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# Economic Benefits and Costs of Tuition-Free College in Illinois

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**Economic Benefits and Costs of Tuition-Free College in Illinois**

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This memo estimates the main economic benefits of tuition-free college in Illinois. These economic benefits are compared with the costs of making tuition free. In addition, we consider possible fiscal benefits of tuition-free college and whether these fiscal benefits for Illinois will offset the fiscal costs of making tuition free. This memo is based on cost estimates presented to the State of Illinois in an August 2020 memo entitled "Estimated Cost of Tuition-Free College in Illinois" and should be considered in conjunction with that memo.

The main *quantifiable* economic benefit of tuition-free college in Illinois is the resulting increase in Illinois residents' per-capita earnings.[1] Due to tuition-free college, additional Illinois residents will complete either a two-year program, earning an associate degree, or a four-year program, earning a bachelor's degree. This higher degree completion will significantly increase graduates' lifetime earnings. Some of these additional graduates will remain in the state.

Our analysis of Illinois economic benefits only counts these higher earnings of graduates who remain in the state. Graduates leaving the state are also better off because of the program, but we take an Illinois perspective and do not count these out-migrants' benefits.

These higher earnings of graduates who stay in Illinois are due to these graduates' higher skills. Economic evidence shows that higher skills of some people in a state or local economy have spillover effects on others' per-capita earnings. Intuitively, if some workers are more skilled at a firm, this enables the firm to more readily introduce overall productivity improvements and become more competitive, thus enabling higher wages for everyone at the firm. In addition, having more skilled workers at a supplier to firm A may make firm B more competitive and allow firm B to increase wages. Furthermore,, a state with more skilled workers will be better able to attract and grow jobs, which will increase the wages of all the state's workers. Finally, a state with more skilled workers may develop better amenities, public services, social services and community well-being, all of which may enhance child development and enhance the long-run earnings of the next generation.[2]

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[1] Higher educational attainment might bring about many other benefits: lower crime, lower substance abuse, more stable families, and better outcomes for the children of these graduates. Our focus on the direct earnings effects for graduates omits these other benefits, which may be large, but are harder to quantify.

[2] In addition, these better community amenities may enhance community well-being in broader ways that cannot be quantified in earnings increases.

We first describe our estimates of additional graduates due to the program. We then describe the earnings benefits that accrue per graduate, adjusted downwards for out-migration from Illinois. The direct effect on Illinois earnings per capita are then the product of the additional graduates, times the added earnings per graduate of Illinois residents. We then add in the indirect spillover benefits of these higher skills and earnings on all Illinois workers' wages. The sum of these direct earnings effects and spillover earnings effects is then discounted to their "present value" in 2021 dollars. This present value of earnings benefits is then compared with the present value of the costs of tuition-free college in Illinois, again expressed in 2021 dollars. [3]

We then consider what effects these added earnings will have on Illinois tax revenue, which will be the main part of the fiscal benefits from the program. We consider both state and local government fiscal benefits and fiscal benefits only for the state government

Our initial analysis is for the program that was costed out in the prior memo. This program was costed from 2021 to 2030. So, in measuring economic benefits consistently with these costs, we only include benefits that occur from a program that just lasts from 2021 to 2030. We then consider how costs and benefits might evolve over time for a permanent Illinois tuition subsidy program.

**Effects of tuition-free college in Illinois on extra college graduates**

Our cost estimates incorporated reasonable assumptions about the program's impacts on the likelihood of attending college, as well as retention rates. For purposes of this analysis, we needed to add some assumptions about graduation rates. Building on the attendance and retention scenarios presented in the August 2020 memo, the estimates below increase community college graduation rates by 1.5 percentage points and public university graduation rates by 5 percentage points. We also assume here that the program adopted was a last-dollar program, which is considerably less expensive and more fiscally feasible than a first-dollar program.

Table 1 below shows the number of additional degrees expected to be created by the tuition-free college programs outlined in the August 2020 memo.

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[3] Present value is a way of converting dollar flows of benefits and costs in any year to their equivalent in dollars of a common year, here 2021. After first adjusting for inflation, we then adjust for the reality that a dollar benefit or cost 5 years from now, or 20 years from now, would not in general be considered to be quite as valuable as the same dollars today. Among other things, a dollar today could be invested in financial assets, and earn some rate of return.

Table 1, Projected additional degree completions due to Illinois tuition subsidy programs, by year of graduation

| | Combined-2-year & 4-degree program | | 2-year program only |
| --- | --- | --- | --- |
| | 2 Year Degree | 4 Year Degree | 2-year degree |
| 2022 | 1,099 | | 1,784 |
| 2023 | 1,454 | | 2,208 |
| 2024 | 1,629 | 706 | 2,591 |
| 2025 | 1,727 | 2,368 | 2,789 |
| 2026 | 1,711 | 3,046 | 2,778 |
| 2027 | 1,667 | 3,724 | 2,713 |
| 2028 | 1,611 | 4,180 | 2,623 |
| 2029 | 1,574 | 4,514 | 2,563 |
| 2030 | 1,555 | 4,734 | 2,533 |
| 2031 | 1,533 | 4,933 | 2,497 |

**Earnings effects of extra graduates**

We analyze the earnings effects of graduating from a two-year or a four-year college, from ages 25 to 79. This omits some years before age 25 during which some college graduates get extra earnings, while others receive extra education and training. Overall, our measure, by focusing on ages 25 to 79, probably omits some extra earnings.

Doing the calculations requires some assumptions about when the typical graduate turns 25. For this analysis, we assume that the average 2-year graduate is 20, and the average 4-year graduate is 22. Therefore, the year in which a 2-year graduate turns 25 is 5 years after their graduation date, and the year in which a 4-year graduate turns 25 is 3 years after their graduation date.

Therefore, the first year considered in this analysis is the cohort that turns 25 in the year 2027. For the combined 2-year and 4-year tuition program, this would include the 1,099 2-year graduates from 2022, and the 706 4-year graduates from 2024. For the 2-year only tuition support program, this includes the additional 1,784 assumed added graduates from 2022.

Hence, we are considering the following cohorts of added graduates, dated by the year they turn age 25, not the year they graduated:

Table 2: Additional degrees from Illinois tuition subsidy programs, by year turned 25

| Year turned 25 | Combined 2-year & 4-year program | | 2-year program only |
| | 2 Year Degree | 4 Year Degree | 2-year degree |
| --- | --- | --- | --- |
| 2027 | 1,099 | 706 | 1,784 |
| 2028 | 1,454 | 2,368 | 2,208 |
| 2029 | 1,629 | 3,046 | 2,591 |
| 2030 | 1,727 | 3,724 | 2,789 |
| 2031 | 1,711 | 4,180 | 2,778 |
| 2032 | 1,667 | 4,514 | 2,713 |
| 2033 | 1,611 | 4,734 | 2,623 |
| 2034 | 1,574 | 4,933 | 2,563 |
| 2035 | 1,555 | - | 2,533 |
| 2036 | 1,533 | - | 2,497 |

As can be seen, we ignore possible added effects of the combined program, which is not modeled after the year 2030 for costs, on 4-year graduates who will turn 25 in 2035 or 2036. Our cost analysis, and this future benefits analysis at this stage is just looking at the effects of a program that is pursued from the 2021 through 2030 school years. Presumably this program would have some diminished effects on 4-year graduations after the year 2031, but we ignore such effects. This understates the economic benefits of the combined program.

For each cohort, we base effects on earnings of 2-year graduates versus high school graduates only, and effects on earnings of 4-year graduates versus high-school graduates. Our estimates are based on data on Illinois residents from the American Community Survey. We use the five-year estimates from 2015 to 2019 but adjusted to 2021 prices. This cross-sectional data has a sufficient sample to provide accurate estimates for high-school graduates, but no higher degree; associate degree holders, but no higher degree; and bachelor's degrees or higher degrees, for single years of age from age 25 to age 79.

These earnings data for different education groups of Illinois residents, for single years of age, are then adjusted for secular increases over time in earnings. The earnings of graduates from, for example, 2022, will in many cases be received in future years such as 2050 or 2060, so it would be foolish to assume no earnings increases take place over time. We adopt the baseline assumptions of the Trustees of the Social Security Program, which are that earnings in the United States will show annual growth of 1.12% per year over the next 75 years.

We also adjust for mortality. These mortality assumptions use the Lifetables for 2017 from the U.S. Center for Disease Control and Prevention. We adjust the future earnings downward to reflect that not all Illinois graduates at ages 20 or 22 will survive to age 25, let alone age 50 or age 79.

We adjust for Illinois out-migration. From the American Community Survey, we consider a sample of persons born in Illinois. We look at how many were still in Illinois when they turned 17.

We then looked at the percentage that were in Illinois at each age from 25 to 79, and how this varied for associate degree holders and bachelor's degree holders. The ratio of the number of Illinois residents in the state as of a later age, to the number at age 17, was considered to be the probability of a graduate staying in Illinois, with this probability varying by degree attainment.

For associate degree holders, this probability is in the 90-percent-plus range in their twenties and thirties, declining to 80 percent or a bit higher when individuals are in their forties, 70-80 percent when in their fifties, and then declining again to about 60 percent when individuals are in their sixties and seventies. For bachelor's degree holders, this probability starts out in the mid-80 percent range when individuals are in their twenties and thirties, declines to 70 percent or a bit higher when individuals are in their forties, 60-70 percent when individuals are in their fifties, and then declining to around 50 percent for people their late sixties and seventies.

We take the product of the predicted extra earnings due to either a 2-year or a 4-year degree for each cohort turning 25 over each age from 25 to 79, times the probability of being alive at that age, times the probability of staying in Illinois at that age conditional on being alive at that age. This is the predicted earnings premium for graduates who survive and stay in Illinois at each year of age from age 25 to 79.

We then discount these predicted earnings back to age 79. We use a 3 percent annual discount rate, which is standard in the research literature.[4] This is done separately for each cohort that turns 25. The present value of a cohort that turns 25 in 2028, versus 2027, will be higher by 1.12 percent due to secular earnings increases, but lower by 3 percent by being discounted by one more year, so on net the present value of the lifetime earnings gains for Illinois residents from graduating will tend to be somewhat lower for later cohorts.

As shown in Table 3, the present value of this earnings gains, for those staying in Illinois only, per Illinois graduate, is sizable. The 2-year degree yields an earnings gain whose present value as of age 21 is between $154K and $182K. The 4-year degree, versus high school only, has a present value per Illinois graduate of between $671K and $793K.

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[4] Chapter 7 of Bartik, Timothy (2011) *Investing in Kids*, provides a review of the discounting literature.

Table 3: Present value of career earnings from ages 25-79 due to attaining higher degrees, for cohorts turning 25 in different years

| Cohort turns 25 in: | Extra due to 2-year degree ($) | Extra due to 4-year degree ($) |
|---|---|---|
| 2027 | 188,118 | 819,504 |
| 2028 | 184,684 | 804,546 |
| 2029 | 181,313 | 789,861 |
| 2030 | 178,004 | 775,444 |
| 2031 | 174,755 | 761,290 |
| 2032 | 171,565 | 747,395 |
| 2033 | 168,434 | 733,753 |
| 2034 | 165,359 | 720,360 |
| 2035 | 162,341 | 707,212 |
| 2036 | 159,378 | 694,304 |

These career-long earnings gains may seem extraordinary, but they reflect the large effects of educational attainment on earnings. For example, from the American Community Survey, Illinois residents who earn only a high school degree, but not any college degree, have annual earnings that average $35,609 (in 2021 dollars) during their forties. But Illinois residents with an associate degree have annual earnings in their forties that average $44,481, almost $9,000 higher per year than their high school only counterparts. Illinois residents who earn a bachelor's degree or some higher degree have annual earnings that in their forties average $89,722, or over $54,000 higher than residents with only a high school diploma. When one takes such differentials and adds them up over a career that might last 40 years very large dollar differentials result, even when a discount rate is applied to future earnings

The direct aggregate earnings benefits for these extra graduates who stay in Illinois are then derived by taking each cohort, defined by the year they turn 25, and multiplying the number of extra graduates by the present value of the earnings gains due to finishing that extra educational attainment. We then sum over all these cohorts involved in this program that runs from 2021 to 2030. These earnings effects are shown in the first row of dollar figures in Table 4.

Table 4: Aggregate Illinois Present Value of Increased Earnings, for Tuition Subsidy Programs Run from 2021 to 2030

| | Combined 2 year and 4-year program | | 2-year program only |
| --- | --- | --- | --- |
| | Effect in combined program due to 2-year degrees ($) | Effect in combined program due to 4-year degrees ($) | Effect in 2-year only program due to 2-year degrees ($) |
| Direct earnings effect on Illinois graduates who stay in Illinois, summed over all graduates considered in cost estimates | 2,691,437,646 | 21,360,458,081 | 4,335,339,265 |
| Spillover earnings increase for other Illinois workers (86% of direct effect) | 2,314,636,375 | 18,369,993,950 | 3,728,391,768 |
| Total effect | 5,006,074,021 | 39,730,452,031 | **8,063,731,033** |
| Total effect of combined 2-year and 4-year program | | **44,736,526,052** | |

These direct effects have spillover effects. Based on the research literature, we assume these spillover effects on other Illinois residents are 86 percent of the direct effect.[5]

This spillover benefit may seem extraordinary but recall that it is summed over all Illinois workers, which is a large number, so even modest spillover effects for other Illinois residents add up. For example, as mentioned, during their forties, Illinois residents with a 4-year degree average annual earnings of $89,722, versus average earnings for those with only a high school degree of $35,609, an increase of 152 percent. If we are able to convert 1 percent of Illinois residents who would have been high school graduates only so that they have a 4-year degree, the resulting increase in average Illinois earnings would be around 1 or 2 percent – 1 in 100 residents gets earnings more than doubled, but averaged over all 100 residents, this will only be boost to average earnings of these 100 residents of 1 percent or so. [6] . Suppose the boost to average earnings was 1 percent. The research literature suggests that having an extra 1 percent of Illinois residents with a college degree is sufficient to increase Illinois productivity and growth enough that it will boost the wages

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[5] See Moretti, Enrico (2004). "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data". *Journal of Econometrics*, 121(1–2), 175–212.

[6] If the high school graduates had exactly average Illinois earnings, then 1 percent of Illinois residents being converted from high school grads to BA degrees, and thereby increasing their earnings by 152 percent, would mechanically increase average earnings by 0.01 times 152 percent or 1.52 percent. If the high school graduates had somewhat less earnings than the Illinois average, the aggregate increase in average eranings would be somewhat less than 1.52 percent udates

of other Illinois residents, those whose educational attainment does not change, by 86 percent of the 1 percent direct boost, or 0.86 percent.  The total gain in earnings per capita of Illinois residents will then be 1 percent plus 0.86 percent or 1.86 percent, which is 86 percent greater than one would predict by looking at the direct effects on the additional Illinois residents who earn a bachelor's degree.

We conclude that the combined 2-year and 4-year program, run for just the years from 2021 through 2030, will increase Illinois's residents per capita earnings by an amount whose present value (in 2021 dollars) is $44,736,526,052. This $44.7 billion estimate is mostly due to the effects of more Illinois residents earning a bachelor's degree. The earnings gain from the added bachelor's degrees is $39.7 billion, versus $5.0 billion from the added associates degrees. The greater effect from the bachelor's degrees is due to the much greater annual earnings effects of such degrees.

The two-year only tuition subsidy program also has considerable earnings per capita benefits. Such a program run only for the years from 2021 through 2030 would increase the present value of Illinois residents' per capita earnings by $8,063,731,033.

How does this compare with the costs of operating either of these two tuition subsidy programs from 2021 to 2030? Using the cost figures from the prior memo, we calculate the present value of this 10-year operation of the combined 4-year and 2-year program, and the 2-year only program, where present value discounts these 10 years of program costs back to the year 2021. These extra costs are in the first row of dollar figures in Table 5. The 2021-2030 operation of the combined 4-year and 2-year program has a present value cost of just under $4.0 billion. For the 2-year only program, the 2021-2030 present value costs of this program are around $438 million.

Table 5: Aggregate Illinois Present Value Costs and Benefits of Tuition-free College Programs Run from 2021 to 2030

|  | Combined 2-year and 4-year program($) | 2-year program only ($) |
| --- | --- | --- |
| Present value of costs in 2021 dollars | 3,978,294,564 | 438,274,379 |
| Present value of direct and spillover earnings benefits for Illinois residents | 44,736,526,052 | 8,063,731,033 |
| Extra state and local tax revenue (earnings benefits times 10.63%) | 4,755,492,719 | 857,174,609 |
| Extra state tax revenue (earnings benefits times 5.48%) | 2,451,561,628 | 441,892,461 |

The present value of earnings per capita benefits from operating these two programs for the 10-year period from 2021 through 2030, taken from the prior table, far exceed these costs. For the combined 4-year and 2-year program, the present value of the earnings per capita benefits, at $44.7 billion, are over 11 times the present value of costs of around $4 billion. For the 2-year only program, the present value of earnings per capita benefits, at a little over $8 billion, are over 18 times the present value of program costs of $438 million. If we interpret Illinois government's purpose as taking actions that have benefits for Illinois residents that exceed their costs, this analysis by itself answers the question of whether these tuition subsidy programs pass a benefit cost test.

Also note that the earnings gains for **other** Illinois residents – those who do not get the higher educational attainment due to the tuition subsidy program – are much greater than program costs. From the prior table, Table 4, the combined 4-year and 2-year program has spillover benefits for Illinois workers who are not direct beneficiaries of the tuition subsidies of over $20 billion, which is far in excess of program costs in Table 5 of somewhat less than $4 billion. Similarly, for the tuition subsidies limited to 2-year programs, the spillover benefits for other Illinois workers are about $4 billion (Table 4), which far exceeds program costs of a little over $400 million. Therefore, in response to the question, "Why should Illinois residents in general pay tuition subsidies that directly benefit other Illinois residents?", one answer is that such subsidies will increase overall earnings of many Illinois workers, not just those who get the tuition help.

These tuition subsidy programs can also be judged by whether they have fiscal benefits greater than their program costs. If so, then from the viewpoint of government officials, the program benefits are so large that the programs become a "free lunch" in that the programs pay for themselves.

As a rough measure of fiscal benefits, we assume that when earnings per capita of Illinois residents go up, the resulting increase in Illinois tax revenue will be equal to the average ratio of Illinois tax revenue to Illinois residents' personal income. For state and local governments in Illinois together, this average ratio is 10.63 percent. For state government only, this ratio is 5.48 percent.

These average ratios are not a precise measure of fiscal benefits. On the whole, it seems likely that these measures **understate** fiscal benefits. These ratios will not be precisely accurate because how much in added revenue accrues will depend upon who gets the added income, where they fall in the income distribution, and how Illinois taxes people at that point in the income distribution. So, this could lead to an overstatement or understatement of revenue gains. On the other hand, this measure of earnings gains does not capture gains in Illinois personal income that are likely to accompany earnings gains. For example, we would expect business profits to go up with higher earnings, which will

increase Illinois businesses' sales and hence profits, and in turn state and local revenue. In addition, over time, with higher earnings, Illinois residents will have higher income due to their savings and investments, which will further increase personal income and tax revenue. Furthermore, with higher earnings, Illinois residents will become less likely to collect welfare income or rely on Medicaid, and this will save the state money on these programs.

Relying on these understated measure of fiscal benefits, Table 5 estimates that the state and local revenue collection from either type of tuition subsidy program will have a present value that exceeds program costs. For a combined 2-year and 4-year program, run from 2021 to 2030, the present value of total state and local revenue collections will be slightly under $4.8 billion, which exceed the present value of program costs of around $4.0 billion. For the tuition subsidy program for only 2-year degrees, running from 2021 to 2030, the present value of state and local revenue collections will be almost $860 million, compared to the present value of program costs of almost $440 million.

For state revenue collections only, Table 5 shows that the tuition subsidy program that is restricted to 2-year degrees is self-financing in present value terms, but this is not true for the more expensive combined program that provides both 2-year and 4-year tuition subsidies. For the 2-year only program, the estimated state revenue collections are slightly greater than $440 million and slightly exceed program costs. For the more expensive combined 2-year and 4-year program, the estimated state revenue gain has a present value of almost $2.5 billion, which is considerable, but only offsets around 60 percent of so of estimated program costs of almost $4 billion.

These fiscal benefit calculations are in present value terms. What this says is that if we take the stream of extra Illinois revenue that occurs over the entire careers of these extra graduates due to one of these 2021 to 2030 programs and discount this future revenue back to the year 2021 to express in present value terms, this is the amount we would get. This is then compared with discounting the stream of program costs from 2021 to 2030 back to 2021 dollars to express in present value terms. Therefore, these present value calculations rest on assumptions about how to treat present versus future dollar flows. But not everyone necessarily agrees with these assumptions. Therefore, we move on to look directly at how fiscal benefits versus costs evolve over time.

To examine how fiscal benefits and costs evolve over time, we assume that the Illinois tuition subsidy being considered, either the combined 2-year or 4-year program, or the 2-year program only, continue forever. We assume that the same number of extra student graduates occur in each subsequent year. The annual costs of the program are assumed to increase by 1.12 percent per year per student. These increased costs reflect the same Social Security Board of Trustee assumptions about the rate of annual wage increases over the long run in the U.S. economy. If wages do increase by 1.12 percent per year, this should eventually drive up the tuition costs of the labor-intensive higher education sector by a similar rate of increase. We emphasize that this 1.12 percent increase is in real terms -

- that is, this is the increase in tuition costs in excess of the overall inflation rate.

For state and local fiscal benefits, and state-only fiscal benefits, we continue to multiply average revenue ratios for Illinois state and local governments, and Illinois state government, by the estimated annual increase in earnings for each cohort of student graduates, due to the additional graduates caused by the program. These annual increases in earnings for each cohort are also assumed to grow over time by the long-run annual wage rate increase of 1.12 percent.

For these calculations, although all figures are in 2021 dollars -- that is, adjusted for inflation -- we do not discount future dollar flows to the year 2021. Rather, we consider all cohorts that are active in the labor market in a given calendar year in Illinois, sum the earnings of all these cohorts, and multiply by the appropriate revenue percentage for either state and local governments, or state government only. These annual dollar flows of government revenue are then compared with the annual costs of the program.

The simulated program continues forever, but Figure 1 shows the flow of annual costs and fiscal benefits of the program from 2021 through 2099.



Fig. 1: Annual Costs & Fiscal Benefits of Illinois Combined 2-year/4-year Tuition Subsidy Program
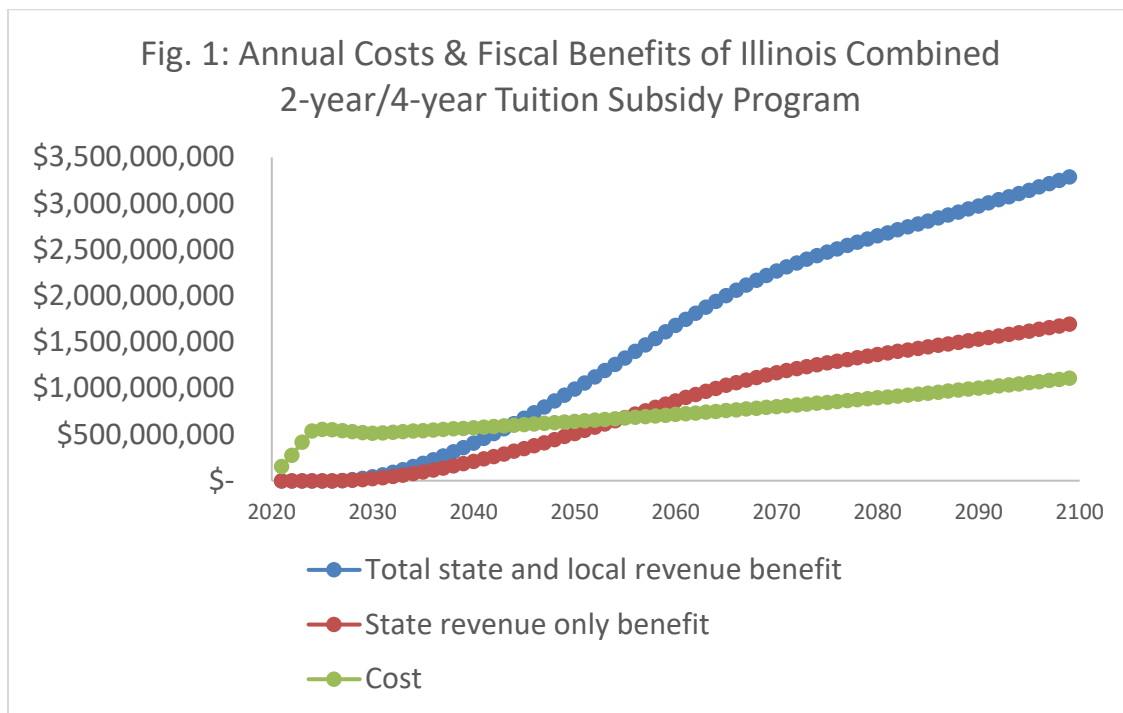
As Figure 1 shows, the program starts out with large annual costs, rapidly increasing to around $500 million per year in 2021 dollars (but not discounted). Annual fiscal benefits are far less, because our earnings measures do not start counting earnings effects until graduates reach the ages of 25, and even after that it takes many years before graduates reach their peak earnings years in their forties and early fifties.

As a result, from a total state and local revenue standpoint, annual added revenue collected does not exceed annual tuition subsidy program costs until the year 2044, where the state and local revenue line crosses the cost line. From a state revenue only line, annual revenue exceeds costs in the year 2055, where the state revenue line crosses the cost line.

However, in either case, on an annual basis, this combined 2-year/4-year program does eventually generate sufficient revenue that annual revenue for just the state exceeds program costs. This does not contradict the prior conclusion that the combined tuition subsidy program is not self-financing on a ***present value*** basis for state revenue alone. The present value of the net fiscal benefit ***beyond*** the "crossover" year of 2055 is less than the present value of the net fiscal costs of the program ***before*** the "crossover" year of 2055. [7] But this rests on particular assumptions about how to discount future revenue flows to calculate a present value. Methodologies that use a lower discount rate might calculate present value differently.

Figure 2 presents the same information in somewhat different form, by calculating the ratio of fiscal benefits to costs for the combined 2-year/4-year tuition subsidy program.

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[7] This is confirmed when we calculate the present value of an infinitely long combined state and local tuition subsidy program. The present value of state revenue is 92 percent of the present value of costs for the combined program, for a program that lasts forever. This is somewhat more favorable than the ratio we got for a program that only lasts from 2021 through 2030. As already mentioned, the 2021 through 2030 analysis was biased down in benefits because it assumes that the program produced no added graduate effects beyond the 2021 through 2030 period, which is an underestimate. For state and local revenue together, the permanent combined 2-year 4-year program has a present value that is 179 percent of the present value of program costs.

Fig. 2: Ratio of Annual Fiscal Benefits to Costs, Combined 2-year/4-year Program
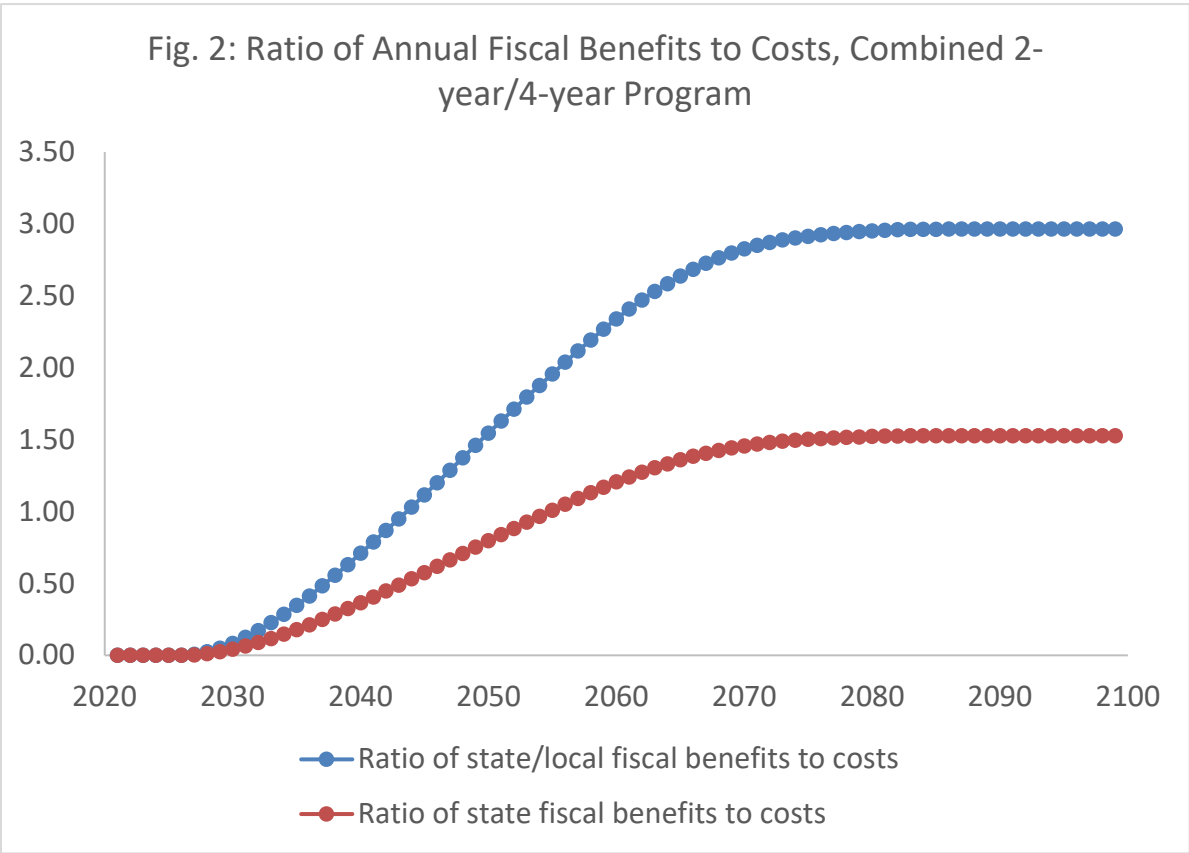
Consistent with the prior figure, the ratio of state/local fiscal benefits to costs exceeds 1 in 2044, and for state fiscal benefits only exceeds 1 in 2055. But what figure 2 adds is that eventually the annual ratio of fiscal benefits to costs settles down at a constant ratio. After 2080, the ratio of annual state/local fiscal benefits to costs settles down at a ratio of around 2.96. The ratio of annual state fiscal benefits to costs stabilizes at a ratio of around 1.53.

The same type of calculations was also done for the 2-year only tuition subsidy program: we assumed the program continued forever at the same scale and calculated annual fiscal benefits and costs from 2021 through 2099. Figure 3 shows the resulting annual flows of fiscal benefits and costs, in real 2021 dollars, but **not** discounted to the year 2021. [8]

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[8] If we calculate the ratio of the present value of fiscal benefits to costs over the infinite life of this hypothetical program, we get 2.08 for state/local revenue, and 1.07 for state revenue only. This is similar to what we got for the program that only lasted from 2021 to 2030.

Fig. 3: Annual Costs & Fiscal Benefits of Illinois 2-year Only Tuition Subsidy Program
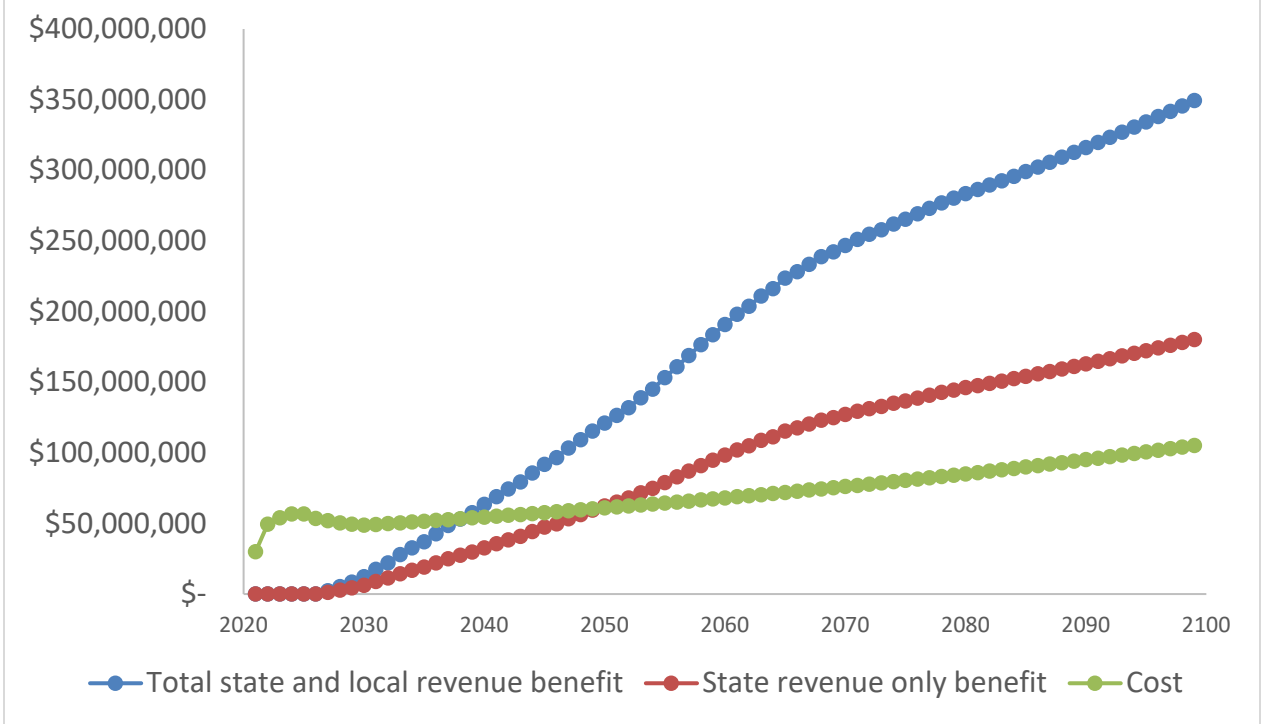
Compared to the combined 2-year and 4-year program, this 2-year only tuition subsidy program has two noticeable differences. First, the annual costs and benefits are much less, and therefore the short-run net fiscal costs are less, as are the long-run net fiscal benefits. Second, the "crossover" year is five years sooner. For this cheaper program, state and local fiscal benefits exceed costs as of 2039, whereas the combined 2-year 4-year program doesn't have such benefits exceeding costs until 2044. For state revenue only, this cheaper program has fiscal benefits exceeding costs by 2050, compared to 2055 for the more expensive combined program.

Figure 4 repackages this same information as RATIOS of fiscal benefits to costs, for the 2-year only program. As the figure shows, the long-run ratio of fiscal benefits to costs for this cheaper program end up being 3.32 for total state and local revenue, and 1.71 for state revenue only.



Fig. 4: Ratio of Annual Fiscal Benefits to Costs, 2-year Only Program
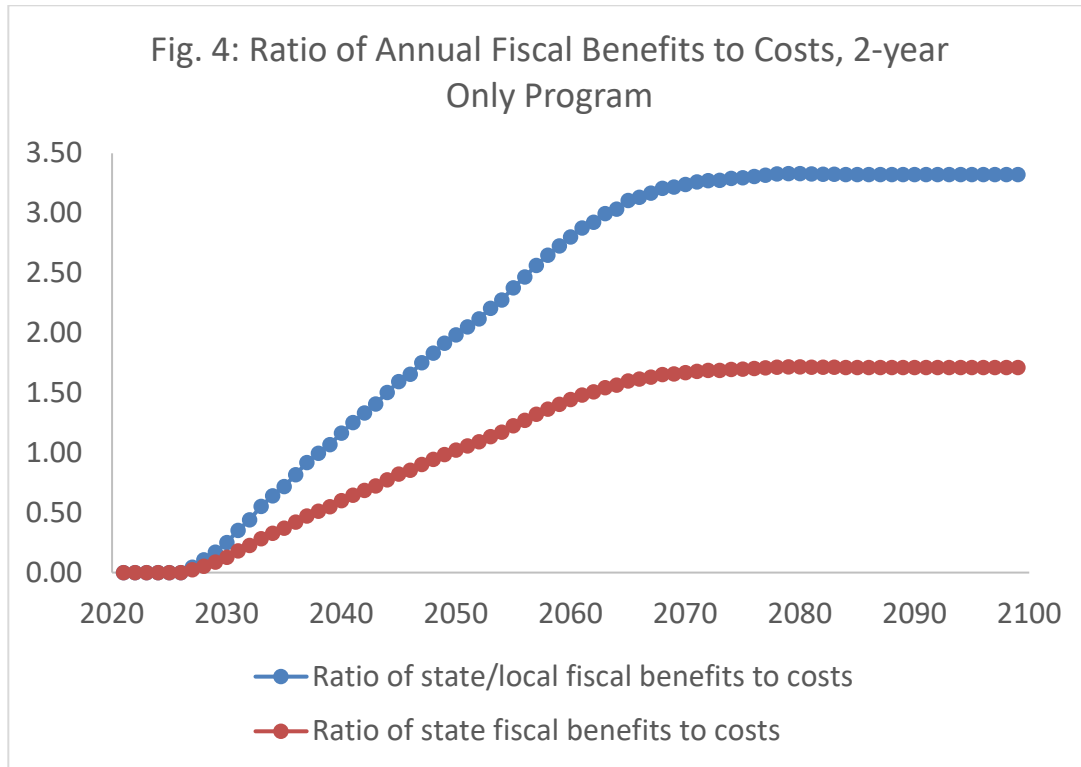
Overall, in considering these two programs' economic and fiscal benefits versus costs, two things stand out. First, for either tuition subsidy program, the true picture of economic and fiscal benefits vs. costs does not emerge until at least 50 years have passed, and one entire generation has gained educational degrees due to the program and completed their working careers. Educational investments are clearly long-run investments and cannot be evaluated properly without considering very long-run effects.

Second, the cheaper 2-year only program tends to have somewhat higher ratios of benefits to costs. But if one could only choose one program, the combined program has a much higher level of net benefits. If the combined program is chosen, the earnings benefits or fiscal benefits, net of costs, will be much higher as a result.

In sum, an investment by the State of Illinois in either a 2-year only, or a 2-year and 4-year combined tuition subsidy program will yield benefits far beyond the costs of either program, although not immediately. These benefits result from enhanced earnings by degree recipients and large spillover effects for non-degree recipients. A sufficient share of this increased income will be paid to Illinois governments that eventually annual fiscal benefits will exceed these tuition subsidy programs' costs.