility for millions of young people from low, modest, and middle-income backgrounds. A program to cover the costs of tuition and academic fees at community colleges and those costs for young people from households earning up to \$125,000 who attend a four-year public college or university could help restore opportunities for genuine social mobility regardless of family income.

The Impact of the Biden Plan on the Economy

The Biden program also would provide meaningful stimulus for the economy. In the short-term, the proposal would raise GDP by increasing the disposable incomes of eligible households and thereby boosting their consumer spending and associated employment. Over a longer-term, the program would increase the numbers of college-educated workers and business investments in the capital equipment used by those educated workers, and thereby raise the economy's productivity. Additional federal spending for most purposes stimulates the economy when it is performing below its potential. This proposal would also increase human capital and business investment, and thereby raise the economy's underlying rate. Further, this additional spending has larger stimulative effects than many other types of spending.

While the direction of the economic effects is clear, their precise dimensions are challenging to estimate. The short-term impact on the economy would be based on the increasing people's disposable incomes by the amount that students and their households expected to participate in the Biden program would otherwise have spent on tuition and academic fees at two-year and four-year colleges and universities. We earlier estimated that more than 12 million students and families would save about \$61 billion in personal tuition and fee payments in the program's first year.⁴⁵ We assume that colleges as well as the federal and state government would shift current tuition grants and scholarships to support for living expenses, by choice or as a requirement of the program. We also treat the tuition implications of shifts from private four-year colleges to public two-year programs as an implicit transfer, as the disposable incomes of those families would increase relative to the baseline scenario of current arrangements.

To estimate the impact of those increases in disposable income on economic growth, we reviewed numerous studies that examine the economic impact of various types of increased government transfers and other spending. The dimensions of those effects depend on the type of spending or transfers involved and the economy's underlying conditions. By directly raising

⁴⁵ This includes 5.5 million students attending community colleges, 4.4 million students attending four-year public colleges and universities and around 300,000 students transferring from private four-year institutions to public undergraduate programs.

the disposable incomes of millions of households, the Biden program would confer direct benefits resembling transfer payments. The broadest study of the economic effects of raising transfer payments examined 17 increases in Social Security benefits from 1952 to 1991.⁴⁶ The researchers found that consumer spending increased by \$1 for each \$1 in additional benefits for about six months, followed by smaller responses.⁴⁷ Another study of the impact of raising Society Security payments found that each 10 percent increase was followed by a 1.7 percent boost in retail sales.⁴⁸

For students from households with below-median income, the Biden program also calls to mind an expanded version of Pell grants. A recent study by Federal Reserve Board economists of the economic impact of increasing federal Pell grants, covering the quarter century from 1990 to 2015, found that each \$1 per-capita increase in those grants generated \$2.40 in local economic activity, with significantly higher multipliers associated with increased grants to community college students and during times of recession.⁴⁹ The researchers also found that over the period from 1999 to 2015, a \$1 increase in per capita Pell grants produced a multiplier of 2.9.

Economists also have established that federal stimulus has the greatest impact when the underlying economy is weak. In this regard, numerous researchers have analyzed the impact of the 2009 Obama stimulus, which was distributed from the end of the Great Recession through the early years of the subsequent weak recovery. One study found that each \$1 in stimulus payments increased output by the weakened economy by \$2.10,⁵⁰ including \$2.00 for expanded transfer payments, \$2.50 for higher government spending on goods and services, and \$1.80 for additional payments to state and local governments.⁵¹ Another analysis found that each \$1 in additional government spending under the 2009 stimulus package increased output by an average of \$1.60 and by as much as \$2.30.⁵² In addition, researchers at the Federal Reserve Board analyzed the employment effects associated with the spending to expand Medicaid under the Affordable Care Act: They found that each 1.0 percent increase in healthcare spending raised employment by more than one-half percent (58 basis points).⁵³

These responses reflect how the Federal Reserve responds to additional federal spending, based on the economy's underlying conditions. When the economy is growing at a healthy rate, the Federal Reserve typically raises interest rates when federal spending and expected budget

⁴⁶ Wilcox (1989). These and other studies rebutted a view held by some economists that raising transfer payments does not affect consumer spending or the overall economy, because reasonable people would instead increase their personal savings in order to pay the higher taxes needed to cover the additional spending. This phenomenon is called a Ricardian equivalence effect.

⁴⁷ Romer and Romer (2016).

⁴⁸ Wilcox, David (1989). These and other studies rebutted a view held by some economists that raising transfer payments does not affect consumer spending or the overall economy, because reasonable people would instead increase their personal savings to pay the higher taxes needed down the road to cover the additional spending. This phenomenon, now rebutted, is called a Ricardian equivalence effect.

⁴⁹ De Ridder, Hannon, and Pfajfar (2020).

⁵⁰ Chodorow-Reich (2019).

⁵¹ Alesina, Favero, and Giavazzi (2019).

⁵² Christiano, Eichenbaum, and Rebelo (2011).

⁵³ Dupor and Guerrero (2020).

deficits abruptly increase.⁵⁴ By so doing, the Federal Reserve limits the boost in consumer spending and the gains in output and employment that follow higher consumer spending. When higher federal spending occurs during a recession or a period of economic weakness, the stimulative effects are greater because the Federal Reserve does not respond with higher interest rates. When the Congress enacted the 2009 stimulus, interest rates already were very low; and the Federal Reserve maintained a policy of very low rates, including a near-zero federal funds rate, until early 2017.⁵⁵ As a result, the impact on output and employment were stronger than other researchers had found during more prosperous periods.

In March 2020, the Federal Reserve restored near-zero interest rates in response to the economic fallout from the COVID-19 pandemic, and the latest forecast from the Federal Reserve Board contemplates maintaining that policy through 2022 and perhaps longer.⁵⁶ In this context, the Biden tuition program should provide substantial stimulus for several years. To estimate the stimulative effect, the most pertinent analysis is the Federal Reserve's study of the stimulus associated with Pell grant increases during the recessionary periods from 2000 to 2015.⁵⁷ That study found that during the 2001 and 2008-2009 recessions and their aftermaths, each \$1 in additional grants to students at two-year colleges stimulated \$5.20 in additional economic activity in the area where the grants were used, while \$1 in additional grants to students at four-year institutions stimulated \$1.60 in economic activity. All told, each \$1 in new educational spending stimulated \$3.78 in new economic activity in the area where the grants were used.

These results are not directly applicable to the Biden tuition program for public colleges and universities. Most Pell grant recipients are from households earning less than \$40,000, most of those grants are used by students enrolled in community colleges, and some recipients attend private not-for-profit or private for-profit colleges and universities. To apply the results to the Biden proposal, we analyzed the study's assumptions and inputs and applied separate multipliers for two-year and four-year students as well as a range of multipliers based on household income. In this way, we could simulate the aggregate impact of the Biden plan's expanded educational grants on economic activity by households with students under the plan would attend a community college and by households earning up to \$125,00 with students who under the plan would attend four-year public institutions. We found that the additional \$61 billion in disposable income will increase GDP by an estimated \$139.24 billion over two years.

Using GDP data issued by the Federal Reserve Bank of St. Louis and recent forecasts for the fourth quarter of 2020, we estimate that GDP in 2020 will total \$21,128.2 billion.⁵⁸ In December 2020, the Federal Reserve Board also estimated that real GDP will increase 4.2 percent in 2021 and 3.2

⁵⁴ The study of Social Security benefit increases (Wilcox, 1989) found that their stimulative impact waned after six months, because in most of those cases, the Federal Reserve responded with higher interest rates

⁵⁵ Federal Reserve Bank of St. Louis (2020-A).

⁵⁶ Board of Governors of the Federal Reserve System (2020-A).

⁵⁷ De Ridder, Hannon, and Pfajfar (2020). This study relied on data for Metropolitan Statistical Areas (MSAs), and its conclusions are applicable to the United States as a whole: 86.2 percent of Americans lived in MSAs in 2019, and 58 percent of the remaining 14 percent who live in rural areas have local access to higher education. U.S. Census Bureau (2020-B); Rosenboom and Blagg (2018); Hillman and Weichman (2016).

⁵⁸ Federal Reserve Bank of St. Louis (2020-B).

percent in 2022,⁵⁹ leading to GDP of \$22,015.6 billion in 2021 and \$22,720.1 billion in 2022 (2020 dollars). Using our estimate of the impact of the increase in disposable income on GDP, we estimate that under the Biden plan, GDP will total \$22,085.2 billion in 2021 and \$22,861.6 billion in 2022 (2020 dollars).

As a result, the Biden plan would raise expected GDP growth from 4.2 percent to 4.53 percent in 2021 and from 3.2 percent to 3.52 percent in 2022. For comparison purposes, consider the Trump 2017 tax program that stimulated growth in 2018 and 2019 by increasing disposable income in very different ways than would the Biden tuition plan and in a very different economic climate. After its passage, Nobel Laureate Robert Barro and Jason Furman, former chair of the Council of Economic Advisers, estimated that the 2017 tax cuts would raise real GDP growth by 0.4 percent per-year over 10 years.⁶⁰ The Biden tuition plan should provide about three-quarters as much stimulus as the Trump tax program, at much less cost and with much broader benefits.

Impact on State GDP

We can also estimate the expected impact of the Biden free tuition program on state GDP over two years, based on increases in disposable income by three groups within each state:

- Gains based on students who would not have enrolled in a four-year public institution under current tuition costs, plus those who would attend at current tuition levels.
- Gains based on students who would shift from enrolling in a private four-year college or university to attending a public four-year institution.
- Gains based on students who would not have attended college under current tuition costs but who would attend a two-year public college under a free tuition program.

The totals, therefore, largely reflect the college-age populations in each state and the current tuition costs in each state. Unfortunately, data were insufficient to generate estimates for each category and each state: We can project the two-year GDP gains for 38 states, plus partial gains for the remaining 12 states (Table 14 below). State GDP would increase over two years by \$5 billion or more in eight states, by \$2 billion to \$5 billion in another 14 states, and by \$1 billion to \$2 billion in 11 states. Of 17 states with estimated GDP gains of \$280 million to \$1 billion, the estimates for 12 of those states are incomplete.

Table 14: Estimated Two-Year GDP Gains Based on Increases in Disposable Incomes by Households with Students Receiving Free Tuition at Public Colleges and Universities, By State

State	GDP Gains Based on Students at Public 4-year Institutions	GDP Gains Based on Students Shifting from Private to Public 4-year Institutions	GDP Gains Based on Students at Public 2-Year Institutions	Total Gains in State GDP
California	\$7,507,100,000	\$932,500,000	\$5,898,900,000	\$14,338,500,000
Texas	\$5,102,000,000	\$412,000,000	\$4,491,700,000	\$10,005,700,000

⁵⁹ Board of Governors of the Federal Reserve System (2020-B)

⁶⁰ Barro and Furman (2018).

New York	\$4,391,000,000	\$1,160,700,000	\$4,164,100,000	\$9,715,800,000
Pennsylvania	\$4,795,700,000	\$600,200,000	\$2,175,000,000	\$7,570,900,000
Illinois	\$2,996,900,000	\$551,900,000	\$3,300,800,000	\$6,849,600,000
New Jersey	\$2,528,200,000	\$432,000,000	\$3,110,300,000	\$6,070,500,000
Ohio	\$3,492,800,000	\$454,300,000	\$1,722,600,000	\$5,669,700,000
Virginia	\$2,444,100,000	\$243,300,000	\$2,549,900,000	\$5,237,300,000
Florida	\$4,252,000,000	\$438,900,000	\$250,700,000	\$4,941,600,000
Michigan	\$2,641,700,000	\$284,200,000	\$1,951,700,000	\$4,877,600,000
Georgia	\$2,830,100,000	\$206,500,000	\$1,042,100,000	\$4,078,700,000
North Carolina	\$1,921,700,000	\$297,800,000	\$1,678,800,000	\$3,898,300,000
Massachusetts	\$1,979,600,000	\$498,400,000	\$1,353,200,000	\$3,831,200,000
Washington	\$2,240,500,000	\$225,600,000	\$1,153,200,000	\$3,619,300,000
Colorado	\$1,544,200,000	\$118,700,000	\$1,201,300,000	\$2,864,200,000
Indiana	\$1,749,600,000	\$251,200,000	\$802,300,000	\$2,803,100,000
Arizona	\$1,335,600,000	\$33,700,000	\$1,306,200,000	\$2,675,500,000
Tennessee	\$1,260,500,000	\$213,800,000	\$1,076,900,000	\$2,551,200,000
Wisconsin	\$1,280,400,000	\$118,800,000	\$938,400,000	\$2,337,600,000
Connecticut	\$965,700,000	\$294,400,000	\$870,600,000	\$2,130,700,000
Maryland	\$1,085,400,000	\$187,200,000	\$808,500,000	\$2,081,100,000
Missouri	\$1,208,100,000	\$174,900,000	\$680,400,000	\$2,063,400,000
Alabama	\$1,309,300,000	\$55,600,000	\$620,700,000	\$1,985,600,000
Louisiana	\$1,111,500,000	\$90,400,000	\$758,700,000	\$1,960,600,000
Kentucky	\$1,065,500,000	\$149,600,000	\$644,900,000	\$1,860,000,000
Oregon	\$736,400,000	\$105,700,000	\$829,500,000	\$1,671,600,000
South Carolina	\$1,040,400,000	\$102,600,000	\$505,800,000	\$1,648,800,000
Oklahoma	\$802,400,000	\$52,700,000	\$701,700,000	\$1,556,800,000
Minnesota	\$1,106,800,000	\$200,700,000	\$218,900,000	\$1,526,400,000
Mississippi	\$658,900,000	\$43,500,000	\$740,400,000	\$1,442,800,000
Utah	\$969,600,000	\$27,600,000	\$300,000,000	\$1,297,200,000
Kansas	\$604,000,000	\$33,900,000	\$529,200,000	\$1,167,100,000
Arkansas	\$557,400,000	\$34,100,000	\$473,600,000	\$1,065,100,000
New Mexico	\$403,300,000	*	\$491,000,000	\$894,300,000
Iowa	\$353,300,000	\$97,200,000	\$367,700,000	\$818,200,000
Nebraska	\$375,000,000	\$39,900,000	\$328,700,000	\$743,600,000
Hawaii	\$392,800,000	\$33,800,000	\$247,300,000	\$673,900,000
Rhode Island	\$204,300,000	\$58,300,000	\$278,700,000	\$541,300,000
Delaware	\$454,000,000	\$71,200,000	*	\$525,200,000

Idaho	\$459,800,000	\$54,300,000	*	\$514,100,000
Nevada	\$445,400,000	\$20,200,000	*	\$465,600,000
Montana	\$259,000,000	\$31,000,000	\$139,800,000	\$429,800,000
New Hampshire	\$321,900,000	\$80,100,000	*	\$402,000,000
West Virginia	\$346,500,000	*	\$2,900,000	\$349,400,000
Alaska	\$242,900,000	*	*	\$242,900,000
Wyoming	*	*	\$230,000,000	\$230,000,000
South Dakota	\$212,600,000	*	*	\$212,600,000
North Dakota	\$191,300,000	*	*	\$191,300,000
Maine	*	\$85,500,000	*	\$85,500,000
Vermont	*	\$50,400,000	*	\$50,400,000

* Incomplete data: Estimates reflect only part of the impact on state GDP.

VII. Conclusions

This study has examined the likely effects of the proposal from President Biden to provide free tuition and academic fees for in-state students at public two-year community colleges and in-state students from households earning up to \$125,000 who attend public four-year institutions. The analysis showed that under today's arrangements, white and Asian students are much more likely to attend and graduate college, especially four-year institutions, than black, Hispanic, Native American, and Alaskan native students. One critical factor is the large costs required to attend and graduate from college, and college enrollments and graduations at four-year colleges and universities are linked to income to more than to race and ethnicity.

This study showed that the Biden tuition plan would substantially raise enrollments and the numbers of associate and bachelor's degrees awarded at two-year and four-year public colleges and universities. These outcomes would lead to higher incomes for millions of people who, but for the Biden plan, would not have attended or not have graduated from college. These outcomes under the Biden plan also should increase social mobility, especially for young people from low and moderate-income families. Finally, by covering the tuitions and fees for millions of students, the program would raise the disposable incomes of those students and their families and thereby provide meaningful stimulus to the American economy during these current difficult times.

* * *

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