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Executive Summary
Public universities have two main revenue sources to cover educational costs—state funding and tuition revenue. This study documents the trends in both revenue sources from 1980 to 2019. The conventional wisdom holds that higher education has been suffering from cuts to state funding (often described as state disinvestment), but the data show that states have increased state funding per student over time. Over the past 4 decades, inflation-adjusted state funding has typically increased by $12 to $48 per student per year. During that time, tuition revenue has increased at a rate of between $126 to $143 per student per year. The combined effect of these trends has led to sustained increases in total educational revenue (the amount of revenue available for instruction) per student, with 2019 total educational revenue reaching an all-time high (of over $15,000 per student) for the sixth straight year.

Introduction
Public universities have two main revenue sources to cover educational costs—state funding and tuition revenue. Some colleges have other sources of revenue to cover non-educational costs. For example, residential colleges generate revenue from room and board, research universities obtain research grants, and universities with medical schools generate revenue from hospital services. But since not all colleges are residential, or have a research focus, and very few colleges have medical schools, this report excludes those revenues and focuses on the “amount of revenue available to public institutions to support instruction” (State Higher Education Executive Officers Association [SHEEO], 2020b, p. 2). This total educational revenue is the sum of state funding and tuition revenue.

This study documents trends in these two main revenue sources for public universities from 1980 to 2019. After adjusting for inflation, state funding increased by $12 to $48 per student per year, and tuition revenue increased by $126 to $143 per student per year.

These trends lead to several related conclusions.

1. **State disinvestment is a myth.**
   State disinvestment is the idea that higher education has been suffering from cuts to state funding for years. Belief in state disinvestment is widespread within academia (Gillen, 2019), but the data show that the long-term trend in state funding per student is positive, not negative. In fact, state funding

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Key Points
- From 1980 to 2019, inflation-adjusted state funding has increased by $12 to $48 per student per year.
- An upward trend in state funding exposes the myth of state disinvestment, but belief in this myth remains widespread due to overgeneralizing from unrepresentative data and a failure to correct for inflation.
- From 1980 to 2019, inflation-adjusted tuition revenue increased by $126 to $143 per student per year.
- Inflation-adjusted total educational/instructional revenue increased substantially over time, and 2019 set a new record high of over $15,000 per student.
- Changes in state funding do not explain changes in tuition. State funding has increased over time, and the numbers do not match even when funding is cut. From 2008 to 2019, state funding fell by $259 per student, yet tuition increased by $2,233.

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1 The federal government also provides funding for higher education, but it is not considered an alternative revenue source for two reasons. First, the SHEF report and this study focus on educational/instructional revenue, and the portion of federal funding related to educational/instructional costs typically takes the form of grants or loans that students then use to pay for tuition and other college expenses. This funding therefore shows up as tuition revenue. Second, the funding that the federal government provides directly to colleges and universities is not included because that funding is largely tied to research rather than instructional activities (e.g., National Institutes of Health grants).

September 2020

SHEEO, 2020b
Gillen, 2019

These variables are defined as:

2. **Tuition increases are not driven by cuts in state funding.**
   Another widespread belief is that rising tuition is explained by cuts to state funding. But the trend in state funding is positive, not negative, so it cannot explain the upward trend in tuition revenue. Even during periods in which state funding is cut, the numbers just do not add up. For example, state funding per student in 2019 was $259 lower than in 2008. Yet tuition increased by $2,233 per student. Clearly, most of the increase in tuition revenue cannot be explained by cuts to state funding.

3. **Universities are historically well resourced.**
   The combined effects of the upward trend in both state funding and tuition revenue has led to record levels of total educational revenue, which measures the revenue available to cover instructional costs. Indeed, each of the past 6 years has set a new record high, with total educational revenues now over $15,000 per student.

This study proceeds as follows. The next section describes the data used in this report. We then document the trend in state funding at both the national and state levels. We then explore two reasons why the erroneous belief in state disinvestment is so widespread. Next, we explore trends in tuition revenue. Finally, we examine the relationship between changes in state funding and changes in tuition revenue, finding little support for the notion that tuition rises to make up for cuts to state funding.

**Data**

This study uses data collected by the State Higher Education Executive Officers Association as part of their annual State Higher Education Finance (SHEF) report (SHEEO, 2020a). Both the SHEF report and this report focus on the two main sources of educational revenue for public universities and colleges—state funding and tuition.

In the SHEF dataset (SHEEO, 2020b), these variables are defined as:

- **“Education appropriations”:** State and local support available for public higher education operating expenses, defined to include state public financial aid and exclude spending for research, agricultural, and medical education, as well as support for independent institutions or students attending them.” (p. 2)
- **“Net tuition revenue”:** Gross tuition and fee revenue less state-funded student aid, institutional tuition discounts and waivers, and tuition revenue paid by medical students. This is a measure of the resources available from tuition and fees to support instruction and related operations at public higher education institutions and includes revenue from in-state and out-of-state students as well as undergraduate and graduate students.” (p. 6)

We calculate total education revenue as the sum of education appropriations and net tuition revenue. For simplicity, we refer to education appropriations as “state funding” and net tuition revenue as “tuition revenue.” Throughout the report, years refer to fiscal years, and all figures have been converted into per-student values (using the net full-time equivalent enrollment reported by SHEF) and, unless otherwise noted, adjusted for inflation of the general level of prices as measured by the Personal Consumption Expenditures (PCE) price index calculated by the Bureau of Economic Analysis.

**There is an Upward Trend in State Funding of Higher Education Over Time**

The conventional wisdom within academia and those who write about it is that higher education has been suffering from state disinvestment for decades. But as noted in an earlier study (Gillen, 2019), this is a myth. This study updates our earlier study and shows that historical data indicate that state funding of higher education typically increases by $12 to $48 per student per year.

This result is illustrated in Figure 1, which shows inflation-adjusted state funding per student in the U.S. from 1980 to 2019. The ups and downs in state funding follow the business cycle. These swings can make beginning and end point comparisons very misleading, particularly if you compare a peak to a trough. To determine the long-run trend more accurately, it is better to use a regression, which estimates the typical yearly change in state funding without being as dependent on the starting and ending dates. This regression is shown by the dotted line in Figure 1, with the corresponding confidence interval indicated by the grey-shaded region. The regression results have a point estimate of $30 with a 95% confidence interval of $12 to $48. This means that the long-run trend of state funding per student has been an increase of between $12 and $48 per student per year, with our best estimate being an increase of $30 per student per year.

While consistent increases in state funding per student over time discredit the state disinvestment story at the national level, there is considerable variation among the states. Figure 2 repeats the regression analysis separately for each state.

Figure 2 reveals that some states increased state funding over time, while others reduced state funding. For example,
an upward slope, indicating a trend of increases in state funding, is apparent for Illinois, Nebraska, and Wyoming. A downward slope, indicating a trend of reductions in state funding over time, is apparent for Pennsylvania and Rhode Island.

The level of state funding matters, too, not just the trend. For example, California has a positive trend, increasing state funding by $62 per student per year, whereas Alaska has a negative trend, reducing state funding by $38 per student per year. Yet even after 40 years of these divergent trends, Alaska still provides more state funding per student ($19,014) than California ($11,489), because Alaska started from a much higher level of funding initially.

**Figure 3** uses a color-coded map to further explore the different state funding trends in the 50 states. Shades of green indicate that the state has an upward trend in state funding over time (as determined by the regression point estimate). For example, Illinois has increased state funding by $237 per student per year. Shades of red indicate that a state has reduced state funding over time. For example, Pennsylvania has reduced funding by $63 per student per year.

While **Figure 3** provided the point estimates of the regression results, not all of these estimates are statistically significant. **Figure 4** shows the confidence interval from the regression for each state. The confidence interval relies on the variation within the data to determine the range of likely values for the point estimate. In other words, 95% of the time, the point estimate for hypothetical data with the same variation would fall within the confidence interval. For example, Illinois’ 95% confidence interval is $213 to $261, which means we expect the true trend in state funding per student—the regression’s point estimate—to fall between $213 and $261 95% of the time.

If a confidence interval includes the value of 0 (the dashed vertical line on the chart), then we usually conclude that the estimate is not statistically significant (at the 5% level).
Figure 2
Higher Education State Funding per Student by State: 1980-2019

Note: Data from SHEF state higher education finance FY 2019, by State Higher Education Executive Officers Association, 2020, and the Bureau of Economic Analysis.
Consider Ohio, which has a point estimate of $1 and a confidence interval of -$24 to $25. This means that while our best estimate is that state funding in Ohio increases by $1 per student per year, the value could reasonably be anywhere between -$24 and $25, including $0. For cases where the confidence interval includes 0, the safest conclusion is that we do not know if there is an upward or downward trend in state funding over time.

Among all 50 states, state disinvestment is convincing in just 7 states—Pennsylvania, Rhode Island, Vermont, New Hampshire, Montana, Iowa, and South Carolina. Twenty-four states have no clear positive or negative trend in state funding over time, and 19 states have convincing increases in state funding over time. In other words, for every state in which state disinvestment is a reality, there are more than 2 states where funding is increasing over time, and more than 3 states that have no upward or downward trend in state funding.

**Why Do People Believe the State Disinvestment Myth?**

If the data show there is a nationwide increase in state funding for higher education over time, and that this trend has been going on for 4 decades, why do so many people believe the opposite—that higher education is suffering from state disinvestment? This misconception is primarily attributable to two errors: generalizing from unrepresentative data and not correcting for inflation.

**Generalizing from Unrepresentative Data**

The first error many people make is using unrepresentative data to draw sweeping conclusions. Adherents of state disinvestment will often compare funding today to funding in 2008, the last year before funding started falling due to the previous recession. And indeed, at the national level, state funding was $259 lower in 2019 than it was in 2008. At the state level, there was more variation, as shown in **Figure 5**.

Funding has exceeded the 2008 value in some states, but many states had lower funding in 2019 than in 2008. But to conclude from this that there has been state disinvestment is a mistake because it relies on unrepresentative starting and ending dates, leading to unreliable conclusions. For instance, if some point to a $259 decline in state funding per student from 2008 to 2019 as evidence for state disinvestment, what is to stop others from pointing to the more recent increase in state funding per student of almost
Figure 4

Annual Change in State Funding per Student by State

$1,700 per student from 2012 to 2019 as evidence of an upward trend in state funding? The reality is that while both statements are accurate, neither is convincing evidence of a larger trend because both rely on unrepresentative, cherry-picked starting years.

Unless there is evidence of a clear structural break in the data that warrants breaking the sample up, comparisons are on safer ground when they use all the available data since that alleviates worries about cherry-picking. For the SHEF data, that means starting in 1980, the first year for which data is available. At the national level, state funding has increased by $2,000 per student between 1980 and 2019.

Unfortunately, we can rely on the regression method rather than arbitrary or cherry-picked beginning and ending dates to determine the long-run trend. The regression makes use of all the available data and is not as reliant on potentially unrepresentative beginning and end dates. And as Figure 1 showed, the regression line has an upward slope, indicating that state funding typically increases by $12 to $48 per student per year. This increase in state funding over time shows that much of the erroneous belief in state disinvestment is due to generalizing from unrepresentative data.

Failing to Correct for Inflation

The other main reason belief in state disinvestment is widespread is that one of the main reports that track state funding over time, the SHEF report (the source of data for this study), does not correct for inflation. When comparing dollar values over time, it is usually advised to correct for inflation because it gradually erodes the purchasing power of a dollar over time. A dollar today cannot buy as much as a dollar 20 years ago could. To correct for inflation, we use a price index to adjust the nominal figures (the values reported at the time) into real values (the past values in the equivalent of today’s dollars).

For higher education, the main error is failing to use a price index that corrects for inflation. For example, the SHEF report uses the Higher Education Cost Adjustment (HECA). But HECA does not correct for inflation—it adjusts for costs, hence the C in the acronym. This means that the values reported by SHEEO are not adjusted for inflation—they are adjusted for (estimated) costs. But as shown in the subtly titled stop Misusing Higher Education Specific Price Indices, industry-specific cost adjustments often provide nonsensical results. That study (Gillen & Robe, 2011) showed that from 2001 to 2008, the cost of a gallon of gasoline more than doubled after correcting for inflation. But when adjusted for costs rather than inflation, the adjusted cost of gas declined—the exact opposite of what happened in reality. The lesson is clear: An industry-specific cost index does not correct for inflation.

To correct for inflation, there are three common choices:

- Consumer Price Index (CPI-U)
- Consumer Price Index – Research Series (CPI-RS)
- Personal Consumption Expenditure Price Index (PCE)

The CPI-U is the most widely used price index. However, once published, it is not updated, which means that methodological improvements are not applied to earlier data. Thus, the CPI-U value for 1980 was not calculated the same way as the CPI-U value for 2019. The CPI-RS addresses this by applying newer methodologies to older data and therefore provides a more consistent measure of inflation for earlier periods.

Yet arguably the best measure of inflation is the PCE. Relative to the CPI-U and the CPI-RS, the PCE better accounts for substitution of purchases by consumers as prices change, and it covers more goods and services. Like the CPI-RS, it is revised as new data and methodologies are discovered. Tellingly, the PCE is the inflation measure of choice for the Federal Reserve System, which, as the central bank of the United States, is the institution with the responsibility to ensure that inflation remains well anchored (Bullard, 2013). In other words, the institution which exists almost exclusively to monitor and control inflation uses the PCE to measure inflation because it believes PCE is the most accurate measure of inflation.

Using any of these price indices to correct for inflation provides dramatically different results compared to using the HECA to adjust for costs. Figure 7 shows state funding over time using three different price indices to adjust...
The long-run trend depends on the price index used to adjust for inflation.

**Figure 7**  
State Funding per Student by Price Index


for inflation as well as the adjustment for costs using the HECA.

To determine the long-run trend in state funding using the various price indices, we ran a regression for each line. **Figure 8** shows the confidence intervals of these regression estimates by price index.

It is noteworthy that the better the price index, the less support it provides for the state disinvestment story. Only the estimates using HECA are consistent with state disinvestment, but as we have noted, the HECA does not adjust for inflation but rather adjusts for estimated costs. Among the price indices that do correct for inflation, the CPI-U is almost as likely to yield an increase in state funding as a decrease. The CPI-RS estimates are even higher than the CPI-U estimate. But since both the CPI-U and CPI-RS confidence intervals include $0, neither is statistically significant, and the safest conclusion for both is that there is no upward or downward trend in state funding over time. The price index that likely does the best job of
measuring inflation, the PCE, shows a clear upward trend in state funding per student over time.

This means that many people believe that state disinvestment is occurring because they rely on figures that adjust for costs using the HECA. Once these figures are adjusted for inflation rather than costs, the trend reverses, with no trend in state funding per student over time (using the CPI or the CPI-RS) or a trend of state funding actually increasing over time (using the PCE).

**Tuition Has Consistently Risen**

Tuition is the other main source of educational revenue for public colleges. Figure 9 shows inflation-adjusted tuition revenue from 1980-2019. Tuition revenue has consistently increased since 1980, with the typical year seeing an increase of between $126 and $143 per student.

**Total Educational Revenue per Student Generally Increases**

Steady and sizable increases in inflation-adjusted annual tuition revenue per student ($126 to $143) combined with less steady and smaller increases in state funding per student ($12 to $48) increase total educational revenue per student. Figure 10 shows inflation-adjusted total educational revenue per student from 1980 to 2019. Over the past four decades, total educational revenue per student has almost
doubled, from $7,800 in 1980 to over $15,000 in 2019. Indeed, in 2019, for the 6th straight year, total educational revenue reached a new all-time high.

**State Disinvestment Does Not Explain Rising Tuition**

For those under the impression that state disinvestment is real, one of the natural corollaries is the belief that tuition is rising to make up for state disinvestment.

The first problem with this idea is that, in a typical year, inflation-adjusted state funding increases between $12 and $48 per student. If changes in tuition are driven by changes in state funding, inflation-adjusted tuition revenue should be *falling* over time, not rising by $126 to $143 per year.

The second problem is that there is little relationship between changes in state funding and changes in tuition revenue. Recall that many observers lament that state funding per student is lower in 2019 than it was in 2008. It is certainly within the realm of possibility that colleges would raise tuition to try to make up for those cuts. But if that is the case, since state funding per student in 2019 was $259 lower than in 2008, we might expect tuition revenue to have increased by $259. But tuition revenue did not increase by $259. It increased by $2,233. In other words, for every $1
colleges lost in state funding, they raised an additional $8 in tuition revenue.

To further explore the relationship between changes in state funding and changes in tuition revenue, Figure 11 plots each year’s change in state funding and its change in tuition revenue. If tuition rises to make up for cuts in state funding, then each year should fall roughly along the red line, which shows a $1 increase in tuition for every $1 cut in state funding.

Most years do not fall close to the red line. In fact, the historical relationship, illustrated by the blue line, shows that for every $1 cut in state funding, tuition revenue changes by $0.19 to -$0.02. The point estimate is an increase of $0.09 which is not statistically significant at the 5% level but is statistically significant at the 10% level. In addition, note where the blue line intercepts the dashed vertical value of $0, at a value of $140. This means that even if there were no change in state funding per student, we would still expect tuition revenue to rise by $140 per student. Since tuition revenue rises by $126 to $143 in a typical year, this means that the vast majority of the typical year’s increase in tuition is unrelated to changes in state funding.

Note that this data set uses nationwide averages. More reliable estimates of the relationship between changes in state funding and changes in tuition can be obtained from...
examining individual colleges. An earlier paper, *Why Does Tuition Keep Increasing*, which used a different data set and covered a different period, found that over 5 years, a $1 cut in state funding was associated with an increase in tuition of around $0.10 (Gillen, 2015). This estimate is quite close to the estimate in this paper using nationwide averages, and both indicate that there is not much of a relationship between changes in state funding and changes in tuition, on the order of a $0.10 increase in tuition for a $1 cut in state funding.

**Conclusion**

This study uses data from the SHEF annual report to examine trends in state funding and tuition revenue.

Over the past 4 decades, state funding has typically increased by $12 to $48 per student per year, and tuition revenue has increased by $126 to $143 per student per year. The combined effect of these trends has led to sustained increases in total educational revenues per student, with total educational revenue reaching an all-time high of over $15,000 per student in 2019.

The upward trend of state funding exposes that so-called state disinvestment is a myth at the national level. At the state level, state disinvestment is a reality for 7 states, higher funding is evident for 19 states, and 24 states show no long-run trend up or down in state funding.

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**Figure 11**

*Changes in Higher Education Funding by Source: 1980-2019*

If tuition rises to offset state funding cuts, each year should fall along this line representing a $1 increase in tuition for every $1 cut to state funding.

But historically, for every $1 cut to state funding, tuition has changed by between +$0.19 to −$0.02.

The common argument that tuition rises to make up for state disinvestment has three problems. First, state funding has increased over time, so tuition should be falling, not rising. Second, the statistical relationship between changes in state funding and changes in tuition is quite weak. Third, even during periods in which state funding falls, tuition rises by many multiples of the cut in state funding. For example, from 2008 to 2019, state funding fell by $259 per student, yet tuition revenue increased by $2,233.

We hope that these findings shed light on current misperceptions of the state of public higher education finance, and that this leads to more informed policy discussions about the path forward for American higher education.

References


ABOUT THE AUTHOR
Andrew Gillen, Ph.D., is a senior policy analyst at Texas Public Policy Foundation and an adjunct professor of economics at Johns Hopkins University. Dr. Gillen's recent work has focused on how to reform federal financial aid, how state disinvestment is a myth, and how post-college earnings and debt should be used to inform student choice and government accountability.

Prior to joining the Foundation, Dr. Gillen spent over a decade at nonprofit and philanthropic organizations researching and trying to improve higher education. He was a program officer for the Charles Koch Foundation and served in research roles for American Institutes for Research, Education Sector; the American Council of Trustees and Alumni; and the Center for College Affordability and Productivity. He was also on the U.S. Department of Education's Advisory Committee on Student Financial Assistance.

Dr. Gillen has a PhD in economics from Florida State University and a BBA (business) degree from Ohio University.

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