

STAFF WORKING PAPERS

TRENDS IN COLLEGE TUITION AND
STUDENT AID SINCE 1970

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NOTES

For simplicity, this paper refers to tuition and required fees as tuition; all data on average tuition include required fees. In addition, all references to net prices paid by students refer to prices paid by students and their families.

Years refer to the fall of the school year. For example, 1970 refers to the 1970-1971 school year.

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SUMMARY

Students, parents, policymakers, and others have focused considerable attention in recent years on the rising price of attending college and on how these higher prices affect the ability of families to pay for college. Most of these discussions have examined the prices charged by institutions of higher education rather than the prices actually paid by students and their families. The prices that students pay for college equal the prices charged by institutions minus student financial aid--referred to here as "net prices." This paper analyzes changes in tuition and fees charged by institutions of higher education as well as changes in tuition and fees paid by students and their families, after adjusting for student financial aid.

Between 1970 and 1986, average tuition and required fees for full-time-equivalent undergraduate students increased substantially in real terms--that is, when adjusted for inflation. Average undergraduate tuition fell slightly in real terms during the 1970s but increased substantially in the 1980s. If the distribution of student enrollments had not shifted during this period--especially if the increase in the proportion of students attending two-year institutions had not occurred--average tuition would have risen more rapidly between 1970 and 1986 than it actually did.

The growth pattern of average student aid for full-time-equivalent students was quite different from that of tuition. Between 1970 and 1980 when average tuition declined in real terms, real student aid--from all federal, state, and institutional sources--increased. Between 1980 and 1986 when tuition rose more quickly than inflation, real student aid declined. As a result, in the 1970s the average real net price paid by students and their families declined by a greater percentage than real tuition. Between 1980 and 1986, however, the average net price paid by students and their families grew more rapidly than tuition.

When federal aid that is available only to specific groups of students--Social Security student benefits and Veterans' education benefits--is excluded, the pattern of growth in financial aid is somewhat different than when all aid is included. Average aid that is generally available also rose in real terms throughout the 1970s; between 1980 and 1986, however, this aid increased further, whereas all aid declined. As a result, when only generally available aid is considered, the average real net price paid by students and their families also fell more rapidly than real tuition during the 1970s. In the 1980s, however, the average net price grew at roughly the same rate in real terms as average tuition. Under all definitions of aid, both average net price paid by students and their families and average tuition charged by institutions were greater in real terms in 1986 than in 1970.

INTRODUCTION

This paper examines how certain costs of attending college have changed since 1970. In particular, it analyzes changes in the average tuition and fees charged by institutions of higher education and the average tuition and fees paid by students and their families, after accounting for financial aid. The price that students actually pay to attend college--stated tuition and fees minus student financial aid--is referred to here as "net price." Because shifts in the proportions of students attending institutions with different charges affect the average college price, the effects of such changes on the trends in average tuition charged by institutions also are examined.

The analysis presented here does not examine changes in the actual costs to the institutions of providing the education. College tuition is substantially less than the costs of providing the education because part of these costs are met through other funding sources, such as federal aid, state appropriations, and endowments. Furthermore, changes in tuition and related fees do not necessarily reflect changes in the total costs of education, and vice versa. The paper also does not examine the opportunity cost of education--that is, the earnings students could have obtained if they had not attended college but instead had worked during those years.

This analysis focuses on average college tuition and fees and the average net price paid by students. Because averages do not necessarily indicate the experience of subgroups or individuals, however, some students face tuitions and net prices that are quite different from those presented in this paper. For example, the net price for students who do not receive any financial aid is the same as the institution's tuition, whereas the net price for students who receive large amounts of aid is below the tuition at their institution.

College tuition and student financial aid generally are measured here in real terms--that is, after adjusting for inflation. Focusing on real rather than nominal prices indicates the extent to which the price of college has changed relative to the average price of goods and services in the economy. If college tuition increases at the same rate as inflation, then it remains constant in real terms; when tuition falls or increases less rapidly than inflation, the real price declines; and when tuition rises more rapidly than inflation, the real price increases.

A commonly used index for adjusting for inflation is the Consumer Price Index (CPI), which reflects changes in living costs. In the late 1970s, problems arose with the way the CPI measured housing costs, which resulted in overestimates of the changes in living costs. In 1983, the Bureau of Labor Statistics adopted a revised method, known as the CPI-X1, to calculate the CPI. Although most analyses of changes in college tuition use the unadjusted CPI

to adjust prices for inflation during the years before 1983, this analysis uses the CPI-X1 for the entire 1970-1986 period.^{1/}

TRENDS IN COLLEGE TUITIONS SINCE 1970

Between 1970 and 1986, the average tuition and required fees for full-time-equivalent (FTE) undergraduate students increased from \$690 to \$2,310, more than tripling in nominal terms and increasing by 28 percent in real terms (see Table 1).^{2/} The average undergraduate tuition fell in real terms during the 1970s but increased substantially in the 1980s (see Figure 1). In particular, the average real tuition in 1980 was 4 percent below the 1970 average, whereas the average real tuition in 1986 was 33 percent above the 1980 average.

Although using the unadjusted CPI shows a similar trend in tuition, it would indicate that real average tuition declined more sharply in the late 1970s than this study indicates and that real tuition increased by less over the entire period than is reported here. For example, the average tuition in 1980 was 10 percent below the average in 1970 using the unadjusted CPI, compared with 4 percent below using the CPI-X1. The average tuition in 1986 was 19 percent higher than in 1970 using the CPI and 28 percent higher using the CPI-X1. During the 1980s, however, the rate of growth in real tuition was roughly the same under either assumption because the method used to calculate the CPI-X1 was adopted for the CPI beginning in 1983.

Changes in average tuition since 1970 result both from changes in tuition charges as such and from changes in the proportions of students attending more expensive and less expensive institutions. The remainder of this section first examines changes in average tuition for the public and private sectors separately and for different types of institutions within each sector, including the effects of changes in both tuition and enrollment. It then analyzes the extent to which changes in the distribution of college enroll-

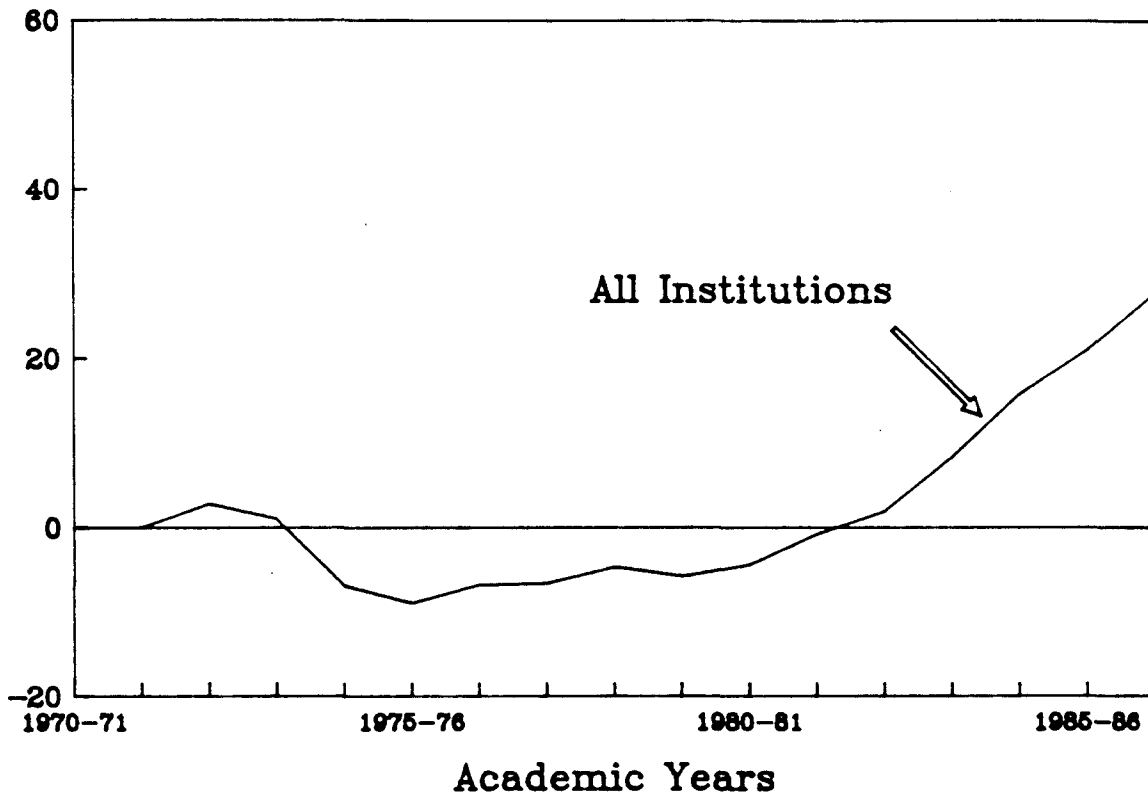
1. For a further discussion of the differences between the two measures, see Congressional Budget Office, Trends in Family Income: 1970-1986 (February 1988), pp. 6-9.
2. Using the number of full-time-equivalent students adjusts for differences across institutions in the proportion of students attending college on a part-time basis, because part-time students only pay a portion of the full-time tuition and fees. Because students attending two-year institutions are more likely to enroll part-time than are students at four-year institutions, the ratio of students to FTEs is higher at two-year institutions than at four-year institutions.

TABLE 1. AVERAGE UNDERGRADUATE TUITION BY SECTOR AND TYPE OF INSTITUTION, FALL 1970 AND 1986

Type of Institution	1970		1986	Percentage Increase Between 1970 and 1986	
	(Nominal dollars)	(1986 dollars)	(1986 dollars)	Nominal Value	Real Value
Public Institutions					
University	480	1,260	1,650	245	31
Other four-year	330	870	1,250	276	43
Two-year	190	490	660	253	34
Total	350	920	1,110	215	20
Private Institutions					
University	1,980	5,210	8,120	310	56
Other four-year	1,600	4,220	6,170	285	46
Two-year	1,110	2,920	3,680	232	26
Total	1,680	4,430	6,320	275	43
All Institutions	690	1,810	2,310	236	28

SOURCE: Congressional Budget Office calculations based on data from the Department of Education, using the CPI-XI to adjust for inflation.

FIGURE 1. LEVEL OF AVERAGE REAL TUITION AND FEES, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education.

NOTE: Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

ments among different kinds of institutions contributed to changes in the overall average college tuition.

Changes by Sector and Type of Institution

Examining college tuition by sector (public and private) and by type of institution within each sector (universities, other four-year colleges, and two-year institutions) helps to highlight some of the variation in tuition that is masked by focusing on overall averages, because average tuition for each category is quite different. It does not address, however, the variations in tuitions that occur within these categories of institutions.

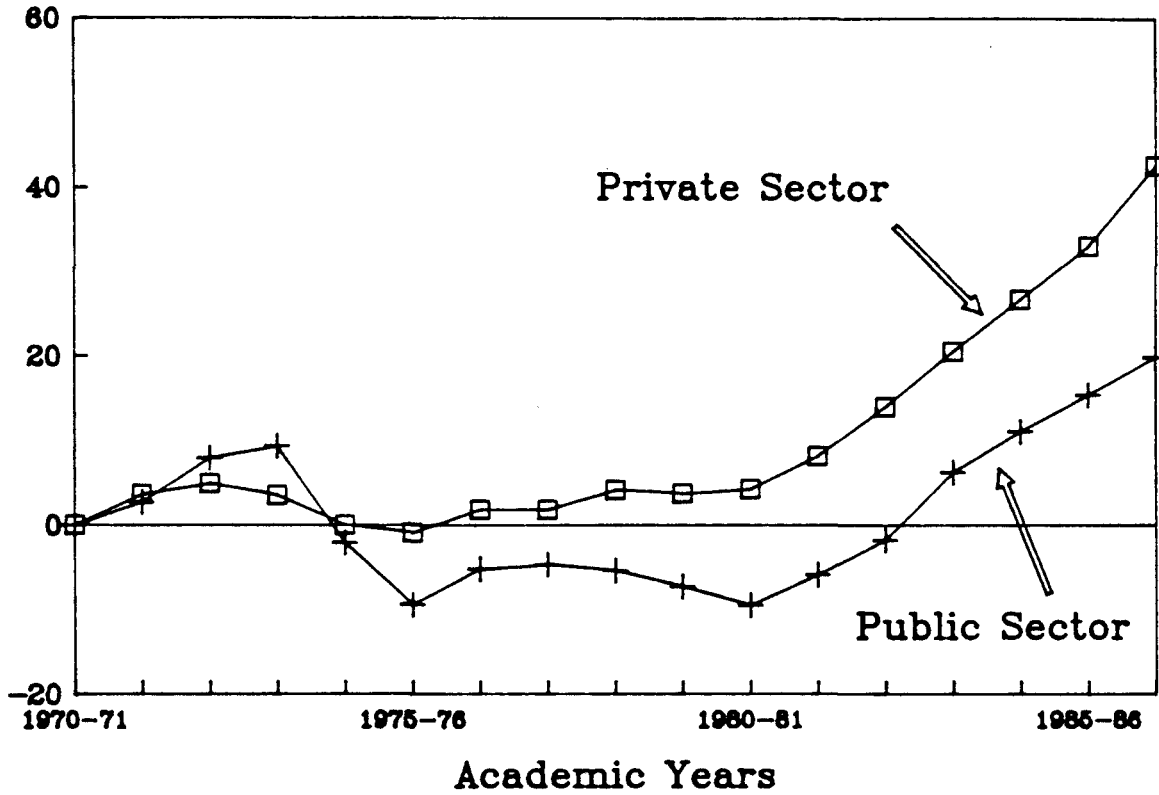
Changes in Tuitions in the Public and Private Sectors. Although the changes in average tuition were somewhat different for the public and private sectors in the 1970s, since 1980 the general pattern has been similar for both sectors (see Figure 2).

Between 1970 and 1980, the average public tuition grew more slowly than inflation--falling by 10 percent in real terms--while the average real tuition at private institutions grew by 4 percent. Thus far during the 1980s, both public and private tuitions have increased in real terms. Between 1980 and 1985, real tuitions at public and private institutions each increased by almost 28 percent. Between 1985 and 1986, however, tuition at public institutions grew more slowly than at private institutions--a 4 percent real increase for public colleges versus a 7 percent increase for private ones. Whether this difference represents a change in the trends or simply a one-year deviation between the two sectors remains to be seen.

Overall, the average tuition in each sector was higher in real terms in 1986 than in 1970, although the average tuition at public institutions grew more slowly than at private ones. At public institutions, the average tuition rose from \$350 to \$1,110, more than tripling in nominal terms and increasing by 20 percent in real terms (see Table 1). Average tuition at private institutions almost quadrupled in nominal terms, rising from \$1,680 to \$6,320--a 43 percent real increase.

Changes in Tuitions by Type of Institution Within Each Sector. Average tuition at public universities has grown somewhat more slowly since 1970 than at other public institutions (see Figure 3). In fact, tuition at other four-year institutions and at two-year colleges actually grew in real terms during the 1970s, while real tuition at universities did not. During the 1980s, average tuition grew more rapidly than inflation at each type of public institution. As a result, tuition at public universities was 31 percent higher in real terms in 1986 than in 1970; tuition at other four-year public institutions was 43 percent higher; and tuition at public two-year institutions was 34 percent higher.

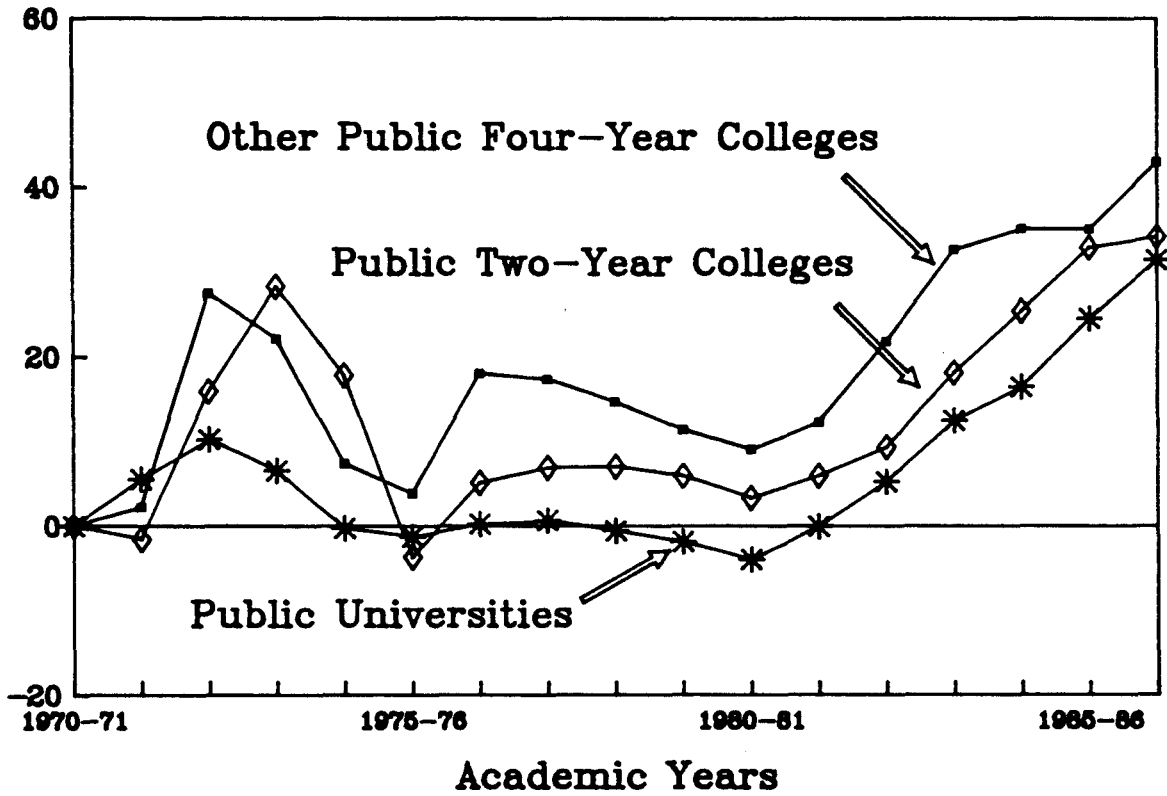
FIGURE 2. LEVEL OF AVERAGE REAL TUITION AND FEES BY SECTOR, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education.

NOTE: Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

FIGURE 3. LEVEL OF AVERAGE REAL TUITION AND FEES BY TYPE OF PUBLIC INSTITUTION, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education .

NOTE: Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-XI to adjust for inflation.

In contrast to the public sector, average tuition in the private sector has grown more rapidly since 1970 at universities than at other private institutions (see Figure 4). Average real tuition at private universities grew by 56 percent between 1970 and 1986, and by 46 percent and 26 percent at other private four-year institutions and two-year colleges, respectively. Universities and other four-year schools represent nearly all of private-sector collegiate enrollments, however, so that the smaller real increase in tuition at private two-year institutions had little impact on the overall average.^{3/}

Changes in the Distribution of Enrollments and Their Effects on Average Tuition

Shifts in enrollments between the public and private sectors, among different types of institutions within a given sector, and among specific colleges within a particular sector and type of institution all affect the pattern of growth in average tuition. If a larger proportion of students enroll in less expensive institutions, for example, average tuition would increase more slowly than if the distribution of students across institutions remained constant or shifted to more expensive ones.

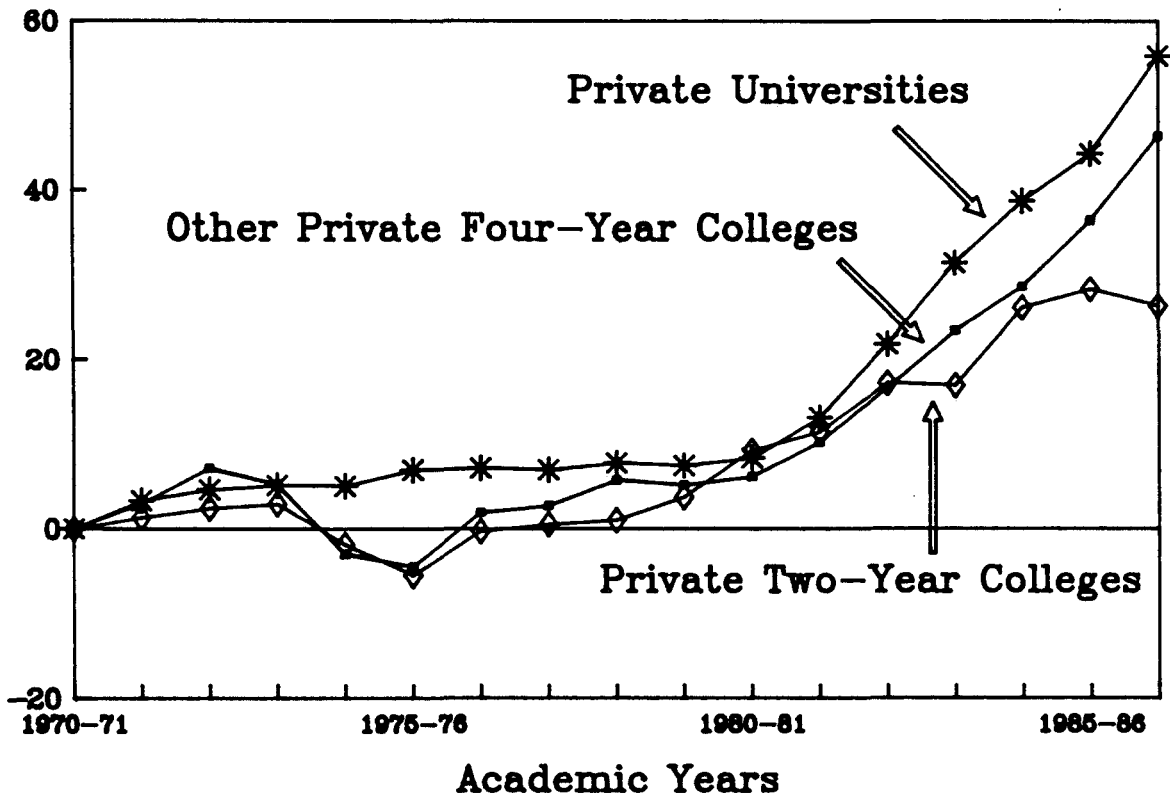
The possible effects of the first two types of shifts are considered in this section by examining changes in the distribution of enrollments between public and private institutions and changes in the distribution of students by type of institution within each of these two sectors. Unfortunately, no data exist on shifts among specific institutions within a particular type of college or university.

Enrollment Patterns Since 1970. The 1970s, especially the first half of that decade, was a period of rapid growth for two-year colleges. This growth caused a shift in the distribution of FTEs toward two-year institutions and the public sector and away from four-year colleges and the private sector. Thus far in the 1980s, the distribution of enrollments has remained fairly stable.

The rapid expansion in community colleges during the 1970s caused collegiate enrollments at two-year institutions to increase more rapidly than those at four-year colleges. Within the public sector, the proportion of FTEs in two-year institutions increased from 29 percent in 1970 to 38 percent in 1975 and remained relatively constant thereafter (see Table 2). The proportion of FTEs at two-year private institutions also increased--from 6 percent of all pri-

3. This paper does not examine tuition and enrollments at proprietary (private, for-profit) institutions because such data have not been collected for most proprietary schools since 1970. Enrollments at proprietary institutions are substantial, however, and have been growing rapidly in recent years.

FIGURE 4. LEVEL OF AVERAGE REAL TUITION AND FEES BY TYPE OF PRIVATE INSTITUTION, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education.

NOTE: Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-XI to adjust for inflation.

TABLE 2. DISTRIBUTION OF FULL-TIME-EQUIVALENT COLLEGE ENROLLMENTS WITHIN SECTOR, SELECTED YEARS, 1970-1985 (In percents)

Type of Institution	1970	1975	1980	1985
Public				
Four-Year	71	62	63	64
Two-Year	<u>29</u>	<u>38</u>	<u>37</u>	<u>36</u>
Total	100	100	100	100
Private				
Four-Year	94	94	92	90
Two-Year	<u>6</u>	<u>6</u>	<u>8</u>	<u>10</u>
Total	100	100	100	100

SOURCE: Compiled by the Congressional Budget Office using data from the Department of Education.

vate enrollments in 1970 and 1975 to 8 percent in 1980, and to 10 percent in 1985.^{4/}

The expansion in community colleges also caused collegiate enrollments to grow somewhat more rapidly in the public sector than in the private sector in the early 1970s (see Table 3). The proportion of FTEs in public institutions increased from 74 percent in 1970 to a peak of 77 percent in 1975. After 1975, the public-sector share of enrollments declined slightly and has continued at roughly 75 percent throughout the 1980s.

Effects of Changes in the Distribution of Enrollments on Average Tuition. If the distribution of enrollments had not changed, average tuition would have risen more rapidly than it did (see Figure 5). During the 1970s, overall average tuition would have increased by 5 percent in real terms if the distribution of enrollments by sector and type of institution had not changed; instead, the average real tuition declined by 4 percent. The rate of growth in the 1980s would have been roughly the same without the enrollment changes because most of the shifts in enrollments took place in the 1970s. In total, average real tuition in 1986 would have been 44 percent above the 1970 level if the distribution of enrollments had not changed; with actual enrollment shifts, however, it was 28 percent higher than in 1970.

The expansion of two-year colleges had the largest impact on average tuition. Because two-year institutions are, on average, less expensive than four-year ones, the relative increase in two-year enrollments held down the rate of growth in overall tuitions. Moreover, this shift had a greater effect in the public sector where two-year institutions represent a larger share of all enrollments than in the private sector. Without these enrollment changes, the average real public tuition in 1986 would have been 36 percent greater than the average in 1970, compared with 20 percent higher under actual enrollments (see Figure 6). Growth in the average private tuition would have differed little--a 48 percent real increase between 1970 and 1986 if enrollments had not changed, compared with a 43 percent real increase with actual enrollment proportions (see Figure 7).

TRENDS IN STUDENT AID AND THEIR EFFECTS ON NET COLLEGE PRICES

Student financial aid--in the form of grants, loans, and work-study aid--provides students with funds for college expenses and thereby enables students and their families to pay less than the amounts the institutions charge. The amount that students actually pay is referred to as the "net price."

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4. The addition of some proprietary institutions caused some of the increased enrollment in two-year private institutions.

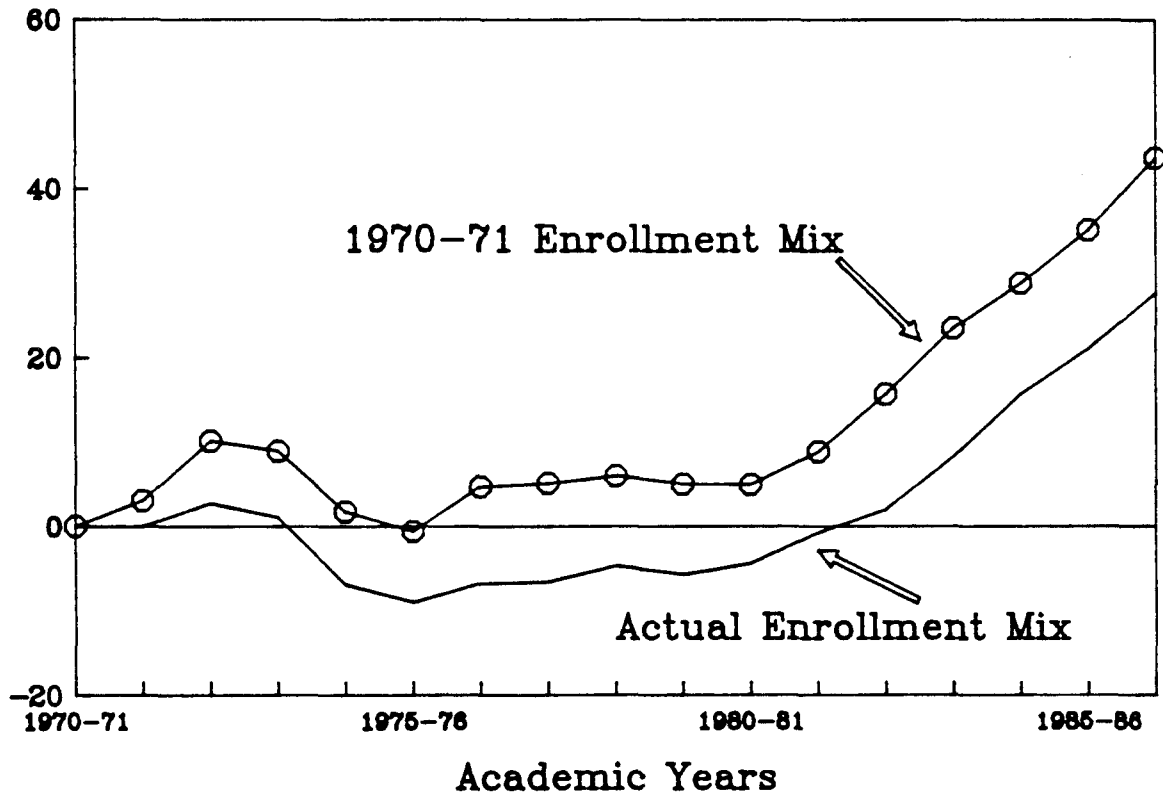
**TABLE 3. FULL-TIME-EQUIVALENT COLLEGE ENROLLMENTS
BY SECTOR AND TYPE OF INSTITUTION,
SELECTED YEARS, 1970-1985 (In thousands)**

	<u>1970</u>		<u>1975</u>		<u>1980</u>		<u>1985</u>	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Public								
Four-Year	3,541	53	4,057	48	4,158	47	4,240	47
Two-Year	<u>1,413</u>	<u>21</u>	<u>2,466</u>	<u>29</u>	<u>2,484</u>	<u>28</u>	<u>2,428</u>	<u>27</u>
Total	4,953	74	6,522	77	6,642	75	6,668	75
Private								
Four-Year	1,679	25	1,844	22	2,003	23	2,055	23
Two-Year	<u>105</u>	<u>2</u>	<u>113</u>	<u>1</u>	<u>174</u>	<u>2</u>	<u>221</u>	<u>2</u>
Total	1,785	26	1,957	23	2,177	25	2,276	25
Total	6,738	100	8,480	100	8,819	100	8,943	100

SOURCE: Compiled by the Congressional Budget Office using data from the Department of Education.

NOTE: Details may not add to totals because of rounding.

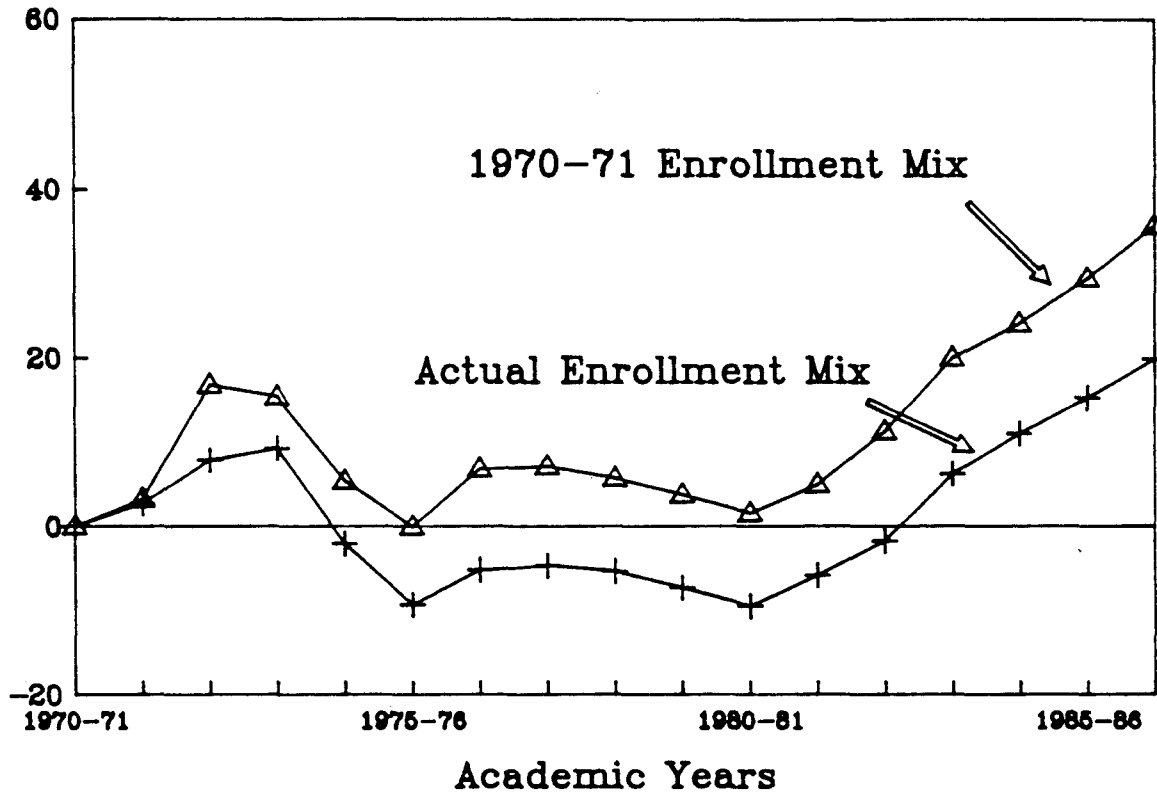
FIGURE 5. LEVEL OF AVERAGE REAL TUITION AND FEES WITH ACTUAL ENROLLMENT MIX AND 1970-1971 ENROLLMENT MIX, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education.

NOTE: The 1970-1971 enrollment mix holds constant the distribution of enrollments by sector and type of institution. Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

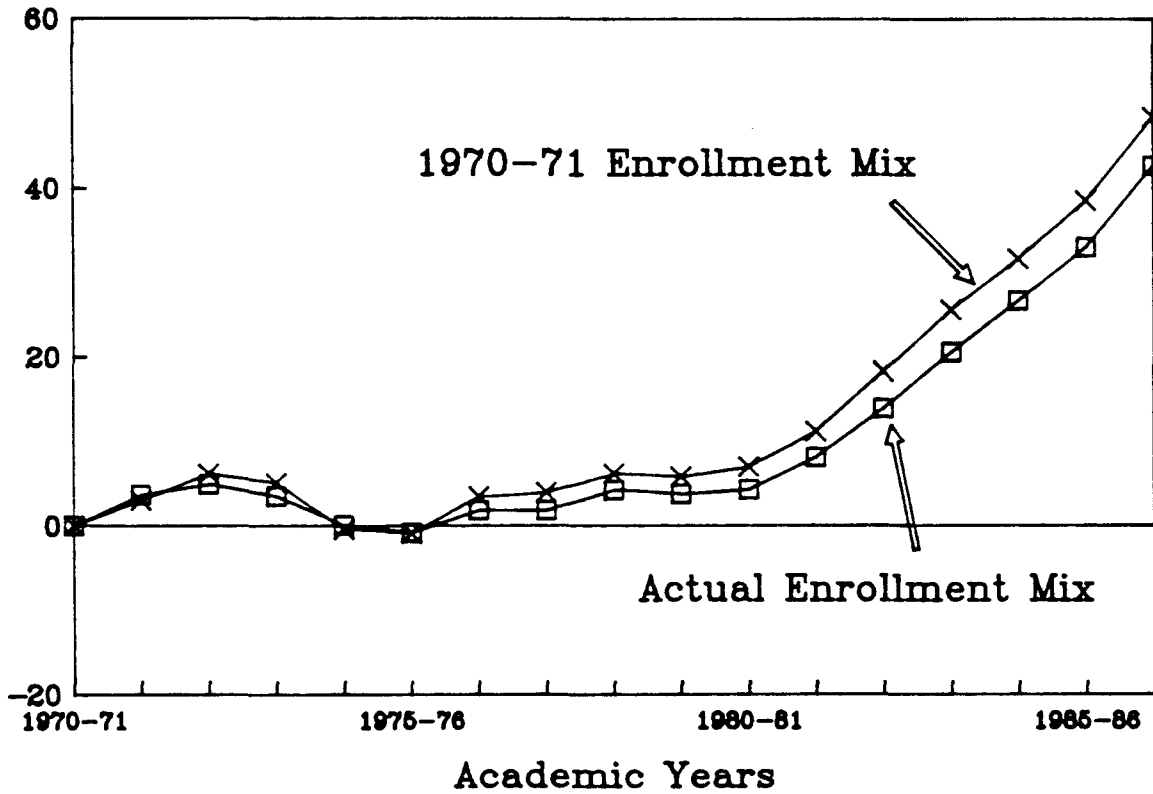
FIGURE 6. LEVEL OF AVERAGE REAL PUBLIC TUITION AND FEES WITH ACTUAL ENROLLMENT MIX AND 1970-1971 ENROLLMENT MIX, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education.

NOTE: The 1970-1971 enrollment mix holds constant the distribution of enrollments by type of institution within each sector. Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

FIGURE 7. LEVEL OF AVERAGE REAL PRIVATE TUITION AND FEES WITH ACTUAL ENROLLMENT MIX AND 1970-1971 ENROLLMENT MIX, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education.

NOTE: The 1970-1971 enrollment mix holds constant the distribution of enrollments by type of institution within each sector. Estimates represent average tuition and fees for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

This section builds on the previous analysis of changes in tuition by analyzing trends in student aid and in the net price of college paid by students. Unfortunately, because data on the distribution of assistance by sector and type of institution are not available for all student aid programs, this analysis cannot examine net prices separately for different kinds of institutions. Moreover, this lack of data also precludes examining how changes in the distribution of enrollments have affected net prices.

Student Aid Since 1970

Total aid awarded to students--including the face value of all grants, both guaranteed and direct loans, and work-study aid from federal, state, and institutional sources--equaled an estimated \$21 billion in 1986 (see Table 4). Grants and loans each accounted for almost one-half of total aid in that year, and work-study assistance equaled 3 percent. Despite declines in the real value of aid in the 1980s, total aid awarded in 1986 was substantially higher than the real value of aid in the early 1970s, and was slightly higher than the real value in 1975.

The federal government is the major provider of direct financial assistance to college students, contributing about three-quarters of all such aid in 1986. States and institutions provided the remaining one-quarter of student aid. Federal aid grew in real terms throughout the 1970s but has declined since 1980. State assistance, on the other hand, has grown throughout the period, while institutional aid increased slightly in real terms in the 1970s and has grown more rapidly in the 1980s.^{5/}

Different types of federal aid have had quite different growth patterns since 1970. Generally available aid, which is available to most students if they meet specific eligibility criteria and includes all assistance provided through the Education Department, was relatively small in 1970 and increased dramatically in later years. Aid available only to specific groups of students--predominantly Social Security student benefits and Veterans' education benefits--was quite substantial in the 1970s but now represents only a small proportion of all student aid.

The Department of Education provides funding for Pell Grants, Stafford Loans (formerly known as Guaranteed Student Loans or GSLs), and three campus-based programs--Supplemental Educational Opportunity Grants, College Work-Study, and Perkins Loans. In 1986, these programs provided more than \$14 billion to students enrolled

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5. Charitable contributions also provide financial assistance to students. Some of this aid is channeled through institutions and appears as institutional aid; other assistance is not included in these data. Data on the extent of charitable contributions are not available.

**TABLE 4. FINANCIAL AID AWARDED TO STUDENTS
IN SELECTED YEARS, 1970-1986
(In millions of 1986 dollars)**

	1970	1975	1980	1986
Type of Aid				
Grants	7,800	16,300	12,400	10,200
Loans	3,400	3,400	9,200	10,200
Work-Study	600	600	900	600
Total	11,800	20,300	22,500	21,100
Source of Aid				
Federal	8,700	16,500	18,700	15,600
State	600	900	1,100	1,400
Institutional	2,500	2,800	2,700	4,100
Total	11,800	20,300	22,500	21,100

SOURCE: Congressional Budget Office calculations using estimates of total available aid from the College Board.

NOTE: Total loan volume--for direct loans as well as guaranteed loans--is included in estimated financial aid. Data for 1970, 1975, and 1980 are inflated to 1986 price levels, using the CPI-X1.

in postsecondary education. One quarter of this aid was provided through Pell Grants--the largest aid program focused on needy students. GSLs accounted for almost two-thirds of this financial assistance, with campus-based grants, loans, and work-study aid accounting for the remainder.

Social Security student benefits and Veterans' education benefits provided only \$800 million of aid in 1986, although these two programs represented a substantial portion of federal aid in the 1970s. Since the early 1970s, the number of veterans eligible for education benefits has declined substantially, and Social Security student benefits were phased out beginning in 1982.

Major expansions in federal aid caused total grants to more than double in real terms between 1970 and 1975. Pell Grants began in 1972, and both Veterans' education benefits and Social Security benefits for students expanded rapidly in the early 1970s. In contrast, loans and work-study aid remained constant in real terms during that period.

Between 1975 and 1980, loan volume almost tripled in real terms when eligibility requirements in the GSL program were loosened and returns to lenders increased. The total volume of grants fell, however, by about 25 percent in real terms during this period. This decline was largely the net result of a decline in Veterans' benefits of almost three-quarters, offset by real increases in Pell Grants and Social Security benefits for students. Work-study aid grew by 50 percent between 1975 and 1980 as a result of increased federal funding.

The 1980s brought major changes in student aid programs in an effort to reverse the trends of increasing federal costs. Total loan volume increased slightly in real terms, while the real value of grants declined by 20 percent and work-study aid by one-third. The reduction in overall grants was the net effect of real increases in Pell Grants, elimination of Social Security student benefits, and a 65 percent real reduction in the remaining Veterans' benefits. As a result, total aid from all sources declined by almost 10 percent between 1980 and 1986.

Issues in Determining the Net Price Paid by Students

Although the concept of net price is quite straightforward, technical issues arise concerning how to value the three types of student aid, and the data needed to perform some of these calculations are not available.

How to Value Different Types of Student Aid. Because differences exist in the obligations students face when receiving grants, loans, and work-study aid, the value to students of each type of aid is different. Grants do not require any repayment or work obligation and thus reduce dollar for dollar the amount that students must pay.

Loans and work-study assistance, on the other hand, require repayment or work obligation on the part of recipients. Thus, each dollar of these types of aid is worth less to students than is a dollar of grants.

Student loans require later repayment and can be valued in several different ways. One approach is to use the total loan principal, which measures the amount that students have available to pay college expenses at the time they attend college. Because this method does not account for future repayment, however, it calculates a grant and a loan of the same amount as being of equal value and, in most circumstances, overstates the value of a loan to the student.

Another approach is to define the subsidy value of a student loan as the difference between the cost to the borrower of a private-market loan and the cost to the borrower of a subsidized loan. Because this subsidy is realized over a period of years, its value must be expressed in present value terms--that is, by calculating the value today of benefits realized now and in the future--if it is to be directly comparable with the subsidy provided by a grant. Consequently, subsidy values differ for different types of loans and vary with market interest rates.

The exact value of the subsidy provided to students by a loan is difficult to determine for several reasons. First, comparable loans that allow long-term repayments and do not require collateral are not readily available in the private market. Second, the interest rate that would be charged on such loans--if they were available--would vary according to the risk of default. Thus, for example, interest rates would probably be higher on loans to poor students than on loans to students from families with higher incomes. Finally, several student loan programs with different guidelines now exist, and these guidelines--as well as market interest rates--have varied considerably over time.

Work-study jobs provide financial aid to students through federally subsidized part-time employment and, as with loans, determining the value of these subsidies to students is quite difficult. Both students and the institutions sponsoring the jobs receive subsidies--students through earnings they might not have otherwise received, and institutions through a reduction in the cost of student labor. These subsidies depend on numerous factors--including whether the jobs would have existed in the absence of federal funding, and the market value of the students' work--and many of these factors cannot be quantified. However, because work-study assistance has always been a small proportion of all student aid, different valuations have a minimal effect on the value of total student aid.

This paper presents three ways of measuring the subsidy for loans and work-study aid because of the difficulties in determining

the value to students of these types of assistance. These different assumptions, explained below, indicate the sensitivity of the trends in net college prices to the method of calculating subsidy values:

- o Include all grants, as well as the face value of all loans and all wages from work-study aid. This estimate reflects the amount of aid that is available to students while they are attending college. This measure overestimates the value of the loans and work-study aid because students have repayment and work obligations associated with them.
- o Include all grants and 50 percent of the face value of loans and work-study aid (as a rough approximation of the subsidy value of these types of aid).
- o Include only grants because grants do not present any valuation problems. This measure underestimates the aid available to students, however, because it does not include any value for student loans or work-study aid.

Limitations of the Data. This analysis focuses on tuition and required fees because they are a major component of total charges--roughly 35 percent, on average--and because reliable data are not available for other components of college prices, such as room and board, books, and travel expenses. Financial aid is provided to students based on total college expenses, however, and including all such aid in this analysis of net college prices would be misleading. Thus, only a portion of financial aid is included in the calculations of net price--the share that tuition and fees represent of estimated total expenses, which also include room, board, tuition, and fees.^{6/}

A second limitation is that data are not now available on the overall distribution of total aid by type of student--especially between undergraduate students and graduate students--or by sector and type of institution.^{7/} This lack of data means that the analysis of net college prices cannot be disaggregated by type of student or by sector or type of institution. Furthermore, the data

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6. This assumption, as well as the 35 percent estimate presented above, uses data on room and board costs only for persons living on campus because they are the only students for whom such information is available.
 7. The National Postsecondary Student Aid Survey (NPSAS), which recently became available, includes detailed information on the distribution of student aid by type of student and by sector and type of institution for the 1986-87 school year. These data have more information on who actually received student aid at one point in time but do not provide information on how reciprocity has changed over time.

on tuition, which pertain only to undergraduate college students and exclude most noncollegiate proprietary institutions, and the data on student aid, which pertain to all postsecondary students, are not completely comparable.

Trends in Net College Prices Since 1970

Average tuition and student aid have had quite different growth patterns since 1970 (see Figure 8). During the 1970-1980 period when average tuition declined in real terms, real student aid increased; when tuition rose between 1980 and 1986, real student aid declined. Including all loans and work-study aid, average student aid was 40 percent higher in real terms in 1986 than in 1970; including one-half of loans and work-study aid, average student aid was 25 percent higher in 1986; and including none of the value of loans and work-study assistance, average real aid in 1986 was roughly the same as in 1970. Thus, the intermediate measure of student aid increased by almost the same percentage as did average tuition (28 percent) between 1970 and 1986.

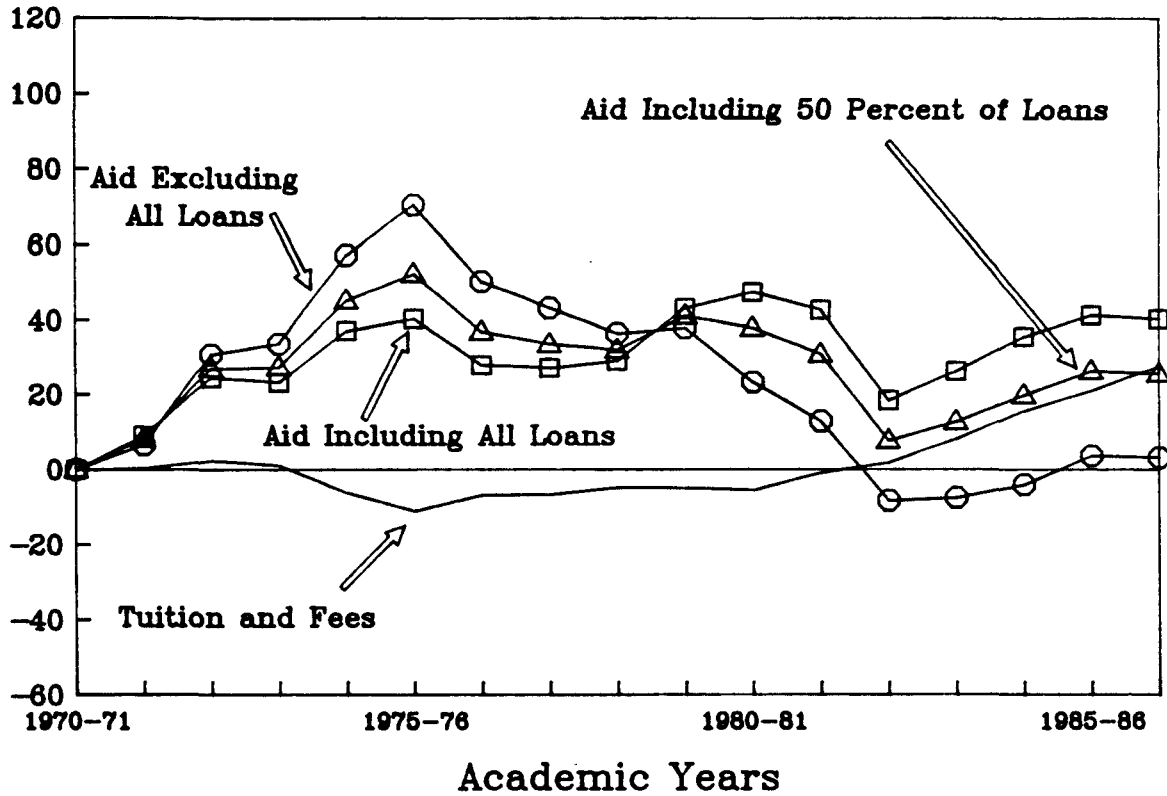
Under all three concepts of net price, the estimated average net price paid by students and their families fell substantially in the first half of the 1970s (see Figure 9). Between 1975 and 1980, net real prices remained roughly the same, if all loan volume and work-study aid are included; if either half or none of loans and work-study assistance are included, net real prices increased. According to all three calculations, however, net prices fell by a greater percentage from 1970 to 1980 than tuition.

During the 1980s, however, rapidly increasing tuition and declining amounts of available student aid caused net prices to rise sharply. The average real net price paid by students in 1986 was 19 percent higher than in 1970, if all loan volume and all work-study assistance are included; 29 percent higher if one-half of this aid and all grants are included; and 36 percent higher if all loans and work-study aid are excluded. Thus, using the intermediate measure of student aid, the average net price increased by roughly the same percentage between 1970 and 1986 as did average tuition.

As discussed previously, some aid is available to all students who meet the eligibility criteria, while other programs provide assistance only to specific groups of students. Because this latter type of aid is available only to a limited subset of college students, including such aid in the calculation of net price overestimates the amount of aid available to most students. Calculating the net price using only generally available aid, however, provides a rough estimate of the changes in aid available to a broad range of students and, therefore, of the effects on the net prices that they pay.

When only generally available student aid is considered, the growth in student aid and net prices is somewhat different than when

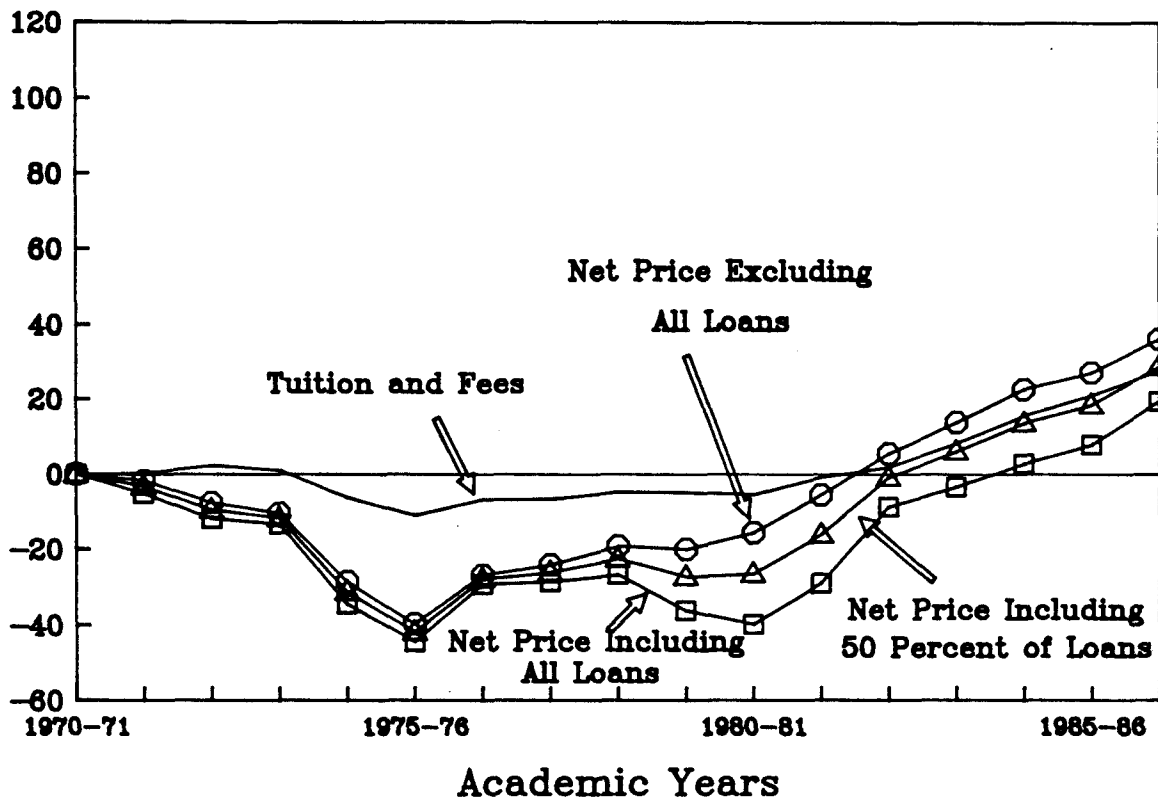
FIGURE 8. LEVEL OF AVERAGE REAL TUITION AND FEES AND STUDENT AID BY DEFINITION OF STUDENT AID, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education and the College Board.

NOTE: The different definitions of student aid consider work-study in the same manner as loans. Estimates represent average tuition and fees and student aid for full-time-equivalent undergraduate students and use the CPI-XI to adjust for inflation.

FIGURE 9. LEVEL OF AVERAGE REAL TUITION AND FEES AND NET PRICE BY DEFINITION OF STUDENT AID, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education and the College Board.

NOTE: The different definitions of student aid consider work-study in the same manner as loans. Estimates represent average tuition and fees and net price for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

all aid is included. Average generally available aid increased in real terms throughout the 1970s when tuition declined in real terms; but between 1980 and 1986, generally available aid increased further whereas all aid declined (see Figure 10). As a result, in 1986, average generally available aid under all three measures was more than double the 1970 level in real terms.

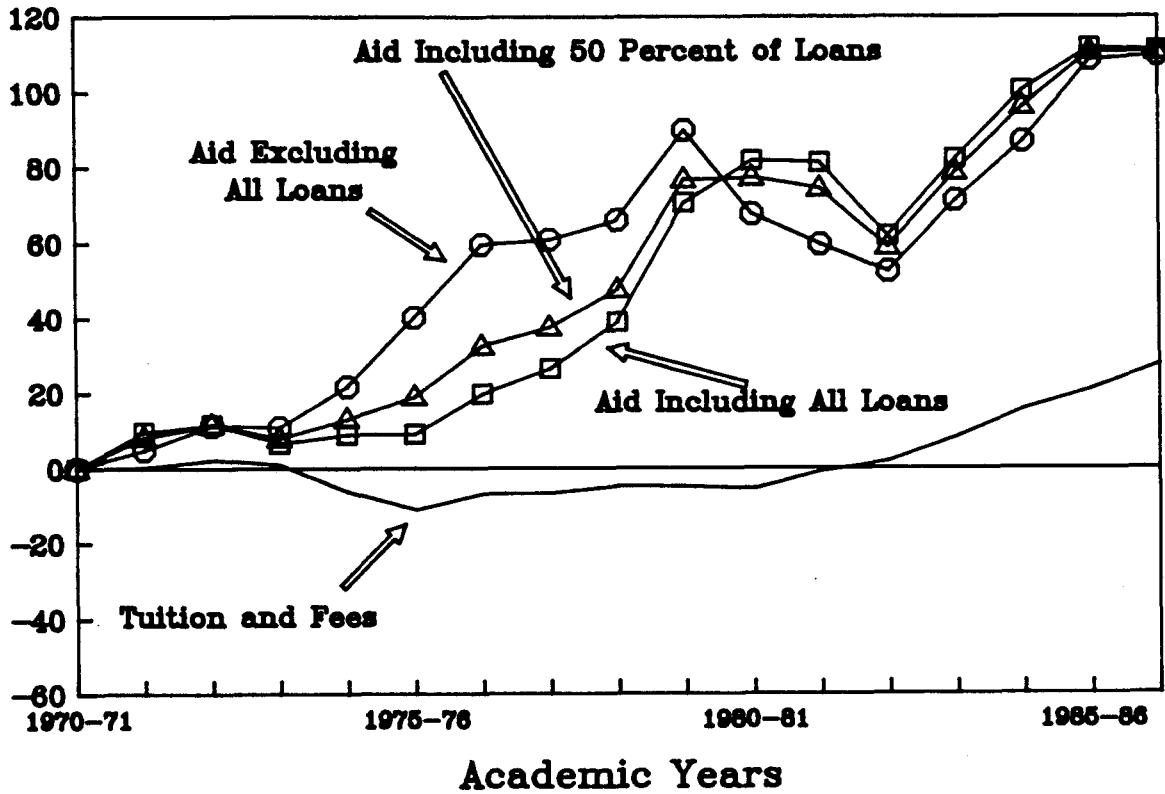
Considering only generally available student aid, the average net price declined by a smaller percentage in the early 1970s than when all aid was considered, because most aid in the early 1970s was available only for specific groups of students (see Figure 11). In the second half of the 1970s, however, more aid became available to broader groups of students and thereby further reduced the average price paid by students. Although net prices, according to all three calculations, increased between 1980 and 1986, the average net price paid by students in 1986 was not as large relative to its 1970 level as was tuition. The net real price in 1986 was between the 1970 level and 17 percent above this level, compared with a 28 percent rise for tuitions.

Several caveats to this analysis deserve mention. First, as discussed above, focusing on average prices masks the variation that occurs in prices faced by individual students. Some students may receive substantially less than the average amount of aid and thus face a higher net price, while other students may receive much more assistance and face a lower net price. Trends in aid for these different types of students--for example, higher-income students compared with very poor students--have varied over time. For instance, loan expansions in the late 1970s increased the proportion of aid going to students with higher family incomes.

Second, students attending proprietary institutions--typically, vocational programs--receive more federal assistance now than they did in the 1970s. Although exact information on the amount of aid received by proprietary students is not available, this shift implies that less aid was available in the collegiate sector in the 1980s than is estimated here.

Finally, shifts in the amount of aid going to students at public and private institutions have also occurred over time. For example, because loans provide a greater proportion of aid to students at private institutions than do most of the grant programs, shifts to a greater reliance on loans have increased the percentage of aid going to students at private institutions and reduced the proportion for students at public institutions.

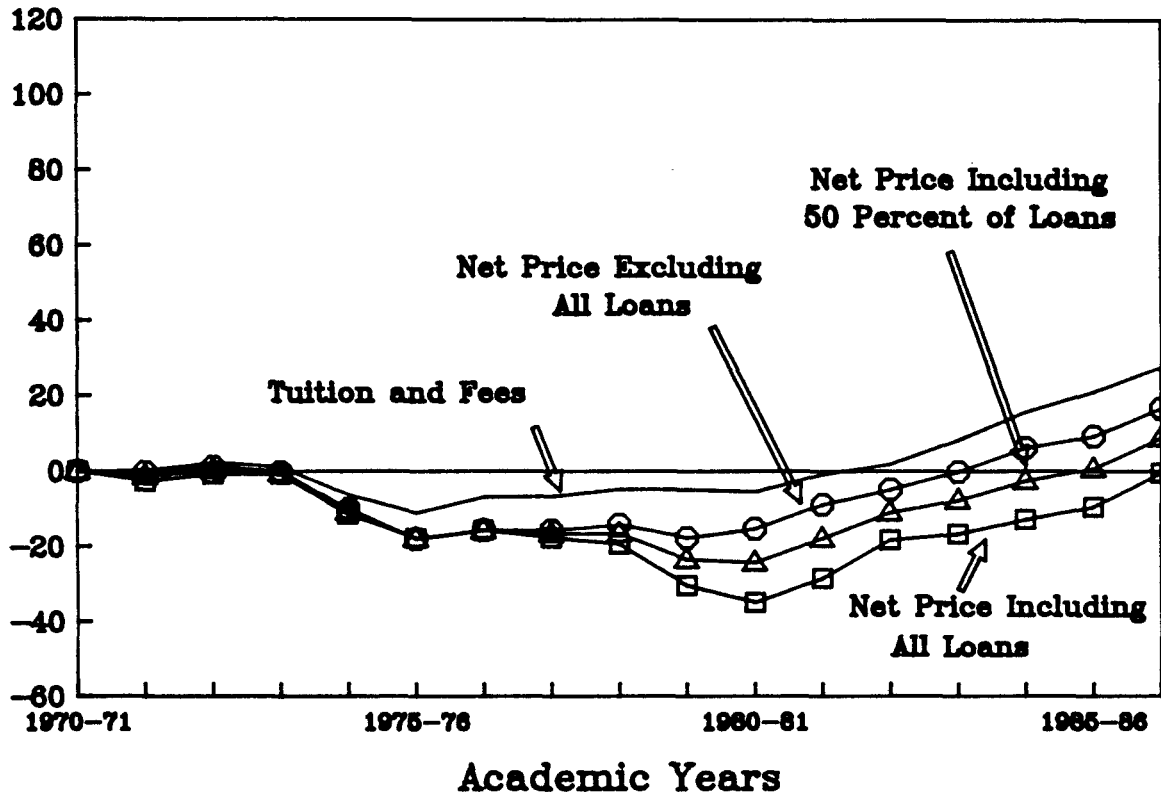
FIGURE 10. LEVEL OF AVERAGE REAL TUITION AND FEES AND STUDENT AID BY DEFINITION OF STUDENT AID INCLUDING ONLY GENERALLY AVAILABLE AID, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education and the College Board.

NOTE: Generally available aid excludes Social Security student benefits and Veterans' education benefits. The different definitions of student aid consider work-study in the same manner as loans. Estimates represent average tuition and fees and student aid for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

FIGURE 11. LEVEL OF AVERAGE REAL TUITION AND FEES AND NET PRICE BY DEFINITION OF STUDENT AID INCLUDING ONLY GENERALLY AVAILABLE AID, EXPRESSED AS PERCENTAGE CHANGE FROM THE 1970-1971 LEVEL



SOURCE: Congressional Budget Office estimates based on data from the Department of Education and the College Board.

NOTE: Generally available aid excludes Social Security student benefits and Veterans' education benefits. The different definitions of student aid consider work-study in the same manner as loans. Estimates represent average tuition and fees and net price for full-time-equivalent undergraduate students and use the CPI-X1 to adjust for inflation.

