

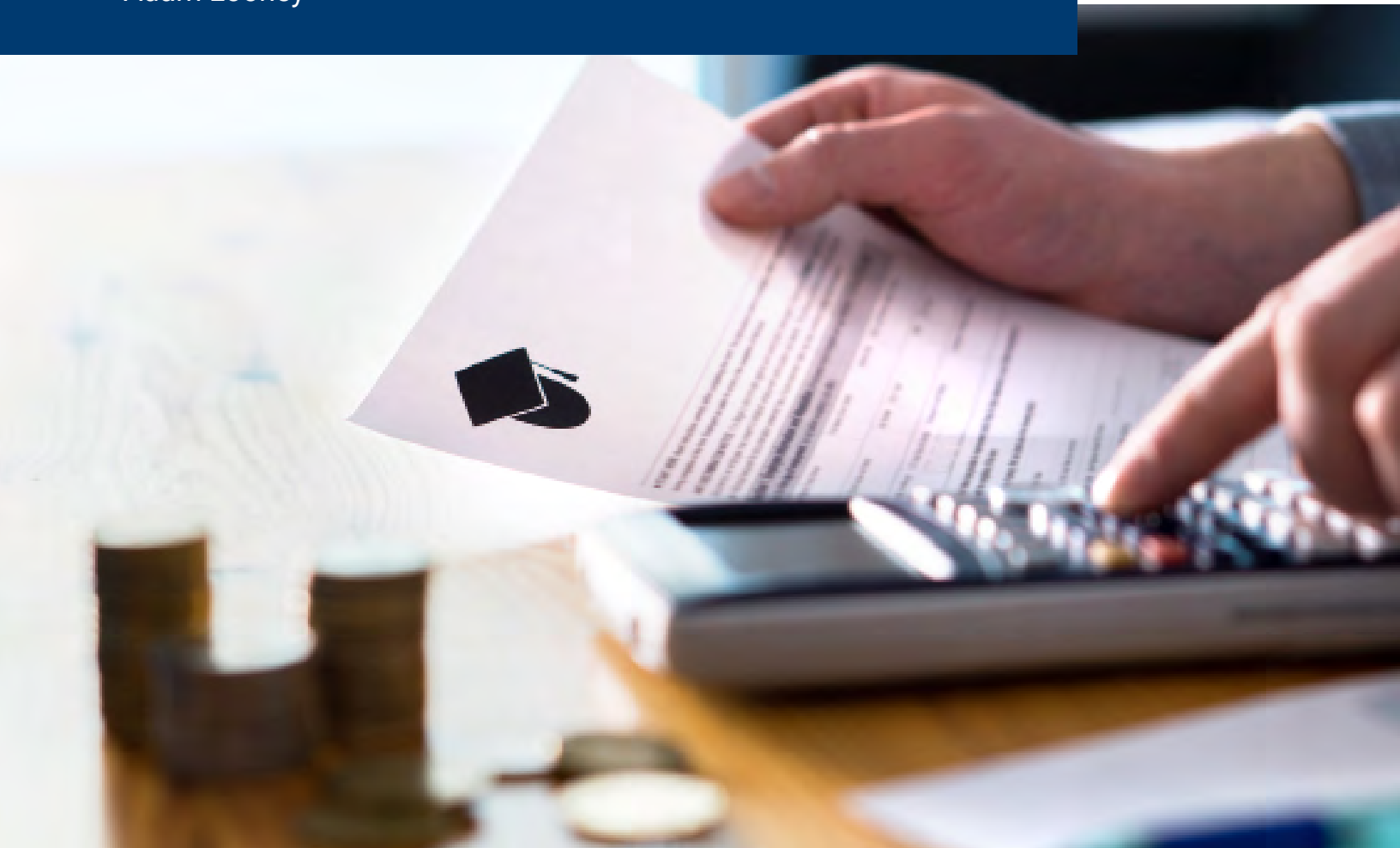
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HOW MUCH DOES COLLEGE COST, AND HOW DOES IT RELATE TO STUDENT BORROWING?

TUITION GROWTH AND BORROWING OVER THE PAST 30 YEARS

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ABSTRACT

The rising cost of college and graduate school is often cited as a cause of rising student loan borrowing. This paper analyzes long-term trends in tuition and student financing using data from the National Postsecondary Student Aid Study. While real top-line “sticker prices” have increased 114% since 1993, after accounting for increases in financial aid and tax benefits net tuition prices have not changed. Over the same period, student borrowing tripled. While certain groups, like graduate students and affluent undergraduates, have faced higher prices, aggregate increases in borrowing are hard to explain by average changes in net tuition prices.

AUTHOR NOTES

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Introduction

The rising cost of tuition is frequently cited as a growing burden on families, a contributor to rising student loan indebtedness, and a reason to forgive student loans. Proponents of these arguments point to the surging top-line “sticker price” of tuition and fees and argue that those costs fall directly on students, causing them to borrow more.

College costs, however, are notoriously opaque. Few students pay the full “sticker price” of tuition because they qualify for discounts, grants, or scholarships, and the value of such financial aid has increased over time. Hence, it is unclear whether increases in net tuition can rationalize the increase in student loan borrowing.

To understand how much postsecondary educational costs for tuition have changed over time and how they relate to changes in borrowing, this paper constructs price indices of total tuition “sticker prices” and net-of-financial-aid tuition for degree-seeking students—both undergraduate and graduate—at U.S. universities using data from the National Postsecondary Student Aid Survey (NPSAS), a nationally-representative survey of students and institutions, and compares changes in prices to changes in total postsecondary spending and student loan borrowing.

While “sticker prices” have more than doubled since 1993 (up 114%), the average net prices paid by degree-seeking postsecondary students, after taking tuition discounts, grants, GI Bill benefits, and other non-loan aid into account, have increased 46% (about \$1,300 per student in 2020 dollars). Accounting for tuition-related tax benefits, net tuition has not increased since the 1990s. The reason is that financial aid (excluding loans) has increased almost as fast as posted tuition prices. In the 1990s, such aid was 45% of total tuition expenditures but about 67% in 2020.

Over the same period, annual student loan borrowing has more than tripled. The fact that borrowing increased so much faster than either average “sticker prices” or average net prices suggests tuition inflation alone is insufficient to explain changes in borrowing.

Of course, not all students pay the average price, and certain groups have faced sharply higher prices. The new pricing paradigm, in which universities set a high sticker price but discount it based on financial need and state and federal governments pay for a rising share with targeted grants and tax benefits, has generated net prices that vary dramatically by degree program and student characteristics. For instance, the NPSAS data suggest net tuition paid by undergraduate students from low- and middle-income backgrounds have declined, while prices paid by higher-income students have increased. Likewise, because most financial aid is targeted to undergraduates, the net price of graduate programs has increased rapidly with their sticker prices. These groups, whose net prices have increased more than average because they have been deliberately carved out of targeted aid programs, have increased their student loan borrowing the most.

But for both groups exposed to high net tuition inflation and those insulated from it by rising aid, student loan borrowing has increased much faster than net tuition prices. While it is not clear why, there are several likely contributors.

First, students are choosing more expensive educational programs than in the past. One illustration of this is that while the index of net tuition prices has increased 46%, total spending per student has increased 86%. This gap reflects shifts in enrollments away from cheaper 2-year undergraduate programs to 4-year programs and from in-state to higher priced out-of-state enrollment, as well as rising graduate enrollment as a share of total postsecondary enrollment. While higher tuition prices and higher tuition spending might sound the same, they are as different as paying more because your landlord raised your rent compared to paying more because you moved to a bigger apartment. Students are paying more in tuition to pursue more advanced or expensive degrees, and students who attend those programs tend to borrow more.

Second, borrowing is rising above and beyond tuition because of changes in the composition of students

and the institutions they attend. Over the 2000s, enrollment surged among historically underrepresented groups who enrolled disproportionately at institutions with high borrowing rates or where borrowing rose during the Great Recession (Looney and Yannelis 2015 and 2024). Compositional changes are particularly important among undergraduate students, who have faced low nominal loan limits for many years. Because most undergraduate borrowers already borrow at the maximum amount, increases in borrowing are driven by increases in the number of students who borrow. Graduate students, however, have faced much higher borrowing limits and, since 2007, no limit on federal loans. Between rising enrollment and higher average borrowing levels, graduate students will soon represent half of the annual total volume of federal student loans (Monarrez and Matsudaira 2023).

Finally, students may be borrowing more for non-tuition costs of attendance or “living expenses.” I exclude an analysis of living expenses to focus on tuition collected directly by colleges as a condition of enrollment. Living expenses are incurred whether or not enrolled and, for the majority of postsecondary students who don’t live on campus, are not paid to the university. Moreover, living expenses are poorly measured for students. While institutions are required to produce estimates of living expenses, it is unclear whether they accurately reflect either prices faced by students or actual spending. These costs (and thus total net cost of attendance) have increased more slowly than net tuition over time. That said, given that borrowing has increased faster than net tuition and has exceeded net tuition since 2000, a sizable share of incremental borrowing is being used for non-tuition costs.

In summary, the basic fact that student borrowing has increased much faster than average net tuition prices casts suspicion on the simple hypothesis that tuition costs are the principle driver of across-the-board increases in borrowing.

Measuring tuition and fees

How much does college actually cost? To tackle this question, this paper produces an index of the net price of college and graduate tuition derived from the National Postsecondary Student Loan Survey. This index is applied to a consistently defined sample of degree programs over time, adjusts for changes in the composition of students and the institutions they attend, and is intended to be comparable to the methods used to measure tuition inflation produced by the Bureau of Labor Statistics (BLS).

The NPSAS is conducted by the U.S. Department of Education’s National Center for Education Statistics (NCES). It collects extensive data on how students finance their postsecondary education including details about grants, loans, work-study programs, and the educational costs faced by students, drawn from administrative financial aid data, institutional student records, and surveys of students. The survey also gathers information on student demographics, family background, and their educational experiences. The survey has been administered in 1987, 1990, 1993, and every four years since 1996, though for ease of comparison across waves I only use data from 1993 onwards.

To construct price indices, I adopt the scope and methodology used to construct the BLS’s Consumer Price Index (CPI) component for tuition and fees (BLS 2024). The CPI component for tuition and fees is intended to reflect the net-price charged by institutions in tuition and required fees (but not living expenses or other costs) across all levels of postsecondary enrollment including for undergraduate and post-graduate studies at 2-year colleges, 4-year colleges, major universities, and professional schools (such as law, dental, or medical programs). The CPI index reflects prices at institutions conferring associate’s, bachelor’s, master’s, professional degrees, and doctoral degrees. Non-degree programs, such as certificate programs, are not included. The CPI aims to reflect the price net of student financial aid. Notably, students who pay no tuition or whose scholarships exceed tuition (and

pay “negative” prices) are excluded. Following the CPI scope, I include students enrolled at 2- and 4-year public, private, and for-profit degree-conferring institutions and students pursuing associate, bachelor’s, master’s, and doctoral degrees only.

The CPI is a Laspeyres (fixed weight) index for net tuition and fees, where the weights (or “market basket”) reflect attendance-adjusted enrollment by detailed enrollment characteristics like institutional control, degree program, residency, and other characteristics. Because the NPSAS microdata is not publicly available, I extract aggregated data for specific groups for whom enrollment forms the fixed weight and for whom the year-to-year change in price or net price is aggregated into the inflation index. The groups are formed separately for associate degree students (by dependency status); bachelor’s degree students (by institution sector, dependency status, and residency); and for master’s, professional degree, and Ph.D. students by sector and gender.¹ In total, there are 33 groups. Ideally, greater levels of disaggregation and richer covariates would allow one to more carefully control for changes in the characteristics of students and the programs they attend. By capturing data by degree program, residency, dependent and independent status, and (for graduate students) gender, I hope to capture in a few manageable variables, major dimensions of price heterogeneity.

With these data, I construct period-to-period measures of price changes that hold fixed enrollments in the first period. In this case, the time between periods is 4 years (except between the 1993 and 1996 surveys).

I construct this index for the total “sticker price” of tuition and fees (total tuition before any grants or institutional discounts) and for the net-of-financial-aid

tuition, (which I call “net tuition”). In particular, financial aid includes institutional grants and discounts; state, federal, or private grants or scholarships; federal work study benefits; veterans benefits and Department of Defense tuition assistance; and research or teaching assistantships (primarily for graduate students). Loans are not included in aid. To the extent these benefits equal or exceed tuition, I allow prices to be zero or negative.

I construct the index for the postsecondary sector as a whole (e.g., associate, bachelor’s, and graduate students combined), within each sector, and by sector and degree. In addition, I construct a separate estimate for dependent undergraduate students pursuing a bachelor’s at four-year public and nonprofit institutions (so called “traditional” students) by parent income-quintile. Parent quintiles are defined based on the 2020 distribution of dependent parent income and adjusted for inflation back to each survey year so that the thresholds that parent income groups are constant in real terms over time.

The NPSAS does not include data on education-related tax credits. Beginning in tax year 1998, the Federal government offered qualifying tax credits and deductions for certain tuition expenses. I gather data on the aggregate amount of these credits from the Department of Treasury estimates of Tax Expenditures (Department of Treasury, various years). Because the value of these benefits is not assigned or imputed directly to specific student groups, I do not include them directly in the price index. Instead, I calculate their average value per student each year and illustrate their effect on net price in the aggregate. Tax benefits are not incorporated in the net price calculations by degree, sector, or parent income quintile.

1 It would be ideal to define groups by specific degree program (e.g. master’s in social work), but coding of degree program names is not consistently defined over time, whereas gender is consistently available and captures a great deal of heterogeneity across programs and shifts in enrollment.

Inflation in net-of-aid tuition

The resulting index is presented in Figure 1, which shows inflation in the top-line “sticker price,” the net-price, the net-price minus tuition-related tax credits, and, for comparison, the BLS’s CPI for tuition and fees. The sticker price and the CPI index are benchmarked to the average total tuition paid across all sectors and degrees in 1993 and the net price to the actual average net price paid in 1993.

Between 1993 and 2020, the sticker price index has increased 114%—almost exactly the same as the CPI for tuition and fees (110%). However, the index of “Net-of-Aid Tuition Paid” both starts at a lower level and grows more slowly. Between 1993 and 2020, the cumulative increase in net prices is 46%. In other words, the cumulative increase in net prices over the 27-year period is 60% less than indicated by the sticker price. In real dollar terms, that is an increase of \$1,265 in annual tuition. Subtracting the average value of education-related tax credits, net-of-aid-and-tax tuition prices are essentially unchanged since the 1990s.

While surprising, the slow growth of net-of-aid-and-tax tuition is consistent with similar estimates from the College Board of tuition and fees for specific categories of undergraduate students. According to their estimates, the average net-of-grant-and-tax-credit tuition charged for in-state 4-year students at public universities is little changed since the 1990s, and the price of an associate degrees has declined (College Board various years).

The basic reason for the divergence between sticker prices and net prices is the rising share of tuition that is either discounted with institutional aid or paid for by government grants and other aid. On a per-student basis, institutional aid in 1993 reduced tuition by about \$800 per student (a 16% discount); in 2020 the average discount was 24% (\$2,900). Other grant aid increased from \$950 per student to \$3,200. GI Bill benefits increased (primarily because of the Post- 9/11 GI Bill) to almost \$500 per student.

Likewise, tuition-related education credits were first enacted in 1997 with the Hope and Lifetime Learning Credits. In 2000, these credits reduced tax liabilities of students or their parents by \$9.9 billion (in 2020 dollars) (U.S. Treasury 2001). The Hope credit was replaced by the larger American Opportunity Tax Credit (AOTC) in 2009. The amount of the credit is 100% of the first \$2,000 of qualifying tuition and fees and 25% of the next \$2,000. In 2012, at their peak, the value of tuition-related tax credits was \$26.5 billion. In 2020, the value of these credits was almost \$1,100 per student.

To illustrate the growth of financial aid, Figure 2 presents annual per-student tuition and how it is financed by specific sources of aid as well as out-of-pocket payments from students and their families. The height of the shaded area represents the average total sticker price of tuition reported in NPSAS in each survey year. The darkest area represents institutional discounts and other institutional aid. Hence, the top of the second-darkest area represents tuition actually collected by institutions. That amount is clearly rising over time—institutions are charging and receiving more per student—but those costs are increasingly paid from other sources of aid rather than passing directly on to students.

The next area represents other grant aid—primarily Pell grants, but also state grants (like the Georgia HOPE Credit or California Cal Grant), and veterans and Department of Defense benefits. The next area represents other, smaller sources of aid, primarily work study and graduate assistantships. The value of tax benefits is the second-lightest shaded area.

Finally, the lightest area represents the net-cost paid by students and their families—the portion of tuition that must either be paid out of pocket or financed with loans.

RISING PRICES VERSUS RISING SPENDING

Note that in Figure 2, the average net-of-aid, net-of-tax price paid by students has increased by 48% (from about \$2,900 to \$4,300 per year) between 1993 and

2020 whereas the index of net-of-price and tax inflation estimated in Figure 1 was 8%. (Likewise, the topline sticker price in Figure 2 increases by 144% compared to the 114% increase in the index of sticker prices.) The reason for the difference is that Figure 1 displays price changes alone (holding fixed enrollment) and Figure 2 combines changes in prices and changes in the types of programs in which students are enrolled.

In 2020, students enrolled in more costly programs than did students in earlier years. In particular, more students pursued 4-year programs than 2-year programs; more 4-year students attended out-of-state institutions; and more students enrolled in graduate programs, particularly master's degree programs.

Put together, this means students are paying more for their education because they are choosing better or more advanced educational programs—in general, a good thing—or are paying more to enroll in institutions that provide them greater amenities (for example, paying higher out-of-state tuition to find a program that is a better academic fit, offers better locational attributes, or, perhaps, has a better football team). Those choices are driving up educational costs, not universities raising tuition.

The dashed line in Figure 2 presents average per-student borrowing (including federal undergraduate, graduate, and parent loans and private loans). Whereas students (or families) only borrowed a fraction of their out-of-pocket share of cost in the 1990s (58% of net tuition), the amounts borrowed increased faster than either average actual out-of-pocket spending or total tuition prices. At the peak, in 2012, the average student borrowed about two times the average net-cost of tuition. In other words, borrowing has increased much faster than can be readily explained just by increases in prices or spending, and its growth far exceeds increases prices.

Differences in tuition inflation across groups

Figure 2 also illustrates the transition from the university pricing model of the 1990s, in which students paid most of the posted price and there were few discounts or other sources of aid, to the new pricing model, in which programs post high prices, discount based on student characteristics, and rely on rising government aid share in the cost. In 1993, according to the data underlying Figure 2, after grants and other aid, students were responsible for almost 60% of total posted tuition, on average. In 2020, the average out-of-pocket share was 35%.

But that aid is applied more selectively than in the past. Institutional aid (aside from merit or athletic scholarships) is increasingly awarded based on need. Likewise, Pell grants, many state grants, GI Bill Benefits, and tax credits are targeted based on factors like family income, characteristics of the student (like veteran status), and level of enrollment.² As a result, different students face increasingly disparate prices across sectors, degree programs, and financial need, with some groups facing falling net prices while others are exposed to full sticker price.

INFLATION BY DEGREE PROGRAM AND SECTOR

Figure 3 disaggregates the NPSAS data by degree and illustrates the cumulative change in inflation-adjusted net tuition and fees for students enrolled in associate, bachelor's, and graduate degree programs since 1993. Net tuition for students pursuing associate degrees

² Such aid now comes from more disparate sources and at inopportune times. For example, while tuition-related tax credits are almost of the same dollar magnitude as Pell grants, they are primarily delivered to parents of undergraduates in the year after tuition is paid meaning that students still have to finance the up-front tuition cost.

has tended to decline since the 1990s, as increases in aid have more than offset increases in top-line tuition, especially in 2012 and 2016. Net prices for bachelor's degrees have increased by about 38% since 1993 before accounting for tax benefits, which mostly accrue to this group and would drive that price increase closer to 15%.

Prices for graduate degrees, however, have surged. The net price of master's programs has increased by 158%, and professional degree programs by 80%. In contrast to undergraduate programs, where net prices have increased much more slowly than sticker prices, the net prices graduate students face have generally increased dollar for dollar with the sticker price.

For master's students, however, aid has declined as a share of total tuition, and the net price paid by master's students has thus increased even faster than indicated by the sticker price. The net price for master's students was about \$8,800 in 2020, almost three times greater than in 2000 (\$3,000) in real terms. The average net tuition of professional degree students in 2020 was \$26,500, almost twice as high as in 2000.

For students pursuing research Ph.D.s (not shown), total aid (including research and teaching assistantships) typically more than covered tuition. But recently, such aid has either declined or more students are enrolled in Ph.D. programs that do not provide such aid (it is not clear which in the aggregated data), resulting in rising net prices for Ph.D. students.

Figures 4A and 4B further disaggregate bachelor's and graduate degrees by sector, and illustrate, respectively, cumulative net price inflation and the level of net price for each group. This detail illustrates the striking rise in the net cost of master's programs in general and in particular at public institutions, as well as for professional degree programs since 2008. At the bachelor's level, tuition has tended to increase by more in percentage terms at public universities than private nonprofits.

The bottom panel of Figure 4 provides context for these changes by presenting net prices paid in inflation-adjusted dollars. Professional degree programs are, by far, the most expensive programs, and their costs have increased since 2008. In dollars, the increases in net prices at master's programs are smaller in magnitude but larger in percentage terms and have lifted the net price from less than that of bachelor's degree students to more.

It is not clear from these aggregated data what is driving the sharp rise in net prices of graduate degrees, which appear to arise both from rising sticker tuition prices and declining aid. One obvious hypothesis is simply that institutions have raised prices and cut aid or created new graduate programs that are more expensive and offer less aid. Another potential explanation is that enrollments are shifting from academic degrees, which tended to come with research funding or teaching opportunities, to programs oriented toward professional work, like those in education, social work-psychology, or health-related fields.

The relationship between tuition and student loan borrowing

The fact that student loan borrowing has increased so much faster than either sticker prices, net prices, or even overall educational spending casts doubt on the idea that higher costs are a primary driver of rising debt. While increases in student borrowing were widespread across sectors and degrees, those groups whose net tuition has increased the most have increased their borrowing the most.

Students (or the parents of dependent undergraduates) can take out federal loans for specified educational costs including required tuition and fees as well as for room and board and other living expenses. Each institution defines this total “cost of attendance” and estimates living expenses for students living on or off campus or at home.

Graduate students may borrow federal loans up to the total cost of attendance minus any grants or scholarships. Undergraduate students can borrow up to the lesser of the statutory borrowing limit based on their academic level and dependency status (e.g. \$5,500 for a first-year dependent undergraduate) and the net cost of attendance. Parents of dependent students may borrow up to the net cost of attendance.

For undergraduate students, a key constraint on borrowing is federal loan limits. Until they were increased in 2007, first-year undergraduate limits had remained fixed at \$2,650 for dependent students and \$6,625 for independent students since 1987 and thus had declined in real terms over this period. Graduate loan

limits were raised more frequently but had also declined in real terms since their peak in the mid-1990s until 2007, when graduate loan limits were effectively eliminated.

To compare price trends to student loan borrowing, Figures 5A and 5B show the change in annual student loan borrowing for the same corresponding groups as in 4A and 4B. An obvious, but important observation is that in the cross section, students who face the highest net prices generally tend to borrow most across both types of degrees and sector, and this has been persistently true over time.

A second observation from these data is that borrowing has tended to increase steeply across all sectors, even within associate programs, whose net prices have tended to fall, and bachelor’s programs, whose net prices have increased more slowly. Since 1993, annual student loan borrowing has increased 105% for associate students, 170% for bachelor’s students, 435% for master students, 112% for professional degree students, and 60% for Ph.D.s.

Differences in the percent increase in borrowing across sectors and programs, however, are clearly related to differences in net price growth. Increases in borrowing are steepest among master’s students where net prices increased the most. Increases in borrowing were lower among associate students and Ph.D.s.

The distribution of cost inflation across socioeconomic groups

A similar pattern is at work among undergraduate bachelor's degree-seeking dependent students at four-year public and private institutions. These students represent the salient group of "traditional" undergraduate students enrolled in their late teens and early 20s. Because they are dependents (and only because they are dependents), their financial aid applications include parent income. Figure 6 disaggregates the net tuition paid by these students by parent income quartile defined in 2020 dollars and applied (after deflating quartile thresholds for inflation) in earlier years.

Net tuition for students from the highest income quartile is higher than for other groups; it has increased by about 63% cumulatively over the past 27 years (to about \$16,500). For students from the 50th-75th percentiles, net tuition has increased by about 40% over that period (to \$8,700). In contrast, net tuition for students in the bottom quartile is substantially lower in the last decade than in the 1990s or 2000s (down 77% cumulatively to about \$250). Net tuition is somewhat lower for students in the 25th to 50th percentiles (down 13% to \$2,800).

The fanning out of net tuition reflects the same elements described above: First, the increase in the "sticker price" but with price discounts that vary by family income. And second, it reflects increases in grant aid from states and in the real value of the Pell grant.

Figure 7 shows the changes in student loan borrowing for the same groups. In 2020 undergraduate students in the 3rd quartile borrowed the most, with top and middle quartiles somewhat lower. Lower-income students borrowed the least. This represents a reversal from the 1990s, when low-income students borrowed more. Indeed, the fastest increases in borrowing were among above-median income families—those whose tuition increased the most but who were carved out of aid eligibility.

Why is borrowing rising (and rising so much faster than net tuition)?

First, for certain groups like higher-income undergraduates and graduate students, higher net tuition likely contributed to rising borrowing. These students face rising costs and untapped student loan credit available, either because they had low historic borrowing rates in the past or because federal loan limits were eliminated after 2006. The evidence suggests that the elimination of loan limits for graduate students increased borrowing for borrowers constrained at the prior limit and caused institutions to raise prices (Black, Turner, and Denning 2023).

Second, students are increasingly selecting more expensive programs, increasing average costs (and borrowing) above and beyond net tuition prices. Over time, a rising share of undergraduate enrollment is at 4-year public and private institutions, where a greater fraction of students borrow, rather than at community colleges where borrowing remains rare. A rising share of college graduates now attend graduate school, and graduate students' share of total enrollment has increased. Monarrez and Matsudaira 2023 show that more students are enrolling in for-profit institutions for graduate school, which typically have higher tuition fees, less institutional aid, and where students rely more on loans. In addition, the expansion of federal loan programs, including higher borrowing limits for graduate students, has facilitated this increase in debt. Between rising enrollment and rising borrowing amounts, graduate debt will soon represent half of federal student lending.

Third, Looney and Yannelis 2015 and 2024 document how the composition of students has changed and enrollment of less-resourced groups has increased. Over time, enrollment has increased among groups historically underrepresented at traditional 4-year programs and graduate programs, including lower-income, first-generation, Black, Hispanic, female, and older students. By itself, these changes in enrollment do not necessarily imply rising borrowing rates because, for example, Hispanic students tend to borrow less than average, and first-generation students borrow about

the same amount as children from highly-educated families. However, this increased enrollment was disproportionate at for-profit institutions and other less selective institutions, where borrowing rates were high, and also at community colleges, where borrowing was historically rare but rose during the Great Recession. Between 2000 and 2012, for-profit college enrollment tripled, and the share of community college students who borrowed increased from 5% to 17%. Consequently, the number of annual undergraduate borrowers doubled from 4.5 million to 9.3 million. Not only did the number of active borrowers increase but those borrowers were more likely to struggle to pay their loans, causing balances to rise and adding to the outstanding stock of borrowers.

Finally, it may be that students are borrowing more for non-tuition costs of attendance or "living expenses." Unlike tuition, which is paid directly to universities and only imposed on students, living expenses are, conceptually, not an economic cost of college; one must purchase food, pay rent, and buy necessities whether or not one is enrolled. Moreover, in most cases living expenses are not imposed by or paid to universities because most students do not live on campus.

One additional challenge is that living expenses of students are poorly measured, so it is unclear how they are changing over time. Institutions that participate in federal aid programs are required to produce estimated student budgets for living expenses in order to determine grant and loan eligibility. For the small number of institutions that require students to live in university-provided housing and purchase university meal plans, those budget elements might be exact. But even then, they must be estimated for costs like travel, clothing, or personal items. And for purposes of measuring inflation, it is not clear whether year-to-year changes in living expenses reflect changes in prices or improvements in spending on quality or amenities.

For other students not living on campus it is even less clear whether university estimates reflect true costs.

Almost all graduate students live off campus. Among bachelor's degree students, 33% lived on campus, 48% lived off campus, and 20% lived with parents in 2020. Among all undergraduate students (including at 2-year schools), only 19% lived on campus and 30% at home (NPSAS 2020). The fraction of students with a meal plan is similar to but slightly lower than the fraction living on campus. For the majority of students, there is no actual data on how much living expenses cost.

The Department of Education provides little guidance or regulations governing how institutions define living expenses, and there is little data or empirical evidence assessing whether the living expense costs reflect actual costs incurred by students. As a result, estimates of living expenses at educational institutions show wide variability and often appear to diverge from the actual costs students incur (Baum and Cohn 2022).

Given that borrowing has increased faster than net tuition and, in the aggregate, has exceeded net tuition since the late 1990s, a sizable share of the increase in student loans must not be used for tuition but instead is used to pay living expenses (or to reduce the amounts contributed directly by students or their parents). The reason for this trend is unclear. Nevertheless, Figure 8 shows the trend in inflation-adjusted living expenses by degree type.³ Notably, the estimated costs of student living expenses appear to have increased faster than the overall cost of living estimated in the Consumer Price Index by about 25% since 2000.

The reason for this disparity is unclear. These budgets represent expenses, not prices, and are set to facilitate access to federal aid. Hence, it is not clear whether estimated costs are rising faster than the overall cost of living because, e.g., rental prices in university towns are rising faster than in other urban areas or, instead, students (and universities) now expect higher living standards (e.g., having one's own room and bathroom while enrolled, rather than having to share with roommates). Or, alternatively, universities may have raised their estimates to allow their students access to more loan aid. In this case, budgeted living expenses might represent a maximum cost allowing students the flexibility to choose more or less expensive arrangements.

Looking across degree programs, both the level of estimated living expenses and their growth rate differ by degree. For students pursuing associate or bachelor's degrees, estimated living expenses have increased by 24% (to \$8,900 in 2020 for associate and to \$13,700 for bachelor's). And for graduate students the increase was 19% (to \$17,600). Within bachelor's degree students, estimated costs increased more for students enrolled in public institutions (30%) versus private non-profits (22%). Note that in general, estimated non-tuition costs of attendance are increasing at lower rates than either sticker tuition prices or net-of-aid tuition, which means that even taking these estimates at face value, total net costs of attendance inflation is even lower than in net prices.

3 Data on living expenses of certain graduate students in 1990 appears to be incomparable to those in later years, and I have excluded those data from the figure.

Conclusion

All told, the NPSAS data suggest the amounts paid in tuition and fees by postsecondary students have increased more slowly than might be expected given increases in the “sticker prices” posted by colleges or measured by the Bureau of Labor Statistics, and they have increased much slower than increases in student debt. These increases in tuition are driven, first and foremost, by graduate programs, the cost of which is greater and has increased faster than for undergraduate programs. For associate degree programs, tuition costs have declined. Likewise, within “traditional” undergraduate students, net tuition and fees have not increased for students who grew up in the bottom half of the parent income distribution but have increased sharply for others. For most undergraduate students, increases in net tuition have not directly led to increases in borrowing simply because undergraduate loan limits have remained at low nominal levels for many years.

Instead, rising student loan indebtedness among undergraduate students appears to be driven by the extensive margin—whether or not a student borrows, rather than incremental changes in how much they borrow—and thus by changes in the composition of students and where they enroll. At the graduate level, where loan limits no longer exist, borrowing is related to both the composition of enrollment and the net prices paid by students.

These trends in net prices and borrowing across groups have implications for analyzing and designing financial aid and student loan policies. The groups who have been exposed to more tuition inflation have tended to borrow more in federal loans. A key reason why these groups experienced higher inflation in net

prices is because they were deliberately excluded from need-based or grant aid by their institutions and by federal and state policymakers. Because of increases in subsidies for student loans created by recent loan forgiveness policies and income-driven repayment plans, however, many of these students will now benefit from significant amounts of federal aid, including higher-income undergraduates and graduate students, raising concerns about the costs and fairness of these loan forgiveness policies.

For students and families, undergraduate degree pricing is notoriously opaque, and figuring out how much college costs either requires using an aid calculator or applying for aid at a specific university and waiting for their aid offer. Another lesson from this analysis is that pricing for master’s degree programs and other graduate programs is similarly opaque, their pricing is changing even more rapidly than for undergraduates, and the costs and borrowing amounts involved are much larger and consequential.

Finally, a great deal about postsecondary costs and borrowing is unknown. Unlike for dependent undergraduate students, we know little about the family backgrounds of graduate students or their educational outcomes (like graduation rates) or career prospects. Hence, it’s unclear in many important dimensions which graduate students are borrowing more and their later outcomes. Likewise, estimated living expenses are the largest element of total cost of attendance for many students. But little is known about the actual costs students face, particularly those living off campus, and thus how they are changing over time and affecting borrowing.

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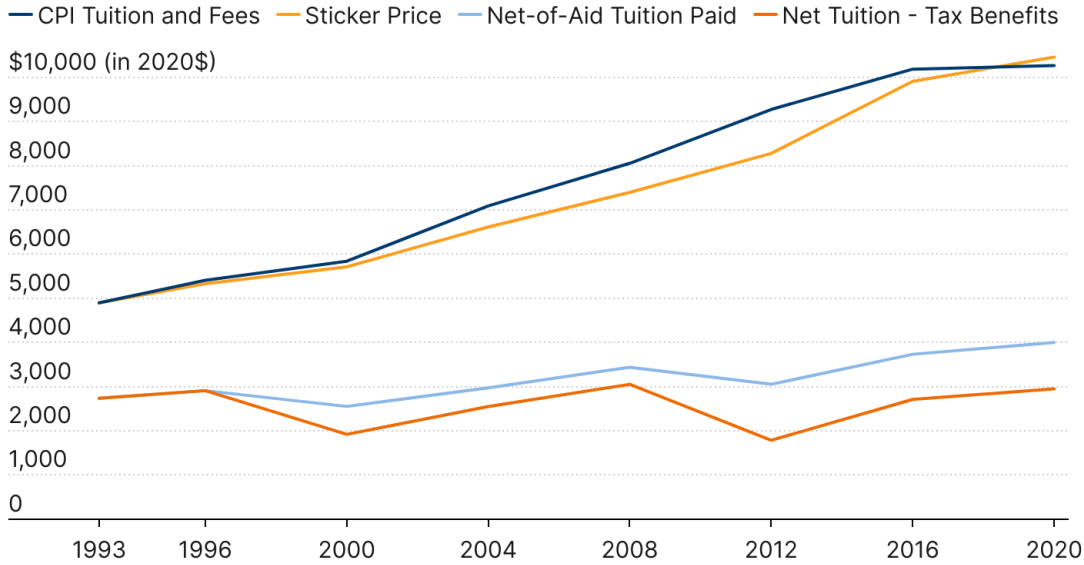
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Figures

FIGURE 1

Inflation in Net Tuition and Fees

Tuition and fees in 2020\$ by year



Source: U.S. Bureau of Labor Statistics, National Postsecondary Student Aid Survey.

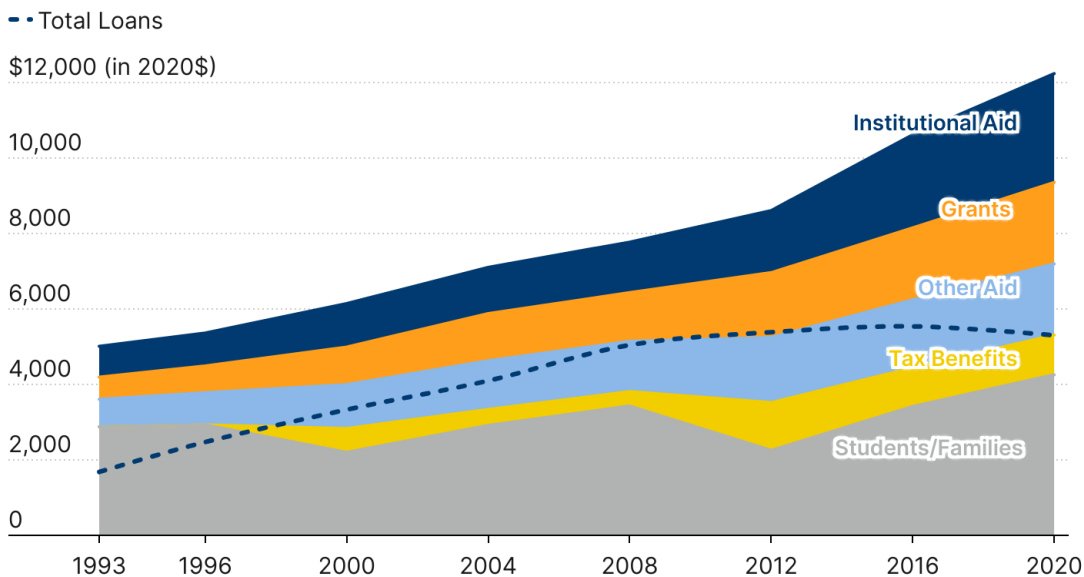
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Note: NPSAS sample of U.S. students pursuing AA, BA, and graduate degrees. Financial aid excludes loans. Tax credits include AOTC, HOPE, LLC.

FIGURE 2

Sources of Tuition Funding

Per Capita Tuition, Financial Aid, and Loans in 2020 \$



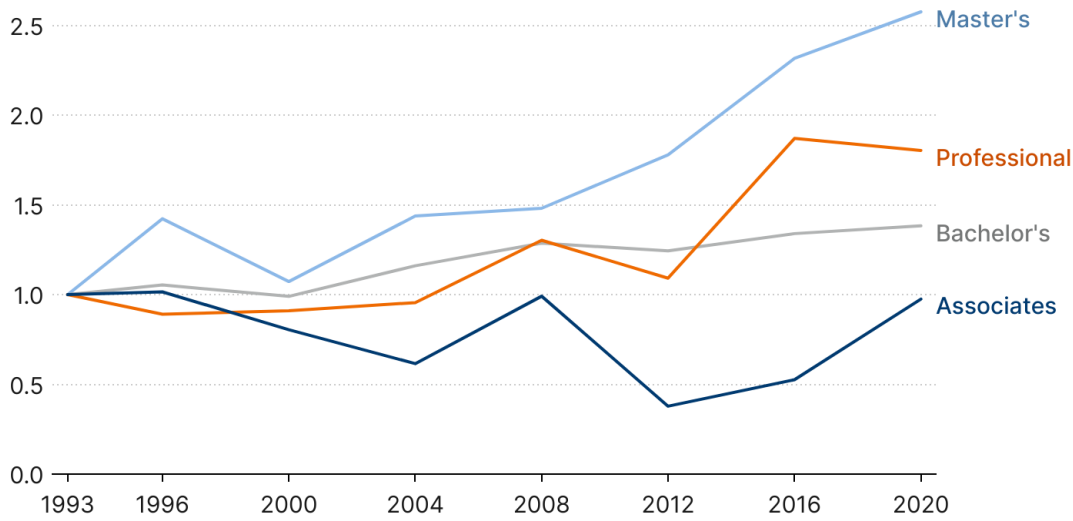
Source: National Postsecondary Student Aid Survey.

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FIGURE 3

Net-of-Aid Tuition Inflation by Degree Level

Indexed to 1993



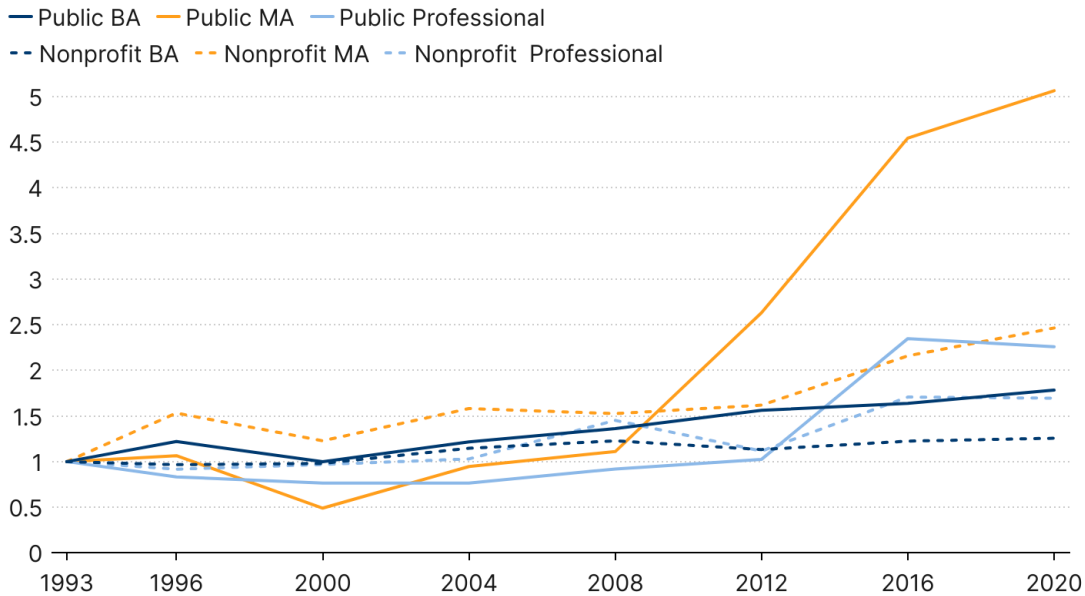
Source: National Postsecondary Student Aid Survey.

Note: Aid includes grants, workstudy, veterans and DoD benefits, and graduate assistantships. Excludes tax benefits.

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FIGURE 4A

Net-of-Aid Tuition Inflation by Sector and Degree



Source: National Postsecondary Student Aid Survey.

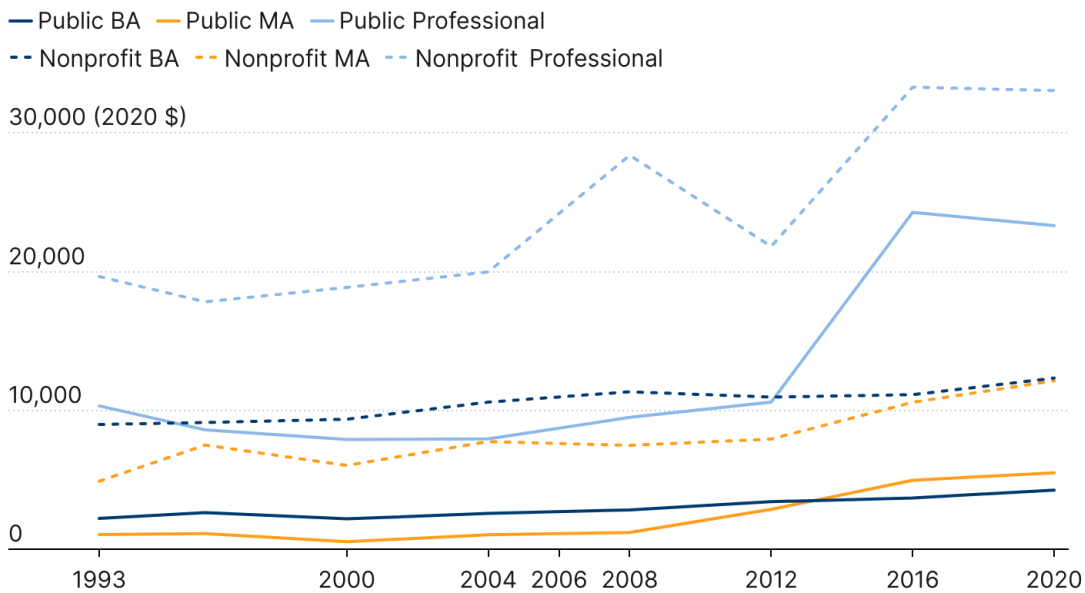
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Note: Aid includes grants, workstudy, veterans and DoD benefits, and graduate assistantships. Excludes tax benefits.

FIGURE 4B

Net-of-Aid Tuition by Sector and Degree

Net tuition and fees in 2020 \$



Source: National Postsecondary Student Aid Survey.

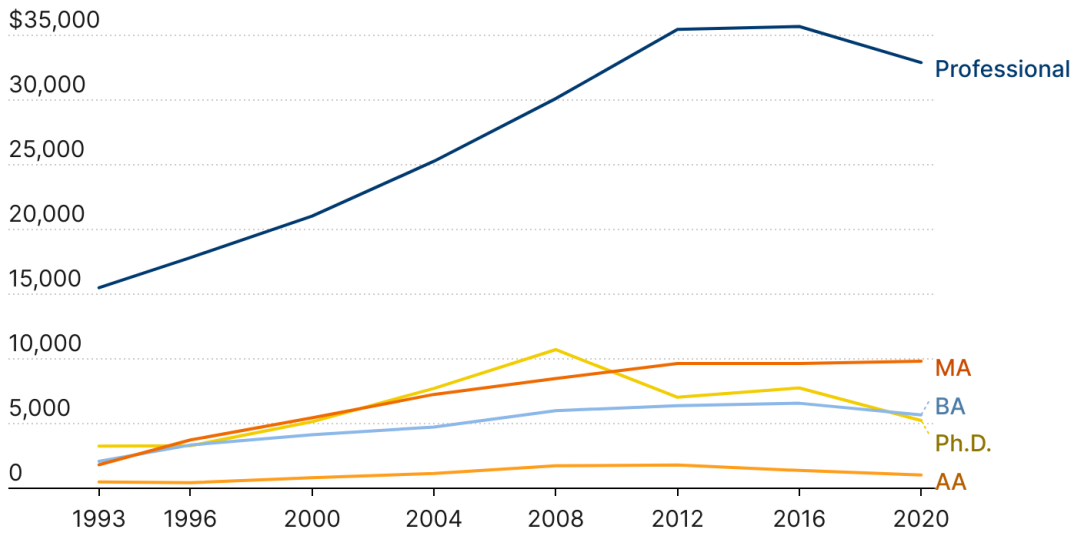
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Note: Aid includes grants, workstudy, veterans and DoD benefits, and graduate assistantships. Excludes tax benefits.

FIGURE 5A

Annual Borrowing by Degree Level

Average total loans, including PLUS, across all students



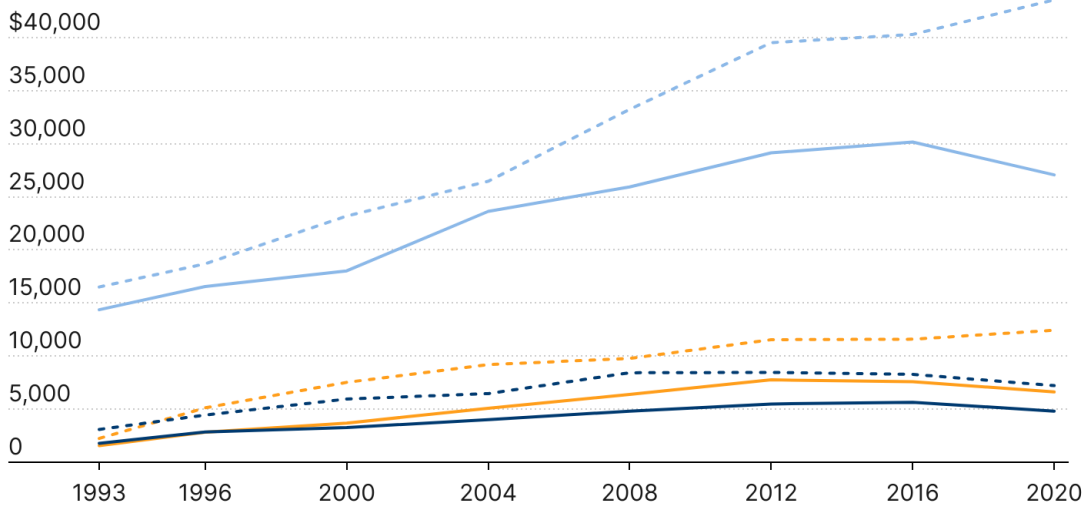
Source: National Postsecondary Student Aid Survey.

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FIGURE 5B

Annual Borrowing by Sector and Degree

— Public BA — Public MA — Public Professional
- - Nonprofit BA - - Nonprofit MA - - Nonprofit Professional



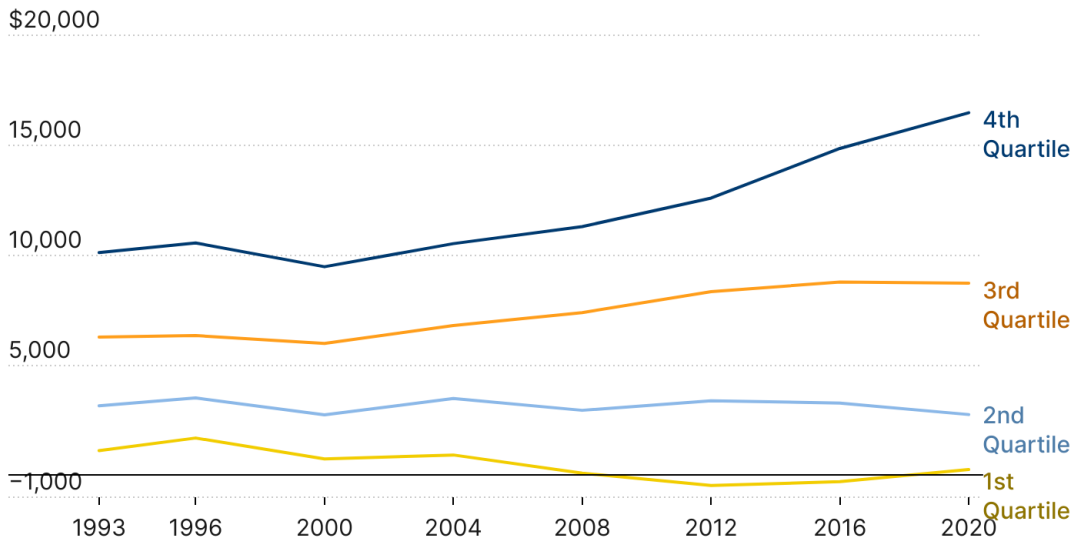
Source: National Postsecondary Student Aid Survey.

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FIGURE 6

Net Tuition Paid by Parent Income Quartile

Tuition and fees in inflation adjusted 2020 \$



Source: National Postsecondary Student Aid Survey.

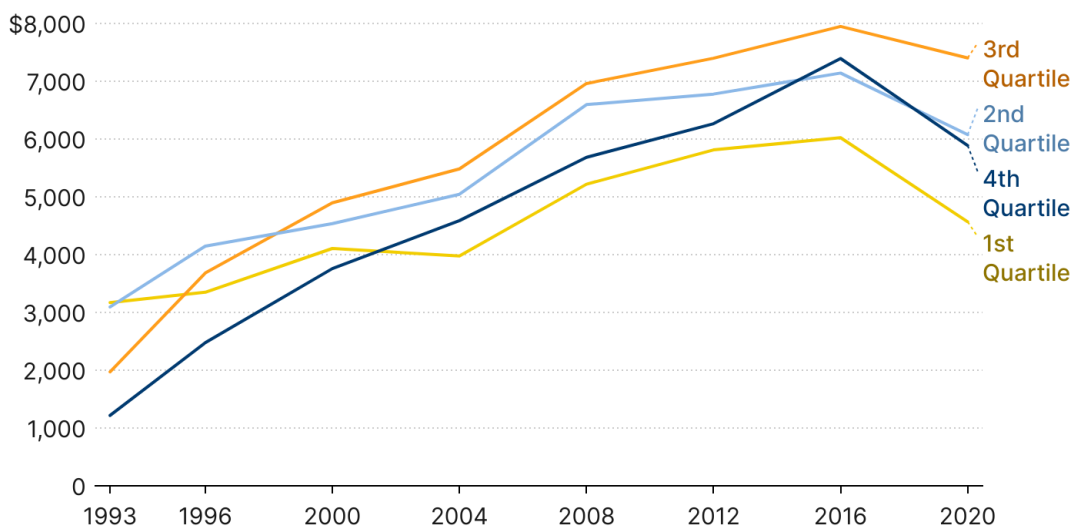
Note: Dependent Bachelor's students at 4-year public and private nonprofit institutions. Excludes tax benefits.

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FIGURE 7

Annual total Borrowing (including PLUS) by Parent Income Quartile

Loan amount in 2020 \$



Source: National Postsecondary Student Aid Survey.

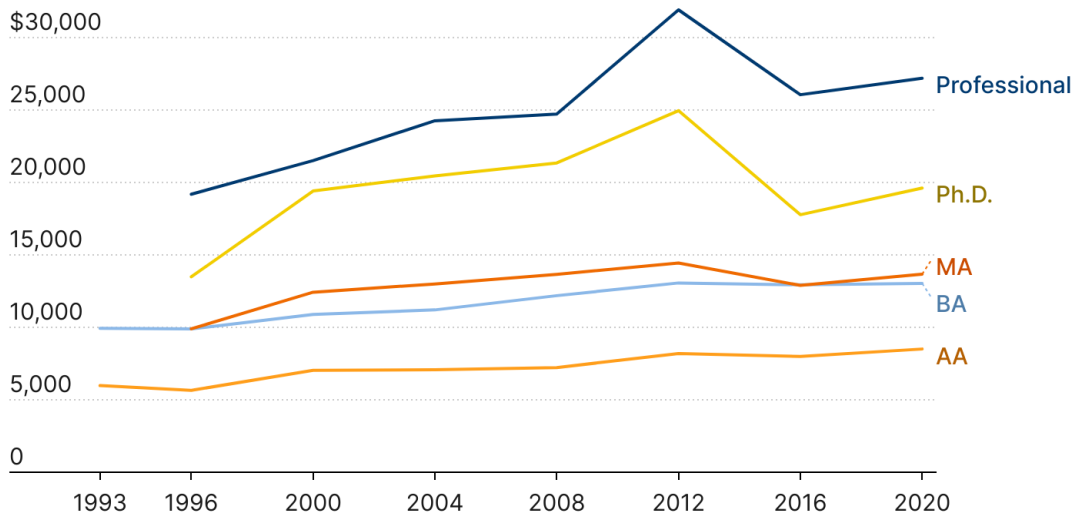
Note: Dependent Bachelor's degree students at 4-year public and private institutions.

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FIGURE 8

Living Expenses by Degree Level

In inflation adjusted 2020 \$



Source: National Postsecondary Student Aid Survey

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