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What Is the Price of College?

Total, Net, and Out-of-Pocket Prices by Type of Institution in 2011–12

AUTHORS

David Radwin
Christina Chang Wei
RTI International

PROJECT OFFICER

Tracy Hunt-White
National Center for Education Statistics

Statistics in Brief publications present descriptive data in tabular formats to provide useful information to a broad audience, including members of the general public. They address simple and topical issues and questions. They do not investigate more complex hypotheses, account for inter-relationships among variables, or support causal inferences. We encourage readers who are interested in more complex questions and in-depth analysis to explore other NCES resources, including publications, online data tools, and public- and restricted-use datasets. See nces.ed.gov and references noted in the body of this document for more information.

Americans believe in the value of a college education but worry about its price. Recent surveys show large majorities affirming the importance of postsecondary education but characterizing it as too expensive and sometimes financially out of reach (Hart Research Associates 2013; Lumina Foundation and Gallup 2013; Taylor et al. 2011). Paying for postsecondary education is an issue likely to affect most young people and their families directly at a time when 64 percent of ninth-graders nationally intend to earn at least an associate's degree (calculated from Ingels et al. 2011, p. 11) and 79 percent of their parents expect their ninth-graders to do so (calculated from LoGerfo, Christopher, and Flanagan 2011, p. 8).

To address these concerns, the Higher Education Opportunity Act of 2008 required the U.S. Department of Education to publish net prices, tuition and fees, and annual percentage changes in these values on the *College Affordability and Transparency Center* Website and to highlight the institutions within each sector with the highest and lowest values. It also required all colleges and universities eligible for Title IV federal aid to report average net prices and to create online calculators to enable prospective students and their families to estimate the net price of attendance.

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This Statistics in Brief describes three measures of the price of undergraduate education in the 2011–12 academic year: average total price of attendance (also known as the student budget), average net price of attendance after grants, and average out-of-pocket net price. It updates an earlier study of 2007–08 college prices (Wei 2010) and adds details and context to more recent publications describing 2011–12 prices (Horn and Paslov 2014b; Paslov and Skomsvold 2014; Simone et al. 2013) and trends in prices over time (Ginder and Sykes 2013; Horn and Paslov 2014a; Snyder and Dillow 2013, pp. 540–546). The findings in this report are drawn from data in the 2011–12 National Postsecondary Student Aid Study (NPSAS:12), a nationally representative study of students enrolled in postsecondary institutions in the 50 states and the District of Columbia.¹ NPSAS:12 covered all institutions participating in federal financial aid programs authorized under Title IV of the Higher Education Act, which include Pell Grants, Direct Subsidized and Unsubsidized Loans (also known as Stafford Loans), Direct PLUS Loans to parents of dependent undergraduates, and federal work-study.

Estimates are presented for students enrolled at four types of postsecondary institutions: public 2-year institutions, public 4-year institutions, private nonprofit 4-year institutions, and for-profit institutions at all levels (less-than-2-year, 2-year, and 4-year).² These types of institutions enrolled 89 percent of full-time, full-year undergraduates in 2011–12: public 2-year institutions enrolled 20 percent of these students,

public 4-year institutions enrolled 39 percent, private nonprofit 4-year institutions enrolled 19 percent, and for-profit institutions enrolled 11 percent (table 1). The remaining 11 percent of undergraduates were enrolled at other types of institutions or enrolled at more than one institution.³

Most undergraduates and their families actually pay less than the total price of

TABLE 1.

UNDERGRADUATE ENROLLMENT, TUITION, AND TOTAL PRICE for full-time, full-year undergraduates, by type of institution attended: 2011–12

Type of institution	Percentage distribution	Average tuition ¹	Average total price ¹
Total	100.0	\$12,700	\$26,400
Public 2-year	20.1	2,800	15,000
Public 4-year	39.1	9,300	23,200
For-profit ²	10.6	15,400	29,300
Private nonprofit 4-year	19.0	28,800	43,500
Other, or more than one institution	11.1	10,800	24,300

¹ Average tuition and average total price estimates are shown for those attending one institution only.

² Includes less-than-2-year, 2-year, and 4-year institutions.

NOTE: Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year.

Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

¹ Prior cycles of NPSAS included sampled institutions from Puerto Rico.

² To learn more about the types of institutions, go to the online college search tool, College Navigator at <http://nces.ed.gov/collegenavigator>. Among full-time undergraduates enrolled at for-profit institutions, there is relatively little variation by institution level in average tuition and fees, total price of attendance, or net price of attendance after grants (Ginder and Sykes 2013, tables 1a, 3a, 4a).

³ Skomsvold, Radford, and Berkner (2011) present detailed information on the educational outcomes of first-time students beginning at these types of institutions.

STUDY QUESTIONS

1 What are the average prices paid by full-time undergraduates at different types of institutions?

2 How do the components of average total and net prices of attendance vary by type of institution?

3 How do the net prices paid by full-time undergraduates vary by income?

attendance because students receive financial aid (Radwin et al. 2013). Therefore, this Statistics in Brief presents the average total price of attendance (tuition and nontuition expenses); the average net price of attendance after grants (total price of attendance minus all grants); and the average out-of-pocket net price (total price of attendance minus all aid, including loans, work-study, job training benefits, military tuition aid, and Veterans' benefits) by type of institution.

Full-Time, Full-Year Enrollment

All of the statistics presented here are based on undergraduates who enrolled full time for the full academic year (at least 9 months) at a single institution, referred to as “full time” throughout the remainder of this report. Such students face higher average tuition expenses and average total price of attendance than students who enrolled part time or for only part of the academic year (Paslov and Skomsvold 2014, pp. 9, 29). Overall, 38 percent of undergraduates enrolled full time in 2011–12. The proportion of students enrolled full time varies with type of institution, ranging

from 20 percent at public 2-year institutions to 32 percent at for-profit institutions, 53 percent at 4-year public institutions, and 63 percent at private nonprofit 4-year institutions (Skomsvold 2014, p. 26), so restricting the analyses to these students facilitates valid comparisons of prices.

All comparisons of estimates were tested for statistical significance using the Student's t statistic, and all differences cited are statistically significant at the $p < .05$ level.⁴ Comparisons that are not statistically significant at this level are characterized as not measurably different.

⁴No adjustments for multiple comparisons were made. The standard errors for the estimates can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>.

KEY FINDINGS

- Among undergraduates who were enrolled full time, public 2-year students had the lowest average total price of attendance (\$15,000) (figure 1). The average total price of attendance was \$23,200 at public 4-year institutions and \$29,300 at for-profit institutions. Undergraduates at private nonprofit 4-year institutions had the highest average total price of attendance (\$43,500).
- Most undergraduates enrolled full time in 2011–12 received grant aid from federal, state, institutional, or private sources (table 2). After grants were taken into account, undergraduates' net price averaged \$11,700 at public 2-year institutions, \$18,000 at public 4-year institutions, \$25,200 at for-profit institutions, and \$27,900 at private nonprofit 4-year institutions (figure 1).
- Many undergraduates also took out loans, participated in work-study, or received Veterans' benefits or other forms of aid to help pay the immediate expenses of postsecondary education (table 2). After accounting for all financial aid, the average out-of-pocket net price for full-time undergraduates was \$9,900 at public 2-year institutions, \$11,800 at public 4-year institutions, \$15,000 at for-profit institutions, and \$18,100 at private nonprofit institutions (figure 1).
- Aside from the total price of attendance, two critical factors determine the allocation of need-based aid: students' dependency status and family income.⁵ For dependent students in most quarters of the income distribution, public 2-year institutions had the lowest average net price of attendance, ranging from \$8,300 to \$14,000 (figure 5), and average out-of-pocket net price, ranging from \$7,500 to \$13,100 (figure 6). Independent students faced the lowest average net price of attendance at public 2-year institutions, ranging from \$11,400 to \$14,100 (figure 7), and the lowest average out-of-pocket net price at public 2-year and public 4-year institutions, ranging from \$8,600 to \$13,600 (figure 8). Dependent and independent students across the income distribution generally paid the highest average net price of attendance and average out-of-pocket net price at private nonprofit institutions and at for-profit institutions, with no measurable difference between the two types of institutions (figures 5–8).

⁵ Income consists of parents' income for dependent students. For independent students, it consists of the income of the student (and spouse if the student is married).

1

What are the average prices paid by full-time undergraduates at different types of institutions?

This Statistics in Brief provides three measures of the price of attending college for undergraduates: the average total price of attendance, the average net price of attendance after grants, and the average out-of-pocket net price of attendance after all aid.

Total Price of Attendance

The total price of attendance, also known as the “student budget,” consists primarily of tuition, fees, books, supplies, transportation, and living expenses. The distinction between tuition and fees is inconsistent across institutions (Archibald and Feldman 2011, p. 138), so the remainder of this report uses the term “tuition” to refer to all the fees charged by institutions for instruction and such other purposes as health insurance and student activities. At some institutions, tuition varies with such factors as field of study, type of degree or certificate, and class level (first year, second year, etc.) (Ehrenberg 2012, p. 211), and public institutions tend to charge lower tuition to state residents and students from states with reciprocal tuition agreements (NCES 2014a; Hopkins 2011). Institutions may also fix or “lock in” tuition for a certain number of years so that returning students are charged the same tuition they were charged in their first year even if the institutions raise tuition for new students (Supiano 2009). Total price of attendance is sometimes referred to as the “sticker price” because most undergraduates actually pay less after subtracting what

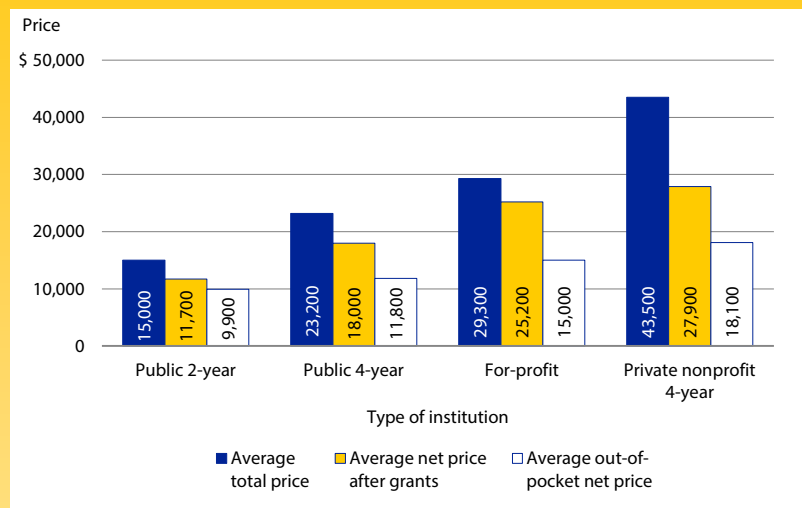
they receive in grants and other forms of financial aid. Students who enroll full time for the full academic year (9 or more months) have higher average tuition and average total price of attendance than do students who enroll part time or for part of the academic year (Paslov and Skomsvold 2014, pp. 9, 29). For that reason, the statistics described in this report

pertain to full-time, full-year undergraduates. In 2011–12, the average total price of attendance for undergraduates enrolled full time ranged from \$15,000 at public 2-year institutions and \$23,200 at public 4-year institutions to \$29,300 at for-profit institutions and \$43,500 at private nonprofit 4-year institutions (figure 1).

FIGURE 1.

UNDERGRADUATE EDUCATION PRICES

Average total price, net price, and out-of-pocket net price of attendance for full-time, full-year undergraduates, by type of institution attended: 2011–12



NOTE: Total price of attendance is the total budget at the institution for students who attended only one institution during the academic year. The budget includes room and board, books and supplies, transportation, and personal expenses. This value is used as students’ budgets for the purposes of awarding federal financial aid. In calculating the net price, all grant aid is subtracted from the total price of attendance. In calculating the out-of-pocket net price, all financial aid received, including Direct PLUS loans to parents of dependent undergraduates, is subtracted from the total price of attendance. Federal education tax benefits are not included in the calculation of net price or out-of-pocket net price. Averages include students who received no aid. Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

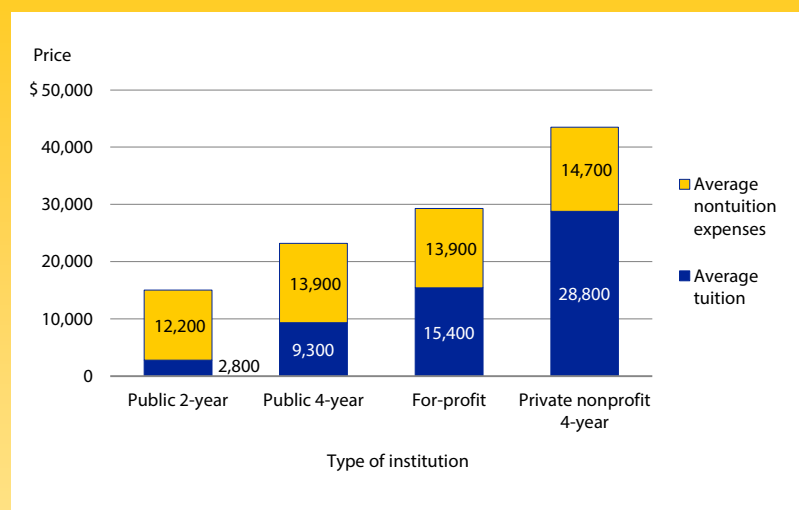
The tuition charged to undergraduates, as well as its contribution to the total price of attendance, varies among types of institutions. In 2011–12, public 2-year institutions charged \$2,800, on average, compared with \$9,300 at public 4-year institutions, \$15,400 at for-profit institutions, and \$28,800 at private nonprofit institutions (figure 2). Nontuition expenses, the other component of total price, are estimated by institutions and include the cost of

books, supplies, transportation, and living expenses. Consequently, the nontuition expenses that students incur depend on whether they live in campus housing, in off-campus housing, or with their parents or other family members, and differences in nontuition expenses by type of institution reflect the variation in the proportion of students with costlier and less costly living arrangements. Average room and board costs are

higher for full-time students living on campus at private nonprofit 4-year institutions (\$10,200) than for those living at for-profit institutions (\$9,500), public 4-year institutions (\$9,100), or public 2-year institutions (\$5,900) (calculated from Snyder and Dillow 2013, pp. 541, 543).⁶ A greater proportion (45 percent) of students attending private nonprofit 4-year institutions live on campus than students attending public 4-year institutions (23 percent), for-profit institutions (1 percent), or public 2-year institutions (1 percent) (Skomsvold 2014, p. 93). Undergraduates enrolled at public 2-year institutions had the lowest average nontuition expenses in 2011–12 (\$12,200) (figure 2). Undergraduates at public 4-year and for-profit institutions had the next highest nontuition expenses, each averaging \$13,900. Undergraduates at private nonprofit 4-year institutions had the highest average nontuition expenses (\$14,700).

FIGURE 2.

TUITION AND NONTUITION EXPENSES
Average tuition and nontuition expenses for full-time, full-year undergraduates, by type of institution attended: 2011–12



NOTE: Tuition includes all tuition and fees. Nontuition expenses include books and supplies, housing, meals, transportation, and other personal expenses. Average tuition and average total price estimates are shown for those attending one institution only. Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

Net Price After Grants

Most undergraduates in 2011–12 received financial aid, including grants and loans, to partially defray the price of attendance (table 2). Net price after grants, as defined in this report and in other recent NCES publications describing college prices, is the difference of total price of attendance minus all federal, state, institutional, and other grants.⁷ (For students who do not receive any grants, net price after grants

⁶ The average cost at for-profit institutions excludes less-than-2-year institutions, where less than 1 percent of students live on campus (Skomsvold 2014, p. 93).

⁷ Several alternative definitions of net price, which subtract other types of aid as well as grants, are represented as variables in NCES's web-based software application, PowerStats. For more information on how to use these variables, see "Run Your Own Analysis With DataLab" on the final page of this Statistics in Brief.

TABLE 2.

FINANCIAL AID for full-time, full-year undergraduates, by type of institution attended: 2011–12

Type of institution	Any aid ¹		Any grants ²		Any loans ³		Any work-study		Veterans' benefits	
	Percent received	Average amount	Percent received	Average amount	Percent received	Average amount	Percent received	Average amount	Percent received	Average amount
Total	84.4	\$15,500	72.4	\$9,200	56.4	\$8,100	11.9	\$2,200	3.6	\$10,100
Public 2-year	75.7	6,800	68.3	4,900	25.4	5,600	4.0	2,500	3.4	6,100
Public 4-year	83.9	13,600	68.5	7,600	59.8	7,600	8.8	2,300	2.6	9,400
For-profit ⁴	94.8	15,100	78.2	5,300	84.1	9,600	2.0	3,700	8.7	12,300
Private nonprofit 4-year	91.4	27,800	85.7	18,300	68.0	9,100	33.7	2,200	2.2	13,400

¹ Any aid includes grants, loans, work-study, job training benefits, Veterans' benefits, and Direct PLUS Loans to parents of dependent undergraduates.

² Grants includes grants, scholarships, or tuition waivers from federal, state, institutional, or private sources, including employers.

³ Loans include only loans to students and may be from any source, but exclude other forms of financing such as credit cards, home equity loans, loans from individuals, and Direct PLUS Loans to parents of dependent undergraduates.

⁴ Includes less-than-2-year, 2-year, and 4-year institutions.

NOTE: Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

equals the total price of attendance even for students who receive other types of aid such as loans and work-study.) In 2011–12, the average net price after grants for undergraduates enrolled full time was \$11,700 at public 2-year institutions and \$18,000 at public 4-year institutions (figure 1). At for-profit institutions, the average net price after grants was \$25,200. Private nonprofit 4-year institutions had the highest average net price after grants (\$27,900).

Out-of-Pocket Net Price

Out-of-pocket net price is the total price of attendance minus grants and all other types of financial aid, including student loans, Direct PLUS Loans

to parents of undergraduate students, work-study, Veterans' benefits, and other aid. Unlike grants, which are typically awarded without imposing any further obligations, other aid usually either must be repaid (in the case of loans) or must be earned through employment while enrolled (work-study) or prior employment (Veterans' benefits). (Financial aid does not include federal tax deductions and credits available to some undergraduates and their families.)

The out-of-pocket net price does not include the subsequent costs of repaying student loans and is, therefore, the immediate amount

that students and their families must pay at the time of attendance.

As with net price after grants, public 2-year institutions had the lowest average out-of-pocket net price for full-time students (\$9,900), followed by public 4-year institutions (\$11,800) (figure 1). The out-of-pocket net price at for-profit institutions was \$15,000, on average, and it was \$18,100 at private nonprofit 4-year institutions.

2

How do the components of average total and net prices of attendance vary by type of institution?

Differences in the average total price of attendance reflect variation in both tuition and such nontuition expenses as whether students live with their parents and whether students themselves are responsible for dependents. Differences in the average net price of attendance after grants and out-of-pocket net price of attendance roughly mirror differences in the average total price of attendance, but they also reflect the aid packages characteristically received by students at each type of institution.

Public 2-Year Institutions

In 2011–12, students enrolled full time at public 2-year institutions had the lowest average total price of attendance (\$15,000), average net price of attendance after grants (\$11,700), and average out-of-pocket net price (\$9,900), compared with students at all the other types of institutions discussed in this report (figure 1). Tuition was lower at public 2-year institutions, averaging \$2,800, compared with \$9,300 to \$28,800 at other types of institutions (figure 2). Nontuition expenses, the other component of total price of attendance, were also lowest at public 2-year institutions, averaging \$12,200. Public 2-year students lived with their parents at a higher rate than other undergraduates (Skomsvold 2014, p. 93), which may have been a less expensive option than living in separate housing.

Just over two-thirds of public 2-year students (68 percent) received grants in 2011–12, and one-quarter (25 percent) took out student loans, the smallest proportions of students at any type of institution described here (table 2). Four percent of public 2-year students participated in work-study, a smaller proportion than at public or private nonprofit 4-year institutions but a

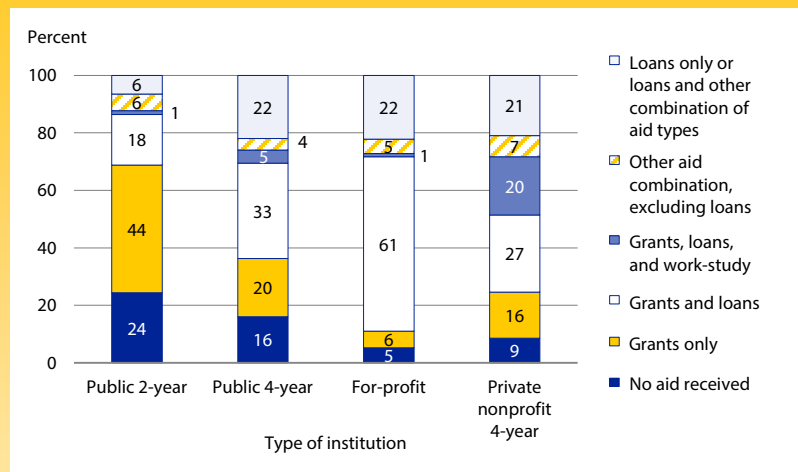
higher proportion than at for-profit institutions. Forty-four percent received grants only, the most common combination of aid types received by students at public 2-year institutions (figure 3).

Public 4-Year Institutions

After public 2-year institutions, public 4-year institutions had the next highest average total price of attendance (\$23,200),

FIGURE 3.

TYPE OF AID PACKAGE
Percentage of full-time, full-year undergraduates who received particular combinations of aid, by type of institution attended: 2011–12



NOTE: Grants includes grants, scholarships, or tuition waivers from federal, state, institutional, or private sources, including employers. Loans include only loans to students and may be from any source, but exclude other forms of financing such as credit cards, home equity loans, loans from individuals, and Direct PLUS Loans to parents of dependent undergraduates. Other aid includes job training benefits, Veterans' benefits, and Direct PLUS Loans to parents of dependent undergraduates. Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

average net price of attendance after grants (\$18,000), and average out-of-pocket net price (\$11,800) for undergraduates enrolled full time in 2011–12 (figure 1). These institutions charged an average of \$9,300 for tuition, more than public 2-year institutions and less than for-profit and nonprofit 4-year institutions (figure 2). Undergraduates at public 4-year institutions also spent more than public 2-year students on average nontuition expenses (\$13,900) and a higher proportion of public 4-year students lived in on-campus or off-campus housing than with their parents (Skomsvold 2014, p. 93).

Undergraduates at public 4-year institutions received financial aid to help defray the total price of attendance at a higher rate than their public 2-year counterparts, with 69 percent of public 4-year students receiving grants, 60 percent taking out student loans, and 9 percent participating in work-study (table 2). As a result, the average out-of-pocket net price for students at public 4-year institutions was only \$1,900 more than that for public 2-year students, even though the average total price of attendance at public 4-year institutions was \$8,200 higher than at public 2-year institutions (figure 1).

For-Profit Institutions

For-profit institutions are privately owned, profit-seeking enterprises that do not receive direct government appropriations or financial support from endowments and philanthropic gifts. They offer bachelor's degrees, associate's degrees, and certificates. Compared with other undergraduates, students at

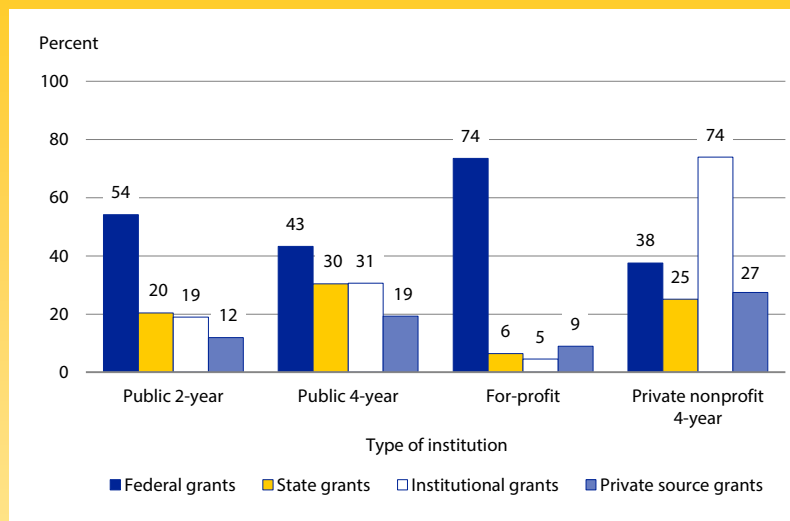
for-profit institutions were more often deemed independent for financial aid purposes and more often had their own dependents (Skomsvold 2014, pp. 64, 85), which added to their nontuition expenses. In 2011–12, the average total price of attendance for undergraduates enrolled full time at for-profit institutions (\$29,300) was higher than that at public 2-year institutions and public 4-year institutions but lower than that at private nonprofit 4-year institutions (figure 1).

Seventy-eight percent of for-profit students received grants to help offset their

total price of attendance in 2011–12, a higher proportion than either public 2-year students or public 4-year students (table 2). For-profit students received federal grants at a higher rate and received state, institutional, and private grants at a lower rate than other undergraduates (figure 4). Most for-profit students (61 percent) received both grants and loans but no other types of aid (figure 3). They paid an average net price of \$25,200 after all grants, more than public 2-year and public 4-year students but less than private nonprofit 4-year students (figure 1).

FIGURE 4.

SOURCES OF GRANT AID
Percentage of full-time, full-year undergraduates who received federal, state, institutional, and private grants, by type of institution attended: 2011–12



NOTE: Grants include grants, scholarships, or tuition waivers from federal, state, institutional, or private sources, including employers. Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

Benefits for military veterans and their qualified dependents were another important source of aid for this group: 9 percent of for-profit students received Veterans' benefits in 2011–12, compared with 2 to 3 percent of students enrolled in other types of institutions (table 2). Although not officially considered grants, Veterans' benefits are similar to grants in that they do not require repayment like loans or employment obligation like work-study, and they do reduce the out-of-pocket net price of postsecondary education. In 2011–12, the average out-of-pocket net price at for-profit institutions was \$15,000, which exceeded the average out-of-pocket net price at public 2-year institutions and public 4-year institutions but was below the average for private nonprofit 4-year institutions (figure 1).

Private Nonprofit 4-Year Institutions

Among students at the types of institutions described in this report, full-time students at private nonprofit 4-year

institutions had the highest average total price of attendance (\$43,500)—\$14,200 higher than that for students at for-profit institutions—which was a result of having both the highest average tuition (\$28,800) and the highest average nontuition expenses (\$14,700) (figures 1 and 2). Students at private nonprofit 4-year institutions had the largest proportion who lived in campus housing, which makes up a substantial portion of nontuition expenses (Skomsvold 2014, p. 93).

Students at private nonprofit 4-year institutions also had the highest proportion who received grants (86 percent) and received the largest average amount of grant aid per recipient (\$18,300) (table 2). Most students in these institutions (74 percent) received grants from the institutions themselves (figure 4). This grant aid helped reduce the average net price after grants to \$27,900, the highest net price after grants across all types of institutions (figure 1). While students

at private nonprofit 4-year institutions still paid more after grants than students at for-profit institutions, grant aid narrowed the gap from a \$14,200 difference in average total price of attendance to a \$2,700 difference in the average net price of attendance.

Loans, work-study, and other aid further reduced the average out-of-pocket net price paid by students at private nonprofit 4-year institutions to \$18,100 (figure 1). Work-study was a particularly prevalent form of aid among students at these institutions. One-third (34 percent) of private nonprofit 4-year students participated in work-study, compared with 2 to 9 percent among their counterparts in other types of institutions (table 2).

3 How do the net prices paid by full-time undergraduates vary by income?

Despite recent increases in the prevalence and proportion of merit-based aid (Woo and Choy 2011; Rampell 2013), most grants to undergraduates are awarded on the basis of financial need, as are loans and work-study. Need represents the difference between the total price of attendance, which varies among types of institutions, and the ability of students and their families to pay. The formulas used to estimate capacity to pay for postsecondary education, commonly known as the *expected family contribution* (EFC), are complex, but two key factors are whether the student is *financially dependent* for the purpose of financial aid determination and the student's family income.⁸ Overall, 69 percent of undergraduates enrolled full time in 2011–12 were financially dependent, including 22 percent of for-profit students, 58 percent of public 2-year students, 80 percent of public 4-year students, and 85 percent of private nonprofit 4-year students (NCES 2014b). Dependent students' EFC is based on their parents' income, whereas independent students' EFC is based on their own income plus their spouses' income if they are married.

Income Distribution by Dependency Status

To portray variations in postsecondary prices by income level, this section first separates dependent undergraduates from independent undergraduates and then divides each group into quarters of the income distribution: low-income, low middle-income, high middle-income, and high-income.

Dependent students are classified based on their parents' income, and independent students are classified based on their own income and that of their spouses if they are married.

The cutpoint values for the income distribution are calculated separately for dependency status. For dependent students, the low-income quarter included students whose family income was less than \$31,224, the low middle-income quarter included students whose family income was \$31,224–\$68,750, the high middle-income quarter included students whose family income was \$68,751–\$111,336, and the high-income quarter included students whose family income was more than \$111,336. For independent students, the low-income quarter included students whose income was

less than \$4,510, the low middle-income quarter included students whose income was \$4,510–\$14,489, the high middle-income quarter included students whose income was \$14,490–\$29,096, and the high-income quarter included students whose income was more than \$29,096.

Dependent Undergraduates

Because the amount of financial aid awarded varies not only by type of institution but also by dependency and financial need, the relative rankings of types of institutions by average net price after grants and out-of-pocket net price can differ by income level. The average net price after grants in 2011–12 for undergraduates enrolled full time was lowest at public 2-year institutions, from \$8,300 for the low-income quarter and \$11,300 for the low middle-income quarter to \$13,300 for the high middle-income quarter and \$14,000 for the high-income quarter of students (figure 5). The type of institution with the highest net price after grants varied by the student's family income. Whereas private nonprofit 4-year institutions had the highest average net price for undergraduates overall

⁸ Independent students are age 24 or over and students under 24 who are married, have dependents, are veterans or on active duty, are orphans or wards of the courts, are homeless or at risk of homelessness, or were determined to be independent by a financial aid officer using professional judgment. Other undergraduates under age 24 are considered to be dependent.

(\$27,900) (figure 1), dependent under-graduates in the bottom three-quarters of the income distribution paid the

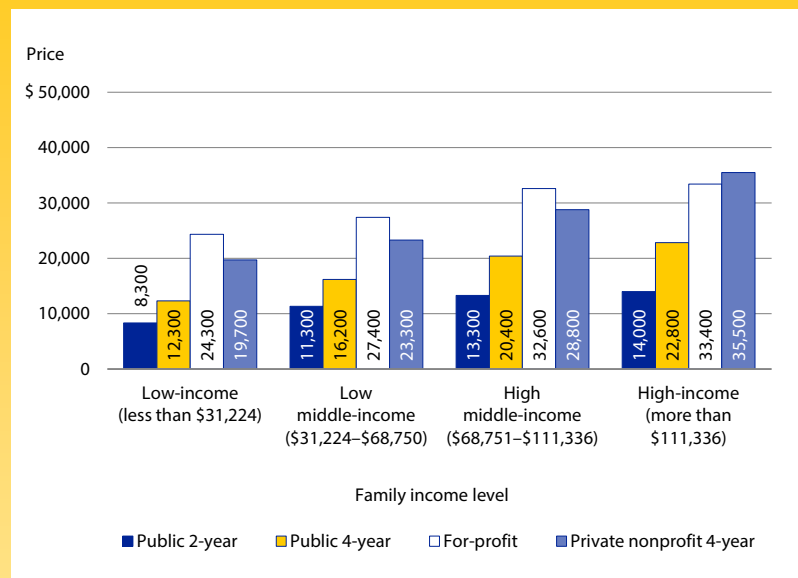
highest average net price at for-profit institutions, ranging from \$24,300 for the low-income quarter to \$27,400 for

the low middle-income quarter and \$32,600 for the high middle-income quarter (figure 5). Dependent students in the high-income quarter faced the highest average net price at private nonprofit 4-year institutions (\$35,500) and for-profit institutions (\$33,400), with no measurable difference (no difference that is statistically significant at the $p < .05$ level) between the two types of institutions (figure 5).

Within every type of institution, dependent undergraduates in the low middle-income quarter faced a higher average net price than dependent undergraduates in the low-income quarter, and those in the high middle-income quarter faced a higher average net price than those in the low middle-income quarter. Dependent undergraduates in the high-income quarter paid a higher average net price than undergraduates in the high middle-income quarter, except for dependent undergraduates at for-profit institutions, where there was no measurable difference in average net price between students in the high-income quarter and students in the high middle-income quarter.

FIGURE 5.

NET PRICE AFTER GRANTS BY FAMILY INCOME
Average net price after grants for full-time, full-year dependent undergraduates, by family income and type of institution attended: 2011–12



NOTE: The net price after grants is the total price of attending a postsecondary institution, including tuition and fees, books and supplies, housing, meals, transportation, and other personal expenses, minus all grant aid. Grants includes grants, scholarships, or tuition waivers from federal, state, institutional, or private sources, including employers. The net price after grants is calculated for all students, regardless of whether they received any grant aid. Family income consists of parents' annual income in 2010. Dollar cutoffs are based on the income distribution among all dependent undergraduates: Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

Overall, public 2-year students paid the lowest out-of-pocket net price (\$9,900) (figure 1). Among dependent undergraduates, those in the bottom quarter of the income distribution had the lowest average out-of-pocket net price at public 4-year institutions (\$7,100) and public 2-year institutions (\$7,500), with no measurable difference between the two groups (figure 6). Dependent undergraduates in the low middle-income quarter also had the lowest average out-of-pocket net price at public 4-year institutions (\$9,900) and public 2-year institutions (\$10,200), with no measurable difference between the two groups. For dependent undergraduates in the top two quarters of the income distribution, public 2-year students had the lowest average out-of-pocket net price at \$11,900 and \$13,100, respectively.

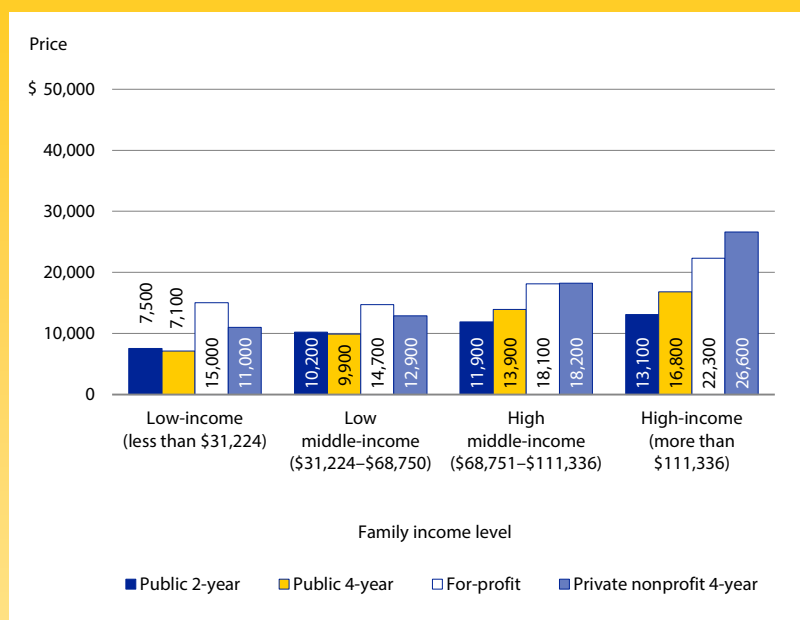
Although undergraduates in general faced the highest average out-of-pocket net price of \$18,100 at private nonprofit 4-year institutions (figure 1), dependent undergraduates in the low-income and low middle-income quarters paid the highest average out-of-pocket net price if they attended for-profit institutions (\$15,000 and \$14,700, respectively) (figure 6). Dependent undergraduates in the high middle-income quarter faced the highest average out-of-pocket net

price at private nonprofit 4-year institutions (\$18,200) and for-profit institutions (\$18,100), with no measurable difference between those at the two types of institutions. Finally,

among dependent undergraduates in the high-income quarter, those who attended private nonprofit 4-year institutions paid the highest average out-of-pocket net price (\$26,600).

FIGURE 6.

OUT-OF-POCKET NET PRICE BY FAMILY INCOME
Average out-of-pocket net price for full-time, full-year dependent undergraduates, by family income and type of institution attended: 2011–12



NOTE: The out-of-pocket net price is the total price of attending a postsecondary institution, including tuition and fees, books and supplies, housing, meals, transportation, and other personal expenses, minus all financial aid. Financial aid includes grants, student loans, Direct PLUS Loans to parents of dependent undergraduates, work-study, job training benefits, Veterans' benefits, and any other type of aid. The out-of-pocket net price is calculated for all students, regardless of whether they received any aid. Family income consists of parents' income in 2010. Dollar cutoffs are based on the income distribution among all dependent undergraduates: Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

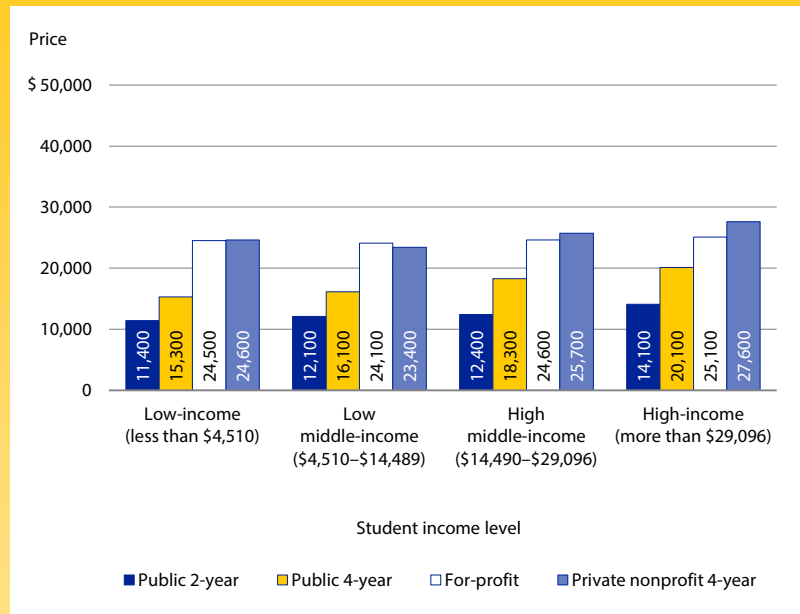
Independent Undergraduates

Like dependent undergraduates and undergraduates overall, independent undergraduates in every quarter of the income distribution who enrolled full time faced the lowest average net price after grants at public 2-year institutions, from \$11,400 for the low-income quarter and \$12,100 for the low middle-income quarter to \$12,400 for the high middle-income quarter and \$14,100 for the high-income quarter (figure 7).

Independent undergraduates across the income distribution faced the highest average net prices after grants at private nonprofit institutions (ranging from \$23,400 to \$27,600) and for-profit institutions (ranging from \$24,100 to \$25,100), with no measurable difference in the average net price after grants between the two types of institutions in any quarter of the income distribution.

FIGURE 7.

NET PRICE AFTER GRANTS BY STUDENT INCOME
Average net price after grants for full-time, full-year independent undergraduates, by student income and type of institution attended: 2011–12



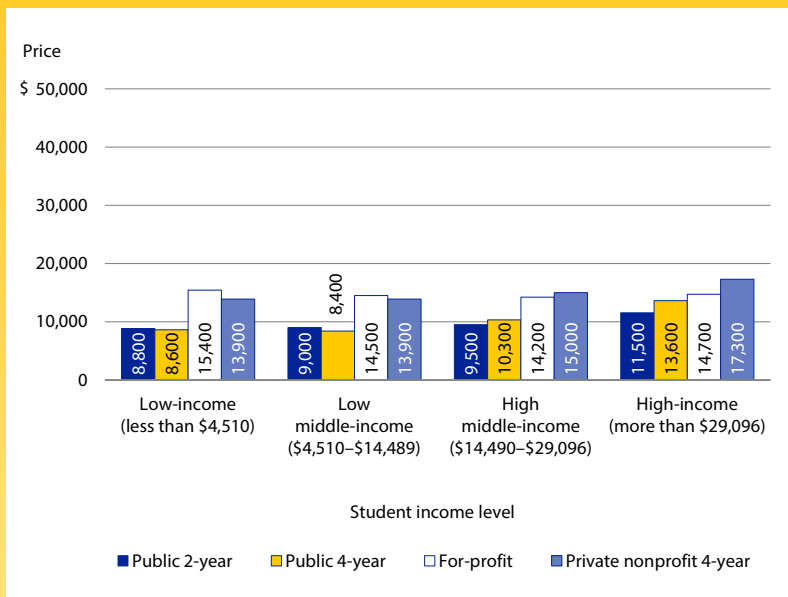
NOTE: The net price after grants is the total price of attending a postsecondary institution, including tuition and fees, books and supplies, housing, meals, transportation, and other personal expenses, minus all grant aid. Grants includes grants, scholarships, or tuition waivers from federal, state, institutional, or private sources, including employers. The net price after grants is calculated for all students, regardless of whether they received any grant aid. Student income includes the student's income (and the income of a spouse if the student is married) in 2010. Dollar cutoffs are based on the income distribution among all independent undergraduates: Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

Independent undergraduates in the bottom three-quarters of the income distribution had the lowest average out-of-pocket net price at public 2-year and public 4-year institutions, with no measurable difference between those at the two types of institutions in any of these three income quarters (figure 8). Students in the low-income quarter paid \$8,800 at public 2-year institutions and \$8,600 at public 4-year institutions, while those in the low middle-income group paid \$9,000 at public 2-year institutions and \$8,400 at public 4-year institutions and those in the high middle-income group paid \$9,500 at public 2-year institutions and \$10,300 at public 4-year institutions. Independent undergraduates in the high-income quarter had the lowest average out-of-pocket net price at public 2-year institutions (\$11,500).

FIGURE 8.

OUT-OF-POCKET NET PRICE BY STUDENT INCOME
Average out-of-pocket net price for full-time, full-year independent undergraduates, by student income and type of institution attended: 2011–12



NOTE: The out-of-pocket net price is the total price of attending a postsecondary institution, including tuition and fees, books and supplies, housing, meals, transportation, and other personal expenses, minus all financial aid. Financial aid includes grants, student loans, work-study, job training benefits, Veterans' benefits, and any other type of aid. The out-of-pocket net price is calculated for all students, regardless of whether they received any aid. Student income includes the student's income (and the income of a spouse if the student is married) in 2010. Dollar cutoffs are based on the income distribution among all independent undergraduates: Full-time, full-year students were enrolled in one postsecondary institution full time for 9 months or more. Full-time status for the purposes of financial aid eligibility was based on 12 credit hours, unless the awarding institution employed a different standard. Students attended for a full year if they were enrolled 9 or more months during the academic year. Months did not have to be contiguous and students did not have to be enrolled for a full month in order to be considered enrolled for that month. For-profit institutions include less-than-2-year, 2-year, and 4-year institutions. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states and the District of Columbia. Prior cycles of NPSAS included sampled institutions from Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

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<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>

More detailed information on prices of attendance for 2011–12 undergraduates can be found in Web Tables produced by the National Center for Education Statistics (NCES) using 2011–12 National Postsecondary Student Aid Study (NPSAS:12) data. These Web Tables are a comprehensive source of information on tuition and fees, total and net prices, and financial aid awarded by type of institution and by demographic and enrollment characteristics.

Web Tables—Undergraduate Financial Aid Estimates by Type of Institution in 2011–12 (NCES 2014-169)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014169>.

Web Tables—Student Financing of Undergraduate Education: 2011–12 (NCES 2015-173)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015173>.

Readers may also be interested in the following NCES products related to the topic of this Statistics in Brief:

2011–12 National Postsecondary Study Aid Study (NPSAS:12): Price Estimates for Attending Postsecondary Education Institutions (NCES 2014-166)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014166>.

2011–12 National Postsecondary Student Aid Study (NPSAS:12): Student Financial Aid Estimates for 2011–12 (NCES 2013-165)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013165>.

Data Point—Out-of-Pocket Net Price for College (NCES 2014-902)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014902>.

Web Tables—College Costs—A Decade of Change: 2002–03 to 2011–12 (NCES 2013-170)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013170>.

Web Tables—Trends in Student Financing of Undergraduate Education: Selected Years, 1995–96 to 2011–12 (NCES 2014-013)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014013>.

Web Tables—What Do Students Pay for College? (NCES 2012-263)
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012263>.

TECHNICAL NOTES

Survey Methodology

The estimates provided in this Statistics in Brief are based on data collected through the 2011–12 National Postsecondary Student Aid Study (NPSAS:12). NPSAS covers broad topics concerning student enrollment in postsecondary education and how students and their families finance their education. In 2012, students provided data through instruments administered over the Internet or by telephone. In addition to student responses, data were collected from the institutions that sampled students enrolled and from other relevant databases, including U.S. Department of Education records on student loan and grant programs and student financial aid applications.

NPSAS:12 is the eighth administration of NPSAS, which has been conducted every 3 to 4 years since the 1986–87 academic year. The NPSAS:12 target population includes students enrolled in Title IV postsecondary institutions in the United States at any time between July 1, 2011, and June 30, 2012.⁹ This population included about 23 million undergraduates and 4 million graduate students enrolled in postsecondary education.

⁹ The target population of students was limited to those enrolled in an academic program, at least one course for credit that could be applied toward an academic degree, or an occupational or vocational program requiring at least 3 months or 300 clock hours of instruction to receive a degree, certificate, or other formal award. The target population excluded students who were also enrolled in high school or a high school completion (e.g., GED preparation) program. Prior cycles of NPSAS included institutions from Puerto Rico.

VARIABLES USED

The variables used in this Statistics in Brief are listed below. Visit the NCES DataLab website <http://nces.ed.gov/datalab> to view detailed information on question wording for variables coming directly from an interview, how variables were constructed, and their sources. After selecting “Postsecondary Education” in the “Go To” box on the right, click on “Codebooks” and use the drop-down menus to select a codebook organized by subject or by variable name for the NPSAS year desired. The program files that generated the statistics presented in this report can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015165>.

Label	Name
Attendance status	ATTNSTAT
Family income for dependent students	PCTDEP
Federal grants	TFEDGRT
Income for independent students	PCTINDEP
Institutional grants	INGRTAMT
Net price of attendance (student budget minus all grants)	NETCST3
Nontuition expenses	BUDNONAJ
Out-of-pocket net price of attendance (student budget minus all aid)	NETCST1
Private grants	PRIVAID
State grants	STGTAMT
Total financial aid	TOTAID
Total grants	TOTGRT
Total price of attendance (student budget [attendance adjusted])	BUDGETAJ
Total student loans	TOTLOAN
Tuition and fees	TUITION2
Type of aid package	AIDTYPE
Type of institution	SECTOR4
Veterans' benefits	VETBEN
Work-study	TOTWKST

The institution sampling frame for NPSAS:12 was constructed from the 2008–09 and 2009–10 Institutional Characteristics, Fall Enrollment, and Completions files of the Integrated Postsecondary Education Data System (IPEDS). NPSAS:12 employed a two-stage sampling design, first selecting from among eligible institutions and, within sampled institutions, from individual students. Institutions were selected with probabilities proportional to a composite measure of size based on expected 2011–12 enrollment. With approximately 1,500 institutions participating in the study, the weighted institution unit response rate was 87 percent. Eligible sampled students were defined as study respondents if a subset of key data elements was available from any data source. Sample members also must have had valid data for at least one key variable from at least one other data source other than the U.S. Department of Education’s Central Processing System. Approximately 95,000 undergraduates and 16,000 graduate students were study respondents, and the weighted student unit response rate for undergraduates was 91 percent. Estimates were weighted to adjust for unequal probability of selection for the sample, for nonresponse, and for poststratification to known population totals.

Key variables used in this report include tuition (TUIION2), total price of attendance (BUDGETAJ), net price after grants (NETCST3), and out-of-pocket net price (NETCST1). These composite

variables are derived from multiple sources of data including IPEDS, the Free Application for Federal Student Aid (FAFSA), the National Student Loan Data System (NSLDS), institution records, and the student interview.

Two broad categories of error occur in estimates generated from surveys: sampling and nonsampling errors. Sampling errors occur when observations are based on samples rather than on entire populations. The standard error of a sample statistic is a measure of the variation due to sampling and indicates the precision of the statistic. The complex sampling design used in NPSAS:12 must be taken into account when calculating variance estimates such as standard errors. NCES’s web-based software application, PowerStats, which generated the estimates in this report, uses the balanced repeated replication (BRR) method to adjust variance estimation for the complex sample design (Wolter 1985).

Nonsampling errors can be attributed to several sources: incomplete information about all respondents (e.g., some students or institutions refused to participate, or students participated but answered only certain items); differences among respondents in question interpretation; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

For more information on NPSAS:12 methodology, see the *2011–12 National Postsecondary Student Aid Study (NPSAS:12) Data File Documentation* (NCES 2014-182) (<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014182>).

Response Rates

NCES Statistical Standard 4-4-1 states that “[a]ny survey stage of data collection with a unit or item response rate less than 85 percent must be evaluated for the potential magnitude of nonresponse bias before the data or any analysis using the data may be released” (U.S. Department of Education 2012). In the case of NPSAS:12, this means that nonresponse bias analysis could be required at any of three levels: institutions, study respondents, or items. Because the institutional and study respondent response rates were 88 and 91 percent, respectively, nonresponse bias analysis was not required at those levels.

The student interview response rate, however, was 69 percent, and therefore nonresponse bias analysis was required for those variables based in whole or in part on student interviews. In this Statistics in Brief, nine variables required nonresponse bias analysis: AIDTYPE (68 percent), BUDGETAJ (40 percent), BUDNONAJ (63 percent), NETCST1 (29 percent), NETCST3 (30 percent), PCTDEP (68 percent), PCTINDEP (60 percent), TOTAID (68 percent), and TUIION2 (63 percent). For each of these variables, nonresponse bias analyses were conducted to determine whether

respondents and nonrespondents differed on the following characteristics: institution sector, region, and total enrollment; student type, sampled as a first-time beginner (FTB), and age group; whether the student had FAFSA data, was a federal aid recipient, was a state aid recipient, was an institution aid recipient, was a Pell Grant recipient, or borrowed a Direct Loan; and the amount, if any, of a student's Pell Grant or Direct Loan (table A-1). Differences between respondents and nonrespondents on these variables were tested for statistical significance at the 5 percent level.

Nonresponse bias analyses of the variables in this report with response rates less than 85 percent indicated that respondents differed from nonrespondents on 67 to 75 percent of the characteristics analyzed, indicating that there may be bias in these estimates. Any bias due to nonresponse, however, is based upon responses prior to stochastic imputation in which missing data were replaced with valid data from the records of donor cases that matched the recipients on selected demographic, enrollment, institution, and financial aid related variables (Krotki, Black, and Creel 2005).¹⁰ The potential for bias in these estimates is tempered by two factors.

First, potential bias may have been reduced due to imputation. Because imputation procedures are designed

TABLE A-1. Summary of item-level nonresponse bias for all students at all institution types: 2011–12

Variable name	Pre-imputation			Difference in means or average percent difference across all categories pre- and post-imputation ¹
	Median percent relative bias across characteristics	Percentage of characteristics with significant bias	Characteristic with greatest significant bias	
AIDTYPE Type of aid package	6.46	67.35	Institution aid receipt unknown	.10
BUDGETAJ Total price of attendance	22.03	74.51	Whether had FAFSA data	.15
BUDNONAJ Nontuition expenses	10.88	72.55	Whether had FAFSA data	.14
NETCST1 Out-of-pocket net price	21.43	73.47	Whether had FAFSA data	.02
NETCST3 Net price after grants	22.42	74.00	Whether had FAFSA data	.12
PCTDEP Family income for dependent students	8.05	72.73	Whether had FAFSA data	.10
PCTINDEP Income for independent students	12.63	70.00	Whether had FAFSA data	.12
TOTAID Total financial aid	6.46	67.35	Institution aid receipt unknown	.07
TUITION2 Tuition and fees	7.11	70.59	Institution aid receipt unknown	.03

¹ Differences are expressed as proportions (Wine, Bryan, and Siegel 2013, table J-68). For example, the average difference in the percentages of students who received each type of aid package (AIDTYPE) was 10 percent (.10) and the mean of the total price of attendance (BUDGETAJ) varied by 15 percent (.15).

NOTE: FAFSA is the Free Application for Federal Student Aid. Relative bias is computed by dividing a variable's estimated bias for a given characteristic by the variable's mean. Relative bias is defined as significant if its difference from zero is statistically significant at $p < .05$.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2011–12 National Postsecondary Student Aid Study (NPSAS:12).

specifically to identify donors with similar characteristics to those with missing data, the imputation is assumed to reduce bias. While the level

of item-level bias before imputation is measurable, the same measurement cannot be made after imputation. Although the magnitude of any change

¹⁰ NCES Statistical Standard 4-1-2 requires all key variables to be imputed prior to data release (U.S. Department of Education 2012), so all the findings in this report are based on data after missing values have been imputed. Wine, Bryan, and Siegel (2013, pp. 156–157) offer additional details on the imputation process used for NPSAS:12.

in item-level bias cannot be determined, the item estimates before and after imputation were compared to determine whether the imputation changed the biased estimate as an indication of a possible reduction in bias.

For continuous variables, the difference between the mean before imputation and the mean after imputation was estimated. For categorical variables, the estimated difference was computed for each of the categories as the percentage of students in that category before imputation minus the percentage of students in that category after imputation. These estimated differences were tested for statistical significance at the 5 percent level. A significant difference in the item means after imputation implies a reduction in bias due to imputation. A nonsignificant difference suggests that imputation may not have reduced bias, that the sample size was too small to detect a significant difference, or that there was little bias to be reduced. The number in the first row, last column of table A-1 indicates that the average difference, before and after imputation, in the percentages of students who received each type of aid package was one percent. The number in the second row of the last column indicates that the mean of the total price of attendance varied by 15 percent between the pre- and postimputation estimates. Statistical tests of the differences between the

means or average percent differences across all categories before and after imputation for seven variables (AIDTYPE, BUDGETAJ, BUDNONAJ, NETCST3, PCTDEP, PCTINDEP, and TOTAID) were significant, indicating that the nonresponse bias was reduced through imputation.

Second, for some composite variables, the components of the variables from which the composites are constructed often constitute a very small proportion of the total variable, attenuating the potential bias introduced by nonresponse. For example, most of the components of TOTAID (total amount of all financial aid received) were obtained from federal databases and institutional records and have very high response rates. Some components of TOTAID, however, are types of financial aid that are often disbursed directly to students and not through institutions (e.g., employer aid and private loans). Because the primary source of information about such types of aid is the student interview, these variables were missing for interview nonrespondents.

In the case of missing information from the student interview, values were stochastically imputed and the imputed values used to construct the composite variables. In the example cited above, both employer aid and private loans were received by relatively few students

and were small components of the total. For example, 59 percent of all undergraduates received any grants (TOTGRT), a primary component of TOTAID, and the average among all undergraduates (including those who did not receive grants) was \$3,600. In comparison, 6 percent received any employer aid (EMPLYAM3), with an average among all undergraduates of \$200. Therefore, despite the low response rates of these components, any bias they contribute is likely to be minimal.

For more detailed information on nonresponse bias analysis and an overview of the survey methodology, see the *2011–12 National Postsecondary Student Aid Study (NPSAS:12) Data File Documentation* (NCES 2014-182) (<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014182>).

Statistical Procedures

Comparisons of means and proportions were tested using Student's *t* statistic. Differences between estimates were tested against the probability of a Type I error¹¹ or significance level. The statistical significance of each comparison was determined by calculating the Student's *t* value for the difference between each pair of means or proportions and comparing the *t* value with published tables of significance levels for two-tailed hypothesis testing. Student's *t* values were computed to test differences

¹¹ A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

between independent estimates using the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large t statistics may appear to merit special attention. This can be misleading because the magnitude of the t statistic is related

not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large (and thus possibly statistically significant) t statistic.

A second hazard in reporting statistical tests is the possibility that one can report a “false positive” or Type I error. Statistical tests are designed to limit the risk of this type of error using a value denoted by alpha. The alpha level of .05 was selected for findings in this

report and ensures that a difference of a certain magnitude or larger would be produced when there was no actual difference between the quantities in the underlying population no more than 1 time out of 20.¹² When analysts test hypotheses that show alpha values at the .05 level or smaller, they reject the null hypothesis that there is no difference between the two quantities. Failing to reject a null hypothesis (i.e., detect a difference), however, does not imply the values are the same or equivalent.

¹² No adjustments were made for multiple comparisons.

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- PERCENTAGE DISTRIBUTION**: General percentage of a population in each category of a variable, displayed in columns. (Icon: 100% with arrows)
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