

CBO

Distribution of Federal Support for Students Pursuing Higher Education in 2016

7. What is the name of the high school where you received or will receive your high school diploma? Enter the complete high school name, and the city and state where the high school is located.

High School Name _____
High School City _____ STATE _____

8. What will you do after you graduate in 2018-2019 school year?
Never attended _____
Attended college _____
2nd year under _____
3rd year under _____
4th year under _____
5th year/other _____
1st year graduate _____
Continuing education _____
Are you interested in attending college? _____

FAFSA
FREE APPLICATION for FEDERAL STUDENT AID
Step One (Student): For questions 1-13, see the instructions.

Your full name (exactly as it appears on your Social Security card)
1. Last name _____

Your permanent mailing address
4. Number and street (include apt. number) _____
5. City (and country if not U.S.) _____

8. Your Social Security Number See Notes page 9. _____
9. Your date of birth _____

Your driver's license number and driver's license state (if you have one)
11. Driver's license number _____

13. Your e-mail address (if you have one) _____
If you do not have an e-mail address, mark this box. See instructions for more information. _____

14. Are you a U.S. citizen? Mark or check the appropriate box. See instructions for more information. _____

16. What is your marital status as of today? See instructions for more information. _____

Form **8863**
Department of the Treasury Internal Revenue Service (99) Name(s) shown on return
Education Credits (American Opportunity and Lifetime Learning Credits)
Attach to Form 1040 or Form 1041 and its separate instructions
Information about Form 8863 and its separate instructions is on page 2.

CAUTION Complete a separate Part III on page 2 for each student you complete Parts I and II.

Part I Refundable American Opportunity Credit

- After completing Part III for each student, enter the total of all amounts from line 1 of Form 8863 for each student.
1 Enter: \$180,000 if married filing jointly; \$90,000 if you are a single filer, head of household, or qualifying widow(er)
- Enter the amount from Form 1040, line 38, or Form 1041, line 38, or Form 2555, 2555-EZ, or 4563, or you're from Puerto Rico, see Pub. 970 for the amount to enter
- Subtract line 3 from line 2. If zero or less, stop here. If more than zero, go to line 4.
- Enter: \$20,000 if married filing jointly; \$10,000 if single or qualifying widow(er)
- If line 4 is:
 - Equal to or more than line 5, enter 1.000 on line 6.
 - Less than line 5, divide line 4 by line 5. Enter the result (round down to two decimal places) if you were

CORRECTED

FILER'S name, street address, city or town, state or province, country, ZIP or foreign postal code, and telephone number _____

FILER'S federal identification no. _____ STUDENT'S taxpayer identification no. _____

STUDENT'S name _____

1 Payments received for qualified tuition and related expenses \$ _____

2 Amounts billed for qualified tuition and related expenses \$ _____

3 If this box is checked, your educational institution has changed its reporting method for 2016. _____

4 Adjustments made for a prior year _____

5 Scholarship _____

OMB No. 1545-0047
2016
Form **1098-E**

At a Glance

In 2016, the federal government provided students pursuing higher education with about \$91 billion in direct financial support through a wide variety of spending programs and tax expenditures, the Congressional Budget Office estimates. This report examines the distribution of that assistance among households, by income group.

- Spending programs account for most of the federal government's support, totaling \$54 billion in 2016. The largest of those programs is the Federal Pell Grant Program, which provides assistance to students on the basis of their financial need.
- Income and payroll tax preferences—generally referred to as tax expenditures—for higher education totaled \$37 billion in 2016. The largest of those preferences are tax credits—the American Opportunity Tax Credit and the Lifetime Learning Credit. Both low- and middle-income taxpayers may qualify for those credits.
- Not all education assistance is need-based. Eligibility for education benefits for veterans, for example, is based on military service and does not vary with financial need. The progressive structure of the tax system causes the value of certain tax preferences (such as exclusions from taxable income) to increase as income rises.
- Households in the lowest two-fifths (or two quintiles) of the population received more than half of the overall education benefits in 2016. Households in the top two quintiles received about 30 percent.
- The benefits paid through spending programs are much more concentrated among lower-income households than higher-income households. The benefits of tax expenditures, in contrast, are more evenly distributed among income groups, with the largest share of tax benefits accruing to households in the three middle-income quintiles.
- All federal assistance, taken together, covers almost one-third of the cost of attendance for students from households in the lowest-income quintile but less than 10 percent for students from households in the highest-income quintile.



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Numbers in the text and tables may not add up to totals because of rounding.

Unless this report indicates otherwise, all years mentioned are calendar years.

In this report, “higher education” and “postsecondary education” are used interchangeably and refer to instructional programs primarily for students who have completed high school or the equivalent. They include academic, vocational, and continuing professional education programs.



Distribution of Federal Support for Students Pursuing Higher Education in 2016

Summary

In 2016, the federal government provided students pursuing higher education with about \$91 billion in direct financial support through a wide variety of spending programs and income and payroll tax preferences, the Congressional Budget Office estimates. The largest programs and preferences give financial assistance to students to offset the cost of school, either through grants or tax credits. Other spending programs and tax preferences reduce borrowing costs for students and their families. Still other tax provisions seek to help families save for postsecondary education by providing tax-favored investment accounts.

How Much Support Does the Government Provide Through Spending Programs and Tax Expenditures?

Spending programs account for most of the support provided by the federal government, totaling \$54 billion in 2016 (see Figure 1). Three programs account for the vast majority of that total.

- The Federal Pell Grant Program, which provides assistance to students on the basis of their financial need, cost about \$28 billion in 2016 (see Table 1).
- The Federal Direct Loan Program makes loans available to students and their families on more favorable terms than they could obtain from a private lender. About \$95 billion in new loans was issued in 2016 through that program. Calculated using the fair-value approach to measuring costs, those loans cost the government about \$13 billion (after accounting for repayments that will be made in the future), CBO estimates.¹

1. Using the guidelines specified in the Federal Credit Reform Act of 1990 (FCRA) to estimate the net lifetime cost of those loans, the Treasury estimates that the federal government *earned* \$10 billion on student loans originated in 2016. The difference between the two estimates occurs because the fair-value approach uses interest rates on comparable private loans to estimate the budgetary effects

- Education benefits provided to current service members and veterans cost about \$12 billion in 2016. Most of that assistance was authorized by the Post-9/11 GI Bill.

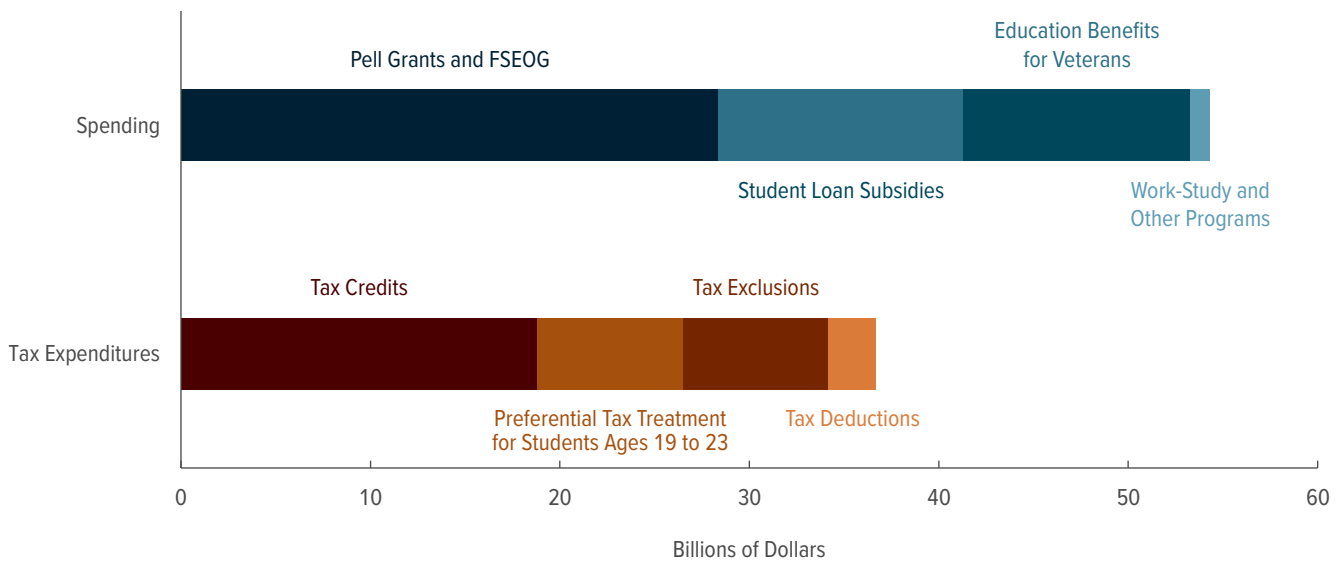
The value of income and payroll tax preferences for students pursuing higher education totaled an additional \$37 billion in 2016, in CBO's estimation.² Those tax preferences are generally referred to as tax expenditures because, like government spending programs, they provide financial assistance for particular activities as well as to certain entities or groups of people. The largest tax expenditures for education considered in this report are for the American Opportunity Tax Credit and the Lifetime Learning Credit, which together accounted for \$19 billion. The tax system also reduces students' cost of attending school by allowing parents of students ages 19 to 23 to claim them as dependents on their tax returns and as qualifying children for the earned income tax credit. Other tax preferences allow taxpayers to exclude from taxation certain income related to education and to deduct qualifying educational expenses.

Students and their families can pay for their education using some forms of tax-preferred savings, such as withdrawals from individual retirement accounts, that are not included in this analysis. It is difficult to determine the extent to which those methods are used to fund higher education.

of student loan programs, whereas the FCRA guidelines stipulate that interest rates on government securities be used.

2. CBO's estimates of income tax expenditures are based on estimates from the staff of the Joint Committee on Taxation (JCT), which CBO converted from a fiscal year basis to a calendar year basis. For more information about JCT's estimates, see Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 2016–2020*, JCX-3-17 (January 2017), <https://go.usa.gov/xnwzn>.

Figure 1.

Size of Federal Spending and Tax Expenditures for Higher Education, 2016

Source: Congressional Budget Office.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits. Spending on student loan subsidies is the estimated lifetime cost of new loans originated in 2016, estimated using the fair-value method.

FSEOG = Federal Supplemental Educational Opportunity Grants.

The federal government also provides funding, through numerous spending programs and tax preferences, directly to colleges and universities rather than to the students who attend them. That funding, in turn, may allow colleges and universities to reduce the cost of attendance or raise the quality of education. The distribution of those indirect effects, however, is very difficult to measure and is not considered in this report.

How Is That Assistance Distributed Among Households?

The support for higher education that is available to students and their families varies across the household income scale. Larger shares of the combined spending and tax benefits accrue to households in lower-income groups. Households in the lowest two-fifths (or two quintiles) of the population received more than 50 percent of the overall benefits in 2016, CBO estimates, whereas households in the highest two quintiles received about 30 percent (see Figure 2).

Viewed separately, however, the distributions of the benefits from spending programs and tax expenditures

differ markedly. The benefits paid through spending programs are much more concentrated among lower-income households than higher-income households, in part because the largest spending benefits—Pell grants—are awarded on the basis of financial need. The benefits of tax expenditures, in contrast, are more evenly distributed among income groups, with middle-income households receiving a modestly larger share than the highest- and lowest-income households. Although many tax expenditures are restricted to households with income below particular amounts, the progressive structure of the tax system causes the value of certain tax preferences (such as deductions) to increase as income rates rise. In addition, students pursuing higher education are more likely to be from higher-income households than from lower-income households. Those two factors result in the largest share of tax benefits accruing to households in the three middle income quintiles.

Measured relative to students' cost of attending school, the combined benefits of spending programs and tax expenditures are larger for lower-income households

than for higher-income households. (Those costs of attendance include published tuition and fees before any reduction provided by the school, room and board, and other expenses.) Lower-income students tend to receive more combined federal benefits, and they are more likely to attend less expensive schools. All federal assistance, taken together, covers about one-third of the cost of attendance for students from households in the lowest-income quintile but less than 10 percent for students from households in the highest-income quintile (see Figure 3).

How Is the Distribution Estimated?

This analysis distributes education benefits across households on the basis of their income in a single year. The distribution of benefits by households' annual income may differ from one using an alternative measure of resources, such as wealth or lifetime earnings, particularly if higher education affects those measures. However, eligibility for federal assistance is typically based on annual income, and information on those alternative measures is generally unavailable.

This analysis focuses on the households who receive financial assistance for higher education from the federal government—either paid directly to the households or to the institutions on their behalf—even though other people or entities (including colleges and universities) may capture part of that benefit. Moreover, the analysis considers only the impact of federal assistance in reducing the households' costs of higher education. It does not account for the effectiveness of that aid in boosting enrollment, completion of postsecondary education, or future earnings.³ Nor does this analysis examine the broader benefits to society associated with the government's provision of financial aid to students.

Overview and Magnitude of Federal Support for Students Pursuing Higher Education in 2016

Direct support provided to students and their families for higher education totaled about \$91 billion in 2016, the Congressional Budget Office estimates. (For more details on the data and methods CBO used, see Appendix A.) The federal government provides that support through a wide variety of spending programs and tax preferences. The largest forms of support provide

Table 1.

Federal Spending and Tax Expenditures for Higher Education, 2016

Billions of Dollars

	Cost
Pell Grants and FSEOG	28.4
Tax Credits	18.8
Student Loan Subsidies	12.9
Education Benefits for Veterans	12.0
Preferential Tax Treatment for Students Ages 19 to 23	7.7
Tax Exclusions	7.7
Tax Deductions	2.5
Work-Study and Other Programs	1.0
Total	91.0

Source: Congressional Budget Office.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits. Spending on student loan subsidies is the estimated lifetime cost of new loans originated in 2016, estimated using the fair-value method.

FSEOG = Federal Supplemental Educational Opportunity Grants.

direct financial assistance—either through direct grants or tax credits—to current students to offset the costs of school.⁴ Other programs reduce borrowing costs for students and their families. Still other tax provisions help families save for postsecondary education through tax-favored investment accounts. Those benefits help students in diverse ways.

The budgetary costs of most federal programs are estimated on a cash basis, which shows the balance of inflows and outflows when they occur. In contrast, costs of student loan programs are measured up front on an accrual basis (meaning that the total costs of each loan from receipt through repayment are recognized in the year in which the loan is made). For student loans taken out in 2016, CBO estimated the net costs to the government over the entire span of the loan—from the year in which the money was borrowed through the year in which the final repayment is expected to be made.

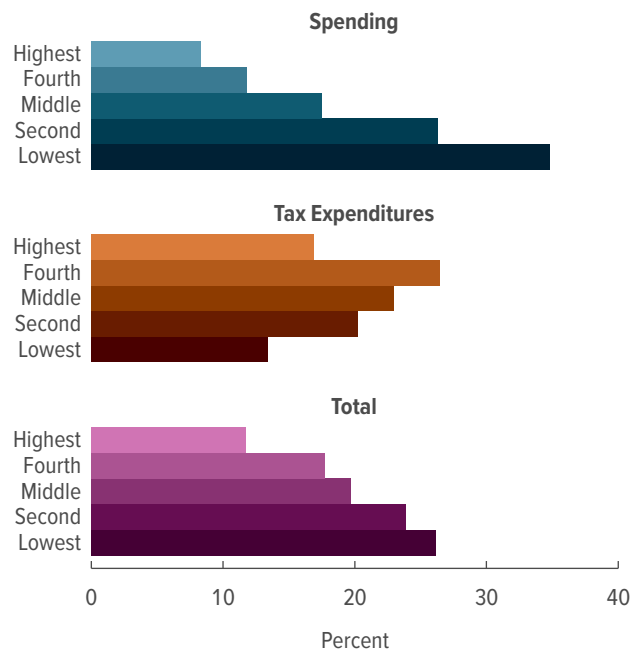
The estimates of program costs and tax expenditures do not represent the budgetary savings that would result if

3. For further discussion, see Congressional Budget Office, *Federal Aid for Postsecondary Students* (forthcoming).

4. Some assistance, such as the deduction of student loan interest from income, also benefits former students.

Figure 2.

Shares of Federal Spending and Tax Expenditures for Higher Education, by Income Group, 2016



Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits.

those provisions were eliminated, for two reasons. First, the estimates do not account for the ways in which people would change their behavior if the provisions were repealed. Second, the estimated size of a collection of benefits taken together might differ from the sum of the estimated sizes of the benefits considered separately because of the interactions among them.

Furthermore, the budgetary effects of some types of assistance might grow rapidly over time even without explicit policy changes by lawmakers. For example, the exclusion from taxation of earnings on qualified tuition programs (including so-called 529 plans) had only a modest budgetary effect in 2016. As more people set up

those accounts and the balances in them grow, however, the forgone revenue to the government will also grow. (Those plans have been available in their current form since 2001.) In this report, CBO considers only the costs of those programs in 2016.

Federal Spending Programs

The federal government spent over \$40 billion in 2016 on programs (other than those providing student loans) to reduce the cost of postsecondary education for students and their families, CBO estimates. The vast majority of that amount was spent on the Federal Pell Grant Program and education benefits provided to veterans by the Post-9/11 GI Bill. Those two programs differ in several ways. Eligibility for Pell grants is based on financial need—the difference between a school's cost of attendance and a family's expected contribution based on its income and assets. Benefits through the Post-9/11 GI Bill, in contrast, are provided to people with qualifying military service regardless of need. In addition, the maximum benefit for the Pell grant (\$5,775 in 2016) is substantially smaller than the benefit for veterans (which averaged \$15,000 per recipient in 2016), but the number of recipients is much larger for Pell grants.

Another significant way in which the federal government helps finance higher education is by providing loans that have more favorable interest rates and repayment terms than those available from private lenders. That program, the William D. Ford Federal Direct Loan Program (FDLP), issued \$95 billion in new loans to students and their parents in 2016, at a fair-value cost to the government of \$13 billion.

CBO uses two methods to estimate the net lifetime costs of federal student loan programs. Those methods differ in the discount rate (that is, the rate of interest) used to translate future cash flows into current dollars. Using the guidelines specified in the Federal Credit Reform Act of 1990 (FCRA), the present value of expected future cash flows is calculated by discounting them using the rates on Treasury securities with similar terms to maturity. (A present value is a single number that expresses a flow of current and future income or payments in terms of an equivalent lump sum received or paid at a specific time.) The Treasury estimates that under FCRA accounting rules, the federal government *earned* \$10 billion on loans originated in 2016. (CBO's official baseline estimates for the costs of student loans are based on those estimates.) In contrast to the FCRA approach, fair-value estimates

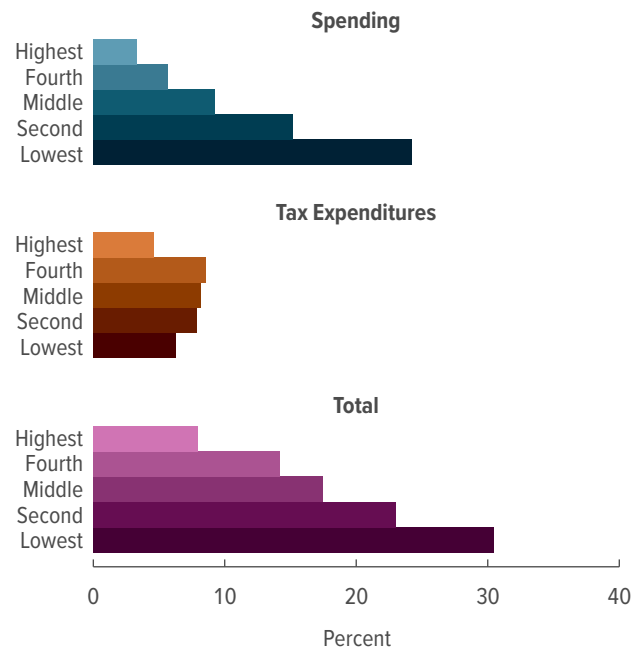
are based on market interest rates, which more fully account for the cost of the risk the government takes on.⁵ CBO estimates that the subsidy provided to students and their families through loans issued in 2016 totaled \$13 billion on a fair-value basis. Compared with FCRA, the fair-value approach offers a more comprehensive estimate of the financial subsidy received by students and their families. The programs' lifetime costs also depend on the rates at which borrowers default on their loans or participate in programs that provide loan forgiveness.

The federal government also subsidizes higher education through spending that does not directly benefit students or their families. Numerous programs provide funding directly to institutions of higher education rather than to the students attending them. For example, colleges and universities received about \$2 billion in grants in 2016 directly from the Department of Education's Office of Postsecondary Education. Those grants are intended to expand access to higher education for disadvantaged students or to improve institutions in some way (such as by renovating classroom facilities). Furthermore, the federal government spends substantial amounts each year on research grants for universities and colleges, obligating almost \$29 billion in fiscal year 2016. Most of those grants were made through the National Institutes of Health, the National Science Foundation, and the Department of Defense.⁶

Federal grants to institutions may indirectly reduce the cost of attendance for students or raise the quality of education. However, the fraction of spending from those programs that is passed through to students is very difficult to measure. The distribution of those benefits to students also depends on the types of schools that they attend. For example, if students in higher-income families are more likely to attend research universities than community colleges, then the distribution of benefits

Figure 3.

Federal Spending and Tax Expenditures for Higher Education as a Percentage of the Cost of Attendance, by Income Group, 2016



Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits. The cost of attendance includes published tuition and fees, room and board, and other expenses.

from research grants may be more tilted toward higher-income families.

Federal Tax Expenditures

The federal government provides significant direct support for higher education through preferences in the tax system. Those provisions are termed tax expenditures because they resemble federal spending by providing financial assistance to specific activities, entities, or groups of people. (For more on how tax expenditures are defined and calculated, see Box 1.)

5. For a more comprehensive comparison of the two accounting methods, see Congressional Budget Office, *Fair-Value Estimates of the Cost of Selected Federal Credit Programs for 2015 to 2024* (May 2014), www.cbo.gov/publication/45383.

6. See Laurie A. Harris and Marcy E. Gallo, *Federally Funded Academic Research Requirements: Background and Issues in Brief*, Report for Congress R44774 (Congressional Research Service, February 28, 2017); and National Science Foundation, National Center for Science and Engineering Statistics, "Survey of Federal Funds for Research and Development, Fiscal Years 2015–17," Table 9, <https://go.usa.gov/xnwzh>.

Box 1.

What Are Tax Expenditures?

In the individual and corporate income tax systems, an array of exclusions, deductions, preferential rates, and credits reduce revenues for any given level of tax rates. Many of those provisions are called tax expenditures because, like government spending programs, they provide financial assistance for particular activities or to certain entities or groups of people.¹

As with conventional federal spending programs, tax expenditures contribute to the federal budget deficit. They also influence people's choices about working, saving, and investing, and they affect the distribution of income. Tax expenditures are more similar to mandatory benefit programs than they are to discretionary spending programs: They are not subject to annual appropriations, and any person or entity that meets the legal requirements can receive the benefits. Because of that budgetary treatment, however, tax expenditures are much less transparent than spending on benefit programs.²

Tax expenditures substantially affect federal revenues. The staff of the Joint Committee on Taxation (JCT) annually publishes estimates of tax expenditures. For this analysis, the Congressional Budget Office converted JCT's fiscal year estimates to calendar year 2016 estimates. An estimate of a tax expenditure typically reflects the value of a tax preference considered in isolation; it is based on people's behavior with the tax expenditure in place and under the assumption that

all other provisions of the tax code are unchanged. However, the total amount of tax expenditures does not represent the increase in revenues that would occur if all tax expenditures were eliminated. Repealing a tax provision would change incentives and lead taxpayers to modify their behavior in ways that would diminish the repeal's impact on revenues.

In this report, CBO's combined estimates for tax expenditures include the interactions that would arise if multiple tax expenditures were eliminated at the same time. For instance, eliminating a particular income tax exclusion would increase taxable income, pushing some income into tax brackets with higher marginal rates (the rate that applies to the last dollar of income). Eliminating all income tax exclusions would increase taxable income by the sum of the change attributable to each preference separately—leaving aside other considerations. Because of the structure of tax brackets and marginal rates, however, a larger share of that additional income would end up in tax brackets that are subject to higher marginal rates. As a result, the budgetary effect of eliminating all exclusions would be larger than the sum of the effects of eliminating each exclusion separately. For that reason, the estimated magnitude of a collection of tax expenditures may differ from the sum of the estimated magnitudes of the separate expenditures.

Furthermore, when appropriate, CBO's estimates of tax expenditures include their effects on income and payroll taxes. The effect on payroll taxes arises because some of the provisions of law that reduce the amount of taxable income under the income tax also decrease the amount of earnings subject to payroll taxes. (Provisions that reduce payroll tax receipts generally lessen future spending for Social Security benefits because those benefits are based on earnings subject to Social Security taxes; that effect on future government spending is not analyzed in this report.)

1. The Congressional Budget Act of 1974 defines tax expenditures as "those revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability."

2. For a more thorough discussion of tax expenditures, see Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 2016–2020*, JCX-3-17 (January 2017), <https://go.usa.gov/xnwzn>; and Congressional Budget Office, *The Distribution of Major Tax Expenditures in the Individual Income Tax System* (May 2013), www.cbo.gov/publication/43768.

The value of tax expenditures directly targeted to students totaled about \$37 billion in 2016, CBO estimates. In this analysis, the largest education-related tax expenditures are for the American Opportunity Tax Credit (AOTC) and the Lifetime Learning Credit, which together accounted for \$19 billion—or more than half of the 2016 total. The tax system also reduces the net cost of attendance for students by allowing parents of students ages 19 to 23 to claim them as dependents on their tax returns. Other tax preferences allow taxpayers to exclude from taxation certain income related to education and to deduct qualifying educational expenses (including interest payments on student loans).

The tax system further subsidizes higher education in other ways. Those approaches are briefly outlined below but not examined more fully in this report for varying reasons. Some tax expenditures associated with education, for instance, benefit students and their families only indirectly. Other tax preferences not targeted toward education may be used for educational purposes. Still other provisions in the tax code subsidize financing for educational institutions, but the extent to which they benefit students and their families is unclear.

Two examples of the support that the tax system provides to educational institutions are the deduction for charitable contributions to those institutions and the exclusion of interest on certain state and local government bonds used to fund higher-education projects. The value of those tax expenditures totaled \$10 billion and \$4 billion, respectively, in 2016. Although those tax expenditures are closely associated with higher education, the extent to which the benefits ultimately result in lower costs of attendance for students is unclear. Nonetheless, for completeness, the distribution among households in different income groups of those tax expenditures that support educational institutions is shown in Appendix B.

Families also may choose to fund educational expenses through tax-preferred-saving strategies not specifically related to education. Such strategies could include taking early withdrawals from certain retirement plans (which, if done for qualified educational expenses, does not incur a penalty), incurring mortgage debt (the interest on which is tax deductible), or taking loans from tax-advantaged retirement accounts. Although those strategies directly benefit students and their families, they were excluded from this analysis largely because of the

difficulty of determining the extent to which they are used to fund higher education.⁷

Other provisions of the tax code affect the financing of higher education. Educational institutions can be organized as not-for-profits, a status that confers various benefits. Such nonprofit organizations are generally exempt from income taxes, even on the earnings that accrue in schools' endowment funds.⁸ Public universities and colleges may also be indirectly financed through the deduction of certain state and local taxes from the federal income tax, which is effectively a federal subsidy to state and local governments. The staff of the Joint Committee on Taxation estimates that the tax expenditure for that deduction totaled about \$100 billion in fiscal year 2016, a portion of which benefits public colleges and universities. It is not clear, however, to what degree the deduction increases total funding for higher education or allows states to divert to other purposes money that would have been spent on higher education.⁹

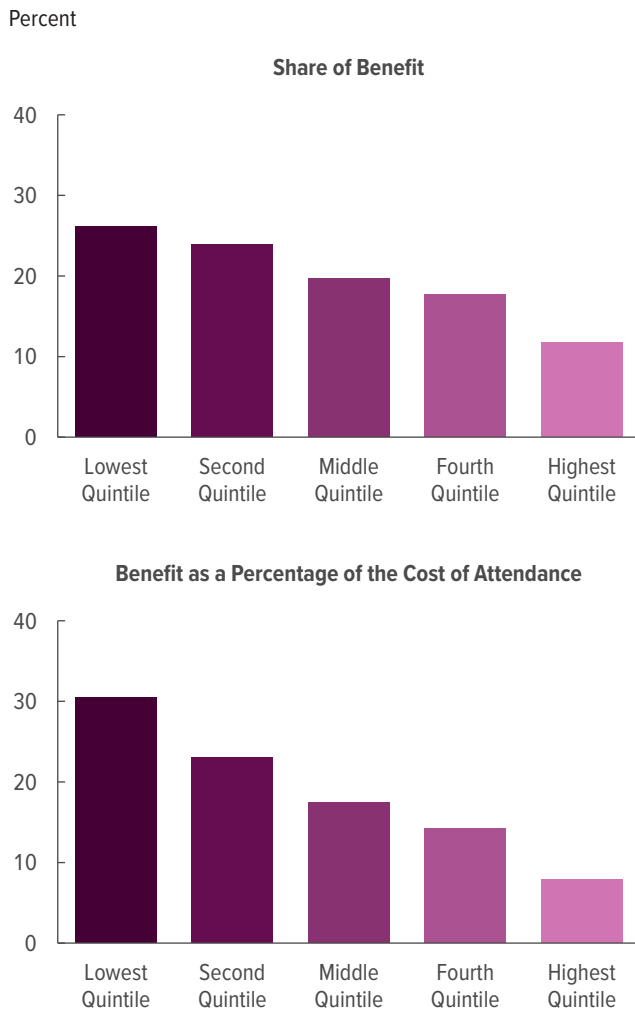
Distribution of Federal Spending and Tax Expenditures in Support of Students Pursuing Higher Education in 2016

Support for higher education is available to students and their families on the basis of varying criteria. For example, only students and families with demonstrated financial need or income below specified thresholds qualify for certain types of educational assistance. Other benefits, particularly some offered through the tax code, are not limited by income and, because of the structure of the income tax system, are often more valuable to households with higher income. (Higher-income

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7. In addition, tuition paid directly by a taxpayer to an educational institution on behalf of a student is not subject to the gift tax, even if it exceeds the annual limit on amounts excluded from that tax. This analysis did not consider that benefit because of the difficulty in determining how much gift-tax revenue is forgone.
 8. Nonprofit status is usually not considered a tax expenditure when the income is derived from nonbusiness activities. For further discussion, see Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 2016–2020*, JCX-3-17 (January 2017), pp. 8–9, <https://go.usa.gov/xnwzn>. Beginning in 2018, the accrued earnings in certain endowment funds are subject to a 1.4 percent excise tax.
 9. In 2015, roughly 10 percent of spending by state and local governments was used to fund public colleges and universities. See Census Bureau, “State and Local Government Finances by Level of Government and by State: 2014–15,” Table 1, <https://go.usa.gov/xQTN5>.

Figure 4.

Federal Spending and Tax Expenditures for Higher Education, by Share of Benefit and by Benefit as a Percentage of the Cost of Attendance for Each Income Group, 2016



Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits. The cost of attendance includes published tuition and fees, room and board, and other expenses.

households generally face higher marginal tax rates than lower-income households, so the forgone revenues from tax preferences that reduce taxable income are greater for higher-income households than lower-income ones. The marginal tax rate is the rate that applies to the last dollar of income.) Still other forms of support are available only to specific groups of people (such as veterans), regardless of their income or financial circumstances. Each of those criteria has a different effect on the distribution of benefits across the income scale.

The distribution of education benefits depends in part on people's choices about whether to pursue postsecondary education and which schools to attend. Those decisions differ among households in different income groups. CBO estimates that postsecondary students in 2016 were more likely to be from higher-income households than from lower-income households. About 23 percent of students were from households in the highest-income quintile, 21 percent were from households in the middle quintile, and 16 percent were from households in the lowest quintile. The distribution of education benefits also reflects the schools that students choose to attend. Some assistance through spending programs depends on a student's financial need. All else being equal, students attending schools with a higher cost of attendance have greater financial need than students attending lower-cost schools. Attending a school with higher tuition and fees may also allow students or their families to receive a larger tax benefit.

Total Assistance

In 2016, larger shares of spending and tax benefits combined—or total assistance—went to households in lower-income groups. CBO estimates that households in the lowest two quintiles received more than 50 percent of the benefits, whereas households in the highest two quintiles received about 30 percent. Total benefits relative to the cost of attendance were also more concentrated among lower-income households (see Figure 4).¹⁰ Those benefits equaled 30 percent of the costs of attendance for households in the lowest-income quintile and 8 percent of the costs of attendance for households in the highest-income quintile. Although postsecondary students are more likely to be from higher-income households, they also tend to enroll in more expensive schools.

10. For some students, the net price of attendance including institutional aid better reflects the costs they face. However, institutional aid varies for students within the same school and may also vary in response to government aid.

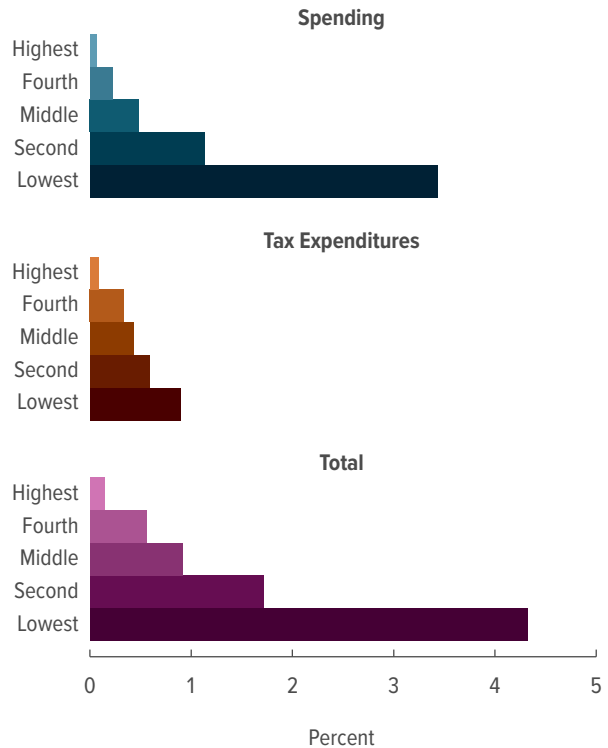
Box 2.

Measuring Benefits for Higher Education as a Share of Income

In other Congressional Budget Office reports, the distribution of taxes and outlays is measured relative to household income. Using that measure, the benefits of federal aid for higher education are far more skewed toward lower-income households. (That is not the case when benefits are measured relative to the costs of education, as this report does.) CBO estimates that in 2016 the benefits of federal aid for higher education totaled about 4 percent of income for all households, including those without students, in the lowest quintile (or fifth) of the population and just 0.1 percent for households in the highest quintile (see the figure).

Benefits from spending programs—in particular, the Federal Pell Grant Program—accounted for most of the variation in benefits as a share of income across all quintiles in 2016. In comparison, benefits from tax expenditures accounted for a smaller share of income. Although the share of total tax expenditures was more concentrated among households in the middle and fourth quintiles of the income distribution, benefits accounted for a smaller share of income for households in higher-income quintiles. That is because the largest tax expenditures are tax credits that are limited to taxpayers with income below certain thresholds. In 2016, the amount of forgone revenues attributable to tax expenditures that are not limited by income—such as the exclusions from income—was smaller than the revenues forgone from tax credits that are limited by income.

Federal Spending and Tax Expenditures for Higher Education as a Percentage of Income, by Income Group, 2016



Source: Congressional Budget Office.

Income is measured before transfers and taxes. Income groups are created by ranking households by income, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares. Benefits are measured as a share of income across all households in each income group, not just among recipients or beneficiaries of each tax preference or spending program.

Because estimates of spending programs and tax expenditures are based on people’s behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits.

(For an alternative analysis that measures benefits relative to income, see Box 2.)

In this analysis, CBO estimated the distribution of education benefits using methods similar to those used in previous CBO reports.¹¹ Households are ranked by income before means-tested transfers or taxes. Means-tested benefits for education are typically based on the resources of a student's family or tax unit. As a result, relatively high-income households that contain multiple families or tax units may receive benefits limited to lower-income people because only resources belonging to certain members of the household are considered when allocating those benefits.¹²

CBO allocated education benefits to the households that directly receive payments from the government (or for whom the government makes payments on their behalf) or that claim the tax expenditures on their tax returns. However, benefits can accrue to people or entities other than the direct recipients. For example, CBO's estimates of the distribution of education benefits leave aside any effect of Pell grants or tax credits on the amount of tuition charged by schools or on institutional assistance. (For more details on the data and methods CBO used, see Appendix A.)

Federal Spending Programs

Lower-income households receive a much larger share of federal spending in support of higher education than higher-income households receive, mainly because Pell grants are awarded on the basis of financial need. When measured relative to the cost of attendance, the benefits of spending programs are also much larger for lower-income households than for higher-income ones. Not only do lower-income students tend to receive more federal benefits than higher-income students do, but they are also more likely to attend less expensive schools.

Pell Grants and Federal Supplemental Educational

Opportunity Grants. The federal government's single largest spending program in support of higher education is the Pell Grant program. Those grants were awarded to about 8 million students (mainly undergraduates) in 2016 at a total cost of about \$28 billion. In 2014, about 54 percent of Pell grant recipients were under age 24. Some of the program's funding is discretionary (and thus requires legislative action each year), and some is mandatory (and thus continues unchanged in the absence of legislative action).

The Department of Education determines which students qualify for Pell grants and the amount they will receive after assessing students' expected financial contribution based on their families' income and assets.¹³ For 2016, the maximum grant was \$5,775 and the average grant was about \$3,700. Those funds may be used for tuition, fees, room and board, books, supplies, transportation, and other qualifying expenses.¹⁴

Pell grant recipients also have priority in receiving Federal Supplemental Educational Opportunity Grants (FSEOG), which are targeted to undergraduate students with great financial need. About 1.5 million students received grants of \$100 to \$4,000 in fiscal year 2015. Federal spending on the program (which is discretionary) totaled roughly \$700 million in 2016.

In 2016, almost three-quarters of the benefits (or \$21 billion) of Pell grants and FSEOG were received by households with income in the lowest two quintiles; just one-tenth of the benefits (or \$3 billion) were received by households with income in the highest two quintiles, CBO estimates (see Table 2 and Figure 5). Larger grants are awarded to students with the most financial need (up to the capped amount). As income rises, however, the overall share of costs covered by those grants drops

11. See Congressional Budget Office, *The Distribution of Household Income, 2014* (March 2018), www.cbo.gov/publication/53597; and Kevin Perese, *CBO's New Framework for Analyzing the Effects of Means-Tested Transfers and Federal Taxes on the Distribution of Income*, Working Paper 2017-09 (Congressional Budget Office, December 2017), www.cbo.gov/publication/53345.

12. For example, a household may consist of two unrelated adult roommates, one of whom is a lower-income full-time student who is eligible for a Pell grant and the other of whom is a higher-income adult whose income places the entire household at the top of the income distribution.

13. That determination is based on information provided by students and their parents on the Free Application for Federal Student Aid (FAFSA) form, which assesses families' expected contribution (using information based, in part, on details reported on their tax returns).

14. When filing a tax return, students must choose whether to report that the grant was used to pay for tuition, fees, and course-related materials or for living expenses. That choice has important tax consequences, either limiting eligibility for certain tax benefits or resulting in part of the grant being treated as taxable income. For further details, see Internal Revenue Service, "Fact Sheet: Interaction of Pell Grants and Tax Credits: Students May Be Foregoing Tax Benefits by Mistake" (undated), <https://go.usa.gov/xnwj4>.

Table 2.

Federal Assistance for Higher Education, by Income Before Transfers and Taxes, 2016

	Dollars (Billions)	Shares (Percent)					Percentiles Within the Highest Quintile			
		Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	81st– 90th	91st– 95th	96th– 99th	Top 1
Spending										
Pell grants and FSEOG	28.4	44	29	15	7	3	2	1	*	*
Student loan subsidies	12.9	26	22	20	18	14	8	4	2	*
Education benefits for veterans	12.0	24	25	22	15	14	9	3	1	*
Work-study and other programs	1.0	26	20	18	20	15	8	4	1	0
All Spending	54.3	35	26	18	12	8	5	2	1	*
Tax Expenditures										
Credits for education	18.8	12	23	28	28	9	7	1	1	*
Preferential treatment for students 19 to 23										
Dependent exemption	4.4	5	15	20	33	27	18	7	1	0
Higher age limit for EITC	3.3	52	29	11	5	3	2	1	*	0
All Preferential Treatment (Including interactions)	7.7	25	21	16	21	17	11	5	1	0
Exclusions from taxable income										
Scholarship and fellowship income	3.6	9	16	17	28	30	16	10	4	*
Employer-provided education benefits and tuition reduction	2.9	12	18	20	25	25	14	7	4	1
Earnings of qualified education savings plans	0.9	*	*	1	3	97	5	10	35	47
Certain discharged student loan debt	0.2	3	5	11	28	56	22	14	15	2
All Exclusions (Including interactions)	7.7	9	15	16	24	37	14	9	8	6
Deductions										
Student loan interest	2.2	2	14	30	39	15	12	2	1	*
Tuition and fees	0.3	7	14	12	36	31	24	5	1	0
All Deductions (Including interactions)	2.5	3	14	28	39	17	14	2	1	*
All Tax Expenditures (Including interactions)	36.6	13	20	23	26	17	10	4	2	1
Total Spending and Tax Expenditures (Including interactions)	91.0	26	24	20	18	12	7	3	1	1
Memorandum:										
Shares of Students	n.a.	16	19	21	22	23	11	6	4	1

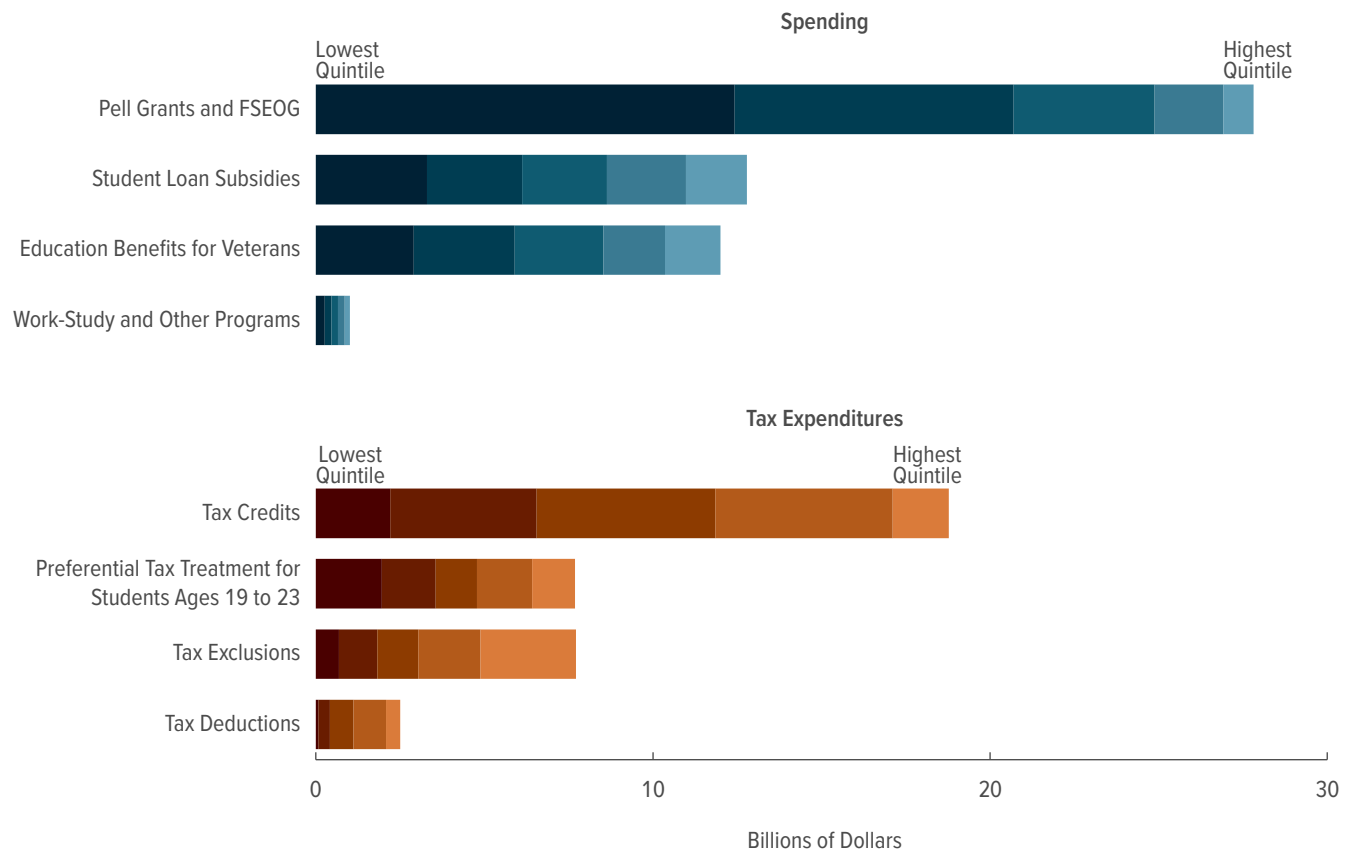
Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people; percentiles (hundredths) contain approximately equal numbers of people as well. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares. Spending on student loan subsidies is the estimated lifetime cost of new loans originated in 2016, estimated using the fair-value method.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits.

EITC = earned income tax credit; FSEOG = Federal Supplemental Educational Opportunity Grants; n.a. = not applicable; * = between zero and 0.5 percent.

Figure 5.

Size and Distribution of Federal Spending and Tax Expenditures for Higher Education, by Income Group, 2016

Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits. Spending on student loan subsidies is the estimated lifetime cost of new loans originated in 2016, estimated using the fair-value method.

FSEOG = Federal Supplemental Educational Opportunity Grants.

rapidly (see Figure 6 and Table 3). Pell grants and FSEOG covered 16 percent of the cost of attendance for households in the lowest-income group in 2016 but 1 percent of the cost of attendance for households in the highest-income group.

Federal Student Loan Programs. To help students and their parents finance higher education, the federal government provides direct loans at below-market interest rates. The William D. Ford Federal Direct Loan Program issued roughly \$95 billion in new loans through several programs to about 9 million borrowers in 2016 at a fair-value cost

of \$13 billion.¹⁵ Borrowers under the age of 25 received about 53 percent of the amount disbursed. Spending for the student loan programs is classified as mandatory, and lending amounts are constrained only by per-borrower limits established in the Higher Education Act of 1965.

15. In 2016, students with substantial financial need could also qualify for low-interest loans through the Federal Perkins Loan Program. Those loans are not included in this analysis, however, because there was no new federal spending on Perkins loans in 2016, even though schools were still able to disburse loans using revolving funds from loan repayments. As of October 1, 2017, schools are no longer allowed to disburse new Perkins loans.

The FDLP comprises four direct loan programs:

- Subsidized Stafford loans (available only to undergraduate students with demonstrated financial need),
- Unsubsidized Stafford loans (available to undergraduate and graduate students),
- Graduate PLUS loans (unsubsidized loans available to graduate students who have reached borrowing limits for other direct federal loans), and
- Parent PLUS loans (unsubsidized loans available to parents of dependent undergraduate students).

Subsidized loans are those for which interest does not accrue while students are in school or during other authorized periods of deferment, and unsubsidized loans are those for which interest accrues at all times. The maximum loan amount, interest rates, fees, and repayment terms also vary across loan products.¹⁶ The maximum loan amount each year ranges from \$5,500 for dependent undergraduates in their first year of school to the total cost of attendance (minus all other aid they have received) for graduate students.¹⁷

The debt incurred by students for loans made through those various programs may be written off, or forgiven, after a certain period under some circumstances.¹⁸ After borrowers have made a specified number of payments and have met various other criteria, the federal government may forgive their remaining student loan debt—thus reducing the share of loan debt ultimately repaid to the government. (For some loans, the amount of debt forgiven is considered taxable income for the year in which the debt is forgiven.) More than 50 federal

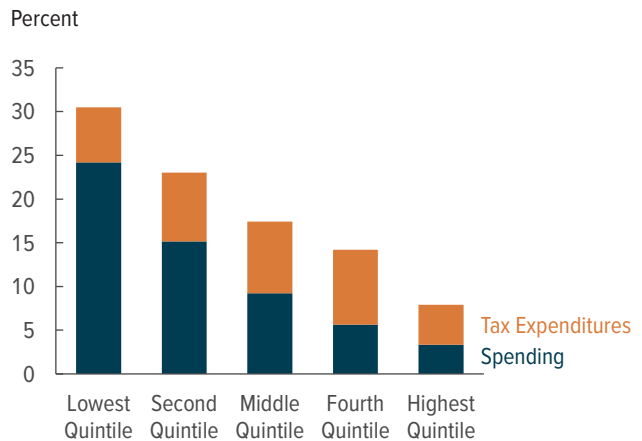
16. For additional information on student loan programs, see David P. Smole, *Federal Student Loans Made Under the Federal Family Education Loan Program and the William D. Ford Federal Direct Loan Program: Terms and Conditions for Borrowers*, Report for Congress R40122 (Congressional Research Service, June 7, 2013).

17. For education spending programs, dependent status is determined using criteria that differ from those for tax purposes. Generally, the Department of Education considers students to be independent if they are age 24 or older, are working toward a graduate degree, are married, have children, or are veterans. Independent students do not have to provide their parents' financial information when applying for federal student aid.

18. Parent PLUS loans are generally ineligible for loan forgiveness.

Figure 6.

Federal Spending and Tax Expenditures for Higher Education as a Share of the Cost of Attendance, by Income Group, 2016



Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits. The cost of attendance includes published tuition and fees, room and board, and other expenses. Spending on student loan subsidies is the estimated lifetime cost of new loans originated in 2016, estimated using the fair-value method.

FSEOG = Federal Supplemental Educational Opportunity Grants.

loan-forgiveness programs are currently authorized.¹⁹ The most significant are income-driven repayment (IDR) plans, including Pay As You Earn plans and Public Service Loan Forgiveness (PSLF) plans. For participants in IDR plans, the outstanding balance of their loans is forgiven after they make monthly payments (which are calculated as a percentage of their income) for a certain period, usually 20 years. In PSLF plans, which are designed for borrowers in an IDR plan who are employed full time in public service, debt forgiveness typically occurs after 10 years of monthly payments. Neither program

19. See Alexandra Hegji, David P. Smole, and Elayne J. Heisler, *Federal Student Loan Forgiveness and Loan Repayment Programs*, Report for Congress R43571 (Congressional Research Service, July 28, 2016).

Table 3.

Federal Assistance for Higher Education as a Percentage of the Cost of Attendance, by Income Before Transfers and Taxes, 2016

	Shares (Percent)						Percentiles Within the Highest Quintile			
	Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	All Quintiles	81st–90th	91st–95th	96th–99th	Top 1
Spending										
Pell grants and FSEOG	15.9	8.8	4.1	1.8	0.7	5.4	0.9	0.6	0.3	0.2
Student loan subsidies	4.2	3.0	2.4	2.1	1.3	2.5	1.6	1.3	0.9	0.7
Education benefits for veterans	3.7	3.2	2.6	1.6	1.2	2.3	1.6	1.1	0.6	*
Work-study and other programs	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0
All Spending	24.2	15.2	9.2	5.7	3.3	10.3	4.2	3.2	1.9	0.9
Tax Expenditures										
Credits for education	2.8	4.6	5.1	4.6	1.2	3.6	2.0	0.7	0.4	0.4
Preferential treatment for students 19 to 23										
Dependent exemption	0.3	0.7	0.8	1.3	0.9	0.8	1.2	0.9	0.2	0
Higher age limit for EITC	2.2	1.0	0.3	0.2	0.1	0.6	0.1	0.1	*	0
All Preferential Treatment (Including interactions)	2.5	1.7	1.2	1.4	0.9	1.5	1.3	1.0	0.2	0
Exclusions from taxable income										
Scholarship and fellowship income	0.4	0.6	0.6	0.9	0.8	0.7	0.9	1.0	0.5	0.1
Employer-provided education benefits and tuition reduction	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.3
Earnings of qualified education savings plans	*	*	*	*	0.6	0.2	0.1	0.2	1.1	6.6
Certain discharged student loan debt	*	*	*	*	0.1	*	0.1	0.1	0.1	0.1
All Exclusions (Including interactions)	0.9	1.2	1.2	1.6	2.1	1.5	1.6	2.0	2.1	7.1
Deductions										
Student loan interest	0.1	0.3	0.6	0.8	0.2	0.4	0.4	0.1	0.1	*
Tuition and fees	*	*	*	0.1	0.1	0.1	0.1	*	*	0
All Deductions (Including interactions)	0.1	0.4	0.7	0.9	0.3	0.5	0.5	0.2	0.1	*
All Tax Expenditures (Including interactions)	6.3	7.9	8.2	8.5	4.6	7.0	5.4	3.8	2.8	7.5
Total Spending and Tax Expenditures (Including interactions)	30.5	23.0	17.4	14.2	7.9	17.3	9.6	7.0	4.7	8.5
Memorandum:										
Shares of Students	16	19	21	22	23	100	11	6	4	1

Source: Congressional Budget Office.

The cost of attendance includes published tuition and fees, room and board, and other expenses. Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people; percentiles (hundredths) contain approximately equal numbers of people as well. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares. Spending on student loan subsidies is the estimated lifetime cost of new loans originated in 2016, estimated using the fair-value method.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits.

EITC = earned income tax credit; FSEOG = Federal Supplemental Educational Opportunity Grants; * = between zero and 0.05 percent.

limits the amount that can be forgiven. Because those forgiveness plans are relatively new and do not apply to most loans issued before the programs were created, the majority of student loans are not yet eligible for forgiveness.²⁰

The net benefits of federal spending on student loans measured using the fair-value accounting method were concentrated among lower- and middle-income groups: Households in the lowest-income quintile received about one-quarter of the total benefits, and households in the highest quintile received 14 percent. Even though eligibility for subsidized Stafford loans is tied to family income, the overall benefits of student loans are much more widely distributed than the overall benefits of Pell grants. The income limits for subsidized loans are higher than those for Pell grants, and eligibility for unsubsidized loans is not limited by family income. Higher-income households are both less likely to need loans to cover the cost of attendance and more likely to receive unsubsidized loans with terms closer to those available from private lenders. (For additional distributional analysis of student loans, including tables by loan type and valuation method, see Appendix C.) Also, because students from higher-income households tend to attend more expensive schools, student loan benefits measured as a share of the costs of attendance were further skewed toward lower-income households. The present value of student loan benefits ranged from 4 percent of costs for households in the lowest-income quintile to 1 percent of costs for households in the highest-income quintile.

Education Benefits for Service Members and Veterans.

The federal government subsidizes higher education through benefits provided to eligible veterans (as well as to certain active-duty service members and their qualifying family members). Those benefits, which are generous compared with other forms of federal aid in support of higher education, are used as a recruiting tool by the military and may be considered deferred compensation for service members (similar to the health care and disability compensation provided through the Department of Veterans Affairs). The spending for those benefits is classified as mandatory.

Primarily provided through the Post-9/11 GI Bill, the education benefits for service members and veterans cover tuition and fees at public colleges and universities (paying the in-state rate) and at private schools (paying up to roughly \$22,000 per year) for up to 36 months. The benefits also include a housing allowance, which can exceed the tuition benefit: In New York City, for example, the housing allowance can top \$30,000 per academic year. Roughly 800,000 students received benefits through the program in 2016, at a cost to the government of about \$12 billion. In fiscal year 2016, veterans accounted for 72 percent of Post-9/11 GI Bill beneficiaries. About 48 percent of those recipients were pursuing undergraduate degrees and were age 34, on average, when they began using those benefits, CBO estimates. A declining portion of veterans' benefits (less than 20 percent) are still provided through the Montgomery GI Bill and other education programs.

Because the veterans' benefits for education are available without consideration of financial need, the Post-9/11 GI Bill's education benefits are distributed relatively evenly among households at different income levels. In 2016, CBO estimates, about 70 percent of the benefits (or \$9 billion) accrued to households in the lowest 60 percent of the income distribution, and about 30 percent (or \$3 billion) was received by households in the top 40 percent. Relative to the total costs of education for each income group, veterans' benefits covered about 4 percent of costs for all students in the lowest quintile and 1 percent of costs for students in the highest quintile. Although veterans' benefits cover most costs for the students receiving them, those recipients account for a small share of all students.

Federal Work-Study and Other Programs. The budgetary costs of other federal financial aid programs are significantly smaller than the costs of the programs already examined. The Federal Work-Study (FWS) program pays some or all of the wages for students who work part time while in school. In fiscal year 2015, approximately 600,000 students received benefits through the program, and the amount of wages paid by the federal government averaged roughly \$1,700 per student. Federal spending on the work-study program (which is discretionary) totaled almost \$1 billion in 2016.

Teacher Education Assistance for College and Higher Education (TEACH) grants are available to students who commit to teaching in high-need fields (such as

20. The first loan balances forgiven in the PSLF program were in October 2017. Because of growth in enrollment in IDR plans and the PSLF program, some analysts expect the costs of those programs to grow substantially as many more balances are forgiven. See Jason Delisle, *The Coming Public Service Loan Forgiveness Bonanza*, Evidence Speaks Reports, vol. 2, no. 2 (Brookings, September 2016), <https://tinyurl.com/j866p38>.

science and mathematics) and in certain schools serving low-income students. In 2016, roughly 31,000 students received TEACH grants of up to \$4,000, and federal spending on the grants totaled \$47 million. Iraq and Afghanistan Service Grants are available to college students who meet all of the eligibility requirements for Pell grants except for financial need and whose parent or guardian dies while serving in Iraq or Afghanistan. In 2016, about 100 students received grants of up to \$5,775, at a cost to the federal government of less than \$0.5 million.

The distribution of benefits from those programs was relatively even across the income scale. FWS benefits are nominally awarded on the basis of financial need. However, federal funding is allocated to schools through an institutional financing system that gives preference to schools that have participated in the program in the past, effectively limiting most of the benefits to students attending more expensive four-year universities.²¹ Because those participating schools have relatively high costs of attendance and schools have discretion in administering the funds to eligible students, even students from households with relatively high income often qualify. Both the TEACH grants and the Iraq and Afghanistan Service Grants are awarded without regard to financial need. In combination, work-study and other programs accounted for 0.2 percent of the costs of attendance in 2016; across quintiles, the range was from 0.3 percent of costs for households in the lowest-income quintile to 0.1 percent of costs for households in the highest quintile. Only a small share of students receive benefits through those programs, and the benefits are relatively small for each recipient.

Federal Tax Expenditures

Overall, the benefits of tax expenditures related to higher education are most concentrated among middle-income households. The distribution of those benefits differs greatly by type of tax expenditure, however. Tax deductions and exclusions from taxable income generally provide larger benefits to higher-income taxpayers than to other taxpayers, whereas tax credits generally provide bigger benefits to lower-income households.

Even though tax credits reduce the amount of taxes owed dollar for dollar, two features of many tax credits increase their value to lower-income taxpayers relative to those with higher income. First, credits are often designed to be less generous as income rises and may be phased out entirely when taxpayers' income exceeds a specified threshold. Second, some tax credits are refundable. If a credit is refundable, it also offsets tax liabilities, but eligible individuals and businesses receive at least a portion of the full amount of the credit even if they do not have any tax to offset. As a result, rather than owing taxes, eligible individuals and businesses receive money back from the government, on net.

Other tax preferences—such as exclusions, exemptions, and deductions—lessen taxable income, and their impact on tax liability generally depends on a taxpayer's marginal tax rate. As tax rates increase, so does the value of those provisions: For example, a taxpayer in the 10 percent tax bracket saves \$100 in taxes by reducing taxable income by \$1,000, but the same reduction in taxable income decreases the tax bill of a taxpayer in the 25 percent tax bracket by \$250. Although certain deductions and exclusions are phased out as taxpayers' income rises, such limitations generally occur at much higher income levels than is the case with tax credits.

When measured relative to education costs, the benefits of all tax expenditures combined are larger for lower-income households than for higher-income households. Those benefits are more dispersed across quintiles than the benefits from spending programs for education, though.

Tax Credits. The largest benefits provided by the tax code in support of higher education are the American Opportunity Tax Credit and the Lifetime Learning Credit, which defray the costs of higher education for students and their families. The two credits together cost the government about \$19 billion in 2016 and were claimed by about 11 million taxpayers, CBO estimates.²²

The AOTC is the larger of the two credits, providing up to \$2,500 each year per student for expenses incurred during the first four years of higher education. The amount of the credit is calculated as 100 percent of the

21. See David P. Smole, *The Campus-Based Financial Aid Programs: A Review and Analysis of the Allocation of Funds to Institutions and the Distribution of Aid to Students*, Report for Congress RL32775 (Congressional Research Service, February 18, 2005).

22. A taxpayer may claim an AOTC for each eligible student for whom he or she pays qualified educational expenses but may claim only one Lifetime Learning Credit (LLC) on a tax return in a given year. A taxpayer may claim an AOTC for one student and an LLC for another in the same year.

first \$2,000 and 25 percent of the next \$2,000 of qualified educational expenses. Up to 40 percent of the credit is refundable, so taxpayers who owe no income tax may still receive a refund of up to \$1,000 for the AOTC. In 2016, the AOTC was phased out for taxpayers who had adjusted gross income (AGI), with some modifications, between \$80,000 and \$90,000 (or between \$160,000 and \$180,000 for married taxpayers filing jointly).²³

The Lifetime Learning Credit provides up to \$2,000 per tax return (rather than per student) each year for qualified educational expenses. The amount of the credit is calculated as 20 percent of the first \$10,000 of eligible expenses, up to a maximum of \$2,000. Unlike the AOTC, there is no limit on the number of years in which the credit may be claimed and the credit is not limited to undergraduate education. However, the credit is not refundable. In 2016, the credit was phased out for taxpayers who had AGI (with some modifications) between \$55,000 and \$65,000 (or between \$111,000 and \$131,000 for married taxpayers filing jointly).

Taken together, the benefits of those two tax credits were spread broadly across the income distribution, CBO estimates, although the largest shares accrued to middle-income households. Households in the three middle quintiles received 79 percent (or \$15 billion) of the combined credits in 2016, and households in the lowest and highest quintiles each received roughly 10 percent (see Table 2 and Figure 5). That pattern is the result of several factors. Lower-income students tend to have smaller qualifying out-of-pocket expenses than students who come from middle-income and higher-income households. In addition, taxpayers without any income tax liability can receive only part of the AOTC as a refund, and taxpayers with income above the thresholds are ineligible for the credits. As a share of costs, the benefit was largest for middle-income households. In 2016, the credits equaled about 5 percent of costs for households in the middle three quintiles, 3 percent of costs for households in the lowest-income quintile, and 1 percent of costs for households in the highest quintile.

Preferential Treatment for Students. If they meet certain criteria, full-time students ages 19 to 23 may be treated

as qualifying children according to the tax code, allowing their parents to claim additional dependent exemptions and a larger earned income tax credit (EITC).

Dependent Exemption for Students Ages 19 Through 23. In 2016, taxpayers could take one personal exemption for themselves (or two for joint filers) and additional exemptions for each qualifying child under age 19 in their household if the child met certain residency and relationship tests. If the child was a full-time student, however, then he or she could be claimed as a dependent up to age 23. (Each exemption in 2016 reduced the amount of income subject to taxation by \$4,050.) Roughly 4.5 million taxpayers claimed full-time students ages 19 through 23 as dependents in 2016, CBO estimates, reducing the taxes they owed by about \$4 billion in total. (Tax legislation enacted in December 2017 repealed all personal exemptions—including those for qualifying students—from 2018 through 2025. During that period, taxpayers with adult children who are students will instead be eligible for a \$500 nonrefundable tax credit for each dependent. For more information, see Box 3.)

Because exemptions lower taxable income, their value generally increases as a taxpayer's marginal tax rate rises. However, two provisions limit the value of personal exemptions for some of the highest-income taxpayers. In 2016, personal exemptions were reduced as AGI rose above \$259,400 (or \$311,300 for joint filers) and no longer allowed when AGI exceeded \$381,900 (or \$433,800 for joint filers.) Moreover, taxpayers subject to the alternative minimum tax (AMT), who also tend to have higher incomes, are not allowed to claim personal exemptions.²⁴

The benefits of the personal exemptions for students ages 19 through 23—in both absolute dollars and relative to costs—accrued largely to households in the highest two quintiles in 2016. The benefits to the very highest-income taxpayers were constrained by the limitations on personal exemptions and the AMT. CBO estimates that, in 2016, households in the lowest 20 percent of the income distribution received just 5 percent of the benefit of the dependent exemption for students ages 19 through 23, whereas households in the fourth and

23. Adjusted gross income includes earnings and other taxable income (such as investment income), net of exclusions of some types of income (tax-exempt interest, for example) and certain adjustments.

24. The alternative minimum tax is similar to the regular income tax, but its calculation includes fewer exemptions, deductions, and rates. People who file individual income tax returns must calculate the tax owed under each system and pay the larger of the two amounts.

Box 3.

The Effects of the 2017 Tax Act on Federal Support for Higher Education

This report examines the distribution of federal support for students pursuing higher education in 2016. The recent enactment of Public Law 115-97, originally called the Tax Cuts and Jobs Act and referred to as the 2017 tax act here, will affect the size and distribution of the federal tax preferences provided in support of education. That legislation temporarily repealed personal exemptions and made other changes that will indirectly affect the tax expenditures analyzed in this report. Overall, the Congressional Budget Office estimates, those changes in tax law will reduce the size of tax expenditures for higher education and slightly shift the distribution of those expenditures among households.

The 2017 tax act fully repealed all personal exemptions for calendar years 2018 through 2025, effectively ending the benefit of claiming dependent exemptions for full-time students ages 19 through 23. However, the law created a new benefit—a \$500 tax credit for dependents not otherwise eligible for an expanded child tax credit—for taxpayers with students ages 19 through 23 who were previously eligible for the dependent exemption. On net, CBO estimates, that change will provide smaller benefits for most people than the exemption provided. In addition, because the benefit is structured as a tax credit (which directly reduces tax liability) instead of as an exemption (which reduces income subject to taxation), lower- and moderate-income households that owe taxes before the credit is applied will receive a larger share of the total benefit. In contrast, higher-income households tend to benefit from exemptions. By lessening taxable income, the value of exemptions generally increases as a taxpayer's marginal tax rate (the rate that applies to the last dollar of income) rises.

Other changes made by the 2017 tax act will indirectly affect the size and distribution of tax expenditures related to education. Most important, that legislation reduced the marginal tax rates faced by most taxpayers and increased the standard deduction for 2018 through 2025, decreasing tax liability for

many students and their families. Taxpayers whose tax liability is eliminated by the 2017 tax act will no longer be able to claim the Lifetime Learning Credit (which is not refundable) or the full value of the American Opportunity Tax Credit, or AOTC (which is only partially refundable). As a result, the tax expenditure for tax credits for education will decline, and lower-income households will receive a relatively smaller share of the credits, CBO estimates. In addition, the tax benefits provided as exclusions and deductions will be relatively less valuable to taxpayers facing lower marginal tax rates. The extent to which the distribution of those benefits among households changes will depend on the relative changes in tax rates for taxpayers at different points in the income distribution.

Over time, the size and distribution of the tax expenditures will be affected by a permanent change in how parameters of the tax code are adjusted (or indexed) to include the effects of inflation. Under the 2017 tax act, the chained consumer price index (CPI) replaces the consumer price index as the measure of inflation. CBO projects that the chained index will grow more slowly than the consumer price index because it takes into account the ways in which people alter their spending patterns when prices rise and effectively eliminates statistical bias related to the limited amount of price data used to calculate the CPI. Indexed tax parameters include the starting points for the tax brackets, as well as income limits for the Lifetime Learning Credit, the deduction for student loan interest, and the earned income tax credit. As a result, if income rises faster than prices, taxable income will be pushed into higher tax brackets, and deductions and exclusions will become more valuable. However, fewer taxpayers will qualify for tax preferences with indexed income limits because the limits will grow more slowly using the chained index than using the CPI. In contrast, the cost of the AOTC will increase relative to the cost calculated using the CPI; with higher tax liabilities, more of the credit will be nonrefundable, and thus taxpayers will not be limited by the cap on the refundable portion of the credit.

highest quintiles received 33 percent and 27 percent of the benefits, respectively. Relative to the cost of attendance, the exemption for full-time students ages 19 through 23 equaled about 1 percent of the cost of attendance for households outside the lowest quintile.

Higher Age Limit for EITC-Qualified Children Who Are Full-Time Students. The EITC is a refundable tax credit available to lower-income taxpayers with earned income. The value of the credit rises as earnings increase and then phases out. In 2016, the credit was not available to any taxpayers with AGI over \$47,955 (or \$53,505 for joint filers). Both the income cutoff and the value of the credit increase as the number of qualifying children rises (up to three). The maximum credit in 2016 was \$506 for taxpayers with no qualifying children, \$3,373 for those with one child, \$5,572 for those with two children, and \$6,269 for those with three or more children. Generally, qualifying children must be under age 19. However, the parents of full-time students ages 19 to 23 are allowed to treat those students as qualifying children for the purposes of calculating the EITC. The tax expenditure for that preferential treatment of adult students provided benefits to about 500,000 taxpayers and totaled about \$3 billion in 2016, CBO estimates.

More than half of the benefits of the special treatment of full-time students under the EITC accrued to households in the lowest quintile of the income distribution in 2016, CBO estimates; for those households, the tax expenditure equaled 2 percent of their costs of attendance. An additional 29 percent of the benefits was received by households in the second quintile, for whom the credit equaled 1 percent of their costs of attendance. In contrast, the highest two quintiles of households together received just 8 percent of the benefits, which, as a consequence, covered a very small portion of education costs among those households.

Exclusions. Various types of income related to higher education may be excluded from taxable income. Among the most valuable are the exclusions that apply to scholarships, fellowships, and other types of tuition assistance as well as to investment income from education savings plans.

Exclusion of Scholarship and Fellowship Income. Income received in the form of scholarships, fellowships, or grants that is used to pay for tuition or certain other allowable educational expenses is generally tax-free when

a student is pursuing a degree at an educational institution. The tax expenditures for that exclusion totaled about \$3.6 billion in 2016, CBO estimates.

Many scholarships, fellowships, and grants are not awarded on the basis of financial need, and the exclusion of those benefits from taxable income is not restricted by income. As a result, the benefits of this exclusion were largely concentrated at the top of the income distribution in 2016, CBO estimates. Households in the highest two quintiles received 58 percent of the benefits, whereas households in the lowest two income quintiles received about 25 percent of the benefits. Across all income quintiles, the exclusion offset less than 1 percent of the costs of attendance.

Exclusion of Employer-Provided Education Benefits and Tuition Reduction. When employers pay for certain postsecondary education costs for their employees, those employees do not pay either income or payroll taxes on up to \$5,250 of that compensation. Colleges and universities may also offer free or reduced tuition for employees and their families, the value of which is not included in employees' taxable income. The tax expenditures for that exclusion totaled about \$3 billion in 2016, CBO estimates, including the forgone payroll taxes on those benefits.

The exclusion for those employer-paid educational expenses is not limited by household income. To receive the benefits, though, at least one person in a household must be employed. As a result, the benefits of the exclusion are skewed toward the top of the income distribution. In 2016, CBO estimates, the lowest two quintiles received 30 percent of the benefits, and about half of the benefits went to households in the highest two quintiles. Those benefits equaled less than 1 percent of the costs of attendance across the income distribution.

Exclusion of Earnings of Education Savings Plans. Qualified tuition programs (also known as 529 plans) and Coverdell education savings accounts each offer similar tax advantages to help people save for higher education. Contributions to both types of plans are made with after-tax income, but the investment earnings that accrue in those accounts are not taxed either when earned or when withdrawn to pay for qualified educational expenses. Eligibility for 529 plans is not based on income, and annual contributions are limited only by the annual exclusion amounts imposed by the gift tax. In

2016, an individual could contribute up to \$14,000 to an account without incurring any gift tax, and a married couple could contribute up to \$28,000. Moreover, a special provision allows five years of contributions to be front-loaded, so a married couple could contribute up to \$140,000 to a single account in 2016 without any gift tax consequences, provided they did not make any further contributions in the subsequent four years. The requirements for Coverdell savings accounts are more restrictive: Participation is limited to taxpayers with AGI (with some modifications) below \$110,000 (or \$220,000 for joint filers), and annual contributions cannot exceed \$2,000 per child.²⁵ Together, tax expenditures for the exclusion of earnings of those plans totaled roughly \$1 billion in 2016, CBO estimates.

The benefits of the exclusion for earnings of those education savings plans accrue largely to higher-income taxpayers. As with all exclusions, the reduction in taxes for a given amount of excluded income is greater for taxpayers in higher tax brackets. Furthermore, higher-income taxpayers are more likely to have the resources to save in advance for higher education. In 2016, about 97 percent of the benefits accrued to households in the highest-income quintile, according to CBO's estimates, and about 47 percent accrued to the top 1 percent of households. However, because the total amount of assets in those types of plans is currently relatively small, the benefit for the exclusion from taxation on the earnings of those assets accounted for less than 1 percent of total education costs for households in the highest quintile.

Exclusion of Certain Discharged Student Loan Debt. The expected costs to the government of loan forgiveness are captured in the present-value estimates of the budgetary effects of the student loan programs (see page 12). However, an additional tax benefit is available to beneficiaries of a subset of student loan forgiveness programs. In general, when the government or a private creditor forgives a debt (including student loans), the amount of debt forgiven is considered taxable income in that year. However, forgiven debt from certain federal student loan programs is excluded from taxation, either because their enacting statute provides a specific exemption or because of a provision in the Internal Revenue Code

that excludes certain loans intended to encourage work in particular professions or for qualifying employers. In general, debts forgiven under IDR plans are not excluded from taxation, unlike debts forgiven under the PSLF program. In 2016, tax expenditures for the exclusion from income of certain forgiven student loan debt totaled about \$200 million, CBO estimates.

The tax benefits of that exclusion accrued disproportionately to higher-income taxpayers in 2016; households in the highest quintile received more than half of the total benefits, according to CBO's estimates. That is not surprising because the loan programs eligible for tax-exempt forgiveness of debt are tied to occupation and employer rather than to borrowers' ability to repay the amount owed. And the terms of the loan forgiveness ensure that the benefits go to people who are employed and are at least 5 to 10 years into their careers. Furthermore, many of the eligible loans currently being forgiven benefit people who have the potential to earn relatively high income. For example, the National Health Service Corps Loan Repayment Program benefits health care professionals, including doctors and nurses, who work in underserved areas but are expected to have relatively high earnings once they have completed their service and qualified for loan forgiveness. Although loans forgiven under the PSLF program are exempt from taxation, no loans were forgiven under that program until after 2016. Finally, as with all tax exclusions, the value of the exclusion rises for taxpayers in higher tax brackets. Because the total value of this exclusion is relatively small (\$200 million in 2016), the benefit accounted for a negligible share of the costs of education for households in the lowest three quintiles and just 0.1 percent for those in the highest quintile.

Deductions. The tax code provides several deductions in support of higher education, including ones for interest payments on student loans and for the costs of tuition and fees. The value of those deductions tends to increase with income because as taxpayers move into higher tax brackets, the forgone tax on a given amount of deducted income rises.

Deduction for Interest on Student Loans. Taxpayers may deduct up to \$2,500 per year in interest payments made on loans for higher education. When AGI (with some modifications) exceeds a specified threshold (in 2016, \$65,000 or \$130,000 for joint filers), the deduction begins to phase out. The deduction is not available to

25. Taxpayers may circumvent those income limits by first giving a child with a lower AGI a gift equal to the amount of the contribution and then having the child fund the Coverdell account.

taxpayers with income above specified levels (in 2016, \$80,000 or \$160,000 for joint filers). The tax expenditure for the deduction for interest paid in 2016 on student loans equaled about \$2 billion in that year, CBO estimates.

Up to the thresholds, the tax value of the deduction for interest on student loans initially rises with income, but the value declines and gradually drops to zero for higher-income taxpayers. Consequently, the benefits of the deduction accrued largely to households in the middle three income quintiles in 2016, CBO estimates. Households in the lowest quintile received just 2 percent of the benefit, and those in the highest quintile received 15 percent. Households in the third and fourth income quintiles received 30 percent and 39 percent of the total benefit, respectively. Relative to the costs of attendance, benefits were also highest for households in the third and fourth quintiles.

Deduction for Tuition and Fees. The tax expenditure for the deduction of up to \$4,000 toward tuition and fees

for postsecondary education equaled about \$300 million in 2016, CBO estimates. (Tuition and fees incurred by a student claiming an education tax credit are not deductible.) In 2016, the deduction was phased out for taxpayers with AGI (with some modifications) between \$65,000 and \$80,000 (or \$130,000 and \$160,000 for joint filers) and was not available to taxpayers with income above those thresholds. The deduction expired at the end of 2017.

Higher-income households received a larger subsidy per dollar deducted in 2016 than lower-income households received. Although the deduction for tuition and fees was restricted to taxpayers with income below certain thresholds, the benefit of this tax expenditure generally increased as income rose. According to CBO's estimates, in 2016 the benefit was greatest for households in the fourth quintile. The highest two quintiles received two-thirds of the total benefit, which accounted for 0.1 percent of the costs of attendance in those quintiles.

Data and Methods

This appendix describes the data and methods the Congressional Budget Office used to produce the estimates in this report. The methods used in this analysis are consistent with those used in recent CBO analyses. In general, the distributions of income and tax expenditures were estimated for calendar year 2010 using a combination of tax and survey data. The distribution of the benefits of spending programs was estimated for academic year 2012. The income measure and the dollar amounts of tax expenditures and spending programs were then scaled to match either administrative data or estimated totals for 2016. All dollar amounts presented in this report are indexed to 2016 dollars.

For some spending programs, CBO had information on the actual expenditures in calendar year 2016. For certain programs, such as student loans, CBO relied on estimates derived from various data sources. Estimates of tax expenditures for fiscal year 2016 were produced by the staff of the Joint Committee on Taxation, and CBO converted those estimates to calendar year values.

CBO used its microsimulation tax model to estimate the distribution of federal spending programs and tax expenditures across households in 2016. That model started with a public-use file of about 160,000 tax returns, which was augmented with survey data from various other sources, to create a representative sample of the population (including people who did not file a tax return).

Sources of Data

For this analysis, CBO relied on three primary sources of information about households' income, receipt of educational assistance, and federal tax liabilities:

- The Internal Revenue Service's Statistics of Income (SOI) public-use tax file for 2010,
- The Census Bureau's Current Population Survey (CPS) for March 2011, and
- The Department of Education's National Postsecondary Student Aid Study (NPSAS) for the 2011–2012 academic year.

Those data, which were the most recent available when this analysis began, measure income in the same period—calendar year 2010. The SOI file is a nationally representative sample of 160,000 individual income tax returns for 2010.¹ The Annual Social and Economic Supplement to the CPS contains detailed information for a large sample of households about their demographic characteristics when the survey was conducted and the income they received in the previous calendar year. The NPSAS is a nationally representative sample survey, conducted every four years, of undergraduate and graduate students enrolled in educational institutions that are eligible to participate in federal financial aid programs.² For the 2011–2012 academic year, the amount of federal financial aid received by students was determined on the basis of their 2011–2012 Free Application for Federal Student Aid (FAFSA), which used information from their 2010 income tax returns.³

Both the SOI and the CPS lack important information needed for allocating federal spending and taxes among households. The SOI contains information about people's receipt of only a few kinds of transfer payments (such as Social Security and unemployment compensation), and it does not include any information about

1. To protect the confidentiality of tax filers, the Internal Revenue Service removes their identifying information from the public-use tax file and applies statistical blurring techniques to the values reported for various components of income and taxes.
2. For further information about the NPSAS data, see Department of Education, National Center for Education Statistics, "2011–12 National Postsecondary Student Aid Study (NPSAS: 12), Student Financial Aid Estimates for 2011–12, First Look" (August 2013), <https://nces.ed.gov/pubs2013/2013165.pdf> (982 KB).
3. Beginning with the 2017–2018 FAFSA, income information will be drawn from tax returns from two years before. The 2015 tax returns are now used for the 2016–2017 FAFSA and the 2017–2018 FAFSA.

families who do not file federal tax returns. For its part, the CPS lacks representative data for high-income households, does not report capital gains, significantly under-reports other income from capital, and lacks information about the deductions and adjustments necessary to compute taxes. Furthermore, although the CPS contains more information about the demographic characteristics of households than the SOI data do, the CPS data may not reflect a household's tax-filing status and composition during the tax year.

To partially overcome the limitations of both data sources, CBO constructed tax units from the CPS household data and then statistically matched those CPS tax units with SOI tax units on the basis of their demographic characteristics and income. After all SOI and CPS tax units had been matched, CBO classified the remaining unmatched CPS tax units as representing people who did not file an income tax return. The resulting statistically matched tax unit file was then aggregated back to the household level.⁴ CBO extrapolated to 2016 the distribution of household income for calendar year 2010 by increasing all income by the rate of total income growth between those years.

Finally, CBO augmented those matched records with additional information on educational spending and costs. The NPSAS contains information on the receipt of various forms of financial aid from the federal government and other sources. It also contains information provided by schools on students' pre-aid cost of attendance (which includes tuition and fees before any discount offered by schools, room and board, and other nontuition expenses).⁵ CBO used data from the NPSAS to construct the distribution of financial aid and costs

of attendance by income. Costs of attendance from the 2011–2012 academic year were then extrapolated to 2016 values using the growth in tuition and fees and in room and board reported by schools to the Department of Education's National Center for Education Statistics in the Integrated Postsecondary Education Data System (IPEDS).

Measure of Household Income

This analysis uses income before transfers and taxes as the measure of household income when ranking households. That measure includes market income and social insurance benefits.

Market income includes the following components:

- *Labor income*: Cash wages and salaries, including those allocated by employees to 401(k) plans; employer-paid health insurance premiums (as measured by the CPS); the employer's share of Social Security, Medicare, and federal unemployment insurance payroll taxes; and the share of corporate income taxes borne by workers.⁶
- *Business income*: Net income from businesses and farms operated solely by their owners, partnership income, and income from S corporations.
- *Capital gains*: Profits realized from the sale of assets. Increases in the value of assets that have not been realized through sales are not included in market income.
- *Capital income (excluding capital gains)*: Taxable and tax-exempt interest, dividends paid by corporations (but not dividends from S corporations, which are considered part of business income), positive rental income, and the share of corporate income taxes borne by capital owners.

4. For a graphical presentation of the statistical matching algorithm, see Kevin Perese, "Statistically Matching Administrative Tax Data With Household Survey Data" (presentation at a Washington Center for Equitable Growth workshop on distributional national accounts, Washington, D.C., July 21, 2017), www.cbo.gov/publication/52914. For a much more detailed explanation of CBO's overall distributional methodology, see Appendix A in Kevin Perese, *CBO's New Framework for Analyzing the Effects of Means-Tested Transfers and Federal Taxes on the Distribution of Household Income*, Working Paper 2017-09 (Congressional Budget Office, December 2017), www.cbo.gov/publication/53345.

5. A student's actual expenditures may differ from the costs of attendance estimated by the school. In addition, the estimated cost of attendance is not reported for students who attend more than one educational institution during an academic year.

6. For a description of CBO's assumptions on the incidence of the corporate income tax, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2013* (June 2016), www.cbo.gov/publication/51361. CBO chose to allocate 25 percent of the burden of the corporate income tax to workers and assigned that amount to households in proportion to their labor income. CBO allocated the remaining 75 percent to owners of capital and assigned that tax to households in proportion to their income from interest, dividends, adjusted capital gains, and rents.

Table A-1.

Minimum Income Thresholds for Different Income Groups, by Household Size, 2016

Dollars

	Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile
One-Person Household	0	25,969	43,982	65,316	97,436
Two-Person Household	0	36,725	62,200	92,371	137,796
Four-Person Household	0	51,937	87,965	130,633	194,872

Source: Congressional Budget Office.

Income is measured before transfers and taxes. Income groups are created by ranking households by income, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people.

Household incomes are adjusted by dividing unadjusted household income by the square root of the household's size, including all members of the household (adults and children).

- *Other income:* Income received in retirement for past services and other sources of income.

Social insurance benefits consist of the following components:

- Social Security benefits (which consist of benefits from Old Age, Survivors, and Disability Insurance).
- Medicare health insurance benefits (measured as the average cost to the government of providing those benefits).
- Unemployment insurance benefits.
- Workers' compensation benefits.

Income Groups

CBO used the household as the unit of analysis for this report. A household consists of the people who share a housing unit, regardless of their relationship. Analyzing income and taxes on a household basis is most useful if households make joint economic decisions, which is probably true in most cases but not all (such as group houses). A household can consist of more than one taxpaying unit, such as a married couple living with a nondependent adult child. As a result, relatively higher-income households may receive means-tested benefits that are based on the income of one or more taxpaying units in the residence.

Households with identical income can differ in ways that affect their economic status. A larger household generally needs more income to support a given standard of living than a smaller one does. However, economies of scale in some types of consumption—housing, in particular—mean that two people generally do not need twice the income to live as well as one person who lives alone. Therefore, to rank households by their standard of living, household income can be adjusted by a factor that is between one (which would result only in household income and would not capture the greater needs of larger households) and the number of people in the household (which would produce household income per person and would not capture the benefits of shared consumption). CBO chose to adjust for household size by dividing household income by the square root of the number of people in the household, counting adults and children equally.

Households were then ranked by their adjusted income and grouped into quintiles (or fifths) of equal numbers of people. Because household sizes vary, different quintiles generally have slightly different numbers of households. In particular, the lowest quintile has somewhat fewer people than other quintiles because CBO excluded households with negative income, which would otherwise be part of that quintile, from the income groups. Such households are likely to contain self-employed people with business losses or people with large investment losses, whose patterns of income, taxes, and receipt of government transfers differ significantly from those of other low-income households. (Households with negative income are, however, included in the totals.) Table A-1 presents the range of income for households of selected different sizes in each category of gross income that CBO used in this analysis.

Allocation of Educational Spending to Households

The amount of federal spending for each program in 2016 was drawn from CBO's baseline estimates. CBO used estimates of monthly outlays to construct spending totals for each program during the calendar year. For each spending program, CBO distributed the benefit across the income distribution on the basis of information about recipients (using administrative or survey data from earlier calendar or academic years). The benefit allocated to each potential recipient is the average benefit based on the total benefits to the income group and the number of potentially eligible recipients in that group.

Family income used to determine eligibility for financial aid may differ from household income in the tax model used to rank households. Eligibility for need-based federal student aid is based on family income reported on the FAFSA. For dependent students, family income includes that of the student's parents.⁷ For independent students, only the income of the student and his or her spouse (if married) is used. Financial information from other members of the household is not included. In addition, financial aid awarded in 2016 is based on the 2015–2016 and 2016–2017 FAFSAs, which use income information from 2014 and 2015, respectively. Income information in the NPSAS and other data sources used to allocate educational spending in this analysis is taken from the FAFSA.

Pell and FSEOG Grants

The distribution of Pell grants by family income and the student's dependency status—dependent, independent with no dependents, or independent with his or her own dependents—is based on administrative data from the 2014–2015 award (or school) year.⁸ The average Pell grant benefit by dependent status and family income group was then assigned to individuals in the tax model with the same characteristics.⁹ Benefits from the Federal Supplemental Educational Opportunity Grants (FSEOG) were assigned to the same households as Pell grants, because both grant programs target the same population and Pell grant recipients are given priority in receiving FSEOG.

7. For education spending programs, dependent status is determined on the basis of a different set of criteria than for tax purposes. Generally, the Department of Education considers students to be independent if they are age 24 or older, are working toward a graduate degree, are married, have children, or are veterans.

8. Information on Pell grants comes from Department of Education, Office of Postsecondary Education, *The 2014–2015 Federal Pell Grant Program End-of-Year Report*, <https://go.usa.gov/xnfBA>.

9. Educational attainment is not included in the tax model. To assign Pell grants only to undergraduates, CBO calculated the share of the population over age 18 with at least a high school diploma and no bachelor's degree in each income group in the CPS and then assigned Pell grants to that share of the adult population in the tax model. That method was also used to impute benefits from the other education spending programs.

Federal Student Loans

This analysis includes the lifetime cost to the federal government of several types of student loans. Throughout most of this report, CBO used the fair-value approach in estimating the value of student loans. That accrual approach accounts up front for the total costs of a loan over its lifetime, from receipt through repayment. (For more information on that approach and alternative valuation methods, see Appendix C.) The federal government makes these types of student loans:

- Subsidized loans for undergraduate students,
- Unsubsidized loans for undergraduate students,
- Unsubsidized loans for graduate students,
- Graduate PLUS loans for graduate students, and
- PLUS loans for parents of dependent undergraduate students.¹⁰

The subsidy provided to each income group is based on the volume of new loan originations in 2016 using a 4 percent sample of the National Student Loan Data System (NSLDS). The subsidy assigned to each potential borrower in the tax model is based on income and loans for which the borrower appears eligible (on the basis of educational attainment) and his or her dependency status. Individuals with at least a high school diploma but no bachelor's degree can receive loans for undergraduates; individuals with a bachelor's degree but no graduate degree can receive loans for graduate students; and individuals who are parents of dependent undergraduate students can receive PLUS loans.

Educational Assistance for Veterans

The 2012 NPSAS contains information about the distribution of veterans' benefits received by students by income.¹¹ For this analysis, CBO distributed the total veterans' benefits reported in administrative data to all households in different income groups in proportion to the shares, reported on the NPSAS, of total benefits

10. Consolidation loans are not included because they do not represent new obligations.

11. The NPSAS also contains information on aid from much smaller programs run by the Department of Defense. The costs of those programs total less than 1 percent of the aid provided through the Department of Veterans Affairs.

received by households in each income group. Thus, every household is assigned a small share of veterans' benefits such that the total benefits received by each income group are consistent with both the administrative total and the distribution reported in the survey data.

Work-Study and Other Programs

Benefits from smaller spending programs were assigned in a similar fashion. The allocation of payments from the Federal Work-Study program was based on the income distribution of work-study participants calculated from the 2012 NPSAS. Benefits from TEACH and Iraq and Afghanistan Service Grants were distributed in proportion to the Work-Study payments.

Allocation of Tax Expenditures to Households

CBO used its tax microsimulation model to simulate the distribution of tax expenditures across tax units and based the total benefit on estimates published by the staff of the Joint Committee on Taxation (after converting the fiscal year values to calendar year values). Some tax expenditures are reported directly on tax returns and thus were available to CBO's tax model through the public-use SOI tax file. For other tax expenditures, CBO used additional data sources to allocate the benefits to taxpayers.

To distribute tax benefits from the exclusion of scholarship and fellowship income and from the exclusion of employer-provided education benefits and tuition reductions, CBO obtained from the NPSAS information about the income distribution of recipients of scholarships, fellowships, employer-provided education benefits, and tuition reductions. Those education benefits were then imputed onto the records in CBO's tax model, and taxes were recalculated with the additional income. The value of the tax expenditure was then calculated as the difference between the taxes paid under current law and the taxes that would have been paid if the education benefits were included in taxable income.

The excluded earnings accrued in qualified education savings plans (including 529 plans) were distributed to households in proportion to the assets held in those types of plans as reported by households in the 2013 Survey of Consumer Finances.

Interactions Among Provisions

Interactions may occur between various spending program rules and provisions of the tax code. Those interactions largely result from people's behavioral responses or because participation in a spending program or the receipt of a tax expenditure may affect people's eligibility for other types of assistance for higher education. CBO's combined estimates for spending programs and tax expenditures in this report implicitly include interactions among provisions because the spending and tax totals are measured with all other programs simultaneously in place.

Effects of Behavior

The amounts of spending and tax expenditures for each program separately do not represent the budgetary savings that would occur if any of those spending programs or tax expenditures were eliminated. That is because repealing a provision would change incentives and lead people to modify their behavior in ways that would amplify or diminish the impact of the repeal.

In some cases, the total savings to the government of repealing one program would exceed the cost of that program alone. For example, if the student loan programs were eliminated, some people who are unable to borrow from private lenders might choose to forgo college altogether. Such a decision would, in turn, make them ineligible for other education benefits they might have otherwise received, such as Pell grants or tax credits.

In other cases, the total budgetary savings to the government of eliminating a program would be less than the cost of that program. For example, if the education benefits for service members and veterans were repealed, some people who would have otherwise used those benefits to cover the cost of their education would instead qualify for Pell grants, student loans, and tax credits. The increases in costs for those other programs would partly offset the savings from eliminating the veterans' benefits.

Effects of Program Requirements

CBO's combined estimates for tax expenditures in this report include the interactions among provisions of tax law that would arise, automatically and without changes in taxpayers' behavior, if multiple tax expenditures were repealed at the same time. The estimated savings from eliminating a collection of tax expenditures may differ from the sum of the estimated savings from eliminating the separate expenditures.

For instance, eliminating a particular income tax exclusion would increase taxable income. Because of the structure of tax brackets and marginal rates (the rate that applies to the last dollar of income), some of that income would be pushed into tax brackets with higher marginal rates. Eliminating all income exclusions would increase taxable income by the sum of the individual increases (leaving aside other considerations) and subject more income to higher marginal rates. As a result, the budgetary effect of eliminating all exclusions would be larger than the sum of the effects of eliminating each exclusion separately.

Certain rules of spending programs also give rise to interactions between provisions. For example, students must choose how to allocate their Pell grant between qualified educational expenses and other (nonqualified) living expenses. The portion of a Pell grant used to pay for qualified expenses is not taxable but will crowd out eligibility for education-related tax expenditures. By contrast, the portion of a Pell grant used to pay for nonqualified living expenses will not crowd out eligibility for education-related tax expenditures but may result in part of the grant being treated as taxable income.¹² Although those interactions were not explicitly modeled in the same way that interactions among tax expenditures were modeled, the total costs of spending programs implicitly include interactions among provisions because those costs are measured with all other programs simultaneously in place.

Sensitivity to Alternative Assumptions

This analysis follows conventions used in CBO's past distributional analyses.¹³ For example, education-related benefits other than federal student loans are valued at their cost to the federal government in a given year. In addition, the value of those benefits is allocated to their direct recipients. And households are ranked by income adjusted by household size. If CBO had made other assumptions, the distribution of benefits would most likely differ.

12. For further details, see Internal Revenue Service, "Fact Sheet: Interaction of Pell Grants and Tax Credits: Students May Be Foregoing Tax Benefits by Mistake" (undated), <https://go.usa.gov/xnwJ4>.

13. For an example, see Congressional Budget Office, *The Distribution of Federal Spending and Taxes in 2006* (November 2013), www.cbo.gov/publication/44698.

Current-Year Accounting

In general, CBO used a current-year cash-accounting approach to record education benefits received by individuals and costs paid by the government in 2016. That method was applied to all the education-related tax expenditures and spending programs except for student loans, which take into account loan repayments borrowers make after 2016. If student loan benefits were included using a cash-accounting approach, then the cost of the government's subsidy would include the total loan amounts disbursed to students in 2016 and none of the future repayments on those loans. Under that approach, the total amount of loan originations in 2016 would be offset by the repayments received by the government in 2016 on all prior outstanding loans. Because the cash-accounting method for student loans would net loan disbursements for current students against loan repayments by prior students, the net amount would not be a meaningful measure of the benefit received by any particular cohort of students.

A lifetime view of the costs and benefits associated with tax expenditures and spending programs would include the benefits that accrue to individuals and the federal government in the future. For example, if subsidies for education resulted in higher future earnings for individuals, then the cost of the subsidies to the government would be reduced by the increased income tax liabilities eventually paid by those workers.

Educational assistance provided through spending programs and tax expenditures in the same calendar year may be associated with a student's educational expenses in different years. Students receive assistance through spending programs when they enroll in school, but they receive assistance through tax expenditures when they file their tax returns. In some cases, there can be a considerable lag between when educational expenses are incurred and when assistance is received. For example, tuition paid by students in 2015 is a qualified educational expense for the education tax credits claimed on their 2015 tax returns. But students generally do not receive those credits until 2016, when they file those returns.¹⁴ Tax expenditures in 2016 depend on a student's status and educational expenses incurred in prior years, but

14. Taxpayers could have adjusted their withholding in 2015 in order to effectively receive the credit during 2015. Adjustments to withholding, however, are complicated to compute and are likely to be imprecise.

benefits from spending programs in 2016 depend on a student's status in 2016.

Incidence of Education Benefits

This analysis allocates education-related benefits to people who claim the tax expenditures on their tax returns or who directly receive payments from the government (or for whom the government makes payments on their behalf). However, benefits can accrue to people or entities other than the direct recipients. Federal aid may supplement support provided by state governments or schools themselves, or it could replace support that would otherwise have been provided by those entities. If schools raise tuition or reduce scholarships and grants in response to more generous federal aid, for example, then the net cost to the student may not decline by as much as the amount of the government benefit; instead, schools will capture a portion of the benefit of the educational assistance.

Researchers have analyzed the extent to which the incidence of education benefits paid directly to students passes through to schools. Schools can change tuition and fees, which affects all students, or adjust the amount of institutional aid, which varies by student. Estimates of the incidence of benefits vary depending on the form of assistance (provided by the government or by the school) and the type of school. For example, the incentives of nonprofit private institutions or public colleges and their ability to set prices may differ from those of for-profit schools. Some research suggests that more-selective schools reduce the amount of institutional aid they provide to students when federal tax credits or Pell grants increase.¹⁵ States have also reduced their support for public universities in the presence of greater federal tax credits for students.¹⁶ Other research finds evidence that schools increase tuition in response to greater federal financial aid, although the magnitude of that response

varies.¹⁷ In the for-profit sector, researchers find, tuition varies depending on the type of school the student attends. Students who attend schools that meet certain criteria can qualify for federal assistance but pay substantially higher tuition than students who attend comparable programs at schools that do not meet those criteria.¹⁸

A broader perspective on the incidence of education benefits reduces those that accrue to the direct recipients, but it is uncertain how the distribution would change. That distribution would depend on how benefits that accrued to the schools and other indirect beneficiaries were ultimately distributed to households.

Income Classification of Households

As in other CBO distributional analyses, households in this analysis are classified on the basis of their income in a single year. That treatment mirrors how the individual income tax system measures income, providing taxpayers with only limited opportunities to transfer income and losses between years. Eligibility for spending programs that provide need-based postsecondary aid is also largely determined by annual income. Classifying households on the basis of income in a single year has several other advantages: The current level of income reflects people's resources and needs at that point in time; taxpayers and aid recipients may have limited ability to borrow because of uncertain future earnings; and basing eligibility on annual income is feasible to administer.

Two disadvantages are that a household's income may vary, and a single year may not accurately indicate overall financial well-being. A spell of unemployment may

15. See Nicholas Turner, "Who Benefits From Student Aid? The Economic Incidence of Tax-Based Federal Student Aid," *Economics of Education Review*, vol. 31, no. 4 (August 2012), pp. 463–481, <http://dx.doi.org/10.1016/j.econedurev.2011.12.008>; and Lesley J. Turner, *The Economic Incidence of Federal Student Grant Aid*, Working Paper (January 2017), <https://tinyurl.com/y9th39h3> (PDF, 855 KB).

16. See Bridget Terry Long, "The Impact of Federal Tax Credits for Higher Education Expenses," in Caroline M. Hoxby, ed., *College Choices: The Economics of Where to Go, When to Go, and How to Pay For It* (University of Chicago Press, 2004), pp. 101–168, www.nber.org/chapters/c10099.

17. See Larry D. Singell Jr. and Joe A. Stone, "For Whom the Pell Tolls: The Response of University Tuition to Federal Grants-in-Aid," *Economics of Education Review*, vol. 26, no. 3 (June 2007), pp. 285–295, <https://doi.org/10.1016/j.econedurev.2006.01.005>; David O. Lucca, Taylor Nadauld, and Karen Shen, *Credit Supply and the Rise in College Tuition: Evidence From the Expansion in Federal Student Aid Programs*, Staff Report No. 733 (Federal Reserve Bank of New York, July 2015, revised February 2017), <https://tinyurl.com/hus2s6c>; and Bradley R. Curs and Luciana Dar, *Does State Financial Aid Affect Institutional Aid? An Analysis of the Role of State Policy on Postsecondary Institutional Pricing Strategies*, Working Paper (July 2010), <http://dx.doi.org/10.2139/ssrn.1641489>.

18. See Stephanie Riegg Cellini and Claudia Goldin, "Does Federal Student Aid Raise Tuition? New Evidence on For-Profit Colleges," *American Economic Journal: Economic Policy*, vol. 6, no. 4 (November 2014), pp. 174–206, <http://dx.doi.org/10.1257/pol.6.4.174>.

temporarily lower income, for example, whereas the sale of a business may briefly raise it. Instead of current income, households could be classified on the basis of lifetime consumption or household wealth. Those measures may better reflect the total resources available to households over a longer period of time.

Ranking households by measures other than annual income would result in different distributions of education benefits. For example, if independent students have relatively low income while they are in school, a distribution of education-related benefits based on current income would be more concentrated among people in lower-income groups than a distribution based on lifetime consumption or wealth. By contrast, if the primary

earners in most households with college-age students are in their peak earnings years, then the distribution of benefits would be more concentrated among people in higher-income groups. Drawbacks to using lifetime consumption or wealth to rank households are that they are not easily measured and often require numerous assumptions about people's choices extending from school years through retirement. Furthermore, if educational attainment is correlated with lifetime consumption or wealth, then the receipt of education-related benefits would alter a household's ranking based on those measures.¹⁹

19. For more information on multiyear measures of tax rates, see Congressional Budget Office, *Effective Tax Rates: Comparing Annual and Multiyear Measures* (January 2005), www.cbo.gov/publication/16212.

Tax Expenditures for Higher Education That Were Not Included in This Analysis

Two tax preferences that are related to higher education were not included in this analysis: the tax expenditure for the deduction for charitable contributions to educational institutions, and the exclusion of interest on certain state and local qualified private activity bonds. The immediate recipients of those tax preferences are the donors who claim the deduction for charitable contributions on their tax returns and the investors who are able to exclude the tax-exempt interest from their adjusted gross income, although ultimately benefits may also accrue to educational institutions, issuers of tax-exempt bonds, and holders of taxable bonds. Students and their families may also indirectly benefit from those tax preferences. In this appendix, the Congressional Budget Office estimates the distribution of those tax expenditures among people who claim the tax expenditures on their tax returns—namely, households containing those donors and investors. (That approach is consistent with the analytical method used in the rest of this report.) In general, those households tend to have much higher income than most households with students currently enrolled in colleges and universities.

The tax preferences for charitable contributions and tax-exempt interest are distinguished from the other education-related tax expenditures in a second way. Both of those tax expenditures also reduce corporate income tax revenues, and the effects are included in the tax expenditure estimates. CBO allocates most corporate income taxes to households in proportion to their share of total capital income, which constitutes a larger share of income for households at the top of the distribution.¹

Consequently, the tax values of both of those tax expenditures were much more skewed to the highest-income households in 2016 than the other tax provisions examined in this report (see Figure B-1 and Table B-1).

Including those two tax preferences increases the share of tax expenditures received by households in the highest quintile (or fifth) of the population from 17 percent to 36 percent.

Deduction for Charitable Contributions to Educational Institutions

The largest tax deduction in support of higher education can be claimed solely by donors to educational institutions. The tax expenditure for the itemized deduction for charitable contributions equaled about \$60 billion in 2016, CBO estimates, roughly \$10 billion of which was directed to educational institutions of all levels. That deduction is available only to the roughly one-third of taxpayers who itemize their deductions rather than take the standard deduction. Lower-income taxpayers are much less likely than higher-income taxpayers to itemize or to have sufficient deductions for itemization to be more advantageous than the standard deduction.

Higher-income households tend to contribute a greater share of their income to qualified nonprofit organizations and to receive a larger subsidy per dollar contributed, according to CBO's estimates.² Consequently, the tax values of this tax expenditure were concentrated among those households in 2016: The highest quintile of the distribution received more than 80 percent of the tax expenditure, and the top 1 percentile received 40 percent.

Exclusion of Interest on State and Local Government Bonds Used to Fund Higher Education

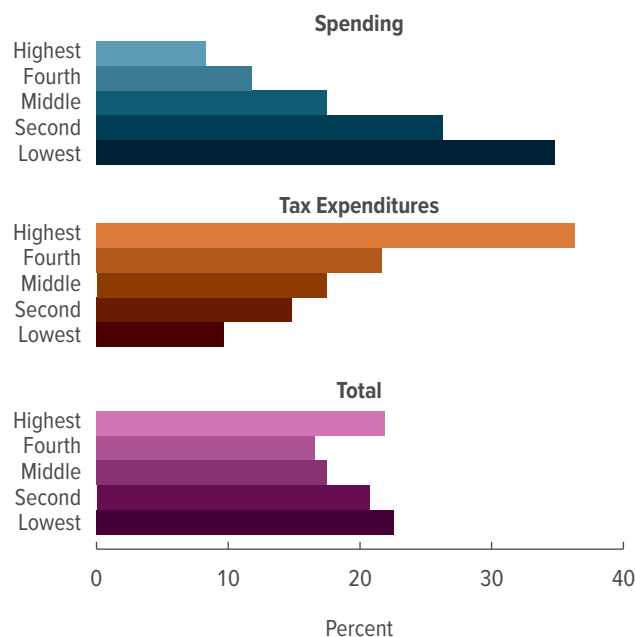
Interest on state and local bonds, some of which are issued to fund activities related to higher education, is generally exempt from taxation under the federal income

1. For more discussion of the incidence of the corporate income tax, see Congressional Budget Office, *The Distribution of Household Income and Federal Taxes, 2013* (June 2016), www.cbo.gov/publication/51361.

2. For more information on taxpayers' behavior with respect to charitable contributions, see Congressional Budget Office, *Options for Changing the Tax Treatment of Charitable Giving* (May 2011), www.cbo.gov/publication/41452.

Figure B-1.

Shares of Federal Spending and Tax Expenditures for Higher Education, Including the Deduction for Charitable Contributions and the Exclusion for Interest on State and Local Bonds, by Income Group, 2016



Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

Because estimates of spending programs and tax expenditures are based on people's behavior under current law, they do not reflect the amount by which spending would be reduced or revenue would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes, as well as the outlay portions of refundable tax credits.

tax. CBO estimates that tax expenditures for the exclusion of interest on state and local bonds used to fund nonprofit and qualified educational facilities (such as university buildings) and student loans totaled about \$4 billion in 2016.

The tax value of the exclusion for interest on state and local bonds accrued largely to higher-income households in 2016, CBO estimates. The exclusion is available to all taxpayers regardless of their income, but the reduction in taxes for a given amount of excluded income is higher for taxpayers in higher tax brackets. Furthermore, because the bonds are tax-exempt, states and localities can pay lower interest rates than those paid by issuers of taxable bonds. As a result, only people who gain the most value from the tax exemption tend to hold tax-exempt bonds, further concentrating the amount received from the exclusion among higher-income households. CBO estimates that, in 2016, households in the highest-income quintile received 91 percent of the value of the tax expenditure, and those in the top 1 percentile received 60 percent of the value.

The final beneficiaries of this exclusion are other investors and educational institutions. The availability of tax-exempt bonds has spillover effects that benefit holders of taxable bonds.³ Tax-exempt bonds are issued at lower interest rates than comparable taxable bonds, allowing educational institutions to obtain financing more inexpensively than they otherwise could. That differential also enables educational institutions to earn interest on investments that exceed the cost incurred from contemporaneous tax-exempt borrowing.⁴

3. For further information on the incidence of tax-exempt bonds, see Harvey Galper and others, *Who Benefits From Tax-Exempt Bonds?: An Application of the Theory of Tax Incidence*, Working Paper (Urban-Brookings Tax Policy Center, September 2013), <https://tinyurl.com/y8bsmgt5>.

4. For more information on how educational institutions benefit from tax-exempt bonds, see Congressional Budget Office, *Tax Arbitrage by Colleges and Universities* (April 2010), www.cbo.gov/publication/21198.

Table B-1.

Tax Expenditures for Higher Education That Were Not Included in This Analysis, by Income Before Transfers and Taxes, 2016

	Dollars (Billions)	Shares (Percent)					Percentiles Within the Highest Quintile			
		Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	81st– 90th	91st– 95th	96th– 99th	Top 1
Deduction for Charitable Contributions to Educational Institutions	10.3	*	1	4	11	83	13	11	18	40
Exclusion of Interest on State and Local Bonds Used for Higher Education	4.3	*	1	2	5	91	6	7	17	60

Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people; percentiles (hundredths) contain approximately equal numbers of people as well. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

Because estimates of tax expenditures are based on people's behavior under current law, they do not reflect the amount of revenue that would be raised if those provisions were eliminated and people adjusted their activities in response to the changes. The tax expenditures include both income and payroll taxes.

* = between zero and 0.5 percent.

Alternative Valuations of Student Loans

In 2016, the William D. Ford Federal Direct Loan Program issued \$95 billion in new loans directly to students and their families, under terms more favorable than those available in the private market. The distribution of the benefits of those loans across the income scale depends crucially on how they are valued. Throughout most of this report, the Congressional Budget Office used the fair-value approach in estimating the cost of student loans. The budget for fiscal year 2016 (S. Con. Res. 11) requires that any CBO cost estimate of a student loan provision also include an estimate calculated on a fair-value basis. That accrual approach accounts up front for the total cost of a loan over its lifetime, from receipt through repayment. Under that fair-value approach, the value of the loans to recipients depends on the sizes of the loans and the differences between the rates borrowers pay and the higher market interest rates that would otherwise apply.

This appendix compares the fair-value accrual valuation approach with two alternatives. Those alternatives are the total volume of new loans issued (excluding future repayments) and an accounting method specified in the Federal Credit Reform Act of 1990 (FCRA), which CBO is required to use for its baseline estimates of the costs of student loans.

Volume of New Loans Issued

An approach that measures the total value of loans disbursed in 2016 but does not account in any way for the future repayment of those loans illustrates the immediate financial assistance provided to students and their families to pay current educational expenses. Overall, the total amount of student loans disbursed in 2016 was distributed relatively evenly among households, with the lowest-income quintile (or fifth) of households borrowing only slightly more (23 percent of the total loan volume) than households in the highest-income quintile (17 percent of the total loan volume); see Table C-1. Although higher-income households tend to have more financial resources, students from those households are

more likely to attend more expensive schools than students from households with lower income.

The types of loans taken out by households at different points in the income distribution do differ, however. Lower-income households are more likely to receive subsidized loans for which eligibility is based on need, and higher-income households are more likely to take out unsubsidized and parent PLUS loans. The same interest rates apply to both subsidized loans and unsubsidized loans for undergraduates, but interest does not accrue on subsidized loans while borrowers are in school and during certain other periods. Moreover, subsidized loans are slightly less likely to be repaid in full than other loans, CBO estimates. The result is that subsidized loans, measured over their lifetime instead of by their initial volume, effectively cost the government more (or earn the government less) than other types of loans. In contrast, parent PLUS loans cost the government less (or earn the government more) than other types of loans because they have higher interest rates and fees than other federal student loans and they do not allow borrowers to use income-driven repayment plans. (Those plans base a borrower's repayment amounts on his or her income and forgive the remainder of a borrower's student loan debt after a certain repayment period.)

FCRA Accrual Approach

Compared with the fair-value approach, FCRA accounting rules provide a less comprehensive estimate of the financial subsidy received by students and their families. (FCRA may be more useful in projecting the average budgetary effects of loan programs, however.) Fair-value accounting provides a market-based evaluation of the cost of student loans, incorporating the portion of the risk correlated with economic conditions. The Treasury estimates that under FCRA accounting rules used to estimate the net lifetime cost of student loans, the federal government will *earn* \$10 billion on loans issued in 2016; in contrast, CBO estimates that the subsidy provided to students and their families through loans issued in that year will *cost* the federal government \$13 billion

Table C-1.

Federal Student Loans Under Alternative Valuation Methods, by Income Before Transfers and Taxes, 2016

	Dollars (Billions)	Shares (Percent)					Percentiles Within the Highest Quintile			
		Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	81st– 90th	91st– 95th	96th– 99th	Top 1
New Student Loans Disbursed										
Subsidized loans	22.5	27	22	20	18	11	7	3	1	*
Unsubsidized loans for undergraduate students	23.8	24	20	18	19	18	10	5	2	*
Unsubsidized loans for graduate students	26.8	24	22	20	19	15	8	4	3	1
Graduate PLUS loans	9.3	28	22	19	16	15	7	4	3	1
Parent PLUS loans	12.4	7	10	16	28	39	21	13	4	0
All	94.8	23	20	19	19	17	10	5	2	*
Student Loans Measured Using Fair Value	12.9	26	22	20	18	14	8	4	2	*
Student Loans Measured Using FCRA	-10.2	19	17	18	21	24	13	7	3	*

Source: Congressional Budget Office.

Income groups are created by ranking households by income before transfers and taxes, adjusted for household size. Quintiles (fifths) contain approximately equal numbers of people; percentiles (hundredths) contain approximately equal numbers of people as well. Households with negative income are excluded from the lowest income group but are included in the totals used to calculate shares.

FCRA = Federal Credit Reform Act; * = between zero and 0.5 percent.

using the fair-value accounting method. The ultimate cost, measured in 2016 dollars, depends on the discount rate that is used to translate future cash flows into current dollars. It also depends on the future behavior of borrowers, because the rates at which borrowers default on their loans or participate in programs that provide loan forgiveness would affect the programs' costs.

Using the FCRA accounting method, CBO estimates that the government's spending for the various student loan products was generally negative in 2016—meaning that over the lifetime of the loans, households repay the government more than the cost of the loans. (The exception is subsidized student loans, which still cost the federal government money even when its cash flow is valued using FCRA's discount rates.) The key reason is that under FCRA's rules, the present value of expected future cash flows is calculated by discounting them using the rates on Treasury securities with similar terms to maturity, which are considered risk-free rates of return. Because student loans carry higher interest rates than Treasury securities, the FCRA accounting method estimates that the government saves money on

the student loan program overall, even after accounting for loan defaults. Those default rates vary by loan type, the type of school the borrower attends, and the year the borrower is in school.

As a result, the distribution of student loans valued under the FCRA method shows the share of the costs borne by households when those costs are calculated as the difference between the interest rates households pay and the risk-free rate of return. In 2016, those costs were spread relatively evenly across the income distribution, according to CBO. Households in the highest two quintiles of the population bore 45 percent of the costs, and households in the lowest two income quintiles bore 37 percent of the costs. Parent PLUS loans, the majority of which are disbursed to households in the highest two quintiles, contribute to that pattern because they cost the government substantially less than other types of loans under the FCRA method. As a result, student loans are more evenly distributed across the income scale when measured under the FCRA method than under the fair-value method.



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About This Document

This Congressional Budget Office report was prepared at the request of the Chairman of the Senate Committee on Health, Education, Labor, and Pensions. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

Shannon Mok and Joshua Shakin wrote the report, with guidance from Janet Holtzblatt and John McClelland. Elizabeth Bass, William Carrington, Heidi Golding, Justin Humphrey, Leah Koestner, Kevin Perese, and Jeffrey Perry, all of CBO, provided useful comments, as did Jason Delisle of the American Enterprise Institute and Nicholas Turner of the Federal Reserve Board. (The assistance of external reviewers implies no responsibility for the final product, which rests solely with CBO.)

Wendy Edelberg and Jeffrey Kling reviewed the report, and Christine Bogusz edited it. Casey Labrack prepared the report for publication and took the photograph for the cover. The report is available on CBO's website (www.cbo.gov/publication/53732).

A handwritten signature in black ink, appearing to read "Keith Hall".

Keith Hall
Director
June 2018