

GENERAL ASSEMBLY OF THE COMMONWEALTH OF PENNSYLVANIA
JOINT STATE GOVERNMENT COMMISSION
HARRISBURG

February 13, 1987

SUBJECT: State-Related and State-Owned
Institutions of Higher Education

TO: Members of the Appropriations and Education
Committees of the Senate of Pennsylvania

FROM: Donald C. Steele
Research Director



Each year the State-related universities are required by their appropriations acts and the State-owned universities by the Public School Code to submit reports on faculty output and salary costs to the appropriations and education committees of the Senate and House of Representatives.

These reports have been extensively analyzed by the Commission's staff and a newly released staff report containing the 1985-86 data is attached for your information.

If you have any questions concerning this report or desire additional copies, please do not hesitate to contact me.

Enclosure



INSTRUCTIONAL OUTPUT
AND FACULTY SALARY COSTS
OF THE STATE-RELATED
AND STATE-OWNED UNIVERSITIES

Analysis of 1985-86 Data
Reported Under 1985 Appropriations Acts
and Public School Code

Staff Report
General Assembly of the Commonwealth of Pennsylvania
JOINT STATE GOVERNMENT COMMISSION
108 Finance Building
Harrisburg, Pennsylvania
February 1987

Foreword

This 14th annual report contains an analysis of the instructional output, instructional faculty salary cost, tuition and appropriations for Pennsylvania's State-related and State-owned universities--the Commonwealth's public universities.

1985-86 output, salary cost, tuition and appropriation data from the universities and other sources are summarized and significant changes from the previous year noted. Prior years' data for the same variables are presented and underlying trends pointed out.

Output and salary data are combined to form a measure of cost efficiency--instructional faculty salary cost per student credit hour produced. Tuition and appropriation data are combined to form a measure of cost sharing--the percentage of total instructional cost borne by taxpayers.

Finally, data from other sectors of higher education in Pennsylvania and from other states are introduced to place the data and analysis for the public universities into perspective.

DONALD C. STEELE
Research Director
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Summary

1. Of the total number of full- and part-time students enrolled in institutions of higher education in Pennsylvania in Fall 1985, approximately 39 percent were enrolled in the Commonwealth's public universities: 128,325 in the 4 State-related universities and 83,168 in the 14 State-owned universities. The total number of full-time equivalent (FTE) students, based on student credit hours (SCH) produced, increased by 1 percent from 1984-85 to 1985-86 in both the State-related and State-owned groups.
2. During the 1985-86 school year, the number of bachelor's and graduate degrees conferred by the public universities, not including medical degrees, totaled 35,983: 21,423 by the State-related universities and 14,560 by the State-owned universities. These degree totals represented increases of 2 percent for the State-related group, and 3 percent for the State-owned group, from the previous year.
3. The aggregate level of FTE student enrollment in the public universities has remained fairly stable since 1980-81. However, small changes have occurred in the composition of this enrollment: undergraduate students have increased relative to graduate students, and full-time, male and out-of-state students have increased relative to part-time, female and in-state students.
4. During the 1985-86 school year, 45 percent of the full-time ranked instructional faculty employed by all institutions of higher education in Pennsylvania were employed by the public universities: 5,163 by the State-related institutions and 4,190 by the State-owned institutions. The average salary for these faculty in the State-related universities was \$33,300, and in the State-owned universities, \$31,600. The comparable average salaries for all public and private institutions of higher education throughout the U.S. were \$33,400 and \$32,300, respectively.

5. In Fall 1985, the overall workweek of the full-time employed faculty averaged 51.6 hours at the State-related universities, and 55 hours at the State-owned universities. Student contact hours averaged 9.2 and 11.4 for the two groups of institutions, respectively. Since 1980-81, average total faculty workweeks for both groups have remained nearly constant. However, student contact hours have declined for both groups.
6. During the 1985-86 school year, a total of 10,914 FTE ranked and unranked instructional faculty were employed by the public universities. This total represents almost no change for the State-related institutions and a 1 percent increase for the State-owned institutions from the previous year. The average salary for these faculty for the two groups of universities was \$27,300 and \$30,500, respectively. The higher average salary for the State-owned group is due, in part, to the use of a larger percentage of faculty in the higher ranks.
7. Between 1980-81 and 1985-86, the average instructional salary for the FTE instructional faculty has increased by about \$6,500 for the State-related group, and approximately \$5,700 for the State-owned group. The relative increase in average salary for the State-related group, due at least in part to a relative increase in the proportion of faculty employed in the higher ranks, has served to close the gap in average salaries somewhat between the two groups.
8. During 1985-86, the ratio of FTE students to FTE instructional faculty averaged 17.1 for the State-related universities and 18.2 for the State-owned universities. These averages represent a 1 percent increase and 1 percent decrease for the two groups, respectively, from the previous year.
9. For 1985-86, the average instructional salary cost per student credit hour (SCH cost) at the undergraduate level was \$41 for the State-related universities, and \$53 for the State-owned universities; at the master's level, SCH cost averaged \$112 for both groups. For the public universities, the undergraduate SCH cost increased by 5 percent from the previous year; the master's SCH cost was unchanged. SCH cost tends to decrease as student credit hours produced increase (for all academic levels), and tends to increase as academic levels increase (for all quantities of student credit hours produced).

10. Regression coefficients determined from 1985-86 data indicate that a decrease in average instructional faculty salary of \$1,000 could be expected to reduce overall SCH cost by approximately \$10.4 million, and an increase in average class (section) size of one student could be expected to reduce overall SCH cost by approximately \$9.7 million, in the public universities.
11. Regression analysis also shows that instructional costs per FTE student in public higher education institutions throughout the nation are positively correlated with average faculty salaries and governmental appropriations, and negatively correlated with average enrollment per institution. When compared to other states, Pennsylvania's relatively high per student cost--in fiscal year 1984, \$5,553, the seventh highest in the nation--would appear to be mainly due to a higher-than-average faculty salary and a lower-than-average FTE student enrollment per campus.
12. During 1985-86, main campus tuition and required fees for full-time in-State undergraduate students averaged \$2,711 at the State-related universities and \$1,790 at the State-owned universities, representing average increases of 7 and 3 percent over 1984-85, respectively. Tuition and fee revenues per FTE student increased by 9 percent at the State-related institutions and by 13 percent at the State-owned institutions from 1984-85 to 1985-86.
13. For fiscal year 1986, the Commonwealth's general fund appropriations to the public universities totaled \$578.9 million: \$316.6 million to the State-related institutions and \$262.3 million to the State-owned universities. From fiscal year 1985 to fiscal year 1986, the change in appropriations was 7 and 6 percent to the two groups of universities, respectively. The average appropriation per FTE student in the State-related group was \$2,810, and \$3,320 in the State-owned group. These per student averages represent one-year changes of 6 and 5 percent, respectively, for the two groups. In addition to the appropriations made directly to public universities, the Commonwealth also allocated about \$37 million from the General Fund to the Pennsylvania Higher Education Assistance Agency, which distributed these funds to students of the public universities through various grant and matching fund programs.

14. From 1980-81 to 1985-86, on an FTE student basis, average tuition and fee revenues collected by the public institutions have increased by a greater percentage than average direct Commonwealth appropriations. Hence, the percentage of total revenues from appropriations has decreased, causing the student share of instructional cost to increase. This increase has been accompanied, however, by a slight increase in per student PHEAA grants and matching funds.

15. During fiscal year 1984, the average student tuition at a public institution of higher education in Pennsylvania (including four-year institutions, two-year institutions, medical schools and research institutions) was \$2,301, nearly double the U.S. average. Total State and local appropriations per FTE student were \$2,871, about 22 percent less than the U.S. average. On an FTE student basis, appropriations to all public institutions of higher education in Pennsylvania are considerably lower than, and total instructional costs somewhat higher than, the national averages. Higher-than-average tuition tends to fill the gap.

I. Introduction

In Fall 1985 there were 229 institutions which provided post-secondary education in Pennsylvania: 4 State-related universities, 14 State-owned universities, 14 community colleges, 12 private State-aided institutions and 185 private independent institutions. These public and private institutions offer students a wide range of choice with regard to size, location, programs, degrees and student charges.

In Fall 1985, nearly 211,500 students were enrolled in the State-related and State-owned institutions--Pennsylvania's public universities--representing about 39 percent of the total head-count enrollment in all of the Commonwealth's institutions of higher education. During fiscal year 1986, the public universities collected nearly \$538 million in tuition and fees from students and received almost \$579 million in direct appropriations for educational and general expenses (excluding amounts allocated for the Board of Governors/Chancellor's Office and System Reserve of the State System of Higher Education) from the Commonwealth; these appropriations represented 97 percent of the total appropriations made specifically for instructional purposes to all colleges, universities, and other post-secondary institutions in Pennsylvania. In addition, students in the public universities received almost \$35 million in Pennsylvania Higher Education Assistance Agency (PHEAA) grants, plus about \$2 million in matching fund aid; these funds represented 31 percent of the total financial aid given to students at all institutions of higher education by PHEAA.

A large proportion of Pennsylvania students and all Pennsylvania taxpayers therefore have an interest in the Commonwealth's public universities producing the highest quality instruction in the most cost-effective manner, as well in how the cost of this instruction is shared between students and taxpayers.

This report addresses the issues of cost efficiency and cost sharing. Using data reported by the individual State-related universities, as required by their appropriations acts, and the individual State-owned universities, as mandated by the Public School Code, the report summarizes and analyzes instructional faculty, faculty output, faculty salaries and faculty workloads by type of

institution, academic level and program area. Levels of the data for 1985-86, changes in the data from the previous year and changes in the data over the past five years are examined. Output and salary data are used to compute a measure of cost efficiency: instructional faculty salary cost per student credit hour produced. Using tuition and fee collections data from the individual State-related universities and the State System of Higher Education (SSHE) and appropriation data from the General Fund Budget, the report summarizes and analyzes the sharing of instructional costs between the two groups who must pay these costs: students and taxpayers. Current year data, plus one- and five-year changes are again examined. Tuition and appropriation data are used to compute a measure of cost sharing: the percentage of total instructional cost borne by taxpayers. The effects of PHEAA programs on the student share of costs is also examined.

The output, input, tuition and appropriations data in this report do not include the medical schools of Penn State, Pittsburgh and Temple.

The report does not address the critically important issues of the quality of education provided by Pennsylvania's public universities, or the "fairness" of cost sharing between students and taxpayers in the Commonwealth. These highly complex and controversial issues are beyond the scope of the report.

The report is intended for use by a variety of persons: by legislators for making appropriation decisions; by university administrators for evaluating policies related to faculty output, salaries and workloads; and by Pennsylvania citizens, for making informed judgments about the levels and shares of costs related to public higher education in the Commonwealth.

II. Instructional Output

For analyses involving instructional output, three alternate measures of output are useful in different ways. Full-time equivalent (FTE) students, which are computed from student credit hours and thus are independent of the mix of full- and part-time students, are helpful in comparing different institutions with diverse full- and part-time student mixes, as well as the same institution whose student mix is changing over time. Student credit hours, which are related to courses taken by students, are helpful in the analysis of instruction differentiated by academic levels and programs. Degrees, which are granted in student majors and therefore are an important indicator of student interests and career objectives, are useful in analyzing societal and economic conditions and trends.

FULL-TIME EQUIVALENT (FTE) STUDENTS

In Fall 1985, Department of Education data¹ show that 211,493 full- and part-time students were enrolled in the Commonwealth's public universities: 128,325 (61 percent) in the 4 State-related institutions and 83,168 (39 percent) in the 14 State-owned institutions. The total head-count enrollment in the public universities represented approximately 39 percent of the total students enrolled in the 229 public and private institutions of higher education in Pennsylvania.

During the 1985-86 school year,² total student credit-hour production by the public universities was the equivalent of 191,435 full-time students: 112,484 (59 percent) by the State-related

¹Pennsylvania Department of Education, Higher Education Summer and Fall Enrollments, 1985.

²Unless otherwise noted, all data in this report apply to the indicated school year, which includes the summer term preceding the academic year, plus the fall and spring terms of the academic year; e.g., the 1985-86 school year includes the summer and fall terms of 1985 plus the spring term of 1986.

institutions, and 78,951 (41 percent) by the State-owned institutions (table 1). FTE enrollments ranged from 57,624 at Penn State, to 1,259 at Lincoln.

The relationship between head-count students and FTE students depends upon the mix of full- and part-time students enrolled at the individual institutions. In Fall 1985, Department of Education data show that the ratios of full-time to total students at Pennsylvania's public universities were as follows:³

<u>Institution</u>	<u>Main campus</u>	<u>Branch campuses</u>	<u>Total</u>
Penn State	89.2	64.6	78.4
Pittsburgh	62.0	73.6	64.0
Temple	63.3	--	63.3
Lincoln	98.1	--	98.1
State-related average	72.9	66.2	71.1
Bloomsburg	81.4	--	81.4
California	77.0	--	77.0
Cheyney	80.9	--	80.9
Clarion	84.9	41.9	80.8
East Stroudsburg	83.2	--	83.2
Edinboro	81.1	--	81.1
Indiana	85.8	--	85.8
Kutztown	80.6	--	80.6
Lock Haven	94.0	--	94.0
Mansfield	81.1	--	81.1
Millersville	73.6	--	73.6
Shippensburg	79.9	--	79.9
Slippery Rock	83.2	--	83.2
West Chester	71.0	--	71.0
State-owned average	80.6	41.9	80.3

The mix of full- and part-time students at each institution, in turn, depends upon such factors as the institution's levels and types of academic programs, the relative number of men and women enrolled, the campus location, etc. The data in table 1 indicate that during the 1985-86 school year at Pittsburgh and Temple, about three quarters of the FTE students were undergraduates. At Penn State, Lincoln and the State-owned institutions, approximately 90 percent of the FTE students were undergraduates. Department of Education data⁴ show

³Higher Education Summer and Fall Enrollments, 1985.

⁴Ibid.

Table 1

FULL-TIME EQUIVALENT STUDENTS BY LEVEL¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Total				Undergraduate				Graduate ³			
	FTE students	One-year change	Percentage change		FTE students	One-year change	Percentage change		FTE students	One-year change	Percentage change	
			One-year	Five-year			One-year	Five-year			One-year	Five-year
			change	average			change	average			change	average
State-related												
Penn State	57,624	344	1%	a	52,438	62	b	a	5,186	282	6%	a
Pittsburgh	28,867	-402	-1	b	21,292	-166	-1%	1%	7,575	-236	-3	-2%
Temple	24,734	739	3	-2%	18,832	693	4	1	5,902	46	1	-7
Lincoln	1,259	26	2	1	1,094	0	0	2	165	26	19	-5
Total	112,484	707	1	a	93,656	589	1	a	18,828	118	1	a
State-owned												
Indiana	12,730	-150	-1	b	11,901	-191	-2	b	829	41	5	1
West Chester	8,535	285	3	1	7,821	248	3	1	714	37	5	-2
Bloomsburg	6,343	173	3	b	5,979	125	2	b	364	48	15	-4
Millersville	6,220	44	1	1	5,692	-2	b	2	528	46	10	-4
Slippery Rock	6,196	31	1	3	5,921	53	1	3	275	-22	-7	-2
Kutztown	5,989	384	7	5	5,733	357	7	6	256	27	12	-2
Clarion	5,833	107	2	2	5,468	44	1	2	365	63	21	12
Shippensburg	5,729	103	2	1	5,224	113	2	1	505	-10	-2	-2
Edinboro	5,516	-227	-4	b	5,196	-217	-4	b	320	-10	-3	-6
California	4,859	143	3	3	4,490	138	3	3	369	5	1	b
East Stroudsburg	4,273	6	b	1	3,878	-51	-1	1	395	57	17	2
Mansfield	2,726	-82	-3	2	2,568	-95	-4	2	158	13	9	3
Lock Haven	2,628	-32	-1	1	2,628	-32	-1	1	na	na	na	na
Cheyney	1,374	-386	-22	-7	1,308	-374	-22	-7	66	-12	-15	b
Total	78,951	399	1	1	73,807	116	b	1	5,144	283	6	-1
All institutions	191,435	1,106	1	a	167,463	705	b	a	23,972	401	2	a

1. Data for each year represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. In addition to the master's level, the graduate level for Penn State, Pittsburgh, Temple and Indiana University includes first professional (excluding medical) and/or doctor's levels.

a. In 1983-84, Penn State's data on FTE students were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

b. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

that, in Fall 1985, at Pittsburgh and Temple, approximately half of the head-count students were men, while at Penn State, the male to total student ratio was nearly 60 percent. At Lincoln and the State-owned institutions, this ratio was about 45 percent.

Table 1 shows that the change from 1984-85 to 1985-86 in total FTE students, as well as FTE undergraduates and graduates, were relatively small at most of the State-related and State-owned universities. Increases in total FTE enrollments of 3 percent or more were reported by Bloomsburg, California, Kutztown, Temple and West Chester, and decreases of 3 percent or more by Cheyney, Edinboro and Mansfield. In each of these cases, the enrollment changes were the result of largely corresponding changes in FTE undergraduate students.

STUDENT CREDIT HOURS

Production by Academic Level

During the 1985-86 school year, about 5.6 million student credit hours (SCH) were produced by Pennsylvania's public universities: 3,262,000 (58 percent) by the State-related institutions and 2,340,000 (42 percent) by the State-owned institutions (table 2).

Table 2 shows that aggregate lower-division undergraduate SCH production decreased by 1 percent from the previous year. Kutztown and Temple reported significant increases in lower-division SCH, while California, Cheyney, Edinboro, Mansfield and Millersville reported significant decreases. In the aggregate, upper-division undergraduate SCH increased by 3 percent. California and Millersville reported exceptionally large increases in upper-division SCH, while Cheyney reported an exceptionally large decrease. Total master's SCH also increased by 3 percent.

Production by Program Area

The mix of student credit hours produced by the various academic departments or program areas in each institution of higher education depends upon many factors, including the overall mission of the institution, the interests of students and faculty, etc. Table 3 summarizes the 1985-86 school year SCH production of the public

Table 2

STUDENT CREDIT-HOUR PRODUCTION BY LEVEL¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)
 (in thousands)

Institution ²	Undergraduate						Graduate					
	Lower division			Upper division			Master's			First professional and doctor's ³		
	Credit hours	Percentage change		Credit hours	Percentage change		Credit hours	Percentage change		Credit hours	Percentage change	
	One-year	Five-year average		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average	
State-related												
Penn State	1,023	-1%	a	550	2%	a	62	14%	a	62	-2%	a
Pittsburgh	420	-1	1%	219	b	b	109	-4	-2%	73	-1	-1%
Temple	302	5	b	263	3	2%	66	1	-8	76	1	-6
Lincoln	26	-1	2	7	6	3	4	19	-5	na	na	na
Total	1,771	b	a	1,039	2	a	241	2	a	211	b	a
State-owned												
Indiana	242	-2	1	115	b	-1	20	5	1	c	c	c
West Chester	168	2	1	67	6	b	17	5	-2	na	na	na
Bloomsburg	127	1	3	53	5	-4	9	15	-4	na	na	na
Millersville	131	-3	1	40	10	5	13	10	-4	na	na	na
Slippery Rock	134	b	4	43	5	1	7	-8	-2	na	na	na
Kutztown	117	7	6	55	6	5	6	12	-2	na	na	na
Clarion	119	-1	1	45	6	3	9	21	12	na	na	na
Shippensburg	115	2	2	42	2	b	12	-2	-2	na	na	na
Edinboro	112	-5	1	44	-1	-1	8	-3	-6	na	na	na
California	91	-6	2	44	28	8	9	1	b	na	na	na
East Stroudsburg	85	-2	2	31	2	-2	9	17	2	na	na	na
Mansfield	55	-7	2	22	5	2	4	9	3	na	na	na
Lock Haven	56	b	-2	23	-3	10	na	na	na	na	na	na
Cheyney	30	-22	-7	9	-22	-9	2	-16	b	na	na	na
Total	1,582	-1	1	633	4	1	125	6	-1	na	na	na
All institutions	3,353	-1	a	1,672	3	a	366	3	a	211	b	a

1. Data for each year represent the summer term preceding the academic year plus the academic year.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. The first professional and doctor's level excludes medical school data for all schools.

a. In 1983-84, Penn State's data on student credit hours were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

b. Rounds to less than 1 percent.

c. Included in master's level.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Table 3

NUMBER AND PERCENTAGE DISTRIBUTION OF STUDENT CREDIT-HOUR PRODUCTION
 BY TYPE OF INSTITUTION, LEVEL AND CIP CLASSIFICATION
 1985-86
 (in thousands)

CIP Classification	State-related institutions						State-owned institutions					
	Lower division	Percent-age of total	Upper division	Percent-age of total	Graduate ¹	Percent-age of total	Lower division	Percent-age of total	Upper division	Percent-age of total	Graduate ¹	Percent-age of total
Agriculture	8.1	a	17.6	2%	3.4	1%	0	0%	0	0%	0	0%
Architecture and environmental design	4.4	a	13.3	1	.4	a	0	0	0	0	0	0
Area and ethnic studies	7.0	a	5.7	1	.5	a	0	0	0	0	0	0
Business	116.6	7%	186.9	18	53.9	12	112.5	7	143.8	23	8.8	7
Communications	18.2	1	25.7	2	3.4	1	27.8	2	24.6	4	1.5	1
Computer and information sciences	61.1	3	30.7	3	11.7	3	44.5	3	15.6	2	.7	1
Education	90.0	5	70.9	7	89.9	20	171.8	11	164.9	26	69.4	56
Engineering	77.9	4	158.5	15	37.3	8	1.7	a	2.4	a	.2	a
Foreign languages	70.3	4	16.1	2	4.3	1	54.0	3	7.9	1	.7	1
Health	17.7	1	67.5	6	58.3	13	5.7	a	21.3	3	2.7	2
Home economics	18.1	1	13.2	1	2.9	1	7.1	a	9.4	1	.6	a
Industrial arts	11.5	1	0	0	0	0	3.2	a	2.1	a	.2	a
Law	.2	a	.5	a	52.6	12	0	0	0	0	0	0
Letters	231.3	13	82.1	8	14.9	3	226.1	14	29.4	5	4.1	3
Liberal/general studies	3.7	a	1.1	a	.1	a	5.4	a	.1	a	0	0
Library and archival studies	.2	a	.1	a	3.4	1	1.9	a	1.4	a	2.8	2
Life sciences	85.5	5	33.9	3	9.3	2	89.4	6	17.8	3	2.4	2
Mathematics	233.9	13	38.6	4	7.3	2	149.1	9	25.0	4	4.1	3
Military sciences	2.6	a	2.8	a	b	a	6.0	a	2.1	a	0	0
Multi/interdisciplinary studies	18.0	1	5.9	1	2.0	a	4.6	a	.8	a	1.4	1
Parks and recreation	1.8	a	4.7	a	1.5	a	5.1	a	4.9	1	.3	a
Personal and social development	0	0	0	0	0	0	0	0	0	0	0	0
Philosophy, religion and theology	41.4	2	9.5	1	4.3	1	34.2	2	3.1	a	0	0
Physical sciences	186.9	11	33.3	3	22.5	5	116.8	7	14.4	2	1.8	1
Psychology	88.7	5	31.0	3	8.0	2	79.3	5	31.2	5	10.3	8
Public affairs and protective services	19.4	1	37.7	4	32.9	7	25.0	2	17.1	3	2.8	2
Social sciences	251.4	14	107.0	10	17.0	4	288.3	18	67.7	11	6.2	5
Trade and industrial	0	0	0	0	0	0	0	0	0	0	0	0
Visual and performing arts	105.6	6	44.2	4	10.1	2	116.1	7	24.1	4	2.5	2
Other	0	0	0	0	0	0	6.6	a	.8	a	b	a
Total ²	1,771.3	100	1,038.4	100	451.9	100	1,582.3	100	631.9	100	123.5	100

1. In addition to the master's level, the graduate level for Penn State, Pittsburgh, Temple and Indiana University includes first professional (excluding medical) and/or doctor's levels.

2. Because of rounding, CIP detail may not sum to total.

a. Rounds to less than 1 percent.

b. Rounds to less than 100 student credit hours.

SOURCE: Reports provided by the individual institutions, 1986.

institutions by Classification of Instructional Programs (CIP).⁵ As this table shows, both the State-related and State-owned university groups produced large proportions of lower-division undergraduate SCH in business, letters, mathematics, physical sciences, social sciences, and visual and performing arts; in addition, the State-owned group produced a relatively large number of SCH in education in the lower division. These program areas are related both to student majors and general distribution requirements. At the upper-division undergraduate level, the State-related group produced large numbers of SCH in business, engineering and the social sciences, and the State-owned group large numbers in business, education and the social sciences--areas related primarily to student majors. At the graduate level, the State-related group produced relatively large amounts of SCH in business, education, health and law; at this level the State-owned group produced over half of its SCH in education.

DEGREES BY ACADEMIC LEVEL

During the 1985-86 school year Pennsylvania's public universities conferred a total of 35,983 bachelor's and graduate degrees, not including medical degrees: 21,423 (60 percent) by the State-related institutions and 14,560 (40 percent) by the State-owned institutions (table 4). These degrees represented about one-half of the total bachelor's and graduate degrees (not including medical degrees) granted by all of Pennsylvania's public and private colleges and universities. Table 4 shows that more than 70 percent of the degrees from the State-related university group, and about 86 percent of the degrees from the State-owned university group, were bachelor's degrees. About 40 percent of the total degrees from Pittsburgh and Temple and 17 percent of those from Penn State were graduate degrees. In the State-owned group, graduate degree production exceeded 15 percent of total degree production at only Edinboro, Mansfield, Shippensburg and West Chester.

⁵The CIP taxonomy, introduced by the Center for Statistics (formerly the National Center for Education Statistics) in 1981, replaces the HEGIS taxonomy. This report utilizes an aggregation of two-digit CIP, each of which corresponds to one or more academic departments or program areas within individual institutions. The CIP groupings are employed to facilitate comparisons, given the large array of departments and programs in the Commonwealth's public universities.

Table 4

DEGREES CONFERRED BY LEVEL¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Total				Undergraduate				Graduate			
	Degrees	One-year change	Percentage change		Degrees	One-year change	Percentage change		Degrees	One-year change	Percentage change	
			One-year	Five-year			One-year	Five-year			One-year	Five-year
			change	average			change	average			change	average
State-related												
Penn State	9,970	15	a	a	8,323	5	a	1%	1,647	10	1%	-1%
Pittsburgh	6,219	101	2%	a	3,689	165	5%	1	2,530	-64	-2	-1
Temple	5,008	206	4	-1%	2,986	4	a	-1	2,022	202	11	-1
Lincoln	226	31	16	-2	157	31	25	1	69	0	0	-6
Total	21,423	353	2	a	15,155	205	1	1	6,268	148	2	-1
State-owned												
Indiana	2,605	112	4	a	2,281	121	6	1	324	-9	-3	-5
West Chester	1,417	227	19	1	1,183	174	17	2	234	53	29	-4
Bloomsburg	1,250	47	4	-1	1,123	45	4	1	127	2	2	-9
Millersville	1,146	-23	-2	1	1,024	-26	-2	2	122	3	3	-5
Slippery Rock	995	-48	-5	-1	876	-57	-6	-2	119	9	8	2
Kutztown	995	12	1	4	874	-1	a	5	121	13	12	-1
Clarion	1,023	2	a	1	898	34	4	2	125	-32	-20	a
Shippensburg	1,340	12	1	-1	999	20	2	a	341	-8	-2	-1
Edinboro	897	25	3	-2	750	-18	-2	-1	147	43	41	-6
California	835	54	7	a	712	69	11	1	123	-15	-11	-5
East Stroudsburg	843	112	15	2	717	68	10	1	126	44	54	8
Mansfield	486	18	4	1	404	-15	-4	a	82	33	67	6
Lock Haven	467	-34	-7	3	467	-34	-7	3	na	na	na	na
Cheyney	261	-45	-15	-6	241	-33	-12	-6	20	-12	-38	-5
Total	14,560	471	3	a	12,549	347	3	1	2,011	124	7	-3
All institutions	35,983	824	2	a	27,704	552	2	1	8,279	272	3	-2

1. Data for each year represent the summer term preceding the academic year plus the academic year. Undergraduate degrees include only bachelor's degrees. Graduate degrees include master's at all institutions except Lock Haven which does not have a master's program, first professional (excluding medical) and doctor's at Pittsburgh and Temple, and doctor's at Penn State and Indiana University.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Table 4 shows that one-year changes in total degrees conferred in several individual public universities were substantial. Increases in total degrees of 3 percent or more were reported by Bloomsburg, California, East Stroudsburg, Edinboro, Indiana, Lincoln, Mansfield, Temple and West Chester, and decreases of 3 percent or more by Cheyney, Lock Haven and Slippery Rock. In all cases except Edinboro and Mansfield, the changes in total degrees were largely correlated with corresponding changes in bachelor's degrees; at Edinboro and Mansfield, decreases in bachelor's degrees were more than offset by increases in master's degrees.

OUTPUT TRENDS - ENROLLMENT LEVELS AND COMPOSITION

Between 1980-81 and 1985-86, total FTE students increased by over 3 percent at Lincoln, decreased by less than 1 percent at Pittsburgh and decreased by over 8 percent (2,253 FTE students) at Temple; noncomparable data for Penn State does not permit a five-year FTE enrollment comparison.⁶ During this time, total FTE students increased by about 5 percent at the State-owned universities as a group. Several individual institutions reported five-year increases of 10 percent or more FTE students: California (15 percent), Clarion (11 percent), Kutztown (26 percent), Mansfield (11 percent) and Slippery Rock (13 percent). At Cheyney, FTE students have decreased by 36 percent since 1980-81.

While the level of aggregate FTE enrollments in the Commonwealth's public universities has remained fairly stable over the past five years, belying the forecasts of large enrollment declines due to the decline of 18- to 24-year-olds in Pennsylvania, the composition of enrollments has changed in several important respects. As shown in table 1, undergraduate students have increased at most institutions, while graduate students have decreased. In addition,

⁶In 1983-84, Penn State's data on FTE students (or student credit hours), FTE faculty and faculty salaries were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year and to a shorter summer term); and improved data collection procedures which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions. Therefore, output and input trends for Penn State are not included in this report.

Department of Education and PHEAA data⁷ indicate total relative increases in full-time students, male students and out-of-state students.⁸ These relative enrollment increases, related to social, demographic and economic factors, may have offset a relative decrease in more "traditional" students, and served to keep aggregate enrollments fairly constant.

RELATIONSHIP BETWEEN OUTPUT MEASURES

The relationship between student credit hours and degrees produced by the public universities is shown in table 5. For the State-related group during the 1985-86 school year, student credit hours per degree averaged 185.4 for undergraduate students and 72.1 for graduate students; for the State-owned group, the SCH per degree ratio averaged 176.4 and 61.5 for the two academic levels, respectively. At the same time, the minimum student credit hours required by the State-related universities averaged 120 for a bachelor's degree and 28 for a master's degree; for the State-owned universities, the minimum credit hour requirements for the two degrees averaged 126 and 30, respectively. Table 5 shows that at all of the institutions, at both academic levels, the SCH per degree ratio greatly exceeded the corresponding degree requirements. In all cases, the excess primarily represents the credit-hour output for students who have dropped out of school without receiving a degree, plus the credit-hour output for students who have taken courses over and above minimum degree requirements.

Table 5 shows that, since 1984-85, SCH per degree for both undergraduates and graduates have decreased, for both the State-related and State-owned groups. More importantly, over the past five years, SCH per degree have changed in divergent trends for the two academic levels and types of universities. For the State-related

⁷Higher Education Summer and Fall Enrollments, 1985, and Kenneth R. Reeher, Trends in Pennsylvania Students' Enrollments, Costs, Incomes and Financial Aid: A Report to the Governor's Commission on Financing Post-Secondary Education, Pennsylvania Higher Education Assistance Agency, April 19, 1984.

⁸Although comparative data are not presently available for Pennsylvania's public universities, it is generally believed that there has also been a relative increase in the average age of students. In fact, it is widely held that an increase in students beyond the traditional college age has been an important factor in preventing expected enrollment declines.

Table 5

RATIO OF STUDENT CREDIT-HOUR PRODUCTION TO DEGREES BY LEVEL¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Ratio	Undergraduate		Ratio	Graduate ³	
		Percentage change One- year	Five-year average		Percentage change One- year	Five-year average
State-related						
Penn State	189.0	a	b	75.6	5%	b
Pittsburgh	173.2	-5%	-1%	71.9	-1	-1%
Temple	189.2	4	2	70.1	-9	-6
Lincoln	208.9	-20	1	58.0	21	2
Total	185.4	-1	b	72.1	-2	b
State-owned						
Indiana	156.5	-7	a	61.4	8	8
West Chester	198.3	-12	-1	73.1	-19	3
Bloomsburg	159.8	-2	a	68.5	13	10
Millersville	166.8	3	a	104.1	7	3
Slippery Rock	202.7	7	5	55.5	-14	-4
Kutztown	196.8	7	1	51.2	1	-1
Clarion	182.6	-3	a	70.4	51	13
Shippensburg	156.9	a	2	35.5	0	a
Edinboro	207.9	-2	2	52.4	-31	1
California	189.2	-7	2	72.4	15	6
East Stroudsburg	162.3	-11	a	75.4	-24	-4
Mansfield	190.6	a	2	46.3	-35	-3
Lock Haven	169.0	6	-2	na	na	na
Cheyney	162.7	-12	-2	80.0	35	6
Total	176.4	-3	a	61.5	-1	3
All institutions	181.3	-2	b	69.5	-2	b

1. Data for each year represent the summer term preceding the academic year plus the academic year. Undergraduate degrees include only bachelor's degrees. Graduate degrees include master's at all institutions except Lock Haven which does not have a master's program, first professional (excluding medical) and doctor's at Pittsburgh and Temple, and doctor's at Penn State and Indiana University.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. The graduate level excludes medical school data for all schools.

a. Rounds to less than 1 percent.

b. In 1983-84, Penn State's data on student credit hours were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

institutions as a group, SCH per degree have decreased for graduates, but are about the same for undergraduates. For the State-owned group, SCH per degree have increased for both undergraduates and graduates. While the SCH per degree ratio is presently higher for both academic levels for the State-related group, the gap has narrowed for graduate students. The implication from these trends is that, for the State-related group, either student dropout rates have declined, or students are receiving their degrees more quickly now than five years ago. For the State-owned group, the opposite is true.

III. Instructional Faculty Input

The principal input in producing instructional output, whether measured by FTE students, student credit hours or degrees, is instructional faculty. Other inputs, complementary to the instructional process such as plant and equipment, administrative staff and overhead, are ordinarily not utilized in units assignable to specific instructional levels. To avoid an essentially arbitrary allocation of the costs of such inputs, instructional faculty and instructional faculty salary are the input and cost measures analyzed in this report.

According to data provided by the Pennsylvania Department of Education, during academic year 1985-86, a total of 9,353 full-time ranked faculty members (including lecturers) were engaged in instructional activities in the Commonwealth's public universities: 5,163 (55 percent) in the State-related institutions and 4,190 (45 percent) in the State-owned institutions.⁹ The full-time ranked instructional faculty employed by the public universities represented approximately 45 percent of this faculty employed by all of the public and private institutions of higher education in Pennsylvania.

FULL-TIME EMPLOYED FACULTY AND WORKLOADS

In Fall 1985, a total of 9,731 faculty members were employed full time by the public universities and engaged in either full- or part-time instruction: 5,456 (56 percent) by the State-related institutions and 4,275 (44 percent) by the State-owned institutions

⁹For comparisons of individual institutions across the various sectors of higher education, full-time ranked instructional faculty is the most commonly used measure.

(table 6).¹⁰ These totals represent a decrease of less than 1 percent for the State-related universities as a group and a small increase for the State-owned universities as a group.

Table 6 shows that the overall average reported workweek of the full-time employed faculty in the public universities was 53.1 hours: 51.6 hours for the State-related group, and 55 hours for the State-owned group. In the various institutions, faculty workweeks were divided into the following activities:

<u>Workweek activity</u>	<u>Penn State</u>	<u>Pitts- burgh</u>	<u>Temple</u>	<u>Lincoln</u>	<u>State- owned univer- sities</u>
Student contact	17.8%	17.4%	19.1%	21.0%	20.7%
Instructional support	38.6	31.1	31.2	35.1	32.2
Research	21.2	30.0	18.5	21.8	15.6
Other university service	<u>22.4</u>	<u>21.5</u>	<u>31.2</u>	<u>22.1</u>	<u>31.5</u>
Total	100.0	100.0	100.0	100.0	100.0

Total faculty hours spent in classroom and other contact with students averaged 9.2 at the more research-oriented State-related universities and 11.4 at the smaller State-owned universities. These average student contact hours represent one-year decreases of 1 and 3 percent, respectively, for the two groups of universities.

FTE INSTRUCTIONAL FACULTY AND SALARIES

Related to Academic Ranks

During the 1985-86 school year, a total of 10,914 ranked and nonranked FTE instructional faculty were employed by the public universities: 6,587 (60 percent) by the State-related institutions

¹⁰Faculty members who are employed full time, and who engage in either full- or part-time instruction, comprise the set of faculty whose workweeks are gathered and reported by the individual institutions and summarized in table 6. Note that this is not the same faculty set for whom instructional salary data are summarized in table 7. See also footnote 11.

Table 6

FULL-TIME EMPLOYED FACULTY WORKWEEKS BY TYPE OF ACTIVITY
1985-86, AND PERCENTAGE CHANGE FROM 1984-85

Institution ¹	Full-time ² employed faculty head count	Average weekly hours ³											
		Total	Student contact			Instruc- tional support	Percent- age change	Research	Percent- age change	Other university service	Percent- age change	Total work- week	Percent- age change
			Percent- age change	Under- graduate	Graduate								
State-related													
Penn State	2,676	9.2	0%	7.3	1.9	20.0	0%	11.0	5%	11.6	-2%	51.8	1%
Pittsburgh	1,542	9.0	-1	5.0	4.0	16.1	-3	15.5	5	11.1	-2	51.7	a
Temple	1,161	9.7	0	6.3	3.4	15.8	1	9.4	-6	15.8	-1	50.7	-1
Lincoln	77	10.8	-8	9.7	1.1	18.1	5	11.2	2	11.4	6	51.5	1
Total	5,456	9.2	-1	6.4	2.8	18.0	-1	12.0	3	12.4	-1	51.6	a
State-owned													
Indiana	661	12.1	-1	11.0	1.1	18.1	-2	10.2	-2	18.2	-2	58.6	-2
West Chester	474	11.8	0	10.7	1.1	19.0	2	9.2	0	20.7	a	60.7	a
Bloomsburg	326	11.5	0	10.9	.6	16.9	2	8.1	1	17.0	5	53.5	2
Millersville	294	11.4	0	10.9	.5	15.8	3	9.6	8	16.5	-1	53.3	2
Slippery Rock	334	11.8	-1	11.2	.6	18.7	1	9.2	10	16.7	-3	56.4	1
Kutztown	309	12.1	-2	11.7	.4	17.0	6	7.9	1	16.1	-3	53.1	1
Clarion	324	11.0	-2	10.5	.5	18.0	4	7.3	7	14.7	-6	51.0	a
Shippensburg	291	10.4	-1	9.5	.9	16.6	-4	7.8	-4	16.9	-2	51.7	-3
Edinboro	311	12.6	-1	11.8	.8	19.3	-2	7.4	-6	15.0	10	54.3	1
California	266	10.2	-22	9.4	.8	16.3	4	7.3	1	18.0	5	51.8	-2
East Stroudsburg	223	11.0	-2	10.2	.8	17.7	-4	9.0	-1	17.4	1	55.1	-2
Mansfield	182	10.2	-21	9.6	.6	20.5	-7	9.6	-8	16.4	9	56.7	-6
Lock Haven	166	11.4	-2	11.4	na	17.4	-1	7.2	3	17.3	1	53.3	0
Cheyney	114	10.2	-6	9.8	.4	14.2	-4	7.5	-4	18.3	4	50.2	-2
Total	4,275	11.4	-3	10.7	.7	17.7	0	8.6	0	17.3	1	55.0	-1
All institutions	9,731	10.2	-2	8.3	1.9	17.9	0	10.5	2	14.5	-1	53.1	a

1. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

2. The number of full-time employed faculty for 1985-86 represents those reported by each school for the fall term.

3. Average calculated using only those full-time employed faculty in the fall who reported a complete workweek of 100 hours or less.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1985 and 1986.

and 4,327 (40 percent) by the State-owned institutions (table 7).¹¹ These totals represent virtually no change for the State-related group and about a 1 percent increase for the State-owned group from the previous year.

Table 7 shows that the overall average instructional salary for the ranked and unranked FTE instructional faculty was \$27,300 for the State-related group and \$30,500 for the State-owned group. These averages represent one-year increases of \$1,100 (4 percent) and \$1,400 (5 percent), respectively, for the two groups of universities.¹²

Table 7 also shows that, as a group, the State-owned universities have a significantly higher percentage of their FTE instructional faculty in the professor and associate professor ranks (68 percent) than do the State-related universities (41 percent). Therefore, even though the average salary for each of the faculty ranks is lower for the State-owned group (except for instructors), the larger percentage of faculty in the two top ranks raises this group's overall average salary above that for the State-related group. Differences in the faculty rank mixes at the two different types of institutions also result from both the size and nature of these institutions. For example, the larger and more research-oriented State-related universities utilize larger numbers of both instructors and teaching assistants (graduate students). The extensive use of such persons for instruction lowers this group's overall average instructional salary, relative to that for the smaller State-owned universities.

Compared with Other Institutions

A comparison of the average salaries for the full-time ranked instructional faculty at Pennsylvania's public universities with the

¹¹The faculty included in table 7 are "full-time equivalent" instructional faculty, i.e., full-time persons plus the full-time equivalency of part-time persons, for the summer term of 1985 plus the 1985-86 academic year. The FTE instructional faculty is the faculty which produces the instructional output and whose cost efficiency is measured in this report. In contrast, the faculty included in table 6 are "full-time employed" faculty only for the fall term of 1985. The full-time faculty is the faculty whose workweeks are measured in this report. See also footnote 10.

¹²Average instructional salaries are computed by dividing the total instructional salary for each rank by the respective number of FTE faculty. Caveat: the changes in average salaries shown in table 7 do not necessarily correspond to general salary changes for all faculty members in a given institution. Average salary changes also reflect changes in the rank distributions of faculty.

Table 7

AVERAGE INSTRUCTIONAL SALARIES OF FULL-TIME EQUIVALENT INSTRUCTIONAL FACULTY AND PERCENTAGE DISTRIBUTION BY RANK¹
1985-86
(Dollars in thousands)

Institution ²	FTE instructional faculty		Average instructional salary		Professor		Associate professor		Assistant professor		Instructor		No rank ³	
	Number	Percentage change	Amount	Percentage change	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty	Average instructional salary	Percent- age of faculty
		1984-85 to 1985-86		1984-85 to 1985-86										
State-related														
Penn State	3,146	a	\$27.2	5%	\$44.3	15%	\$33.7	17%	\$26.5	26%	\$18.2	18%	\$19.7	24%
Pittsburgh	1,783	-2%	28.0	4	41.8	19	30.0	27	23.9	19	15.6	12	23.6	23
Temple	1,563	1	27.2	4	39.0	28	31.0	25	25.0	16	14.1	14	14.5	17
Lincoln	95	-8	21.3	10	28.7	17	24.9	13	20.4	39	18.3	19	14.5	12
Total	6,587	a	27.3	4	41.5	19	31.7	22	25.5	22	16.8	15	19.8	22
State-owned														
Indiana	664	-2	29.3	6	35.9	36	29.8	28	24.7	24	17.2	12	28.1	a
West Chester	477	3	30.0	4	38.3	27	31.2	37	24.7	24	18.3	12	31.8	a
Bloomsburg	339	1	30.1	7	37.7	30	30.9	32	25.1	27	20.1	11	na	0
Millersville	330	1	29.1	4	35.5	33	29.7	32	23.8	28	18.5	7	24.0	a
Slippery Rock	326	1	30.4	3	36.9	40	29.5	24	24.4	26	22.6	10	29.0	a
Kutztown	317	4	31.2	6	37.9	36	30.7	34	24.9	24	20.0	6	43.4	a
Clarion	305	4	29.4	3	35.8	32	30.5	31	24.2	30	18.9	7	24.4	a
Shippensburg	292	1	32.2	7	38.3	41	31.1	32	25.4	22	19.6	5	42.1	a
Edinboro	319	-1	32.1	4	36.9	44	30.7	31	25.6	24	20.8	1	31.1	a
California	260	6	31.7	1	37.2	42	30.9	35	25.2	16	17.7	7	29.7	a
East Stroudsburg	246	a	29.3	4	34.6	42	28.3	31	24.1	20	15.2	7	na	0
Mansfield	165	-2	29.7	4	37.8	28	30.7	34	24.2	31	17.1	7	na	0
Lock Haven	151	0	33.0	4	39.1	38	31.4	43	25.7	14	20.6	5	19.6	a
Cheyney	136	-6	34.7	15	40.7	35	33.7	48	26.3	9	23.8	7	24.6	1
Total	4,327	1	30.5	5	37.0	36	30.6	32	24.7	24	18.8	8	29.5	a
All institutions	10,914	a	28.6	5	39.1	26	31.1	26	25.2	23	17.3	12	19.9	13

1. Average instructional salary is calculated by dividing the total instructional salary paid to all staff members in the respective rank categories by their total full-time equivalency in the instructional function. One full-time equivalent faculty represents one full-time workload for two terms (one academic year). The summer term is treated as one term or one-half the academic year. Data for each year represent the summer term preceding the academic year plus the academic year.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. The full-time equivalency of nonranked faculty members is based on the time spent in instruction by all nonranked personnel, including lecturers, administrators, librarians, research staff and graduate assistants.

a. Rounds to less than 1 percent.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1985 and 1986.

average salaries for comparable faculty at individual private institutions in the Commonwealth, individual public institutions in other states, and public and private institutions in the nation as a whole, is informative.

For academic year 1985-86, the overall average salary for full-time ranked instructional faculty at public institutions of higher education in the U.S. was \$33,400; for private institutions the overall average was \$32,300 (table 8). The comparable average salary for the Commonwealth's State-related universities was \$33,300 and for the State-owned universities \$31,600. The percentages of this faculty in the top two faculty ranks averaged 67 and 64 in public and private colleges and universities across the nation and 61 and 70 in Pennsylvania's State-related and State-owned universities, respectively.

Table 8 shows that the average salaries for the full-time ranked instructional faculty at the individual State-related universities were generally lower than those for this faculty at both comparable private institutions in Pennsylvania and public institutions in other states. Average salaries at the individual State-owned universities were generally higher than those for selected public or private institutions which award only bachelor's degrees in Pennsylvania or other states, but generally lower than those for selected institutions in both sectors which award both bachelor's and advanced degrees within and outside the Commonwealth.

INPUT TRENDS

Faculty Workweek Activities

Between 1980-81 and 1985-86, at the State-related institutions, average undergraduate contact hours decreased by nearly 10 percent and average graduate contact hours by nearly 7 percent. Over the same interval, at the State-owned institutions, average undergraduate contact hours decreased by about 2 percent and average graduate contact hours by nearly 13 percent. Since the average total faculty workweeks for both groups of institutions remained approximately constant during this time, decreases in student contact hours have been largely offset by increases in other workweek activities.

Full-Time Employed Faculty and FTE Instructional Faculty

Between Fall 1980 and Fall 1985, the total full-time employed faculty--the faculty members whose workweek activities are included in this report--increased by 12 at Pittsburgh and 1 at Lincoln, but

Table 8

AVERAGE INSTRUCTIONAL FACULTY SALARIES¹ AND PERCENTAGE OF FULL-TIME FACULTY
BY RANK AND TYPE OF INSTITUTION²
SELECTED PUBLIC AND PRIVATE INSTITUTIONS OF HIGHER EDUCATION
ACADEMIC YEAR, 1985-86
(Dollars in thousands)

Group	Institution	Average salary					Total ranked instructional faculty	Percentage of ranked faculty			
		All ranks ³	Prof.	Assoc. prof.	Asst. prof.	Instr.		Prof.	Assoc. prof.	Asst. prof.	Instr.
I. INSTITUTIONS AWARDING ONLY BACHELOR'S DEGREES											
	State-owned (Pennsylvania)										
	Lock Haven	\$32.9	\$39.6	\$32.3	\$26.1	\$20.1	169	36%	40%	15%	9%
	Private (Pennsylvania)										
	Dickinson College	29.9	40.9	31.4	24.5	21.5	129	21	33	34	12
	Franklin & Marshall College	35.1	46.6	36.0	25.0	23.3	132	32	29	34	5
	Gettysburg College	32.9	43.0	33.1	25.3	24.4	133	28	38	27	7
	Lebanon Valley College	24.9	28.4	24.9	21.7	nd	65	32	34	29	5
	Swarthmore College	38.8	48.4	33.6	26.1	nd	139	50	23	24	3
	Wilson College	22.0	27.1	22.6	18.4	nd	30	30	30	30	10
	Public (other states)										
	Mary Washington College (VA)	29.2	34.7	30.3	24.3	21.7	145	33	28	33	6
	University of N.C. at Asheville (NC)	30.5	39.9	31.2	27.9	24.0	91	24	37	30	9
II. INSTITUTIONS AWARDING BACHELOR'S AND ADVANCED DEGREES											
	State-related and State-owned (Pennsylvania)										
	Penn State ⁴	34.9	47.1	34.7	28.5	18.0	1,419	36	29	24	11
	Pittsburgh ⁴	36.4	48.3	34.1	27.1	18.7	1,197	35	36	23	6
	Temple	36.1	43.4	33.7	27.8	23.0	1,173	42	35	20	3
	Lincoln	24.8	33.0	27.1	22.6	19.3	76	21	20	42	17
	Bloomsburg	31.2	39.1	32.0	25.6	21.4	337	30	31	30	9
	California	32.3	37.4	31.0	24.7	19.7	263	42	37	18	3
	Cheyney	32.1	37.5	31.0	25.7	21.1	148	37	45	11	7
	Clarion ⁴	31.2	39.0	31.7	25.2	19.5	292	32	32	28	8
	East Stroudsburg	33.1	38.3	31.8	25.7	nd	220	44	33	21	2
	Edinboro	32.3	37.4	30.8	25.4	nd	304	44	31	25	a
	Indiana	30.7	37.3	30.5	24.4	17.8	606	39	28	26	7
	Kutztown	32.4	38.8	31.5	25.3	20.7	285	37	36	23	4
	Mansfield	30.0	36.9	30.6	23.9	16.6	159	31	35	30	4
	Millersville	31.2	38.8	31.4	25.2	19.9	309	31	34	29	6
	Shippensburg	33.3	38.9	31.7	25.7	21.2	274	43	32	22	3
	Slippery Rock	30.7	37.4	30.5	24.2	19.6	330	41	25	26	8
	West Chester	32.2	38.8	31.9	25.5	21.6	444	32	40	25	3
	Private (Pennsylvania)										
	Bryn Mawr College	34.2	42.5	33.8	26.1	nd	122	47	26	25	2
	Carnegie-Mellon University	43.8	55.8	37.9	33.4	26.5	473	42	27	29	2
	Lehigh University	40.7	48.8	35.6	28.4	29.4	360	50	28	19	3
	University of Pennsylvania	46.3	56.2	40.0	32.9	nd	1,017	50	25	25	a
	Public (other states)										
	Eastern New Mexico U.-Main (NM)	27.5	35.5	29.8	25.4	20.9	149	17	28	37	18
	Lake Superior St. College (MI)	28.5	33.4	29.2	25.5	21.0	109	26	37	27	10
	Rutgers University-Camden (NJ)	38.7	56.1	39.3	29.1	24.8	200	20	47	26	7
	SUNY at Stony Brook (NY)	40.9	53.5	37.2	27.9	23.8	630	44	28	27	1
	University of Maryland at College Park (MD)	37.2	48.9	35.6	29.1	21.4	1,243	37	35	20	8
	University of Michigan at Ann Arbor (MI)	42.6	51.8	38.3	32.2	20.9	1,573	54	22	23	1
	University of North Carolina at Chapel Hill (NC)	40.5	50.7	36.8	30.4	27.5	1,042	49	27	22	2
	University of Texas at Austin (TX)	38.2	48.3	33.2	29.3	21.0	1,844	45	27	26	2
	PENNSYLVANIA AVERAGES										
	State-related institutions	33.3	45.5	33.5	26.7	19.8	5,016	30	31	28	11
	State-owned institutions	31.6	38.0	31.3	25.0	19.8	4,190	37	33	25	5
	U.S. AVERAGES ⁵										
	Public institutions	33.4	42.3	32.2	26.7	20.9	212,188	37	30	26	7
	Private institutions	32.3	43.0	30.9	25.2	19.1	91,383	35	29	29	7

1. All data include only full-time ranked faculty whose major assignment is instruction—including those with release time for research—and excludes part-time and administrative faculty and faculty for preclinical and clinical medicine. Average salaries are based on contracted salaries (adjusted to a standard academic year basis, when necessary), excluding summer teaching, extra loads, etc.
2. Institutions in group I award only the bachelor's degree or equivalent. Institutions in group II also award advanced degrees. Group I corresponds to Academe category IIB, and group II corresponds to Academe categories I plus IIA (See source below).
3. The all ranks average includes lecturers, not separately shown here.
4. Main Campus data.
5. Includes faculty and salaries for institutions which participated in the AAUP 1985-86 annual survey.
 - a. Rounds to less than 1 percent.
 - nd. No data.

SOURCE: Individual institutions - "Annual Report on the Economic Status of the Profession, 1985-86," Academe 72, Bulletin of the American Association of University Professors (Washington, D.C.: March-April 1986), pp. 20-70; Pennsylvania averages - Pennsylvania Department of Education, Bureau of Information Systems, Division of Data Services; U.S. averages - Maryse Eymonerie Associates (MEA), McLean, Virginia.

decreased by 87 (7 percent) at Temple. During this interval the total full-time employed faculty at the State-owned universities increased by 83 (2 percent).

Between 1980-81 and 1985-86, the total FTE instructional faculty--the faculty members whose instructional output and salary cost are the focus of this report--decreased by 49 (3 percent) at Pittsburgh and 178 (10 percent) at Temple, and were unchanged at Lincoln. During this time, the total FTE instructional faculty at the State-owned universities increased by 136 (4 percent).¹³

Average Instructional Faculty Salary

Between 1980-81 and 1985-86, the average instructional salary of the FTE instructional faculty increased by \$7,200 (35 percent) at Pittsburgh, \$5,900 (28 percent) at Temple and \$4,000 (23 percent) at Lincoln. During these years the average instructional salary of the FTE instructional faculty at the State-owned universities increased by approximately \$5,700 (23 percent).¹⁴ These increases were caused by two separate factors at the various institutions: (1) changes in faculty salaries; and (2) changes in faculty rank distributions. Between 1980-81 and 1985-86, the percentage of FTE instructional faculty in the two top academic ranks (professor and associate professor) increased by 2 percent at Pittsburgh and 4 percent at Temple, and decreased by 5 percent at Lincoln. During this five-year period, the faculty in the two top ranks at the State-owned universities decreased by 4 percent. The relative decline in the percentage of top ranked faculty in the State-owned group has helped to narrow the gap between the average instructional salary for the FTE instructional faculty for this group and the corresponding average salary for the State-related group.

Between the 1980-81 and 1985-86 academic years, the average salary of the full-time ranked instructional faculty at institutions in the various sectors of higher education in Pennsylvania, as well as

¹³The increase is approximate because the FTE instructional faculties reported by Millersville for 1980-81 and 1985-86 are noncomparable.

¹⁴The increase is approximate because the instructional salaries for the FTE instructional faculty reported by Cheyney, Millersville and West Chester for various years during this five-year period are noncomparable.

at public and private institutions in the United States as a whole, increased by approximately the following percentages:¹⁵

<u>Pennsylvania</u>	
State-related universities	35%
State-owned universities	21
Community colleges	55
Private institutions	45
<u>U.S.</u>	
Public institutions	38
Private institutions	43

RELATIONSHIP BETWEEN OUTPUT AND INPUT

The relationship between FTE students and FTE instructional faculty is shown in table 9. During the 1985-86 school year, FTE students per FTE faculty averaged 17.1 at the State-related group, ranging from 18.3 at Penn State to 13.3 at Lincoln. For the State-owned group, the ratio averaged 18.2, ranging from 19.6 at Shippensburg to 10.1 at Cheyney.

Table 9 shows that, since last year, FTE students per FTE faculty have increased slightly at Pittsburgh and Temple, increased considerably at Lincoln and remained unchanged at Penn State. The output/input ratio has also increased at 6 of the 14 State-owned universities, decreased at 7 institutions and remained unchanged at 1 institution. Over the past five years, FTE students per FTE faculty have increased at Pittsburgh, Temple and Lincoln, as well as at 9 of the 14 State-owned universities.

¹⁵Sources: Pennsylvania Department of Education, preliminary data for 1985-86, Our Colleges and Universities Today--Faculty and Other Personnel, vol. XVIII (1980-81), no. 7; Academe, vol. 67, and data from Maryse Eymonerie Associates (MEA), McLean, Virginia.

Table 9
 FTE STUDENTS PER FTE INSTRUCTIONAL FACULTY¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	FTE students per FTE instructional faculty	Percentage change	
		One- year	Five-year average
State-related			
Penn State	18.3	0%	a
Pittsburgh	16.2	1	1%
Temple	15.8	2	b
Lincoln	13.3	11	1
Total	17.1	1	a
State-owned			
Indiana	19.2	1	b
West Chester	17.9	1	b
Bloomsburg	18.7	2	b
Millersville	18.8	-1	a
Slippery Rock	19.0	0	1
Kutztown	18.9	3	1
Clarion	19.1	-2	1
Shippensburg	19.6	1	b
Edinboro	17.3	-3	1
California	18.7	-3	3
East Stroudsburg	17.4	1	-2
Mansfield	16.5	-1	1
Lock Haven	17.4	-1	b
Cheyney	10.1	-17	-5
Total	18.2	-1	a
All institutions	17.5	0	a

1. Data for each year represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

a. Noncomparable data.

b. Rounds to less than 1 percent.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

IV. Cost Efficiency

Cost efficiency is the minimization of the input cost of producing a given amount of output. In higher education the simplest measure of cost efficiency is the instructional faculty salary cost per student credit hour produced.

INSTRUCTIONAL FACULTY SALARY COST PER STUDENT CREDIT HOUR PRODUCED (SCH COST)

By Academic Level

During the 1985-86 school year, the instructional faculty salary cost per student credit hour produced (SCH cost) by the State-related universities averaged \$41 at the undergraduate level and \$112 at the master's level; the SCH cost for the State-owned universities averaged \$53 and \$112 at the two academic levels, respectively. Undergraduate SCH cost ranged from \$109 at Cheyney to \$38 at Penn State and master's SCH cost from \$282 at Cheyney to \$72 at Lincoln (table 10).

Compared to 1984-85, the 1985-86 SCH cost for the State-related group increased by \$2 (5 percent) for undergraduates and was unchanged for master's students; for the State-owned group the one-year changes were a \$2 (4 percent) increase for undergraduates and a \$1 (1 percent) decrease for master's students.

Table 10 shows that while SCH cost varies widely among the individual institutions, two important general relationships are evident. First, SCH cost tends to vary inversely with the quantity (or scale) of output: for all academic levels, average instructional faculty salary cost per student credit hour produced tends to decrease as the quantity of student credit hours produced increases. Second, SCH cost tends to vary directly with academic levels: for all quantities of student credit hours produced, SCH cost tends to increase as the academic level increases.

Table 10

AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER STUDENT CREDIT HOUR BY LEVEL¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Undergraduate									Master's		
	Total under-graduate	Percentage change		Lower division	Percentage change		Upper division	Percentage change		Total master's	Percentage change	
	One-year	Five-year average	One-year		Five-year average	One-year		Five-year average	One-year		Five-year average	One-year
State-related												
Penn State	\$38	6%	a	\$32	3%	a	\$50	6%	a	\$99	1%	a
Pittsburgh	42	11	6%	31	11	6%	62	7	6%	132	2	8%
Temple	47	7	3	39	5	4	55	6	2	94	-1	1
Lincoln	53	0	3	45	2	4	84	-9	2	72	0	10
Total	41	5	a	33	6	a	54	6	a	112	0	a
State-owned												
Indiana	46	5	4	36	6	5	67	3	4	153	3	7
West Chester	53	2	5	43	2	5	78	3	4	112	7	5
Bloomsburg	53	6	6	44	5	4	74	7	10	86	-2	8
Millersville	51	6	4	41	5	3	83	5	4	76	-10	5
Slippery Rock	51	2	4	42	2	3	79	0	6	122	7	5
Kutztown	54	2	3	39	0	3	87	7	3	99	6	5
Clarion	50	9	4	41	5	2	73	9	6	93	-21	-4
Shippensburg	52	6	5	46	5	5	69	8	7	106	8	7
Edinboro	60	11	4	53	10	6	78	8	4	112	-21	3
California	53	4	0	42	0	-2	74	-3	1	129	5	4
East Stroudsburg	56	4	6	44	-2	6	89	14	9	74	-1	8
Mansfield	57	6	2	41	5	1	99	3	2	132	2	19
Lock Haven	63	5	5	53	10	5	88	1	3	na	na	na
Cheyney	109	38	b	93	39	b	161	36	b	282	50	b
Total ³	53	4	4	43	2	4	78	5	5	112	-1	6
All institutions	46	5	a	38	6	a	63	5	a	112	0	a

1. The instructional faculty salary cost per student credit hour for each level was calculated as follows: the instructional salary for each rank was assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank was summed by level and divided by the total student credit-hour production at that level. In the case of individual instruction, one course credit was attributed to every three student credit hours produced in individual instruction.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. Five-year average percentage changes exclude Cheyney.

a. In 1983-84, Penn State's data on instructional salaries and student credit hours were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

b. No data.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

By Program Area

For both groups of public universities, SCH cost also varies considerably by program areas. Table 11 shows that program areas (CIP) with substantially higher than average undergraduate SCH cost ("high-cost" CIP) at the State-related universities include agriculture, area and ethnic studies, education, health, and parks and recreation. For this group of institutions, psychology is a "low-cost" undergraduate CIP. For the State-owned group, engineering, health, industrial arts, library and archival sciences, physical sciences and visual and performing arts are "high-cost" undergraduate CIP, while liberal and general studies is a "low-cost" undergraduate CIP.

Like table 10, table 11 clearly shows that SCH cost tends to vary directly with academic levels.

DETERMINANTS OF SCH COST

Appendix A of this report presents a model of SCH cost determination. This model shows that there are three variables which university administrators can control, at least to some extent, to influence SCH cost, or cost efficiency.

Average Instructional Faculty Salary

Average instructional faculty salaries tend to vary directly with faculty ranks (see table 7). Since faculty ranks also tend to vary directly with academic levels, average faculty salaries tend to vary directly with academic levels, and have a positive effect on SCH cost.

Average Class (Section) Size

Average class (section) size tends to vary inversely with academic levels: lower-division undergraduate classes are generally larger in size than upper-division classes, and upper-division classes are typically larger in size than master's level classes at all academic levels (table 12). Thus class (section) size has a negative effect on SCH cost.

Number of Classes (Sections) per Course

The number of classes (sections) per course tends to vary inversely with academic level, but positively with the quantity of

Table 11

AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER STUDENT CREDIT HOUR¹
BY TYPE OF INSTITUTION, LEVEL AND CIP CLASSIFICATION
1985-86

CIP classification	State-related				State-owned			
	Undergraduate			Master's	Undergraduate			Master's
	Total under-graduate	Lower division	Upper division		Total under-graduate	Lower division	Upper division	
Agriculture	\$54	\$48	\$57	\$191	--	--	--	--
Architecture and environmental design	51	59	49	152	--	--	--	--
Area and ethnic studies	59	47	73	234	--	--	--	--
Business	34	31	37	60	\$38	\$32	\$42	\$89
Communications	40	24	52	136	47	34	62	151
Computer and information sciences	42	38	50	69	47	42	60	130
Education	52	34	74	67	67	50	84	92
Engineering	51	57	48	113	93	76	106	126
Foreign languages	47	38	84	151	63	55	120	90
Health	70	59	73	301	115	81	124	156
Home economics	34	22	50	184	61	39	78	210
Industrial arts	--	--	--	--	99	88	115	255
Law	48	60	42	79	--	--	--	--
Letters	39	37	46	128	52	47	89	170
Liberal/general studies	39	29	72	73	20	20	4	--
Library and archival sciences	40	49	13	83	70	51	95	88
Life sciences	32	24	52	242	59	45	131	309
Mathematics	34	31	54	117	45	42	66	110
Military sciences	--	--	--	--	--	--	--	--
Multi/interdisciplinary studies	51	45	68	146	57	53	81	45
Parks and recreation	72	37	86	108	65	49	82	185
Personal and social development	--	--	--	--	--	--	--	--
Philosophy, religion and theology	46	36	88	177	44	40	98	--
Physical sciences	39	34	67	168	68	54	178	266
Psychology	26	18	52	162	44	34	70	96
Public affairs and protective services	47	30	55	95	51	37	73	72
Social sciences	37	29	55	156	43	36	76	179
Trade and industrial	59	59	--	--	--	--	--	--
Visual and performing arts	44	32	74	179	68	54	139	266
Other	--	--	--	--	92	62	334	1,451
Total	41	33	54	112	53	43	78	112

1. The instructional faculty salary cost per student credit hour for each level was calculated as follows: the instructional salary for each rank was assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank was summed by level and divided by the total student credit-hour production at that level. In the case of individual instruction, one course credit was attributed to every three student credit hours produced in individual instruction.

SOURCE: Reports provided by the individual institutions, 1986.

Table 12

AVERAGE CLASS SIZE IN CLASSROOM INSTRUCTION BY LEVEL¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Undergraduate									Master's		
	Total undergraduate			Lower division			Upper division			Percentage change		
	Class size	One-year	Five-year average	Class size	One-year	Five-year average	Class size	One-year	Five-year average	Class size	One-year	Five-year average
State-related												
Penn State	30	3%	a	30	3%	a	30	0%	a	15	25%	a
Pittsburgh	27	0	0%	29	0	0%	23	0	-1%	16	0	-1%
Temple	23	0	b	25	0	b	21	0	b	13	0	b
Lincoln	16	7	0	18	0	-1	11	22	4	12	9	-3
Total	27	0	b	29	4	b	26	4	b	14	0	b
State-owned												
Indiana	24	0	0	30	0	-1	17	0	1	7	0	-2
West Chester	21	0	b	25	4	b	15	0	b	10	0	b
Bloomsburg	20	-13	-3	23	-12	-2	16	-16	-3	13	0	0
Millersville	21	-5	-2	26	0	-1	13	-7	-3	13	8	-1
Slippery Rock	23	-4	-1	29	-3	1	15	0	-2	11	0	0
Kutztown	22	5	-1	29	7	-2	14	8	-1	11	10	-5
Clarion	27	-7	0	33	0	1	19	-5	0	14	17	15
Shippensburg	26	4	0	28	0	0	21	0	-1	14	0	2
Edinboro	22	0	1	24	-4	1	17	6	1	11	38	2
California	24	0	4	29	4	5	17	6	3	9	0	-2
East Stroudsburg	24	0	-1	28	0	-1	16	-6	-2	15	7	-1
Mansfield	18	0	-2	26	4	-1	10	0	-3	7	0	-10
Lock Haven	23	0	0	27	0	0	18	0	2	na	na	na
Cheyney	14	-7	-4	16	-6	-6	10	0	-2	7	-12	0
Total	22	-4	b	27	0	b	16	0	b	10	0	b
All institutions	25	0	b	28	0	b	21	0	b	13	8	b

1. Average class size for each level is calculated by dividing total classroom student credit hours by total classroom assigned credits.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

a. In 1983-84, Penn State's data on classroom student credit hours and classroom assigned credits were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years data from Penn State and the other institutions.

b. Noncomparable data.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

student credit hours produced at each academic level (table 13). Therefore, the number of classes (sections) per course has a negative effect on SCH cost.¹⁶

QUANTITATIVE ANALYSIS OF COST EFFICIENCY

The specification of the SCH cost model can be statistically validated and quantitative estimates of the various control variable made using the technique of multiple regression analysis. The regression equation which results from the model is:¹⁷

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2$$

where:

Y = instructional salary cost per student credit hour (\$)

X₁ = average FTE instructional faculty salary (\$)

X₂ = average class (section) size (students)

b₀, b₁ and b₂ are regression coefficients to be estimated; ln is natural log.

Separate regressions were estimated for the State-related and State-owned groups of universities, using data for the lower and upper division and various CIP for the 1985-86 school year.¹⁸ The coefficient estimates for the control variables obtained from these regressions are as follows:

¹⁶Administrators can change the number of classes (sections) per course as an alternative to permitting changes in class size to occur as student demands vary. Therefore, class (section) size and the number of classes (sections) per course are negatively correlated.

¹⁷This regression equation is actually a logarithmic transformation of a multiplicative version of the linear SCH cost equation derived in appendix A; the transformed equation is used to account for non-linearities between the X's and the Y. Notice that the regression equation does not include the number of classes (sections) as an explanatory variable. As noted above, variations in the number of classes and average class size are alternative policy actions. Therefore, inclusion of both variables in the regression would be conceptually and statistically incorrect.

¹⁸The actual regression data are not included in this report. These data and all other regression details are available from the staff of the Joint State Government Commission.

Table 13

AVERAGE NUMBER OF SECTIONS PER UNDERGRADUATE COURSE BY DIVISION¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Lower division	Percentage change		Upper division	Percentage change	
		One- year average	Five- year average		One- year average	Five- year average
State-related						
Penn State	7.18	-1%	a	1.75	1%	a
Pittsburgh	2.77	2	1%	1.40	-1	5%
Temple	3.70	a	a	1.65	a	a
Lincoln	1.67	8	-2	1.10	-9	-3
Total	4.40	a	a	1.61	a	a
State-owned						
Indiana	3.03	-1	b	1.62	-1	-6
West Chester	1.94	-2	b	1.33	-3	-5
Bloomsburg	2.42	12	2	1.80	16	b
Millersville	2.42	5	4	1.71	12	6
Slippery Rock	2.00	-1	b	1.46	-1	b
Kutztown	2.39	-1	3	1.52	-3	-11
Clarion	1.90	3	b	1.39	4	2
Shippensburg	2.60	4	2	1.48	3	1
Edinboro	2.26	-3	b	1.46	-1	-2
California	2.08	7	2	1.52	2	b
East Stroudsburg	1.50	-1	1	1.37	6	-1
Mansfield	1.40	-6	2	1.58	1	6
Lock Haven	1.79	1	-8	1.34	2	-10
Cheyney	1.85	-17	-1	1.16	-11	-2
Total	2.15	b	1	1.50	1	-3
All institutions	2.92	a	a	1.55	a	a

1. Average sections per course are computed as: total classroom course credit hours divided by three equals number of sections; number of sections divided by total number of courses equals average sections per course.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

a. Noncomparable data.

b. Rounds to less than 1 percent.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

<u>Variable</u>	<u>Coefficient estimates</u>			
	<u>State-related universities</u>		<u>State-owned universities</u>	
	<u>Lower division</u>	<u>Upper division</u>	<u>Lower division</u>	<u>Upper division</u>
ln constant	-3.49	-3.39	-6.88	-4.87
ln X ₁	.95	.93	1.27	1.12
ln X ₂	-.74	-.65	-.73	-.85

All of the estimated coefficients are statistically significant at the 5 percent level or better and have the expected signs: SCH cost in the Commonwealth's public universities is positively correlated with average instructional faculty salary, and negatively correlated with average class (section) size. The model has considerable explanatory power: the regressions explain from 55 to 75 of the variation in SCH cost, depending upon the type of institution and academic level.

The quantitative values of the coefficients indicate, for example, that in the lower division of the State-owned universities, a 1 percent increase in the average salary of the FTE instructional faculty could be expected to increase SCH cost by about 1.27 percent and a 1 percent increase in average class (section) size could be expected to decrease SCH cost by about .73 percent, with all other control variables held constant. For a given percentage change in either salary or class size, the percentage impact on SCH cost could be expected to be greater for the smaller State-owned group than the larger State-related group. For both groups, however, the regressions demonstrate substantial "economies of scale": lower SCH cost is strongly related to larger class size.

The regression results also indicate the overall reductions in SCH cost which could be expected from several possible "policy actions" by university administrators, i.e., changes in each of the control variables with the other control variables held constant:

<u>Policy action</u>	<u>State-related universities</u>		<u>State-owned universities</u>		<u>Total</u>
	<u>(\$000)</u>		<u>(\$000)</u>		
	<u>Lower division</u>	<u>Upper division</u>	<u>Lower division</u>	<u>Upper division</u>	
Decrease average FTE instructional faculty salary by \$1,000	\$2,700	\$2,400	\$3,200	\$2,100	\$10,400
Increase average class (section) sizes by one student	1,900	2,200	2,100	3,500	9,700

COST-EFFICIENCY TRENDS

Between 1980-81 and 1985-86, average instructional faculty salary cost per student credit hour for undergraduates increased to \$42 from \$32 (31 percent) at Pittsburgh, to \$47 from \$41 (15 percent) at Temple and to \$53 from \$46 (15 percent) at Lincoln. For the State-owned universities as a group, average SCH cost for undergraduates increased to \$53 from \$44 (20 percent).¹⁹

Practically all of the increase in SCH cost is directly attributable to increases in instructional faculty salary cost. No offsetting increases in average class size were instituted.

INTERSTATE COMPARISON OF COST EFFICIENCY

Because of insufficient data, it is presently not possible to make interstate comparisons of the cost efficiency of public colleges and universities based on the SCH cost measure detailed above. However, state data are available to make comparisons based on a related measure of cost efficiency: total instructional cost per FTE student. The latter measure of cost efficiency includes instructional salaries plus other costs related to instruction, and thus is more comprehensive than SCH cost (see footnote to table 14); the more inclusive measure does not, however, avoid the allocation problem referred to in the introduction to the previous section of this report. For fiscal year 1984, a computed total instructional cost per FTE student for all publicly controlled institutions of higher education in each of the 50 states is shown in table 14. The U.S. mean cost per student was \$4,948, and the median cost per student about \$4,954. The cost per student for Pennsylvania's public institutions-- including State-related and State-owned universities, and community colleges--was \$5,553, 12 percent higher than the U.S. mean and seventh highest in the nation.²⁰

¹⁹This SCH cost increase excludes Cheyney for which no data are available for 1980-81.

²⁰Notice that this set of public institutions for Pennsylvania includes the public universities plus community colleges. Thus, this measure of cost efficiency is noncomparable with SCH cost which is computed above for the public universities only.

Table 14

TOTAL INSTRUCTIONAL COST¹ PER FTE STUDENT BY STATE
ALL PUBLICLY CONTROLLED INSTITUTIONS OF HIGHER EDUCATION
FISCAL YEAR 1984

State	Rank	Instructional cost per FTE student
Alaska	1	\$9,612
Wyoming	2	7,106
Vermont	3	6,658
New York	4	6,377
Delaware	5	6,106
Kentucky	6	5,670
PENNSYLVANIA	7	5,553
Rhode Island	8	5,377
Maine	9	5,331
South Carolina	10	5,302
Iowa	11	5,278
Wisconsin	12	5,273
Michigan	13	5,196
Indiana	14	5,179
North Dakota	15	5,153
Washington	16	5,137
Texas	17	5,119
Minnesota	18	5,092
Ohio	19	5,004
Oregon	20	5,003
Idaho	21	4,997
New Jersey	22	4,978
Maryland	23	4,975
Colorado	24	4,969
North Carolina	25	4,965
Arkansas	26	4,942
Utah	27	4,940
Kansas	28	4,938
Tennessee	29	4,917
Georgia	30	4,807
Mississippi	31	4,798
Florida	32	4,769
California	33	4,740
Montana	34	4,665
Alabama	35	4,651
Nebraska	36	4,620
Virginia	37	4,593
West Virginia	38	4,523
Hawaii	39	4,516
Connecticut	40	4,504
Arizona	41	4,486
New Mexico	42	4,394
South Dakota	43	4,377
Nevada	44	4,311
Missouri	45	4,287
Illinois	46	4,278
New Hampshire	47	4,223
Louisiana	48	4,172
Massachusetts	49	3,922
Oklahoma	50	3,617
U.S. average		4,948

1. Direct instructional costs for each state include Instruction, Student Services, and Scholarships and Fellowships. Allocatable costs include Libraries, Academic Support, Instructional Support, Plant Operation and Mandatory Transfers. The latter costs are allocated to instruction on the basis of the ratio of each state's direct instructional costs to its total costs, where total costs equal direct instructional costs plus direct noninstructional costs (Public Service and Research).

SOURCE: Data provided by the National Center for Education Statistics, Washington, D.C., February 1985 and September 1986.

A regression model for explaining total instructional cost per FTE student in terms of several important control variables similar to the model detailed above is as follows:²¹

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3$$

where:

Y = total instructional cost per FTE student (\$)

X₁ = average full-time ranked instructional faculty salary (\$)

X₂ = average FTE student enrollment per institution

X₃ = State government appropriations per State population (\$) ²²

b₀, b₁, b₂ and b₃ are regression coefficients to be estimated; ln is natural log.

This regression equation was estimated for the 50 states, using data for fiscal year 1984.²³ The coefficient estimates obtained from the regression are as follows:

<u>Control Variable</u>	<u>Coefficient estimate</u>
ln constant	3.34
ln X ₁	.510
ln X ₂	-.091
ln X ₃	.148

All of the coefficients are statistically significant at the 5 percent level or better and have the expected signs: total instructional cost per FTE student in the public institutions is

²¹In the present regression model, average FTE enrollment per institution (campus) is the size (scale) variable. If average FTE enrollment and average class size tend to be positively correlated within individual institutions, then this model of cost efficiency is conceptually equivalent to the SCH cost model developed above.

²²The X₃ variable, State government appropriations per State population, is a proxy for statewide "preference for higher education"; this variable would not be applicable to intra-state models of cost efficiency.

²³See footnote 18.

positively correlated with both average full-time ranked instructional faculty salary and average public support for higher education, and negatively correlated with average FTE student enrollment per institution. The regression explains about 37 percent of the interstate variation in student cost.

The higher-than-average cost per student in Pennsylvania's public institutions of higher education would appear to be largely explained by two of the three causal variables in the interstate model: average instructional faculty salary is about 5 percent higher, and average FTE student enrollment per institution about 16 percent lower, than the 50 states' average for these same variables.

V. Cost Sharing

For the most part, the instructional costs of Pennsylvania's public universities are covered by tuition and fees collected from students plus monies appropriated directly to the universities by the General Assembly through the General Fund Budget. Of course, tuition and fees are not necessarily borne totally by students; students receive financial assistance from many sources. The Commonwealth gives financial aid to students at its public universities in two forms: grants under the State Higher Education Grant Program, and loans from or student employment by the public universities under various State Matching Fund programs. These financial aid programs, administered by the Pennsylvania Higher Education Assistance Agency and also funded through the General Fund Budget, assist students in paying tuition plus other college-related expenses. PHEAA also administers Federal interest-subsidized and payment-guaranteed loans from private lenders under the State Guaranteed Student Loan and PLUS programs. Properly computed student and public shares of the total cost of instruction at the Commonwealth's public universities must consider all of these factors.

STUDENT TUITION AND FEES

Tuition and Fees for Full-Time Students

Tuition and required fees for students at the State-related universities are determined by the individual institutions. A single tuition for students at the State-owned universities is set by the State System of Higher Education; required fees are set by the individual State-owned institutions.

Department of Education data²⁴ indicate that, for the 1985-86 academic year, tuition and fee charges for in-State full-time undergraduate students at the State-related universities ranged from

²⁴See table 15 for source.

\$1,930 (Lincoln) to \$3,142 (Temple) and in-State full-time graduate students from \$2,300 (Lincoln) to \$3,592 (Pittsburgh). For the State-owned universities, the basic tuition for Pennsylvania residents was \$1,600 for both full-time undergraduate and graduate students; required fees for in-State full-time undergraduates ranged from \$126 (Millersville) to \$270 (Edinboro), and for in-State full-time graduates from \$20 to \$258 (same institutions) (table 15). At Penn State and Pittsburgh, tuition and fees for nonresident full-time students exceeded those for residents by approximately 100 percent. At Temple, the out-of-state premium was 75 percent for full-time undergraduates and 25 percent for full-time graduates. At Lincoln, the out-of-state premiums for the two academic levels were 50 and 65 percent, respectively. At the State-owned institutions, nonresident full-time undergraduate students paid about 70 percent more, but nonresident full-time graduate students only about 10 percent more, than Pennsylvania residents.

Table 15 shows that, from 1984-85 to 1985-86, tuition and fees for full-time undergraduates increased by 8 percent at Penn State, 9 percent at Pittsburgh, 7 percent at Temple and 5 percent (4 percent for nonresidents) at Lincoln. Charges for full-time graduates increased by the same percentages as charges for full-time undergraduates at Penn State and Temple, increased by 11 percent at Pittsburgh and decreased by 1 percent (6 percent for nonresidents) at Lincoln. The one-year increases in tuition for full-time undergraduates and graduates were 2 percent, and for required fees averaged 10 percent, at the State-owned universities.

Tuition and Fee Revenues Collected

Table 16 indicates that during fiscal year 1986, total tuition and fee revenues collected by the public universities were \$537.6 million: \$393.3 million (73 percent) by the State-related universities and \$144.3 million (27 percent) by the State-owned universities. These collections represent one-year increases of 10 percent by the State-related group and 14 percent by the State-owned group.

Table 16 also shows that per FTE student tuition and fee revenues in the State-related institutions ranged from \$2,500 (Lincoln) to \$3,860 (Pittsburgh) and in the State-owned institutions from \$1,690 (California) to \$2,040 (East Stroudsburg). These per student revenues represent one-year increases of 9 percent for the State-related group and 13 percent for the State-owned group.

Table 15

ACADEMIC YEAR TUITION AND REQUIRED FEES FOR FULL-TIME STUDENTS BY LEVEL AND RESIDENCE
1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ¹	Undergraduate						Graduate ²					
	In-State			Out-of-state			In-State			Out-of-state		
	Tuition and required fees	Percentage change		Tuition and required fees	Percentage change		Tuition and required fees	Percentage change		Tuition and required fees	Percentage change	
	One-year	Five-year average		One-year	Five-year average		One-year	Five-year average		One-year	Five-year average	
State-related												
Penn State	\$2,760	8%	14%	\$5,544	8%	14%	\$2,942	8%	14%	\$5,880	8%	14%
Pittsburgh ³	3,010	9	12	5,900	9	12	3,592	11	16	7,102	11	16
Temple ³	3,142	7	10	5,480	7	8	3,458	7	11	4,346	7	2
Lincoln	1,930	5	7	2,930	4	7	2,300	-1	5	3,800	-6	5
Average	2,711	7	11	4,964	7	11	3,073	7	12	5,282	6	9
State-owned												
Indiana	1,824	3	10	3,096	5	10	1,748	2	9	1,930	7	12
West Chester	1,731	2	9	2,999	4	10	1,655	-2	10	1,837	3	13
Bloomsburg	1,744	2	9	3,012	4	10	1,654	2	10	1,836	7	13
Millersville	1,726	2	8	2,994	5	9	1,620	2	9	1,802	7	12
Slippery Rock	1,838	4	11	3,106	6	11	1,838	4	13	2,020	9	16
Kutztown	1,738	2	8	3,006	4	9	1,648	5	9	1,830	10	13
Clarion	1,792	2	9	3,060	4	10	1,741	2	8	1,923	7	11
Shippensburg	1,822	2	9	3,090	4	10	1,730	2	10	1,912	7	13
Edinboro	1,870	6	11	3,138	7	11	1,858	6	11	2,040	10	14
California	1,860	2	10	3,128	4	10	1,782	2	10	1,964	7	13
East Stroudsburg	1,790	3	10	3,058	5	10	1,730	2	11	1,912	8	14
Mansfield	1,785	2	9	3,053	4	10	1,680	2	10	1,862	7	13
Lock Haven	1,765	5	9	3,033	6	10	na	na	na	na	na	na
Cheyney	1,775	3	9	3,043	5	10	1,755	3	9	1,937	8	13
Average	1,790	3	9	3,058	5	10	1,726	2	10	1,908	7	13

1. Arranged in descending order with respect to total full-time equivalent students for 1985-86.
 2. Excludes first professional level.
 3. Average cost for most programs; fees vary with programs.
- na. Not applicable.

SOURCE: Pennsylvania Department of Education, Tuition and Required Fees and Room and Board Charges at Institutions of Higher Education in Pennsylvania, 1980-81 to 1982-83, and Basic Student Charges at Institutions of Higher Education, 1983-84 to 1985-86.

Table 16

TUITION AND FEE REVENUES RELATED TO FTE STUDENTS¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Tuition and fee revenues			Tuition and fee revenues per FTE student			
	Amount (in millions)	One- year	Five-year average	Amount	One-year change	One- year	Five-year average
State-related							
Penn State	\$186.2	11%	20%	\$3,230	\$300	10%	a
Pittsburgh	111.4	9	14	3,860	370	11	15%
Temple	92.6	9	8	3,740	190	5	10
Lincoln	3.1	b	2	2,500	-60	-2	2
Total	393.3	10	15	3,500	290	9	a
State-owned							
Indiana	22.5	15	13	1,770	250	16	12
West Chester	16.8	20	18	1,970	280	17	16
Bloomsburg	11.1	12	14	1,750	140	9	14
Millersville	11.3	13	14	1,820	200	12	11
Slippery Rock	11.2	7	15	1,810	110	6	11
Kutztown	11.0	15	17	1,830	130	8	10
Clarion	10.4	11	14	1,780	140	9	11
Shippensburg	10.6	19	14	1,850	260	16	12
Edinboro	9.8	10	13	1,780	230	15	13
California	8.2	17	18	1,690	210	14	13
East Stroudsburg	8.7	20	15	2,040	330	19	13
Mansfield	5.1	11	17	1,870	230	14	13
Lock Haven	4.9	15	11	1,860	260	16	10
Cheyney	2.7	-14	-1	2,000	180	10	10
Total	144.3	14	14	1,830	210	13	12
All institutions	537.6	11	15	2,810	260	10	a

1. FTE students include in-State and out-of-state undergraduate and graduate students.
2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.
- a. Noncomparable FTE student data.
- b. Rounds to less than 1 percent.

SOURCE: FTE students - reports provided by the individual institutions, 1981 to 1986; tuition and fee revenues - data provided by the individual State-related institutions, 1981 to 1986, the Pennsylvania Department of Education, Bureau of Budget and Management, 1981 to 1983, and the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1986.

COMMONWEALTH APPROPRIATIONS

Direct Appropriations to the Public Universities and the State System of Higher Education

For fiscal year 1986, the Commonwealth's General Fund appropriations to the public universities for educational and general purposes (instruction) totaled \$578.9 million: \$316.6 million (55 percent) directly to the State-related universities and \$262.3 million (45 percent) to the State System of Higher Education for allocation to the State-owned universities (table 17).²⁵ These appropriations represented 97 percent of the total appropriations made by the Commonwealth specifically for instructional purposes to all colleges, universities and other post-secondary institutions in Pennsylvania. Direct appropriations to the State-related universities ranged from \$5.8 million for Lincoln to \$128.3 million for Penn State. SSHE allocations ranged from \$11 million for Lock Haven to \$37.8 million for Indiana.

As shown in table 17, one-year increases in direct appropriations varied considerably by institution, from 5 percent at Lincoln to 9 percent at Pittsburgh. One-year SSHE allocation increases also ranged widely, from 3 percent at California, Cheyney, Mansfield and Shippensburg to 8 percent at West Chester; the average one-year allocation increase for the State-owned group was 6 percent.

Table 17 indicates that direct appropriations per FTE student ranged from \$2,230 at Penn State to \$4,620 at Lincoln. SSHE per student allocations ranged from \$2,970 at Indiana to \$8,450 at Cheyney; the average per student allocation for the State-owned group was \$3,320.

As shown in table 17, one-year increases in direct appropriations per FTE student also varied considerably by institution, from 2 percent at Temple to 10 percent at Pittsburgh. One-year changes in per student allocations ranged from no change at California to a 32 percent increase at Cheyney. Percentage changes in per FTE student appropriations or allocations are approximately equal to percentage changes in total appropriations or allocations (see table 17) minus percentage changes in FTE student enrollments (see table 1).

²⁵Note that the total Commonwealth appropriation to the State System of Higher Education does not include amounts for either the Board of Governors/Chancellor's Office or the System Reserve.

Table 17

STATE APPROPRIATIONS FOR INSTRUCTION RELATED TO FTE STUDENTS¹
 1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Appropriation			Appropriation per FTE student			
	Amount (in millions)	Percentage change One- year	Five-year average	Amount	One-year change	Percentage change One- year	Five-year average
State-related							
Penn State	\$128.3	8%	7%	\$2,230	\$160	8%	a
Pittsburgh ³	88.6	9	8	3,070	290	10	8%
Temple	93.9	6	8	3,800	90	2	10
Lincoln	5.8	5	11	4,620	140	3	10
Total	316.6	7	8	2,810	170	6	a
State-owned							
Indiana	37.8	7	8	2,970	230	8	8
West Chester	27.0	8	6	3,170	130	4	5
Bloomsburg	20.2	6	7	3,190	90	3	7
Millersville	20.0	6	8	3,220	160	5	6
Slippery Rock	19.1	6	5	3,080	170	6	2
Kutztown	17.9	7	7	2,980	-10	b	1
Clarion	18.0	4	5	3,080	60	2	3
Shippensburg	18.0	3	5	3,140	40	1	4
Edinboro	19.2	7	3	3,470	370	12	3
California	16.4	3	2	3,370	0	0	-1
East Stroudsburg	14.9	5	5	3,490	160	5	4
Mansfield	11.3	3	2	4,140	240	6	b
Lock Haven	11.0	4	5	4,190	210	5	4
Cheyney	11.6	3	4	8,450	2,050	32	17
Total ⁴	262.3	6	5	3,320	160	5	4
All institutions ⁴	578.9	7	7	3,020	170	6	a

1. Appropriations include only funding for educational and general purposes.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. Includes appropriation for Titusville campus.

4. Excludes amount of appropriation allocated to Board of Governors/Chancellor's Office and System Reserve.

a. Noncomparable FTE student data.

b. Rounds to less than 1 percent.

SOURCE: FTE students - reports provided by the individual institutions, 1981 to 1986; appropriations - Governor's Executive Budget, 1982-83 and 1986-87, data provided by the Pennsylvania Department of Education, Bureau of Budget and Management, 1981 to 1983, and the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1986.

Appropriations to the Pennsylvania
Higher Education Assistance Agency for
Financial Aid to Public University Students

The Governor's Executive Budget shows that, for fiscal year 1986, Commonwealth appropriations from the General Fund to the Pennsylvania Higher Education Assistance Agency totaled over \$117 million; of this total, PHEAA data²⁶ indicate that about \$37 million, or approximately 31 percent, was used for grant and matching fund programs for students enrolled at Pennsylvania's public universities. The financial aid from PHEAA for fiscal year 1986 to the public universities and their students represented an increase of 9 percent over fiscal year 1985.

During academic year 1985-86, the Pennsylvania Higher Education Assistance Agency awarded over \$22 million (average full-year award \$957) to 25,902 undergraduates (30 percent of the fall undergraduate enrollment) at the State-related universities, and over \$12 million (average award \$648) to 20,420 undergraduates (28 percent of the fall undergraduate enrollment) at the State-owned universities, under the State Higher Education Grant Program. The awards to State-related university students amounted to a little over 25 percent and to State-owned university students about 14 percent of the total dollar value of the grants made to students in all institutions of higher education in Pennsylvania under this grant program. These awards need not be repaid to PHEAA.

During academic year 1985-86 PHEAA disbursed State funds as allocations to institutions and aid to students in the total amounts of \$557,514 to the State-related universities and \$1,194,454 to the State-owned universities under the State Matching Fund Program. These funds were used by the institutions for National Direct Student Loans, nursing student loans, and as matching funds for various work-study programs, internships, etc.

In the same year PHEAA administered federal interest-subsidized and payment-guaranteed loans by private lenders to 46,783 State-related university undergraduate and graduate students (average loan value \$2,366) and 35,371 State-owned university undergraduate and graduate students (average loan value \$1,873), under the State Guaranteed Student Loan Program. Low interest and guaranteed loans to the State-related university students represented about 25 percent and to the State-owned university students about 15 percent of the total dollar value of the guaranteed loans to students in all institutions

²⁶Pennsylvania Higher Education Assistance Agency, Year-By-Year Summary Statistics [for various PHEAA programs], 1986 and data provided by PHEAA.

of higher education in Pennsylvania under this program. In addition, PHEAA administered guaranteed loans to 1,640 State-related university students (average loan value \$2,539) and 938 State-owned university students (average loan value \$2,184) under its PLUS loan program. Under both programs the federal government reimburses lenders for the difference between market rates of interest and the lower rates charged to students, and covers student loan defaults.

COST SHARING

For 1985-86, the ratio of direct Commonwealth appropriations to total revenues from tuition, fees and appropriations was 41 percent at Penn State, 44 percent at Pittsburgh, 50 percent at Temple and 65 percent at Lincoln (table 18). The percentage of direct Commonwealth support was unchanged from the previous year for Penn State and Pittsburgh, but decreased by 2 percent for Temple and increased by 2 percent for Lincoln.

For the same year, the ratio of SSHE allocation to total revenue varied by institution, ranging from 62 percent at Kutztown and West Chester to 81 percent at Cheyney. Allocations to the State-owned universities averaged 64 percent of total revenues, a decrease of 3 percent from 1984-85.

Per FTE student, PHEAA grants and matching funds ranged from \$118 at Kutztown to \$220 at Lincoln. On an FTE student basis, this PHEAA aid averaged 6 percent of tuition and fees at the State-related universities, and 9 percent at the State-owned universities.

COST-SHARING TRENDS

Since 1980-81, the average tuition and fee revenues collected per FTE student has increased by 73 percent at Pittsburgh, 52 percent at Temple and 9 percent at Lincoln, and by an average of 62 percent at the State-owned universities.²⁷ Over the same interval, the average direct Commonwealth educational and general appropriation per FTE student has risen by 40 percent at Pittsburgh, 51 percent at Temple

²⁷Tuition and fee revenues collected in total and on an FTE student basis depend upon the mix of students in several categories at each institution: academic level, attendance status, residence status, etc.

Table 18

TUITION AND FEE REVENUES, STATE APPROPRIATION AND STUDENT AID PER FTE STUDENT¹
1985-86, CHANGE FROM 1984-85 AND FIVE-YEAR AVERAGE ANNUAL RATE OF CHANGE (1980-81 to 1985-86)

Institution ²	Per FTE student			Ratio of Appropriation to total			Student aid per FTE student ³
	Tuition and fee revenues	Appropriation	Total	Percentage	Percentage change		
					One-year	Five-year average	
State-related							
Penn State	\$3,230	\$2,230	\$5,460	41%	0%	a	205
Pittsburgh	3,860	3,070	6,930	44	0	-2%	217
Temple	3,740	3,800	7,540	50	-2	b	211
Lincoln	2,500	4,620	7,120	65	2	2	220
Total	3,500	2,810	6,310	45	0	a	210
State-owned							
Indiana	1,770	2,970	4,740	63	-2	-1	225
West Chester	1,970	3,170	5,140	62	-3	-2	143
Bloomsburg	1,750	3,190	4,940	65	-2	-1	171
Millersville	1,820	3,220	5,040	64	-2	-1	138
Slippery Rock	1,810	3,080	4,890	63	0	-2	174
Kutztown	1,830	2,980	4,810	62	-3	-2	118
Clarion	1,780	3,080	4,860	63	-3	-2	187
Shippensburg	1,850	3,140	4,990	63	-5	-2	143
Edinboro	1,780	3,470	5,250	66	-1	-2	170
California	1,690	3,370	5,060	67	-3	-3	220
East Stroudsburg	2,040	3,490	5,530	63	-5	-2	125
Mansfield	1,870	4,140	6,010	69	-1	-3	195
Lock Haven	1,860	4,190	6,050	69	-3	-1	179
Cheyney	2,000	8,450	10,450	81	4	1	238
Total ⁴	1,830	3,320	5,150	64	-3	-2	172
All institutions	2,810	3,020	5,830	52	-2	a	194

1. FTE students include in-State and out-of-state undergraduate and graduate students. Tuition and fees are based on revenues collected by the individual institutions. State appropriations include only funding for educational and general purposes.

2. Arranged in descending order with respect to total full-time equivalent students for 1985-86.

3. Includes grants and matching funds. Does not include student loans.

4. Appropriations exclude amount allocated to Board of Governors/Chancellor's Office and System Reserve.

a. Noncomparable FTE student data.

b. Rounds to less than 1 percent.

SOURCE: FTE students - reports provided by the individual institutions, 1981 to 1986; tuition and fee revenues - data provided by the individual State-related institutions, 1981 to 1986, the Pennsylvania Department of Education, Bureau of Budget and Management, 1981 to 1983, and the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1986; appropriations - Governor's Executive Budget, 1982-83 and 1986-87, and data provided by the Pennsylvania Department of Education, Bureau of Budget and Management, 1981 to 1983, and the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1986; student aid - 1985-86 Impact Report to College Presidents, Pennsylvania Higher Education Assistance Agency.

and 49 percent at Lincoln; the average SSHE allocation per FTE student has increased by an average of 20 percent at the State-owned institutions.²⁸ The more rapid growth of tuition, relative to per student appropriations, has decreased the share of total revenues from appropriations at most of Pennsylvania's public universities by an average of 1 to 3 percent per year (see table 18).²⁹

Over the same interval, the number of students receiving PHEAA grants decreased from about 34 to about 30 percent of the undergraduate students at the State-related universities, and from about 30 to about 28 percent of these students at the State-owned universities. The average full-year grant amount per student increased to \$957 from \$614 (56 percent), and to \$648 from \$426 (52 percent), respectively, at the two groups of schools. The percentage of total student charges covered by PHEAA grants (tuition, fees, room and board, etc.) remained at about 17 percent over this five-year period.

During the five-year period, PHEAA administered federally guaranteed loans by private lenders (under its largest loan guarantee program) to about 45 percent of the FTE students at the State-related universities and over 49 percent of the FTE students at the State-owned universities. The average loan guarantee amount per FTE student under this program increased to \$2,366 from \$2,138 (11 percent), and to \$1,873 from \$1,752 (7 percent), respectively, for the two groups of institutions.

INTERSTATE COMPARISON OF COST SHARING

Hegis survey data³⁰ show that in fiscal year 1984 the average tuition revenue per FTE student in Pennsylvania's State-related universities (including medical schools), State-owned universities and

²⁸Over the years, "educational and general" appropriations have been expanded to include appropriation categories which had previously been separate line items in the General Fund Budget. In this report, total general and educational appropriations are used for comparisons, as these are available to the institutions for general instructional purposes.

²⁹Comparable FTE student data are not available for Penn State (see footnote 6). Surely, however, per student revenue from appropriations has declined in a similar manner during the past five years at Penn State.

³⁰See table 19 for source.

community colleges was \$2,301, nearly double the U.S. average for all public institutions of higher education (table 20). In 24 states the average tuition for students in all public institutions was higher than the U.S. average. However, in only two states was the average tuition higher than in Pennsylvania.

On the other hand, the Hegis data³¹ show that, for the same year, total Commonwealth and local appropriations (excluding student aid) to these same institutions amounted to \$2,871 per FTE student, considerably less than the U.S. average. Twenty-one states made direct appropriations to public higher education which exceeded the U.S. average on an FTE basis. In only four states was the average per student appropriation less than in Pennsylvania.

Data from a survey made by the National Center for Higher Education Management Systems³² show that the average student aid (grants and matching funds) given directly to students in Pennsylvania's public universities and community colleges in fiscal 1984 amounted to \$140 per FTE student (see table 19). Based on data reported by other states (20 percent of the states did not report student aid), Pennsylvania's aid per student far exceeded the other-states average.

In any comparisons between states, varying institutional mixes (medical schools, research universities, four-year institutions, two-year institutions, etc.) play a large role in determining varying revenues, costs, etc.

On a per FTE student basis, appropriations to all public institutions of higher education in Pennsylvania are considerably lower than, and total instructional costs somewhat higher than, the national averages. Higher-than-average tuition tends to fill the gap.

³¹Ibid.

³²Ibid.

Table 19

TUITION REVENUE, STATE AND LOCAL APPROPRIATIONS AND STUDENT AID PER FTE STUDENT BY STATE
ALL PUBLICLY CONTROLLED INSTITUTIONS OF HIGHER EDUCATION¹
FISCAL YEAR 1984

State	Per FTE student			Percentage of appropriations to total	Student aid per FTE student ²
	Tuition revenue	State and local appropriations	Total		
Alabama	\$1,134	\$3,359	\$4,493	75%	nd
Alaska	1,026	11,516	12,542	92	112
Arizona	1,106	3,299	4,405	75	7
Arkansas	1,099	3,662	4,761	77	nd
California	742	3,782	4,524	84	0
Colorado	1,787	2,987	4,774	63	189
Connecticut	1,209	3,342	4,551	73	71
Delaware	2,251	3,202	5,453	59	nd
Florida	879	3,941	4,820	82	141
Georgia	1,113	4,503	5,616	80	9
Hawaii	630	4,779	5,409	88	212
Idaho	997	3,837	4,834	79	160
Illinois	1,017	3,174	4,191	76	386
Indiana	1,677	3,382	5,059	67	109
Iowa	1,297	4,307	5,604	77	9
Kansas	1,116	3,983	5,099	78	8
Kentucky	1,193	4,714	5,907	80	29
Louisiana	956	3,858	4,814	80	0
Maine	1,620	3,025	4,645	65	0
Maryland	1,443	3,729	5,172	72	0
Massachusetts	1,108	2,758	3,866	71	174
Michigan	1,809	3,049	4,858	63	29
Minnesota	1,344	3,480	4,824	72	266
Mississippi	1,061	3,702	4,763	78	0
Missouri	1,220	2,948	4,168	71	8
Montana	864	3,268	4,132	79	nd
Nebraska	1,135	3,859	4,994	77	0
Nevada	978	2,999	3,977	75	0
New Hampshire	2,530	1,887	4,417	43	5
New Jersey	1,443	3,627	5,070	72	223
New Mexico	820	3,765	4,585	82	71
New York	1,359	4,505	5,864	77	435
North Carolina	707	4,308	5,015	86	49
North Dakota	1,200	3,527	4,727	75	9
Ohio	1,991	3,010	5,001	60	81
Oklahoma	579	3,123	3,702	84	nd
Oregon	1,338	3,665	5,003	73	23
PENNSYLVANIA	2,301	2,871	5,172	56	140
Rhode Island	1,577	3,650	5,227	70	70
South Carolina	1,285	4,276	5,561	77	nd
South Dakota	1,470	2,600	4,070	64	13
Tennessee	1,071	2,992	4,063	74	43
Texas	628	4,623	5,251	88	nd
Utah	1,107	3,788	4,895	77	85
Vermont	4,063	2,142	6,205	35	nd
Virginia	1,408	3,054	4,462	68	58
Washington	1,078	3,633	4,711	77	nd
West Virginia	1,017	3,256	4,273	76	55
Wisconsin	1,304	3,908	5,212	75	245
Wyoming	708	6,606	7,314	90	nd
U.S. average ³	1,192	3,695	4,887	76	nd

1. For Pennsylvania, includes State-related universities (including medical schools), State-owned universities and community colleges.

2. Includes grants and matching funds. Does not include student loans.

3. Includes the District of Columbia, not separately shown.

nd: No data.

SOURCE: Tuition revenues and state and local appropriations - NCES HEGIS XIX: "Financial Statistics of Institutions of Higher Education for Fiscal Year Ending 1984," Washington, D.C.: NCES, 1984; Student aid - special survey of states conducted by NCHES in February 1985 entitled, "Survey of Selected State Funding for Postsecondary Education," Boulder, CO, 1985; all cited by Higher Education Financing in the Fifty States, Interstate Comparison, Fiscal Year 1984, National Center for Higher Education Management System, Inc., Boulder, CO, August 1986.

Appendix A: Model of SCH Cost Determination

Average instructional faculty salary cost per student credit hour, or SCH cost, at each academic level and in each program area can be expressed by the following model:

$$\frac{\text{Instructional FTE faculty salaries}}{\text{Student credit hours}} = \left\{ \frac{\text{Number of FTE instructional faculty}}{\text{Number of courses}} \times \text{Average course credit value} \right\} \times \left\{ \frac{\text{Average FTE instructional faculty salary}}{\text{Number of classes}} \times \text{Average class size} \right\}$$

The two terms on the right-hand side of this equation illustrate the two different kinds of factors which determine SCH cost.

The components of the first term are approximately constants or constant relationships. The number of FTE faculty per course is approximately 0.8 in the State-related universities and approximately 0.5 in the State-owned universities. The average assigned credit per course is very close to three in both types of institutions. In the short run, these components cannot readily be varied by university administrators to influence SCH cost.

The second term in the equation contains control variables: average instructional faculty salary, average class (section) size, and the number of classes (sections) per course. To at least some degree, each of these variables can be controlled by administrators to affect SCH cost. Adjustments in the number of classes (sections) per course are an alternative to permitting average class size to change with changes in enrollment.

This model is the basis for the multiple regression analysis of SCH cost in the text (see pp. 31-36).



Appendix B: Historical Data Tables



Appendix Table 1A

FULL-TIME EQUIVALENT STUDENTS BY LEVEL¹
1980-81 to 1985-86

Institution	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
State-related						
Penn State						
Total	a	a	a	58,369	57,280	57,624
Undergraduate	a	a	a	53,446	52,376	52,438
Graduate	a	a	a	4,923	4,904	5,186
Pittsburgh						
Total	29,011	29,154	29,294	29,329	29,269	28,867
Undergraduate	20,760	20,967	21,152	21,369	21,458	21,292
Graduate	8,251	8,187	8,142	7,960	7,811	7,575
Temple						
Total	26,987	25,408	23,793	23,288	23,995	24,734
Undergraduate	17,852	17,008	16,959	17,216	18,139	18,832
Graduate	9,135	8,400	6,834	6,072	5,856	5,902
Lincoln						
Total	1,217	1,525	1,351	1,314	1,233	1,259
Undergraduate	998	1,300	1,128	1,113	1,094	1,094
Graduate	219	225	223	201	139	165
State-owned						
Bloomsburg						
Total	6,354	6,314	6,183	6,191	6,170	6,343
Undergraduate	5,901	5,944	5,839	5,881	5,854	5,979
Graduate	453	370	344	310	316	364
California						
Total	4,226	4,541	4,370	4,630	4,716	4,859
Undergraduate	3,850	4,193	4,086	4,302	4,352	4,490
Graduate	376	348	284	328	364	369
Cheyney						
Total	2,143	2,080	1,795	1,996	1,760	1,374
Undergraduate	2,078	2,003	1,757	1,923	1,682	1,308
Graduate	65	77	38	73	78	66
Clarion						
Total	5,262	5,493	5,451	5,635	5,726	5,833
Undergraduate	5,034	5,290	5,237	5,397	5,424	5,468
Graduate	228	203	214	238	302	365
East Stroudsburg						
Total	4,090	4,050	4,150	4,188	4,267	4,273
Undergraduate	3,737	3,777	3,891	3,853	3,929	3,878
Graduate	353	273	259	335	338	395
Edinboro						
Total	5,541	5,607	5,613	5,705	5,743	5,516
Undergraduate	5,095	5,213	5,294	5,350	5,413	5,196
Graduate	446	394	319	355	330	320
Indiana						
Total	12,600	12,869	12,935	12,960	12,880	12,730
Undergraduate	11,805	12,139	12,264	12,116	12,092	11,901
Graduate	795	730	671	844	788	829
Kutztown						
Total	4,762	4,965	5,295	5,522	5,605	5,989
Undergraduate	4,474	4,709	5,070	5,298	5,376	5,733
Graduate	288	256	225	224	229	256
Lock Haven						
Total	2,526	2,575	2,567	2,585	2,660	2,628
Undergraduate	2,526	2,575	2,567	2,585	2,660	2,628
Graduate	na	na	na	na	na	na
Mansfield						
Total	2,451	2,554	2,665	2,731	2,808	2,726
Undergraduate	2,312	2,440	2,563	2,630	2,663	2,568
Graduate	139	114	102	101	145	158
Millersville						
Total	5,829	5,947	6,030	6,263	6,176	6,220
Undergraduate	5,189	5,349	5,543	5,791	5,694	5,692
Graduate	640	598	487	472	482	528
Shippensburg						
Total	5,467	5,457	5,488	5,504	5,626	5,729
Undergraduate	4,920	4,937	4,994	4,994	5,111	5,224
Graduate	547	520	494	510	515	505
Slippery Rock						
Total	5,460	5,564	5,654	5,932	6,165	6,196
Undergraduate	5,152	5,281	5,409	5,674	5,868	5,921
Graduate	308	283	245	258	297	275
West Chester						
Total	8,189	8,352	8,647	8,393	8,250	8,535
Undergraduate	7,417	7,661	8,018	7,784	7,573	7,821
Graduate	772	691	629	609	677	714

1. Data for each year represent the summer term preceding the academic year plus the academic year. Full-time equivalent students are calculated by dividing undergraduate student credit hours by 30 and graduate student credit hours by 24. In addition to the master's level, the graduate level for Penn State, Pittsburgh, Temple and Indiana University includes first professional (excluding medical) and/or doctor's levels.

a. In 1983-84, Penn State's data on FTE students were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table 2A

STUDENT CREDIT-HOUR PRODUCTION BY LEVEL¹
TOTAL YEAR AND SUMMER 1980-81 to 1985-86
(in thousands)

Institution	Total year							Summer			
	Lower division	Upper division	Total under-graduate	Master's	First professional	Doctor's	Total graduate	Grand total	Under-graduate	Graduate	Total
State-related											
Penn State²											
1983-84	1,058	546	1,604	54	na	64	118	1,722	105	23	128
1984-85	1,033	538	1,571	54	na	63	117	1,688	95	18	113
1985-86	1,023	550	1,573	62	na	62	124	1,697	95	19	114
Pittsburgh											
1980-81	406	217	623	121	44	33	198	821	72	48	120
1981-82	412	217	629	121	42	33	196	825	74	47	121
1982-83	420	215	635	121	42	33	196	831	75	46	121
1983-84	426	215	641	119	39	33	191	832	75	45	120
1984-85	426	218	644	114	41	33	188	832	71	42	113
1985-86	420	219	639	109	42	31	182	821	69	39	108
Temple											
1980-81	295	241	536	114	97	8	219	755	46	31	77
1981-82	277	233	510	102	93	7	202	712	37	26	63
1982-83	273	236	509	85	66	13	164	673	42	18	60
1983-84	250	267	517	67	56	23	146	663	39	17	56
1984-85	288	257	545	65	52	23	140	685	41	16	57
1985-86	302	263	565	66	52	24	142	707	42	16	58
Lincoln											
1980-81	24	6	30	5	na	na	5	35	4	1	5
1981-82	32	7	39	5	na	na	5	44	5	1	6
1982-83	28	6	34	5	na	na	5	39	3	1	4
1983-84	27	6	33	5	na	na	5	38	3	a	3
1984-85	27	6	33	3	na	na	3	36	3	a	3
1985-86	28	7	33	4	na	na	4	37	2	a	2
State-owned											
Bloomsburg											
1980-81	112	65	177	11	na	na	11	188	15	5	20
1981-82	115	63	178	9	na	na	9	187	15	4	19
1982-83	116	59	175	8	na	na	8	183	14	4	18
1983-84	120	57	177	7	na	na	7	184	15	3	18
1984-85	125	51	176	8	na	na	8	184	13	3	16
1985-86	127	53	180	9	na	na	9	189	14	3	17
California											
1980-81	85	31	116	9	na	na	9	125	11	3	14
1981-82	95	31	126	8	na	na	8	134	14	3	17
1982-83	92	31	123	7	na	na	7	130	9	2	11
1983-84	97	32	129	8	na	na	8	137	10	2	12
1984-85	96	34	130	9	na	na	9	139	9	3	12
1985-86	91	44	135	9	na	na	9	144	9	3	12
Cheyney											
1980-81	46	16	62	2	na	na	2	64	3	1	4
1981-82	44	16	60	2	na	na	2	62	3	a	3
1982-83	40	13	53	1	na	na	1	54	2	a	2
1983-84	45	13	58	2	na	na	2	60	4	a	4
1984-85	39	12	51	2	na	na	2	53	3	a	3
1985-86	30	9	39	2	na	na	2	41	2	a	3
Clarion											
1980-81	112	39	151	5	na	na	5	156	9	2	11
1981-82	117	42	159	5	na	na	5	164	11	2	13
1982-83	116	41	157	5	na	na	5	162	10	1	11
1983-84	122	40	162	6	na	na	6	168	10	1	11
1984-85	121	42	163	7	na	na	7	170	11	2	13
1985-86	119	45	164	9	na	na	9	173	10	2	12
East Stroudsburg											
1980-81	78	34	112	9	na	na	9	121	10	5	15
1981-82	81	32	113	7	na	na	7	120	10	4	14
1982-83	84	33	117	6	na	na	6	123	11	3	14
1983-84	84	31	115	8	na	na	8	123	11	4	15
1984-85	87	31	118	8	na	na	8	126	11	4	15
1985-86	85	31	116	9	na	na	9	125	11	5	16
Edinboro											
1980-81	108	45	153	11	na	na	11	164	12	4	16
1981-82	112	45	157	9	na	na	9	166	11	4	15
1982-83	116	43	159	8	na	na	8	167	11	3	14
1983-84	119	41	160	9	na	na	9	169	10	2	12
1984-85	118	44	162	8	na	na	8	170	11	2	13
1985-86	112	44	156	8	na	na	8	164	10	2	12
Indiana											
1980-81	235	119	354	19	na	b	19	373	33	8	41
1981-82	242	122	364	18	na	b	18	382	33	6	39
1982-83	246	122	368	16	na	b	16	384	34	5	39
1983-84	246	118	364	20	na	b	20	384	34	5	39
1984-85	248	115	363	19	na	b	19	382	33	6	39
1985-86	242	115	357	20	na	b	20	377	32	6	38

Kutztown											
1980-81	91	43	134	7	na	na	7	141	6	3	9
1981-82	95	46	141	6	na	na	6	147	7	2	9
1982-83	103	49	152	5	na	na	5	157	6	2	8
1983-84	106	53	159	5	na	na	5	164	8	2	10
1984-85	110	52	162	6	na	na	6	168	9	2	11
1985-86	117	55	172	6	na	na	6	178	9	2	11
Lock Haven											
1980-81	60	16	76	na	na	na	na	76	3	na	3
1981-82	60	17	77	na	na	na	na	77	3	na	3
1982-83	59	18	77	na	na	na	na	77	3	na	3
1983-84	59	19	78	na	na	na	na	78	3	na	3
1984-85	56	24	80	na	na	na	na	80	3	na	3
1985-86	56	23	79	na	na	na	na	79	3	na	3
Mansfield											
1980-81	50	20	70	3	na	na	3	73	4	2	6
1981-82	54	19	73	3	na	na	3	76	5	1	6
1982-83	57	19	76	2	na	na	2	78	5	1	6
1983-84	59	20	79	2	na	na	2	81	4	1	5
1984-85	59	21	80	3	na	na	3	83	5	1	6
1985-86	55	22	77	4	na	na	4	81	6	1	7
Millersville											
1980-81	124	32	156	15	na	na	15	171	15	9	24
1981-82	128	32	160	14	na	na	14	174	14	9	23
1982-83	133	34	167	12	na	na	12	179	17	6	23
1983-84	138	36	174	11	na	na	11	185	18	7	25
1984-85	134	37	171	12	na	na	12	183	18	7	25
1985-86	131	40	171	13	na	na	13	184	17	8	25
Shippensburg											
1980-81	107	41	148	13	na	na	13	161	11	5	16
1981-82	109	39	148	12	na	na	12	160	10	5	15
1982-83	109	40	149	12	na	na	12	161	10	4	14
1983-84	109	41	150	12	na	na	12	162	10	4	14
1984-85	113	41	154	12	na	na	12	166	10	4	14
1985-86	115	42	157	12	na	na	12	169	10	4	14
Slippery Rock											
1980-81	114	41	155	7	na	na	7	162	9	3	12
1981-82	118	40	158	7	na	na	7	165	9	2	11
1982-83	122	40	162	6	na	na	6	168	11	2	13
1983-84	130	40	170	6	na	na	6	176	11	1	12
1984-85	135	41	176	7	na	na	7	183	11	2	13
1985-86	134	43	177	7	na	na	7	184	11	2	13
West Chester											
1980-81	157	66	223	18	na	na	18	241	19	7	26
1981-82	166	64	230	16	na	na	16	246	18	6	24
1982-83	174	67	241	15	na	na	15	256	19	5	24
1983-84	169	65	234	15	na	na	15	249	19	4	23
1984-85	164	63	227	16	na	na	16	243	17	5	22
1985-86	168	67	235	17	na	na	17	252	18	5	23

1. Data for each year represent the summer term preceding the academic year plus the academic year. The first professional and doctor's level excludes medical school data at all schools.
2. In 1983-84, Penn State's data on student credit hours were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.
 - a. Rounds to less than one thousand student credit hours.
 - b. Included in master's level.
 - na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table 3A
DEGREES CONFERRED BY LEVEL¹
1980-81 to 1985-86

Institution	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
State-related						
Penn State						
Total	9,766	10,088	10,900	9,568	9,955	9,970
Undergraduate	8,024	8,385	9,154	7,997	8,318	8,323
Graduate	1,742	1,703	1,746	1,571	1,637	1,647
Pittsburgh						
Total	6,156	6,153	6,231	6,128	6,118	6,219
Undergraduate	3,485	3,458	3,500	3,439	3,524	3,689
Graduate	2,671	2,695	2,731	2,689	2,594	2,530
Temple						
Total	5,216	5,193	4,994	4,853	4,802	5,008
Undergraduate	3,101	3,028	2,969	2,999	2,982	2,986
Graduate	2,115	2,165	2,025	1,854	1,820	2,022
Lincoln						
Total	249	220	249	194	195	226
Undergraduate	148	146	169	123	126	157
Graduate	101	74	80	71	69	69
State-owned						
Bloomsburg						
Total	1,327	1,367	1,317	1,235	1,203	1,250
Undergraduate	1,088	1,147	1,141	1,084	1,078	1,123
Graduate	239	220	176	151	125	127
California						
Total	825	842	715	725	781	835
Undergraduate	664	687	611	614	643	712
Graduate	161	155	104	111	138	123
Cheyney						
Total	369	340	331	307	306	261
Undergraduate	343	308	296	284	274	241
Graduate	26	32	35	23	32	20
Clarion						
Total	961	981	992	987	1,021	1,023
Undergraduate	834	859	862	857	864	898
Graduate	127	122	130	130	157	125
East Stroudsburg						
Total	767	710	767	763	731	843
Undergraduate	677	626	671	648	649	717
Graduate	90	84	96	115	82	126
Edinboro						
Total	1,012	951	937	929	872	897
Undergraduate	797	763	779	770	768	750
Graduate	215	188	158	159	104	147
Indiana						
Total	2,657	2,570	2,776	2,628	2,493	2,605
Undergraduate	2,217	2,139	2,421	2,280	2,160	2,281
Graduate	440	431	355	348	333	324
Kutztown						
Total	835	869	825	945	983	995
Undergraduate	708	733	723	838	875	874
Graduate	127	136	102	107	108	121
Lock Haven						
Total	401	393	429	455	501	467
Undergraduate	401	393	429	455	501	467
Graduate	na	na	na	na	na	na
Mansfield						
Total	462	440	390	426	468	486
Undergraduate	400	381	353	378	419	404
Graduate	62	59	37	48	49	82
Millersville						
Total	1,085	1,139	1,124	1,150	1,169	1,146
Undergraduate	917	960	976	1,038	1,050	1,024
Graduate	168	179	148	112	119	122
Shippensburg						
Total	1,384	1,353	1,247	1,340	1,328	1,340
Undergraduate	1,017	1,025	934	1,029	979	999
Graduate	367	328	313	311	349	341
Slippery Rock						
Total	1,063	1,066	988	961	1,043	995
Undergraduate	955	931	862	862	933	876
Graduate	108	135	126	99	110	119
West Chester						
Total	1,360	1,360	1,358	1,397	1,190	1,417
Undergraduate	1,063	1,110	1,123	1,175	1,009	1,183
Graduate	297	250	235	222	181	234

1. Data for each year represent the summer term preceding the academic year plus the academic year. Undergraduate degrees include only bachelor's degrees. Graduate degrees include master's at all institutions except Lock Haven which does not have a master's program, first professional (excluding medical) and doctor's at Pittsburgh and Temple, and doctor's at Penn State and Indiana University.
na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table 4A

FULL-TIME EMPLOYED FACULTY AVERAGE WEEKLY STUDENT CONTACT HOURS BY LEVEL¹
1980 to 1985

Institution	Full-time employed faculty head count ²						Undergraduate contact hours						Graduate contact hours					
	1980	1981	1982	1983	1984	1985	1980	1981	1982	1983	1984	1985	1980	1981	1982	1983	1984	1985
State-related																		
Penn State	a	a	a	2,690	2,711	2,676	a	a	a	7.5	7.4	7.3	a	a	a	1.8	1.8	1.9
Pittsburgh	1,530	1,499	1,535	1,542	1,536	1,542	5.2	5.5	5.3	5.1	5.1	5.0	4.3	4.2	3.9	4.1	4.0	4.0
Temple	1,248	1,232	1,211	1,117	1,181	1,161	6.5	5.6	6.2	6.0	6.3	6.3	4.0	3.8	4.2	4.2	3.4	3.4
Lincoln	76	71	69	70	72	77	10.2	11.0	10.8	10.5	10.8	9.7	1.3	1.1	1.2	1.0	.9	1.1
Total	a	a	a	5,419	5,500	5,456	a	a	a	6.6	6.5	6.4	a	a	a	3.0	2.8	2.8
State-owned																		
Bloomsburg	312	312	322	323	326	326	11.0	10.9	10.6	10.8	10.8	10.9	.8	.7	.6	.6	.7	.6
California	284	266	245	243	257	266	10.2	10.0	11.1	9.8	12.1	9.4	.9	.8	.6	.7	1.0	.8
Cheyney	167	166	136	144	145	114	11.5	10.5	9.7	10.3	10.5	9.8	.6	.6	.6	.8	.4	.4
Clarion	302	288	310	302	305	324	10.5	10.8	10.3	10.8	10.6	10.5	.6	.5	.6	.6	.6	.5
East Stroudsburg	220	224	228	227	231	223	10.5	10.3	10.6	11.5	10.4	10.2	.6	.6	.6	.7	.8	.8
Edinboro	341	342	325	314	322	311	11.3	10.9	11.2	11.7	11.8	11.8	1.0	1.0	.8	.9	.9	.8
Indiana	599	613	632	630	659	661	11.8	11.5	11.1	11.5	11.0	11.0	1.0	1.1	1.2	1.2	1.2	1.1
Kutztown	283	282	284	287	298	309	11.7	11.9	11.7	12.0	11.9	11.7	.5	.4	.5	.4	.4	.4
Lock Haven	161	161	170	171	166	166	11.7	11.7	11.3	11.7	11.6	11.4	na	na	na	na	na	na
Mansfield	158	162	169	158	166	182	10.2	10.1	11.9	12.0	11.8	9.6	.5	.4	.5	.5	1.1	.6
Millersville	291	289	290	292	292	294	10.8	11.1	11.1	10.9	10.9	10.9	.7	.7	.4	.6	.5	.5
Shippensburg	292	289	293	295	292	291	9.2	9.2	9.0	9.8	9.6	9.5	1.0	.8	.9	1.0	.9	.9
Slippery Rock	315	323	319	318	331	334	a	11.5	11.4	11.4	11.4	11.2	a	.6	.6	.5	.5	.6
West Chester	467	453	452	468	467	474	10.9	10.9	10.3	10.7	10.6	10.7	1.1	1.1	1.1	1.0	1.2	1.1
Total ³	4,192	4,170	4,175	4,172	4,257	4,275	10.9	10.9	10.8	11.1	11.0	10.7	.8	.8	.7	.8	.8	.7
All institutions	a	a	a	9,591	9,757	9,731	a	a	a	8.5	8.5	8.3	a	a	a	2.0	1.9	1.9

1. Average calculated using only those full-time employed faculty in the fall who reported a complete workweek of 100 hours or less.

2. The number of full-time employed faculty represents those reported by each school for the fall term.

3. Contact hours exclude Slippery Rock for 1980.

a. Noncomparable data.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table SA

AVERAGE INSTRUCTIONAL SALARIES OF FULL-TIME EQUIVALENT INSTRUCTIONAL FACULTY BY RANK¹
 1980-81 to 1985-86
 (Dollars in thousands)

Institution	Number of FTE instructional faculty	Average instructional salaries					No rank ²
		All faculty	Professor	Associate professor	Assistant professor	Instructor	
State-related							
Penn State³							
1983-84	3,056	\$25.0	\$38.5	\$29.3	\$23.5	\$17.2	\$18.9
1984-85	3,136	26.0	41.6	31.5	24.9	18.0	19.2
1985-86	3,146	27.2	44.3	33.7	26.5	18.2	19.7
Pittsburgh							
1980-81	1,832	20.8	30.8	22.2	17.5	12.4	18.4
1981-82	1,824	22.7	33.6	24.4	19.0	13.1	20.3
1982-83	1,849	24.2	36.1	25.7	20.4	14.0	21.1
1983-84	1,831	25.3	37.9	26.8	21.5	14.2	22.0
1984-85	1,815	26.8	40.3	28.4	22.7	14.7	23.2
1985-86	1,783	28.0	41.8	30.0	23.9	15.6	23.6
Temple							
1980-81	1,741	21.3	33.6	24.9	17.9	10.3	10.3
1981-82	1,666	22.0	34.7	25.6	19.6	11.6	9.7
1982-83	1,617	23.1	32.0	24.5	18.3	13.7	16.7
1983-84	1,522	24.7	34.9	26.3	20.4	12.5	18.7
1984-85	1,545	26.2	36.9	28.9	23.9	13.1	15.3
1985-86	1,563	27.2	39.0	31.0	25.0	14.1	14.5
Lincoln							
1980-81	95	17.3	22.7	19.0	16.7	14.2	13.5
1981-82	97	17.7	26.0	19.9	16.0	15.2	13.1
1982-83	93	18.4	23.2	21.0	17.4	16.0	13.5
1983-84	99	18.2	23.9	21.7	17.4	14.5	15.8
1984-85	103	19.3	27.0	23.1	17.7	15.5	17.7
1985-86	95	21.3	28.7	24.9	20.4	18.3	14.5
State-owned							
Bloomsburg							
1980-81	335	23.6	29.0	24.0	18.4	13.9	na
1981-82	336	25.1	30.9	25.6	20.0	15.5	na
1982-83	337	26.2	33.1	26.9	21.0	16.9	na
1983-84	347	27.2	34.1	27.6	21.8	18.1	na
1984-85	335	28.2	34.9	29.1	22.8	19.2	na
1985-86	339	30.1	37.7	30.9	25.1	20.1	na
California							
1980-81	264	26.8	30.4	25.3	20.7	16.9	27.4
1981-82	241	28.5	32.3	26.4	22.8	18.6	30.7
1982-83	240	29.7	33.4	27.7	24.1	19.9	33.0
1983-84	240	30.0	34.7	28.6	23.8	16.5	32.8
1984-85	245	31.3	36.3	30.4	24.9	18.4	35.5
1985-86	260	31.7	37.2	30.9	25.2	17.7	29.7
Cheyney							
1980-81	163	a	a	a	a	a	a
1981-82	144	27.5	32.5	26.8	22.8	18.2	9.6
1982-83	136	29.4	34.5	28.0	24.1	19.8	na
1983-84	137	29.3	33.5	28.6	26.2	22.5	21.7
1984-85	144	30.2	35.1	29.2	26.4	21.0	34.1
1985-86	136	34.7	40.7	33.7	26.3	23.8	24.6
Clarion							
1980-81	288	24.4	30.1	24.3	20.2	15.2	30.1
1981-82	289	25.5	31.7	25.6	21.0	16.8	28.5
1982-83	293	26.9	33.5	27.6	22.0	15.9	31.1
1983-84	298	27.7	34.5	28.1	22.6	17.8	33.6
1984-85	294	28.6	34.8	29.3	23.5	19.5	20.1
1985-86	305	29.4	35.8	30.5	24.2	18.9	24.4
East Stroudsburg							
1980-81	216	24.2	29.3	23.5	19.2	10.5	35.0
1981-82	223	25.8	30.5	25.1	20.5	14.1	31.9
1982-83	226	27.7	32.7	26.6	22.2	14.2	34.6
1983-84	232	28.2	32.8	27.1	21.8	13.1	25.4
1984-85	247	28.1	33.1	26.6	22.5	16.4	29.4
1985-86	246	29.3	34.6	28.3	24.1	15.2	na
Edinboro							
1980-81	334	25.3	29.4	24.8	20.5	19.1	23.9
1981-82	340	27.0	31.8	26.2	22.0	18.2	na
1982-83	322	29.2	33.9	28.2	23.5	17.9	28.4
1983-84	317	29.3	34.0	28.3	23.5	18.7	21.2
1984-85	322	30.8	35.4	29.7	24.7	18.7	29.9
1985-86	319	32.1	36.9	30.7	25.6	20.8	31.4
Indiana							
1980-81	649	24.0	28.7	23.1	19.4	15.8	17.5
1981-82	681	25.3	29.9	25.0	20.6	18.6	20.0
1982-83	650	27.5	32.9	26.9	22.7	19.6	14.7
1983-84	661	26.9	32.4	27.0	22.5	15.9	19.2
1984-85	679	27.7	33.8	28.4	22.9	16.6	21.1
1985-86	664	29.3	35.9	29.8	24.7	17.2	28.1

Kutztown							
1980-81	265	26.1	30.7	26.2	21.2	16.3	28.8
1981-82	268	27.7	32.8	27.0	22.1	18.2	25.0
1982-83	269	29.0	35.0	28.8	23.6	19.2	10.3
1983-84	283	29.0	34.7	28.2	23.3	19.4	25.9
1984-85	306	29.5	35.9	29.3	24.0	18.9	31.5
1985-86	317	31.2	37.9	30.7	24.9	20.0	43.4
Lock Haven							
1980-81	146	25.7	31.0	25.1	20.5	15.6	na
1981-82	147	27.6	32.9	26.8	22.3	17.0	32.9
1982-83	149	29.8	35.0	28.9	23.0	19.1	45.9
1983-84	153	30.2	35.3	30.0	24.4	20.5	28.0
1984-85	151	31.7	36.9	30.4	24.4	21.5	30.5
1985-86	151	33.0	39.1	31.4	25.7	20.6	19.6
Mansfield							
1980-81	154	25.2	31.4	26.5	20.8	15.0	na
1981-82	160	25.9	33.1	27.0	22.0	16.0	na
1982-83	163	27.4	35.1	28.6	22.8	15.9	na
1983-84	155	28.2	35.2	29.4	23.2	19.1	na
1984-85	168	28.5	36.8	29.2	23.1	17.8	na
1985-86	165	29.7	37.8	30.7	24.2	17.1	na
Millersville							
1980-81	b	b	b	b	b	b	b
1981-82	318	25.1	30.2	24.8	20.3	14.9	16.2
1982-83	321	26.7	32.1	26.4	22.0	16.2	28.6
1983-84	324	27.0	32.6	27.2	22.0	17.4	30.9
1984-85	327	28.0	34.0	27.9	23.2	19.0	47.6
1985-86	330	29.1	35.5	29.7	23.8	18.5	24.0
Shippensburg							
1980-81	284	25.0	30.0	24.5	20.2	16.5	23.8
1981-82	287	26.5	31.6	25.9	21.3	17.5	na
1982-83	286	28.7	34.1	28.1	23.1	20.6	29.6
1983-84	286	29.2	34.9	28.1	23.0	17.8	35.9
1984-85	290	30.2	36.0	29.0	23.9	19.5	34.2
1985-86	292	32.2	38.3	31.1	25.4	19.6	42.1
Slippery Rock							
1980-81	295	24.9	30.0	24.9	19.9	16.2	22.4
1981-82	306	26.7	31.7	26.8	21.6	17.2	23.4
1982-83	301	29.0	34.7	28.3	23.1	18.6	41.1
1983-84	315	28.2	33.7	27.5	22.4	19.7	24.9
1984-85	324	29.5	35.3	29.4	23.7	19.0	22.3
1985-86	326	30.4	36.9	29.5	24.4	22.6	29.0
West Chester							
1980-81	468	24.0	29.4	24.4	19.8	15.0	25.7
1981-82	458	25.5	31.3	25.9	21.0	15.7	27.0
1982-83	460	27.1	33.3	27.6	22.6	16.8	35.9
1983-84	465	27.7	35.0	28.5	22.9	16.6	32.4
1984-85	465	28.8	36.3	29.7	23.6	17.5	36.5
1985-86	477	30.0	38.3	31.2	24.7	18.3	31.8

1. Average instructional salary is calculated by dividing the total instructional salary paid to all staff members in the respective rank categories by their total full-time equivalency in the instructional function. One full-time equivalent faculty represents one full-time workload for two terms (one academic year). The summer term is treated as one term or one-half the academic year. Data for each year represent the summer term preceding the academic year plus the academic year.

2. The full-time equivalency of nonranked faculty members is based on the time spent in instruction by all nonranked personnel, including lecturers, administrators, librarians, research staff and graduate assistants.

3. In 1983-84, Penn State's data on instructional faculty and instructional salaries were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

a. No data.

b. Noncomparable data.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table 6A

AVERAGE INSTRUCTIONAL FACULTY SALARY COST PER STUDENT CREDIT HOUR BY LEVEL¹
1980-81 to 1985-86

Institution	Total undergraduate						Lower division						Upper division						Master's					
	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
State-related																								
Penn State	a	a	a	\$34	\$36	\$38	a	a	a	\$28	\$31	\$32	a	a	a	\$45	\$47	\$50	a	a	a	\$90	\$98	\$99
Pittsburgh	\$32	\$35	\$38	38	38	42	\$24	\$25	\$29	29	28	31	\$48	\$53	\$55	57	58	62	\$96	\$104	\$110	114	129	132
Temple	41	41	44	43	44	47	33	32	36	36	37	39	50	51	54	51	52	55	88	95	101	90	95	94
Lincoln	46	38	42	46	53	53	38	31	34	39	44	45	78	67	77	79	92	84	48	48	54	55	72	72
Total	a	a	a	37	39	41	a	a	a	30	31	33	a	a	a	49	51	54	a	a	a	101	112	112
State-owned																								
Bloomsburg	41	44	46	49	50	53	36	37	39	41	42	44	49	55	60	66	69	74	62	75	83	106	88	86
California	53	47	51	48	51	53	46	39	42	39	42	42	72	70	76	74	76	74	107	117	136	131	123	129
Cheyney	b	61	70	64	79	109	b	55	59	54	67	93	b	78	105	100	118	161	b	157	308	180	188	282
Clarion	42	42	45	46	46	50	37	36	38	38	39	41	57	60	66	69	67	73	120	146	147	139	118	93
East Stroudsburg	43	47	50	52	54	56	34	37	39	41	45	44	62	73	77	79	78	89	52	65	72	69	75	74
Edinboro	49	52	53	52	54	60	41	44	45	45	48	53	66	73	74	72	72	78	96	107	128	117	141	112
Indiana	38	40	42	42	44	46	29	31	33	31	34	36	56	59	60	63	65	67	112	146	158	127	149	153
Kutztown	47	49	48	48	53	54	34	36	36	35	39	39	75	75	75	74	81	87	79	82	93	99	93	99
Lock Haven	50	53	58	60	60	63	42	46	50	50	48	53	78	77	85	89	87	88	na	na	na	na	na	na
Mansfield	53	54	54	52	54	57	39	39	39	36	39	41	88	94	100	97	96	99	68	85	129	120	130	132
Millersville	42	43	46	45	48	51	35	37	39	37	39	41	68	69	71	74	79	83	60	71	80	81	84	76
Shippensburg	41	44	47	47	49	52	37	38	42	42	44	46	52	58	60	61	64	69	79	91	103	102	98	106
Slippery Rock	43	47	50	48	50	51	37	39	42	39	41	42	61	71	73	76	79	79	96	105	118	115	114	122
West Chester	43	43	45	48	52	53	34	33	34	39	42	43	64	69	72	71	76	78	91	104	115	111	105	112
Total ²	44	46	48	48	51	53	36	37	39	39	42	43	62	67	70	72	74	78	86	102	116	111	113	112
All institutions	a	a	a	42	44	46	a	a	a	34	36	38	a	a	a	57	60	63	a	a	a	104	112	112

1. The instructional faculty salary cost per student credit hour for each level was calculated as follows: the instructional salary for each rank was assigned by level according to the percentage distribution of the course (assigned) credits within each rank. The salary determined by this method for each rank was summed by level and divided by the total student credit-hour production at that level. In the case of individual instruction, one course credit was attributed to every three student credit hours produced in individual instruction.

2. Excludes Cheyney for 1980-81.

a. In 1983-84, Penn State's data on instructional salaries and student credit hours were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

b. No data.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table 7A

AVERAGE CLASS SIZE IN CLASSROOM INSTRUCTION BY LEVEL¹
1980-81 to 1985-86

Institution	Total undergraduate						Lower division						Upper division						Master's					
	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
State-related																								
Penn State	a	a	a	30	29	30	a	a	a	30	29	30	a	a	a	30	30	30	a	a	a	11	12	15
Pittsburgh	27	27	27	27	27	27	29	30	30	29	29	29	24	24	24	24	23	23	17	18	17	17	16	16
Temple	b	21	22	24	23	23	b	23	24	26	25	25	b	19	19	22	21	21	b	13	12	13	13	13
Lincoln	16	18	17	16	15	16	19	22	21	18	18	18	9	10	9	10	9	11	14	14	14	12	11	12
Total	b	b	b	28	27	27	b	b	b	29	28	29	b	b	b	26	25	26	b	b	b	14	14	14
State-owned																								
Bloomsburg	23	23	22	23	23	20	26	27	25	26	26	23	19	19	18	18	19	16	13	13	12	11	13	13
California	20	23	23	24	24	24	23	27	27	28	28	29	15	16	15	16	16	17	10	9	8	8	9	9
Cheyney	18	19	18	19	15	14	23	21	21	22	17	16	11	15	13	12	10	10	7	9	6	8	8	7
Clarion	27	29	28	28	29	27	31	35	34	34	33	33	19	19	19	18	20	19	8	8	9	9	12	14
East Stroudsburg	25	24	25	24	24	24	30	29	29	29	28	28	18	17	18	17	17	16	16	14	12	15	14	15
Edinboro	21	21	22	22	22	22	23	24	25	25	25	24	16	15	16	16	16	17	10	9	8	8	8	11
Indiana	24	24	25	25	24	24	31	30	31	31	30	30	16	17	18	17	17	17	8	6	6	8	7	7
Kutztown	23	24	25	25	21	22	32	32	34	33	27	29	15	16	16	17	13	14	15	15	13	11	10	11
Lock Haven	23	24	23	23	23	23	27	27	26	26	27	27	16	17	17	16	18	18	na	na	na	na	na	na
Mansfield	20	19	18	19	18	18	27	27	26	27	25	26	12	11	9	10	10	10	14	13	7	7	7	7
Millersville	23	24	24	23	22	21	27	28	27	27	26	26	15	16	16	14	14	13	14	13	13	11	12	13
Shippensburg	26	25	25	25	25	26	28	28	28	27	28	28	22	20	21	21	21	21	13	13	11	13	14	14
Slippery Rock	24	23	24	24	24	23	28	28	29	30	30	29	17	15	16	15	15	15	11	10	10	11	11	11
West Chester	b	20	20	21	21	21	b	26	27	25	24	25	b	12	12	15	15	15	b	7	7	10	10	10
Total	22	23	23	23	23	22	27	28	28	28	27	27	16	16	16	16	16	16	11	9	9	10	10	10
All institutions	b	b	b	26	25	25	b	b	b	29	28	28	b	b	b	21	21	21	b	b	b	12	12	13

1. Average class size for each level is calculated by dividing total classroom student credit hours by total classroom assigned credits.

a. In 1983-84, Penn State's data on classroom student credit hours and classroom assigned credits were affected by two major reporting changes: a change in the university's academic calendar (to two semesters from three terms in the academic year, and to a shorter summer term); and improved data collection procedures, which permitted the first-time inclusion of activities related to the university's continuing education credit program. Since then Penn State's data are comparable to current year data from the other institutions, but are noncomparable to prior years' data from Penn State and the other institutions.

b. Noncomparable data.

na. Not applicable.

SOURCE: Reports provided by the individual institutions, 1981 to 1986.

Appendix Table BA

TUITION AND REQUIRED FEES FOR FULL-TIME STUDENTS BY LEVEL AND RESIDENCE
1980-81 to 1985-86

Institution	Undergraduate		Graduate	
	In-State	Out-of-State	In-State	Out-of-State
State-related				
Penn State				
Main Campus				
1980-81	\$1,641	\$3,297	\$1,749	\$3,498
1981-82	1,848	3,711	1,968	3,936
1982-83	2,118	4,254	2,256	4,512
1983-84	2,312	4,644	2,464	4,926
1984-85	2,562	5,146	2,730	5,458
1985-86	2,760	5,544	2,942	5,880
Pittsburgh				
Main Campus				
1980-81	1,880	3,670	1,986	3,926
1981-82	2,060	4,030	2,216	4,386
1982-83	2,318	4,528	2,624	5,184
1983-84	2,528	4,948	2,954	5,844
1984-85	2,758	5,408	3,240	6,410
1985-86	3,010	5,900	3,592	7,102
Temple				
1980-81	2,068	3,854	2,248	3,984
1981-82	2,382	4,440	2,640	3,528
1982-83	2,616	4,800	2,904	3,720
1983-84	2,802	4,986	3,048	3,864
1984-85	2,940	5,124	3,242	4,058
1985-86	3,142	5,480	3,458	4,346
Lincoln				
1980-81	1,450	2,150	1,820	3,020
1981-82	1,450	2,150	1,820	3,020
1982-83	1,750	2,750	1,820	3,020
1983-84	1,830	2,830	2,200	3,700
1984-85	1,830	2,830	2,325	4,025
1985-86	1,930	2,930	2,300	3,800
State-owned				
Bloomsburg				
1980-81	1,192	2,022	1,120	1,120
1981-82	1,352	2,292	1,270	1,270
1982-83	1,582	2,692	1,500	1,500
1983-84	1,606	2,716	1,524	1,524
1984-85	1,714	2,892	1,624	1,714
1985-86	1,744	3,012	1,654	1,836
California				
1980-81	1,242	2,072	1,176	1,176
1981-82	1,392	2,332	1,326	1,326
1982-83	1,654	2,764	1,584	1,584
1983-84	1,724	2,834	1,654	1,654
1984-85	1,830	3,008	1,752	1,842
1985-86	1,860	3,128	1,782	1,964
Cheyney				
1980-81	1,210	2,040	1,190	1,190
1981-82	1,380	2,320	1,360	1,360
1982-83	1,640	2,750	1,620	1,620
1983-84	1,644	2,754	1,624	1,624
1984-85	1,730	2,908	1,710	1,800
1985-86	1,775	3,043	1,755	1,937
Clarion				
Main Campus				
1980-81	1,230	2,060	1,230	1,230
1981-82	1,410	2,350	1,370	1,370
1982-83	1,642	2,752	1,600	1,600
1983-84	1,648	2,758	1,600	1,600
1984-85	1,758	2,936	1,710	1,800
1985-86	1,792	3,060	1,741	1,923
East Stroudsburg				
1980-81	1,210	2,040	1,120	1,120
1981-82	1,358	2,298	1,270	1,270
1982-83	1,650	2,760	1,550	1,550
1983-84	1,654	2,764	1,500	1,500
1984-85	1,744	2,922	1,688	1,778
1985-86	1,790	3,058	1,730	1,912
Edinboro				
1980-81	1,206	2,036	1,206	1,206
1981-82	1,398	2,338	1,398	1,398
1982-83	1,628	2,738	1,628	1,628
1983-84	1,648	2,758	1,648	1,648
1984-85	1,758	2,936	1,758	1,848
1985-86	1,870	3,138	1,858	2,040
Indiana				
1980-81	1,230	2,060	1,189	1,189
1981-82	1,395	2,335	1,349	1,349
1982-83	1,632	2,742	1,584	1,584
1983-84	1,654	2,764	1,600	1,600
1984-85	1,778	2,956	1,710	1,800
1985-86	1,824	3,096	1,748	1,930

Kutztown				
1980-81	1,220	2,050	1,120	1,120
1981-82	1,367	2,307	1,255	1,255
1982-83	1,594	2,704	1,480	1,480
1983-84	1,604	2,714	1,480	1,480
1984-85	1,708	2,886	1,570	1,660
1985-86	1,738	3,006	1,648	1,830
Lock Haven				
1980-81	1,222	2,052	na	na
1981-82	1,372	2,312	na	na
1982-83	1,604	2,714	na	na
1983-84	1,604	2,714	na	na
1984-85	1,675	2,853	na	na
1985-86	1,765	3,033	na	na
Mansfield				
1980-81	1,216	2,046	1,124	1,124
1981-82	1,366	2,306	1,274	1,274
1982-83	1,673	2,783	1,564	1,564
1983-84	1,673	2,783	1,564	1,564
1984-85	1,755	2,933	1,650	1,740
1985-86	1,785	3,053	1,680	1,862
Hillsville				
1980-81	1,212	2,042	1,120	1,120
1981-82	1,362	2,302	1,270	1,270
1982-83	1,598	2,708	1,500	1,500
1983-84	1,598	2,708	1,500	1,500
1984-85	1,686	2,864	1,590	1,680
1985-86	1,726	2,994	1,620	1,802
Shippensburg				
1980-81	1,254	2,084	1,170	1,170
1981-82	1,414	2,354	1,320	1,320
1982-83	1,646	2,756	1,550	1,550
1983-84	1,686	2,796	1,590	1,590
1984-85	1,782	2,960	1,690	1,780
1985-86	1,822	3,090	1,730	1,912
Slippery Rock				
1980-81	1,198	2,028	1,120	1,120
1981-82	1,400	2,340	1,320	1,320
1982-83	1,668	2,778	1,570	1,570
1983-84	1,680	2,790	1,676	1,676
1984-85	1,766	2,944	1,766	1,856
1985-86	1,838	3,106	1,838	2,020
West Chester				
1980-81	1,200	2,030	1,120	1,120
1981-82	1,374	2,314	1,270	1,270
1982-83	1,604	2,714	1,500	1,500
1983-84	1,606	2,716	1,500	1,500
1984-85	1,694	2,872	1,694	1,784
1985-86	1,731	2,999	1,655	1,837

1. Average cost for most programs; fees vary with program.
na. Not applicable.

SOURCE: Pennsylvania Department of Higher Education, tuition and Required Fees and Room and Board Charges at Institutions of Higher Education in Pennsylvania, 1980-81 to 1982-83 and Basic Student Charges at Institutions of Higher Education, 1983-84 to 1985-86.

Appendix Table 9A

STATE APPROPRIATIONS¹
1980-81 to 1985-86
(in millions)

Institution	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
State-related						
Penn State	\$96.5	\$100.7	\$106.6	\$110.8	\$118.6	\$128.3
Pittsburgh ²	66.4	69.2	73.2	76.0	81.5	88.6
Temple	70.9	73.9	78.2	81.2	89.0	93.9
Lincoln	3.9	4.1	4.4	4.6	5.5	5.8
Total	237.7	247.9	262.4	272.6	294.6	316.6
State-owned						
Bloomsburg	15.2	16.0	17.8	17.8	19.2	20.2
California	15.0	14.9	15.1	15.1	15.9	16.4
Cheyney	9.7	10.4	10.7	10.7	11.3	11.6
Clarion	14.4	15.3	16.4	16.4	17.3	18.0
East Stroudsburg	11.9	12.6	13.4	13.4	14.2	14.9
Edinboro	17.0	16.6	16.6	16.6	17.8	19.2
Indiana	26.6	28.9	31.9	32.0	35.2	37.8
Kutztown	13.3	14.1	15.4	15.4	16.8	17.9
Lock Haven	8.9	9.4	10.0	10.0	10.6	11.0
Mansfield	10.4	10.4	10.4	10.4	11.0	11.3
Millersville	14.5	15.4	17.4	17.4	18.9	20.0
Shippensburg	14.2	15.1	16.5	16.5	17.4	18.0
Slippery Rock	15.2	16.1	16.2	16.3	17.9	19.1
West Chester	20.8	22.1	22.6	22.8	25.1	27.0
Total ³	207.1	217.3	230.4	230.8	248.6	262.4
All institutions ³	444.8	465.2	492.8	503.4	543.2	579.0

1. Appropriations include only funding for educational and general purposes.

2. Includes appropriation for Titusville campus.

3. Excludes amount of appropriation allocated to Board of Governors/
Chancellor's Office and System Reserve.

SOURCE: Governor's Executive Budget, 1982-83, 1983-84, 1984-85, 1985-86 and 1986-87; Pennsylvania Department of Education, Bureau of Budget and Management, 1981 to 1983; data furnished by the State System of Higher Education, Commonwealth of Pennsylvania, 1984 to 1986.